

## CONTRACT FOR CONSTRUCTION

**THIS CONTRACT FOR CONSTRUCTION (“Contract”)** is made and entered into as of the date stated on the City’s signature page below (the **“Effective Date”**) by and between the **CITY AND COUNTY OF DENVER**, a municipal corporation of the State of Colorado acting on behalf of its Department of Aviation (the **“City”**), and **THYSSENKRUPP ELEVATOR CORPORATION**, a Delaware corporation authorized to do business in the State of Colorado (**“Contractor ”**) (collectively the **“Parties”**).

### WITNESSETH

**WHEREAS**, the City conducted an Informal Competitive Procurement, for Contract No. 201952239, ON-CALL PASSENGER CONVEYANCE MODERNIZATION at Denver International Airport (**“DEN”**); and

**WHEREAS**, a proposal in response to said Informal Competitive Procurement was received by the Chief Executive Officer of DEN (the **“CEO”**), who has recommended that a contract for the work be made and entered into with Contractor, which was the lowest, responsive, qualified proposer; and

**WHEREAS**, Contractor is qualified, willing, and able to perform the work in accordance with its proposal and the Contract Documents defined below;

**NOW, THEREFORE**, for and in consideration of the compensation to be paid by the City to Contractor and subject to the terms of this Contracts, the Parties agree as follows:

### ARTICLE I. CONTRACT DOCUMENTS

It is agreed by the Parties that the instruments, drawings, and documents described below and whether attached to and bound with this Contract or not (the **“Contract Documents”**), are incorporated into the Contract by this reference, and are as fully a part of this Contract as if they were set out here verbatim and in full:

- Contract
- Request for Proposals
- Notice to Proceed
- Form of Final Receipt
- Building Information Modeling (**“BIM”**) if applicable
- Change Directives
- Change Orders
- Exhibit A Federal Appendices
- Exhibit B Equal Employment Opportunity Provisions
- Exhibit C Insurance Requirements

- Exhibit D Prevailing Wage Schedules
- Exhibit E Special Conditions
- Exhibit F Standard Specifications for Construction General Contract Conditions (2011 Edition) (the “Yellow Book”) (“General Conditions”) (Table of Contents attached as Exhibit F)
- Exhibit G Payment and Performance
- Exhibit I Technical Specifications
- Exhibit J Contract Drawings
- Exhibit K Contractor’s Response to Request for Proposal and Forms

In the event of an irreconcilable conflict between a provision of Articles 1 through XXXV of this Contract document and any other provisions of the Contract Documents such that it is impossible to give effect to both, the order of precedence to determine which document shall control to resolve such conflict is as follows, in descending order:

1. Exhibit A Federal Appendices
2. Contract
3. Exhibit K Request for Proposals & Contractor’s Response to Request for Proposal and Forms
4. Change Directives
5. Change Orders
6. Exhibit B Equal Employment Opportunity Provisions
7. Exhibit E Special Conditions
8. Exhibit F Standard Specifications for Construction General Contract Condition (2011 Edition) (the “Yellow Book”) (“General Conditions”) (Table of Contents attached as Exhibit F)
9. Exhibit C Insurance Requirements
10. Exhibit D Prevailing Wage Schedules
11. Exhibit I Technical Specifications
12. Exhibit J Contract Drawings
13. Exhibit G Payment and Performance Bond
14. Notice to Proceed
15. Form of Final Receipt
16. Building Information Modeling (“BIM”) if applicable

The remaining order of precedence is established in General Conditions Title 4.

## ARTICLE II. SCOPE OF WORK

Contractor shall furnish all labor and tools, supplies, equipment, superintendence, materials, and everything necessary for and required to do, perform, and complete all of the work described, drawn, set forth, shown, and included in the Contract Documents (the “**Work**”).

## ARTICLE III. TERM OF CONTRACT

The Senior Vice President of Airport Infrastructure Management will issue a written notice to proceed to Contractor (the “**Notice to Proceed**”), and Contractor shall begin performing the Work required under this Contract within ten (10) days of such Notice to Proceed (the “**Commencement Date**”). Contractor shall fully complete the Work in its entirety within Five (5) years from the date of the Notice to Proceed (“**Contract Time**”). Contractor is not authorized to commence work prior to its receipt of the Notice to Proceed.

## ARTICLE IV. TERMS OF PAYMENT

**A.** The City agrees to pay Contractor for the performance and completion of all of the Work as required by the Scope of Work and the Contract Documents associated with each authorized Task Order. In no event will the City’s liability exceed the Maximum Contract Amount specified herein.

**B.** The maximum amount to be paid by the City to the Contractor for satisfactory completion of all Task Orders authorized by the City and performed by the Contractor under this Contract shall in no event exceed **Forty Million Dollars and Zero Cents (\$40,000,000.00)**, unless the Contract is modified to increase said amount by a duly authorized, written contract amendment mutually agreeable to and executed by the parties hereto. The Parties specifically agree that any performance by Contractor hereunder shall not subject the City to any cost, charge, or fee not specified above.

## ARTICLE V. VERIFIED STATEMENT OF CLAIMS

Colorado Revised Statutes § 38-26-107 (“**C.R.S.**”) requires that, in the event any person or company files a verified statement of amounts due and unpaid in connection with a claim for labor and materials supplied on this project, the City shall withhold from payments to Contractor sufficient funds to ensure the payment of any such claims. Should the City be made a party to any lawsuit to enforce such unpaid claims or any lawsuit arising out of or relating to such withheld funds, Contractor agrees to pay to the City its costs and a reasonable attorney’s fee incurred in any such lawsuit. Because the City Attorney Staff does not bill the City for legal services on an hourly basis, Contractor agrees a reasonable fee shall be computed at the rate of two hundred dollars and no cents (\$200.00) per hour of City Attorney time.

## ARTICLE VI. DISPUTES

All disputes arising under or related to this Contract shall be resolved by administrative hearing under the procedures described in Denver Revised Municipal Code Section 5-17 (“**D.R.M.C.**”) and all related rules and procedures. The determination resulting from said

administrative hearing shall be final, subject only to Contractor's right to appeal the determination under Colorado Rule of Civil Procedure, Rule 106.

## **ARTICLE VII. INDEMNIFICATION**

**A.** To the fullest extent permitted by law, the Contractor hereby agrees to defend, indemnify, reimburse and hold harmless City, its appointed and elected officials, agents and employees for, from and against all liabilities, claims, judgments, suits or demands for damages to persons or property arising out of, resulting from, or related to the work performed under this Agreement that are due to the negligence or fault of the Contractor or the Contractor's agents, representatives, subcontractors, or suppliers ("Claims"). This indemnity shall be interpreted in the broadest possible manner consistent with the applicable law to indemnify the City.

**B.** Contractor's duty to defend and indemnify City shall arise at the time written notice of the Claim is first provided to City regardless of whether suit has been filed and even if Contractor is not named as a Defendant.

**C.** Contractor will defend any and all Claims which may be brought or threatened against City and will pay on behalf of City any expenses incurred by reason of such Claims including, but not limited to, court costs and attorney fees incurred in defending and investigating such Claims or seeking to enforce this indemnity obligation. Such payments on behalf of City shall be in addition to any other legal remedies available to City and shall not be considered City's exclusive remedy.

**D.** Insurance coverage requirements specified in this Agreement shall in no way lessen or limit the liability of the Contractor under the terms of this indemnification obligation. The Contractor shall obtain, at its own expense, any additional insurance that it deems necessary for the City's protection.

**E.** This defense and indemnification obligation shall survive the expiration or termination of this Agreement.

## **ARTICLE VIII. WAIVER OF C.R.S. § 13-20-801, *et seq.***

Notwithstanding any other provision of this Contract, Contractor specifically waives all of the provisions of C.R.S. §§ 13-20-801 *et seq.* as they may relate to Contractor's performance under this Contract.

## **ARTICLE IX. LIQUIDATED DAMAGES**

If Contractor fails to achieve Substantial Completion of the Work within the Contract Time as specified on each authorized Task Order or fails to substantially complete the Work described in the Scope of Work within the time set forth in the Special Conditions, the City will suffer substantial damages, which damages would be difficult to accurately determine. The Parties hereto have considered the possible elements of damages and have agreed that the amount of liquidated damages for Contractor's failure to substantially complete the work within the Contract Time or to substantially complete the work described in Milestone Areas within the time set forth in each authorized Task Order or as specified in the Special Conditions shall be a minimum of \$500.00



per day or as specified in the executed Task Order. If Contractor shall fail to pay such liquidated damages promptly upon demand therefor, the Surety on its Performance Bond and Payment Bond shall pay such damages. Also, the City may withhold all, or any part of, such liquidated damages from any payment due Contractor. Additional provisions relating to liquidated damages are set forth in the Construction Contract General Conditions and Special Conditions.

## ARTICLE X. INSURANCE REQUIREMENTS

**A.** Contractor shall obtain and keep in force all of the minimum insurance coverage forms and amounts set forth in *Exhibit C* (“**Insurance Requirements**”) during the entire term of this Contract, including any extensions of the Contract or other extended period stipulations stated in *Exhibit C*. All certificates of insurance and any required endorsements must be received and approved by DEN Risk Management before any airport access or work commences.

**B.** Unless specifically excepted in writing by DEN Risk Management, if Contractor shall be using subcontractors to provide any part of the services under this Contract, Contractor shall do one of the following:

1. Include all subcontractors performing services hereunder as insureds under its required insurance and specifically list on all submitted certificates of insurance required under *Exhibit C*; or
2. Ensure that each subcontractor provides its own insurance coverage in accordance with the requirements set forth in this Contract.

**C.** The City in no way warrants or represents the minimum limits contained herein are sufficient to protect Contractor from liabilities arising out of the performance of the terms and conditions of this Contract by Contractor, its agents, representatives, employees, or subcontractors. Contractor shall assess its own risks and maintain higher limits and/or broader coverage as it deems appropriate and/or prudent. Contractor is not relieved of any liability or other obligations assumed or undertaken pursuant to this Contract by reason of its failure to obtain or maintain insurance in sufficient amounts, duration, or types.

**D.** In no event shall the City be liable for any of the following: (i) business interruption or other consequential damages sustained by Contractor; (ii) damage, theft, or destruction of Contractor's inventory, or property of any kind; or (iii) damage, theft, or destruction of an automobile, whether or not insured.

**E.** The Parties understand and agree that the City, its elected and appointed officials, employees, agents and volunteers are relying on, and do not waive or intend to waive by any provisions of this Contract, the monetary limitations and any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, C.R.S. §§ 24-10-101, *et seq.*, or otherwise available to the City, its elected and appointed officials, employees, agents and volunteers.

## **ARTICLE XI. CONTRACT BINDING**

It is agreed that this Contract shall be binding on and inure to the benefit of the Parties hereto, their heirs, executors, administrators, assigns, and successors.

## **ARTICLE XII. SEVERABILITY**

If any part, portion, or provision of this Contract shall be found or declared null, void, or unenforceable for any reason whatsoever by any court of competent jurisdiction or any governmental agency having authority thereover, only such part, portion, or provision shall be affected thereby and all other parts, portions, and provisions of this Contract shall remain in full force and effect.

## **ARTICLE XIII. ASSIGNMENT**

Contractor shall not assign, pledge or transfer its duties, obligations, and rights under this Contract, in whole or in part, without first obtaining the written consent of the CEO or his/her authorized representative. Any attempt by Contractor to assign or transfer its rights hereunder without such prior written consent shall, at the option of the CEO or his/her authorized representative, automatically terminate this Contract and all rights of Contractor hereunder.

## **ARTICLE XIV. APPROPRIATIONS**

Payment will be in accordance with the provisions of the Contract Documents, including Title 9 of the General Conditions, and will be made solely and exclusively from funds appropriated and otherwise lawfully made available for the purposes of this Contract from the City and County of Denver Municipal Airport System Funds. The City has no obligation to make payments from any other fund or source or to make additional appropriations or allocations to such fund to satisfy such costs or other obligations.

## **ARTICLE XV. APPROVALS**

In the event this Contract calls for the payment by the City of Five Million Dollars and no cents (\$5,000,000.00) or more, approval by the Denver City Council, acting by Resolution in accordance with Section 3.2.6 of the Charter of the City and County of Denver, is and shall be an express condition precedent to the lawful and binding execution and performance of this Contract.

## **ARTICLE XVI. JOINT VENTURE**

If Contractor is a Joint Venture, the partners to the Joint Venture shall be jointly and severally liable to the City for the performance of all duties and obligations of Contractor which are set forth in the Contract.

## **ARTICLE XVII. NO DISCRIMINATION IN EMPLOYMENT**

In connection with the performance of work under this Contract, Contractor agrees not to refuse to hire, discharge, promote or demote, or to discriminate in matters of compensation against any person otherwise qualified, solely because of race, color, religion, national origin, gender, age,

military status, sexual orientation, gender variance, marital status, or physical or mental disability; and Contractor further agrees to insert the foregoing provision in all subcontracts hereunder.

### **ARTICLE XVIII. COORDINATION OF SERVICES**

Contractor agrees to perform its work under this Contract in accordance with the operational requirements of DEN, and all work and movement of personnel or equipment on areas included within the DEN site shall be subject to the regulations and restrictions established by the City or its authorized agents.

### **ARTICLE XIX. COMPLIANCE WITH ALL LAWS AND REGULATIONS**

Contractor and its subcontractor(s) shall perform all work under this Contract in compliance with all existing and future applicable laws, rules, regulations and codes of the United States and the State of Colorado and with the Charter, ordinances and rules and regulations of the City.

### **ARTICLE XX. PROMPT PAYMENT**

**A.** The City will make monthly progress payments to Contractor for all services performed under this Agreement based upon Contractor's monthly invoices. Such invoices shall be in a form acceptable to the City and shall include detail of the time worked by Contractor's own personnel, billings from subcontractors, and all other information necessary to assess Contractor's progress. Invoices shall be accompanied by documentation of expenses for which reimbursement is sought, and all other supporting documentation required by the City. The City's Prompt Payment Ordinance, §§ 20-107 to 20-118, D.R.M.C., applies to invoicing and payment under this Agreement.

**B.** Final Payment to Contractor shall not be made until after the Project is accepted, and all certificates of completion, record drawings and reproducible copies are delivered to the City, and the Agreement is otherwise fully performed by Contractor. The City may, at the discretion of the DSBO Director, withhold reasonable amounts from billing and the entirety of the final payment until all such requirements are performed to the satisfaction of the Director. However, no deductions shall be made from Contractor's compensation because of penalty, liquidated damages or other sums withheld from payments to contractor(s).

**C.** For contracts of one million dollars (\$1,000,000.00) and over to which § 28-72, D.R.M.C. applies, Contractor is required to comply with the Contractor Prompt Payment provisions under § 28-72, D.R.M.C., with regard to payments by Contractor to MWBE subcontractors. The Contractor shall make payments to such subcontractors by no later than thirty-five (35) days from receipt by the Contractor of the subcontractor's invoice.

### **ARTICLE XXI. OWNERSHIP AND DELIVERABLES.**

Upon payment to Contractor, all records, data, deliverables, and any other work product prepared by Contractor or any custom development work performed by Contractor for the purpose of performing this Contract on or before the day of payment shall become the sole property of the City. Upon request by the City, or based on any schedule agreed to by Contractor and the City,

Contractor shall provide the City with copies of the data/files that have been uploaded to any database maintained by or on behalf of Contractor or otherwise saved or maintained by Contractor as part of the services provided to the City under this Contract. All such data/files shall be provided to the City electronically in a format agreed to by the Parties. Contractor also agrees to allow the City to review any of the procedures Contractor uses in performing any work or other obligations under this Contract, and to make available for inspection any and all notes, documents, materials, and devices used in the preparation for or performance of any of the scope of work, for up to six (6) years after termination of this Contract. Upon written request from the City, Contractor shall deliver any information requested pursuant to this Article within ten (10) business days in the event a schedule or otherwise agreed-upon timeframe does not exist.

## **ARTICLE XXII. COLORADO OPEN RECORDS ACT**

**A.** Contractor acknowledges that the City is subject to the provisions of the Colorado Open Records Act (“**CORA**”), C.R.S. §§ 24-72-201 *et seq.*, and Contractor agrees that it will fully cooperate with the City in the event of a request or lawsuit arising under such act for the disclosure of any materials or information which Contractor asserts is confidential or otherwise exempt from disclosure. Any other provision of this Contract notwithstanding, all materials, records, and information provided by Contractor to the City shall be considered confidential by the City only to the extent provided in CORA, and Contractor agrees that any disclosure of information by the City consistent with the provisions of CORA shall result in no liability of the City.

**B.** In the event of a request to the City for disclosure of such information, time and circumstances permitting, the City will make a good faith effort to advise Contractor of such request in order to give Contractor the opportunity to object to the disclosure of any material Contractor may consider confidential, proprietary, or otherwise exempt from disclosure. In the event Contractor objects to disclosure, the City, in its sole and absolute discretion, may file an application to the Denver District Court for a determination of whether disclosure is required or exempted. In the event a lawsuit to compel disclosure is filed, the City may tender all such material to the court for judicial determination of the issue of disclosure. In both situations, Contractor agrees it will either waive any claim of privilege or confidentiality or intervene in such legal process to protect materials Contractor does not wish disclosed. Contractor agrees to defend, indemnify, and hold harmless the City, its officers, agents, and employees from any claim, damages, expense, loss, or costs arising out of Contractor’s objection to disclosure, including prompt reimbursement to the City of all reasonable attorney’s fees, costs, and damages the City may incur directly or may be ordered to pay by such court, including but not limited to time expended by the City Attorney Staff, whose costs shall be computed at the rate specified in Verified Statement of Claims section above.

## **ARTICLE XXIII. EXAMINATION OF RECORDS**

**A.** Any authorized agent of the City, including the City Auditor or his or her representative, has the right to access, and the right to examine, copy and retain copies, at City’s election in paper or electronic form, any pertinent books, documents, papers and records related to Contractor’s performance pursuant to this Contract, provision of any goods or services to the City, and any other transactions related to this Contract. Contractor shall cooperate with City representatives and City representatives shall be granted access to the foregoing documents and

information during reasonable business hours and until the latter of six (6) years after the final payment under the Contract or expiration of the applicable statute of limitations. When conducting an audit of this Contract, the City Auditor shall be subject to government auditing standards issued by the United States Government Accountability Office by the Comptroller General of the United States, including with respect to disclosure of information acquired during the course of an audit. No examination of records and audits pursuant to this paragraph shall require Contractor to make disclosures in violation of state or federal privacy laws. Contractor shall at all times comply with D.R.M.C. § 20-276.

**B.** Additionally, Contractor agrees until the expiration of six (6) years after the final payment under this Contract, any duly authorized representative of the City, including the CEO or his or her representative, shall have the right to examine any pertinent books, documents, papers and records of Contractor related to Contractor's performance of this Contract, including communications or correspondence related to Contractor's performance, without regard to whether the work was paid for in whole or in part with federal funds or was otherwise related to a federal grant program.

**C.** In the event the City receives federal funds to be used toward the services performed under this Contract, the Federal Aviation Administration ("FAA"), the Comptroller General of the United States and any other duly authorized representatives shall have access to any books, documents, papers and records of Contractor which are directly pertinent to a specific grant program for the purpose of making audit, examination, excerpts and transcriptions. Contractor further agrees that such records will contain information concerning the hours and specific services performed along with the applicable federal project number.

#### **ARTICLE XXIV. CITY REVIEW OF PROCEDURES**

Contractor agrees that the City's Auditor, the Manager, the Conveyance Administrator, or any of the CEO's duly authorized representatives, until the expiration of six (6) years after the termination of this Contract, shall have the right, at any reasonable time and at its own expense, to have access to and the right to examine any books, documents, papers and records of Contractor pertinent to this Contract.

#### **ARTICLE XXV. PREVAILING WAGE REQUIREMENTS**

**A.** Contractor shall comply with, and agrees to be bound by, all requirements, conditions and determinations of the City regarding the Payment of Prevailing Wages Ordinance, D.R.M.C. §§20-76 through 20-79, including, but not limited to, the requirement that every covered worker working on a City-owned or leased building or on City-owned land shall be paid no less than the prevailing wages and fringe benefits in effect on the date the bid or request for proposal was advertised. In the event a request for bids, or a request for proposal, was not advertised, Contractor shall pay every covered worker no less than the prevailing wages and fringe benefits in effect on the date funds for the contract were encumbered.

Date bid or proposal issuance was advertised March 3, 2020.

**B.** Prevailing wage and fringe rates will adjust on the yearly anniversary of the actual date of bid or proposal issuance, if applicable, or the date of the written encumbrance if no



bid/proposal issuance date is applicable. Unless expressly provided for in this Contract, Contractor will receive no additional compensation for increases in prevailing wages or fringe rates.

C. Contractor shall provide the Auditor of the City and County of Denver with a list of all subcontractors providing any services under the Contract.

D. Contractor shall provide the Auditor with electronically-certified payroll records for all covered workers employed under the Contract in a manner specified by the Auditor.

E. Contractor shall prominently post at the work site the current prevailing wage and fringe rates. The posting must inform workers that any complaints regarding the payment of prevailing wages or fringe benefits may be submitted to the Denver Auditor by calling 720-913-5000 or emailing [auditor@denvergov.org](mailto:auditor@denvergov.org).

F. If Contractor fails to pay workers as required by the Prevailing Wage Ordinance, Contractor will not be paid until documentation of payment satisfactory to the Auditor has been provided. The Auditor may enforce the Prevailing Wage Ordinance in a manner provided by law, including the Prevailing Wage Ordinance. The City also may, by written notice, suspend or terminate work if Contractor fails to pay required wages and fringe rates.

#### **ARTICLE XXVI. MINIMUM WAGE REQUIREMENTS**

To the extent required by law, Contractor shall comply with and agrees to be bound by all requirements, conditions, and City determinations regarding the City's Minimum Wage Ordinance, D.R.M.C. §§ 20-82 through 20-84, including, but not limited to, the requirement that every covered worker shall be paid no less than the City Minimum Wage in accordance with the City's Minimum Wage Ordinance. By executing this Contract, Contractor expressly acknowledges that Contractor is aware of the requirements of the City's Minimum Wage Ordinance and that any failure by Contractor, or any other individual or entity acting subject to this Contract, to strictly comply with the foregoing D.R.M.C. Sections shall result in the penalties and other remedies authorized therein.

#### **ARTICLE XXVII. COMPLIANCE WITH MINORITY/WOMEN BUSINESS ENTERPRISE REQUIREMENTS**

A. This Contract is subject to all applicable provisions of D.R.M.C. Chapter 28 ("**M/WBE Ordinance**"). In accordance with the requirements of the M/WBE Ordinance, Contractor is committed to, at a minimum, meet the participation goal of eight percent (8%) established for this Project utilizing properly certified M/WBE subcontractors and suppliers. Without limiting the general applicability of the foregoing, Contractor acknowledges its continuing duty, pursuant to D.R.M.C. §§ 28-72, 28-73 and 28-75 and the M/WBE Program, to meet and maintain throughout the duration of this Contract its participation and compliance commitments and to ensure that all Subcontractors subject to the M/WBE Ordinance or the M/WBE Program also maintain such commitments and compliance. Failure to comply with these requirements may result, at the discretion of the Director of the Division of Small Business Opportunity ("**DSBO**"), in the imposition of sanctions against Contractor in accordance with D.R.M.C. § 28-77. Nothing contained in this Article or in the M/WBE Ordinance shall negate the City's right to prior approval of Subcontractors, or substitutes therefore, under this Contract.

**B.** Under § 28-68, D.R.M.C., the Contractor has an ongoing, affirmative obligation to maintain for the duration of this Agreement, at a minimum, compliance with its originally achieved level of MWBE participation upon which this Agreement was awarded, unless the City initiates a material alteration to the scope of work affecting MWBEs performing on this Agreement through change order, contract amendment, force account, or as otherwise described in § 28-70, D.R.M.C. The Contractor acknowledges that:

1. If directed by DSBO, the Contractor is required to develop and comply with a Utilization Plan in accordance with § 28-62, D.R.M.C. Along with the Utilization Plan requirements, the Contractor must establish and maintain records and submit regular reports, as directed by DSBO, which will allow the City to assess progress in complying with the Utilization Plan and achieving the MWBE participation goal. The Utilization Plan is subject to modification by DSBO.
2. If change orders or any other contract modifications are issued under the Contract, the Contractor shall have a continuing obligation to immediately inform DSBO in writing of any agreed upon increase or decrease in the scope of work of such contract, upon any of the bases discussed in § 28-70, D.R.M.C., regardless of whether such increase or decrease in scope of work has been reduced to writing at the time of notification.
3. If change orders or other amendments or modifications are issued under the contract that include an increase in the scope of work of this Contract, whether by amendment, change order, force account or otherwise, which increases the dollar value of the contract, whether or not such change is within the scope of work designated for performance by an MWBE at the time of contract award, such change orders or contract modification shall be immediately submitted to DSBO for notification purposes.
4. Those amendments, change orders, force accounts or other contract modifications that involve a changed scope of work that cannot be performed by existing project subcontractors are subject to the original contract goal. The Contractor shall satisfy the goal with respect to such changed scope of work by soliciting new MWBEs in accordance with § 28-70, D.R.M.C. The Contractor must also satisfy the requirements under §§ 28-60 and 28-73, D.R.M.C., with regard to changes in scope or participation. The Contractor shall supply to the DSBO Director all required documentation described in §§ 28-60, 28-70, and 28-73 D.R.M.C. with respect to the modified dollar value or work under the contract.
5. Failure to comply with these provisions may subject the Contractor to sanctions set forth in § 28-76 of the MWBE Ordinance.
6. Should any questions arise regarding specific circumstances, the Contractor should consult the MWBE Ordinance or may contact the Project's designated DSBO representative at (720) 913-1999.

## **ARTICLE XXVIII. SENSITIVE SECURITY INFORMATION**

Contractor acknowledges that, in the course of performing its work under this Contract, Contractor may be given access to Sensitive Security Information (“SSI”), as material is described



in the Code of Federal Regulations, 49 C.F.R. Part 1520. Contractor specifically agrees to comply with all requirements of the applicable federal regulations, including but not limited to, 49 C.F.R. Parts 15 and 1520. Contractor understands any questions it may have regarding its obligations with respect to SSI must be referred to the DEN's Security Office.

### **ARTICLE XXIX. DEN SECURITY**

**A.** Contractor, its officers, authorized officials, employees, agents, subcontractors, and those under its control, shall comply with safety, operational, or security measures required of Contractor or the City by the FAA or TSA. If Contractor, its officers, authorized officials, employees, agents, subcontractors or those under its control, fail or refuse to comply with said measures and such non-compliance results in a monetary penalty being assessed against the City, then, in addition to any other remedies available to the City, Contractor shall fully reimburse the City any fines or penalties levied against the City, and any attorney fees or related costs paid by the City as a result of any such violation. Contractor must pay this amount within fifteen (15) days from the date of the invoice or written notice. Any fines and fees assessed by the FAA or TSA against the City due to the actions of Contractor and/or its agents will be deducted directly from the invoice for that billing period.

**B.** Contractor is responsible for compliance with Airport Security regulations and 49 C.F.R. Parts 1542 (Airport Security) and 14 C.R.F. Parts 139 (Airport Certification and Operations). Any and all violations pertaining to Parts 1542 and 139 resulting in a fine will be passed on to and borne by Contractor. The fee/fine will be deducted from the invoice at time of billing.

### **ARTICLE XXX. FEDERAL RIGHTS**

**A.** This Contract is subject and subordinate to the terms, reservations, restrictions and conditions of any existing or future contracts between the City and the United States, the execution of which has been or may be required as a condition precedent to the transfer of federal rights or property to the City for airport purposes, and the expenditure of federal funds for the extension, expansion or development of the Denver Municipal Airport System.

**B.** General Civil Rights: Contractor agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal Assistance. This provision binds Contractor and sub-tier contractors from the bid solicitation period through the completion of the contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

**C.** Federal Fair Labor Standards Act: This Contract incorporates by reference the provisions of 29 C.F.R. Part 201, the Federal Fair Labor Standards Act ("FLSA"), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part-time workers. Contractor agrees to incorporate by reference the provisions of FLSA in all contracts and subcontracts resulting from this Contract. Contractor has full responsibility to monitor compliance to the referenced regulation. Contractor must address any claims or disputes arising from this requirement directly with the U.S.

Department of Labor – Wage and Hour Division.

**D.** Occupational Safety and Health Act: This Contract incorporates by reference the requirements of 29 C.F.R. Part 1910 with the same force and effect as if given in full text. Contractor must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. Contractor retains full responsibility to monitor its compliance and any subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (29 C.F.R. Part 1910). Contractor must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

**E.** Contractor covenants it will include the provisions of this section in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Federal Acts, Regulations and directives issued pursuant thereto. Contractor covenants it will take action with respect to any subcontract or procurement as City or the FAA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, Contractor may request City to enter into any litigation to protect the interests of City. In addition, Contractor may request the United States to enter into the litigation to protect the interests of the United States.

#### **ARTICLE XXXI. CITY EXECUTION OF CONTRACT**

This Contract is expressly subject to, and shall become effective upon, the execution of all signatories of the City and, if required, the approval of Denver City Council. This Contract may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same.

#### **ARTICLE XXXII. INSPECTION AND ACCEPTANCE:**

Contractor shall perform all services in accordance with the standard of care exercised by highly competent vendors who perform like or similar services. City may inspect all goods/services prior to acceptance. Payment does not constitute acceptance. Contractor shall bear the cost of any inspection/testing that reveal goods/services that are defective or do not meet specifications. City's failure to accept or reject goods/services shall not relieve Contractor from its responsibility for such goods/services that are defective or do not meet specifications nor impose liability on City for such goods/services. If any part of the goods/services are not acceptable to City, City may, in addition to any other rights it may have at law or in equity: (1) make a warranty claim; (2) repair and/or replace the goods or substitute other services at Contractor's expense; or (3) reject and return the goods at Contractor's cost and/or reject the services at Contractor's expense for full credit. Any rejected goods/services are not to be replaced without written authorization from City, and any such replacement shall be on the same terms and conditions contained in this Agreement.

#### **ARTICLE XXXIII. RISK OF LOSS.**

Contractor shall bear the risk of loss, injury or destruction of goods prior to delivery to City. Loss, injury or destruction shall not release Contractor from any obligation hereunder. 1-year

warranty after issuance of executed Certificate of Substantial Completion for each authorized Task Order.

#### **ARTICLE XXXIV. WARRANTY.**

Contractor warrants and guarantees to City that all goods furnished under each executed Task Order are free from defects in workmanship and materials, are merchantable, and fit for the purposes for which they are to be used. For any goods furnished under each executed Task Order which become defective within twelve (12) months (unless otherwise specified) after date of receipt and final acceptance by City, Contractor shall either, at City's election and to City's satisfaction, remedy any and all defects or replace the defective goods at no expense to City within seven (7) days of receipt of the defective goods or accept the defective goods for full credit and payment of any return shipping charges. For one (1) year following installation and final acceptance by the City, Contractor shall furnish all replacement parts necessary (at no additional cost) for the repair and maintenance of the purchased conveyance unit. Contractor shall provide a spare parts list for each executed Task Order that must be approved by the City. Contractor shall also be required to make periodic on-site evaluations/adjustment or repairs to the units during the 12 months after final acceptance by the City. Evaluation dates will be mutually agreed upon by the Parties.

#### **ARTICLE XXXV. ELECTRONIC SIGNATURES AND ELECTRONIC RECORDS**

The Contract, and any other documents requiring a signature hereunder, may be signed electronically by the City and/or Contractor in the manner specified by the City. The Parties agree not to deny the legal effect or enforceability of the Contract solely because it is in electronic form or because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the Contract in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

**[END OF PAGE]**

**Contract Control Number:** PLANE-201952239  
**Contractor Name:** THYSSENKRUPP ELEVATOR CORPORATION

IN WITNESS WHEREOF, the parties have set their hands and affixed their seals at Denver, Colorado as of:

**SEAL**

**CITY AND COUNTY OF DENVER:**

**ATTEST:**

By:

\_\_\_\_\_

\_\_\_\_\_

**APPROVED AS TO FORM:**

**REGISTERED AND COUNTERSIGNED:**

Attorney for the City and County of Denver

By:

By:

\_\_\_\_\_

\_\_\_\_\_

By:

\_\_\_\_\_

**Contract Control Number:**  
**Contractor Name:**

PLANE-201952239  
THYSSENKRUPP ELEVATOR CORPORATION

By: DocuSigned by:  
*Tyler Cantrell*  
59FC6A203C9D4A2... \_\_\_\_\_

Name: Tyler Cantrell  
(please print)

Title: Contract Analyst  
(please print)

ATTEST: [if required]

By: \_\_\_\_\_

Name: \_\_\_\_\_  
(please print)

Title: \_\_\_\_\_  
(please print)

**EXHIBIT A**

**Appendix No. 1**

**Standard Federal Assurances and Nondiscrimination Non-Federal  
Construction Provision**

## **APPENDIX 1-A**

### **GENERAL CIVIL RIGHTS PROVISIONS**

The contractor agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision binds the contractor and subtier contractors from the bid solicitation period through the completion of the contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

### **COMPLIANCE WITH NONDISCRIMINATION REQUIREMENTS**

The term "sponsor" shall mean the "City."

During the term of this Contract, the Contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

1. **Compliance with Regulations.** The Contractor will comply with the Title VI List of Pertinent Non-Discrimination Statutes and Authorities, as they may be amended from time to time, which are herein incorporated by reference and made part of this Agreement.
2. **Nondiscrimination.** The Contractor, with regard to the work performed by it during this Agreement, will not discriminate on the grounds of race, creed, color, national origin, or sex in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and Regulations, including employment practices when the Agreement covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
3. **Solicitations for Subcontractors, Including Procurements of Materials and Equipment.** In all solicitations, either by competitive bidding or negotiation, made by the Contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the Contractor's obligations under this Agreement and the Acts and Regulations relative to nondiscrimination on the grounds of race, color, or national origin.
4. **Information and Reports.** The Contractor will provide all information and reports required by the Acts, Regulations or directives issued pursuant thereto and will permit access to its books, records, accounts other sources of information, and its facilities as may be determined by the sponsor or the Federal Aviation Administration (FAA) to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the sponsor or the FAA, as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance.** In the event of a Contractor's noncompliance with the nondiscrimination provisions of this Agreement, the sponsor will impose such Contract sanctions as it or the FAA may determine to be appropriate, including, but not limited to:
  - a. Withholding of payments to the Contractor under this Agreement until the Contractor complies, and/or;
  - b. Cancelling, terminating, or suspending this Agreement, in whole or in part.
6. **Incorporation of Provisions.** The Contractor will include the provisions of paragraphs one (1) through six (6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations or directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the sponsor or the FAA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the sponsor to enter into such litigation to protect the interests of the sponsor. In addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.



## **APPENDIX 1-C**

### **CLAUSES FOR TRANSFER OF REAL PROPERTY ACQUIRED OR IMPROVED UNDER THE ACTIVITY, FACILITY, OR PROGRAM**

As used below, the term “sponsor” will mean City.

Contractor, for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as part of consideration hereof, does hereby covenant and agree, as a covenant running with the land that:

1. In the event facilities are constructed, maintained, or otherwise operated on the property described in this Agreement for a purpose for which a FAA activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the Contractor will maintain and operate such facilities and services in compliance with all requirements imposed by the Nondiscrimination Acts and Regulations listed in the Pertinent List of Nondiscrimination Authorities, as may be amended from time to time, such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.
2. With respect to this Agreement, in the event of breach of any of the above Nondiscrimination covenants, sponsor will have the right to terminate this Agreement, and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if this Agreement had never been made or issued.

## **APPENDIX 1-D**

### **STANDARD FEDERAL ASSURANCES AND NONDISCRIMINATION IN CONSTRUCTION, USE, OR ACCESS TO FACILITIES**

As used below, the term "sponsor" will mean City.

- A. Contractor for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as part of the consideration hereof, does hereby covenant and agree, as a covenant running with the land, that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the Contractor will use the Premises in compliance with all other requirements imposed by or pursuant to the List of Pertinent Nondiscrimination Authorities.
- B. With respect this Agreement, in the event of breach of any of the above nondiscrimination covenants, sponsor will have the right to terminate this Agreement and to enter, re-enter, and repossess said land and the facilities thereon, and hold the same as if this Agreement had never been made or issued.

## APPENDIX 1-E

### TITLE VI LIST OF PERTINENT NONDISCRIMINATION AUTHORITIES

The term "sponsor" will mean City.

During the performance of this Agreement, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees to comply with the following nondiscrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits' discrimination on the basis of race, color, national origin);
- 49 CFR part 21 (Non-discrimination In Federally-Assisted Programs of The Department of Transportation-Effectuation of Title VI of The Civil Rights Act of 1964);
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601 ), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S. C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC§ 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 1 00-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and Contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 -12189) as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S. C. 1681 *et seq.*).

## **APPENDIX 1-F**

### **FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE)**

All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 CFR part 201, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part time workers.

The Contractor has full responsibility to monitor compliance to the referenced statute or regulation. The Contractor must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division

## **APPENDIX 1-G**

### **OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970**

All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 CFR Part 1910 with the same force and effect as if given in full text. Contractor must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The Contractor retains full responsibility to monitor its compliance and their subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (20 CFR Part 1910). Contractor must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

**EXHIBIT B**

**CITY AND COUNTY OF DENVER  
RULES AND REGULATIONS AND BID  
CONDITIONS OF THE  
MANAGER OF PUBLIC WORKS**

**PERTAINING TO EQUAL EMPLOYMENT OPPORTUNITY  
IN THE CITY AND COUNTY OF DENVER**

APPROVED FOR LEGALITY:

APPROVED AND ADOPTED:

/s/ \_\_\_\_\_  
Attorney for the City and  
County of Denver

/s/ \_\_\_\_\_  
Manager of Public Works

Adopted and Published Pursuant to Article 111, Division 2 of Chapter 28  
the Revised Municipal Code  
of the City and County of Denver

These Rules and Regulations cancel and supersede any and all previous issued Rules and  
Regulations on the subject

**RULES AND REGULATIONS**  
**REGARDING**  
**EQUAL EMPLOYMENT OPPORTUNITY**

Promulgated and adopted by the Manager of Public Works pursuant to and by authority of Article III, Division 2, Chapter 28 of the Revised Municipal Code of the City and County of Denver, and for the purpose of insuring that contractors, subcontractors and suppliers soliciting and receiving compensation for contract work from or through the City and County of Denver provide equal opportunity in employment without regard to race, color, creed, sex, national origin, age, religion, marital status, political opinion or affiliation or mental or physical handicap and meet certain requirements for the hiring, training, promotion and treatment during employment of members of ethnic groups subjected to differential treatment, including persons of African descent (Black), Spanish-surnamed (Hispanic), Asian-American and American Indian groups.

**RULE I**  
**DEFINITIONS**

- A. "City" means the City and County of Denver.
- B. "Manager" shall mean the Manager of Public Works for the City and County of Denver.
- C. "Contract" means a contract entered into with the City and County of Denver, financed in whole or in part by local resources or funds of the City and County of Denver, for the construction of any public building or prosecution or completion of any public work.
- D. "Contractor" means the original party to a contract with the City and County of Denver, also referred to as the "general" or "prime" contractor.
- E. "Director" means the Director of the Mayor's Office of Contract Compliance.
- F. "Subcontractor" means any person, company, association, partnership, corporation, or other entity which assumes by subordinate agreement some or all of the obligations of the general or prime contractor.
- G. The Phrase "Bidding Specifications" as used in Article 111, Division 2 of Chapter 28 of the Revised Municipal Code shall include BID CONDITION, INVITATION TO BID AND NOTICE OF PROPOSAL.
- H. "Affirmative Action Program" means a set of specific and result-oriented procedures or steps to which a contractor commits himself to apply every good faith effort to employ members of ethnic minority groups, to include persons of African descent (Black), Spanish surnamed (Hispanic), Asian-American, American Indians, and persons with mental or physical handicap.
- I. "Mayor's Office of Contract Compliance" means the City agency established pursuant to Article III, Division 1 of Chapter 28 of the Denver Revised Municipal Code.



**RULE II**  
**NOTICE OF HEARING**

When results of conciliation efforts are unsatisfactory to the Manager and he is informed in accordance with Article III, Division 2 of Chapter 28 of the Revised Municipal Code that a contractor or subcontractor has apparently failed to meet affirmative action and equal employment opportunity requirements after a reasonable period of notice to correct deficiencies, the Manager will, prior to imposition of any sanctions, afford the general contractor a hearing in order to determine whether the contractor or his subcontractors have failed to comply with the affirmative action and equal employment opportunity requirements of Article III, Division 2 of Chapter 28 of the Revised Municipal Code or of the contract. Written notice of such hearing shall be delivered personally or sent by certified mail return receipt requested, to the contractor and to any subcontractor involved at least ten days prior to the date scheduled for the hearing.

**RULE III**  
**HEARING**

- A. Contractors will appear at hearings and may be represented by counsel, and may present testimony orally and other evidence.
- B. Hearings shall be conducted by one or more hearing examiners designated as such by the Manager.
- C. The Director of the Mayor's Office of Contract Compliance may participate in hearings as a witness.
- D. Hearings shall be held at the place specified in the notice of hearing.
- E. All oral testimony shall be given under oath or affirmation and a record of such proceedings shall be made.
- F. All hearings shall be open to the public.
- G. The hearing officer shall make recommendations to the Manager who shall make a final decision.

**REGULATIONS**

**REGULATION NO. 1.** **ORDINANCE:** The Rules and Regulations of the Manager shall be inserted in the bidding specifications for every contract for which bidding is required.

**REGULATION NO. 2.** **EXEMPTIONS:** Each contract and subcontract, regardless of dollar amount, shall be subject to affirmative action requirements unless specifically exempted in writing individually by the Manager. Exemptions apply only to "affirmative action" in equal employment opportunity, and are not to be construed as condonation in any manner of "discrimination" or "discriminatory practices" in employment because of race, color, creed sex age national origin, religion, marital status, political opinion or mental or physical handicap.

**REGULATION NO. 3. DIRECTOR OF CONTRACT COMPLIANCE:** The Director of the Mayor's Office of Contract Compliance shall perform the duties assigned to such official by Article III, Division 2 of Chapter 28 of the Revised Municipal Code and by the Manager. (1) The Director of the Mayor's Office of Contract Compliance or designated representatives shall inform bidders and contractors of affirmative action procedures, programs, and goals in accordance with the ordinance at pre-bid and pre-construction conference; (2) make regular on-site inspections; (3) supply contractors and subcontractors with report forms to be completed by them when requested, and furnished to the Director of the Mayor's Office of Contract Compliance; and (4) review payroll records, employment records and practices of general contractors and their subcontractors and suppliers during the performance of any contract. The Director of the Mayor's Office of Contract Compliance shall promptly report apparent affirmative action deficiencies to the Manager.

**REGULATION NO. 4. GOALS AND TIMETABLES:** In general, goals and timetables should take into account anticipated vacancies and the availability of skills in the market place from which employees should be drawn. In addition, where discrimination in employment by a general contractor or any of his subcontractors is indicated, a corrective action program will take into account the need by the general contractor and his subcontractors to correct past discriminatory practices and reach goals of minority manpower utilization on a timely basis through such recruiting and advertising efforts as are necessary and appropriate.

**REGULATION NO.5. AWARD OF CONTRACTS:** It shall be the responsibility of the Director of the Mayor's Office of Contract Compliance to determine the affirmative action capability of bidders, contractors and subcontractors and to recommend to the Manager the award of contracts to those bidders, contractors and subcontractors and suppliers who demonstrate the ability and willingness to comply with the terms of their contract.

**REGULATION NO. 6. PUBLICATION AND DUPLICATION:** Copies of these Rules and Regulations as amended by the Manager from time to time, shall as soon as practicable and after Notice being published will be made a part of all City Contracts.

**REGULATION NO. 7. NOTICE TO PROCEED:** Prior to issuance of Notice to Proceed a sign-off will be required of the Director of the Mayor's Office of Contract Compliance or his designee.

**REGULATION NO. 8. CONTRACTS WITH SUBCONTRACTORS:** To the greatest extent possible the contractor shall make a good faith effort to contract with minority contractors, subcontractors and suppliers for services and supplies by taking affirmative actions which include but are not limited to the following:

1. Advertise invitations for subcontractor bids in minority community news media.
2. Contact minority contractor organizations for referral of prospective subcontractors.
3. Purchase materials and supplies from minority material suppliers.

**REGULATION NO. 9. AGENCY REFERRALS:** it shall be no excuse that the union with which the contractor or subcontractor has an agreement providing for referral, exclusive or otherwise, failed to refer minority employees.

**REGULATION NO. 10. CLAUSES:** The Manager shall include the appropriate clauses in every contract and the contractor shall cause to be inserted in every subcontract the appropriate clauses:

1. **APPENDIX A:** City and County of Denver Equal Opportunity Clause-ALL CONTRACTS funded only with City & County of Denver monies.
2. **APPENDIX B:** Equal Opportunity Clause (11246)-ALL FEDERAL ASSISTED
3. **APPENDIX C:** Section 3-Assurance of Compliance-HUD ASSISTED PROJECTS.
4. **APPENDIX D:** Section 3-Clause-HUD ASSISTED PROJECTS.

All amendments to the appendices shall be included by reference.

**REGULATION NO. 11. SHOW CAUSE NOTICES:** When the Manager has reasonable cause to believe that a contractor has violated Article III, Division 2 of Chapter 28 of the Revised Municipal Code, he may issue a notice requiring the contractor to show cause, within fifteen days why enforcement procedures, or other appropriate action to insure compliance, should not be instituted.

**REGULATION NO. 12. BID CONDITIONS-AFFIRMATIVE ACTION REQUIREMENTS-EQUAL EMPLOYMENT OPPORTUNITY:**

**1. APPENDIX E:**

The Bid Conditions- Affirmative Action Requirements-Equal Employment Opportunity as amended and published by the U.S. Department of Labor, Employment Standards Administration, Office of Federal Contract Compliance, shall be inserted verbatim for bidding specification for every non-exempt contract involving the use of Federal funds.

**2. APPENDIX F:**

The Bid Conditions- Affirmative Action Requirements-Equal Employment Opportunity as published by the Department of Public Works, City and County of Denver shall be inserted verbatim as bidding specifications for every non-exempt contract using City funds.

**APPENDIX A****CITY AND COUNTY OF DENVER EQUAL OPPORTUNITY CLAUSE-ALL CONTRACTS**

1. The contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, age, national origin, religion, marital status, political opinion or affiliation, or mental or physical handicap. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, creed, color, sex, age, national origin, religion, marital status, political opinion or affiliation, or mental or physical handicap. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex, age, national origin, religion, marital status, political opinion or affiliation, or mental or physical handicap.
3. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided, advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
4. Each contractor will comply with all provisions of Article III, Division 2, Chapter 28 of the Revised Municipal Code, and the rules, regulations, and relevant orders of the Manager and Director.
5. The contractor will furnish all information and reports required by Article III, Division 2, Chapter 28 of the Revised Municipal Code, and by rules, regulations and orders of the Manager and Director or pursuant thereto, and will permit access to his books, records, and accounts by the Manager, Director or their designee for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
6. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations or orders this contract may be cancelled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further City contracts in accordance with procedures authorized in Article III, Division 2, Chapter 28 of the Revised Municipal Code, or by rules, regulations, or order of the Manager.
7. The contractor will include Regulation 12 Paragraph 2 and the provisions of paragraphs (1) through (6) in every subcontract or purchase order unless, exempted by rules, regulations, or orders of the Manager issued pursuant to Article III, Division 2, Chapter 28 of the Revised Municipal Code, so that such provisions will be binding upon each subcontractor or suppliers. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

The applicant further agrees to be bound by the above equal opportunity clauses with respect to its own employment practices when it participates in City contracts. The contractor agrees to assist and cooperate actively with the Manager and the Director in obtaining compliance of subcontractors and suppliers with the equal opportunity clause and the rules, regulations and relevant orders of the Manager, and will furnish the Manager and the Director such information as they may require for the supervision of compliance, and will otherwise assist the Manager and Director in the discharge of the City's primary responsibility for securing compliance. The contractor further agrees to refrain from entering into any contract or contract modification subject to Article III, Division 2, Chapter 28 of the Revised Municipal Code with a contractor debarred from, or who has not demonstrated eligibility for, City contracts.

The contractor will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the Manager and Director. In addition, the contractor agrees that failure or refusal to comply with these undertakings the Manager may take any or all of the following actions:

- A. Cancellation, termination, or suspension in whole or in part of this contract.
- B. Refrain from extending any further assistance to the applicant under the program with respect to which the failure occurred until satisfactory assurance of future compliance has been received from such applicant.
- C. Refer the case to the City Attorney for appropriate legal proceedings.

**SUBCONTRACTS:** Each prime contractor or subcontractor shall include the equal opportunity clause in each of its subcontracts.

**APPENDIX F  
BID CONDITIONS  
AFFIRMATIVE ACTION REQUIREMENTS  
EQUAL EMPLOYMENT OPPORTUNITY**

For all Non-Exempt Construction Contracts to be Awarded by  
the City and County of Denver, Department of Public Works

**NOTICE**

EACH BIDDER, CONTRACTOR OR SUBCONTRACTOR (HEREINAFTER THE CONTRACTOR) MUST FULLY COMPLY WITH THE REQUIREMENTS OF THESE BID CONDITIONS AS TO EACH CONSTRUCTION TRADE IT INTENDS TO USE ON THIS CONSTRUCTION CONTRACT, AND ALL OTHER CONSTRUCTION WORK (BOTH CITY AND NON-CITY) IN THE DENVER AREA DURING THE PERFORMANCE OF THIS CONTRACT OR SUBCONTRACT. THE CONTRACTOR COMMITS ITSELF TO THE GOALS FOR MINORITY MANPOWER UTILIZATION, AS APPLICABLE, AND ALL OTHER REQUIREMENTS, TERMS AND CONDITION OF THESE BID CONDITIONS BY SUBMITTING A PROPERLY SIGNED BID.

THE CONTRACTOR SHALL APPOINT A COMPANY EXECUTIVE TO ASSUME THE RESPONSIBILITY FOR THE IMPLEMENTATION OF THE REQUIREMENTS, TERMS AND CONDITIONS OF THESE BID CONDITIONS.

EULOIS CLECKLEY  
Manager of Public Works  
City and County of Denver

**A. REQUIREMENTS --AN AFFIRM ATIVE ACTION PLAN:**

Contractors shall be subject to the provisions and requirements of these bid conditions including the goals and timetables for minority' and female utilization, and specific affirmative action steps set forth by the Office of Contract Compliance. The contractor's commitment to the goals for minority, and female utilization as required constitutes a commitment that it will make every good faith effort to meet such goals.

**1. GOALS AND TIMETABLES:**

The goals and timetables for minority<sup>1</sup> and female participation, expressed in percentage terms for the contractor's aggregate workforce in each trade are as follows:

**GOALS FOR MINORITY PARTICIPATION  
FOR EACH TRADE**

From January 1, 1982  
to 21.7% - 23.5%  
Until Further Notice

**GOALS FOR FEMALE PARTICIPATION  
FOR EACH TRADE**

From January 1, 1982  
to 6.9%  
Until Further Notice

The goals for minority and female utilization above are expressed in terms of hours of training and employment as a proportion of the total number of hours to be worked by the contractor's aggregate workforce, which includes all supervisory personnel, in each trade, on all projects for the City and County of Denver during the performance of its contract (i.e., The period beginning with the first day of work on the City and County of Denver funded construction contract and ending with the last day of work).

The hours of minority and female employment and training must be substantially uniform throughout the length of the contract in each trade and minorities and females must be employed evenly on each of a contractor's projects. Therefore, the transfer of minority or female employees from contractor to contractor or from project to project for the purpose of meeting the contractor's goals shall be a violation of these Bid Conditions.

If the contractor counts the nonworking hours of apprentices they must be employed by the contractor during the training period; the contractor must have made a commitment to employ apprentices at the completion of their training subject to the availability of employment opportunities; and the apprentices must be trained pursuant to training programs approved by the Bureau of Apprenticeship and Training.

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<sup>1</sup> "Minority" is defined as including, Blacks, Spanish Surname Americans, Asian-Americans, and American Indians, and includes both men and Minority women.



## 2. **SPECIFIC AFFIRMATIVE ACTION STEPS:**

No contractor shall be found to be in noncompliance solely on account of its failure to meet its goals, but will be given an opportunity to demonstrate that the contractor has instituted all the specific affirmative action steps specified and has made every good faith effort to make these steps work toward the attainment of its goals within the timetables, all to the purpose of expanding minority and female utilization in its aggregate workforce. A contractor, who fails to comply with its obligation under the Equal Opportunity Clause of its contract and fails to achieve its commitments to the goals for minority and female utilization has the burden of proving that it has engaged in an Affirmative Action Program directed at increasing minority and female utilization and that such efforts were at least as extensive and as specific as the following:

- a. The contractor should have notified minority and female organizations when employment opportunities were available and should have maintained records of the organization's response.
- b. The contractor should have maintained a file of the names and addresses of each minority and female referred to it by any individual or organization and what action was taken with respect to each such referred individual, and if the individual was not employed by the contractor, the reasons. If such individual was sent to the union hiring hall for referral and not referred back by the union or if referred, not employed by the contractor, the file should have documented this and their reasons.
- c. The contractor should have promptly notified the Department of Public Works, and Mayor's Office of Contract Compliance when the union or unions with which the contractor has collective bargaining agreements did not refer to the contractor a minority or female sent by the contractor, or when the contractor has other information that the union referral process has impeded efforts to meet its goals.
- d. The contractor should have disseminated its EEO policy within its organization by including it in any employee handbook or policy manual; by publicizing it in company newspapers and annual reports and by advertising such policy at reasonable intervals in union publications. The EEO policy should be further disseminated by conducting staff meetings to explain and discuss the policy; by posting of the policy; and by review of the policy with minority and female employees.
- e. The contractor should have disseminated its EEO policy externally by informing and discussing it with all recruitment sources; by advertising in news media, specifically including minority and female news media; and by notifying and discussing it with all subcontractors.
- f. The contractor should have made both specific and reasonably recurrent written and oral recruitment efforts. Such efforts should have been directed at minority and female organizations, schools with substantial minority and female enrollment, and minority and female recruitment and training organizations within the contractor's recruitment area.

- g. The contractor should have evidence available for inspection that all tests and other selection techniques used to select from among candidates for hire, transfer, promotion, training, or retention are being used in a manner that does not violate the OFCCP Testing Guidelines in 41 CFR Part 60-3.
- h. The contractor should have made sure that seniority practices and job classifications do not have a discriminatory effect.
- i. The contractor should have made certain that all facilities are not segregated by race.
- j. The contractor should have continually monitored all personnel activities to ensure that its EEO policy was being carried out including the evaluation of minority and female employees for promotional opportunities on a quarterly basis and the encouragement of such employees to seek those opportunities.
- k. The contractor should have solicited bids for subcontracts from available minority and female subcontractors engaged in the trades covered by these Bid conditions, including circulation of minority and female contractor associations.

**NOTE:** The Director and the Mayor's Office of Contract Compliance will provide technical assistance on questions pertaining to minority and female recruitment sources, minority and female community organizations, and minority and female news media upon receipt of a request for assistance from a contractor.

3. **NON-DISCRIMINATION:**

In no event may a contractor utilize the goals and affirmative action steps required in such a manner as to cause or result in discrimination against any person on account of race, color, religion, sex, marital status, national origin, age, mental or physical handicap, political opinion or affiliation.

4. **COMPLIANCE AND ENFORCEMENT:**

In all cases, the compliance of a contractor will be determined in accordance with its obligations under the terms of these Bid Conditions. All contractors performing or to perform work on projects subject to these Bid Conditions hereby agree to inform their subcontractors in writing of their respective obligations under the terms and requirements of these Bid Conditions, including the provisions relating to goals of minority and female employment and training.

A. **Contractors Subject to these Bid Conditions:**

In regard to these Bid Conditions, if the contractor meets the goals set forth therein or can demonstrate that it has made every good faith effort to meet these goals, the contractor shall be presumed to be in compliance with Article III, Division 2, Chapter 28 of the Revised Municipal Code, the implementing regulations and its obligations under these Bid Conditions. In the event, no formal sanctions or proceedings leading toward sanctions shall be instituted unless the contracting or administering agency otherwise determines that the contractor is violating the Equal Opportunity Clause.

- 1. Where the Office of Contract Compliance finds that a contractor failed to comply with the requirements of Article 111, Division 2, Chapter 28 of the Revised Municipal

Code or the implementing regulations and the obligations under these Bid Conditions, and so informs the Manager, the Manager shall take such action and impose such sanctions, which include suspension, termination, cancellation, and debarment, as may be appropriate under the Ordinance and its regulations. When the Manager proceeds with such formal action it has the burden of proving that the contractor has not met the goals contained in these Bid Conditions. The contractor's failure to meet its goals shall shift to it the requirement to come forward with evidence to show that it has met the good faith requirements of these Bid Conditions.

2. The pendency of such proceedings shall be taken into consideration by the Department of Public Works in determining whether such contractor can comply with the requirements of Article 111, Division 2, Chapter 28 of the Revised Municipal Code, and is therefore a "responsible prospective contractor".
3. The Mayor's Office of Contract Compliance shall review the contractor's employment practices during the performance of the contract. If the Mayor's Office of Contract Compliance determines that the contractor's Affirmative Action Plan is no longer an acceptable program, the Director shall notify the Manager.

**B. Obligations Applicable to Contractors:**

It shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority or female employees. Discrimination in referral for employment, even if pursuant to provisions of a collective bargaining agreement, is prohibited by the National Labor Relations Act, as amended, Title VI of the Civil Rights Act of 1964, as amended, and Article III, Division 2, Chapter 28 of the Revised Municipal Code. It is the policy of the Department of Public Works that contractors have a responsibility to provide equal employment opportunity, if they wish to participate in City and County of Denver contracts. To the extent they have delegated the responsibility for some of their employment practices to a labor organization and, as a result, are prevented from meeting their obligations pursuant to Article III, Division 2, Chapter 28 of the Revised Municipal Code, such Contractors cannot be considered to be in compliance with Article III, Division 2, Chapter 28 of the Revised Municipal Code, or its implementing rules and regulations.

**C. General Requirements**

Contractors are responsible for informing their subcontractors in writing regardless of tier, as to their respective obligations. Whenever a contractor subcontracts a portion of work in any trade covered by these Bid Conditions, it shall include these Bid Conditions in such subcontracts and each subcontractor shall be bound by these Bid Conditions to the full extent as if it were the prime contractor. The contractor shall not, however, be held accountable for the failure of its subcontractors to fulfill their obligations under these Bid Conditions. However, the prime contractor shall give notice to the Director of any refusal or failure of any subcontractor to fulfill the obligations under these Bid Conditions. A subcontractor's failure to comply will be treated in the same manner as such failure by a prime contractor.

1. Contractors hereby agree to refrain from entering into any contract or contract modification subject to Article 111, Division 2, Chapter 28 of the Revised Municipal Code with a contractor debarred from, or who is determined not to be a "responsive" bidder for the City and County of Denver contracts pursuant to the Ordinance.
2. The contractor shall carry out such sanctions and penalties for violation of these Bid Conditions and the Equal Opportunity Clause including suspension, termination and cancellation of existing subcontracts and debarment from future contracts as may be ordered by the Manager pursuant to Article 111, Division 2, Chapter 28 of the Revised Municipal Code and its implementing regulations.
3. Nothing herein is intended to relieve any contractor during the term of its contract from compliance with Article III, Division 2, Chapter 28 of the Revised Municipal Code, and the Equal Opportunity Clause of its contract with respect to matters not covered in these Bid Conditions.
4. Contractors must keep such records and file such reports relating to the provisions of these Bid Conditions as shall be required by the Office of Contract Compliance.
5. Requests for exemptions from these Bid Conditions must be made in writing, with justification, to the Manager of Public Works, City and County Building, Room 379, Denver, Colorado 80202, and shall be forwarded through and with the endorsement of the Director.

**CITY AND COUNTY OF DENVER  
INSURANCE REQUIREMENTS FOR DEPARTMENT OF AVIATION  
EXHIBIT C**

**A. Certificate Holder**

The certificate shall be issued to:      CITY AND COUNTY OF DENVER  
Denver International Airport  
8500 Peña Boulevard, Suite 8810  
Denver CO 80249  
Attn: Risk Management

**B. Acceptable Certificate of Insurance Form and Submission Instructions**

Please read these requirements carefully to ensure proper documentation and receipt of your certificate(s) of insurance.

- ACORD FORM (or equivalent) must be emailed in pdf format to: [contractadmininvoices@flydenver.com](mailto:contractadmininvoices@flydenver.com)
- HARD COPIES of certificates and/or copies of insurance policies will not be accepted.
- ACORD FORM (or equivalent) must reference the DEN assigned Contract Number.

**C. Coverages and Limits**

1. Commercial General Liability:

Vendor shall maintain insurance coverage including bodily injury, property damage, personal injury, advertising injury, and products and completed operations in minimum limits of \$5,000,000 each occurrence, \$5,000,000 products and completed operations aggregate and \$5,000,000 annual policy aggregate.

- a. Such insurance shall also provide contractual liability covering liability assumed under this Agreement (including defense costs assumed under contract) within the scope of coverages provided.
- b. Coverage shall include Mobile Equipment Liability, if used to perform services under this Agreement.

2. Business Automobile Liability:

Vendor shall maintain a minimum limit of \$1,000,000 combined single limit each occurrence for bodily injury and property damage for all owned, leased, hired and/or non-owned vehicles used in performing services under this Agreement.

- a. If operating vehicles unescorted airside at DEN, a \$10,000,000 combined single limit each occurrence for bodily injury and property damage is required.
- b. If Vendor does not have blanket coverage on all owned and operated vehicles, then a schedule of insured vehicles (including year, make, model and VIN number) must be submitted with the Certificate of Insurance.
- c. The policy must not contain an exclusion related to operations on airport premises
- d. If transporting waste, hazardous material, or regulated substances, Vendor shall carry the Broadened Pollution Endorsement and an MCS 90 Endorsement on its policy.
- e. If Vendor is an individual or represents that Vendor does not own any motor vehicles and Vendor's owners, officers, directors, and employees use their personal vehicles for business purposes, Personal Automobile Liability insurance coverage will be accepted provided it includes a business use endorsement.
- f. If Vendor will be completing all services to DEN under this Agreement remotely this requirement will be waived.

3. Workers' Compensation and Employer's Liability Insurance:

Vendor shall maintain the coverage as required by statute for each work location and shall maintain Employer's Liability insurance with limits no less than \$1,000,000 per occurrence for each bodily injury claim, \$1,000,000 per occurrence for each bodily injury caused by disease claim, and \$1,000,000 aggregate for all bodily injuries caused by disease claims.

- a. If Vendor is a sole proprietor, Workers' Compensation and Employer's Liability is exempt under the Colorado Workers' Compensation Act.

4. Contractors Pollution Liability:

Vendor shall maintain coverage for its work site operations that are conducted on DEN's premises including project management and site supervision duties with a limit no less than \$1,000,000 each occurrence and aggregate resulting from claims arising out of a pollution condition or site environmental condition resulting out of work site operations on DEN's premises.

- a. Coverage shall include claims/losses for bodily injury, property damage including loss of use of damaged property, defense costs including costs and expenses incurred in the investigation, defense or settlement of claims, and cleanup cost for pollution conditions resulting from illicit abandonment, the discharge, dispersal, release, escape, migration or seepage of any solid, liquid, gaseous or thermal irritant, contaminant, or pollutant, including soil, silt, sedimentation, smoke, soot, vapors, fumes, acids, alkalis, chemicals, electromagnetic fields, hazardous substances, hazardous materials, waste materials, low level radioactive waste, mixed wastes, on, in, into, or upon land and structures thereupon, the atmosphere, surface water or groundwater on the DEN premises.
- b. For the purpose of this provision, work site means a location where covered operations are being performed, including real property rented or leased from the City for the purpose of conducting Vendor's covered operations.

5. Installation Floater:

Vendor shall provide coverage with a limit equal to the full insurable value of materials and equipment and be written on a Special Covered Cause of Loss Form including theft, faulty workmanship, mechanical or electrical damage during testing and labor costs to repair damaged work, and soft costs. The policy shall cover property while located at the project site, at temporary locations, or in transit; and name the City as the loss payee on the policy, as its interests may appear. Coverage shall remain in force until acceptance of the work by the City.

6. Property Coverage:

Vendor is solely responsible for any loss or damage to their business personal property including, without limitation, tools, equipment, temporary structures, or property or materials created or provided under the Agreement until installed at the Project Site. If Vendor has purchased a property insurance policy to insure their business personal property, such policy must include a Waiver of Subrogation clause in favor of the City (refer to Section E).

7. Property Coverage for City Property in Vendor's Care, Custody and Control:

Vendor shall provide coverage on a replacement cost basis for damage to property that is owned or leased by the City that is in the care, custody and control of Vendor during its operations under this Agreement.

- a. The City shall be named Loss Payee as its interest may appear.
- b. Any deductible in excess of \$100,000 each occurrence must be disclosed to and approved by DEN Risk Management.

8. Professional Liability (Errors and Omissions) Insurance:

Vendor shall maintain a minimum limit of \$1,000,000 each claim and annual aggregate, providing coverage for all applicable services outlined in this Agreement.



9. **Excess/Umbrella Liability:**

Combination of primary and excess coverage may be used to achieve minimum required coverage limits. Excess policy(es) must follow form of the primary policies with which they are related to provide the minimum limits.

**D. Additional Insured**

For all coverages required under this Agreement (excluding Workers' Compensation and Professional Liability), Vendor's insurer(s) shall include the City and County of Denver, its elected and appointed officials, employees and volunteers as Additional Insureds by policy endorsement.

**E. Waiver of Subrogation**

For all coverages required under this Agreement, Vendor's insurer(s) shall waive subrogation rights against the City and County of Denver, its elected and appointed officials, employees and volunteers by policy endorsement.

**F. Notice of Material Change, Cancellation or Nonrenewal**

Each certificate and related policy shall contain a valid provision requiring notification to the Certificate Holder in the event any of the required policies be canceled or non-renewed or reduction in coverage before the expiration date thereof.

1. Such notice shall reference the DEN assigned contract number related to this Agreement.
2. Said notice shall be sent thirty (30) days prior to such cancellation or non-renewal or reduction in coverage unless due to non-payment of premiums for which notice shall be sent ten (10) days prior.
3. If such written notice is unavailable from the insurer or afforded as outlined above, Vendor shall provide written notice of cancellation, non-renewal and any reduction in coverage to the Certificate Holder within seven (7) business days of receiving such notice by its insurer(s) and include documentation of the formal notice received from its insurer's as verification.

**G. Additional Provisions**

1. Deductibles, Self-Insured Retentions, or any other type of retention are the sole responsibility of the Vendor.
2. Defense costs shall be on addition to the limits of liability. If this provision is unavailable that limitation must be evidenced on the Certificate of Insurance.
3. A severability of interests or separation of insureds provision (no insured vs. insured exclusion) is included.
4. A provision that coverage is primary and non-contributory with other coverage or self-insurance maintained by the City, excluding Professional Liability and Workers' Compensation policies, if required.
5. Coverage limits purchased by Consultant greater than the minimum amounts required under this Agreement must be referenced on any provided certificate of insurance and extended to the benefit of the City.
6. All policies shall be written on an occurrence form. If an occurrence form is unavailable, claims-made coverage may be accepted by the City provided the retroactive date is on or before the Agreement Effective Date or the first date when any goods or services were provided to the City, whichever is earlier, and continuous coverage will be maintained or an extended discovery period of three years beginning at the time work under this Agreement is completed or the Agreement is terminated, whichever is later.
7. Vendor shall advise the City in the event any general aggregate or other aggregate limits are reduced below the required per occurrence limits. At their own expense, and where such general aggregate or other aggregate limits have been reduced below the required per occurrence limit, the Vendor will procure such per occurrence limits and furnish a new certificate of insurance showing such coverage is in force.

8. Certificates of Insurance must specify the issuing companies, policy numbers and policy periods for each required form of coverage. The certificates for each insurance policy are to be signed by a person authorized by the insurer to bind coverage on its behalf and must be submitted to the City at the time the Permittee signed this Agreement.
9. The insurance shall be underwritten by an insurer licensed or authorized to do business in the State of Colorado and rated by A.M. Best Company as A- VIII or better.
10. Certificate of Insurance and Related Endorsements: The City's acceptance of a certificate of insurance or other proof of insurance that does not comply with all insurance requirements set forth in this Agreement shall not act as a waiver of Vendor's breach of this Agreement or of any of the City's rights or remedies under this Agreement. The City's acceptance of any submitted insurance certificate is subject to the approval of DEN Risk Management. All coverage requirements specified in the certificate shall be enforced unless waived or otherwise modified in writing by DEN Risk Management. Vendor is solely responsible for ensuring all formal policy endorsements are issued by their insurers to support the requirements herein.
11. The City shall have the right to verify or confirm, at any time, all coverage, information or representations, and the insured and its undersigned agent shall promptly and fully cooperate in any such audit the City may elect to undertake.
12. No material changes, modifications or interlineations to insurance coverage shall be allowed without the review and approval of DEN Risk Management.
13. Vendor shall be responsible for ensuring DEN is provided updated Certificate(s) of Insurance ten (10) days prior to each policy renewal.
14. Vendor's failure to maintain the insurance required by this Agreement shall be the basis for immediate termination of this Agreement at DEN's sole discretion and without penalty to the City.



## EXHIBIT D



**TO:** All Users of the City and County of Denver Prevailing Wage Schedules  
**FROM:** Ryland Feno, Classification and Compensation Technician II  
**DATE:** October 1, 2019  
**SUBJECT:** Latest Change to Prevailing Wage Schedules

The effective date for this publication will be **Friday, September 27, 2019** and applies to the City and County of Denver for **BUILDING CONSTRUCTION PROJECTS** (does not include residential construction consisting of single family homes and apartments up to and including 4 stories) in accordance with the Denver Revised Municipal Code, Section 20-76(c).

General Wage Decision No. CO190020  
Superseded General Decision No. CO20180030  
Modification No. 4  
Publication Date: 09/27/2019  
(6 pages)

Unless otherwise specified in this document, apprentices shall be permitted only if they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor (DOL). The employer and the individual apprentice must be registered in a program which has received prior approval by the DOL. Any employer who employs an apprentice and is found to be in violation of this provision shall be required to pay said apprentice the full journeyman scale.

Attachments as listed above.

**\*Career Service Board approved to adjust all Davis Bacon classifications under \$13.00 to comply with the city's minimum wage. The effective date is August 15, 2019. See page 6 for reference.**

"General Decision Number: CO20190020 09/27/2019

Superseded General Decision Number: CO20180030

State: Colorado

Construction Type: Building

County: Denver County in Colorado.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/04/2019
1	02/01/2019
2	02/22/2019
3	05/10/2019
4	09/27/2019

ASBE0028-002 07/01/2018

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR - MECHANICAL (Duct, Pipe & Mechanical System Insulation).....	\$ 31.73	14.23

\* CARP0055-002 05/01/2019

	Rates	Fringes
CARPENTER (Drywall Hanging Only).....	\$ 29.95	10.29

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 \* CARP1607-001 06/01/2019

	Rates	Fringes
MILLWRIGHT.....	\$ 32.00	16.43

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 \* ELEC0068-012 06/01/2019

	Rates	Fringes
ELECTRICIAN (Includes Low Voltage Wiring).....	\$ 36.50	16.18

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 ELEV0025-001 01/01/2019

	Rates	Fringes
ELEVATOR MECHANIC.....	\$ 45.05	34.125

FOOTNOTE:

- a. Vacation: 6%/under 5 years based on regular hourly rate for all hours worked. 8%/over 5 years based on regular hourly rate for all hours worked.
- b. PAID HOLIDAYS: New Year's Day; Memorial Day; Independence Day; Labor Day; Veterans' Day; Thanksgiving Day; the Friday after Thanksgiving Day; and Christmas Day.

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 ENGI0009-017 05/01/2018

	Rates	Fringes
POWER EQUIPMENT OPERATOR (Crane)		
141 tons and over.....	\$ 31.07	10.70
50 tons and under.....	\$ 28.40	10.70
51 to 90 tons.....	\$ 28.57	10.70
91 to 140 tons.....	\$ 29.55	10.70

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 IRON0024-009 01/01/2019

	Rates	Fringes
IRONWORKER, ORNAMENTAL.....	\$ 29.85	11.42

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 IRON0024-010 01/01/2019

	Rates	Fringes
IRONWORKER, STRUCTURAL.....	\$ 29.85	11.42

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 PAIN0079-006 08/01/2017

	Rates	Fringes
PAINTER (Brush, Roller and Spray; Excludes Drywall Finishing/Taping).....	\$ 20.50	8.41
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PAIN0079-007 08/01/2017		
	Rates	Fringes
DRYWALL FINISHER/TAPER.....	\$ 21.20	8.41
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PAIN0419-001 07/01/2016		
	Rates	Fringes
SOFT FLOOR LAYER (Vinyl and Carpet).....	\$ 20.00	10.83
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PAIN0930-002 07/01/2018		
	Rates	Fringes
GLAZIER.....	\$ 31.52	10.13
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PLUM0003-009 06/01/2018		
	Rates	Fringes
PLUMBER (Excludes HVAC Duct, Pipe and Unit Installation).....	\$ 35.48	15.94
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PLUM0208-008 06/01/2018		
	Rates	Fringes
PIPEFITTER (Includes HVAC Pipe and Unit Installation; Excludes HVAC Duct Installation).....	\$ 37.55	14.95
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SFCO0669-002 04/01/2017		
	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers).....	\$ 36.73	20.47
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SHEE0009-004 07/01/2018		
	Rates	Fringes
SHEET METAL WORKER (Includes HVAC Duct Installation; Excludes HVAC Pipe and Unit Installation).....	\$ 34.02	17.49

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 SUCO2013-006 07/31/2015

	Rates	Fringes
BRICKLAYER.....	\$ 21.96	0.00
CARPENTER (Acoustical Ceiling Installation Only).....	\$ 22.40	4.85
CARPENTER (Metal Stud Installation Only).....	\$ 17.68	0.00
CARPENTER, Excludes Acoustical Ceiling Installation, Drywall Hanging, and Metal Stud Installation.....	\$ 21.09	6.31
CEMENT MASON/CONCRETE FINISHER....	\$ 20.09	7.03
LABORER: Common or General.....	\$ 14.49	5.22
LABORER: Mason Tender - Brick....	\$ 15.99	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 16.00	0.00
LABORER: Pipelayer.....	\$ 16.96	3.68
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 20.78	5.78
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 19.10	3.89
OPERATOR: Grader/Blade.....	\$ 21.50	0.00
ROOFER.....	\$ 16.56	0.00
TRUCK DRIVER: Dump Truck.....	\$ 17.34	0.00
WATERPROOFER.....	\$ 12.71	0.00

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 WELDERS - Receive rate prescribed for craft performing  
 operation to which welding is incidental.

**Office of Human Resources  
Supplemental Rates  
(Specific to the Denver projects)  
Revision Date: 08-21-2019**

<b>Classification</b>		<b>Base</b>	<b>Fringe</b>
Boilermaker		\$30.97	\$21.45
Iron Worker, Reinforcing		\$18.49	\$3.87
Laborer: Concrete Saw		\$13.89	-
Paper Hanger		\$20.15	\$6.91
Plasterer		\$24.60	\$12.11
Plaster Tender		\$13.00	-
Power Equipment Operator	Concrete Mixer - Less than 1 yd	\$23.67	\$10.67
	Concrete Mixer - 1 yd and over	\$23.82	\$10.68
	Drillers	\$23.97	\$10.70
	Loader - up to and incl 6 cu yd	\$23.67	\$10.67
	Loaders - over 6 cu yd	\$23.82	\$10.68
	Mechanic	\$18.48	-
	Motor Grader	\$23.97	\$10.70
	Oilers	\$22.97	\$10.70
	Roller	\$23.67	\$10.67
	Tile Finisher		\$20.87
Tile Setter		\$26.83	\$8.48
Truck Driver	Flatbed	\$19.14	\$10.07
	Semi	\$19.48	\$10.11
Waterproofer		\$13.00	\$0.00

Go to [www.denvergov.org/Auditor](http://www.denvergov.org/Auditor) to view the Prevailing Wage Clarification Document for a list of complete classifications used.

**EXHIBIT E**

**XIII. ATTACHMENT 9, SPECIAL CONDITIONS**

**SPECIAL CONDITIONS**

These pages are not included in the page numbering of this contract document.

## **SPECIAL CONDITIONS**

### **SC-1 CONSTRUCTION CONTRACT GENERAL CONDITIONS**

The Construction Contract General Conditions which constitute a part of the Contract Documents are set forth in a separately published document, entitled "City and County of Denver, Department of Aviation and Department of Public Works, Standard Specifications for Construction, General Contract Conditions," 2011 Edition, the Table of Contents to which is bound herein (which may be informally referred to as the Yellow Book). The General Conditions book is available for purchase for \$12.00 per copy at the following locations during the business hours stated, Monday through Friday, excluding holidays:

Office of the Cashier  
Wellington E. Webb Municipal Office Building, 2nd Floor  
201 West Colfax Avenue  
Denver, Colorado, USA 80202  
7:30 a.m. to 4:30 p.m.

The General Conditions are also available on the DEN Contract Procurement on the City and County of Denver website at:

<https://www.denvergov.org/content/dam/denvergov/Portals/743/documents/2011%20DENVER%20GENERAL%20CONTRACT%20CONDITIONS.pdf>

### **SC-2 DRAWINGS AND SPECIFICATIONS TO BE FURNISHED BY THE CITY**

The City will provide the following Contract Documents to the Contractor in electronic format at no expense to the Contractor:

Document

Technical Specifications: Division 1 and Divisions 142100, 142113, 143100, 143200

The City will provide future drawings and specifications by task order at the time of bid.

Additional copies of the foregoing documents will be furnished to the Contractor at the Contractor's expense. The Contractor will be responsible for supplying all subcontractors with copies of the Contract Documents at its expense.

If Sensitive Security Information ("SSI") is provided to the Contractor, the Contractor shall be required to comply with Department of Aviation, Standard Policies and Procedures No. 6003, "Contractor Protection of Sensitive Security Information," or its successor, and 49 C.F.R. § 1520, or its successor.



The City will not supply any copies of the General Contract Conditions to the Contractor at City expense.

### **SC-3 REVISIONS TO G.C. 201**

The second sentence of General Condition 201 is amended to read: “The unit responsible for this management and control is the Airport Infrastructure Management Office under the supervision of the Senior Vice President for Maintenance and Airport Infrastructure Management.”

### **SC-4 CITY LINE OF AUTHORITY AND CONTACTS**

In accordance with General Condition 214, the City’s line of authority for administration of this Contract is:

Chief Executive Officer (CEO). Executive Office, 9th Floor, Airport Office Building, 8500 Peña Boulevard, Denver, CO 80249. Any reference to the Manager of Aviation shall also mean Chief Executive Officer, Department of Aviation (CEO).

Executive Vice President – Chief Operating Officer (EVP-COO) who reports to the CEO. Airport Infrastructure Management office, 9th Floor, Airport Office Building, 8500 Peña Boulevard, Denver, CO 80249.

Senior Vice President - Airport Infrastructure Management (SVP-AIM) who reports to the COO. Airport Infrastructure Management office, 10th Floor, Airport Office Building, 8500 Peña Boulevard, Denver, CO 80249.

Director of Facilities Services, reports to the SVP-AIM. The Project Manager reports to the Director of Facilities Services. Airport Infrastructure Management Division, 7<sup>th</sup> Floor, Airport Office Building, 8500 Peña Boulevard, Denver, CO 80249.

Project Manager, the City representative who has day to day administrative responsibility of this Contract, and who reports to the SVP-AIM. All notices, requests, pay applications (pursuant to G.C. 902), and other correspondence from the Contractor shall be sent to the assigned Project Manager unless otherwise provided in this Contract. The Project Manager for this Contract is: Joshua Spoon, Airport Infrastructure Management Office, 7th Floor, Airport Office Building, 8500 Peña Boulevard, Denver, CO 80249, phone 303-342-4477.

The CEO may from time to time substitute a different City official as the designated “SVP-AIM” hereunder, and any such change will be effective upon the issuance of written notice to the Contractor which identifies the successor SVP-AIM. The SVP-AIM may from time to time change the assigned Project Manager, and any such change will be effective

upon the issuance of written notice to the Contractor which identifies the successor Project Manager.

**SC-5 CONTRACTOR PERFORMANCE; SUBCONTRACTING**

With respect to General Condition 501, no more than ninety-five percent (90%) of the work may be subcontracted. If it is determined to be in the City's best interest, this percentage may be modified throughout the course of the project by the SVP-AIM.

**SC-6 COOPERATION WITH OTHERS**

The Task Order will describe the constraints on the physical work site areas. These descriptions are not exhaustive and the Contractor is required to coordinate its activities and work as may be required to meet FAA or City requirements while performing work on DEN.

Without limiting the foregoing, the following contracts administered by the City involve or may involve work overlapping or adjoining the Work under this Contract, and may be prosecuted concurrently with the Work performed under this Contract. There may also be other adjoining or overlapping contracts which are not listed.

**SC-7 PROSECUTION AND COMPLETION OF THE WORK:**

The Work to be performed under the Contract is issued as Task Orders.

Work will be issued to the Contractor as Task Orders upon reaching a negotiated contract between the Contractor and the City as to the cost of the work. Markups on labor, materials, equipment, and subcontractors will be applied to the negotiated costs, in accordance with the contract terms. All contractor proposals for Task Order work or Task Order Change Orders will be in a format as outlined in the Task Order Notice. Proposal line items will include quantities and units of work as well as man-hours and material cost per unit. Work for which a negotiated cost agreement cannot be reached between the City and the Contractor may be, at the direction of the Assistant Manager, performed and compensated on a time and materials basis, with the associated markups applied.

Since this is a contract for on-call services, the Contractor is not guaranteed nor entitled to the issuance of any Task Orders. Task Orders may be negotiated with this or another existing On Call Contractor, or bid between existing On Call Contractors and/or other active airport contractors. Bids for such Task Orders should be submitted per the requirements provided by the City, and may not necessarily require utilization of the rates and markups submitted in the initial On Call Construction contract. Changed work in competitively bid Task Orders will utilize the rates and markups submitted in the initial On Call Construction contract.

The Contractor shall (a) commence work under any issued Task Order within ten (10) calendar days after the date of the Notice to Proceed, (b) prosecute said work diligently, and (c) complete the entire work ready for use no later than the number of calendar days required in the Task Order. The time stated for completion shall include final cleanup of the premises or work site plus such extension or extensions of time as may be granted by the CEO in accordance with the provisions of these General Contract Conditions and Special Contract Conditions.

With respect to any work that is authorized by a Task Order issued prior to the contract completion date, but not completed by that date, the City shall have the option to terminate the work in progress and pay only for that portion of the work satisfactorily completed within the period of performance specified herein or to provide for, in writing, a limited extension of the contract completion date to complete the remaining work.

For each Task Order submitted to the Contractor for pricing, the Contractor agrees to review and price the Task Order within fourteen (14) consecutive calendar days of the date of such Task Order.

#### **SC-8 TASK ORDER NOTICE TO PROCEED**

Following the issuance of any fully executed Task Order hereunder, the Contractor shall commence work in accordance with the Notice to Proceed date established in the Task Order. In the event the Task Order does not include a Notice to Proceed date, the City will issue a separate Notice to Proceed, and Contractor shall commence work within ten (10) consecutive calendar days of the date of the Task Order Notice to Proceed; however, no work will commence on any project until such time as the Contractor has complied with all administrative requirements for that particular project and the Contractor has satisfied all bonding requirements for the particular Task Order (SC-25 PERFORMANCE AND PAYMENT BOND). Thereafter the Contractor shall prosecute the work to be accomplished under the Task Order at such time and place as the Task Order directs and shall fully complete in every detail all specified work in accordance with the terms and conditions of the Task Order and the provisions of these General Contract Conditions and Special Contract Conditions.

#### **SC-9 LIQUIDATED DAMAGES**

If the Contractor fails to complete the work with the time specified or if the Contractor causes disruptions to DEN activities or operation as defined herein the Contractor shall pay the City liquidated damages in the amount of five hundred Dollars (\$500.00) per day until substantial completion is achieved or as noted in future Task Orders.

At any time after the occurrence of the first incident, DEN may determine that by causing any of these disruptions, the Contractor is not properly managing the work and DEN may,

in its sole discretion, terminate the entire Contract for Cause under General Contract Condition section 2201. In the event of such termination, the Contractor shall not be entitled to any cancellation penalty or additional compensation, and the Contractor shall be liable to DEN for all costs and expenses of taking over and completing the work as provided in General Contract Condition section 2201.

Article IV of the Contract and General Condition 602 cover payment and withholding of liquidated damages.

#### **SC-10 PRECONSTRUCTION MEETING**

Prior to the issuance of the first Task Order and the start of such work, the Contractor, and the City shall meet to discuss and resolve any and all issues that may pertain to the understanding of the terms and conditions of the contract and scope of work. Individual pre-construction meetings will be held at the City's discretion on each issued Task Order prior to issuance of each Notice to Proceed for that Task Order.

#### **SC-11 FACILITY SECURITY AND PERSONNEL ACCESS**

The Contractor shall conduct all its activities at the Airport in compliance with the Airport security system rules and regulations, which are administered by the Airport Operations Division. The Contractor shall obtain the proper access authorizations for its employees, subcontractors and suppliers (i.e., Badges and Permits), and shall be responsible for such persons' compliance with all the Airport rules and regulations. A copy of the Contractors' section of the Airport Security rules and regulations are available for Contractor review at the Airport Access Services Office, Concourse A East Subcore, 4th Level. Persons regularly entering the construction areas must obtain personnel access badges from the Airport Access Services Office and must display badges, at all times, upon entering the construction, restricted and sterile areas of the airport. Any employee, subcontractor or supplier who violates such rules may be subject to revocation of his access authorization, including authorization for access to the construction site and all other restricted and sterile areas.

The security status of the Airport is subject to change without notice. These contract Special Conditions are applicable to the current security status of the Airport. Should the security status of the Airport change at any time during the term of this Contract, a written notice shall be issued to the Contractor detailing all applicable security modifications from the airport's current security status. The Contractor shall take **immediate steps** to comply with those security modifications as directed in the written notice.

If these security modifications involve any additional project cost, the Contractor shall submit a Contractor Change Request in accordance with the General Conditions for the additional cost. The Contractor Change Request shall outline in specific detail the effects

of the security modifications on the Contractor's performance of the Contract, and shall provide a detailed cost breakdown for each item for which the Contractor is requesting reimbursement.

The Contractor shall return to the City, at contract completion or termination, or upon demand by the City, all access keys issued to it by the City to all areas of the Airport. If the Contractor fails to return any such key or keys at contract completion or termination or upon demand by the City, the Contractor shall be liable to the City for all the City's costs, including the City's labor costs for employees, incurred in re-coring doors and any other work which is required to prevent compromise of the Airport security system. In order to collect such costs hereunder, the City may withhold funds in such amount from any amounts due and payable to the Contractor under this Contract.

The construction of all the Project / Task Items that involve the breaching of any airport perimeter security boundary or continued access to restricted access rooms or areas will require the posting of authorized contract security personnel to maintain required security controls. The Contractor's **Guarantee Maximum Price / Total Contract BID Amount / Task Order Proposal** shall include the cost of providing security services to maintain control and supervision of any and all airport perimeter security boundary breaches and for the duration of work activities where access to restricted areas is required and until the airport perimeter security boundaries are reestablished.

When security boundaries are opened for any reason, the Contractor must maintain one hundred percent (100%) control and supervision for the entire time that the openings are present to prevent unauthorized access to the secure / restricted access areas.

**THE IMPORTANCE OF THIS SPECIAL CONDITION CANNOT BE OVER-EMPHASIZED. SEVERE FINANCIAL PENALTIES AS WELL AS CONTRACT TERMINATION COULD RESULT IF AIRPORT PERIMETER SECURITY REQUIREMENTS ARE NOT STRICTLY FOLLOWED. THE REQUIREMENT TO PROVIDE ONE HUNDRED PERCENT (100%) CONTROL AND SUPERVISION OF BREACHES IN THE AIRPORT'S PERIMETER SECURITY BOUNDARY IS ABSOLUTE. AT NO TIME, DURING WORK AND NON-WORK HOURS SHALL ANY BREACHES IN THE AIRPORT'S SECURITY PERIMETER BE UNSUPERVISED AND / OR UNSECURED.**

For off-hours of construction, the Contractor may choose to erect a temporary wall to close all perimeter openings. The wall construction shall be of sufficient materials and strength to prevent access to the airport's Sterile/Restricted Areas. The Contractor shall submit for review and approval, the details and materials for the temporary closure of security perimeter breaches for review and approval.

The Contractor will provide contract security guard services to maintain supervision of these openings. The security services must provide coverage to allow for lunch breaks, comfort breaks and etc. The security services **must** be obtained from the following contract security guard company:

HSS  
900 S. Broadway, Suite 100  
Denver, Colorado 80209

DEN Contact: Glenn Spies  
(303) 342-4323

All security guards provided for this project must have a Denver Airport SIDA Badge.

The DEN Security Guard Contractor may change between the bidding or proposal phase of this contract from Notice to Proceed to closure of all security perimeter breaches. The Contractor shall maintain a contractual relationship with the Security Guard Contractor holding the most current contract with Denver International Airport.

The Contractor shall continue to provide security of these areas until such time that the breaches in the airport's security perimeter have been permanently secured.

The Contractor shall submit a written security plan for approval to the Director of Airport Security prior to the start of construction on any work where a breach of the perimeter security boundaries is required.

#### **SC-12 CONSTRUCTION ACCESS**

The work site is located at Denver International Airport Concourse A, B, C, Terminal, North Terminal and Airport Office Building (AOB). The Contractor shall have access to the work site via Jeppesen Terminal. All equipment and materials deliveries shall be routed through DEN Security Gates 04 and 05. The contractor shall be responsible for submitting a map detailing the routing of materials and equipment to DEN jobsite for approval. No equipment and materials is allow on site without the DEN PM's approval. .

The City will not provide parking spaces for the Contractor's employees or subcontractor employees at the Airport. Arrangements for transportation and parking for all of its and its subcontractors employees will be the responsibility of the Contractor. The Total Contract Bid Amount or Contract Amount shall include any and all costs associated with the Contractor's and subcontractors' employee parking. Information about parking facilities and charges is available from the Airport Parking Office. Refundable deposits are required for all parking passes.

Unless specifically required by the Contract Documents, the Contractor shall install no fences or other physical obstructions on or around any project work area without the approval of the City.

### **SC-13 VEHICLE PERMITTING**

Vehicle access on the Airport Operation Area (AOA) is controlled by and operated by DEN Airport Operations and Security. Contractor is required to obtain a vehicle access permit for any vehicle entering inside this area. Contractor is responsible for complying with DEN Airport Operations and Security requirement Only direct construction support vehicles and/or equipment will be allowed in the contractor's work areas or sites.

### **SC-14 VENDORS AND SUPPLIERS**

The Contractor shall provide the Project Manager's office with a list of its equipment/material vendors and suppliers for each Task Order. Vendors or suppliers shall access the construction work areas via the Contractor's access route, described in SC-12 above. All delivery vehicles are subject to search.

### **SC-15 COMMUNICATION DEVICES**

Any site communications devices, mobile communication devices or internet data devices used at DEN must be approved by DEN Technologies.

### **SC-16 USE, POSSESSION OR SALE OF ALCOHOL OR DRUGS**

The Contractor and its officers, agents, and employees shall cooperate and comply with the provisions of Executive Order No. 94 thereto concerning the use, possession, or sale of alcohol or drugs. Violation of these provisions or refusal to cooperate with implementation of the policy can result in the City's barring the Contractor from City facilities or participating in City operations.

### **SC-17 ATTORNEY'S FEES**

Colorado Revised Statute 38-26-107 requires that in the event any person or company files a verified statement of amounts due and unpaid in connection with a claim for labor and materials supplied on this project, the City shall withhold from payments to the Contractor sufficient funds to insure the payment of any such claims. Should the City and County of Denver be made a party to any lawsuit to enforce such unpaid claims or any lawsuit arising out of or relating to such withheld funds, Contractor agrees to pay to the City its costs and a reasonable attorney's fee. Because the City Attorney Staff does not bill the City for legal services on an hourly basis, Contractor agrees a reasonable fee shall be computed at the rate of one hundred dollars per hour of City Attorney time.

### **SC-18 INSURANCE REQUIREMENTS**

In accordance with the provisions of Title 16 of the General Conditions, the minimum insurance requirements for this contract are set forth in the Attachment 1, attached to this Contract. The Contractor specifically agrees to comply with each condition, requirement or specification set forth in the attachment for each required coverage during all periods when the required coverage's are in effect.



Contractor and sub-contractors shall procure and maintain until all of their obligations have been discharged, including any warranty periods under this Contract are satisfied, required insurance against claims for injury to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or sub-contractors.

The insurance requirements herein are minimum requirements for this Contract and in no way limit the indemnity covenants contained in this Contract.

The City and County of Denver in no way warrants that the minimum limits contained herein are sufficient to protect the Contractor from liabilities that might arise out of the performance of the work under this Contract by the Contractor, his agents, representatives, employees or sub-contractors. The Contractor shall assess its own risks as it deems appropriate and/or prudent, maintain higher limits and/or broader coverages. The Contractor is not relieved of any liability or other obligations assumed or pursuant to the Contract by reason of its failure to obtain or maintain insurance in sufficient amounts, duration or types.

Contractor shall furnish the City and County of Denver with certificates of insurance (ACORD form or equivalent approved by CCD) as required by this Contract. The certificates for each insurance policy are to be signed by a person authorized by the insurer to bind coverage on its behalf.

All certificates and any required endorsements are to be received and approved by the City before work commences. Each insurance policy required by this Contract must be in effect at or prior to commencement of work under this Contract and remain in effect for the duration of the project. Failure to maintain the insurance policies as required by this Contract or to provide evidence of renewal is a material breach of the Contract. All insurance coverages for sub-contractors shall be subject to the minimum requirements identified in the Attachment 1. All sub-contractors certificates and endorsements shall be received and approved by the Contractor before work commences. The City reserves the right to request copies of these certificates at any time.

All certificates required by this Contract shall be sent directly to Denver International Airport, Business Management Services, Airport Office Building, Room 8810, 8500 Peña Boulevard, Denver, Colorado 80249. The City project/Contract number and project description shall be noted on the certificate of insurance. The City reserves the right to require complete, certified copies of all insurance policies required by this Contract at any time.

The parties hereto understand and agree that the City and County of Denver, its officers, officials and employees, are relying on, and do not waive or intend to waive by any provisions of this Contract, the monetary limitations or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, §§ 24-10-101 - 120,



C.R.S., or otherwise available to the City and County of Denver, its officers, officials and employees.

### **SC-19 SUBCONTRACTOR RELEASES**

The release form referred to in General Condition 907 is attached to this Contract. It is entitled "Denver International Airport Partial Release."

### **SC-20 ADDITIONAL AFFIRMATIVE ACTION REQUIREMENTS, FEDERAL PROVISIONS**

This contract is subject and subordinate to the terms, reservations, restrictions, and conditions of any existing or future agreements between the City and the United States, the execution of which has been or may be required as a condition precedent to the transfer of federal rights or property to the City for airport purposes, and the expenditure of federal funds for airport purposes. The "Federal Requirements" section attached hereto is made a part of this Contract.

### **SC-21 APPLICATIONS FOR PROGRESS PAYMENTS TO CONTRACTORS**

General Condition 902.3 is amended by the addition of the following:

Where applicable, with respect to any Task Order issued hereunder, progress payments for performance of any work shall be based on completed work estimates and shall be subject to the following requirements:

1. The Contractor shall submit a complete and separate application for payment for the work estimates of each Task Order performed during the specified billing period.
2. Each submitted estimate shall specify the percent of the work complete. This percentage shall be certified by the Project Engineer/Manager or the Consulting Architect or Engineer, as appropriate.
3. Each estimate of work completed shall also specifically identify those MBE/WBE Subcontractors or Suppliers that the Contractor is utilizing on the Project pursuant to the requirements of Article VII, Division 1 and 3 of Chapter 28, of the D.R.M.C.
4. Each estimate of work for each Task Order performed shall be submitted using a separate Application for Progress Payment Task Order Contracts (Form CM-18A), accompanied by either duplicate sets of verified Contractor's Certifications of Payment (Form CM-19), or by verified Partial Release of Contractor forms from each subcontractor and supplier (Form CM-26). Each estimate of work completed shall also be accompanied by:

- a. A written schedule of values, which set out the quantities and costs for the Project and
  - b. The Project Engineer/Manager's, or Consulting Architect or Engineer, as applicable, Architect's or Engineer's estimated statement of the percentage of work completed for each line item of cost for which the City has promised to pay the Contractor. The Contractor shall also submit to the Auditor and other appropriate officials of the City, in a timely fashion, all information required by General Conditions Title 10.
5. The estimate of the percentage of estimate of work completed shall constitute a representation by the Contractor to the City that the work has progressed to the point indicated; that the quality of the work covered by the estimate is in accordance with the Contract Documents; that each obligation covered by the estimate (except as otherwise noted), and the payments required will be used to discharge such obligation unless previously discharged; and that the Contractor is entitled to payment in the amount requested. The Project Engineer/Manager or the Consulting Architect or Engineer, as appropriate, with the assistance of input from the Project Construction Manager, in the event that such has been retained, will also verify the estimate of work completed prior to any acceptance by the City.
6. The Contractor warrants that:
  - a. Title to work covered by an estimate of work completed will pass to the City by incorporation into the completed work;
  - b. Work covered by previous estimates of work completed is free and clear of liens, claims, security interests or encumbrances, hereinafter referred to as "liens", except for any interest created by retainage; and
  - c. No work covered by an estimate of work completed will have been acquired by the Contractor, or any other person or entity performing work at the work site or furnishing materials or equipment for the Project and that no work covered by any estimate is subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person or entity.
7. Approval of an estimate of work completed or actual payment shall not foreclose the right of the City to examine the books and records of the Contractor to determine the correctness and accuracy of any estimate item.
8. Pursuant to General Condition 908, applications for a reduction in retainage must

be accompanied by Partial Release of Contractor forms from each subcontractor or supplier (Form LR-1).

9. The final estimate for payment shall also be accompanied by Final Lien Release forms from each subcontractor and supplier (Form CM-70).
10. Receipt of Contractor's Certifications of Payment or Partial Lien Release forms by the City hereunder shall not act to impair the City's Obligations imposed by C.R.S. 38-26-107 or successor statute.
11. If the Contractor disputes a subcontractor's and/or supplier's entitlement to a portion of the previous month's payment, the Contractor need not submit a Contractor's Certificate of Payment or Partial Release for Contractors from such subcontractor and/or supplier. However, in lieu of such submittal, the Contractor shall submit to the City copies of a written communication from the Contractor to such subcontractor and/or supplier explaining the Contractor's determination not to render payment to such subcontractor or supplier, together with proof of service of such written communication upon such subcontractor and/or supplier.

#### **SC-22 REVISIONS TO G.C. 1102**

G.C. 1102.2 is amended by replacing the phrase "Change Request" in all its occurrences in such G.C. with the phrase "Change Notice."

G.C. 1102.3 is amended by replacing the phrase "Field Order/Change Order Directive" in all its occurrences in such G.C. with the phrase "Change Order Directive."

#### **SC-23 DESCRIPTION OF TASK ORDER**

The Project Manager will provide the Contractor with a Task Notice for Proposal (TNP) describing the services/work to be provided for any Task Order. The Contractor shall respond to the City's request for TNP within 2 working days by (1) visiting the proposed work site in the company of the Project Manager or the Project Manager's authorized representative, or (2) establishing verbal contact with the Project Manager or the Project Manager's authorized representative to further define the scope of the work. The Contractor shall then furnish a work plan and price proposal to the Project Manager for all work described in the TNP. Time for the submittal of the work plan and proposal shall be identified on the TNP. The Contractor shall submit to the Project Manager requests for site inspections and other investigations as necessary for its preparation of a work plan and proposal.

The work plan and proposal shall indicate, but not be limited to:

- a statement of the work to be accomplished

- discussion of the implementation process to include the method of operation, type of equipment, key personnel and subcontractors
- how quality of materials and workmanship will be established and maintained
- any additional design requirements
- special considerations
- schedule and keep milestones

The work shall be broken down according to CSI Divisions. Proposal line items will include quantities and units of work as well as man-hours and material cost per unit. It shall be subject to negotiation with the Project Manager. Mark-ups on labor, material, equipment, and subcontractors will be applied to agreed to amounts. Costs for performance and payment bonds will be included as a separate item. The City will review the work plan proposal for completeness and negotiate conditions of performance with the Contractor. If suitable conditions of performance including price and time cannot be negotiated, a Task Order and Notice to Proceed will not be executed or if critical, may be performed on a time and material basis with the mark-ups included with this proposal applied. The City may utilize other means to procure the required work at any time.

Prior to submitting a work plan and price proposal, the Contractor shall inspect the work site and its surroundings. Requests for site visits shall be submitted to the Project Manager. For purposes of the contract, it shall be conclusively presumed that the Contractor has made a thorough inspection of the site and has waived the right to claim extra payment or time extensions for conditions which would have been evident during that inspection. Because the Proposal information cannot be guaranteed, the Contractor shall have assumed the risks attendant to successful performance of the work except for the risk of encountering differing site conditions which are defined in the General Conditions, and shall never make claim for additional payments or time extensions on the grounds that the nature or amount of work to be done was not understood by the Contractor at the time of submittal of the work plan and price proposal.

#### **SC-24 FUND AVAILABILITY**

Task Order approval and acceptance is contingent upon the availability of funding. Approved Task Orders issued under this contract will obligate funds.

#### **SC-25 PERFORMANCE AND PAYMENT BOND**

Delete the requirements of General Contract Conditions 1501, 1502 and 1503 for separate bonds. Combined Performance and Payment Bonds in the total amount of all current outstanding Task Orders, provided in the precise form contained in these documents, shall be furnished before any work is undertaken in connection with any Task Order. All other terms and conditions of General Contract Conditions 1501, 1502 and 1503 shall remain in effect.

## **SC-26 TASK ORDER PROCESS**

### **TASK ORDERS**

Upon review of any Contractor pricing submittal made pursuant to a Task Notice for Proposal, the City may, at its sole discretion, direct that the work described in the Task Notice for Proposal and priced by the Contractor be completed by issuance of a Task Order to the Contractor or reject the pricing submittal.

The City reserves the right to issue such a Task Order, at the price (either lump sum or time and material) and under the terms of the Contractor's pricing submittal, at any time before the expiration 120 consecutive calendar days from the date the pricing submittal was received by the City. If no Task Order is issued and the pricing submittal is not rejected within this period, the Contractor's pricing Proposal shall be deemed rejected by the City.

A Task Order shall not be issued and no work shall commence until such time as the Task Order is signed by the Contractor and all designated City officials and the Contractor has submitted a Payment and Performance Bond or Bond Change Rider for the work satisfactory to the City Attorney and the CEO.

Upon issuance of a Task Order, the Contractor agrees to satisfactorily perform and complete all work or effort described in each issued Task Order or any subsequently issued Task Order Changes within the period of performance specified in the Task Order and Notice to Proceed plus such extensions of time as may be granted by the CEO in accordance with the provisions of this contract.

#### **TASK ORDER CHANGES**

In accordance with all terms and conditions provided for standard change orders under General Contract Conditions 1101 et seq. CHANGE ORDERS and ADJUSTMENT TO CONTRACT AMOUNT, the City may issue Change Orders providing for deletions, additions and modifications to the work under a duly issued Task Order. Change Orders must be issued on the Change Order or Change Order Directive Form, samples of which are included herein in the Contract Forms Section. In the event of a conflict between GC 1104.2 and the markups submitted by the Contractor identified in the Schedule of Prices and Quantities, regarding any pay item identified in GC 1104.2, the markups and rates submitted by the Contractor in the Schedule of Prices and Quantities shall prevail.

#### **TASK ORDER CLOSEOUT**

After all work performed under each Task Order has been accepted hereunder, final payment and Task Order closeout shall be made in accordance with the terms and conditions of General Contract Condition 910 FINAL ESTIMATE AND PAYMENT. Except that, with the consent of the contractor, legal advertisement, pursuant to Article 26, Colorado Revised Statutes as amended may be held for Task Orders which do not exceed Fifteen Thousand Dollars (\$15,000.00) until such time as several such projects are completed and eligible for legal advertisement.

#### **CONTRACT CLOSE-OUT**

Following final closeout of all Task Orders performed hereunder, the Contract shall proceed to final contract closeout. Final contract closeout shall be completed in accordance with all procedures, terms and conditions set forth in the General Conditions except that final settlement and release or retention will be made upon completion of each Task Order rather than contract completion. In addition, Contractor shall execute a Final Receipt and provide a final contract closeout.

#### **SC-27 TASK ORDER DIRECTIVE**

A Task Order Directive is a written order, signed by the CEO or the CEO's designated representative, which directs the Contractor to commence a Task Order prior to complete agreement on or execution of a Task Order.

Upon receipt of a Task Order Directive, the Contractor shall immediately sign the Task Order Directive and return it to the Project Manager, and shall immediately proceed with performing the work. The Contractor, within fifteen (15) days after receiving the Task Order Directive, shall provide the Project Manager with a complete and itemized proposal

which includes the estimated increase or decrease in the Contract Amount and/or Contract Time attributable to the planned work.

**Time and Materials**

- a. The City will identify a cost estimate or a Not to Exceed lump sum for the work described in the Task Order Directive. If the maximum cost of the work to be performed under the Task Order Directive has not been agreed upon and reduced to writing in the actual Task Order Directive, the Contractor shall proceed with such Work on a Time and Material basis through completion of the Task Order Directive or until the cost of the work has been agreed upon for the Task Order Directive.
- b. Whenever Work is performed on a Time and Material basis, the Contractor shall fully document all costs associated with such work. Beginning with the first Day such Work is performed, and on a daily basis thereafter, the Contractor shall submit to the Project Manager a daily itemization of all such costs in such form as the Project Manger may require.
- c. The final Task Order Directive amount performed on a Time and Material basis shall be calculated in accordance with the Schedule of Prices and Quantities indicated in this contract.

**SC-28 TASK ORDER DIRECTIVES AND CHANGE ORDER DIRECTIVES**

“Work”, as defined in the General Conditions, shall include all work under any Task Order or Task Order Directive. Any reference in the General Conditions to “Change Directive” shall mean “Change Order Directive”.

**SC-29 SUBCONTRACTOR**

The term “subcontractor” includes a labor pool.

**SC-30 NOTICE TO PROCEED AND COMPLETION OF THE WORK**

GC 302 is hereby deleted and replaced with the following:

- .1 A written Initial Notice to Proceed will be issued by the SVP-AIM to initiate the Contract only, and such Initial Notice to Proceed is not authorization for the Contractor to proceed with the Work or to proceed with mobilization. Thereafter, the SVP-AIM may issue a Task Order and subsequent NTP authorizing Work and/or mobilization.
- .2 Upon issuance of the Initial Notice to Proceed, the Contractor is allowed and authorized to incur reimbursable costs related to insurance, payment and performance bonds, and such other essential activities such as security access

(vehicular access and personnel badging). Home office overhead, core staff and other allowable general conditions costs are not authorized under the initial Notice to Proceed.

- .3 Core staff and agreed upon general conditions' costs are authorized and allowed only for the time Work is authorized pursuant to a Second or subsequent Notice to Proceed and Task Order issued by the Project Manager. These costs, in part, are identified on Schedule of Prices and Quantities attached hereto, related to the rates and charges mutually agreed upon by City and Contractor. Requests for Task Order pricing proposals will not authorize the contractor to accumulate reimbursable costs. Costs for Task Order proposal preparation and Task Order negotiation will not be reimbursable. Upon the substantial completion of Work under any subsequent Notice to Proceed, including a Second Notice to Proceed and/or Work Order, whichever is applicable, reimbursement for these costs expires unless otherwise agreed to in writing and authorized by the Project Manager, limited to the sole and only purpose of facilitating Final Completion of the authorized Work. Any costs the Contractor incurs, except for those costs allowed under the Initial Notice to Proceed, after substantial completion without written authorization by the Project Manager shall be absorbed by the Contractor and shall be at the Contractor's own risk.
- .4 If any milestones are described in the Contract Documents, the Work described by each milestone shall be accomplished in accordance with the Contract Documents within the specified Contract Time, or in the alternative, if a Task Order is issued for Work, than the Work shall be accomplished in accordance with the Task Order and completed within the time set forth by said Task Order.

### **SC-31 MOBILIZATION**

The Contractor, upon issuance of a Task Order, shall submit a detailed mobilization plan to the Project Manager, or Project Manager's designee, setting forth the approved proposed location for mobilization and layout. All costs associated with this activity shall be included in the Contractor's proposal.

### **SC-32 BONDS, SALES TAX AND INSURANCE**

Bonds, sales and use tax and insurance shall be paid at cost without mark up.



**SC-33 SUBCONTRACTOR PAYMENTS AND SUBCONTRACTOR RELEASES – REQUIRED USE OF THE B2G CONTRACT MANAGEMENT SYSTEM**

The Contractor is required to use the City B2G Contract Management System to report all subcontractor payments and shall adhere to the City’s Procedure for Reporting Subcontractor Payments. It is the Contractor’s obligation to ensure that complete subcontractor information is entered into the B2G System prior to submission of the first application for payment in order to avoid any delays in payment. The Contractor shall, prior to the submission of each subsequent invoice, ensure payments to subcontractors have been entered into the B2G System, including subcontractor confirmation of amount of payment received, for services performed during the prior billing period.

**SC-34 CHANGE ORDER DIRECTIVE**

Any reference in the General Conditions to “Change Order” shall mean “Change Order Directive”

**SC-35 PROJECT CONTROLS REQUIREMENT**

The Contractor will be required to use the designated Project Management Information System (PMIS), Unifier, BIM 360 Field and Primavera P6 compatible to comply with the requirements of DEN’s Project Controls System. The PMIS is Airport Infrastructure Management’s tool for project and information management, data analysis and document control. Denver International Airport will be responsible for providing the licensing and training for PMIS. The Contractor will be responsible for providing a compatible Primavera P6. The Contractor will also be responsible for providing and maintaining the computer hardware, software and system environment capable of supporting Project Controls System requirements including as the minimum: internet connection; Microsoft Internet Explorer 8 or better; Microsoft Office 2010; Oracle Java JRE 1.7.0 Update 5 and Adobe Acrobat X Pro. This is the only project management system that will be accepted.

**SC-26 SUBCONTRACTOR PAYMENTS AND SUBCONTRACTOR RELEASES - REQUIRED USE OF THE B2G MANAGEMENT SYSTEM.**

The Contractor is required to use the City B2G Contract Management System to report all subcontractor payments and shall adhere to the City’s Procedure for Reporting Subcontractor Payments. It is the Contractor’s obligation to ensure that complete subcontractor information is entered into the B2G System prior to submission of the first application for payment in order to avoid any delays in payment. The Contractor shall, prior to the submission of each subsequent invoice, ensure payments to subcontractors have been entered into the B2G System, including subcontractor confirmation of amount of payment received, for services performed during the prior billing period.

## SC-37 PAYMENTS TO CONTRACTORS

The Contractor further agrees that, to the fullest possible within the CPM System, the City shall be entitled to all non-Confidential records, reports, data and other information related to the project that are available to Contractor through the CPM System, including, but not limited to, information related to Contractor and subcontractor billings. To that end, Contractor agrees that it will activate any available settings within the CPM System that are necessary to grant the City access to such non-Confidential information related to the contract and the project.

Applications for payment shall be based on the Contract Unit Prices or the approved Schedule of Values described in GC 903.1

In accordance with General Contract Condition 902, PAYMENT PROCEDURE,  
The party(ies) responsible for review of all Pay Applications shall be:

**Agency/Firm**

DEN Division CA

DEN Division PM

DEN Division Director

DEN Contract Svcs CA

CCD Denver Prevailing Wage

In accordance with General Contract Condition 906, APPLICATIONS FOR  
PAYMENT, each Application submitted shall include the following:

1. The estimate of Work completed shall be based on the approved schedule of values or unit prices, as applicable, and the percent of the Work complete.
2. Each Application for Payment shall include each and every independent subcontractor's payroll information including pay dates and pay amounts.
3. The Contractor shall also submit to the Auditor and other appropriate officials of the City in a timely fashion, information required by General Contract Condition 1004, REPORTING WAGES PAID.

In accordance with General Contract condition 907, RELEASES AND CONTRACTORS CERTIFICATION OF PAYMENT, applications for Payment must be accompanied by completed Partial or Final Claim Release Form, as appropriate, from EACH subcontractor and supplier, **AND** the Contractor's Certification of Payment Form.

**EXHIBIT F**

**City and County of Denver**



**DENVER**  
THE MILE HIGH CITY

DEPARTMENT OF AVIATION  
DEPARTMENT OF PUBLIC WORKS

**STANDARD SPECIFICATIONS FOR  
CONSTRUCTION  
GENERAL CONTRACT CONDITIONS**

2011 Edition

**Statement**

The City and County of Denver does not warrant or represent the accuracy or timeliness of the information contained in this page or any of its constituent pages and the information presented is for instructional purposes and illustration only and is not intended to be specific advice, legal or otherwise. The City has made every effort to provide accurate up-to-date information, however this database is dynamic and errors can occur. The City and County of Denver shall not be held responsible for errors or omissions nor be liable for any special consequential or exemplary damages resulting, in whole or in part, from any viewer(s)' uses of, or in reliance upon, this material.

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**EXHIBIT G**

**CITY AND COUNTY OF DENVER  
DEPARTMENT OF AVIATION**

**PERFORMANCE AND PAYMENT BOND**

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned \_\_\_\_\_

\_\_\_\_\_ ,  
a corporation organized and existing under and by virtue of the laws of the State of \_\_\_\_\_ ,  
hereafter referred to as the "Contractor", and \_\_\_\_\_ ,

\_\_\_\_\_ ,  
a corporation organized and existing under and by virtue of the laws of the State of \_\_\_\_\_ ,  
and authorized to transact business in the State of Colorado, as Surety, are held and firmly bound unto the  
CITY AND COUNTY OF DENVER, a municipal corporation of the State of Colorado, hereafter referred to  
as the "City", in the penal sum of \_\_\_\_\_ (\$), lawful money of the United States of  
America, for the payment of which sum, well and truly to be made, we bind ourselves and our heirs,  
executors, administrators, successors and assigns, jointly and severally, firmly by these presents;

**THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH THAT:**

WHEREAS, the above bounden Contractor has entered into a written contract with the City for furnishing all labor and tools, supplies, equipment, superintendence, materials and everything necessary for and required to do, perform and complete **CONTRACT NO. 201952239**, Denver, Colorado, and has bound itself to complete the project within the time or times specified or pay liquidated damages, all as designated, defined and described in the said Contract and Conditions thereof, and in accordance with the Plans and Technical Specifications therefore, a copy of said Contract being made a part hereof;

NOW, THEREFORE, if the said Contractor shall and will, in all particulars well and truly and faithfully observe, perform and abide by each and every Covenant, Condition and part of said Contract, and the Conditions, Technical Specifications, Plans, and other Contract Documents thereto attached, or by reference made a part thereof and any alterations in and additions thereto, according to the true intent and meaning in such case, then this obligation shall be and become null and void; otherwise, it shall remain in full force and effect;

PROVIDED FURTHER, that if the said Contractor shall satisfy all claims and demands incurred by the Contractor in the performance of said Contract, and shall fully indemnify and save harmless the City from all damages (liquidated or actual, including, but not limited to, damages caused by delays in the performance of the Contract), claims, demands, expense and charge of every kind (including claims of patent infringement) arising from any act, omission, or neglect of said Contractor, its agents, or employees with relation to said work; and shall fully reimburse and repay to the City all costs, damages, losses and expenses which it may incur in making good any breach or default based upon the failure of the Contractor to fulfill its obligation to furnish maintenance, repairs, services, or replacements for the full guarantee period provided in the Contract Documents, then this obligation shall be null and void; otherwise it shall remain in full force and effect;

PROVIDED FURTHER, that if said Contractor shall at all times promptly make payments of all amounts lawfully due to all persons supplying or furnishing it or its subcontractors with labor and materials, rental machinery, tools or equipment used or performed in the prosecution of work provided for in the above Contract and that if the Contractor will indemnify and save harmless the City for the extent of any and all payments in connection with the carrying out of such Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect;

PROVIDED FURTHER, that if the said Contractor fails to duly pay for any labor, materials, team hire, sustenance, provisions, provender, gasoline, lubricating oils, fuel oils, grease, coal, or any other supplies or materials used or consumed by said Contractor or its subcontractors in performance of the work contracted to be done, or fails to pay any person who supplies rental machinery, tools or equipment, all amounts due as the result of the use of such machinery, tools or equipment in the prosecution of the work, the Surety will pay the same in any amount not exceeding the amount of this obligation, together with interest as provided by law;

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to contracts with others in connection with this project, or the work to be performed thereunder, or the Technical Specifications and Plans accompanying the same, shall in any way affect its obligation on this bond and it does hereby waive notice of any change, extension of time, alteration or addition to the terms of the Contract, or contracts, or to the work, or to the Technical Specifications and Plans.

IN WITNESS WHEREOF, said Contractor and said Surety have executed these presents as of this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

Attest:

\_\_\_\_\_  
Secretary

\_\_\_\_\_  
**Contractor**

By: \_\_\_\_\_  
**President**

\_\_\_\_\_  
**Surety**

By: \_\_\_\_\_  
**Attorney-In-Fact**

(Accompany this bond with Attorney-in-Fact's authority from the Surety to execute bond, certified to include the date of the bond).

APPROVED AS TO FORM:

**KRISTIN M. BRONSON,**  
City Attorney for the City and County of  
Denver

By: \_\_\_\_\_  
**Assistant City Attorney**

APPROVED FOR THE CITY AND COUNTY  
OF DENVER

By: \_\_\_\_\_  
**MAYOR**

By: \_\_\_\_\_  
**CEO DEPARTMENT OF AVIATION**

**PERFORMANCE AND PAYMENT BOND  
SURETY AUTHORIZATION  
(SAMPLE)**

FAX NUMBER: 303-342-2552  
TELEPHONE NUMBER: 303-342-2540

Assistant City Attorney  
Airport Office Building  
8500 Pena Blvd. #9810  
Denver, CO 80249-6340

RE: (Company name)

Contract No: «Contract\_No»  
Project Name: «Project\_Name»  
Contract Amount:  
Performance and Payment Bond No.:

Dear Assistant City Attorney,

The Performance and Payment Bonds covering the above captioned project were executed by this agency, through

\_\_\_\_\_ insurance  
company, on \_\_\_\_\_, 20\_\_.

We hereby authorize the City and County of Denver, Department of Aviation, to date all bonds and powers of attorney to coincide with the date of the contract.

If you should have any additional questions or concerns, please don't hesitate to give me a call at \_\_\_\_\_.

Thank you.

Sincerely,

## SECTION 011100 - SUMMARY OF WORK

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY AND DESCRIPTION

- A. The Work specified in this contract consists of furnishing all management, supervision, labor, materials, tools, equipment, services, testing and incidentals for the construction of the Work indicated in the contract documents including lump sum items and unit price items.
- B. The Work in this Contract may affect operations at DEN. The Contractor shall bid, plan and execute the Work to minimize disruption of operations and inconvenience to the public.
- C. Change Notice:
  - 1. The Contractor will be required to submit a proposal for each Change Notice
  - 2. The Contractor shall submit a proposal for the complete scope of the Work within the specified duration identified by the Notice. Where there is no time requirement identified by the notice documents, the Contractor shall submit a proposal within 20 days of receiving the notice or as allowed in Title 11 - Changes in the Work, Contract Price, or Contract Time of the General Contract Conditions, 2011 Edition.
  - 3. The proposal could contain both competitive bid and estimated costs and shall adhere to the requirements of Title 11 of the General Contract Conditions.
  - 4. The Contractor shall not proceed on any change notice work until a change order is issued.
- D. Change Directives:
  - 1. The DEN Project Manager may issue Change Directive(s) for a Scope of Work. The Contractor shall keep all Time and Material record for any Change Directive(s) issued until a final settlement for the task is settled and finalized in a Change Order.
  - 2. The Contractor shall keep records and approvals for all Time and Material impacts of a Change Directive until a final settlement is reached and fully executed by the DEN Project Manager.
  - 3. The Contractor may invoice for a Change Directive in accordance with Title 11 of the General Contract Conditions, 2011 Edition.

## EXHIBIT I

TECHNICAL SPECIFICATIONS  
01 GENERAL REQUIREMENTS  
011100  
SUMMARY OF WORK

DENVER INTERNATIONAL AIRPORT  
DEN TECH SPECS 2020  
CONTRACT NO. 00000

- E. Guaranteed Maximum Price (GMP): For Contracts assigned as GMP the Contractor shall follow the Special Conditions issued for the Contract.
- F. This Project will be administered using the current Project Management Information System (PMIS). The application will be supplied by DEN at no cost to the Contractor. DEN will provide PMIS training for up to two (2) of the contractor's personnel.
- G. The Contractor shall participate in a preconstruction coordination meeting and update the existing BIM Project Execution Plan or prepare a BIM Project Execution Plan if one does not exist based upon the DEN BIM Project Execution Plan (BXP) template included as provided by the DEN BIM group and the coordination meeting instructions.
- H. DEN utilizes several programs as part of the Asset Management System. Keeping accurate as-built record and operation and maintenance data are essential in the integrity and the validity of the airport operation. The Contractor is required to make every effort to keep the airport data informed, updated and accurate in the format required by DEN Project Manager:
1. The Contractor shall provide and implement BIM Project Execution Plan based on the DEN BIM Project Execution Plan. The Contractor shall employ or contract a consultant to provide all the requirements to produce the Project model in the latest edition of the [currently approved DEN format] <insert requirements>.
  2. The Contractor shall comply with all the requirements of DEN BIM Project Execution Plan and provide the data to DEN to produce the complete record of the BIM model of the Project
- I. Inspection Requirements:
1. Special Inspection and Testing required by the building official or the Engineer of Record in the Contract Documents or in the Statement of Special Inspections will be performed by DEN contracted Agencies.
  2. Contractor shall subcontract Qualified Material Testing Agency(s) to perform all necessary Quality Control, processing control and any additional Testing required by the Contract Documents.
  3. DEN Quality Assurance Manager may audit all material tests performed by the Contractor Quality Control at any time. Testing and Inspections for structural elements [reinforced concrete, steel, masonry caissons, fire protection, precast and post tension concrete] not identified as special inspection will be performed by the Contractor Quality Control Program and Contractor Material Testing Agency and audited and confirmed by DEN Quality Assurance Manager. DEN will perform 100% visual inspection on all weldments. DEN will perform Quality Assurance testing at a frequency of approximately 10% of the Quality Control test and inspection frequencies. The testing frequencies by DEN may escalate to higher percentages and the Contractor will be responsible for all costs associated with failing tests of the same pay item elements. The Contractor may not hire the DEN contracted or testing agency in any capacity on this Project.
- J. DEN Quality Assurance will perform all quality assurance pull and adhesion tests on all airfield joint sealants. Contractor shall perform all quality control tests for the same items.

- K. DEN Quality Assurance is required to submit a letter indicating that all Work performed on the project complies with all applicable codes. The Contractor shall make sure that all required test frequencies and all deficiencies has been corrected to comply with all applicable codes, standards and the requirements of the Contract Documents.

### 1.3 WORK BY OTHERS AND FUTURE WORK

- A. Refer to Title 7 – Cooperation, Coordination and Rate of Progress of the General Contract Conditions, 2011 Edition

### 1.4 SITE CONDITIONS

- A. Refer to Title 14 – Site Conditions of the General Contract Conditions, 2011 Edition

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### 3.1 CONTRACTOR'S DUTIES

- A. Refer to Title 3 – Contractor Performance and Services of the General Contract Conditions, 2011 Edition
- B. Execute the Work as specified and in a timely manner. Submit a schedule of Work that will be performed at times other than during the eight-hour working day of Monday through Friday, daylight hours. Submit this schedule five (5) working days prior to the beginning of Work to the DEN Project Manager for review and acceptance. Approval to work at night may be obtained after Contractor presents a written program outlining special precautions to be taken to control the extraordinary hazards presented by night work. That program shall include, but not limited to, supplementary lighting of work areas, availability of medical facilities, security precautions, and noise limitations.

### 3.2 COORDINATION

- A. Coordinate execution of the Work with those public utilities, governmental bodies, private utilities and other contractors performing work on and adjacent to the worksites. Eliminate or minimize delays in the Work and conflicts with those utilities, bodies, and contractors. Schedule governmental, private utility and public utility work that relies upon survey points, lines and grades established by the Contractor to occur immediately after those points, lines and grades have been established. Confirm coordination measures for each individual case with the DEN Project Manager in writing.
- B. In the coordination effort of work by others, the Contractor shall obtain and refer to equipment locations and other layouts, as available, to avoid interface problems.

- C. The City reserves the right to permit access to the site of the Work for the performance of work by other contractors and persons at such times that the City deems proper. The exercise of such reserved right shall in no way or to any extent relieve the Contractor from liability for loss and damage to the Work due to or resulting from its operations or from responsibility for complete execution of the Contract. The Contractor shall cooperate with other contractors and persons in all matters requiring common effort.

### 3.3 CONTRACTOR USE OF WORK SITE

- A. Confine work site operations to areas permitted by law, ordinances, permits, and the Contract.
- B. Consider the safety of the Work and that of the people and property on and adjacent to the work site when determining amount, location, movement, and use of materials and equipment on work site.
- C. Do not load work site with equipment and products that would interfere with the Work. Only equipment, tools, or materials required for this Work may be stored at the work site.
- D. Protect products, equipment, and materials stored on work site.
- E. Relocate stored products, equipment, and materials that interfere with operations of City, government bodies, public, and private utilities, and other contractors.

## PART 4 - MEASUREMENT

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

## PART 5 - PAYMENT

### 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

## END OF SECTION 011100

## SECTION 011400 - WORK SEQUENCE AND CONSTRAINTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 OTHER WORK

- A. Other concurrent construction contracts with which the Contractor must interface are described elsewhere in the Contract Documents. Refer to Section 013210 "Schedule" and the Special Conditions for specific work constraints and milestones.

#### 1.3 WORK SEQUENCE

- A. The work sequence shall comply with Phasing, Sequencing, and Milestones as indicated in the Contract Documents and in accordance with the approved Construction Schedule developed by the Contractor. The schedule shall comply with requirements indicated in the Special Conditions and Section **011400** "Work Sequence and Constraints". The Construction Schedule is described in Section 013210 "Schedule".

#### 1.4 WORK CONSTRAINTS

- A. Site Constraints:
1. Access to the Project shall be generally as indicated in the Contract Documents. Access shall be organized and planned by the Contractor to ensure no disruption of airline or DEN operations.
  2. Access to work sites will be strictly monitored and must comply with DEN Airport Operations and FAA Regulations. The Contractor shall provide monitoring and escorts as required by DEN Operations in the area of the Work.
  3. The Contractor's staging area will be as indicated in the Construction Documents.
  4. Contractor employee parking will not be allowed within the existing revenue control system. Parking facilities will be as indicated in the Construction Documents.
  5. Material for work in the Terminal may be brought in through the [Terminal Loading Dock accessed via Gate 1] <Insert location>. Employee and material access to the Concourses will be via [Gate 5] <Insert location>.
  6. The Contractor shall use the haul routes specified in the Construction Documents.



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7. If required, the Contractor shall provide a bus and driver to transport the Contractor's employees between the designated employee parking area and the work sites. No separate payment will be made for this bus and driver. The cost shall be included in the bid item "Mobilization". The bus driver shall be provided at all times when Contractor employees are working on the Project.

B. System Interruptions:

1. DEN is a 24/7/365 facility. Construction activity that requires any system shutdown must be coordinated with the project manager and DEN AIM MCC.
2. The Shutdown cannot proceed unless all approver groups have approved the request. If any of the groups rejects the request, you may not proceed with the Shutdown. If a Shutdown is determined to be an emergency due to pending health issues or the risk of additional damage, this process may be bypassed. If the Shutdown is an emergency, proceed with the shutdown without the approvals. Approvals must be obtained as follows
  - a. Airfield Shutdowns must be submitted at least 72 hours prior to the shutdown start date.
  - b. All other Shutdowns must be submitted at least five (5) business days prior to the shutdown start date.
  - c. All Shutdown Requests must be submitted using the Shutdown Request form, which can be accessed via the Home page of the DEN intranet.

C. Airfield Operations at Denver International Airport:

1. Full airport and aircraft operations are underway adjacent to this Project. Contractors are required to obtain a Contractor Participant Manual from the Security Manager and must follow the guidelines in the manual. Copies of the Contractor section of the manual are available for review at the Denver International Airport Access Services Office.
  - a. If any Work contains requirements for Work activities or access through or in the restricted area, reference Section 011420 "Security Requirements & Sensitive Security Information (SSI)" for requirements.
  - b. If not in a restricted area, the Contractor personnel still must be badged; reference Section 011420 "Security Requirements & Sensitive Security Information (SSI)".

D. Conduct of persons using the Denver Municipal Airport system:

1. Contractor activities shall comply with Airport Operations and Regulation 130 "TRAFFIC" and Regulation 20 "CONDUCT OF PERSONS USING THE DENVER MUNICIPAL AIRPORT SYSTEM" shall be followed at all times. These regulations are available from Airport Operations at Denver International Airport.

E. Operational safety on airports during construction:

1. All Work shall be accomplished in accordance with FAA Advisory Circular AC150/5370-2C, "Operational Safety on Airports during Construction", FAR Part 139 and FAR Part 107 except as herein modified.

F. Welding Equipment, Procedures and Constraints:

1. Natural gas-powered portable welders or inverter single- and three-phase electric portable welders are the only acceptable welding equipment to be used inside the building basement or tunnel areas. Acceptability of equipment other than the equipment noted above shall be at the sole discretion of the DEN Project Manager.
2. Welding activities inside buildings require submittal of a System Interruption Request (See paragraph "System Interruptions" above). Prior to welding in any area, the Contractor shall locate smoke detectors and shall request interruption of the fire alarm system. Subsequent to the interruption of the fire alarm system and prior to welding activities, the Contractor shall cover and protect smoke detectors until work is complete. Prior to expiration of each interruption of the system, the Contractor shall uncover the smoke detectors.
3. Electrical Service: The Contractor shall be responsible for verifying with the DEN Project Manager or representatives' locations acceptable for accessing electrical power for welders and other electrical equipment feeders. The Contractor shall be responsible for all work and equipment required to install temporary or permanent electrical modifications for construction power and lighting.
  - a. Temporary Hook-up: In addition to the requirements of paragraph "Temporary Power and Lighting for Construction" below, comply with the following:
    - 1) Provide wiring sized to accommodate full load of welding equipment, accounting for voltage drop.
    - 2) Provide appropriate NEMA twist-lock or ANSI receptacle for welder hook-up.
    - 3) 480V, 3 phase, 3 pole, 4-wire twist lock ground line.
    - 4) NEMA L16-20 or ANSI C73.87.
  - b. The Contractor may not begin operation of the equipment prior to request for inspection by DEN representatives and acceptance of the installation.
  - c. Permanent installation of electrical branch circuiting for welding equipment shall be made in accordance with all Division 26 Specification Sections
4. Welding Practices: All standard safe welding practices must be followed, including but not limited to the following:
  - a. Flash protection for surrounding areas.
  - b. Contractor fire extinguisher in area.
  - c. One person in each welding area solely designated as fire watch for each welder.
  - d. Protect all equipment, cable trays and contents, etc., in area.
  - e. Use fire blankets and other appropriate materials to confine sparks and molten metal from the welding, cutting, and/or grinding activities.
  - f. All welders shall have been qualified through welding tests in accordance with applicable welding code, such as but not limited to AWS, ASME, API, within one year prior to welding taking place. Evidence of qualification shall be through Welding Performance Qualification Records (WPQR).



1. The Contractor shall have wireless communications in place prior to initiation of work in the tunnel or basements by use of cell phone and/or radio. Radio and cell phone coverage in the tunnels and basements varies in signal strength throughout the campus. An RF Application must be submitted for the Radio equipment intended for use at least 14 days prior to intended use. Include the following radio information:
  - a. Make
  - b. Model
  - c. Frequency
  - d. Effective Radiated Power (ERP)
2. Contractors must receive an approval letter from the RF Systems Manager prior to use of the radio equipment on the DEN campus.

K. Keys:

1. The Contractor shall be required to contact DEN Maintenance Control to procure keys for access to all rooms having locks in order to gain access. Keys may be checked out at the beginning of each work shift by the Contractor and shall be returned to DEN Maintenance Control at the end of each work shift

## 1.5 COORDINATION

- A. The Contractor will designate a contact person for coordination with the DEN Project Manager and airline tenants. The contact person shall have the authority to make decisions for the Contractor firm and shall have binding signatory power for changes in work. The contact person shall be on site at all times during work activity.
- B. No additional costs shall be considered for coordination activities throughout this project. The Contractor shall include in the Contractor's bid costs for coordination of all activities.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 DUST/PROTECTION BARRIERS

- A. HVAC system containment. The Contractor shall submit to DEN Maintenance HVAC and Fire Alarm shutdown requests prior to modifications to the area of work for dust containment. The HVAC system shall be interrupted, re-routed, or blocked off to prevent dust from entering return or supply ducts.

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- B. Debris and Protection Barriers: The Contractor shall construct code-approved and DEN-approved dust and debris barriers on both sides of walls and doors that are to be modified. Barriers shall be constructed to allow emergency ingress and egress to and from equipment and spaces. Barriers shall be constructed to allow continual uninterrupted function of building equipment and spaces.

1. Return all removed door hardware to DEN. Label each hardware set correlating the door number of the original hardware set. Coordinate with the DEN Project Manager for storage and return of hardware.

**3.2 EQUIPMENT**

- A. Equipment: CNG-powered equipment is allowed within the buildings. No other fossil fuel equipment may be used within the buildings unless the equipment is directly vented to the building exterior.
- B. Electric: Electric powered equipment is acceptable in the Work area.

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT****5.1 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section.

**END OF SECTION 011400**

## **SECTION 011420 - SECURITY REQUIREMENTS & SENSITIVE SECURITY INFORMATION (SSI)**

### **PART 1 - GENERAL**

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 DESCRIPTION

- A. Each Contractor is required to become a "Participant" in the DEN Airport Security Program (ASP) and must remain in good standing in order to retain Airport Security privileges.
- B. All Contractor employees and all vehicles requiring access to the Secured Area, Sterile Area, and/or any other Controlled Areas shall be required to obtain the proper access authorizations for Airport ID badges and vehicle permits.

#### 1.3 PARTICIPANT OF AIRPORT SECURITY PROGRAM

- A. Contractors are required to become a "Participant" of the ASP. In order to become a "Participant", your company must attend a Participant meeting within the Airport Security Office.
- B. The Contractor shall comply with all Denver Municipal Airport System Rules and Regulations and all Transportation Security Administration (TSA) regulations. Special emphasis should be paid to Denver Municipal Airport System Rules and Regulations Part 20 – Airport Security Rules and Regulations and Part 130 – Operating Vehicles In The Secured Area" and Part 35 – Operations Infraction Accountability Program". The Denver Municipal Airport System Rules and Regulations can be found on the [flydenver.com](http://flydenver.com) website.
- C. The TSA has the authority to issue civil penalties for failure to adhere to their regulations.

- D. It is the responsibility of the Airport Security Office to ensure all fences and gates are secure. If a Contractor's operations necessitate the frequent use of a particular gate, the Contractor shall place, at the Contractor's expense, two (2) contract security guards at the gate that shall have been trained and certified by the Airport Operations Division to facilitate access to its Work. The Contractor assumes full responsibility for maintaining security once this is done. If the perimeter gate will be used as a haul route, the contractor must also place, at the Contractor's expense, Haul Route Monitors as dictated by the TSA approved Temporary Amendment. Any fines levied against the Airport as a result of the failure by the Contractor to provide adequate security shall be passed on to the Contractor.
1. If the Contractor provides guards or monitors, the Contractor must also supply a shelter for the guards/monitors. The shelter must meet the following requirements:
    - a. One 10 x 12 Tuff Shed or similar type structure with a window, 24-inch convex mirror mounted outside for vehicle inspection, sufficient HVAC capability, generator, light plant, and sanitary services, which are maintained by the Contractor.
- E. Contractors will be required at all times to have a supervisor or foreman at each work location in Secured, Sterile, and Controlled Areas.
- F. All Work shall be accomplished in accordance with the most current FAA Advisory Circular (AC) 150/5370-2, "Operational Safety on Airports during Construction", 49 Code of Federal Regulations (CFR) Part 1542 and 14 CFR Part 139 except as modified herein.
- G. All Work shall be accomplished in accordance with the most current TSA Security Directives applicable to DEN, except as modified herein.
- H. This Section intends to supplement, modify, change, delete from, or add to the most current FAA AC150/5370-2. Where any paragraph, subparagraph, or clause of the AC is modified or deleted by these supplements, the unaltered provisions of that paragraph, subparagraph, or clause shall remain in effect.
- 1.4 SENSITIVE SECURITY INFORMATION (SSI)
- A. If the Contract involves SSI information or procedures, the Contractor must contact the Assistant Director of Airport Security or designee, for disclosure information, as well as protocols that must be followed with SSI distribution.
  - B. This Section governs the maintenance, safeguarding, and disclosure of records and information that the TSA has determined to be SSI as defined by 49 CFR Part 1520, "Protection of Sensitive Security Information". SSI is information that the TSA has determined to be detrimental to the security of Denver International Airport if disclosed to unauthorized persons. This is a process for the documentation, use, and recovery of SSI of a specific origin.



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- C. Applicability:
1. For all management staff, all authorized departments, all contractors, and subcontractors handling documents or materials containing SSI information.
  2. Each person employed by, contracted to, or acting on behalf of the Department of Aviation at Denver International Airport is subject to the requirements of this Section.
  3. SSI disclosure is limited to persons or entities under criteria identified in federal regulations, subject to strict "need-to-know" standard, and as otherwise determined by TSA or the Department of Homeland Security (DHS).
- D. Except as otherwise provided in this Section, records containing SSI are not available for public inspection or copying. Denver International Airport will not release such records to persons without a need to know. Prime contractors will not release SSI records to any subcontractor without a need to know. An employee or contractor has a "need to know" SSI if access to the information is necessary for performance of his or her official duties.
- E. Unauthorized disclosure of SSI is a Federal violation of 49 CFR Part 1520 and violation is grounds for a civil penalty and other enforcement action by DHS Security. In addition to the civil penalties, corrective action may include issuance of an order requiring retrieval of SSI to remedy unauthorized disclosure, an order to cease future unauthorized disclosure, and dismissal from the work site.
- F. Except as otherwise provided in writing by the TSA in the interest of public safety or airport security, the following information and records containing such information constitute SSI:
1. Information that would be detrimental to the security of Denver International Airport and aviation transportation.
  2. Any performance specification, including a description of devices and procedures used by Denver International Airport, for the detection of any weapon, explosive, incendiary, or destructive substance.
  3. Any performance specification, including a description of devices and procedures, for any communications equipment used by Denver International Airport in carrying out any aviation transportation security requirements.
  4. Details of any security inspection or investigation of an alleged violation of aviation transportation security requirements of Federal law that could reveal security vulnerability.
  5. Specific details of aviation transportation security measures including those recommended by the Federal government.
  6. The following information regarding security screening under aviation transportation security requirements of Federal law:
    - a. Procedures for screening of persons, property, checked baggage, U.S. mail, and cargo.
    - b. Information used by a passenger or property-screening program or system, including an automated screening system.
    - c. Detailed information, if determined by the TSA to be SSI, about the locations at which particular screening methods or equipment are used.



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- d. Performance or test data from security equipment or screening systems.
  7. Identifying information of certain aviation transportation security personnel including lists of the names or other identifying information that identify persons as having unescorted access to a secure area of the airport.
  8. Critical aviation asset information identifying systems so vital to the airport that the incapacity or destruction of such assets would have a debilitating impact on aviation security.
  9. Any information involving the security of operational or administrative data systems identified by the Department of Transportation or DHS as critical to the safety or security of Denver International Airport.
  10. Solicited or unsolicited proposals, pursuant to a grant or contract, to perform work that relates to security measures.
- G. Restrictions on the Disclosure of SSI:
1. Employees and contractors working onsite have a duty to protect sensitive security information and must take reasonable steps to safeguard SSI in that person's possession from unauthorized disclosure. When a person is not in physical possession of SSI, the person must store it in a secure container such as a locked desk, a locked file cabinet, or in a locked room. SSI is to be disclosed only to persons having a need to know as stated in CFR 1520. Requests for SSI are to be referred to City Project Manager.
  2. Prior to receiving SSI records, contractors must sign the "Confidentiality and Non-Disclosure Agreement", Form PS-17, stating that SSI will be guarded from unauthorized persons, that records will be controlled while in use and secured when not in use, and that all SSI plans and records will be returned to the airport or destroyed following the completion of the Project.
  3. Return or destruction of SSI documents must be done in a timely manner and documented on the SSI Return or Destruction Compliance Form, Form PS-20. Companies under contract to the City must return or destroy all SSI material following the completion of the Work. Companies not selected during the bidding process must return or destroy all SSI material immediately following the announcement of bid results.
- H. If a record containing SSI is received that is not marked as specified in this Section below, the following steps must be taken:
1. Mark the record as specified in paragraph Part 1 of this Section.
  2. Inform the sender of the record that the record must be marked as specified in Part 1 of this Section.
- I. If a person becomes aware that SSI has been released to unauthorized persons, promptly inform the Communication Center Supervisor at 303-342-4020 and request to speak to the on-call Airport Security Coordinator
- J. Marking SSI:

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1. In the case of paper records containing SSI, a covered person must mark the record by placing the PROTECTIVE MARKING conspicuously on the top, and the DISTRIBUTION LIMITATION STATEMENT on the bottom, of following parts of the document:
  - a. The outside of any front and back cover, including a binder cover or folder, if the document has a front and back cover.
  - b. Any title page
  - c. Each page of the document
2. Protective Marking:
  - a. SENSITIVE SECURITY INFORMATION
  - b. Distribution Limitation Statement:
  - c. WARNING: This record contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR parts 15 and 1520
3. In the case of non-paper records that contain SSI, including motion picture films, videotape recordings, audio recording, and electronic and magnetic records, a covered person must clearly and conspicuously mark the records with the protective marking and the distribution limitation statement such that the viewer or listener is reasonably likely to see or hear them when obtaining access to the contents of the record.

K. Destruction of SSI:

1. When the employee or contractor no longer needs the SSI to carry out their work requirements, the SSI must be returned to the issuing entity or completely destroyed by burning or cross-shredding to preclude recognition or reconstruction of the information.
2. The Contractor shall comply with all the requirements of the Department of Aviation Standards and Procedures, Protection of Sensitive Security Information (SSI) No. 10003 Revised 08/01/15 regarding Contractor Protection of Sensitive Security Information (SSI).

1.5 MISCELLANEOUS

A. Dumpster Security Requirements:

1. The following procedures must be followed to provide maximum security with all construction projects in public areas unless an exception has been made by the Airport Security Coordinator (ASC) or designee:

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- a. Roll-off dumpsters must have the ability to be covered (hard side) and locked when not in use.
  - b. When unlocked and in use, the Contractor shall provide an employee, or a subcontractor's employee, to stand by the dumpster to prevent unauthorized placement of prohibited items
2. If the Contractor is not able to have a roll-off dumpster with the ability to be locked, the dumpster shall be removed from the public area when the construction site is inactive.
- B. Contractor Fences (Not Perimeter Fence):
1. If required, the Contractor shall establish and maintain a secure (fenced) perimeter at its primary operations area to include its field offices, staging and storage areas, and maintenance facilities. The responsibility for security within its operations area shall rest solely with the Contractor. Entrance gates to operations areas shall be equipped with a combination of locks to include a lock provided by the City for its use in accessing emergency equipment, should that need arise. The location, size and other physical characteristics of the Contractor's operations area must be approved by the DEN Project Manager prior to its installation.
  2. Unless specifically required by the Contract Documents and with the exception of the fenced operations area described above, the Contractor shall install no fences or other physical obstructions on or around the Project work area without the written approval of the DEN Project Manager.

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION****3.1 SUBMITTAL FOR AIRPORT ID BADGES**

- A. By submitting information for the individual requesting or requiring an Airport ID badge that would permit unescorted access to the Sterile and/or Secured Areas must be fingerprinted and pass a Criminal History Records Check (CHRC) and Security Threat Assessment (STA). Passing a CHRC means the employee shall not have been convicted, given a deferred sentence, found not guilty by reason of insanity or have been arrested and are awaiting judicial proceedings of any felony charge during the ten (10) years before the date of the individual's application for unescorted access authority. For an individual to obtain driver authorization to drive within the Secured Area, the individual must have a valid driver license that allows them to drive their contractor vehicle.

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- B. An employee requesting an Airport ID badge must resolve all pending or valid violations before being allowed to proceed in the airport ID badging process. If the employee no longer works for the company and is attempting to be employed by a different company, a management representative from the “new” company must attend the Violation Notice Hearing along with the employee.
- C. Airport ID Badges are obtained as follows:
1. The Contractor shall meet with the City Project Manager to review the procedures and required access points at DEN. The Contractor and the DEN Project Manager shall visit the site to verify the access points. Access points shall be listed and submitted by the Contractor to the DEN Project Manager for review and comment prior to Contractor’s application for badging.
  2. The Contractor shall designate an Authorized Signatory who must attend an annual class with Airport Security. The Authorized Signatory must be an employee of the Contractor, have a valid Denver International Airport ID badge. The Authorized Signatory will be authorized to sign for the Contractor on the Fingerprinting and Badge Application Form and will be the primary designation contact for Airport Security related business.
  3. The Contractor’s Authorized Signatory shall schedule a Participant Meeting with the DEN Airport Security Office to review DEN security procedures and receive training on how to ensure that all Participants remain in compliance with Part 20 of the Denver Municipal Airport System Rules and Regulations. A second meeting will be scheduled for the Authorized Signatory to learn how to successfully complete the required forms for Airport ID badges and vehicle permits.
  4. A CHRC and STA are required for each employee requesting unescorted access to the Secure and/or Sterile Area. The employee will complete the Fingerprinting and Badge Application (two-sided form) and schedule an appointment with the Airport Security Office to have the form reviewed and to be fingerprinted. The Federal Bureau of Investigation will conduct the CHRC and will return the results to the Airport Security Office. For the fee for the Fingerprinting, please see the flydenver.com website. The Transportation Security Administration will process the STA and will return the results to the Airport Security Office.
  5. When the Authorized Signatory is notified by Airport Security that the CHRC and STA have cleared, the applicants must come to the Airport Security Office to receive regulated security and driver training. The training will take approximately one (1) hour for security training and approximately two (2) hours for security and driver training.
  6. All applicants must watch and pass all concepts of a computer based security training module for a Security Identification Display Area (SIDA) Airport ID badge. All individuals requesting driver authorization in the non-movement area must also view an interactive computer based driver training module and complete a test by passing all concepts. In addition, the individual must receive non-movement driver orientation training by the Contractor’s driver representative before being allowed to drive on the airfield. Non Movement Orientation training should be conducted annually.
  7. All Airport ID badges must be immediately terminated upon employee separation from the Contractor or when a need for DEN access no longer exists.

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8. The Airport ID badges must be returned to the Airport Security Office prior to final payment. All Airport ID badges are issued with an annual expiration date. The expiration date is determined by the birthday of the Airport ID badge holder. Contractors shall notify the DEN Project Manager as soon as possible but in no case less than four (4) weeks in advance of any requirement to extend the Sponsorship status.

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT****5.1 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section.

**END OF SECTION 011420**

## SECTION 011430 - VEHICLE AND EQUIPMENT PERMITTING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Contractor shall comply with the Airport Security Program. Vehicle permits are required for all vehicles operating in the Secured Area. The DEN vehicle permit is required for vehicles operating in the Secured Area but limited to above grade, outdoor activity. Vehicles or machinery operating within buildings shall be required to acquire a DEN emissions permit as well as a DEN vehicle permit.
- B. Special emphasis should be paid to Denver Municipal Airport System Rules and Regulations Part 20 – Airport Security Rules and Regulations and Part 130 – Operating Vehicles in The Secured Area" and Part 35 – Operations Infraction Accountability Program". The Denver Municipal Airport System Rules and Regulations can be found on the flydenver.com website.
1. All Work shall be accomplished in accordance with the most current FAA Advisory Circular (AC) 150/5370-2, "Operational Safety on Airports during Construction", 49 Code of Federal Regulations (CFR) Part 1542 and 14 CFR Part 139 except as modified herein.
  2. All Work shall be accomplished in accordance with the most current TSA Security Directives applicable to DEN, except as modified herein.
  3. Access to the runways, taxiways, and aprons shall be gained by the Contractor after establishing radio communications with Airport Operations through the DEN Inspector. No personnel or equipment will be allowed on the runways until radio contact has been made with Airport Operations and permission given.
  4. Access to the Movement Area will be limited in order to allow the maximum efficient movement of aircraft. As part of this limitation, the Contractor may be required to only use these areas late at night when there is less aircraft traffic
  5. Once admitted into the Secured Area, the Contractor shall proceed directly to the work location by way of a route assigned by Airport Security. At no time shall a Contractor or any of its personnel enter onto a taxiway, runway, or ramp without proper clearance from the Airport Operations Manager or Assistant Airport Operations Manager. Contractors or individuals violating these requirements for driving in the Secured Area may be subject to fines, suspension, or permanent revocation of their driver authorization and/or Airport ID badge privileges.



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6. The Transportation Security Administration (TSA) requires that all operating airports be secured from the general public and has the authority to issue citations for violations of these requirements. It is the responsibility of the Airport to ensure all fences and gates are secure. If a Contractor's operations necessitate the frequent use of a particular gate, the Contractor shall place guards at the gate. Refer to 011420 – Security Requirements and SSI for details regarding the placement of guards.
- C. General Safety Regulations When in Aircraft Operations Areas May Include the Following:
1. At all times, the Contractor shall coordinate its Work with the requirements of the Airport site and operations. All Work, movement of personnel, materials, supplies and equipment in areas used by aircraft shall be subject to regulations and restrictions established by the City. The Contractor shall take special precautions and be fully responsible for the prevention of damage to materials and equipment in the areas affected by the jet blast of taxiing aircraft. No work shall proceed until necessary protective devices are placed as required to protect the public, airport operations, property, and personnel from the hazards of the Work. The Contractor shall proceed with the Contractor's Work, including temporary work and storage of tools, machinery, and materials, to cause no interference with or hazards to the operation of the Airport.
  2. Landings, takeoffs, and taxiing shall take precedence over all Contractors' operations. In the event that the Contractor is notified that an emergency landing or a takeoff is imminent, the Contractor shall stop all operations immediately, regardless of the sequence of events in progress and shall immediately evacuate the Contractor's personnel and equipment from the runway and taxiway areas as directed.
  3. The Contractor shall remove its personnel and equipment to the distance specified below for the prevailing conditions:
    - a. For emergencies, the Contractor shall move all personnel and equipment as directed by Airport Operations or the DEN Project Manager.
    - b. At the end of a work day in areas where aircraft are operating, all equipment shall be moved to a location that is not less than 750 lineal feet measured from the near edge of the runway, taxiway or ramp area or to the location designated by the City.
  4. If the Contractor is asked to leave part of its work site to allow aircraft operation, the Contractor shall clean the area to allow safe aircraft movement. Cleaning may include sweeping the area to prevent damage to aircraft.
- D. Vehicle Permitting:
1. Refer to the Denver Municipal Airport System Rules and Regulations Part 20 – Airport Security Rules and Regulations and Part 130 – Operating Vehicles in The Secured Area" and Part 35 – Operations Infraction Accountability Program" for information regarding vehicle permitting. These Denver Municipal Airport System Rules and Regulations can be found on the flydenver.com website.
  2. For additional information regarding permitting, the Contractor must contact DEN Security.

E. Equipment Permitting

1. Fossil fuel powered equipment to be used in the interior of buildings and/or in basement/tunnel areas shall require inspection by DEN Maintenance and the Denver Fire Department.
  - a. Only CNG fossil fuel powered equipment may be used; gasoline powered, propane powered, or diesel powered equipment will not be acceptable unless identified and operated per Section 011400 "Work Sequence and Constraints".

1.3 SUBMITTALS

- A. Refer to Section 03300 "Submittal Procedures" for submittal procedures
- B. Submit a copy of each vehicle permit and/or equipment and vehicle emissions permit a maximum of fourteen (14) days after receipt of permit.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION**

3.1 PERMITS

- A. Vehicle permits shall not be issued prior to Notice to Proceed. The Contractor may, at the Contractor's own risk, submit required information prior to Notice to Proceed to the following:
  1. Vehicle permit: DEN Project Manager or DEN Airport Security.
  2. Equipment and vehicle emissions permit. DEN Project Manager or DEN Maintenance Group.

3.2 SCHEDULE

- A. The Contractor shall allow in the Contractor's schedule five (5) days for DEN review of submittals for permits. Testing of equipment and review by the Denver Fire Department shall be scheduled by the Contractor. By submitting information for permits, the Contractor certifies that equipment and vehicles comply with Contract documents and with all City, state and federal regulations including but not limited to emissions, licensing and safety requirements.



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**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 011430**

## SECTION 011810 - UTILITIES INTERFACE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Various utilities are located within the limits of work in the Project area. The owners of these utilities hereinafter noted may require that the Contractor is to work around their existing facilities until such alterations, relocation, or abandonment have been completed. All known existing utilities are shown; however, the Contractor shall verify and satisfy himself that there are no other existing utilities that may not be shown.
- B. The owners of known utilities within the project area and corresponding representatives include, but are not limited to:
1. Century Link Telephone
  2. DEN Telephone
  3. Xcel Energy Natural Gas
  4. Xcel Energy Elec. Services
  5. DEN Storm Water
  6. DEN Sanitary Sewer
  7. Denver Water Department
  8. Inland Technologies
  9. Fuel System (ASI)
  10. Premise Wiring System- DEN IT Section
  11. FAA Duct Bank
  12. Oil/Gas Wells
  13. DEN Electrical Department
  14. Fire Alarm System
  15. Paging System
- C. The location and establishment of each construction vehicle crossing shall be at sites mutually agreed upon in writing by the Contractor and the owner of the utility.
- D. At the locations where the Contractor needs to establish a construction vehicle crossing over any of the operating pipelines, the furnishing and placing of a crossing shall be by the Contractor. The crossing shall allow the normal operation of the pipeline at all times. Each crossing shall be adequately marked and signed for safe passage of vehicles over the crossing. Construction vehicles shall not be allowed to cross over operating pipelines at any place other than an established crossing.

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- E. These utility locations are based upon information provided by the utility companies or previous construction contractors that were the basis for determining utility coordinates. The Contractor is responsible for confirming the accuracy of the provided coordinates.
- F. The Contractor shall control the Contractor's operations in order to avoid creating any obstacles for the utility owner's access for maintaining or operating their equipment.

### 1.3 REFERENCE DOCUMENTS

- A. Section 312323.33 "Flowable Backfill (Controlled Low-Strength Material)"

### 1.4 REGULATORY REQUIREMENTS

- A. The Contractor shall obtain and pay for all utility company permits, fees, and licenses necessary for the execution of this work. The Contractor shall give all notices and shall comply with all laws, ordinances, rules, and regulations of all authorities having jurisdiction.

### 1.5 QUALITY CONTROL

- A. When the Contractor performs any operations that will affect a utility owner, the Contractor shall give timely notice to the utility owner and the DEN Project Manager so that the Contractor's operations may be observed by the utility owner or their representative.

### 1.6 WORK INCLUDED

- A. The Work of this Section includes furnishing all materials, equipment, and labor necessary to provide utility crossings as required and as specified herein and subject to approval by the associated utility owner.
- B. North American Resources has a line passing through airport property. The Contractor shall contact the utility prior to beginning earthwork operations to ascertain any special requirements or conditions required to maintain and protect this service during construction activities.
- C. FAA Underground Duct lines: The FAA has duct lines passing under the site. The Contractor shall contact the FAA prior to beginning earthwork operations to ascertain any special requirements or conditions required to maintain this service during construction activities.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. Suitable cover material shall be in accordance with Colorado Department of Transportation Standard Specifications. Wet, soft, or frozen material, asphalt chunks, or other deleterious substances shall not be used for cover.
- B. Aggregate for road base material shall consist of clean, sound and durable particles of crushed stone, crushed gravel or crushed slag, shall be free from coatings of clay, silt and organic matter, and shall contain no clay balls. Material shall conform to the State of Colorado Standard Specifications for Road and Bridge Construction Class 6 aggregate base unless otherwise specified.
- C. The materials for the load distribution system on top of the cover shall conform to the specification of the American Institute of Steel Construction, the American Institute of Timber Construction, or the American Concrete Institute, as applicable, depending upon the system agreed upon between the Contractor and utility owner.
- D. Materials for the sleeving of the pipelines shall be purchased by the utility owner at the Contractor's expense.
- E. Comply with utility backfill requirements for the use of flowable backfill in Section 312323.33 "Flowable Backfill (Controlled Low-Strength Material)" and Division 26 and Division 33 requirements.

**PART 3 - EXECUTION****3.1 NOTIFICATION OF UTILITIES FOR LOCATING AND POTHOLING**

- A. The Contractor shall verify the location of all utilities prior to any operations including physically uncovering the utility to verify location as required by the utility owner.
- B. The Contractor shall notify the Utility Notification Center of Colorado at (303) 534-6700 or 811, as a minimum for location of utilities.

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

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**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 011810**

## SECTION 012300 - ALTERNATES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

#### 1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
  - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

#### 1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
  - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Prior to the Contractor signing the Contract, the Owner will notify each party involved, in writing, of the status of each alternate, indicating if alternates have been accepted, rejected, or deferred for later consideration. The owner will also include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other Work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the Work described under each alternate.

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**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION****3.1 SCHEDULE OF ALTERNATES**

- A. Alternate No. <Insert number>: <Insert title of alternate>.
1. Base Bid: <Insert brief description of base-bid requirement> [as indicated on Sheet <Insert title of sheet>] [and] [as specified in Section <Insert Section number> "<Insert Section title>."] ]
  2. Alternate: <Insert brief description of alternate requirement> [as indicated on Sheet <Insert title of sheet>] [and] [as specified in Section <Insert Section number> "<Insert Section title>."] ]

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT****5.1 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section.

**END OF SECTION 012300**

## SECTION 012510 - SUBSTITUTIONS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. All material and equipment substitutions must comply with Title 4, Article 406: Substitution of Materials and Equipment in the General Contract Conditions, 2011 Edition.
- B. The Work specified in this Section consists of submitting form CM-09, Request for Substitution for the approval of a different material, equipment, or process than is described in the Contract Documents.
- C. If the substitution changes the Scope of Work, Contract cost, or Contract time, a Change Order is required.
- D. As-built drawings and specifications must include all substitutions even if a Change Order is not issued.

#### 1.3 REFERENCE DOCUMENTS

- A. Form CM-09, Request for Substitution
- B. Section 013300 "Submittal Procedures"
- C. Section 013325 "Shop and Working Drawings, Product Data and Samples"

#### 1.4 QUALITY CONTROL

- A. The substitution shall provide as a minimum, the same performance as specified.

#### 1.5 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.
- B. A completed Form CM-09 shall be submitted at least 60 days prior to when an order needs to be placed or a method needs to be changed.



- C. The submittal shall contain all the data required to be submitted for acceptance of the originally specified item or process, including, as appropriate:
1. Detailed product data sheets for the specified items and the substitution.
  2. Samples and shop drawings of the substitution.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### **3.1 SUBSTITUTION PROCESS**

- A. Provide the information as required on Form CM-09.

### **3.2 SUBSTITUTION REQUEST**

- A. The formal Request for Substitution will be evaluated by the DEN Project Manager and the Designer of Record based on the following criteria:
1. Compatibility with the rest of the project.
  2. Reliability, ease of use and maintenance.
  3. Both initial and long term cost.
  4. Schedule impact.
  5. The willingness of the Contractor to share equally in any cost savings.
  6. The ability of the item or process to meet all applicable governing regulations, rules, and laws along with funding agency requirements.
  7. The cost of evaluating the substitution.
- B. Based upon the above evaluation, the Sr. Director of AIM Development will make a final determination of what is in the best interest of the City and either approve, disapprove or approve as noted the requested substitution.

### **3.3 CONDITIONS**

- A. As a condition for submitting a Request for Substitution the Contractor waives all rights to claim for extra cost or change in Contract time other than those outlined in the request and approved by the Deputy Manager of Aviation. The Contractor, by submitting a Request for Substitution, also accepts all liability for cost and scheduling impact on other contractors or the City due to the substitution.
- B. Included with the Request for Substitution shall be the following statement:
1. "The substitution being submitted is equal to or superior in all respects to the Contract-required item or process. All differences between the substitution and the Contract-required item or process are described in this request along with all required information, cost, and scheduling data."

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- C. The statement shall be signed and dated by the Contractor's Superintendent.
- D. Replacement of Substitution Found to be Not Equal: The Contractor shall be responsible for all aspects and conditions of the substitution that are not clearly identified in the substitution submittal, and shall be liable for the appearance, function, performance or other aspects of the substitution that are found not to be equal to the originally specified item.
1. The Contractor shall incur all labor and costs associated with replacement of any substitution that is found to be not equal to the originally specified item or process and rejected by the DEN Project Manager.
  2. The replacement of any rejected substitution shall either be with the originally specified item or process, or a substitution approved by the DEN Project Manager

**PART 4 - MEASUREMENT**

## 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

## 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 012510**

## SECTION 012910 - SCHEDULE OF VALUES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions other Division 01 Specification Sections, and Related Requirements apply to this Section.

#### 1.2 RELATED REQUIREMENTS

- A. The Work specified in this Section consists of preparing and submitting the Schedule of Values ("Schedule") as referenced in the General Conditions. Use the Project Specifications Table of Contents or Bid Tabs, if applicable, as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section. The Work also includes the preparing and submitting of updated copies of the Schedule if the Schedule is affected by change orders.
- B. A Schedule of Stored Material is a detailed cost breakdown for permanent materials that will be temporarily stored prior to their being installed and for which the Contractor seeks partial payments. The Schedule of Stored Material will be incorporated as a part of the Schedule of Values.
- C. Within 14 calendar days of issuance of the Notice to Proceed (NTP), the Contractor shall submit the Schedule of Values including the Schedule of Stored Material if applicable. The Schedule of Values and Schedule of Stored Material used to prepare the work/cost breakdown for the Schedule will be used for the Contractor's billings.
- D. Any Contract allowances shall be included in the Schedule. Expenditure of allowances shall be done using the Allowance Authorization form. Use of this form does not increase or decrease the Contract value.

#### 1.3 RELATED DOCUMENTS

- A. Title 9 – Compensation of the General Contract Conditions, 2011 Edition
- B. Section 013300 "Submittal Procedures"
- C. Section 013325 "Shop and Working Drawings, Product Data and Samples".
- D. Form CM-89, Schedule of Values
- E. Form CM-91, Schedule of Values for Unit Price Contracts

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**1.4 SUBMITTALS**

- A. The Schedule of Values shall be formally approved by the DEN Project Manager.
- B. The Schedule shall identify each item of work. Work items in the Schedule shall represent all Work and shall be referenced with the Technical Specifications section numbers, specification subparagraph, specification section title and the bid item number used for the Schedule of Prices and Quantities when applicable.
- C. Upon request by the City, the Contractor shall support values given with the data that will substantiate the correctness of the values.
- D. The Schedule will be utilized only as a basis for review of the Contractor's application for progress payment.

**1.5 REVIEW AND RESUBMITTAL**

- A. If review by the DEN Project Manager indicates that changes to the Schedule are required, the Contractor shall revise and resubmit the Schedule.

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION****3.1 PREPARING SCHEDULE OF VALUES**

- A. Provide a breakdown of the Contract Price in enough detail to facilitate continued evaluation of Applications for Payment and progress reports.
- B. Breakdown of the items used in the Schedule shall include the following item costs. Ensure each item is complete:
  - 1. Delivered cost of product with applicable taxes paid.
  - 2. Total installation cost with overhead and profit.
  - 3. Breakdown costs of each lump sum item with a list of products and major operations for which the Contractor seeks to receive progress payments to recover the Contractor's costs for that bid item.
  - 4. Each unit price item as listed in the bid Schedule of Prices and Quantities shall list products and major operations for which the Contractor seeks to receive progress payments for that bid item.

**3.2 PREPARING SCHEDULE OF STORED MATERIAL**

- A. The Contractor shall submit with the Schedule an indication of whether products will be stored on or off the work site. The Schedule of Stored Material shall show all quantities and types of products that will be stored.

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- B. Material allowances consist of only the net cost of the product, the cost of delivery and unloading at the storage site, the cost of applicable sales taxes, and all discounts.
- C. In no case will the cost paid for a permanent material be greater than 90 percent of the Contract price for the Work in which they are included.

### 3.3 PAYMENT FOR STORED MATERIALS

- A. Only materials that are described in the specifications and on the drawings will be considered permanent materials. Permanent materials are materials that will be left in the Work after the Contract is completed.
- B. Nothing in these specifications shall be interpreted as requiring the City to pay for stored materials. The DEN Project Manager shall decide on a case-by-case basis whether stored materials shall be paid for. No payment will be made for stored materials that have not been submitted and accepted.
- C. The Contractor must, at all times, store permanent materials in accordance with manufacturer's recommendations. Any material not properly stored will not be paid for. Amounts will be deducted from payments for any stored permanent material previously paid for and subsequently found to be improperly stored or not present, based upon a physical inventory of stored permanent material.
- D. Only the neat line quantity of material needed for the finished product may be paid for.
- E. All requests for stored permanent material payment must be accompanied by paid invoices clearly showing the quantity of permanent material, the type of permanent material and discounts or rebates and the net amount paid to the supplier along with a certificate stating that the permanent material is free of any liens or judgments preventing its use by the City.
- F. If the permanent material is stored outside the Denver area the Contractor must pay for the City representative's transportation and lodging to see the stored material as needed. Acceptable lodgings must, as a minimum, have a Mobil Travel Guide Rating Criteria® rating of Two-Star or the American Automobile Association Lodging Listing Requirements & Diamond Rating Guidelines® rating of Two Diamonds. The minimum transportation shall be by regularly scheduled commercial air carrier at coach rates. The DEN Project Manager will determine if an overnight stay is required.
- G. All permanent material stored off site, for which payment is being requested, must be insured and stored in bonded, insured warehouses. The Contractor shall provide proof of insurance for all material stored off site, and specific address and storage conditions of storage location.
- H. Any permanent material on which payment is requested must be in such a form that it cannot be used on work other than this Contract, or stored in a manner acceptable to the DEN Project Manager to ensure that the permanent material cannot be used on work other than this Contract.

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**3.4 ALLOWANCE AUTHORIZATION AND PAYMENT**

- A. Contractor shall request written approval for expenditure of any Contract allowances **PRIOR TO** performing the Work involved. List work to be performed and estimated cost in the requesting correspondence.
- B. Original copies of all invoices and receipts must be submitted with the Allowance Authorization as part of the request for payment.
- C. Using the format provided by the City, the Contractor's request for payment of all Contract allowances shall be included in the Schedule of Values.

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT****5.1 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section.

**END OF SECTION 012910**

## SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations and coordination with other stakeholders and adjacent Contractors on the Project including,

1. Subcontractor's Acceptance Certification and Subcontractors List.
2. General Coordination Procedures.
3. Contract Administration Procedures.
4. Current Project Management Information Systems (PMIS)
5. Coordination drawings.
6. Current DEN Asset Management Systems
7. Requests for Information (RFIs).

- B. Related Requirements:

1. Section 011100, " Summary of Work" for a description of the division of work among separate contracts and responsibility for coordination activities not in this Section.
2. Section 011400 "Work Sequence and Constraints" for shutdown requests and coordinating with airport operational activities.
3. Section 011420 "Security Requirements and Sensitive Security Information (SSI)".
4. Section 013210 "Schedule" for preparing and submitting Contractor's Construction Schedule.
5. Section 013223 "Construction Layout, As-built and Quantity Surveys" for coordinating, survey activities and survey related record documents.
6. Section 013300 "Submittal Procedures. "
7. Section 013325 "Shop and Working Drawings, Product Data and Samples".
8. Section 017720 "Contract Closeout" for coordinating closeout of the Contract.
9. Section 017419 "Construction Waste Management and Recycling".
10. DEN Building Information Modeling (BIM) Design Standards Manual (DSM)

#### 1.3 DEFINITIONS

- A. RFI: Request from the DEN Contractor DEN Project Manager seeking information required by or clarifications of the Contract Documents.

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**1.4 SUBMITTALS - SUBCONTRACTORS ACCEPTANCE CERTIFICATION AND SUBCONTRACTORS LIST**

- A. To comply with Section 502.2 in the General Contract Conditions, 2011 Edition, the Contractor must complete and submit form CM-02 Subcontractor Acceptance Certification for each Subcontractor working on the project. Additionally, the Contractor must prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.
- B. Provide emergency contacts list to the DEN Project Manager prior to any site activities. List must contain project name, number, location, company name and address, name and title of emergency contacts in order and time and assigned responsibilities. Keep list current and accurate at all times. Include any specific security arrangements or special projects requirements.
- C. Within two (2) days of Notice to Proceed, the Contractor shall submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identifying individuals and their duties and responsibilities listing addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Providing names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
  - 1. Post copies of the accepted list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

**1.5 GENERAL COORDINATION PROCEDURES**

- A. Coordination with other Contractors:
  - 1. For details on coordinating with other Contractors, refer to Article 701 Cooperation with Other Work Forces, Article 702 Coordination of the Work, and Article 703 Coordination of Public Contact in the General Contract Conditions, 2011 Edition.
- B. Minimum cooperation requirements with other contractors include the following, unless directed by the DEN Project Manager in writing:
  - 1. Regular meetings, minimum weekly.
  - 2. Construction schedule coordination.
  - 3. Staging area and access planning (to include employee shuttle routes).
  - 4. Deliveries.
  - 5. Traffic control.
  - 6. When and where required or specified, the Contractor shall develop appropriate coordination drawings for use by interfacing adjacent parties using the Denver International Airport site.
- C. The following is a list that includes, but is not limited to, all of the contractors that will be working in the area of the project limits:



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- D. Coordination with DEN entities shall include but is not limited to the following:
1. Coordinate with Owner Contracted Communication Contractor.
  2. Coordinate with Utility Companies for utilities that are single sole source.
  3. Coordinate with Airport Security and DEN Maintenance for all security related services.
  4. Coordinate with DEN Life Safety Team for all issues related to fire alarm, fire protection systems in addition to compliance with all regulatory agencies.
  5. Coordinate all shutdowns and system interruptions in accordance with section 011400 "Work Sequence and Constraints."

1.6 Contract Administration Procedures:

- A. This Project will be administered in part using the current Project Management Information System (PMIS). Any processes necessary to properly administer the Contract and not included in the list below shall be addressed as acceptable to the DEN Project Manager. DEN Project Manager may modify the list below in serialized correspondence without constituting a change to the Contract. Administrative tools and processes shall not in any form waive any contractual or legal requirements of the law or the Contract. The Contractor shall attend all coordination meetings with the DEN Project Manager and the DEN Project Control Administrators to arrange for staff training, and technical support to facilitate the execution of electronic data management and control.
- B. Project Management Information Systems (PMIS): Oracle Unifier Enterprise Project Portfolio Manager (EPPM), or the Oracle Primavera P6.
- C. All submittals, RFIs, Pay Applications, Correspondence, change requests, and pricing proposals and settlement agreements shall be recorded and submitted using the current PMIS:
1. The Contractor shall follow the specified PMIS Access Request Procedure and adhere to all user license conditions.
  2. The Contractor shall sign the Information Technology Agreement (ITA) to comply with the DEN computer system security requirements and any contractual obligation to the software and service providers for the current PMIS software
  3. DEN will train the Contractor's staff on the use of the PMIS.
  4. At a minimum, the Contractor shall provide computer hardware and software to meet the following requirements and to run the following programs, as required for the project:
    - a. Internet connectivity that provides the necessary high-speed connection to perform all activities indicated in this Contract.
    - b. Internet Explorer version 8 or higher.
    - c. Based on the project, a specific Java JRE application may be required, which can be downloaded from the Internet. If needed, the revision and update number will be provided at NTP.
    - d. Other files capability pre-approved by the DEN Project Manager or as required by the DEN BIM Execution Plan
    - e. Most current version of Revit, as per DEN requirements.

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**1.7 COORDINATION DRAWINGS**

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, BIM Design Standards Manual and BIM Project Execution Plan (BPPX), and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity. Coordination drawings will be the result of a Contractor driven Spatial Coordination effort as spelled out in the BPPX.
1. Field verify all existing dimensions and any as-built dimensions, whether built by the Contractor or others, necessary to produce accurate coordination and working drawings.
  2. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Use applicable Models/Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
    - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
    - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
    - f. Indicate required installation sequences.
    - g. Indicate dimensions shown on the Models/Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to DEN Project Manager indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Using software as in the BPPX, the Contractor shall coordinate these systems per floor or zone per BPPX, and as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
  2. Plenum Space: Indicate sub-framing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.

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3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire alarm, and electrical equipment.
  4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
  6. Mechanical and Plumbing Work: Show the following:
    - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    - c. Fire-rated enclosures around ductwork.
  7. Electrical Work: Show the following:
    - a. Runs of vertical and horizontal conduit.
    - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    - c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor control center locations.
    - d. Location of pull boxes and junction boxes dimensioned from column centerlines.
  8. Fire-Protection System: Show the following:
    - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
  9. Review: DEN Project Manager will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If DEN Project Manager determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, DEN Project Manager will so inform Contractor, who shall make changes as directed and resubmit.
- C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings, unless approved otherwise by DEN Project Manager.
  2. File Preparation Format: Provided in the Project BIM Execution Plan operating in Microsoft Windows operating system.
  3. File Submittal Format: Submit or post coordination drawing files as required in the Project BIM Execution Plan.
  4. The submittal must be logged in accordance with the submittal procedure

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5. For Fire Protection system; provide shop drawing and design calculations as approved by the building department. Submit as-built drawings in format as outline in BXP.
  6. For all projects, receiving official variance from the BIM requirements not utilizing BIM, coordination drawings must be submitted in acceptable digital format shall be in an industry recognized 3D AutoCAD model.
  7. BIM File Incorporation: DEN Project Manager will incorporate Contractor's coordination drawing files into Building Information Model for Revit as established for Project.
    - a. Contractor shall lead three-dimensional component conflict analysis as part of preparation of coordination drawings. Resolve component conflicts prior to submittal. Indicate where conflict resolution requires modification of design requirements by Architect or other sub-consultants.
  8. DEN Project Manager will furnish Contractor one (1) set of digital data files of Models and/or Drawings for use in preparing coordination digital data files.
    - a. The Design consultants and Contractors and Sub Contractors acknowledge and represent the following Right Of Reliance regarding Electronic Models and/or Drawing deliverables:
      - 1) Models may be transferred for allowing the recipients to develop derivative models to develop the means and methods by which to construct the project.
      - 2) It must be clear that each party be able to rely on the fact that the model furnished by others "match the 2D Contract Documents or shop drawings in their equivalent state of development"
- 1.8 Coordination with DEN Asset Management System:
- A. The full intent is to produce comprehensive record documents integrating existing data in the form of digital files and models, reconciled to actual field conditions, modifications or additions facilities or components of existing facilities according to new Contract Documents, and to produce record documents that could be incorporated into DEN asset management system.
  - B. Utilize the BIM to link all necessary data content to the model and follow the BXP as collaboratively modified by the Contractor, Designer, and DEN BIM Administrators and approved by DEN Project Manager
  - C. Provide the following information through the execution of the Contract for all elements and element types that DEN has designated as assets. The information shall include but is not limited to:
    1. Project title, number, project manager contact information, contractor and subcontractor contact information
    2. Pertaining shop drawings
    3. Operational Manuals and safety information, MSDS and cut sheets, and any pertinent technical information.

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4. Details of all components' maintenance procedures and requirements.
5. Details of all applicable warranties including but not limited to; warranty providers, manufacturers information, warranty start and finish dates, contacts , bonding company name, consent of surety,
6. Equipment location (by room number and location description or grid location format acceptable to DEN Project Manager, for civil projects), equipment make, model, serial number, and other asset information as outlined in the DEN BIM DSM
7. List of all spare parts including but not limited to; equipment make and model, location, submittal number or link, and suppliers reordering information
8. Commissioning results, acceptance criteria, test reports, and Tab reports

## 1.9 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI through the PMIS
  1. DEN Project Manager will distribute the RFIs to the proper entities.
  2. DEN Project Manager will coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's Work or work of subcontractors
- B. DEN Project Manager has the right to reject RFIs or those that do not contain proper information and required data to properly evaluate the request and respond in a timely manner.
- C. RFIs: Use PMIS to generate RFIs.
  1. Attachments shall be electronic files in Adobe Acrobat PDF format.
  2. Attachments include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- D. For projects not using Unifier to create the RFI, the RFI must include a detailed, legible description of item needing information or interpretation and the following:
  1. Project name.
  2. Project number.
  3. Date.
  4. Name of Contractor.
  5. Name of DOR[ and DEN Project Manager].
  6. RFI number, numbered sequentially.
  7. RFI subject.
  8. Specification Section number and title and related paragraphs, as appropriate.
  9. Drawing number and detail references, as appropriate.
  10. Field dimensions and conditions, as appropriate.

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11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  12. Contractor's signature.
  13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- E. DEN Project Manager will review each RFI, determine action required, and respond. RFIs received by DEN Project Manager after 1:00 p.m. will be considered as received the following working day. Direct responses by any entity other than DEN Project Manager shall not be binding to the City and County of Denver. E-mails, and verbal conversations must be followed by an official RFI or proper contractual vehicle before it is considered for any additional compensation or time impact to the project terms and conditions.
1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for approval of Contractor's means and methods.
    - d. Requests for coordination information already indicated in the Contract Documents.
    - e. Requests for adjustments in the Contract Time or the Contract Sum.
    - f. Requests for interpretation of DEN Project Manager's actions on submittals.
    - g. Incomplete RFIs or inaccurately prepared RFIs.
  2. DEN Project Manager's action may include a request for additional information, in which case DEN Project Manager's time for response will date from time of receipt of additional information.
  3. DEN Project Manager's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Title 11 - Changes In the Work, Contract Price, or Contract Time in the General Contract Conditions, 2011 Edition as amended by Special Conditions.
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify DEN Project Manager in writing within five (5) days of receipt of the RFI response or the time required by Title 11 - Changes In the Work, Contract Price, or Contract Time in the General Contract Conditions, 2011 Edition
- F. RFI Log: For projects not utilizing the PMIS application, prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. The log shall include but not limited to the following data:
1. Project name.
  2. Name and address of Contractor.
  3. Name and address of DEN Project Manager.
  4. RFI number including RFIs that were returned without action or withdrawn.
  5. RFI description.
  6. Date the RFI was submitted.

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7. Date DEN Project Manager's response was received.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT:

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT:

- A. No additional Payment will be made for compliance with the requirements of this section.

**END OF SECTION 013100**



## **SECTION 013119 - PROJECT MEETINGS**

### **PART 1 - GENERAL**

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Work specified in this Section requires the Contractor's Project Manager, Superintendent, and Quality Control representative to attend meetings scheduled by the DEN Project Manager for the collection and dissemination of information related to the subject Contract.
- B. The DEN Project Manager will prepare the minutes of each meeting and distribute them to each of the participants.

#### 1.3 REFERENCE DOCUMENTS

- A. Form CM-01, Preconstruction Meeting Agenda
- B. Form CM-62, Construction Meeting Agenda/Minutes

#### 1.4 OTHER MEETINGS

- A. The Contractor shall attend all other project related meetings as directed by the DEN Project Manager.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION**

#### 3.1 PRECONSTRUCTION MEETING

- A. A Preconstruction Meeting will be scheduled by the DEN Project Manager after the Contract has been signed by all parties. The purpose of this meeting is to introduce the City's Representatives to their counterparts in the Contractor's organization and to establish lines of communication between these representatives and outline some Contract requirements. The Contractor's key personnel shall attend this meeting.



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- B. The DEN Project Manager will distribute a notice of this meeting, along with an agenda of the subjects to be addressed. Refer to form CM-01, Preconstruction Meeting Agenda.
- C. The DEN Project Manager will explain and discuss the responsibilities and authorities of the City, the Designer of Record, and the DEN Project Manager's organization.
- D. The Contractor shall introduce the Contractor's key personnel, subcontractors, and representatives and briefly describe each person's responsibilities.
- E. Explanations provided by the DEN Project Manager will not amend, supersede, or alter the terms or meaning of any Contract document, and the Contractor shall not claim reliance on such explanations as a defense to any breach or failure by the Contractor to perform as specified in the Contract.

**3.2 CONSTRUCTION PROGRESS MEETINGS**

- A. Progress meetings will be scheduled weekly and more often as necessary by the DEN Project Manager to promote the competent and timely execution of the Contract.
- B. The meetings will be held at the work site or at a location selected by the DEN Project Manager. Meetings will be chaired by the DEN Project Manager or the DEN Project Manager's representative.
- C. The Contractor's key personnel shall attend unless otherwise agreed by the DEN Project Manager.
- D. At a minimum, and as directed by the DEN Project Manager, the items detailed in CM-62, Construction Meeting Agenda/Minutes shall be addressed at each meeting. The items addressed in the meeting do not waive notification or submittal requirements as required elsewhere in the Contract.
- E. The DEN Project Manager will be responsible for publishing minutes of the meetings. Refer to form CM-62, Construction Agenda/Meeting Minutes.

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT****5.1 METHOD OF PAYMENT**

- A. No separate payment shall be made for work under this Section.

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- B. All payments for any Work done under this contract shall be in accordance with Title 9  
- Compensation of the General Contract Conditions, 2011 Edition.

**END OF SECTION 013119**

## SECTION 013210 - SCHEDULE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Work specified in this Section describes the procedures and requirements for scheduling and documenting the progress of the project:

1. Preliminary Construction Schedule.
2. Initial Project Construction Schedule (IPS).
3. Monthly Progress Schedule update.
4. As-built Schedule.
5. Three-Week Look-Ahead Schedule.
6. Submittal Schedule.
7. Fabrication Schedule.
8. Material Delivery Schedules, cranes, special equipment and staging status.
9. Daily Superintendent/Foreman Reports
10. Daily Quality Control Reports
11. Special reports:
  - a. Weather impacts and mitigations.
  - b. Recovery Schedule and alternatives.

- B. Reference Documents

1. Article 1105 – Time Extensions in the General Contract Conditions, 2011 Edition.
2. Section 011100 "Summary of Work"
3. Section 011420 "Work Sequence and Constraints".
4. Section 012910 "Schedule of Values".
5. Section 013119 "Project Meetings"
6. Section 013300 "Submittal Procedures"

#### 1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a Construction Schedule consume time and resources:

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- B. **Contract Time:** Total number of days provided in the Contract Documents from the Notice to Proceed to the date of Final Completion of the Work. Substantial Completion shall occur prior to Final Completion. Contract Time may be further defined and divided into phases by the Technical Specifications or Special Conditions. The Contract Documents may require completion on or before a certain specified date.
- C. **Cost Loading:** The allocation of the total contract value spread across each appropriate activity. All project costs, including those for stored materials, allowances and indirect costs shall be loaded into the schedule and shall be balanced to where no activity is unfunded.
- D. **Critical Activity:** An activity on the critical path that must start and finish on the planned early start and finish dates. Any delay in the start or finish of a critical activity will cause a delay to the project finish.
- E. **Critical Path Method (CPM):** A method of planning and scheduling a construction project where activities are arranged based upon defined relationships. Defined relationships determine when activities can be performed and the critical path for completing the Work.
- F. **Critical Path:** The longest chain of interdependent activities through the network sequence that establishes the shortest duration for completing the work and contains no float. The critical path shall be calculated as total float equal to but not less than zero days. Activities on the critical path have a total float of zero.
- G. **Data Date:** The date on which the schedule status is determined. For initial schedules, it is the project Notice to Proceed date. For schedule updates, it is the reporting period cut-off date. Updated schedules depict the actual status of the work started, on-going and/or completed within the reporting period. The data date is used to start the scheduling calculations for forward and backward passes.
- H. **Days:** Consecutive calendar days unless specifically designated otherwise and includes weekends, holidays or days of normal inclement weather.
- I. **Direct Man-hours:** Man-hours related only to the physical construction of the Work, i.e., drywall, carpeting, electrical, masonry, mechanical, etc.
- J. **Final Completion:** Occurs following Substantial Completion and when the Project Manager confirms in writing that the Contractor has completed the work in accordance with the contract, including completion of all punch list items, cleanup work and delivery of all required guarantees, warranties, licenses, releases and other required deliverables.
- K. **Free float:** The amount of time an activity can be delayed without adversely affecting the early start of its successor activity.
- L. **Indirect Man-hours:** Man-hours related to support of the physical construction of the Work, i.e., mobilization, cleanup, traffic control, temporary activities, badging, supervision and overhead, etc.

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- M. Lag: The delay of a successor activity and represents time that must pass before the second activity can begin. There are no resources associated with a lag.
- N. Lead: The acceleration of a successor activity where it can begin in parallel with the predecessor activity. It compresses the total combined duration of both activities. The dependency must be discretionary and there is no physical limitation on completing Activity "A" before Activity "B" begins.
- O. Longest Path: The longest continuous path of activities through a project, which controls project early completion. It is possible for otherwise defined critical path activities to not be on the longest path and longest path activities to not show calculated critical float.
- P. Notice to Proceed: A notification letter from the Owner addressed to the contractor stating the date on which the contractor can begin project work. The NTP date marks the beginning of the Contract Time.
- Q. Predecessor Activity: An activity that comes before a dependent activity in the network sequence. It must either start or finish before a specified activity can begin.
- R. Resource Loading: A calculated value based on the actual worker's hours and costs, equipment and materials costs that are required to complete an activity. The value is allocated to the specific activities.
- S. Substantial Completion: The Work has progressed to the point that the City can beneficially occupy or utilize the Work for the purpose for which it is intended, and the Work complies with all applicable codes and regulations, including, if required, issuance of a certificate of occupancy, or certificate of suitability for use from the appropriate governmental agencies, as determined by the Manager in its sole discretion.
- T. Successor Activity: A dependent activity that logically comes after another activity in the network sequence.
- U. Total float: The amount of time that an activity in a network sequence can be delayed without causing a delay to subsequent activities and/or the completion date of the Work.
- V. Work Breakdown Structure (WBS): A hierarchical decomposition of the Work to be executed by the contractor. It shall allow for the roll-up and summarization to a predetermined level. The level of breakdown shall be agreed upon by the Contractor and the DEN Project Manager prior to the start of Work.

#### 1.4 SUBMITTALS

- A. Submit for City acceptance the following in accordance with Section 013300 – Submittal Procedures:
1. Project Scheduler Qualifications
  2. Preliminary Project Construction Schedule

3. Initial Project Construction Schedule
4. Monthly Progress Update Schedules
5. Time Impact Analysis, when necessary
6. As-built Schedule

B. Scheduler/Scheduling Consultant Qualifications:

1. A professional with a minimum of two (2) years of experience with scheduling construction projects similar in size and scope of work as this project using Oracle Primavera P6 software.
2. The scheduler shall have a comprehensive knowledge of Critical Path Method (CPM) scheduling principles and application.
3. The scheduler shall also have the ability to produce reports and diagrams within 24 hours of the DEN Project Manager's request and be able to perform the below tasks, including, but not limited to, the following:
  - a. Create, maintain and update the project construction schedule.
  - b. Prepare monthly progress schedule updates, submit for review and incorporate the City's review comments into the schedule, if any.
  - c. Coordinate the participation of qualified personnel to assist in the development of the initial construction schedule and updating of the monthly progress schedule.
  - d. Develop a WBS to the appropriate level and be able to discuss verbally and in writing the applicability of the WBS.
  - e. Incorporate delivery dates for Owner-furnished products.
  - f. Incorporate submittal requirements, procedures and time required for review of submittals and resubmittals.
  - g. Incorporate requirements for tests and inspections by independent testing and inspecting agencies.
  - h. Incorporate time required for Project closeout and Owner start-up procedures, including commissioning activities.

1.5 COORDINATION

- A. Pre-scheduling Conference: Schedule conference at Pre-Construction meeting to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to setting up the Preliminary Project Construction Schedule and Initial Project Construction Schedule, including, but not limited to, the following:
1. Verify availability of qualified personnel needed to develop and update schedule.
  2. Review content and format for reports.
  3. Discuss constraints, including phasing, area separations, interim milestones, and partial Owner occupancy.
  4. Review delivery dates for Owner-furnished products.
  5. Review submittal requirements and procedures.
  6. Review time required for review of submittals and resubmittals.
  7. Review time required for Shutdown request and approval.
  8. Review requirements for tests and inspections by independent testing and inspecting agencies.

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9. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
  10. Review procedures for updating schedule.
  11. Review requirements for content and input of direct man-hour resources in activities.
  12. Review requirements for cost loading of activities.
- B. Coordinate Initial Project Construction Schedule with the Schedule of Values.
- C. Work items in the Initial Construction Schedule shall be identified in a Work Breakdown Structure (WBS) format that corresponds with the areas, phasing or schedules of the project and the technical specifications.
- D. Secure time commitments for performing critical elements of the Work from entities involved.
- E. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

**PART 2 - PRODUCTS****2.1 SOFTWARE**

- A. DEN Default Software:
1. DEN shall use Oracle Primavera P6, Release 18.7 for all City scheduling needs.
- B. Contractor Software:
1. Scheduling software used by the contractor shall be Oracle Primavera P6 Release 16 or higher.
  2. The software and any support agreements shall be purchased at the contractor's expense from a vendor of the contractor's choosing.
  3. The City will not provide training or support services for contractor purchased software.
- C. Oracle Primavera P6:
1. The following settings are mandatory and required in all schedule submissions to the City:
    - a. Activity codes shall be Project Level, not Global or EPS level.
    - b. Calendars shall be Project Level, not Global or Resource level.
    - c. Activity Duration Types shall be set to "Fixed Duration & Units".
    - d. Percent Complete Types shall be set to "Physical".
    - e. Time Period Admin. Preferences shall remain the default "8.0 hour/day, 40 hour/week, 172 hour/month, 2000 hour/year". Set Calendar Work Hours/Day to 8.0-hour days.

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- f. Set Schedule Option for defining Critical Activities to “Total Float less than or equal to zero (0) hours/day”.
- g. Set Schedule Option for defining progressed activities to “Retained Logic”.
- h. Set up cost loading using single lump sum resource. The Price/Unit shall be \$1/hour, Default Units/Time shall be 8h/d”, and settings “Auto Compute Actuals” and “Calculate Cost from Units” selected.
- i. Activity ID’s shall not exceed 10 characters.
- j. Activity Names shall have the most defining and detailed description within the first 30 characters.

**PART 3 - EXECUTION****3.1 GENERAL REQUIREMENTS**

- A. Prepare for acceptance all Project Schedules utilizing the Critical Path Method (CPM) of network calculation to generate all Project Schedules.
- B. Prepare each Project Schedule utilizing the Precedence Diagram Method (PDM).
- C. Show in the schedule, the proposed sequence to perform the work and dates contemplated for starting and completing the schedule activities.
- D. The scheduling of the entire project is required.
- E. Provide a schedule that is forward planning as well as a project monitoring tool
- F. Contractor management personnel shall actively participate in its development.
- G. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate project schedule.
- H. The contractor shall keep the subcontractors and suppliers informed of the Project Construction Schedule to enable the subcontractors to plan and perform their work properly.

**3.2 COST LOADING**

- A. Activity cost loading shall be reasonable and without front-end loading.
- B. Provide additional documentation to demonstrate reasonableness, if requested by the City.

**3.3 WITHHOLDINGS / PAYMENT REJECTION**

- A. Failure to meet the requirements of this Section may result in the disapproval of the schedules or updates and subsequent rejection of payment requests until requirements are met.



- B. If the DEN Project Manager directs schedule revisions and those revisions have not been included in subsequent Project Schedule revisions or updates, the DEN Project Manager may withhold 10 percent of pay request amount for each payment period until such revisions to the project schedule have been made.

### 3.4 PROJECT SCHEDULE DETAIL REQUIREMENTS

A. Level of Detail Required

1. Develop the Project Schedule as a Level 4 execution schedule.
2. Level of detail to address major milestones and to allow for satisfactory project planning and execution.
3. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval.
4. The DEN Project Manager will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail

B. Activity Durations

1. Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods.
2. Less than 2 percent of all non-procurement activities shall have Original Durations (OD) greater than 20 work days or 30 calendar days.

C. Procurement Activities

1. Include activities associated with the critical submittals and their approvals, procurement, fabrication and delivery of long lead materials, equipment, fabricated assemblies and supplies.
2. Long lead procurement activities are those with an anticipated procurement sequence of over 30 calendar days.

D. Mandatory Tasks

1. Include the following tasks/activities in the preliminary and initial project schedules and all updates.
  - a. Notice to Proceed milestone activity.
  - b. Submission, review and acceptance of preconstruction submittals (individual activity for each).
  - c. Long procurement activities.
  - d. Submission and approval of testing activities, as needed by project.
  - e. Submission and approval of Operations & Maintenance (O&M) manuals.
  - f. Submission and approval of as-built drawings.
  - g. City Punch list walk-through.
  - h. Correction of Punch list items based on City Punch list walk-through.
  - i. Substantial Completion milestone activity.

E. Owner Activities

1. Show the City and other agency activities that could impact progress. These activities include, but are not limited to:
  - a. Approvals
  - b. Acceptance
  - c. Building Department Permits
  - d. Environmental Permit Approvals by State Regulators
  - e. Inspections
  - f. Utility Tie-Ins
  - g. Owner Furnished Equipment
  - h. NTP For Phasing Requirements.
  
- F. Workers Per Day
  1. Assign workers per day for the field construction and direct work activities, if directed by DEN Project Manager.
  2. Workers per day shall be the average number of workers expected each day to perform the task for the duration of the activity.
  
- G. Responsible Party Coding
  1. Assign responsibility for activities to the Prime Contractor, subcontractors, DEN or other agencies responsible for performing the activity.
  2. Activities cannot have more than one Responsibility Code.
  3. Examples of acceptable activity code values are:
    - a. DOR (Designer of Record)
    - b. ELEC (electrical subcontractor)
    - c. MECH (mechanical subcontractor)
    - d. PAVE (paving subcontractor)
    - e. DEN (Denver International Airport)
  
- H. Calendars
  1. Schedule activities on a calendar to which the activity logically belongs.
  2. Develop calendars to accommodate Contract-defined work periods, such as a 7-day calendar for City Acceptance activities, concrete cure times, etc.
  3. Develop the default calendar to match the physical work plan with non-work periods identified including weekends and holidays.
  4. Develop and assign seasonal calendars to seasonally affected activities.
  5. If an activity is weather-sensitive, assign it to a calendar showing non-work days on a monthly basis, with the non-work days selected at random across the weeks of the calendar:
    - a. The assignment of the non-work days should be over a 7-day week since weather records are compiled on 7-day weeks, which will cause some of the weather related non-work days to fall on weekends.
    - b. Monthly average rain and snow measurements can be obtained from the National Climatic Data Center for the Denver Metropolitan Area or any similar trusted resource.

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I. Contract Milestones and Constraints

1. Milestone shall be used for significant project events including, but not limited to, project phasing, project start and end activities, and interim milestone and/or completion dates.
2. The use of artificial float constraints such as "zero free float" or "zero total float" are prohibited.
3. Mandatory constraints that ignore or affect network logic are prohibited.
4. No constrained dates are allowed in the schedule other than those specified herein. Submit additional constraints to DEN Project Manager for approval on a case-by-case basis.

J. Project Start Date Milestone

1. The first activity in the project schedule shall be a start milestone titled "NTP Issued" with a date equal to the date that NTP was issued to the contractor.

K. Project Finish Milestone

1. The last activity in the schedule shall be a finish milestone titled "Substantial Completion".
2. The project schedule shall be constrained to reflect the last day of the contract duration in such a way that if the schedule calculates an early finish, then the float calculation for "Substantial Completion" milestone reflects positive float.
3. If the project schedule calculates a late finish, then the "Substantial Completion" milestone float calculation reflects negative float.
4. The City is under no obligation to accelerate City activities to support a Contractor's early completion.

L. Interim Completion Dates and Constraints

1. Constrain contractually specified interim milestone completion dates to show negative float when the calculated last finish date of the last activity in that phase is later than the specified interim completion date.

M. Start Phase

1. Use a start milestone as the first activity for a project phase.
2. The start milestone shall be called "Start Phase X" where "X" refers to the phase of work.

N. End Phase

1. Use a finish milestone as the last activity for a project phase.
2. Call the finish milestone "End Phase X" where "X" refers to the phase of work.

O. Open Ended Logic

1. Only two (2) open ended activities are allowed: the first activity "NTP Issued" shall have no predecessor logic, and the last activity "Substantial Completion" shall have no successor logic.

P. Default Progress Data Disallowed

1. Actual Start and Finish dates shall not automatically update with default mechanisms included in the scheduling software.
2. Updating of the percent complete and the remaining duration of an activity shall be independent functions.
3. Disable program features that calculate one of these parameters from the other. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process shall match those dates provided in the Contractor Quality Control Reports.
4. Failure to document the AS and AF dates in the Daily Quality Control report will result in disapproval of the Contractor's schedule.

Q. Out-of-Sequence Progress

1. Activities that have been progressed before the preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis and subject to DEN Project Manager approval.
2. Propose logic corrections to eliminate Out-of-Sequence Progress.
3. Address Out-of-Sequence Progress and logic changes in the Narrative Report and in the periodic schedule update meetings.

R. Added and Deleted Activities

1. Do not delete activities from the project schedule or add new activities to the schedule without approval from the DEN Project Manager.
2. Activity ID and description changes are considered new activities and shall not be changed without approval from the City.

S. Original Durations

1. Activity Original Durations (OD) shall be reasonable to perform the work item. OD changes are prohibited unless justification is provided to and approved by the DEN Project Manager.

T. Leads, Lags, and Start to Finish Relationships

1. Lags shall be reasonable as determined by the DEN Project Controls and not used in place of realistic original durations, shall not be in place to artificially absorb float, or to replace proper schedule logic.
2. Leads (negative lags) and Start to Finish (SF) relationships are prohibited.

U. Retained Logic

1. Schedule calculations shall retain the logic between predecessors and successors ("retained logic" mode) even when the successor activity starts, and the predecessor activity has not finished (out-of-sequence progress).
2. Software features that, in effect, sever the tie between predecessor and successor activities when the successor has started, and the predecessor logic is not satisfied ("progress override") shall not be allowed.

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V. Percent Complete

1. Update the percent complete for each activity started, based on the realistic assessment of earned value.
2. Activities which are complete, but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete to allow for proper schedule management.

W. Remaining Duration

1. Update the remaining duration for each activity based on the number of estimated work days necessary to complete the activity.
2. Remaining duration may not mathematically correlate with percentage found under Paragraph "Percent Complete", above.

X. Work Performed Under Adverse Weather Conditions

1. In accordance with the 2011 Denver General Contract Conditions (GCC) Section 305 Work Performed Under Adverse Weather Conditions, adverse weather conditions are those that are not abnormal weather conditions but that can, depending on the Work to be performed, cause defective Work.
2. High and low temperatures, excessive moisture or unusual drying conditions are examples. Reflect the number of anticipated adverse weather days allocated to a weather-sensitive activity in the activity's calendar.
3. These conditions must be recorded in the Contractor Daily QC Reports, notification of adverse weather shall be given within twenty-four (24) hours of occurrence to the DEN Project Manager for concurrence and the adverse weather day documented in order to be considered for a time extension adjustment.

Y. Time Extensions for Abnormal Weather Conditions

1. In accordance with the 2011 Denver General Conditions (GCC) Section 1105 Time Extensions, if abnormal weather conditions are the basis for a request to extend the Contract Time, such request will be documented by data substantiating that weather conditions were unusually severe for the period of time and could not have been reasonably anticipated.
2. To establish that the existence of abnormal weather, the Contractor must submit documentation that establishes that the weather conditions experienced fall outside of the extreme ranges of weather data published by the National Climatic Data Center for the Denver Metropolitan Area for the ten (10) year period immediately preceding the data of the Contract.
3. Regardless of actual weather conditions, any Day in which the Contractor is able to work eighty percent (80%) or more of its scheduled work force shall not be counted as an abnormal weather Day for purposes of calculating weather related time extensions.

Z. Early Completion Schedule and the Right to Finish Early

1. An Early Completion Schedule is an Initial Project Schedule that indicates the scope of the required contract work will be completed before the contractually required completion date.
2. An Initial Project Schedule indicating an Early Completion will not be accepted without being fully resource-loaded (including crew sizes and manhours) and without the DEN Project Manager agreeing that the schedule is reasonable and achievable.
3. The City is under no obligation to accelerate its own work items to ensure that the early completion is met nor is it responsible to modify incremental funding (if applicable) for the project to meet the Contractor's accelerated work.

### 3.5 PROJECT SCHEDULE SUBMISSIONS

#### A. General

1. Submit the electronic data files (.xer), reports, and network diagrams required for each submission as described in Article 1.4 SUBMITTALS.
2. If the Contractor fails or refuses to furnish the information and schedule updates as set forth, the Contractor will be deemed unresponsive and payment may be withheld as described in Article 3.3 WITHOLDINGS / PAYMENT REJECTION.
3. Review comments made by DEN Project Controls on the schedules do not relieve the Contractor from compliance with the Contract.
4. Provide the submissions as described below.

#### B. Preliminary Project Construction Schedule Submission

1. Within ten (10) days after the issuance of Notice to Proceed (NTP), submit the Preliminary Project Construction Schedule:
  - a. If contract time is greater than 120 calendar days, submit the Schedule defining the planned operations detailed, at a minimum, for the first sixty (60) calendar days of the project for acceptance.
  - b. If contract time is shorter than 120 calendar days, submit the Schedule defining the planned operations detailed for the full contract term for acceptance.
  - c. It shall be early start and late finish constrained and logically tied as specified.
2. The Preliminary Project Construction Schedule shall form the basis for the Initial Project Construction Schedule specified herein and shall include all the required plan and program preparations, submissions and approvals identified in the contract. For example, Quality Control Plan, Site-specific Safety Plan, and Environmental Protection Plan, etc.
3. The DEN Project Manager will respond within 14 days to the Preliminary Schedule submittal with either acceptance or direction to revise and resubmit.
4. In lieu of the Preliminary Project Construction Schedule, the Contractor may, at the Contractor's own discretion, submit the Initial Project Construction Schedule at the Preconstruction Meeting.

- a. If the Initial Project Construction Schedule is submitted in lieu of the Preliminary Project Construction Schedule, the DEN Project Manager will respond within thirty (30) days with acceptance or direction to revise and resubmit within ten (10) days.
5. Acceptance of Preliminary Project Construction Schedule will not constitute approval of Schedule of Values.
- C. Gantt Chart Schedule
1. Submit a time-scaled network diagram printout of the Preliminary Project Construction Schedule at the pre-construction meeting.
  2. Preparation
    - a. Indicate each significant construction activity separately.
    - b. Identify first workday of each week with a continuous vertical line.
    - c. Outline significant construction activities for the contract duration.
    - d. Include skeleton diagram for the remainder of the Work, when necessary.
    - e. For a project with contract time greater than 120 calendar days, the Preliminary Schedule shall show all significant Work tasks that occur in the first sixty (60) days including, but not limited to planning, mobilization, shop drawings and technical submittals and approval time, procurement, fabrication and construction.
    - f. For a project with contract time less than 120 calendar days, the Preliminary Schedule shall show all Work tasks that occurs during the contract time including, but not limited to planning, mobilization, shop drawings and technical submittals and approval time, procurement, fabrication and construction.
    - g. It shall identify work items or milestones that affect or are affected by City, other Contractor's work, utilities, and other third parties and it shall list major submittals required by the Contract.
- D. Narrative Report
1. For a project with contract time greater than 120 calendar days, the Preliminary Project Construction Schedule shall be accompanied by a narrative describing the Contractor's approach to mobilization, procurement, and construction during the first sixty (60) days.
  2. For a project with contract time less than 120 calendar days, the Preliminary Project Construction Schedule shall be accompanied by a narrative describing the Contractor's approach to mobilization, procurement, and construction during the contract time.
  3. The narrative shall elaborate based on durations, production rates, major equipment to be used, and shall identify all major assumptions used to develop the schedule.

### 3.6 Initial Project Construction Schedule Submission

#### A. General



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1. Submit the Initial Project Construction Schedule for acceptance within thirty (30) days after issuance of NTP.
  2. The schedule shall demonstrate a reasonable and realistic sequence of activities which represent the Work through the entire contract performance period.
  3. The DEN Project Manager will respond within 14 days with acceptance or direction to revise and resubmit.
  4. The acceptance of the schedule is for general conformity to the Contract requirements and shall not constitute any relief of any Contract requirements.
  5. Upon acceptance from the DEN Project Manager and DEN Project Controls, the Initial Project Construction Schedule shall become the Baseline Schedule for the duration of the project.
  6. The Baseline Project Construction Schedule may be changed when one or more of the following events occur:
    - a. When a Change Order significantly affects the contract completion date or sequence of work.
    - b. When the Contractor elects to change the sequence or duration of work items affecting the critical path resulting in a major change that requires DEN PM approval.
    - c. When the City directs a change that affects a milestone dates specified in the Special Conditions or alters the length of a critical path.
  7. Failure to include any work item required for performance of this Contract shall not excuse the Contractor from completing all Work within applicable completion dates, regardless of the City's acceptance of the schedule.
  8. Failure of the contractor to have an Initial Project Construction Schedule accepted by DEN Project Manager will be considered cause for withholding progress payment.
- B. Preparation:
1. Project Duration
    - a. Extend schedule from NTP date to Substantial Completion.
    - b. Contract completion date shall not be changed by submission of a schedule that shows an early or late completion date, unless specifically amended by Change Order.
  2. Activities
    - a. Treat each building floor or separate area as a separate numbered activity for each main element of the Work.
    - b. Prepare a list of all activities required to complete the Work and indicate the estimated time duration, sequence requirements, and relationships of each activity in relation to the other activities.
  3. Activity Duration:
    - a. Define activities so no construction activity is longer than twenty (20) days, unless specifically allowed by DEN Project Manager. Include estimated time frames for the following activities:



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- 1) Preparation and processing of submittals.
  - 2) Mobilization and demobilization.
  - 3) Purchase of materials.
  - 4) Delivery of materials.
  - 5) Fabrication of materials
  - 6) System shutdown request and approval
  - 7) Utility/system interruptions
  - 8) Installation of Work
  - 9) Work by City, other contractors, utilities and other third parties that may affect or be affected by Contractor's activities.
  - 10) Startup, Testing and Commissioning
  - 11) Punch list and Final Completion.
4. Critical Path Activities:
- a. No more than twenty-five (25) percent of the activities may be on the critical path, unless approved IN WRITING by DEN Project Manager.
  - b. Identify critical path activities, including those for interim completion dates.
  - c. Scheduled start and completion dates shall be consistent with Contract milestone dates.
5. Procurement Activities:
- a. Include procurement activities for long lead items and major items as separate activities in schedule.
  - b. Procurement cycle activities including, but are not limited to, submittals, approvals, purchasing, fabrication and delivery.
  - c. May have a duration greater than twenty (20) calendar days and should represent the time to complete the procurement cycle as described above.
6. Submittal Review Time:
- a. Include review and re-submittal times indicated in Technical Specification 013300 "Submittal Procedures" in schedule unless time frame is reduced by approval of the DEN Project Manager.
  - b. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
7. Substantial Completion:
- a. Indicate date established for Substantial Completion.
8. Milestones:
- a. Include milestone indicated in the Contract Documents, including, but not limited to, NTP, Phasing Milestones and Substantial Completion.
9. Constraints:
- a. Include constraints and work restrictions indicated in the Contract Documents and show how the sequence of the Work is affected:

- 1) Phasing:
  - a) Arrange activities in schedule in Work Breakdown Structure (WBS) by Area, Phase or Bid Schedule.
  - b) Coordinate phasing and constraints with those established in Technical Specification Section 011400 "Work Sequence and Constraints".
- 2) Products Ordered in Advance:
  - a) Include separate activity for each product.
  - b) Include delivery date indicated in Technical Specification Section 011100 "Summary of Work".
  - c) Delivery dates indicated stipulate the earliest possible delivery data.
- 3) Owner-furnished Products:
  - a) Include separate activity for each product.
  - b) Include delivery date indicated in Technical Specification Section 011100 "Summary of Work".
  - c) Delivery dates indicated stipulate the earliest possible delivery date.

10. Resource Loading of Construction Schedule:

- a. Coordinate with DEN Project Controls and DEN Project Manager for the requirements.
- b. Activities shall be resource loaded with direct man-hours required to perform the physical construction of the project. Indirect man-hours shall not be included as resources to activities.

C. Schedule Narrative Report

1. The Initial Project Construction Schedule shall be accompanied by a narrative describing the Contractor's approach to mobilization, procurement, and construction for the project.
2. It shall elaborate on the original assumptions of estimated quantities and production rates, hours per shift, workdays per week, and types, number and capacities of major construction equipment to be used and whether the Contractor plans to work weekends.

3.7 MONTHLY PROGRESS CONSTRUCTION SCHEDULE UPDATES

- A. The Contractor shall submit a monthly progress schedule at the end of each month following the issuance of NTP.
- B. At the end of each month, the Contractor and DEN Project Manager shall agree on the progress of the work and the Contractor shall update the Construction Schedule accordingly.

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- C. This review does not constitute an acceptance of the Monthly Progress Schedule update and shall not be used for the purpose of modifying the accepted Baseline Project Construction Schedule.
- D. Failure of the Contractor to have a Monthly Progress Construction Schedule accepted by the DEN Project Manager will be considered cause for withholding progress payment per Article 306 - Working Hours and Schedules and Article 909 - Additional Withholding of Progress Payments of the General Contract Conditions, 2011 Edition.
- E. The Contractor's monthly progress schedule shall include a written narrative describing the overall progress of the Work, provide a critical path analysis, explain the basis for determining construction logic, discuss significant problems with proposed corrective action, and how the status of major changes and any other changes are affecting the project schedule.
- F. Concurrent with making revision to the schedule, prepare a tabulated report showing the following and include in the narrative report:
1. Identification of activities that have changed.
  2. Changes in early and late start dates.
  3. Changes in early and late finish dates.
  4. Changes in activity durations for remaining work activities only.
  5. Changes in critical path.
  6. Change in total float
  7. Changes in contract time.
- G. Minor revisions submitted at monthly progress review meeting are not considered as changes in this context.
- H. If after submitting a request for change to the Construction Schedule, the DEN Project Manager does not agree with the request, the DEN Project Manager will schedule a meeting with the Contractor to discuss the differences.
- I. If a settlement cannot be reached on the change in the Construction Schedule, or if the Contractor has failed to submit revisions to the network, the DEN Project Manager has the option of providing suggested logic or duration changes in all subsequent update schedules.
- J. The suggested logic and/or duration times will remain in effect until the change in the Construction Schedule is settled or until the logic and duration are superseded.
- 3.8 THREE WEEK LOOK-AHEAD SCHEDULE
- A. The Contractor shall provide the DEN Project Manager an electronic copy prior to and a minimum of four (4) hard copies of the Contractor's Three (3) Week Look-Ahead Schedule for review at the DEN Project Manager's weekly progress meeting.

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- B. The schedule shall be generated from Primavera P6 in time-scaled network diagram bar chart format based on the approved accepted CPM Baseline Project Schedule and shall include dates of activities in progress, work to be completed within the period, percent complete of activities, and responsible subcontractor for the activities, testing activities, and anticipated dates of inspection by DEN and other agencies.

### 3.9 AS-BUILT CONSTRUCTION SCHEDULE:

- A. After all Contract Work items are complete, the contractor shall submit an as-built Project Construction Schedule that reflects the actual sequence of construction activities, includes all change order scope of work changes and shows actual start and finish dates for all work items and milestones for acceptance by the DEN Project Manager.
- B. The basis for the As-built Construction schedule will be the approved Monthly Progress Schedules.

### 3.10 RECOVERY SCHEDULE

- A. When a monthly progress schedule update indicates the Work is behind the current approved schedule, submit a separate Recovery Schedule indicating means by which Contractor intends to regain compliance with the schedule.
- B. No additional costs will be allowed if such expediting measures are necessary to meet the agreed completion date or dates except as provided elsewhere in the Contract Documents.
- C. If the early finish date for any work item or the substantial completion date does not fall within the Contract Duration, the sequence of work or duration shall be revised by the Contractor through concurrent operations, additional manpower, additional shifts or overtime, additional equipment, or alternative construction methods until the schedule produced indicates that all significant contract completion dates, occupancy dates and milestone dates will be met.
- D. Provide a narrative indicating changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- E. The narrative shall be submitted in accordance with Article 1105 – Time Extensions in the General Contract Conditions, 2011 Edition.

### 3.11 REQUEST FOR TIME EXTENSION

- A. General:
1. Provide a justification of delay to the DEN Project Manager, in accordance with the Contract provisions and clauses, for approval within 10 days of a delay occurring.

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2. Prepare a time impact analysis for each DEN Change Directive, Change Notice and Contractor's Change Request to justify time extensions.
3. Added work by the City does not necessarily entitle Contractor to a Time Extension, unless the Contractor can prove that this new added scope impacts the current critical path without manipulating any of the logic and relationships in the most recent and approved schedule.
4. The City may reject any Time Extension Request that does not include a detailed and a clear time impact analysis that shows direct impact to the most current critical path along with a detailed productivity rate calculation to justify the requested time to execute such added work.
5. If the Contractor is granted an extension of time for completion of any milestone or contract completion date under the provisions of the Contract, the determination of the total number of extended days will be based upon the current analysis of the schedule and upon all data relevant to the extension. Such data shall be incorporated into the next monthly update of the schedule.
6. The Contractor acknowledges and agrees that delays in work items that, according to schedule analysis, do not affect any milestone dates or the Contract completion date shown on the CPM Network Schedule at the time of the delay will not be the basis for a Contract extension.

B. Justification of Delay

1. Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify the schedule activities impacted.
2. Show that the event that caused the delay/impact was the responsibility of the City.
3. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion dates.
4. Multiple impacts shall be evaluated chronologically; each with its own justification of delay. With multiple impacts, consider concurrency of delay.
5. A time extension and the schedule fragment become part of the project schedule and future schedule updates upon approval by DEN Project Controls.

C. Time Impact Analysis (Prospective Analysis)

1. Prepare a time impact analysis for City approval based on industry standard AACE 52R-06. Use a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis.
2. If DEN Project Controls determines the time frame between the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis.
3. Unless approved by the DEN Project Controls, no other changes will be incorporated into the schedule being used to justify the time impact.

D. Fragmentary Network (FragNet)

1. Prepare a proposed fragment for time impact analysis. The proposed fragment shall sequence new activities into the project schedule to demonstrate the influence of the delay or impact to the project's contractual dates.
2. Clearly show how the proposed fragment shall be tied into the project schedule, including the predecessors and successors to the fragment activities.

3. Obtain City approval of the proposed fragment before incorporating it into the project schedule.

E. Time Extension

1. Time extensions will not be granted until after the City has approved the Justification of Delay, including the time impact analysis.
2. No time extension will be granted unless the delay consumes the available Project Float and extends the projected finish date ("Substantial Completion" milestone) beyond the Contract Duration.
3. The time extension will be in calendar days.
4. Actual delays that the City determines are caused by the Contractor's own actions and result in a calculated schedule delay will not be a cause for an extension to the performance period, completion date, or interim milestone date.

F. Impact to Early Completion Schedule

1. No extended overhead will be paid for delay prior to the original Contract Substantial Completion date.

### 3.12 FAILURE TO ACHIEVE PROGRESS

A. General:

1. If the progress falls behind the approved baseline project schedule for reasons other than those that are excusable within the terms of the Contract, the City may require submittal of a written recovery plan for approval.
2. The plan shall detail how progress shall be recovered, including which activities will be accelerated by adding additional crews, longer work hours, extra work days, etc.

B. Artificially Improving Progress

1. Artificially improving progress by means such as, but not limited to, revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited.
2. Indicate assumptions made and the basis for logic, constraint, duration, and calendar changes used in the creation of the recovery plan.
3. Additional resources, manpower, and daily and weekly work hour changes proposed shall be evident at the work site and documented in the daily report along with the Schedule Narrative Report.

C. Failure to Perform

1. Failure to perform work and maintain progress in accordance with the supplemental recovery plan may result in an interim and final unsatisfactory performance rating and/or may result in Non-Conformance Report for corrective action directed by DEN Project Controls pursuant to other Contract provisions.

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**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 013210**

## SECTION 013223.11 – CONSTRUCTION LAYOUT AND AS-BUILT SURVEYS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section covers Denver International Airport (DEN) procedures and accuracy requirements for survey services for construction layout, and as-built.
- B. Before commencing any field surveys on DEN property, the Contractor must coordinate a pre-survey preparation activities meeting. This meeting is to be arranged through the DEN Project Manager's Office with the attendance of the Contractor and the DEN Survey Section. The Contractor is responsible for obtaining DEN related survey guidance, Access to DEN survey network, Primary Control, projection parameters, and training materials from the DEN Survey at the pre-survey meeting and/or prior to beginning any survey work.
  - 1. Survey Project Checklist, provided as part of this Specification, must be reviewed at the pre-survey preparation activities meeting. (Refer to Article 1.11.)

#### 1.3 REFERENCE DOCUMENTS:

- A. Section 013223.15 "Survey Information".
- B. Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples".
- C. Latest version of Federal Aviation Administration Advisory Circular 150/5300
- D. Latest Version of DEN BIM DSM (Design Standards Manual)
- E. Latest Version of Colorado Department of Transportation (CDOT) Survey Manual.
- F. Latest Version of Minimum Standard Detail Requirements for ALTA/ NSPS Land Title Survey

#### 1.4 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for the submittal process.



**B. Survey Statement of Work (SSOW):**

1. The Contractor must develop a complete SSOW and submit it to the DEN Project Manager. The SSOW is the Contractor's written description of the Contractor's methodology for surveying services that must be provided as part of the Project, including specific features that must be surveyed, action items, timelines necessary airport resources and general information.
2. SSOW must be submitted by the Contractor prior to commencement of any survey or layout work on the site.
3. The SSOW will be accepted by the DEN Project Manager.
4. Under no circumstances must the Contractor begin work until the SSOW has been accepted.

**C. Survey and Quality Control Plan (SQCP):**

1. The Contractor must develop a complete SQCP and submit it to the DEN Project Manager. The SQCP is the Contractor's written description detailing the Contractor's methodologies for data collection, data safeguarding and quality assurance. Provide insight on how the Contractor must completely check all data to ensure it is complete, reliable, and accurate. Identify data safeguards used to protect the sensitive and safety critical data. Utilize a checklist based quality control process with definable and repeatable standards for each element ensuring consistency of work between different personnel within an organization. Submit the plan in a non-editable PDF.
2. SQCP must be submitted by the Contractor prior to commencement of any survey or layout work on the site.
3. The SQCP will be accepted by the DEN Project Manager.
4. Under no circumstances must the Contractor begin work until the SQCP has been accepted.

**D. Weekly Project Status Report:**

1. Contractor must submit a project status report in compliance with FAA AC 150/5300-18B to the DEN Project Manager every Monday by 2:00 P.M. Mountain Time, from the date of the task order until the date of Substantial Completion
2. The Weekly Project Status Report must use format from AC 150/5300-18B

**E. Final Project Survey Report:**

1. The Final Project Survey Report, must use format from AC 150/5300-18B
2. Final Project Survey Report must be stamped and wet signed by a current Colorado Registered Professional Land Surveyor.

**F. SURVEY DELIVERABLES:**

1. Contractor must submit all of the following deliverables.
2. All raw files: GPS and Levels that is compatible with Trimble Business Center.
3. If combining x, y from GPS and z from Levels, provide field notes and data that shows where this data came from to verify values. The GPS point numbers must match to the Level descriptions.

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4. As-built or as-constructed survey submittals must need to be in both Portable Document Format (PDF) and in AutoCAD Civil 3D. Refer to current and criteria document for direction on PDF production.
5. All copies of original pages of field notes or electronic field notes must be in (PDF).
6. Scanned copies of all original field notebooks used for this Project must be submitted at the end of Contract.
7. All as-built points files must be in either CSV or TXT format.
8. All CAD drawings must be in current approved Autodesk Civil 3D format.
  - a. CAD layers are specified in DEN BIM Design Standards Manual
  - b. DEN must provide the Autodesk Civil 3D drawing template.
9. The as-built survey must follow the most recent Minimum Standard Detail Requirements for ALTA/ NSPS Land Title Survey for all sections, as far as they are applicable to the scope of work for the project and site in question.
10. Documentation in accordance with "Table A, Optional Survey Responsibilities and Specifications" (Refer to Article 1.11.) is filled out with the required content to be submitted.
11. Hard copy of all documentation stamped and wet signature by licensed PLS responsible for the work.

#### 1.5 QUALITY REQUIREMENTS

- A. Contractor – Company contracted to perform survey work under the direct supervision of a Colorado Registered Professional Land Surveyor with current FAA "Idle Certification"
- B. Subsurface Utilities Engineering (SUE): Refer to Section 011810 "Utilities Interface" for information related to underground utilities.
- C. Surveying accuracies and tolerances in control surveys, construction layouts: See CDOT Survey Manual for acceptable tolerances.

#### 1.6 DEN SITE SURVEY REQUIREMENTS

- A. A site survey, construction survey, or construction as-built survey providing horizontal location and level information of surface features and both above and below ground services and utilities must be completed. This must also be annotated with information (where applicable) relating to the size, direction of and material type.
  1. When collecting utilities, Contractor must be responsible to have all exposed and installed utilities surveyed prior to being covered. If Contractor fails to survey utilities, DEN Project Manager can have the Contractor uncover the utilities so they can be surveyed.
  2. Any temporary works that remain at the completion of the project must also be surveyed.

3. FAA and DEN Survey codes must be provided by The DEN Project Manager via DEN Survey or Designee and must be used throughout the project by Contractor for as surveyed features.
4. The most current DEN Civil 3D template must be provided by The DEN Project Manager via the DEN BIM team. All DEN BIM requirements must be met.

## 1.7 DEN ALIGNMENT MONUMENTATION

- A. Alignment monuments must be set at their corresponding coordinates as shown on the monumentation sheet of the Alignment Plans. When monumenting the Alignment, the Contractor must verify that the latest set of Alignment plans are being used. After the Alignment monument locations are staked in the field, any necessary utility locates should be called for prior to setting the monument.
- B. All Alignment monuments set must be established within the Minimum Horizontal Accuracy Tolerance as required in this chapter for a CDOT Class B – Secondary survey.
- C. Alignment monuments must be set at the locations as shown on the Alignment Plans, which include the following locations:
  1. 1. All angle points or changes of directions.
  2. 2. At the beginning and ending of curves.
  3. 3. At the points of change of direction or changes of radius of any boundary defined by circular arcs.
  4. 4. Not to exceed 1400 feet apart along any straight boundary line.
  5. 5. Any other points as approved by the Survey Coordinator due to field conditions encountered during setting of the Alignment monumentation.
- D. Alignment monuments must have a witness post installed within 2 ft and facing the monument, or as accepted by DEN Survey. For setting easement monuments, the witness post requirement may be waived by DEN Survey.
- E. Use Orange Carsonite witness post:
- F. All Alignment monument caps set in the field must be stamped with the following:
  1. 1. DEN Project Code number
  2. 2. Point number as shown on the Right of Way Plans
  3. 3. Colorado PLS number setting the monument
- G. All Alignment monuments set in the field must be shown on the Final set of Alignment Plans in accordance with the CDOT Right of Way Manual, Chapter 2 – ROW Plans. The Colorado PLS who is in responsible charge for setting the Alignment monuments must stamp her/his number on the monument cap, and must certify on the Alignment Plans to setting of the Alignment monuments in the field.

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- H. The Contractor in responsible charge of the Alignment Plans and the Contractor in responsible charge of setting the Alignment monuments in the field might not be the same individual. Therefore, care must be taken to ensure any monuments set in the field at locations different than that shown on the Alignment Plans are communicated to the Alignment plans section, and the final Alignment Plans are corrected to show these new monument locations and descriptions prior to submitting the plans to DEN Survey.
- I. Alignment monuments, witness posts, and monument box materials must be furnished by Contractor.

## 1.8 FEATURES TO BE RECORDED

- A. Surface and Above Ground Features: The survey of surface features must include, but is not limited to:
1. Structures and Surfaces – paths, driveways, retaining walls, slabs/paved areas, significant structural footings (plinths etc.), poles/ floodlighting.
  2. Drainage Structures – headwalls, open drains, grated drains, culverts.
  3. Roads – edge of pavement, curbs, shoulders, line-marking, bridges, road furniture (NOTE – the top back and bottom face of curb, and all water channels must be surveyed and recorded).
  4. Buildings – footprints, awnings, overhangs, columns, external fixtures (stairs, ramps, plant, etc.).
  5. Fences and Gates – AOA, security, general fencing, gates and handrails.
  6. Aircraft Pavements and Movement Area Structures – finished surfaces, pavement markings, airfield markers/signage/ navigational aids, PLB and other aeronautical infrastructure;
  7. Topographical Features – general topography, embankments, earthworks platforms and surcharge.
  8. Vegetation – gardens, significant trees (>0.2' trunk diameter, decorative shrubs), vegetation stands, riparian zones.
  9. Signage – road, airfield, parking, advertising, other general signage.
  10. Survey Marks – survey control points used, any settlement plates/ monitoring points placed during works.
  11. Airfield panel corner elevations must be derived from digital levels.
- B. Services and Utilities - Prior to any backfilling or covering, information on all underground services must be obtained and documented according to DEN's modified ASCE-SUE Standards, including but not limited to:
1. Electrical (LV and HV) – top of conduit every fifty feet including horizontal and vertical bends, cables and conduits, pits/ manholes and chambers, HV cable joints, earth points and earth mats, substations/ transformers and surrounding pad, pillars, cabinets and switchboards, top of conduits.
  2. Fuel Control – top of conduit every fifty feet including horizontal and vertical bends, cables and conduits, pits/ manholes and chambers, cabinets, emergency shut-off points.

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3. Communications - top of conduit every fifty feet including horizontal and vertical bends, fiber optic, microducts, comms cables and conduits, pits/ manholes and chambers, top of conduit casing/housing.
  4. Drainage – top of pipes at fifty-foot intervals and at every vertical and horizontal bend, inspection openings, pits/ manholes and chambers, roof water drainage (downpipes, small pits/ grates).
  5. Fuel – top of pipes every fifty feet including horizontal and vertical bends, all weld points with weld numbers documented in the point description and in the field notes, pits/ manholes and chambers, valves, hydrants, earth points, test points.
  6. Sewer (note whether gravity or force main) – top of pipes every fifty feet including horizontal and vertical bends, pipes, pipe inverts, pipe outflows, inspection openings, pits/ manholes and chambers, vent pipes, pump stations and associated components.
  7. Water (differentiate between potable and recycled) – top of pipes every fifty feet including horizontal and vertical bends, pits/ manholes and chambers, valves (and type), meters, taps, hydrants, tanks, pumps, irrigation control.
  8. Compressed Air – top of pipes every fifty feet including horizontal and vertical bends, hoses and other fixtures.
  9. Natural Gas / Petroleum– top of pipes every fifty feet including horizontal and vertical bends, valves, tanks, meters.
- C. Sufficient points must be recorded to ensure that the extremities of all surface features, structures and footings are clearly defined and all bends, intersections, and changes of gradient are accurately recorded. The distance between points of location should generally be about 50 feet and must not exceed 100 feet. All curves must be accurately defined using a minimum of three points (two tangent points and one midpoint).
- D. Where actual positions of linear features deviate from a straight line, sufficient additional points of location must be provided to define the deviation – horizontal and/or vertical change in directions.
- E. For systems, utilities, and features not identified herein, refer to PM for direction on capture requirements
- 1.9 SURVEY METHODOLOGY – SERVICES AND UNDERGROUND FEATURES
- A. Sufficient points must be recorded to ensure that the extremities of all pits, manholes, and any other features related to the service are clearly defined and all bends, joints, intersections, changes of gradient, and fittings on or along the service, pipe or conduit are accurately recorded. All curves must be accurately defined using a minimum of three points (two tangent points and one midpoint). Where actual positions of linear features deviate from a straight line, sufficient additional points of location must be provided to define the deviation – horizontal and/or vertical change of directions.
  - B. The maximum distance between points of location along services must not exceed 50 feet. Horizontal and vertical locations must be surveyed on the top of the utility and must be labeled as “top”. Inverts measurements must also be taken in manholes and must be labeled.

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- C. The Contractor must record and annotate all services and utilities with information relating to the size, direction of and material type. The Contractor must record and clearly differentiate between the communication service providers and DEN and/or FAA communications infrastructure.
- D. The Contractor must record the size and orientation of all grates, pits and manholes. Grates and pits must be recorded using a minimum of three corner or edge points. Pit/manhole chambers only need to be located and where the extents of the chamber extend past the extremities of the pit at surface level. In all instances, any thrust blocks or concrete cover/ protection over services must be located, showing depth.

**1.10 EXISTING FEATURES AND SERVICES**

- A. Existing Services: where the existence of services and other features on the site of the Work and the Work exposes or interacts with these existing services, the Contractor must locate and record the details of all such features and services.
- B. Tunnel Boring: The Contractor must provide records (logs, profiles etc.) relating to all tunnel boring undertaken as part of the Project. Where appropriate this information must be incorporated into the as-built site survey. Where the contract drawings do not show the existence of certain utilities and features and the Work exposes or interacts with the utilities and features, these must be located and recorded by the Contractor.
- C. Services Alteration/ Abandonment / Demolition: Where existing infrastructure, building services and/or utilities are demolished or services realigned or abandoned this information must be reflected within the as-built site survey. A distinction must be made between services (or part services) which have been abandoned (but left in the ground) and those that have been physically removed.

**1.11 SURVEY CHECK LIST**

	Yes	No	N/A	Project Kickoff Phase
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did Contractor meet with DEN PM obtain the data standards and general requirements for data gathering?
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did Contractor meet with Airport Survey Office to obtain airport survey control points, projection parameters, and airport survey training materials?
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did Contractor provide Survey Statement of Work to DEN PM?
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did Contractor provide Geodetic Verification Survey to DEN PM?
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did Contractor provide Survey Control Plan to DEN PM?
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did Contractor provide Imagery Plan to DEN PM? (Only required if collecting aerial imagery)?
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the FAA accept survey plans?
	Yes	No	N/A	Construction Phase (As-Built)
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did Contractor perform field survey of project site to collect accurate as-built data?



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9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Contractor provide DEN PM with subsurface utility data?
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Each week, did the Contractor provide DEN PM with Project Status Reports?
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Contractor provide DEN PM with 25% as-built data in both CADD and GIS formats including all attribute information and metadata?
12a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did DEN PM report 25% QA findings via email to Contractor?
12b	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If required, did the Contractor provide DEN PM with 50% as-built data in both CADD and GIS formats including all attribute information and metadata?
12c	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If applicable, did DEN PM report 50% QA findings via email to Contractor?
12d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If required, did the Contractor provide the DEN PM with 75% as-built data in both CADD and GIS formats including all attribute information and metadata?
12e	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If applicable, did DEN PM report 75% QA findings via email to Contractor?
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Contractor provide DEN PM with 100% as-built data in both CADD and GIS formats including all attribute information and metadata?
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did Contractor provide DEN PM with a completed Final Survey Report?
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did DEN PM report QA findings via email to Contractor?

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION****3.1 CONSTRUCTION LINES AND GRADES**

- A. The Contractor must make surveys and layouts as necessary to delineate the Work. The Contractor must make the surveys for the proper performance of the Work. As a part of such surveys, the Contractor must furnish, establish, and maintain in good order survey control points that may be required for the completion of the Work subject to the approval of the DEN Project Manager as to their location, sufficiency and adequacy. However, such approval by the DEN Project Manager must not relieve the Contractor of responsibility for the accuracy of the Contractor's survey work.
- B. The DEN Project Manager must have the right to check surveys and layouts made by the Contractor prior to approving any of the Work. The Contractor must give advance notice of not less than forty-eight (48) hours to the DEN Project Manager to enable such checking prior to placing any work. The Contractor must furnish assistance as may be required for checking purposes when so requested by the DEN Project Manager.

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- C. The Contractor must furnish skilled labor, instrument platforms, ladders and such other temporary structures as may be necessary for making and maintaining points and lines in connection with the surveys required.
- D. The DEN Project Manager may draw the Contractor's attention to errors or omissions in lines or grades, but the failure to point out such errors or omissions must not give the Contractor any right or claim nor must in any way relieve the Contractor of obligations according to the terms of this Contract.
- E. The Contractor's instruments and other survey equipment must have current certification from manufacturer's representative Surveys must be performed under the direct supervision of a current Colorado Registered Licensed Land Contractor.
- F. Field Notes:
1. The Contractor must record surveys in field notebooks or as electronic field notes, whichever is more appropriate to the type of survey work.
  2. If the DEN Project Manager finds errors in the field notes DEN must have the Contractor correct and resubmit the notes. This review does not relieve the Contractor from the responsibility of maintaining accurate survey data. Whichever method of note-taking the Contractor starts with, the Contractor must use the same method throughout the Contract duration.
- G. The DEN Project Manager may at any time use line and grade points and markers established by the Contractor. The Contractor's surveys are a part of the Work and may be checked by the DEN Project Manager or the DEN Project Manager's representatives at any time.

**PART 4 - MEASUREMENT**

## 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

## 5.1 METHOD OF PAYMENT

- A. No separate payment must be made for work under this Section. The cost of the work described in this Section must be included in the applicable contract value, work order or lump sum bid item.

**END OF SECTION 013223.11**



## SECTION 013223.15 – SURVEY INFORMATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section covers Denver International Airport (DEN) procedures and accuracy requirements for survey control.
- B. Before commencing any field surveys on DEN property, the Contractor must coordinate a pre-survey preparation activities meeting. This meeting is to be arranged through the DEN Project Manager's Office with the attendance of the Contractor and the DEN Survey Section. The Contractor is responsible for obtaining DEN related survey guidance, Access to DEN survey network, Primary Control, projection parameters, and training materials from the DEN Survey at the pre-survey meeting and/or prior to beginning any survey work.
- C. Survey Project Checklist, provided after the end of this Section, will be reviewed at the pre-survey preparation activities meeting.

#### 1.3 REFERENCE DOCUMENTS:

- A. Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples".
- B. Latest version of Federal Aviation Administration Advisory Circular 150/5300
- C. Latest Version of DEN BIM DSM (Design Standards Manual)
- D. Latest Version of Colorado Department of Transportation (CDOT) Survey Manual.
- E. Latest Version of Minimum Standard Detail Requirements for ALTA/ NSPS Land Title Survey

#### 1.4 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for the submittal process.
- B. Survey Statement of Work (SSOW):

1. The Contractor must develop a complete SSOW in accordance with Specification Section 013223.11, "Construction Layout and As-Built Surveys".

C. Survey and Quality Control Plan (SQCP):

1. The Contractor must develop a complete SQCP in accordance with Specification Section 013223.11, "Construction Layout and As- Built Surveys".

## 1.5 QUALITY REQUIREMENTS

A. Equipment Calibration:

1. Equipment must be regularly checked, and calibrated for accuracy at the beginning of any survey project to ensure that the equipment is operating appropriately. Errors due to poorly maintained or malfunctioning equipment will not be accepted. If any equipment errors are found to exist they must be reported to the DEN Survey prior to the start of any surveying. These errors must be verified and eliminated prior to performing any survey work. For projects lasting longer than six (6) months, the checking, and calibration of equipment must be repeated. Furthermore, documentation must verify such equipment has met acceptable tolerances.
2. The Contractor must submit to the DEN Project Manager written proof that survey equipment has been checked and calibrated before commencing any survey work. If repairs are made, documentation of such repairs from an authorized equipment vendor must be submitted.

B. See CDOT Survey Manual for acceptable procedures for calibrating equipment electronic survey instruments adjustments, calibration, or repairs:

1. All electronic survey instruments must be repaired, adjusted, or calibrated only by an authorized equipment vendor or manufacturers service department.
2. A calibration check on all types of electronic survey instrumentation is essential to obtain and maintain the tolerances required for any DEN project. At the beginning of any DEN project, all survey equipment utilized to perform the survey must be calibrated by the surveyor in charge of the Project.
3. See CDOT Survey Manual for acceptable procedures for calibrating equipment.

C. Baseline Calibration Requirements:

1. See CDOT Survey Manual for the procedures to check the survey equipment and the method of reporting the findings to the DEN Project Manager and the DEN Survey Section.
2. The Contractor must submit to the DEN Project Manager written proof that survey equipment has been checked and calibrated before commencing any survey work. If repairs are made, documentation of such repairs from an authorized equipment vendor must be submitted.

## 1.6 SURVEY CONTROL

- A. DEN utilizes its own local coordinate system that is tied to the National Spatial Reference System (NSRS). The DEN Survey Section will provide the data required to use this coordinate system during the mandatory pre-survey preparation activities meeting. The DEN Survey Section will also provide coordinates for all Primary Control Points based upon the location of the Project.
- B. The coordinates of the Primary Airport Control Station (PACS) and Secondary Airport Control Station (SACS) were correct at the time of installation (or subsequent date listed on the plan) but may be subject to the effects of subsequent subsidence and/ or disturbance. Marks with any noticeable signs of disturbance, damage, or location out of tolerance must be reported so that they can be repaired and/ or noted on the control plan. In addition, any marks that have been or will be destroyed either before or during Works must be noted and mentioned in the Survey Statement of Work and the Survey and Quality Control Plan. If removed or destroyed, the Contractor will create a plan and must replace the PACS or SACS.
- C. DEN is based on the North American Vertical Datum of 1988 (NAVD 1988). Vertical Control and Bench Marks must be tied into this datum. DEN has existing established National Geodetic Survey (NGS) vertical stations around its property and these points must be used in all DEN projects. Project control points must be established by performing measurements with a digital level from at least two NGS vertical stations that are given by the DEN Survey Section. The benchmarks used to establish ties to the datum must be shown in the Contractor's notes and on the CSP.
- D. The Contractor will be provided survey control from the DEN Survey Section. If the nearest NGS Vertical Station is a considerable distance from the site, the Contractor may establish a Temporary Survey Control Point (TSCP) near the site. Appropriate survey procedures must be used to establish any additional TSCP. A minimum of 3 TSM must be established for the project. Each must be visible and tied to at least 2 separate TSCP or PACS and/or SACS. It is the Contractor's responsibility to verify the stability of the mark over the life of the project. Where unacceptable discrepancies in control marks due to land settlement, disturbance or from other factors are apparent, the Contractor must refer the matter to DEN Project Manager for resolution prior to the continuation of Work.
- E. Horizontal Control is based on a local coordinate system. The Contractor must establish reliable horizontal control that will last the duration of the Project. Where unacceptable discrepancies in control marks due to land settlement, disturbance or from other factors are apparent, the Contractor must refer the matter to DEN Project Manager for resolution prior to the commencement of Work. The horizontal control establishing ties to the datum must be shown in the Contractor's notes and on the CSP.
- F. Geodetic Verification Survey Instructions and Procedures:

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1. The geodetic verification survey is created to insure the stable position of the DEN Primary control points that are used to reference the TSCP to the NSRS. Acceptable monuments will be identified by the DEN Survey Section and will be limited to monuments of the NSRS with permanent identifiers (PIDS) and published positions and elevations. Temporary design/construction control points established for such project will be referenced by direct measurement to at least two (2) separate NGS control stations.
  - a. The Contractor must recover each identified monument and determine its condition, stability, and suitability for the intended use. A location sketch and visibility diagram will be prepared for each station. A minimum of three (3) digital photographs, one of each type described in AC 150/5300-18B, Section 1.5.2.1, will be captured, captioned, and properly named. A recovery note will be filed with NGS if no current recovery is shown in the NSRS database.
  - b. After recovering the identified NSRS NGS control stations that are located on DEN property, the procedure to verify the control points are as follows:
    - 1) DEN has created its own Virtual Reference System (VRS) Network that will be used on all survey projects. This network will be known as DENVRS.
      - a) This system is comprised of hardware and software designed to facilitate real-time GPS/GNSS positioning based on a set of reference stations.
      - b) DEN has created a control network that incorporates fifteen (15) Primary Control Points tied together with the reference stations for the DENVRS,
      - c) This network, in turn, is tied to the National Spatial Reference System (NSRS).
      - d) DEN will be monitoring the stations on an annual basis and the primary control points on an annual basis and the primary control points on a quarterly basis.
    - 2) The Consultant is required to validate the DENVRS by observing at least two (2) Primary control points using a Fast Static method
      - a) Fast Static surveys allow for systematic errors to be resolved when high accuracy positions are required by collecting simultaneous data between stationary receivers for a shorter period of time than that of Static surveys. DEN will require an observation time of (15) minutes on all Primary control points. Each baseline between adjacent intervisible control points must be observed at least twice.
    - 3) The results must be reviewed and approved by the DEN Survey Office, allowing at least seventy-two (72) hours to review and either approve or reject the temporary control. All temporary control points **MUST BE** accepted before any design survey work can commence.

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- 4) Obtain elevation checks either from GPS observations or from digital levels. The distances must agree within, plus or minus, three ( $\pm 3$ ) cm; the difference in ellipsoidal height must agree within, plus or minus, four ( $\pm 4$ ) cm, and the difference in orthometric height must agree within, plus or minus, five ( $\pm 5$ ) cm. If the tolerances are not met the data must be recollected.
- 5) Provide the results or the comparisons as part of the observational data in a report to the DEN Project Manager to be reviewed and approved by the DEN Survey Section prior to the start of construction and include this approved report in the final report.
- 6) Submit a Recover Observe Report for the NGS horizontal control stations to the NGS. Refer to <https://www.ngs.noaa.gov/GPSonBM/Report.shtml> for the report format.

G. Limitations and Additional Information for NGS Control Stations and NGS Benchmarks:

1. The use of control monuments and projection parameters for construction layout other than those shown on the Contract Drawings or furnished by or approved by the DEN Survey Section is STRICTLY PROHIBITED. Use of other monuments is solely at the risk of the Contractor.
2. The DEN Survey Section will provide the Contractor with the projection parameters and any assistance in implementing the coordinate system. It is up to the Contractor to use the correct methodology in performing any survey task which must be submitted to the DEN Project Manager and reviewed during the pre-survey preparation activities meeting.
3. The DEN Project Manager will need all pertinent data from the Contractor to check and verify that the Contractor implemented the coordinate system correctly.

H. Modifications to AC 150/5300-18B, Section 2.6.10.1.1, Verification of Survey Marks:

1. DEN requires Contractor to verify the unmoved position and elevation of both the PACS and SACS for any airside projects and any two (2) DEN approved NGS control stations for any landside project.
2. The Contractor must follow the same verification procedure as stated in Section G above.

I. Reporting Damage or Errors of NGS Control Stations:

1. Report damaged or destroyed airport control points, bench marks, and section corner monuments promptly to the DEN Project Manager.
  - a. If section corner monuments are damaged or destroyed during construction activities, such points must be re-established pursuant to Laws of the State of Colorado Regulating the Practice of Land Surveying by a current Registered Professional Land Contractor in the State of Colorado.
  - b. If NGS control stations or NGS bench marks are damaged, moved, altered, or destroyed by the Contractor, DEN's cost of reestablishing such points must be borne by the Contractor.

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- c. DEN will not be responsible for any increased costs or delays to the Contractor relating to reference points, airport control points, or bench marks which are damaged, moved, altered, or destroyed by the Contractor or its, suppliers, agents or employees or other Contractors working on the site.
2. Report alleged errors in NGS control stations or NGS bench marks promptly to the DEN Project Manager.
    - a. Discontinue use of NGS control stations or NGS bench marks alleged to be in error until the accuracy of points can be verified or as directed.
    - b. Claims for extra compensation for alteration or reconstruction allegedly due to errors in NGS control stations or NGS benchmarks will not be allowed unless original NGS control stations and NGS bench marks still exist or substantiating evidence proving error is furnished by the Contractor, and unless the Contractor has reported such errors to the DEN Project Manager as specified herein.

#### 1.7 TEMPORARY SURVEY CONTROL

- A. The Contractor MUST set a minimum of either 'chiseled X' in concrete; a drill hole with lead and tack in concrete; a PK nail with shiner in asphalt or concrete or a 5/8" rebar with plastic cap in natural ground. An 'Inked X' set as a control point is UNACCEPTABLE.
- B. When a Contractor establishes TSCP for DEN survey work the Contractor MUST follow FAA guidelines. All TSCP must be referenced to the National Spatial Reference System (NSRS) using the NGS control stations provided by the DEN Survey Section. Temporary control may be necessary based on project site location. Below are the acceptable means to establish temporary geodetic control for DEN design or construction projects:
  1. Temporary control must be established under close cooperation with the DEN Survey Section following the procedures outlined in AC150/5300-16 "General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to National Geodetic Survey" only in the following cases:
    - a. Large airport construction projects that significantly changes the airport geometry and would trigger the need to acquire new Digital Stereo Imagery following AC 150/5300-17 "General Guidance and Specification for Aeronautical Survey Airport Imagery Acquisition and Submission to the National Geodetic Survey". Examples include a new runway and taxiway complex, significant modification of existing runway or taxiway system, development of new outboard deice pad complex or establishment of new mid airfield concourse and terminal complex. The size and complexity of the Project will dictate the need to acquire new digital stereo imagery for significant construction.
    - b. Construction that establishes a new ILS CAT II/III Operations.
    - c. New Instrument Development Procedure.



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- d. New Airport Layout Plan Survey Update.
  - e. New Airport Obstruction Chart Update.
  - f. New Airport Mapping Database.
2. On DEN projects, the Contractor, may use TSCPs on their project site. These TSCP must be referenced to the nearest two (2) DEN primary control points and MUST BE referenced vertically to two (2) different NGS benchmarks. Also, all Contractors MUST obtain permission to establish TSCPs on DEN property by means of communicating with the DEN Survey Section.
  3. In addition, all vertical control MUST BE established only using a digital level unless otherwise authorized by the DEN Survey Section.
  4. Minimum Construction Horizontal and Vertical Accuracy Tolerance:
    - a. Adjustments:
      - 1) No adjustment of the survey field data will be permitted without the written consent of the DEN Project Manager. If it is determined that an adjustment is necessary, a weighted least squares adjustment method is recommended.
    - b. Primary NGS vertical stations values must be held unless the Contractor has determined that there is an issue with one of the values. If this is the case, the Contractor must notify the DEN Project Manager to determine which other Primary stations can be used.
    - c. Secondary Control Project Benchmark Minimum Vertical Accuracy Tolerance:
      - 1) Setting of secondary control benchmarks must meet the Minimum Vertical Accuracy Tolerance of the square root of the total horizontal distance of the level loop in miles multiplied by 0.035 feet.
      - 2) The results of this evaluation must be recorded in the field book for each differential level loop. At least two (2) established NGS benchmarks on the same datum must be used to verify that the starting mark has not been disturbed. If.
  5. Whether establishing TSCPs or not, the Contractor must set up a Pre-Survey Preparation Activity meeting with the DEN Project Manager to discuss Geodetic Control Verification, obtain pertinent survey data, and projection parameters before the commencement of any survey work.
  6. If TSCPs are needed, the Contractor can set and collect temporary control while performing as outlined in Part 1 of this Section. Once the data is collected the Contractor is required to submit all pertinent data to the DEN Project Manager. This data must include all GPS raw data in a Trimble format with an Excel spreadsheet that displays the comparison from each observation of the NGS control stations. The comparison must include showing the delta northings, delta eastings, and delta elevations for each redundant pair of control points Contractor Only the redundant values of the TSCPs should be averaged. The results must be reviewed and accepted by the DEN Project Manager, allowing at least seventy-two (72) hours to review and either approve or reject the temporary control. All TSCPs MUST BE approved before any survey work can commence.

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**PART 2 - Products (Not Used)**

**PART 3 - Execution (Not Used)**

**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 013223.15**



## SECTION 013223.19 QUANTITY SURVEYS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section covers Denver International Airport DEN procedures and accuracy requirements for survey services for construction layout, as-built and quantity surveys.
- B. Before commencing any field surveys on DEN property, the Contractor must coordinate a pre-survey preparation activities meeting. This meeting is to be arranged through the DEN Project Manager's Office with the attendance of the Contractor, the Contractor's surveyor, and the DEN Survey Section. The Contractor is responsible for obtaining DEN related survey guidance, primary control stations, projection parameters and training materials from the DEN Survey Section prior to beginning any survey work.
- C. Reference Contract General Conditions.

#### 1.3 REFERENCE DOCUMENTS:

- A. Section 013326 "Survey Control".
- B. Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples".
- C. Latest version of Federal Aviation Administration Advisory Circular 150/5300
- D. Latest Version of DEN BIM DSM (Design Standards Manual)
- E. Latest Version of Colorado Department of Transportation (CDOT) Survey Manual.
- F. Latest Version of Minimum Standard Detail Requirements for ALTA/ NSPS Land Title Survey

#### 1.4 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for the submittal process.
- B. Weekly Project Status Report:

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1. Contractor must submit a project status report in compliance with FAA AC 150/5300-18B to the DEN Project Manager every Monday by 2:00 P.M. Mountain Time, from the date of the task order until the date of Substantial Completion
2. The Weekly Project Status Report must use format from AC 150/5300-18B

C. Final Project Survey Report:

1. The Final Project Survey Report, must use format from AC 150/5300-18B
2. Final Project Survey Report must be stamped and wet signed by a current Colorado Registered Professional Land Surveyor.

1.5 QUALITY REQUIREMENTS

A. Equipment Calibration:

1. Equipment must be regularly checked, and calibrated for accuracy at the beginning of any survey project to ensure that the equipment is operating appropriately. Errors due to poorly maintained or malfunctioning equipment will not be accepted. If any equipment errors are found to exist they must be reported to the DEN Survey prior to the start of any surveying. These errors must be verified and eliminated prior to performing any survey work. For projects lasting longer than six (6) months, the checking, and calibration of equipment must be repeated. Furthermore, documentation must verify such equipment has met acceptable tolerances.
2. The Contractor must submit to the DEN Project Manager written proof that survey equipment has been checked and calibrated before commencing any survey work. If repairs are made, documentation of such repairs from an authorized equipment vendor must be submitted.

B. See CDOT Survey Manual for acceptable procedures for calibrating equipment electronic survey instruments adjustments, calibration, or repairs:

1. All electronic survey instruments must be repaired, adjusted, or calibrated only by an authorized equipment vendor or manufacturers service department.
2. A calibration check on all types of electronic survey instrumentation is essential to obtain and maintain the tolerances required for any DEN project. At the beginning of any DEN project, all survey equipment utilized to perform the survey must be calibrated by the surveyor in charge of the Project.
3. See CDOT Survey Manual for acceptable procedures for calibrating equipment.

C. Baseline Calibration Requirements:

1. See CDOT Survey Manual for the procedures to check the survey equipment and the method of reporting the findings to the DEN Project Manager and the DEN Survey Section.
2. The Contractor must submit to the DEN Project Manager written proof that survey equipment has been checked and calibrated before commencing any survey work. If repairs are made, documentation of such repairs from an authorized equipment vendor must be submitted.

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION****3.1 QUANTITY SURVEYS FOR PAYMENT**

- A. When the specifications or the DEN Project Manager require items in the Schedule of Prices and Quantities to be measured by surveying methods, the Contractor must perform the surveys.
- B. All such surveys, including control surveys run for establishing the measurement reference lines, must be performed in the presence of the DEN Project Manager or the DEN Project Manager's representative who will witness the surveying operation and who will acknowledge receipt of the field notes or keep duplicate field notes, at the DEN Project Manager's option.
- C. The Contractor must reduce the field notes and calculate final quantities for payment purposes. The note reductions and calculations must be given to the DEN Project Manager.

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement must be made for work under this Section.

**PART 5 - PAYMENT****5.1 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section must be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 013223.19**

## SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
  1. Preconstruction photographs.
  2. Periodic construction photographs.
  3. Final Completion construction photographs.
  4. Preconstruction video recordings.
  5. Periodic construction video recordings.
  6. Web-based construction photographic documentation.

#### 1.3 REFERENCE DOCUMENTS:

- A. Section 013300 "Submittal Procedures"
- B. Section 017720 "Contract Closeout"
- C. Section 017900 "Demonstration and Training"
- D. Section 024116 "Structure Demolition"
- E. Section 024119 "Selective Demolition"
- F. Section 311000 "Site Clearing"

#### 1.4 ALTERNATES

- A. Refer to Section 012300 "Alternates"

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For photographer and Web-based photographic documentation service provider.

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- B. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each [photograph] [video recording]. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
- C. Digital Photographs: Submit image files within three (3) days of taking photographs.
1. Digital Camera: Minimum sensor resolution of 10 megapixels.
  2. File Format: Minimum 1080 pixels, in unaltered .RAW original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
  3. Identification: Provide the following information with each image description in file metadata tag:
    - a. Project title and Project number.
    - b. Name and contact information for photographer.
    - c. Name of DEN Project Manager.
    - d. Name of Contractor.
    - e. Date photograph was taken.
    - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
      - 1) Include work order number or change order number if applicable.
    - g. Unique sequential identifier keyed to accompanying key plan.
    - h. Photograph number.
- D. Construction Photographs: Submit two (2) prints of each photographic view within seven (7) days of taking photographs.
1. Format: **8-by-10-inch** smooth-surface matte prints on single-weight, commercial-grade photographic paper; mounted on linen or card stock to allow a **1-inch**-wide margin and enclosed back to back in clear plastic sleeves that are punched for standard three-ring binder.
  2. Identification: On back of each print, provide an applied label or rubber-stamped impression with the following information:
    - a. Name of Project.
    - b. Name and contact information for photographer.
    - c. Name of DEN Project Manager.
    - d. Name of Contractor.
    - e. Date photograph was taken if not date stamped by camera.
    - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
    - g. Unique sequential identifier keyed to accompanying key plan.
- E. Video Recordings: Submit video recordings within seven (7) days of recording.

1. Submit video recordings in an electronic format acceptable to DEN Project Manager by posting to Web-based photographic documentation service provider's Web site. Recordings shall be high-resolution 1080p with a minimum framerate of 60Hz
2. Identification: With each submittal, provide the following information:
  - a. Name of Project.
  - b. Name and address of photographer.
  - c. Name of DEN Project Manager.
  - d. Name of Contractor.
  - e. Date video recording was recorded.
  - f. Description and key plan of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
  - g. Weather conditions at time of recording.

F. Web-Based Photographic Documentation: Submit time-lapse sequence video recordings within seven (7) days of recording.

1. Submit time-lapse sequence video recordings by posting to Web-based photographic documentation service provider's Web site.
2. Identification: For each recording, provide the following information:
  - a. Name of Project.
  - b. Name and contact information for photographer.
  - c. Name of DEN Project Manager.
  - d. Name of Contractor.
  - e. Date(s) and time(s) video recording was recorded.
  - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
  - g. Weather conditions at time of recording.

## 1.6 QUALITY ASSURANCE

- A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.
- B. Web-Based Photographic Documentation Service Provider: A firm specializing in providing photographic equipment, Web-based software, and related services for construction projects, with record of providing satisfactory services similar to those required for Project for not less than three years.

## 1.7 USAGE RIGHTS

- A. Obtain and transfer copyright usage rights from photographer to City and County of Denver for unlimited reproduction of photographic documentation.

## **PART 2 - PRODUCTS**

### 2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 10 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.
- B. Digital Video Recordings: Provide high-resolution 1080p with a minimum framerate of 60Hz in electronic format acceptable to DEN Project Manager.

### 2.2 WEB-BASED PHOTOGRAPHIC DOCUMENTATION

- A. Project Camera: Provide fixed exterior camera installation, mounted to provide unobstructed view of construction site from location approved by DEN Project Manager.
  - 1. Provide one fixed-location camera(s), with the following characteristics:
    - a. Static view with optical zoom of 500 percent minimum.
    - b. Provide power supply, active high-speed data connection to service provider's network, and static public IP address for each camera.
- B. Wireless Hand-Held Camera: Provide portable camera system capable of producing images complying with requirements in this Section, with wireless transmission to service provider's network enabling a live image stream viewable by multiple parties.
  - 1. Provide battery charger, spare battery pack, base station hub, and base station connections in a number and distribution adequate to enable wireless camera operation throughout Project site. Contractor responsible for ensuring camera stays in operation.
  - 2. Provide power supply, active high-speed data connection to service provider's network, and static public IP address at base station hub. Provide power supply, conduit, and data wiring between base station hub and base station connections.
- C. Web-Based Image Access: Password-protected access for Project team administered by Contractor, providing current image access and archival image access by date and time, with images downloadable to viewer's device.
  - 1. Provide public viewer open access to most recent project camera image.

## **PART 3 - EXECUTION**

### 3.1 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified photographer to take construction photographs.

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- B. General: Take photographs using the maximum range of depth of field, and that are in focus, to show clearly the Work. Photographs with blurry or out-of-focus areas will not be accepted.
1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software. Provide commercial quality, digital color photographs in PDF format. PDF file shall be security-free, bookmarked by date with all photos rotated to the correct orientation. Identify the following information on each photograph on the lower right corner.
1. Subject description (include work order number or change order number if applicable)
  2. Station point of camera and direction of view. Include letter size diagram of project indicating Station point
  3. Date and time each photo was taken
  4. Name of Contractor.
  5. Photograph number
  6. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to DEN Project Manager.
- D. Preconstruction Photographs: starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by DEN Project Manager.
1. Flag construction limits before taking construction photographs.
  2. Take at least 10 photographs to show existing conditions adjacent to property before starting the Work.
  3. Take at least 10 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
  4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
  5. Haul route, laydown yard, and other locations as directed by DEN Project Manager.
- E. Periodic Construction Photographs: Take at least 10 photographs monthly and submit with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- F. DEN Project Manager-Directed Construction Photographs: From time to time, DEN Project Manager will instruct photographer about number and frequency of photographs and general directions on vantage points. Select actual vantage points and take photographs to show the status of construction and progress since last photographs were taken.
- G. Time-Lapse Sequence Construction Photographs: Take 10 photographs as indicated, to show status of construction and progress since last photographs were taken.



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1. Frequency: Take photographs monthly with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment.
  2. Vantage Points: Following suggestions by DEN Project Manager and Contractor, photographer to select vantage points. During each of the following construction phases, take not less than two of the required shots from same vantage point each time to create a time-lapse sequence as follows:
    - a. Commencement of the Work, through completion of subgrade construction.
    - b. Above-grade structural framing.
    - c. Exterior building enclosure.
    - d. Interior Work, through date of Substantial Completion.
- H. Final Completion Construction Photographs: Take at least 10 color photographs after date of Substantial Completion for submission as project record documents. DEN Project Manager will inform photographer of desired vantage points.
1. Do not include date stamp.
- I. Additional Photographs: DEN Project Manager may request photographs in addition to periodic photographs specified. Additional photographs shall be paid for by Change Order and are not included in the Contract Sum.
1. Three days' notice shall be given, where feasible.
  2. In emergency situations, take additional photographs within 24 hours of request.
  3. Circumstances that could require additional photographs include, but are not limited to, the following:
    - a. Special events planned at Project site.
    - b. Immediate follow-up when on-site events result in construction damage or losses.
    - c. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
    - d. Substantial Completion of a major phase or component of the Work.
    - e. Extra record photographs at time of final acceptance.
    - f. DEN's request for special publicity photographs.
- 3.2 CONSTRUCTION VIDEO RECORDINGS
- A. Video Recording Photographer: Engage a qualified videographer to record construction video recordings.
- B. Recording: Mount camera on tripod before starting recording unless otherwise necessary to show area of construction. Display continuous running time and date. At start of each video recording, record weather conditions from local newspaper or television and the actual temperature reading at Project site.

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- C. Narration: Describe scenes on video recording by audio narration by microphone or dubbing audio narration off-site after video recording is recorded. Include description of items being viewed, recent events, and planned activities. At each change in location, describe vantage point, location, direction (by compass point), and elevation or story of construction.
1. Confirm date and time at beginning and end of recording.
  2. Begin each video recording with name of Project, Contractor's name, videographer's name, and Project location.
- D. Preconstruction Video Recording: Before starting construction, record video recording of Project site and surrounding properties from different vantage points, as directed by DEN Project Manager.
1. Flag construction limits before recording construction video recordings.
  2. Show existing conditions adjacent to Project site before starting the Work.
  3. Show existing buildings either on or adjoining Project site to accurately record physical conditions at the start of construction.
  4. Show protection efforts by Contractor.
- E. Periodic Construction Video Recordings: Record video recording monthly, coinciding with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last video recordings were recorded. Minimum recording time shall be ten (10) minutes.
- F. Time-Lapse Sequence Construction Video Recordings: Record video recording to show status of construction and progress.
1. Frequency: During each of the following construction phases, set up video recorder to automatically record one frame of video recording every five (5) minutes, from same vantage point each time, to create a time-lapse sequence of 30 minutes in length as follows:
    - a. Commencement of the Work, through completion of subgrade construction.
    - b. Above-grade structural framing.
    - c. Exterior building enclosure.
  2. Timer: Provide timer to automatically start and stop video recorder so recording occurs only during daylight construction work hours.
  3. Vantage Points: Following suggestions by DEN Project Manager and Contractor, photographer shall select vantage points.

### 3.3 WEB-BASED CONSTRUCTION PHOTOGRAPHIC DOCUMENTATION

- A. Live Streaming Construction Site Images: Provide Web-accessible image of current site image from fixed location camera(s), updated at 15 minute intervals during daytime operation.

- B. Time-Lapse Sequence Construction Site Recordings: Provide video recording from a fixed-location camera to show status of construction and progress.
1. Frequency: Record one frame of video recording every 15 minutes, from same vantage point each time, to create a time-lapse sequence of construction activities.
  2. Timer: Provide timer to automatically start and stop video recorder so recording occurs only during daylight construction work hours.
- C. Maintain cameras and Web-based access in good working order according to Web-based construction photographic documentation service provider's written instructions until Final Completion. Provide for service of cameras and related networking devices and software.

#### **PART 4 - MEASUREMENT**

##### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

#### **PART 5 - PAYMENT**

##### 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

#### **END OF SECTION 013233**

## SECTION 013300 - SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Work specified in this Section summarizes the requirements for the submittal of documents to the DEN Project Manager that are defined in these Specifications. It also describes the procedures for "supplemental" submittals.
- B. The Contractor must follow all the requirements of the procedures and the product details and keep all the submittals current and approved prior to any placement of work.

#### 1.3 SUBMITTAL SCHEDULE

- A. The Contractor shall provide a submittal schedule within 14 days after Notice to Proceed. The Submittal Schedule shall be directly related to the CPM schedule, shall identify all the submittals, and shall include the following information for each submittal item
  1. Specification section, Contract article, or special condition.
  2. Specification Subparagraph.
  3. Item description.
  4. Date the submittal shall be submitted.
  5. Name of subcontractor or supplier.
- B. The submittal schedule shall be kept current by the Contractor and submitted with the progress payment requests.
- C. For large files that cannot be loaded or e-mailed through the electronic Project Manager application (Unifier), submit the files on a CD, DVD, or USB flash drive media.

#### 1.4 ELECTRONIC SUBMITTALS

- A. Before the initiation of the submittal process, coordinate and insure that all submittals comply and follow the requirements of the DEN Building Information Modeling (BIM) Design Standards Manual (DSM) and the DEN BIM PXP.

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- B. Submit request for progress payment applications utilizing TEXTURA software as instructed by DEN Project Manager.
- C. Submit Subcontractor's Contract information required by the City and County of Denver Small Business Office as instructed by DEN Project Manager.
- D. Submit original electronic copies of all City and County of Denver Development Department/ Building Inspection Department Approved drawings including all approvals of Deferred Submittals; including but not limited to shoring plans, Fire Protection distribution plans, and structural shop drawings to DEN Project Manager as Informational Submittals. The lack of approval of the Denver Development Services on any document shall be basis for rejection of Work and non-compliance.
1. NOTE: Only original copies shall be accepted. Scans will not be accepted.
- E. Submit electronically scanned copies of all documents required by Chapter 17 "Special Inspection and Testing" of the International Building Code 2009 as amended by City and County of Denver 2011. Keep scale and clarify dimension where electronic copies are not as originally scaled and dimensioned.
- F. All submittals shall be delivered to the DEN Project Manager utilizing the Primavera Construction Manager program (PCM) as attachments and as separate file when files are too large to attach or of an electronic media that is not supported by PCM or Utilizing the EPPM Unifier software uploaded to the share drive Unifier's project site when directed by DEN Project Manager.
1. Acceptable electronic formats
- a. Print document format (pdf) shall have no security and bookmark every applicable submittal. All pages shall be completely legible and oriented to correct reading view.
2. Formats are acceptable only with written permission of the DEN Project Manager or required by the BIM PXP. For files in any of the following formats, the corresponding stringency will apply:
- a. Microsoft Office 2007 or newer. All files shall be fully compatible with Microsoft Office 2007.
- 1) AutoCAD files shall be self-contained with no external x-references.
- b. BIM files shall conform to the standards and formats outlined in the BIM PXP and DEN BIM DSM.
- c. Other files pre-approved by the DEN Project Manager.

## 1.5 INITIAL SUBMITTAL

- A. Each submittal document shall include a title block showing the following information:
1. Date of submittal and revision dates.

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2. Contract title and number.
  3. The names of Contractor, subcontractor, supplier, manufacturer and when applicable, the seal and signature of an Engineer registered in the State of Colorado, for the involved discipline.
  4. Identification of product by either description, model number, style number or lot number.
  5. Subject identification by Contract Drawing or specification reference.
- B. On each submitted drawing, include a blank space on each sheet, three inches by four inches, in the lower right corner, just above the title block, in which the DEN Project Manager or the Designer of Record may indicate the action taken.
- C. Make submissions sufficiently in advance so that the DEN Project Manager Review may be completed not less than 30 days before Work represented by those submittals is scheduled to be performed.
- D. Allow a minimum cycle of 30 days for review of each submittal by the DEN Project Manager.
- E. Accompany submittal documents with DEN transmittal form CM-30, Submittal, which shall contain the following information:
1. Contractor's name, address and telephone number.
  2. Submittal number and date.
  3. Contract title and number.
  4. Supplier's, manufacturer's, or subcontractor's name, address and telephone number.
  5. Identification of variations from Contract Documents.
  6. Contractor's stamp and signature certifying the Contractor's review.
  7. Identification of submittal:
    - a. If the submittal is being made on a General Condition or Special Condition, reference the General or Special Condition number the first two digits of the specification section shall be 00XXXX.
    - b. If the submittal is being made under a specification section, reference the specification number, paragraph number, and subparagraph number.
    - c. If the submittal is being made under a drawing, reference the drawing(s) number and sub-number.
- F. The Contractor shall describe, at the time of submission, variations from the Contract documents in writing, separate from the submittal document. If the DEN Project Manager approves any such variations, an appropriate Contract change order shall be issued, except that if the variation is minor and does not involve a change in price or in time of performance, a modification need not be issued. If a submission contains variations and the variation column is not marked on the transmittal form, it will not be considered for review and acceptance. Along with marking the transmittal as a variation, a description must be included which outlines all the differences including maintenance and utility services along with any cost savings from an item not containing the variation.

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- G. Changes in accepted submittal documents will not be permitted unless those changes have been accepted, in writing, by the DEN Project Manager.
- H. The form and quality of submittal documents shall comply with Section 013325 "Shop and Working Drawings, Product Data, and Samples."

## 1.6 SUPPLEMENTAL SUBMITTALS

- A. Supplemental submittal documents initiated by the Contractor for consideration of corrective procedures shall contain sufficient data for review. Make supplemental submittals in the same manner as initial submittals with the appropriate primary transmittal referenced.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### 3.1 CONTRACTOR'S REVIEW

- A. The Contractor shall review all submittal documents, stamp, and sign as reviewed and approved as complying with Contract Documents prior to submission to the DEN Project Manager. Submittal documents that are submitted to the DEN Project Manager **THAT HAVE NOT BEEN REVIEWED BY THE CONTRACTOR** will not be reviewed and will be returned to the Contractor. Contractor is responsible for any delays in the Project due to improperly reviewed, stamped, and signed submittals.
- B. The Owner review period will be limited to ten (10) business days from the time complete submittal documents have been submitted.
- C. The Contractor is responsible to obtain all approvals for all deferred submittals, shop drawings, and significant changes from the CCD Development Service Department.
- D. All submittals must delineate any deviation from the intended design and must submit request for substitution to address any significant variation. Refer to Title 4, Article 405 – Shop Drawings, Product Data, and Samples, and Article 406 – Substitution of Materials and Equipment of the General Contract Conditions, 2011 Edition.

### 3.2 REVIEW BY DEN PROJECT MANAGER

- A. Submittal documents will be reviewed by the DEN Project Manager, the DEN Project Manager Team, and/or the DOR for conformance to requirements of the Contract Documents. Review of a separate item will not constitute review of an assembly in which the item functions. The DEN Project Manager will withhold approval of submittals that depend on other submittals not yet submitted. Review and acceptance will not relieve the Contractor from the Contractor's responsibility for accuracy of submittals, for conformity of submittal document to requirements of Contract Drawings and specifications, for compatibility of described product with contiguous products and the rest of the system, or for protection and completion of the Contract in accordance with the Contract Drawings and specifications.
- B. The City, the DOR, and/or the DEN Project Manager will review the submittal documents for general conformance with the Contract Documents and mark the Action Code, sign, and date the transmittal.
- C. The Action Codes have the following meanings:
1. Accepted (ACC)
    - a. The submittal conforms to the respective requirements of the contract documents.
  2. Accepted as Noted (AAN)
    - a. The submittal conforms to the respective requirements of the Contract Documents after changes are made in accordance with reviewer's comments. AAN submittals do not need to be resubmitted.
  3. Revise and Resubmit (R&R)
    - a. The submittal is unacceptable and must be revised and resubmitted.
  4. Rejected (REJ)
    - a. The submittal is not approved and a new submittal in accordance with the Contract Documents must be prepared and submitted.
  5. For Information Only (FIO)
    - a. An item is received by the DEN Project Manager but is not reviewed.

### 3.3 CONTRACTOR'S RESPONSIBILITIES

- A. Coordinate each submittal document with the requirements of the Work. Place particular emphasis upon ensuring that each submittal of one trade is compatible with other submittals of that trade and submittals of other trades including producing as needed drawings showing the relationship of the Work of different trades.



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- B. Contractor's responsibility for errors and omissions in submittal documents and associated calculations is not relieved by the DEN Project Manager's review, correction, and acceptance of submittals.
- C. Contractor's liability to the City, in case of variations in the submittal document from the requirements of the Contract Documents, is not relieved by the DEN Project Manager's review and acceptance of submittals containing variations unless the DEN Project Manager expressly approves the deviation in writing, in which the DEN Project Manager describes the variation.
- D. The Contractor shall maintain a file of all approved submittal documents at the work site. The complete file of approved submittal documents shall be turned over to the DEN Project Manager with the as-built documents at the end of the job.
- E. Schedule impact due to resubmittal requirements is the responsibility of the Contractor.

**PART 4 - MEASUREMENT**

## 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

## 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 013300**

## SECTION 013325 - SHOP AND WORKING DRAWINGS, PRODUCT DATA, AND SAMPLES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Work specified in this Section consists of preparing and submitting shop and working drawings, product data, samples, and record documents required by other specifications Sections.
1. The Contractor shall submit all shop drawings, working drawings, product data, and samples, as defined in the General Conditions, to the DEN Project Manager in accordance with the requirements in the technical specifications. The DEN Project Manager will return one (1) copy of the shop drawings, working drawings and product data to the Contractor with a written transmittal.
- B. The Contractor shall not submit as shop drawings, copies or reproductions of drawings issued to the Contractor by DEN.
- C. Related Requirements
1. Section 013300 "Submittal Procedures
  2. Section 012510 "Substitutions"
  3. Section 017720 "Contract Closeout"

#### 1.3 SUBMITTALS

- A. All submittals shall be delivered to the DEN Project Manager in electronic format. All submittals must be of a consistent format (all PDF). No combination of electronic file types will be allowed unless required by a specific specification section.
1. Acceptable electronic formats: Comply with the electronic file formats approved by DEN Building Information Modeling (BIM) Design Standards Manual If any of the files are in any of the formats listed below then the version of the software shall be no less than identified below:
    - a. Adobe Acrobat 8.0 or newer. All files shall be fully compatible with Adobe Acrobat 8.0.
    - b. Microsoft Office 2007 or newer. All files shall be fully compatible with Microsoft Office 2007.

- c. AutoDesk AutoCAD 2007 or newer. All files shall be fully compatible with AutoDesk AutoCAD 2007.
  - d. AutoCAD files shall be self-contained with no external x-references.
  - e. BIM format outlined in the BIM Project Execution Plan (PXP)
  - f. Other files pre-approved by the DEN Project Manager.
2. Adobe Acrobat Requirements:
- a. Drawings shall have security set to "No Security." Commenting, printing, adding photos, form fields and document signing must be allowed.
  - b. PDF submittals shall be one continuous file or Portfolio. No external links are allowed.
  - c. All individual components of submittals shall be bookmarked inside the PDF file.
  - d. All original documents shall be directly converted from the original electronic format to PDF. Scanning of files shall only be allowed by the DEN Project Manager when the original electronic information is not obtainable.
  - e. Failure to comply with these requirements will result in a return of file to the Contractor for immediate revision.
3. Electronic files submitted shall correspond with DEN File Control Numbering System available from the DEN Project Manager.

B. Quantities

1. One (1) electronic submittal in Unifier containing electronic files of each shop or working drawing.
2. One (1) electronic submittal in Unifier containing electronic files of manufacturer's standard schematic drawings.
3. One (1) electronic submittal in Unifier containing electronic files of manufacturer's calculations and manufacturer's standard data.
4. One (1) electronic submittal in Unifier containing electronic files of manufacturer's printed installation, erection, application, and placing instructions.
5. Nine (9) samples of each item specified in the various specification sections, unless otherwise specified.
6. One electronic submittal in Unifier containing electronic files of inspection, test reports, and certificates of compliance.
7. Note: If manufacturer's printed information is in color, all copies of submittals must be in color.

C. Review:

1. Submittal review comments by the DEN Project Manager will be in electronic form and incorporated into the electronic submittal file.
2. Resubmittals of electronic documents shall modify the original electronic file with new information and include the DEN Project Manager's comments with appropriate responses and additional information.

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#### 1.4 CHANGES

- A. Changes in products for which shop or working drawings, product data or samples have been submitted will not be permitted unless those changes have been accepted and approved in writing by the Deputy Manager of Aviation as provided in Section 012510 "Substitutions."

#### 1.5 QUALITY CONTROL

- A. Shop drawings and record documents shall be prepared to the standards of quality outlined in the specifications, DSM and BIM PXP, prepared and printed from Revit and checked in the spatial coordination format specified in the BIM PXP.
- B. Refer to DEN BIM DSM for other requirements that may be applicable to this Article.

### PART 2 - PRODUCTS.

#### 2.1 SHOP AND WORKING DRAWINGS

- A. Prepare shop and working drawings in an electronic format that is current and approved by DEN to a scale large enough to easily depict and annotate each of the various items.
- B. Comply per other BIM requirements for Shop and Working Drawings as established in the DEN BIM DSM.
- C. Include the following as they apply to the subject:
1. Contract title, work order, and number.
  2. Respective Contract drawing numbers.
  3. Applicable specification section numbers.
  4. Relation to adjacent structure or materials.
  5. Field dimensions clearly identified as such.
  6. Applicable standards such as ASTM or Federal Specification number, FAA, AASHTO, and pertinent authority specifications or standards.
  7. Identification of deviations from the Contract Drawings and specifications.
  8. Drawing name, number, and revision.
  9. Contractor's stamp, initialed or signed, certifying:
    - a. Verification of field measurements.
    - b. Review of submittals for compliance with Contract requirements.
    - c. Compatibility of the Work shown thereon with that of affected trades.
  10. Blank space on each sheet per Technical Specifications Section 013300 "Submittal Procedures."

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- D. Drawings of equipment and other items that contain multiple parts shall include exploded views showing the relationship of parts and the description of the parts into the smallest units that may be purchased or serviced.
- E. Comply with all submittal requirements of Section 013300 "Submittal Procedures."

## 2.2 PRODUCT DATA

- A. Modify manufacturer's standard and/or schematic drawings to delete information that is not applicable to the Contract. Supplement standard information with additional information applicable to this Contract.
- B. Modify manufacturer's standard(s), diagrams, schedules, performance charts, illustrations, calculations, and other descriptive data to delete information that is not applicable to the Contract. Indicate dimensions, clearances, performance characteristics, and capacities. Include with the submittal electrical, plumbing, HVAC, and any other diagrams, as applicable.
- C. Modify erection, application, and placing instructions to delete information that is not applicable to the Contract or work order.
- D. Include the following:
  - 1. Contract title, work order, and number.
  - 2. Respective Contract drawing numbers.
  - 3. Applicable Contract technical specification section numbers.
  - 4. Applicable standards such as ASTM or Federal Specification number, FAA, AASHTO and pertinent authority specifications or standards.
  - 5. Identification of deviations from the Contract Drawings and specifications.
  - 6. Contractor's stamp, initialed or signed, certifying:
    - a. Dimensional compatibility of the product with the space in which it is intended to be used.
    - b. Review of submittals for compliance with Contract requirements.
    - c. Compatibility of the product with other products with which it is to perform or which will be next to it.
    - d. The products electrical, plumbing, control and HVAC requirements conform to Contract Documents and the necessary utilities are provided for in the Contract Documents.

- E. Comply with all submittal requirements of Section 013300 "Submittal Procedures."

## 2.3 SAMPLES

- A. Submit samples of sizes and quantities to clearly illustrate full color range and functional characteristics of products and materials including attachment devices.

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- B. Erect field samples and mockups at the work site as specified in specification Sections and at locations acceptable to the DEN Project Manager. All field samples shall be erected in a location that will be readily visible throughout the life of the Contract to allow comparison of the Work as it progresses to the field sample. Field samples and mockups may be incorporated into the Work at Contractor's risk if approved by DEN Project Manager.
- C. The Contractor shall verify, through appropriate inspections and tests, that the samples submitted meet the specifications and shall provide inspection and test data with the samples. The review and comments on the sample shall not relieve the Contractor of the Contractor's responsibility for completion of the Contract.
- D. Show the following information:
1. Contract title and number.
  2. Respective Contract drawing numbers.
  3. Applicable technical specification section numbers.
  4. Applicable standards such as ASTM or Federal Specification number.
  5. Identification of deviations from the Contract Drawings and specifications
  6. Contractor's stamp, initialed or signed, certifying:
    - a. Dimensional compatibility of the product with the space in which it is intended to be used
    - b. Review of submittals for compliance with Contract requirements
    - c. Compatibility of the product with other products with which it is to perform or which will be next to it
  7. If multiple samples are submitted and the DEN Project Manager is requested to make a choice, each sample shall have a unique identification number attached to it so the returned transmittal can state the identification number of the accepted sample and the Contractor will know which one it is.
- E. Comply with all submittal requirements of Section 013300 "Submittal Procedures."

**PART 3 - EXECUTION****3.1 CONTRACTOR RESPONSIBILITIES**

- A. Verify field measurements, catalog numbers, and similar data.
- B. The Contractor shall not start work for which submittals are required until a transmittal has been received by the Contractor marked with the Action Code ACCEPTED or ACCEPTED AS NOTED by the DEN Project Manager.
- C. Before making submittals, ensure that the products will be available in the quantities and at the times required by the Contract.

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- D. Submit final, corrected, electronic copies of Contract and shop and working drawings showing the Work as actually installed, placed, erected, and applied. Refer to Section 017720 "Contract Closeout."

### 3.2 REVIEW BY THE DEN PROJECT MANAGER

- A. One (1) electronic copy of the marked-up shop and working drawing and one (1) electronic copy of the product data will be returned to the Contractor by the DEN Project Manager. Only the transmittal form appropriately marked with the Action Code and comments, if any, will be returned on sample submittals.
- B. Contractor's responsibility for errors and omissions in submittals for compatibility will not be reduced, waived or otherwise limited by the review and acceptance of submittals by the DEN Project Manager.

## **PART 4 - MEASUREMENT**

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

## **PART 5 - PAYMENT**

### 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section. .

## **END OF SECTION 013325**

## SECTION 013510 - CONSTRUCTION SAFETY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Work specified in this Section includes construction safety precautions and programs by the Contractor and the basis for reviews by the DEN Project Manager.
- B. For projects enrolled under DEN Rolling Owner Controlled Insurance Program (ROCIP) reference the Contract Special Conditions for all safety requirements.
- C. For projects enrolled under DEN Owner Controlled Insurance Program (OCIP) reference the Contract Special Conditions for all safety requirements.

#### 1.3 RESPONSIBILITY

- A. The Contractor is responsible for the health and safety of the Contractor's personnel, agents, subcontractors and their personnel, and other persons on the worksite, for the protection and preservation of the Work and all materials and equipment to be incorporated therein, and for the worksite and the area surrounding the worksite. The Contractor shall take all necessary and reasonable precautions and actions to protect all such persons and property.
- B. This Section shall be interpreted in its broadest sense for the protection of persons and property by the Contractor and no action or omission by the DEN Project Manager or the DEN Project Manager's authorized representatives shall relieve the Contractor of any of its obligations and duties hereunder.

#### 1.4 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for the submittal process. The Contractor's Site Specific Safety Plan shall be submitted and approved under the general Contract prior to commencing any Work. If a Task Order or Change Order is issued where the Work is not covered by the approved Contractor's Site Specific Safety Plan, then a revision to the Safety Plan specific for the Work in the Task Order shall be resubmitted for approval.
  - 1. No progress payment shall be approved until the Contractor's Site Specific Safety Plan has been accepted by the DEN Project Manager.



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- B. The Contractor shall provide six (6) copies of the Contractor's Site Specific Safety Plan to the DEN Project Manager for review at least ten (10) calendar days before on-site construction begins. The Contractor's program must meet, as a minimum, all applicable federal, state and local government requirements, and the following:
1. The Contractor shall provide the following information for acceptance by the DEN Project Manager prior to the commencement of construction activities. The Site Specific Safety Plan must address all aspects listed below. If an item is not applicable, then this must be noted in the plan.
    - a. Name of the Contractor's safety representative.
    - b. If the Contractor is running multiple shifts or working more than (40) hours per week, the name of an assistant safety representative who can act in the absence of the site safety representative.
    - c. Twenty-four (24) hours per day emergency phone numbers of Contractor site management to be used in case of injury or accident. Provide at least four contacts.
    - d. Means of protecting employees working in trenches and excavations, including sloping and shielding.
      - 1) Soil classification will be considered as Type C when designing protective systems, unless the Contractor can prove to the satisfaction of DEN that the soil classification is otherwise. Soil classification change request shall be provided to the DEN Project Manager in writing. The decision of the DEN Project Manager will be provided to the Contractor in writing.
    - e. The Contractor shall show how material shall be stored beside the excavation. Stored material shall include the excavated and backfilled material
    - f. Injury and accident handling, including samples of the reporting form.
    - g. How personnel will be handled who are unable to safely perform their duties, including how the Contractor will determine whether personnel are unable to safely perform duties. This may include the Contractor's disciplinary process and employee's physical capabilities to perform the work safely.
    - h. How and when equipment will be checked to see that it is safe, that all safety guards are in place, and that the equipment is being used for its designed purpose and within its rated capacity.
    - i. How and when all electric devices will be checked for proper grounding and insulation. Describe the methods that will be used to lock out electric systems that should not be energized.
    - j. How trash and human organic waste will be disposed of.
    - k. How snow and ice will be removed by the Contractor in the project area.
    - l. How concrete forms will be anchored to ensure their stability, including calculations showing that the forms will safely hold the maximum construction loads.
    - m. How flammable materials will be stored and handled, and how any spills will be cleaned up and removed for disposal.

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- n. What system will be used to prevent fires and, if fires do occur, who will be trained to fight them. In addition, what firefighting equipment will the Contractor have available and how will this equipment's condition be monitored.
- o. How materials will be received, unloaded, stored, moved, and disposed of.
- p. How personnel working above ground level will be protected from falling.
- q. How people working beneath the construction work will be protected.
- r. What will be done to protect personnel in case of severe weather.
- s. How adequate lighting will be provided and monitored.
- t. How air quality will be monitored to ensure that chemical exposures are below current, established OSHA Permissible Exposure Limits. How personnel will be protected if these limits are exceeded.
- u. How the safety of work platforms, man lifts, material lifts, ladders, shoring, scaffolding, etc., will be ensured relating to load capacity and the protection of personnel using or working around them.
- v. The type of personal protective equipment that will be used to protect personnel from hazards.
- w. The type of safety training that will be provided to personnel to inform them of safe work procedures.
- x. How daily audits and inspections will be performed to ensure compliance with the Contractor's Site Specific Safety Plan and current, applicable OSHA regulations.
- y. Procedures to ensure that welding and other hot work is performed safely.
  - 1) A hot work permit from the Denver Fire Department (DFD) will be required for all welding, soldering, cutting, and brazing and or other processes required by DFD on the project. Contractor will comply with all of the provisions in the permit.
- z. How compressed gases will be safely stored, handled, and used.
- aa. Methods to ensure that personnel safely enter, work in, and exit confined spaces.
  - 1) All confined spaces on DEN property are considered permit required. A permit must be obtained from the DFD before Contractor personnel may enter a confined space. Contractors will comply with all provisions and requirements of this permit.
- bb. How the hazards of chemicals will be communicated to personnel, including the use of material safety data sheets and chemical labels.
- cc. Methods to ensure that forklifts and other powered industrial trucks are operated in a safe manner.
- dd. How an effective hearing conservation program will be used to protect personnel from high noise levels and prevent hearing loss.
- ee. How personnel will be protected from the effects of jet blast.
- ff. How hazards will be identified and corrected when reported.

## 1.5 DEN PROJECT MANAGER'S REVIEW

- A. Prior to the start of any work by contractor or subcontractor personnel, the Contractor shall provide the DEN Project Manager with a list of its personnel, subcontractor's personnel and other personnel the Contractor has requested to work at Denver International Airport, who have signified in writing that they have been briefed on, or have read and understand, the Contractor's Site Specific Safety Plan.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 IMPLEMENT CONTRACTOR'S OPERATIONAL SAFETY PLAN

- A. Implement the approved Contractor's Operational Safety Plan as described in Article 1 of this Section and in Section 011100 "Summary of Work."
- B. If the Contractor experiences lost time or an injury rate greater than 75 percent of the national average for all construction, the Contractor shall notify the DEN Project Manager and audit its safety procedures and submit a plan to reduce its rates.
- C. If at any time the lost time or injury rates experienced by the Contractor are 150 percent or more of the national average for construction, the Contractor shall notify the DEN Project Manager and immediately hire an independent safety professional who shall audit the Contractor's procedures and operations and make a report of changes that the Contractor should implement to reduce the rate including changing personnel.
1. The report shall be submitted to the DEN Project Manager.
  2. The Contractor shall immediately begin implementing the recommendations of the independent safety professional.
  3. A weekly report shall be submitted by the Contractor to the DEN Project Manager on the status of the implementation of the recommendations.
  4. Failure to comply with these requirements is a basis to withhold a portion of progress payments.

### 3.2 ROLLING OWNER CONTROLLED INSURANCE PROGRAM (ROCIP)

- A. Implement Rolling Owner Controlled Insurance Program (ROCIP) as provided in the Project Manual issued for bid or proposal

### 3.3 OWNER CONTROLLED INSURANCE PROGRAM (OCIP)

- A. Implement Owner Controlled Insurance Program (OCIP) as provided in the Project Manual issued for bid or proposal

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**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 013510**

## SECTION 013516 - ALTERATION PROJECT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes special procedures for alteration work.

#### 1.3 DEFINITIONS

- A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.
- B. Consolidate: To strengthen loose or deteriorated materials in place.
- C. Design Reference Sample: A sample that represents the DOR's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.
- D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by DOR.
- F. Refinish: To remove existing finishes to base material and apply new finish to match original or as otherwise indicated.
- G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.
- J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.

- K. Retain: To keep existing items that are not to be removed or dismantled.
- L. Strip: To remove existing finish down to base material unless otherwise indicated.

#### 1.4 COORDINATION

- A. Alteration Work Sub schedule: A construction schedule coordinating the sequencing and scheduling of alteration work for entire Project, including each activity to be performed, and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for alteration work.
  - 1. Schedule construction operations in sequence required to obtain best Work results.
  - 2. Coordinate sequence of alteration work activities to accommodate the following:
    - a. Owner's continuing occupancy of portions of existing building.
    - b. Owner's partial occupancy of completed Work.
    - c. Other known work in progress.
    - d. Tests and inspections.
  - 3. Detail sequence of alteration work, with start and end dates.
  - 4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
  - 5. Use of elevator and stairs.
  - 6. Equipment Data: List gross loaded weight, axle-load distribution, and wheelbase dimension data for mobile and heavy equipment proposed for use in existing structure. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.
- B. Pedestrian and Vehicular Circulation: Coordinate alteration work with circulation patterns within Project buildings and site. Some work is near circulation patterns and adjacent to restricted areas. Circulation patterns cannot be closed off entirely and in places can be only temporarily redirected around small areas of work. Access to restricted areas may not be obstructed. Plan and execute the Work accordingly.

#### 1.5 PROJECT MEETINGS FOR ALTERATION WORK

- A. Preliminary Meeting for Alteration Work: Before starting alteration work, DEN Project Manager will conduct meeting at Project site.
  - 1. Attendees: In addition to representatives of City, DEN Project Manager, DOR, and Contractor, testing service representative, and specialists shall be represented at the meeting.
  - 2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:

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- a. Alteration Work Subschedule: Discuss and finalize; verify availability of materials, specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
  - b. Fire-prevention plan.
  - c. Governing regulations.
  - d. Areas where existing construction is to remain and the required protection.
  - e. Hauling routes.
  - f. Sequence of alteration work operations.
  - g. Storage, protection, and accounting for salvaged and specially fabricated items.
  - h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
  - i. Qualifications of personnel assigned to alteration work and assigned duties.
  - j. Requirements for extent and quality of work, tolerances, and required clearances.
  - k. Embedded work such as flashings and lintels, special details, collection of waste, protection of occupants and the public, and condition of other construction that affects the Work or will affect the work.
3. Reporting: DEN Project Manager will record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from meeting.
- B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at weekly intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation meeting.
1. Attendees: In addition to representatives of the City, DEN Project Manager, DOR, and Contractor, each specialist, supplier, installer, and other entity concerned with progress or involved in planning, coordination, or performance of alteration work activities shall be represented at these meetings. All participants at meeting shall be familiar with Project and authorized to conclude matters relating to alteration work.
  2. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of alteration work. Include topics for discussion as appropriate to status of Project.
    - a. Alteration Work Subschedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.
    - b. Schedule Updating: Revise Contractor's Alteration Work Subschedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
    - c. Review present and future needs of each entity present, including review items listed in the "Preliminary Meeting for Alteration Work" Paragraph in this article and the following:



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- 1) Interface requirements of alteration work with other Project Work.
- 2) Status of submittals for alteration work.
- 3) Access to alteration work locations.
- 4) Effectiveness of fire-prevention plan.
- 5) Quality and work standards of alteration work.
- 6) Change Orders for alteration work.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

#### 1.6 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to City that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain the City's property.
  1. Carefully dismantle and salvage each item or object in a manner to prevent damage and protect it from damage, then promptly deliver it to where directed.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. Alteration Work Subschedule:
  1. Submit alteration work subschedule within 14 days of date established for commencement of alteration work.
- B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.
- C. Alteration Work Program: Submit 30 days before work begins.
- D. Fire-Prevention Plan: Submit 30 days before work begins.

#### 1.8 QUALITY ASSURANCE

- A. Specialist Qualifications: An experienced firm regularly engaged in specialty work similar in nature, materials, design, and extent to alteration work as specified in each Section and that has completed a minimum of [five] <Insert number> recent projects with a record of successful in-service performance that demonstrates the firm's qualifications to perform this work.



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1. Field Supervisor Qualifications: Full-time supervisors experienced in specialty work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on-site when specialty work begins and during its progress. Supervisors shall not be changed during Project except for causes beyond the control of the specialist firm.
    - a. Construct new mockups of required work whenever a supervisor is replaced.
  - B. Title X Requirement: Each firm conducting activities that disturb painted surfaces shall be a "Lead-Safe Certified Firm" according to 40 CFR 745, Subpart E, and use only workers that are trained in lead-safe work practices.
  - C. Alteration Work Program: Prepare a written plan for alteration work for whole Project, including each phase or process and protection of surrounding materials during operations. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project alteration work program with specific requirements of programs required in other alteration work Sections.
    1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
    2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.
  - D. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with City's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.
  - E. Safety and Health Standard: Comply with the current version of the ANSI/ASSE Safety and Health Program Requirements for Demolition Operations
- 1.9 STORAGE AND HANDLING OF SALVAGED MATERIALS
- A. Salvaged Materials:
    1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
    2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
    3. Store items in a secure area until delivery to specified location.
    4. Transport items to the designated storage area.
    5. Protect items from damage during transport and storage.
  - B. Salvaged Materials for Reinstallation:
    1. Repair and clean items for reuse as indicated.

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2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
  3. Protect items from damage during transport and storage.
  4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.
- C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by DOR, items may be dismantled and taken to an approved, suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.
- D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.
1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
  2. Secure stored materials to protect from theft.
  3. Control humidity so that it does not exceed 85 percent. Maintain temperatures **5°F** or more above the dew point.
- E. Storage Space:
1. DEN Project Manager will arrange for limited on-site locations for free storage of salvaged material. This storage space does not include security and climate control for stored material.
  2. Arrange for off-site locations for storage and protection of salvaged material that cannot be stored and protected on-site.
- 1.10 FIELD CONDITIONS
- A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of measured drawings, preconstruction photographs and preconstruction videotapes.
1. Comply with requirements specified in Section 013233 "Photographic Documentation."
- B. Discrepancies: Notify DEN Project Manager of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.
- C. DEN's Removals: Before beginning alteration work, verify in correspondence with DEN Project Manager that the following items have been removed:
- D. Size Limitations in Existing Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within existing spaces, areas, rooms, and openings, including temporary protection, by **12 inches** or more.

**PART 2 - PRODUCTS - (Not Used)****PART 3 - EXECUTION****3.1 PROTECTION**

- A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.
1. Use only proven protection methods, appropriate to each area and surface being protected.
  2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
  3. Erect temporary barriers to form and maintain fire-egress routes.
  4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
  5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
  6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
  7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
  8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.
- B. Temporary Protection of Materials to Remain:
1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
  2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.
- C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
- D. Utility and Communications Services:
1. Notify DEN Project Manager, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
  2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
  3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

- E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify DEN Project Manager immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.
1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
  2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.
- F. Existing Roofing: Prior to the start of work in an area, install roofing protection.

### 3.2 PROTECTION FROM FIRE

- A. General: Follow fire-prevention plan and the following:
1. Comply with NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations requirements unless otherwise indicated. Perform duties titled "City's Responsibility for Fire Protection."
  2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
    - a. If combustible material cannot be removed, provide fire blankets to cover such materials.
- B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:
1. Obtain City's approval for operations involving use of open-flame or welding or other high-heat equipment. Use of open-flame equipment is not permitted. Notify DEN Project Manager at least 72 hours before each occurrence, indicating location of such work.
  2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
  3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
  4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
  5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
  6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:

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- a. Train each fire watch in the proper operation of fire-control equipment and alarms.
  - b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
  - c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
  - d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
  - e. Maintain fire-watch personnel at each area of Project site until 60 minutes after conclusion of daily work.
- C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire extinguisher and blanket use.
- D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.
1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.

### 3.3 PROTECTION DURING APPLICATION OF CHEMICALS

- A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.
- B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.
- C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.
- D. Neutralize alkaline and acid wastes and legally dispose of off City's property.
- E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

### 3.4 GENERAL ALTERATION WORK

- A. Have specialty work performed only by qualified specialists.
- B. Ensure that supervisory personnel are present when work begins and during its progress.
- C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs or video recordings. Comply with requirements in Section 013233 "Photographic Documentation."
- D. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.
- E. Notify DEN Project Manager of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.
  - 1. Do not proceed with the work in question until directed by DEN Project Manager.

**END OF SECTION 013516**

## **SECTION 013520 - CONSTRUCTION SAFETY - AIRSIDE**

### **PART 1 - GENERAL**

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Work specified in this Section includes construction safety precautions and programs by the Contractor for airside, and the basis for reviews by the DEN Project Manager.
- B. Related Specification Sections:
  - 1. Section 011420 "Security Requirements and Sensitive Security Information".
  - 2. Section 011430 "Vehicle and Equipment Permitting".
  - 3. Section 011810 "Utilities Interface".
  - 4. Section 013510 "Construction Safety".
- C. For projects enrolled under DEN Rolling Owner Controlled Insurance Program (ROCIP) reference the Contract Special Conditions for all safety requirements.
- D. For projects enrolled under DEN Owner Controlled Insurance Program (OCIP) reference the Contract Special Conditions for all safety requirements.

#### 1.3 RESPONSIBILITY

- A. The Contractor is responsible for the health and safety of the Contractor's personnel, agents, subcontractors and their personnel, and other persons on the worksite, for the protection and preservation of the Work and all materials and equipment to be incorporated therein, and for the worksite and the area surrounding the worksite. The Contractor shall take all necessary and reasonable precautions and actions to protect all such persons and property.
- B. This Section shall be interpreted in its broadest sense for the protection of persons and property by the Contractor and no action or omission by the DEN Project Manager or the DEN Project Manager's authorized representatives shall relieve the Contractor of any of its obligations and duties hereunder.



#### 1.4 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for the submittal process. The Contractor's Operational Safety Plan shall be submitted and approved under the general Contract prior to commencing any Work. If a Task Order or Change Order is issued where the Work is not covered by the approved Contractor's Operational Safety Plan, then a revision to the Safety Plan specific for the Work in the Task Order shall be resubmitted for approval.
1. No progress payment shall be approved until the Contractor's Operational Safety Plan has been accepted by the DEN Project Manager.
- B. Scope: The Contractor's Operational Safety Plan shall be developed and submitted by the contractor for the DEN Project Manager's review and approval. The Operational Safety Plan shall be developed according to the guidelines and requirements provided in FAA AC No. 150/5370-2F "Operational Safety on Airports During Construction" and will describe how the Contractor will comply with the requirements of the Construction Safety and Phasing Plan (CSPP). The Operational Safety Plan shall cover the actions of not only the construction personnel and equipment, but the actions of inspection personnel and airport staff for the duration of construction activities.
- C. Definitions:
1. Approach Surface: A surface longitudinally centered on the extended runway centerline and extending outward and upward from either a runway threshold or 200 feet behind a threshold. This surface is needed to define where unobstructed airspace above the runway begins.
  2. Notice To Airmen (NOTAM): A notice to the flying public (airmen) through FAA's NOTAM system. Normally initiated by message to the nearest FAA Flight Service Station. Issuance of the NOTAM will be coordinated through the DEN Project Manager and DEN Operations.
  3. Object Free Area: A two-dimensional ground area surrounding runways, taxiways, and taxi lanes that is clear of objects, except for objects whose location is fixed by function.
  4. Safety Area (see AC 150/5300-13A): A defined surface adjacent to runways, taxiways and taxi lanes prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot or excursion from the paved surface. Each safety area must be cleared and graded and have no potentially hazardous ruts, humps, depressions or other surface variations. Each safety area must be drained by grading or storm sewers to prevent water accumulation. East safety area must be capable under dry conditions of supporting snow removal and aircraft rescue and firefighting equipment and or supporting the occasional passage of aircraft without causing any damage to the aircraft. No objects may be located in any safety area, except for objects that need to be located in a safety area because of their function. These objects must be constructed, to the extent practical, on frangibly mounted structures of the lowest practical height, with the frangible point no higher than three (3) inches above grade.



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- D. Policy: Aviation safety is a primary consideration during airport construction. These activities shall be planned and scheduled to minimize disruption of normal aircraft activities. If the clearances and restrictions described in this plan cannot be maintained while construction is underway, action will be taken by the Contractor to perform Work at night or during periods of minimal aircraft activity.
- E. Safety Impacts: The Contractor shall take all necessary steps and precautions to mitigate the impact of hazardous conditions as they may relate to the Work. Potentially hazardous conditions which may occur during airport construction include, but are not limited to, the following:
1. Trenches, holes, or excavations on or adjacent to any active runway, taxiway, taxi lane, apron, or related safety areas.
  2. Unmarked/unlighted holes or excavations on or adjacent to any active runway, taxiway, taxi lane, apron, or related safety areas.
  3. Mounds or piles of earth, construction material, temporary structures, or other objects on or in the vicinity of any active runway, taxiway, taxi lane, apron or related safety, approach, or departure areas.
  4. Pavement drop-offs that would cause, if crossed at normal operating speeds, damage to aircraft that normally use the airport. The maximum drop-off is 3 inches per FAA AC 150/5300-13A.
  5. Vehicles or equipment (whether operating or idle) on any active runway, taxiway, taxi lane, apron or related safety, approach, or departure areas.
  6. Vehicles, equipment, excavations, stockpiles, or other materials that could impinge upon NAVAID-critical areas and degrade or otherwise interfere with electronic NAVAIDS or interfere with visual NAVAIDS facilities.
  7. Unmarked utility, NAVAIDS, weather service, runway lighting, underground power, or signal cables that could be damaged during construction.
  8. Objects or activities anywhere on or in the vicinity of an airport which would be distracting, confusing, or alarming to pilots during aircraft operations.
  9. Unflagged/unlighted low visibility items such as tall cranes, backhoes, scrapers, dump trucks, rollers, compactors, dozers and the ilk, in the vicinity of an active runway, taxiway, taxi lane, apron or related safety, approach, or departure areas.
  10. Dirt, debris, or other transient accumulations that temporarily obscure pavement markings or pavement edges, or derogate the visibility of runway or taxiway markings or lighting or of construction and maintenance areas.
  11. Trash or other materials with foreign object damage (FOD) potential, whether on runways, taxiways, taxi lanes, aprons or in related safety areas.
  12. Failure to control vehicle, human and large animal access to, and nonessential nonaeronautical activities on, open aircraft movement areas.
  13. Failure to maintain radio communication between construction vehicles and air traffic control or other on-field communications facilities.
  14. Construction activities or material which could hamper Aircraft Rescue and Fire Fighting (ARFF) vehicle access from ARFF stations to all parts of the runway/taxiway system, runway approach and departure areas, or aircraft parking locations.
  15. Inadequate fencing or other marking to separate construction areas from open aircraft operating areas.
  16. Bird attractions such as edibles (food scraps, etc.), trees, brush, other trash, grass/crop seeding, or ponded water on or near the airport.

F. Safety Requirements:

1. General:

- a. During performance of this Contract, the airport runways, taxiways, taxi lanes, and aircraft parking aprons shall remain in use by aircraft to the maximum extent possible, consistent with continual safety. Aircraft use of areas near the Contractor's Work will be controlled to minimize disturbance to the Contractor's operation. However, AIRCRAFT HAVE THE RIGHT OF WAY AT ALL TIMES. The Contractor shall not allow employees, subcontractors, suppliers, or any unauthorized persons to enter or remain in any airport area that would be hazardous to persons or to aircraft operations.
- b. Contractor personnel, airport staff and field inspectors directly involved in on-airport construction shall:
  - 1) Be aware of the types of conditions, safety problems, and/or hazards identified each day at the airport. To insure that all personnel are aware, daily meetings between management and supervisory personnel and their employees shall be scheduled prior to any work commencing on the shift.
  - 2) Inspect daily all work and/or storage areas for which the Contractor is responsible to be aware of current conditions.
  - 3) Promptly take all steps needed to remedy any unsafe or potentially unsafe condition. Coordinate with the DEN Project Manager to insure immediate corrective action is undertaken
- c. Before commencement of construction activity the Contractor, through coordination with the DEN Project Manager and DEN Operations, shall give notice using the NOTAM system of construction on the airfield. In addition, a NOTAM shall be issued for the completion of construction on the airfield.

2. Construction Area Marking: Temporary lighting, barricades, flagging, and flashers are required as shown on the plans and per FAA AC 150/5370-2F Chapter 2 Section 220.b.(1)(2) Flag lines, traffic cones, flashers, edge lights, and/or signs shall be used as necessary:

- a. To clearly separate all construction from other parts of an air operations area
- b. To identify isolated hazards, such as open manholes, excavations, areas under repair, stockpiled material, waste areas, etc.
- c. Vehicle and pedestrian access routes used for airport construction shall be controlled to prevent any unauthorized entry of persons, vehicles, or animals.
- d. Vehicle parking areas for Contractor employees shall be designated in advance to minimize traffic in open/active aircraft movement areas.

3. Cables and Utilities:

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- a. Special attention shall be given to preventing unscheduled interruption of utility services and facilities. The location of all cables and utilities shall be identified prior to construction activities.
  - b. There shall be coordination among the Contractor, the DEN Project Manager, DEN Operations, the FAA, the National Weather Service, utility companies, and any other appropriate entity or organization. NAVAIDS, weather service facilities, electric cables, and other utilities must be fully protected during the entire construction time.
  - c. Power, communication, and control cables leading to and from any FAA NAVAIDS, weather service, and other facilities will be marked in the field by the appropriate individuals as identified in Section 011810 "Utilities Interface" for the information of the Contractor before any work in their general vicinity is started. Thereafter, through the entire duration of construction, utilities shall be protected from any possible damage.
  - d. At the intersection of expansion joints and centerline lighting circuits on taxiways and runways, the electrical conduit may be within the 21" portion of the Portland cement concrete pavement. Coordination with the DEN Project Manager's representative and the DEN Electrical Department is of utmost importance for both the scheduling of an outage and the removal of conductors while cutting the joint.
4. Vehicle and Employee Identification:
- a. Contractor vehicles and equipment shall be flagged for high daytime visibility and if appropriate, lighted for nighttime operations. Vehicles that are not marked and lighted shall be escorted by a vehicle that is equipped with appropriate marking and lighting devices. Marking and lighting shall be in conformance with FAA AC 150/5210-5D, current edition, or as outlined in Section 011430 "Vehicle and Equipment Permitting" of the Contract Documents.
  - b. The Contractor will be required to conform to the specific requirements as outlined in Section 011420 "Security Requirements and Sensitive Security Information (SSI)" of the Contract documents.
5. Radio Communications:
- a. The Contractor's construction superintendent and flag personnel shall be required to coordinate directly with the DEN Project Manager or designated Representative. Only the DEN Project Manager or designated Representative shall monitor transceiver radios tuned to the frequency for communications with DEN Operations and B Tower Control. Radios shall be used to obtain the proper clearance concerning the movement of equipment, trucks, etc., on the airfield. Further, any unusual occurrences in the flight pattern of approaching or departing aircraft shall be acknowledged by all concerned so that operation of the airport and the construction work can be safely carried on at all times.
6. Haul Routes Crossing Active Aircraft Operation Areas:

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- a. The Contractor shall provide a minimum of one (1) broom truck to continuously clean the surface of the active taxiway, taxi lane or apron of any foreign object damage (FOD) or other objectionable debris that may result from hauling activities. Additional broom trucks may be required to expedite the cleanup process. Opening the taxiway, taxi lane, or apron to aircraft operations shall only be approved after a visual inspection of the pavement surface by the DEN Airfield Operations Manager.
- b. The Contractor shall not work within the minimum of the following: 160 ft. of the centerline of an active taxiway, 310 ft. of the centerline of an active runway, or the minimum requirements of the FOD or Safety Zone unless otherwise noted in the Contract Documents and as approved in writing by the DEN Project Manager.
- c. All construction equipment and vehicles shall be flagged for high daytime visibility and if appropriate, lighted for nighttime operations. Vehicles that are not marked and lighted shall be escorted by a vehicle that is equipped with appropriate marking and lighting devices. Marking and lighting shall be in conformance with FAA AC 150/5210-5D, current edition.
- d. All Contractor and Subcontractor employees must be aware of the types of safety problems and hazards associated with aircraft operations and construction activities.

**PART 2 - PRODUCTS****2.1 Contractor's Operational Safety Plan**

- A. The Contractor shall provide six (6) copies of the Contractor's Operational Safety Plan to the DEN Project Manager for review at least ten (10) calendar days before on-site construction begins. The Contractor's program must meet, as a minimum, all applicable federal, state and local government requirements, and the following:
  1. The Contractor shall provide the following information for acceptance by the DEN Project Manager prior to the commencement of construction activities. The Operational Safety Plan must address all aspects listed below. If an item is not applicable, then this must be noted in the plan.
    - a. Name of the Contractor's safety representative.
    - b. If the Contractor is running multiple shifts or working more than (40) hours per week, the name of an assistant safety representative who can act in the absence of the site safety representative.
    - c. Twenty-four (24) hours per day emergency phone numbers of Contractor site management to be used in case of injury or accident. Provide at least four contacts.
    - d. Means of protecting employees working in trenches and excavations, including sloping and shielding.

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- 1) Soil classification will be considered as Type C when designing protective systems, unless the Contractor can prove to the satisfaction of DEN that the soil classification is otherwise. Soil classification change request shall be provided to the DEN Project Manager in writing. The decision of the DEN Project Manager will be provided to the Contractor in writing.
- e. The Contractor shall show how material shall be stored beside the excavation. Stored material shall include the excavated and backfilled material
- f. Injury and accident handling, including samples of the reporting form.
- g. How personnel will be handled who are unable to safely perform their duties, including how the Contractor will determine whether personnel are unable to safely perform duties. This may include the Contractor's disciplinary process and employee's physical capabilities to perform the work safely.
- h. How and when equipment will be checked to see that it is safe, that all safety guards are in place, and that the equipment is being used for its designed purpose and within its rated capacity.
- i. How and when all electric devices will be checked for proper grounding and insulation. Describe the methods that will be used to lock out electric systems that should not be energized.
- j. How trash and human organic waste will be disposed of.
- k. How snow and ice will be removed by the Contractor in the project area.
- l. How concrete forms will be anchored to ensure their stability, including calculations showing that the forms will safely hold the maximum construction loads.
- m. How flammable materials will be stored and handled, and how any spills will be cleaned up and removed for disposal.
- n. What system will be used to prevent fires and, if fires do occur, who will be trained to fight them. In addition, what firefighting equipment will the Contractor have available and how will this equipment's condition be monitored.
- o. How materials will be received, unloaded, stored, moved, and disposed of.
- p. How personnel working above ground level will be protected from falling.
- q. How people working beneath the construction work will be protected.
- r. What will be done to protect personnel in case of severe weather.
- s. How adequate lighting will be provided and monitored.
- t. How air quality will be monitored to ensure that chemical exposures are below current, established OSHA Permissible Exposure Limits. How personnel will be protected if these limits are exceeded.
- u. How the safety of work platforms, man lifts, material lifts, ladders, shoring, scaffolding, etc., will be ensured relating to load capacity and the protection of personnel using or working around them.
- v. The type of personal protective equipment that will be used to protect personnel from hazards.
- w. The type of safety training that will be provided to personnel to inform them of safe work procedures.
- x. How daily audits and inspections will be performed to ensure compliance with the Contractor's Operational Safety Plan and current, applicable OSHA regulations.

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- y. Procedures to ensure that welding and other hot work is performed safely.
  - 1) A hot work permit from the Denver Fire Department (DFD) will be required for all welding, soldering, cutting, and brazing and or other processes required by DFD on the project. Contractor will comply with all of the provisions in the permit.
- z. How compressed gases will be safely stored, handled, and used.
- aa. Methods to ensure that personnel safely enter, work in, and exit confined spaces.
  - 1) All confined spaces on DEN property are considered permit required. A permit must be obtained from the DFD before Contractor personnel may enter a confined space. Contractors will comply with all provisions and requirements of this permit.
- bb. How the hazards of chemicals will be communicated to personnel, including the use of material safety data sheets and chemical labels.
- cc. Methods to ensure that forklifts and other powered industrial trucks are operated in a safe manner.
- dd. How an effective hearing conservation program will be used to protect personnel from high noise levels and prevent hearing loss.
- ee. How personnel will be protected from the effects of jet blast.
- ff. How hazards will be identified and corrected when reported.

## 2.2 DEN PROJECT MANAGER'S REVIEW

- A. Prior to the start of any work by contractor or subcontractor personnel, the Contractor shall provide the DEN Project Manager with a list of its personnel, subcontractor's personnel and other personnel the Contractor has requested to work at Denver International Airport, who have signified in writing that they have been briefed on, or have read and understand, the Contractor's Operational Safety Plan.

## PART 3 - EXECUTION

### 3.1 IMPLEMENT CONTRACTOR'S OPERATIONAL SAFETY PLAN

- A. Implement the approved Contractor's Operational Safety Plan as described in Part 1 and Part 2 of this Section and in Section 011100 "Summary of Work."
- B. If the Contractor experiences lost time or an injury rate greater than 75 percent of the national average for all construction, the Contractor shall notify the DEN Project Manager, audit its safety procedures, and submit a plan to reduce its rates.



- C. If at any time the lost time or injury rates experienced by the Contractor are 150 percent or more of the national average for construction, the Contractor shall notify the DEN Project Manager and immediately hire an independent safety professional who shall audit the Contractor's procedures and operations and make a report of changes that the Contractor should implement to reduce the rate including changing personnel.
1. The report shall be submitted to the DEN Project Manager.
  2. The Contractor shall immediately begin implementing the recommendations of the independent safety professional.
  3. A weekly report shall be submitted by the Contractor to the DEN Project Manager on the status of the implementation of the recommendations.
  4. Failure to comply with these requirements is a basis to withhold a portion of progress payments.

### 3.2 ROLLING OWNER CONTROLLED INSURANCE PROGRAM (ROCIP)

- A. Implement Rolling Owner Controlled Insurance Program (ROCIP) as provided in the Project Manual issued for bid or proposal

### 3.3 OWNER CONTROLLED INSURANCE PROGRAM (OCIP)

- A. Implement Owner Controlled Insurance Program (OCIP) as provided in the Project Manual issued for bid or proposal

## PART 4 - MEASUREMENT

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

## PART 5 - PAYMENT

### 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

## END OF SECTION 013520

## SECTION 014100 - REGULATORY REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section identifies primary compliance with the State, City and County of Denver's regulatory requirements including:
  - 1. City and County of Denver / Department of Aviation.
  - 2. Colorado Department of Public Health and Environment.
  - 3. City and County of Denver Development Services, including the Department of Public Works and Division of Wastewater Management.
  - 4. The standards that govern design and construction projects at Denver International Airport.
- B. Construction shall be based on the latest edition of the referenced codes including additions and revisions thereto that are in effect at the time of Project bidding or Task Order pricing or GMP established whichever is latest, and as specifically related.

#### 1.3 RELATED SECTIONS

- A. Section 015719 "Temporary Environmental Controls" for environmental and related permitting requirements.

#### 1.4 BUILDING CODE

- A. All design and construction work shall be governed by the Building Code for the City and County of Denver, latest edition. This is based upon the International Building Code of the International Code Council with Denver Amendments to this code. Appendix N of the Denver Amendments addresses Construction of Airport Buildings and Structures.
  - 1. This Contract shall be based on the most current published version of the ICC series as Amended by The City and County of Denver.

#### 1.5 DENVER BUILDING DEPARTMENT

- A. For review and approval of all construction documents for compliance to the Denver building code:



## 1.6 DENVER FIRE DEPARTMENT

- A. For review and approval of plans for compliance with the Denver Fire Department's requirements as they apply to the Denver International Airport:

Denver Fire Department  
745 West Colfax Avenue  
Denver, Colorado 80204  
Telephone 720-913-3474

- B. The Contractor is advised that the Denver Fire Department – Fire Prevention Bureau requires permitting for the following activities as they apply to the scope of work. The Contractor is responsible for obtaining the appropriate permits necessary to complete the work. All costs associated with this permitting and policy compliance shall be the responsibility of the Contractor. The policies all reference the International Fire Code (IFC).

1. "Hot work", which is defined as the operation of any equipment or tool that creates sparks, hot slag, or radiant or convective heat as a result of the work. This includes, but is not limited to, welding, cutting, brazing, or soldering.
2. Use and storage of compressed gas for both temporary storage and permanent facility installation. This includes, but is not limited to, flammable gas (excluding propane-LPG), oxidizer (including oxygen), and inert and/or simple asphyxiates.
3. Tank installation, which includes aboveground storage tanks (AST) and underground storage tanks (UST) for both temporary tanks and permanent facility installations.

- C. In addition to the above permits, the Denver Fire Department may require other permits that are associated with the specific work in the Contract Documents. Policies provided by the Denver Fire Department are meant to provide basic information for the most common conditions and situations. In any given occupancy, many other Uniform Fire Code requirements may be enforced. These should be addressed with the Denver Fire Department before construction begins and during construction with premise inspection(s).

1. The Fire Prevention Bureau web site is [denfpb@denvergov.org](mailto:denfpb@denvergov.org)

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 PERMITS AND CERTIFICATIONS

- A. The Contractor shall maintain records on site of all permits acquired by federal, state, and local agencies. Posting of permits shall conform to requirements of the respective agencies.

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- B. At the completion of any inspection by other agencies, the Contractor shall forward copies of the status of the inspection and copies of any approved or "signed-off" inspections by the respective agencies to the DEN Project Manager.
  
- C. At the time of request for Substantial Completion, the Contractor shall forward to the DEN Project Manager all permits approved by the respective agencies.

**PART 4 - MEASUREMENT**

## 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

## 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 014100**

## SECTION 014210 - REFERENCED MATERIAL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 REFERENCED MATERIAL

- A. City and County of Denver, Department of Aviation, Standard Specification for Construction, General Contract Conditions
- B. The following documents may be available for examination at the Owner's offices unless otherwise noted. The referenced material and documents are not part of the Contract Documents unless otherwise specified.
  - 1. Environmental Impact Statement (EIS).
  - 2. Geotechnical Reports:
    - a. Borings, other field and laboratory explorations, and investigations have been made to indicate subsurface materials at particular locations. Explorations and investigations conducted by designers and their subconsultants are solely for the purpose of study and design.
    - b. The subsurface exploration and investigation information is presented or made available to indicate some of the conditions that may be encountered during construction and is offered as supplementary information only. Geotechnical information presented in the referenced material represents the opinion of soils consultants as to the character of the materials encountered. Subsurface information was directly obtained only at the specified location and necessarily indicates subsurface conditions only at the respective plan location, depths penetrated and only at the time of the exploration.
    - c. Neither the City nor the Designers assume any responsibility whatever in respect to the sufficiency or accuracy of borings made, or of the logs of test borings, or of other investigations, or of the interpretations made thereof, and there is no warranty or guarantee, either expressed or implied, that the conditions indicated by such investigations are representative of those existing throughout such area, or any part thereof, or that unforeseen developments may not occur. It is expressly understood that the making of deductions, interpretations, and conclusions from all of the accessible factual information, including the nature of the materials to be excavated, the difficulties of doing other work affected by the geology, groundwater elevations and other subsurface conditions at the site of the Work are the Contractor's sole responsibility.

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- d. Information derived from inspection of logs of borings, topographic maps, technical memorandum, reports, or plans showing information of the subsurface of site conditions will not relieve the Contractor from any risk or from properly examining the site and making such additional investigations as the Contractor may elect or from properly fulfilling all the terms of the Contract Documents.
3. Available Conceptual Utility and Drainage Reports.
4. DEN Building Information Modeling (BIM) Design Standards Manual (DSM)
5. Woolpert, Inc. Report - "A Low Distortion Projection for Denver International Airport (DEN)", dated 12/10/2010.

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION (Not Used)****PART 4 - MEASUREMENT**

## 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

## 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 014210**

## SECTION 014220 - ABBREVIATIONS AND SYMBOLS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 REFERENCE LIST

- A. Documents published by the following agencies may be referenced within these Contract Documents to define the quality of materials, equipment, workmanship, and other features of Work. Unless otherwise stated, the reference documents shall be of the latest edition as of the date of the Advertisement for Bids.
- B. Wherever used in the Contract Documents, the following abbreviations will have the meanings listed:

Abbreviation	Definition
AALA	American Association of Laboratory Accreditation
AAN	American Association of Nurserymen
AAO	Affirmative Action Officer
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
AFI	Air-Filter Institute
AGTS	Automated Ground Transportation System
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute, Inc.
APA	American Plywood Association
APEN	Air Pollution Emission Notes
APWA	American Public Works Association
ARI	Air Conditioning and Refrigeration Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASNT	American Society for Non-Destructive Testing
ASPE	American Society of Plumbing Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
AWPA	American Wood Preserver's Association

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Abbreviation	Definition
AWS	American Welding Society
AWWA	American Water Works Association
BID	Building Inspection Division, Department of Public Works
BIM	Building Information Modeling
CAR	Corrective Action Report
CCD	City and County of Denver
CCR	Contractor Change Request
CCRL	Cement Concrete Reference Laboratory
CD	Change Directive
CDOH	Colorado Department of Highways or Colorado Department of Health
CDOT	Colorado Department of Transportation
CMEC	Concrete Materials Engineering Council
CN	Change Notice
CO	Change Order
COE	Corps of Engineers
CPM	Critical Path Method
CR	Change Request
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DEN	Denver International Airport
DFD	Denver Fire Department
DOT	United States Department of Transportation
DOR	Designer of Record
DWB	Denver Water Board
EEO	Equal Employment Officer or Equal Employment Opportunity
EIA	Electronics Industry Association
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FHWA	Federal Highway Administration
FM	Factory Mutual Association
FS	Federal Specifications (U.S. General Services Administration)
GCC	General Contract Conditions
GIS	Geographic Information Systems
GMP -	Guaranteed Maximum Price
IAPMO	International Association of Plumbing and Mechanical Officials
IBC	International Building Code (published by ICC)
IBR	Institute of Boiler and Radiator Manufacturer's
ICBO	International Conference of Building Officials
ICC	International Code Council
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IMC	International Mechanical Code (published by ICBO)
IPC	International Plumbing Code (published by ICBO)
ISA	Instrument Society of America
ITA	Independent Testing Agency

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Abbreviation	Definition
MIL	Military Specifications (Naval Publications and Forms Center)
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
MUTCD	Manual of Uniform Traffic Control Devices
NAAB	National Association of Air Balance
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards (now called National Institute of Standards and Technology)
NEC	National Electric Code (NFPA 70)
NECA	National Electric Contractors Association
NEMA	National Electrical Manufacturer's Association
NESC	National Electrical Safety Code
NFC	National Fire Code (as published by NFPA)
NFPA	National Fire Protection Association
NICET	National Institute for the Certification of Engineering Technologies
NIST	National Institute of Standards and Technology
NGS	National Geological Survey
NLMA	National Lumber Manufacturers Association
NOAA	National Oceanic and Atmospheric Administration
NRMCA	National Ready Mix Concrete Association
NTP	Notice to Proceed
NVLAP	National Voluntary Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PDM	Precedent Diagram Method
PS	Product Standard of NIST (U.S. Department of Commerce)
PM	Project Manager
PMT	Project Management Team
PXP	Project Execution Plan
QA	Quality Assurance
QC	Quality Control
RFI	Request for Information
RTD	Regional Transportation District
SC	Special Contract Condition
SDI	Steel Door Institute
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
SSPWC	Standard Specifications for Public Works Construction
TCP	Traffic Control Plan
TSA	Transportation Security Administration
UL	Underwriters Laboratories, Inc.
USC	United States Code
WBS	Work Breakdown Schedule

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**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 014220**



## SECTION 014225 - REFERENCE STANDARDS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section contains a summary of industry-accepted and recognized standards published by trade associations, government, and institutional organizations that are referred to in the various Sections of these specifications or elsewhere in the Contract Documents.
- B. Standards listed herein are included in the Contract Documents by this reference and become a part of the Contract Documents to the same extent as though included in their entirety unless specific limitations are noted in the individual specifications Sections.
- C. Listings of reference standards include name and address of the organization publishing the standard, and the full name and designator of each of the standards referenced herein.
- D. If a publication date or edition number is listed with the reference standard, that publication date or edition number shall apply. Otherwise, the publication date or edition number in effect at the Contract date shall apply.
- E. Inclusion of reference standards herein does not make the DEN Project Manager an agent of the publishing agency, nor does it obligate the DEN Project Manager to perform inspections required by or to enforce rules or regulations contained in the reference standards.

#### 1.3 SCHEDULE OF REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials (AASHTO), 444 North Capitol Street, NW, Suite 249, Washington, DC 20090:
  - 1. AASHTO M 36—Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains.
  - 2. AASHTO M216—Standard Specification for Lime for Soil Stabilization.
  - 3. AASHTO T26—Standard Method of Test for Water to be Used in Concrete.
  - 4. AASHTO T84—Specific Gravity and Absorption of Fine Aggregate.
  - 5. AASHTO T85—Specific Gravity and Absorption of Coarse Aggregate.
  - 6. AASHTO T103—Soundness of Aggregates by Freezing and Thawing
  - 7. AASHTO T219—Standard Methods of Testing Lime for Chemical Constituents and Particle Sizes.

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- B. American Concrete Institute (ACI) 38800 Country Club Drive, Farmington Hills, MI 48331
1. ACI 211.1—Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
  2. ACI 301—Specifications for Structural Concrete for Buildings.
  3. ACI 304—Recommended Practices for Measuring, Mixing, Transporting and Placing Concrete.
  4. ACI 304.2R—Placing Concrete by Pumping Methods.
  5. ACI 305R—Hot Weather Concreting.
  6. ACI 306R—Cold Weather Concreting.
  7. ACI 318—Building Codes Requirements for Structural Concrete
    - a. Reference to ACI 318 may be limited to more stringent requirements of local building code.
- C. American Society for Testing and Materials (ASTM), International 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428:
1. ASTM A 27—Mild to Medium Strength Carbon - Steel Casting for General Application.
  2. ASTM A 36—Structural Steel.
  3. ASTM A 47—Malleable Iron Castings.
  4. ASTM A 82—Specification for Steel Wire, Plain, for Concrete Reinforcement: Replaced by A1064
  5. ASTM A 123—Hot-dip Galvanizing.
  6. ASTM A 184—Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
  7. ASTM A 185—Specifications for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement: Replaced by A1064
  8. ASTM A 283—Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars.
  9. ASTM A 615—Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
  10. ASTM A 706—Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
  11. ASTM C 25—Method for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime.
  12. ASTM C29—Unit Weight and Voids in Aggregate
  13. ASTM C 31—Methods of Making and Curing Concrete Test Specimens in the Field.
  14. ASTM C 33—Specification for Concrete Aggregates.
  15. ASTM C 39—Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  16. ASTM C 42—Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
  17. ASTM C 76—Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
  18. ASTM C 88—Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
  19. ASTM C 94—Specification for Ready Mixed Concrete.
  20. ASTM C 109—Compressive Strength of Hydraulic Cement Mortars

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21. ASTM C 110—Methods for Physical Testing of Quicklime, Hydrated Lime, and Limestone.
22. ASTM C 117—Materials Finer than 75 mm (No. 200) Sieve in Mineral Aggregates by Washing.
23. ASTM C 131—Resistance of Abrasions of Small Size Coarse Aggregate by Use of the Los Angeles Machine.
24. ASTM C 136—Method for Sieve Analysis of Fine and Coarse Aggregates.
25. ASTM C 138—Unit Weight, Yield, and Air Content of Concrete.
26. ASTM C 143—Test Method for Slump of Hydraulic – Cement Concrete
27. ASTM C 150—Specification for Portland Cement
28. ASTM C 171—Specification for Sheet Material for Curing Concrete.
29. ASTM C 172—Method of Sampling Fresh Concrete.
30. ASTM C 173—Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
31. ASTM C 231—Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
32. ASTM C 260—Specification for Air Entraining Admixture for Concrete.
33. ASTM C 309—Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
34. ASTM C 443—Joints for Concrete Pipe and Manholes, using Rubber Gasket
35. ASTM C 494—Specification for Chemical Admixtures for Concrete.
36. ASTM C 595—Blend Hydraulic Cements.
37. ASTM C 618—Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for use in Concrete
38. ASTM C 655—Reinforced Concrete D Load Culvert, Storm Drain, and Sewer Pipe.
39. ASTM C 789—Precast Reinforced Concrete Box Sections for Culverts, Storm Drains and Sewers: Replaced by C1433
40. ASTM C 803—Test Method for Penetration Resistance of Hardened Concrete.
41. ASTM C 805—Test Method for Rebound Number of Hardened Concrete.
42. ASTM C 977—Specification for Quicklime and Hydrated Lime for Soil Stabilization.
43. ASTM D 75—Sampling Aggregate.
44. ASTM D 422—Test Method for Particle Size Analysis of Soils.
45. ASTM D 516-88—Standard Test Method for Sulfate Ions in Water.
46. ASTM D 693—Crushed Stone, Crushed Slag and Crushed Gravel for Dryer Water-Bound Macadam Base Courses and Bituminous Macadam Base and Surface Courses of Pavements: Withdrawn
47. ASTM D 698—Laboratory Compaction Characteristics of Soil using Standard Effort
48. ASTM D 751—Test Method for Coated Fabrics
49. ASTM D 1556—Test Method for Density of Soil in Place by the Sand-Cone Method.
50. ASTM D 1557—Laboratory Compaction Characteristics of Soil using Modified Effort
51. ASTM D 1682—Ultraviolet Resistance Grab Tensile Strength Grab Tensile Elongation Toughness: Replaced by D5034 and D5035
52. ASTM D 1751—Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.
53. ASTM D 1752—Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

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54. ASTM D 2167–Test Method for Density of Soil in Place by the Rubber-Balloon Method.
  55. ASTM D 2216–Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock and Soil Aggregate Mixtures.
  56. ~~ASTM D -79~~ Hydroxypropyl Methylcellulose
  57. ASTM D 2419–Sand Equivalent Value of Soils and Fine Aggregate.
  58. ASTM D 2487–Test Method for Classification of Soils for Engineering Purposes.
  59. ASTM D 2922—Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Method: Replaced by D6938
  60. ASTM D 3017—Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth): Replaced by D6938
  61. ASTM D 3665–Random Sampling of Paving Materials.
  62. ASTM D 4253–Test Method for Maximum Index Density of Soils Using Vibratory Table.
  63. ASTM D 4318–Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
  64. ASTM D 4397–Specification for Polyethylene Sheeting for Construction, Industrial and Agricultural Applications.
  65. ASTM D 4546–Test Method for One-Dimensional Swell or Settlement Potential of Cohesive Soils.
  66. ASTM E 329–Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
  67. ASTM F 477–Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
  68. ASTM F 758–Smooth-Wall Poly (Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport and Similar Drainage.
- D. American Welding Society (AWS), 550 NW LeJeune Road, Miami, FL 33135 AWS Code for Welding in Building Construction (Structural Welding Code).
- E. Concrete Reinforcing Steel Institute (CRSI) 933 N. Plum Grove Road, Schaumburg, IL 60195, (312) 490-1700:
1. Manual of Standard Practice.
- F. Colorado Department of Transportation (CDOT) Division of Administration, Office of Bid Plans, 4201 E. Arkansas Avenue, Denver, CO 80222:
1. Standard Specifications for Road and Bridge Construction (latest edition) Colorado Standard Plans, M&S Standards.
- G. Federal Highway Administration (FHWA) Superintendent of Documents, US Government Printing Office, Washington DC, 20402:
1. Manual of Uniform Traffic Control Devices (latest edition).

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**PART 2 - PRODUCTS (Not used)**

**PART 3 - EXECUTION (Not used)**

**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 014225**

## SECTION 014230 - DEFINITIONS AND CONVENTIONS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section contains a list of definitions of words or phrases and grammatical or contextual conventions commonly used in these Contract Documents.

#### 1.3 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. Alphabetical Listing of Definitions:
  - 1. As indicated: Shown on the drawings by graphic indication, notes, or schedules, or written in the specifications or elsewhere in the Contract Documents.
  - 2. As directed, as approved, as requested: Unless otherwise indicated, these terms imply "by the DEN Project Manager" and require that an instruction be obtained by the Contractor from the DEN Project Manager.
  - 3. Concealed: Embedded in masonry, concrete, or other construction; installed in furred spaces; within double partitions or hung ceilings; in trenches; in crawl spaces or in enclosures.
  - 4. Ensure: To make certain in a way that eliminates the possibility of error.
  - 5. Exposed: Not installed underground or "concealed" as defined above.
  - 6. Furnish or Provide: To supply, install and connect complete and ready for safe and regular operation of particular work unless specifically otherwise noted.
  - 7. Indicated, Shown, or Noted: As depicted on drawings or specifications.
  - 8. Install: To erect, mount and connect complete with related accessories.
  - 9. Or equal, or approved equal: Refers to products which, in the opinion of the DEN Project Manager, are similar in all respects to products specified by proprietary brand name. Refer to Section 012510 "Substitutions" for procedures for submittal of proposed substitutions.
  - 10. Rework: To repair existing items or work required to be removed and replaced in order to accomplish the Work in accordance with the Contract Documents.
  - 11. Related Work: Includes, but not necessarily limited to, mentioned work associated with, or affected by, the Work specified.
  - 12. Reviewed, Satisfactory, Accepted, or Directed: Assumes by or to the DEN Project Manager.
  - 13. Similar, or Equal: Same in materials, weight, size, design, construction, capacity, performance, and efficiency of specified product.

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14. Supply: To purchase, procure, acquire and deliver complete with related accessories.
15. Unless Otherwise Indicated and Unless Otherwise Noted: General note to perform work as indicated or shown on drawings or in specifications unless specifically directed otherwise elsewhere in the Contract Documents; may be abbreviated "U.O.N.", "U.O.I.", or "U.N.O."

C. BIM Model Definitions:

1. Building Information Model (BIM): BIM is a digital representation of the physical and functional characteristics of the Project and is referred as a Model(s), which term may be used to describe a Model Element, a single Model or technology used to create the Model.
2. Design Model: A Model that has reached the stage of completion that would customarily be expressed by an architect or engineer in two-dimensional Construction Documents.
3. Construction Model: The equivalent of shop drawing and other information useful to construction. A model that consists of data imported from a "Design Model or", if none exist, from a designer's "Construction Document".
4. Federated Model: Distinct component models "linked" together in such a manner that the linked data sources so not lose the indent or integrity by being so linked.
5. Level of Development (LOD): LoD describes the level of completeness to which a Model Element is developed.
6. Model Element: Is a portion of the BIM representing a component system or assembly within a building or building site.
7. Model Element Author: The party responsible for developing the content of a specific Model Element to the LoD for a particular phase of the Project.

1.4 BIM REFERENCE STANDARDS

- A. Refer to the DEN BIM Design Standard Manual (DSM) for the proposed minimum requirements of the BIM Execution Plan. The execution plan shall be further developed jointly with DEN and the Contractor to specifically address the administrative steps necessary to provide comprehensive BIM system before during and after construction.

1.5 CONVENTIONS

A. Specifications Format:

1. In order to standardize the location of information in the Contract Documents, the specifications generally are organized in one or more of the following formats:
  - a. The "MASTERFORMAT" 2011 Edition published by the Construction Specifications Institute.
  - b. The Standard Specifications for Road and Bridge Construction published by CDOT.
  - c. The alphanumeric system as published by the FAA.

B. Organization of Drawings and Specifications:



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1. Organization of the specifications into divisions and sections, and arrangement or numbering of drawings is intended solely for the convenience of the Contractor in the Contractor's responsibilities to divide the Work among subcontractors or to establish the extent of work to be performed by any trade.
2. Neither the City nor the DEN Project Manager assume any liability arising out of jurisdictional issues or claims advanced by trade organizations or other interested parties based on the arrangement or organization of drawings or specifications.

C. Gender and Number:

1. For convenience and uniformity, parties to the Contract, including the City, Contractor, and DEN Project Manager, and their subcontractors, suppliers, installers, consultants or other interested parties are referred to throughout the Contract Documents as if masculine in gender and singular in number. Such reference is not intended to limit the meaning of the Contract Documents to the masculine gender or singular number.

D. Singular vs. Plural:

1. Materials, products, equipment, or other items of work referred to in the singular shall be construed as plural where applicable by the intent of the Contract Documents and shall not limit quantities to be provided by the Contractor.

E. Imperative Mood:

1. Specifications and notes on the drawings or elsewhere in the Contract Documents are generally written in the imperative mood as instructions to the Contractor, whether the Contractor is specifically addressed or not.

F. References to Subcontractors or Trades

1. References to subcontractors, trades or other entities, which are not parties to the Contract, shall be construed as meaning the Contractor whose responsibility it shall be to divide the Work among subcontractors or trades. Such references are used as a matter of convention, and are not intended to preclude or direct the Contractor's responsibility to divide the Work.

G. Abbreviations

1. A list of abbreviations used in the Contract Documents is included in Technical Specifications Section 014220 "Abbreviations and Symbols"; an abridged list of abbreviations used on the drawings is included with the drawings.
2. Abbreviations are believed to be those in general use in the construction industry. Contact the DEN Project Manager for clarification of abbreviations for which the meaning is not clear.



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**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 014230**

## SECTION 014510 - CONTRACTOR QUALITY CONTROL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section identifies the Quality Control activities to be performed during all phases of the Contract by the Contractor.
- B. The Contractor shall have in place a Quality Control Program as necessary to ensure that all materials and work are completed in compliance with Contract Documents. The Contractor is solely responsible for Quality Control and shall provide the necessary quality control personnel to assure that all materials, workmanship, and tests are in conformance with the Project documents with the exception of those tests and/or audits that may be conducted by the City as defined in the contract documents.
- C. Test schedules and/or testing requirements for materials used on this project are included in the technical specifications. Laboratory and field-testing identified in the specifications shall be conducted by a Testing Agency retained by the Contractor; hereafter is referred to as the Contractor Testing Agency (CTA).
- D. The City or its consultant working as the City agent will employ a testing agency to perform all the required Quality Assurance and Special Inspection Testing of material and Inspection of workmanship required by the Contract Documents and the Building Official to fulfill the code and the regulatory authority's requirements. The Contractor must schedule these tests and provide access to the City agents' inspectors and testers to perform these tests and inspections. The performance of the tests by the City does not relieve the Contractor of the responsibility to deliver a fully functional building meeting all the requirements of the Contract Documents and their intent. The Contractor must develop its own testing program for processing, acceptance from the subcontractor or suppliers at a frequency defined by the contractor for its own process control and to assure delivery of the intended acceptable workmanship. All time impacts of testing and retesting shall be accounted for in the updated schedule and any mitigation of time impacts shall be the responsibility of the Contractor.

#### 1.3 SUBMITTALS

- A. Refer to Section 013300 "Submittals" and Section 013325 "Submittal Procedures" for submittal requirements.

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- B. Quality Control Plan: Within ten (10) days after Notice to Proceed, the Contractor shall submit a Quality Control Plan for review and acceptance. The Quality Control Plan shall be accepted by the DEN Project Manager prior to any Work or materials being incorporated into the Project. Acceptance by the DEN Project Manager does not relieve the Contractor of its responsibility to comply with the Contract Requirements. The Contractor Quality Control Plan shall address the following as a minimum:
1. A general description of Quality Control monitoring to be performed until final acceptance by DEN. Include monitoring activities of Work and the work site during times that no construction activity is scheduled to take place.
    - a. No work requiring QC inspection and testing shall take place without QC inspection and testing staff on site.
  2. An individual designated by the Contractor and approved in writing by the DEN Project Manager whose [sole] responsibility is Quality Control Management. This individual shall be highly qualified in all phases of construction as it relates to this Project and shall have the authority to direct work changes required to bring the Work into conformance with Contract requirements, including stopping non-conforming work in progress. A detailed resume of the proposed Quality Control Manager including applicable education, experience, and certifications shall be included in the Quality Control Plan.
    - a. At the discretion of the DEN Project Manager, for Small Projects, Early Work Packages and Task Orders all of value less than \$1,000,000 or a duration which is less than three (3) months, the Contractor may assign one of the Contractor's staff, i.e. Contractor's Superintendent, Office Engineer, Field Engineer, or Contractor's Project Manager as Quality Control Manager. The assigned person must be on site while work requiring QC inspection and testing is being completed and available to discuss quality issues, manage all aspects of the Project Quality Control Plan, coordinate all required Special Inspection and Quality Assurance testing, and provide proposed solutions on all quality issues at any time as to not cause any delay to the project. Any delays caused in part or in all due to defective or no conforming work shall be borne by the Contractor.
  3. Quality Control inspection staff as needed to assist the Quality Control Manager with implementation of the Quality Control Program. Duties of the Quality Control Inspectors shall be limited strictly to inspection of the ongoing work. Sampling and testing of materials shall be performed by Quality Control personnel other than Quality Control Inspectors. Quality Control Inspectors shall inspect only those work elements for which they are qualified. Resumes of the proposed Quality Control Inspectors including applicable education, experience and certifications shall be included in the Quality Control Plan.

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4. An Organization Chart identifying all Quality Control staff by name and function. The chart shall indicate the total staff required to implement all elements of the Quality Control Program, including inspection and testing for each item of work including tests performed by the CTA or DTA. If necessary, different Quality Control staff can be utilized for specific inspection and testing functions for different items of work. The chart shall show that the Quality Control Manager, Quality Control Inspectors, and Quality Control testing personnel are outside of the production staff with clear lines of authority for Quality Control.
5. The City and/or the City Program Management Team acting as the City agent will employ a DTA. The Contractor's testing and inspection shall be performed for the processing, preparation and to request City's inspection and as necessary to produce the required product as specified in the Contract Documents. The Contractor shall meet the minimum inspection and testing frequencies specified in the contract documents. When the contract documents do not specify minimum inspection and testing frequencies the Contractor shall propose in writing to the DEN Project Manager a QC inspection and testing frequencies that meet or exceed industry standards for the material and work being placed or conducted.
6. Any test performed by any agency on the Project shall be recorded and show a passing re-test of all failing tests.
  - a. All test results shall be made available for inspection by the DEN Project Manager. This includes tests that are above the QC testing frequency required.
7. Any tests submitted by the Contractor for basis of acceptance, or payment reduction when performed by the Contractor's agency, must meet all standards and must be certified to have followed approved procedure, processed in a certified lab by properly certified or licensed personnel by properly certified testers and on calibrated and certified equipment. Authentications of tests must be preapproved and cannot be selectively submitted. All tests shall be recorded in the field witnessed by DEN inspector to be accepted as a record test of the material in question. Any failing tests could be the sole basis for rejecting the material.
8. Each technical specification division's requirements for quality control identifying each item requiring submittal and approval/acceptance prior to installation of work, all inspections to be performed during work and prior to acceptance of work, each item of work requiring testing by the independent testing agency or the City provided testing agency, and the testing frequency.
9. The plan shall address all elements of special inspection required by the statement of special inspection as approved by the Building Official. All special inspections and tests will be performed by agencies employed by the City.
10. The Contractor is responsible for the complete record of inspection file including but not limited to all manufacturer certificates, certificates of material compliance, Certificates of Material Testing Record, successful re-inspection of all deficiency items, proper deposition of design related Non-Conformance reports (NCR), Structural Engineers' observation reports, certification letters from the DTA, Building Inspectors' records of approvals, permit cards, fire suppression and fire-alarm tests records as witnessed by the authorities of jurisdiction and any record necessary to achieve a certificate of occupancy.

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11. The Contractor must keep track of all logs of discrepancies and submit periodic updates, as required by the DEN Project Manager, of all open issues and track the closure of open items in a timely manner.
  12. Establish controls and documentation format to ensure that items or materials that have been accepted through receiving inspection are used or installed. Identification and traceability shall be provided throughout all inspections, test activities, and records. For stored items, provisions shall be made for the control of item/material identification, consistent with the expected duration and type of storage.
  13. A methodology of monitoring, testing, and exercising of all equipment, valves, and/or assemblies to ensure the Work installed is in proper working order.
  14. A list of suppliers and subcontractors. This list shall include items to be supplied by each supplier and/or subcontractor and shall identify work to be performed by each subcontractor. The list shall be updated and resubmitted as required.
  15. All approvals related to Special Inspection are subject to the acceptance or approval of the Building Official.
  16. Emergency contact information including name, company, title, work phone number, home phone number, and other means of contact. The Emergency Contact list shall include at least four individuals. The Emergency Contact list shall be maintained on a daily basis. In the event there is any change in any of the information, the Contractor shall forward the updated list to the DEN Project Manager and to DEN Maintenance Control (303-342-2800). The Emergency Contact list shall include the project number, project title, and date of issue.
- C. The Contractor shall transmit the following daily reports to the DEN Project Manager electronically PRIOR TO THE CLOSE OF BUSINESS ON the following work day:
1. CM-13 Contractors Daily Construction Report. The Foreman may add sheets of information to this form as needed.
  2. CM-07 Daily Quality Control Inspection Report and all CTA test results performed that day.
  3. CM-08 Daily DEN Time and Materials Report
- D. Deficiency List: The Quality Control Manager shall establish a deficiency list including the minimum information for each deficiency item; description, date, location, drawings reference, detail reference, specification reference, and superseding document NCR, date of expected solution date repaired date inspected by City representative and accepted.
- 1.4 DOCUMENTATION
- A. The Contractor shall not change or alter approved submittals, procedures, specifications, drawings/MODELS, or other pertinent documentation without the DEN Project Manager's written authorization.

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- B. All records and documents that are quality related shall be prepared, identified and maintained by the Contractor and shall be made available to DEN upon request. Records shall be protected from damage, deterioration, or loss. A copy of the records and documents shall be maintained at the Work site at all times unless the DEN Project Manager has approved other locations in writing. Retention time for all quality records shall be not less than three (3) years from date of Final Acceptance of the Contract.
- C. The Contractor is responsible for the complete record of inspection file including but not limited to all manufacturer certificates, certificates of material compliance, Certificates of Material Testing Record, successful re-inspection of all deficiency items, proper deposition of design related NCRs, Structural Engineers' observation reports, certification letters from the DTAs, Building Inspectors' records of approvals, permit cards, fire suppression and fire-alarm tests records as witnessed by the authorities of jurisdiction and any record necessary to achieve a Certificate of Occupancy.
- D. The Contractor shall maintain records at the actual worksite and at Contractor's office to show the inspection status of materials and items installed in order to ensure that the required inspections and tests have been performed in a timely and correct manner.
- E. The Contractor must keep a record of all deficiency issues and show positive evidence of closure (passing re-inspection or re-test) to every issue.

## 1.5 INSPECTIONS AND TESTS

- A. Inspections, tests and system shut down requests, conducted by persons or agencies other than the Contractor, shall not in any way relieve the Contractor of the responsibility and obligation to meet all specifications and the referenced standards. The Contractor's designated Quality Control Representative shall inspect the work and shall ensure the Work complies with the Contract requirements prior to any requests for inspection or testing.
- B. When the specifications, laws, ordinances, rules, regulations or orders of any public agency having jurisdiction require the DEN Project Manager's surveillance of inspections or tests, the Contractor shall notify the DEN Project Manager, in writing, of the place, date and time 48 hours prior to the inspection and/or test. The Contractor shall be responsible for notifying and requesting inspection by other agencies including but not limited to the Denver Building Inspection Division, Denver Fire Department, and Denver Water Department. Prior to request for other agency inspections, the Contractor shall meet and plan inspection times with the DEN Project Manager.
- C. Special inspections or tests may be required by the technical specifications, City, State and/or Federal Agencies in addition to those tests already performed. The Contractor shall notify the DEN Project Manager, in writing, at least 48 hours in advance of the additional inspections or tests.
- D. Quantities will be verified as defined in the Pre-Work Meetings.



## 1.6 INSPECTION PLAN

- A. The Contractor shall utilize the following six-point inspection plan to ensure the conformance of the Work performed by the Contractor meets the requirements of the Contract Drawings and specifications, the referenced codes and standards and the approved submittals:
1. Prework Coordination: Prior to the start of construction work on the Contract and prior to the start of Work under each separate specification section and prior to the start of Work where a change in a construction operation is contemplated by the Contractor, and prior to a new subcontractor starting work, a coordination meeting to ensure that the Contractor's personnel have no misunderstandings regarding their safety and quality procedures as well as the technical requirements of the Contract will be held with the Contractor's superintendent, Quality Control and Safety representatives, and DEN Project Manager. Supervisory, Safety and Quality Control, representatives of all applicable subcontractors will also attend. Prior to the meeting, the Contractor's Quality Control Manager shall provide the DEN Project Manager with a meeting agenda for review. The Contractor's Quality Control Manager shall conduct the meeting and distribute the approved agenda. The Quality Control Manager shall develop and electronically distribute finalized meeting minutes within one business day upon completion of the meeting. The following items shall be presented and reviewed by the Contractor:
    - a. Contract requirements and specifications.
    - b. Shop drawings, certifications, submittals, models, and as-built drawings.
    - c. Testing and inspection program and procedures.
    - d. Contractor's Quality Control program.
    - e. Familiarity and proficiency of the Contractor's and subcontractor's workforce to perform the operation to required workmanship standards including certifications of installers.
    - f. Safety, security, and environmental precautions to be observed.
    - g. Any other preparatory steps dependent upon the particular operation.
    - h. The Contractor's means and methods for performing the Work.
  2. Initial Inspection: Upon completion of a representative sample of a given feature of the Work and no later than two weeks after the start of a new or changed operation, the DEN Project Manager and/or the DEN Project Manager's designated representatives will meet with the Contractor's Quality Control representative and applicable subcontractor's supervisor and their Quality Control representatives to check the following items, as a minimum:
    - a. Workmanship to established quality standards.
    - b. Conformance to Contract Drawings, specifications and the accepted shop drawings.
    - c. Adequacy of materials and articles utilized.
    - d. Results of inspection and testing methods.
    - e. Adequacy of as-built drawings/MODELS maintained daily.

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- f. Once accepted, the representative sample will become the physical baseline by which ongoing work is compared for quality and acceptability. To the maximum practical extent, approved representative samples of work elements shall remain visible until all work in the appropriate category is complete. Acceptance of a sample does not waive or alter any Contract requirements or show acceptance of any deviation from the Contract not approved in writing by the DEN Project Manager.
3. Follow-up Inspection: The Contractor's Quality Control representative will monitor the Work to review the continuing conformance of the Work to the workmanship standards established during the preparatory and initial inspections.
4. Completion Inspection: Forty-eight (48) hours prior to the completion of an item or segment of work and prior to covering up any work, the Contractor shall notify the DEN Project Manager, in writing, who will verify that the segment of work is substantially complete, all inspections and tests have been completed and the results are acceptable. The purpose of this inspection is to allow further corrective work upon, or integral to, the completed segment of work. THIS IS NOT AN ACCEPTANCE INSPECTION. If any items are determined to be deficient, need correction or are non-conforming, a Deficiency List will be prepared and issued to the respective Contractor for correction, repair, or replacement of any deficient or non-conforming items. The DEN Project Manager and Contractor's Quality Control representative will verify the correction of the deficient and/or non-conforming items prior to the start of the next operation.
5. Pre-Final Acceptance Inspection: Prior to requesting a Pre-Final Acceptance Inspection by DEN, all work and operational systems to be inspected shall be satisfactorily completed and tested by the Contractor. The Contractor's written request for this inspection shall be made seventy-two (72) hours in advance. With the request shall come a list of any known deficiencies and when they will be corrected. If the list is too large or contains too many significant items, in the opinion of the DEN Project Manager, no inspection will be held because of the incompleteness of the Work.
6. The DEN Project Manager will schedule the Pre-Final Acceptance Inspection and will prepare a list of deficient items (punch list) discovered during the inspection. If during the inspection, the list becomes too large or too many significant items are on the list, the inspection will be canceled by the DEN Project Manager. After the inspection is completed, the Deficiency List will be transmitted to the Contractor for correction of the deficient items.
7. Final Acceptance Inspection: After the Contractor has completed all items on the Deficiency List (generated from the Pre-Final Acceptance Inspection), he shall request a Final Acceptance Inspection. The request shall be made in writing at least seventy-two (72) hours in advance of the inspection. All areas must be cleaned and ready for turnover prior to this inspection. The DEN Project Manager, the design consultant, a representative of the funding agency (if applicable) and other interested parties will inspect the subject Work to ensure that all deficiencies have been satisfactorily attended to and that no new deficiencies have appeared and that all systems are completely functional. Any outstanding or additional deficient items will be noted and handled per the requirements of the Pre-Final Acceptance Inspection noted above until the Work is acceptable to the DEN Project Manager.



1.7 CONTRACTOR SUBMITTAL OF PROPOSED CONTRACTOR'S TESTING AGENCIES

- A. Refer to Section 014525 - Material Testing Agency

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION**

3.1 REQUIREMENTS

- A. All materials required for the Contract shall be new except where specified otherwise. The DEN Project Manager may elect to perform additional inspections and/or tests at the place of the manufacture, the shipping point or at the destination to verify conformance to applicable specifications. Inspections and tests performed by DEN shall not relieve the Contractor from the responsibility to meet the specifications, nor shall such inspections/tests be considered a guarantee for acceptance of materials that will be delivered at a later time.
- B. Materials accepted based on a Certificate of Compliance may be sampled and inspected/tested by DEN or its designer at any time. The fact that the materials were accepted based on such certification shall not relieve the Contractor of the responsibility to use materials that conform to the specifications.
- C. The Contractor shall impose upon suppliers the same quality control requirements, including inspection and test procedures, as imposed upon him by the specifications and referenced standards. The Contractor shall apply appropriate controls, designed to ensure that all materials supplied meet the requirements and specifications.

**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.
- B. Refer to Article 1706 - Removal of Defective Materials and Work in the General Contract Conditions, 2011 Edition.

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**END OF SECTION 014510**

## SECTION 014525 - MATERIAL TESTING AGENCY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Contractor shall employ the services of a Material Testing Agency; hereafter referred to as the Contractor Testing Agency (CTA). This Section identifies the requirements for the Contractor to employ a Material Testing Agency and identifies the required activities of the Material Testing Agency.
- B. Laboratory and field-testing requirements to be conducted by the CTA for materials and construction methods used on this project are included in the appropriate technical specifications. Where the Specifications reference the CDOT Standard Specifications for Road and Bridge Construction, the references shall also mean CDOT Field Materials Manual for schedule of tests unless otherwise stated. As a minimum, the CTA described in this Section shall perform all applicable tests listed in the manual including the independent assurance sampling and testing. In the event of such a conflict between the schedule and a specification in these technical provisions, the more comprehensive testing shall govern unless otherwise noted.
- C. Inspections and tests conducted by the CTA shall not in any way relieve the Contractor of the Contractor's responsibility and obligation to meet all specifications and referenced standards. Employment of the CTA does not relieve the Contractor of providing the required Quality Control program.
- D. When inspections or tests by the CTA prove that the item or material does not meet all applicable specifications and requirements, the cost incurred for the re-testing or re-inspection shall be borne by the Contractor as per this Section.
- E. Samples will only be considered if taken at random. The Contractor shall permit representatives of the City to witness the selection of samples. Inspection or tests of items or materials that fail shall be sufficient cause to terminate further inspections/tests of the same brand, make or source of that product.
- F. The Contractor is obligated to correct any item deemed deficient at no additional cost to DEN.

### 1.3 SUBMITTALS

- A. All submittals shall comply with requirements of Sections 013300 "Submittal Procedures" and 013325 "Shop and Working Drawings, Product Data and Samples" for submittal requirements.

### 1.4 CONTRACTOR SUBMITTAL OF PROPOSED TESTING AGENCIES

- A. The Contractor shall employ the services of a CTA that has been accredited by AASHTO or CCRL or an approved equal to perform the tests required in the Contract. The CTA may also provide technicians to perform the required inspections. However, inspection and testing cannot be performed simultaneously by the same technician. The Contractor shall receive written acceptance from the DEN Project Manager of the CTA prior to any permanent work being installed or tested.
- B. The Contractor shall not submit for acceptance to the DEN Project Manager any testing agency or laboratory utilized in the design or construction document preparation or presently employed by DEN as part of DEN Quality Assurance, Material Testing, or special inspection agencies.
- C. For consideration of acceptance, the Contractor shall submit to the DEN Project Manager the following items received from the CTA:
1. Affidavit of current accreditation from a national certification and/or accreditation programs.
  2. Evidence that the CTA Laboratory is accredited to perform the testing required in the Contract Documents.
  3. Resumes and evidence of professional engineer registration and licensing in the State of Colorado for the personnel reviewing and signing test reports.
  4. Resumes and current certifications verifying that CTA management and supervisory personnel, laboratory staff, field testing technicians, and inspecting technicians are qualified in accordance with ASTM C 1077, D 3666, D 3740, and E 329 requirements to perform the Work. NICET, ACI, WAQTC, LabCAT, CDOT, NRMCA, PCA, AWS, ASNT certifications or a degree in a related engineering field with construction field experience that can demonstrate qualifications. A list summarizing all management, supervisory, laboratory, field testing, and inspection personnel assigned to the Project including the testing and/or inspection each individual will be performing, certifications held by each individual, and the expiration date of each certification.
  5. A matrix indicating each technical specification section, paragraph, quantity and type of sampling and/or testing required.
  6. Copies of all laboratory, field testing, and inspection report forms.

### 1.5 SUBMITTAL OF REPORTS

- A. Test results shall be submitted by the Contractor to the DEN Project Manager after completion of inspections/tests by the CTA and prior to incorporation of the items into the Work unless the test or inspection must be done during or after installation.

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- B. All field test results including but not limited to fresh concrete properties and in-place moisture-density shall be reported in legible draft form to the DEN Inspector immediately at the test site. Any failing test shall be reported separately to the DEN Inspector or DEN Project Manager. The draft test results shall also be attached to the Daily Quality Control Inspection Report (reference Section 014510 "Contractor Quality Control") and transmitted to the DEN Project Manager the next workday.
- C. Typed test reports shall be provided to the DEN Project Manager as specified in the "Weekly Reports" Article in this Section. The test reports shall be numbered sequentially in chronological order. Individual tests shall be numbered sequentially. The reports and tests shall also be organized per specification section. All test results must be reviewed and signed by a registered licensed engineer in the State of Colorado. The signature represents that the test procedures used are in strict conformance with the applicable testing standard, the calculated data are true and accurate, the tools and equipment used were in calibration, the sample was not contaminated and the persons running the test were qualified.
- D. Reports of inspections and test activities are record documents and shall be maintained in a manner that provides integrity of item identification, acceptability, and traceability. Reports shall identify the following:
1. Contractor's name.
  2. DEN Contract number and title.
  3. Material Testing Agency name.
  4. Name of items inspected/tested including a physical description and, as applicable, model and make.
  5. Quantity of items.
  6. Inspection/test procedure used. If national standards are used, any deviation from these standards.
  7. Date the sample was taken and the date the test was made.
- E. Location (by coordinates, building grid or station number and elevation) of where tests and/or samplings were performed including environmental condition where applicable. Include plan drawing indicating location of test, lot size and location and work item sampled or tested.
1. Name of inspector/tester.
  2. In the event the testing or sampling is a re-test or re-sampling, reference the previous respective testing or sampling report.
  3. Specified requirements in the Contract that the item must meet. Include reference to technical specification section and paragraphs.
  4. Acceptability.
  5. Deviations/nonconformance.
  6. Evaluation of results.
  7. All information required for the specific test as specified in the applicable ASTM standard.
  8. Signature of authorized evaluator.

## 1.6 WEEKLY SUMMARY REPORTS

- A. The CTA and Quality Control Manager shall prepare and submit to the DEN Project Manager a weekly summary report each week, which summarizes by specification section all work activities and results for the quality control tests and inspections conducted during that period. The weekly summary report shall be submitted within two (2) weeks from the end of the reporting period. At a minimum, the weekly summary report shall identify all inspections, test types, test locations, testers, test results, specifications, whether the test passed or failed, quantity of materials placed and the number of tests performed for each material, and the material supplier, installer and Contractor. Re-tests shall be identified in a fashion that easily correlates to the failing test. Any failed tests that have not been corrected when the report is published shall be highlighted and noted in the cover letter of the report.
- B. The weekly report shall be submitted per Sections 013000 and 013350 requirements.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 REMOVAL OF NONCONFORMING MATERIAL

- A. The Contractor is obligated to correct or remove nonconforming materials, whether in place or not. If necessary, the DEN Project Manager will send written notification to the Contractor to correct or remove the defective materials from the project. If the Contractor fails to respond, the DEN Project Manager may order correction, removal, and/or replacement of defective materials by others, in which case the Contractor shall bear all costs incurred by such actions.

### 3.2 PERFORMANCE

- A. If the DEN Project Manager determines that the CTA or its personnel are not effectively enforcing or performing the testing and documentation requirements specified in the Contract, the DEN Project Manager will require, in writing, the Contractor to remove and replace CTA or such personnel at no cost to DEN.

### 3.3 CONTROL OF MEASURING AND TEST EQUIPMENT

- A. The CTA shall select measuring and test equipment in such a manner as to provide proper type, range, accuracy, calibration, and tolerance for determining compliance with specified requirements. Measuring and test devices shall be calibrated, adjusted and maintained at prescribed intervals prior to use based upon equipment stability and other conditions affecting measurement. Provisions shall be made for the proper handling and storage of equipment. Calibration shall be accomplished using certified standards that have a known traceable relationship to the National Institute of Standards and Technology. Every calibrated measuring and test device shall show the current status, date of last calibration and the due date for the next calibration. Calibration records shall be maintained onsite as quality records and shall be made available for inspection upon the DEN Project Manager's request.

## PART 4 - MEASUREMENT

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under the Section.

## PART 5 - PAYMENT

### 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.
- B. Refer to Title 17 - Inspection and Defects of the General Contract Conditions, 2011 Edition, for guidance on payment methods.

**END OF SECTION 014525**



## SECTION 014545 - SPECIAL INSPECTION AGENCY AND OWNER TESTING AGENCIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Special Inspection Statement issued as part of the application for building permit for the specific task or project.

#### 1.2 SUMMARY

- A. The City will employ the services of Special Inspection Agencies (SIA). This Section identifies the requirements for the Contractor to coordinate, facilitate, and support DEN and its agents and consultants to fulfill the requirements of Special Inspection.
  - 1. Any additional tests deemed necessary by the Building Official, Engineer of Record, Special Inspector or DEN Project Manager to assure these agencies that all material and work on the Project meet the requirements of the Contract and all applicable codes and regulations.
  - 2. Minimum Laboratory and field testing requirements to be conducted by the SIA for materials and construction on this Project are included in the Table at the end of this Section.
  - 3. All caissons and piers drilling on this Project shall be continuously inspected by Special Inspection Agency hired by DEN directly or through the Engineer of Record or its sub-consultants.
  - 4. The Contractor shall not perform any work that could cover work or material that has not passed the requirement of special inspection or require the presence of the special inspector to meet the requirements of continuous or periodic inspection.
  - 5. It is the responsibility of the Contractor to plan, coordinate all testing requirements on the project to assure no delays are occurring due to the lack of inspection or testing.
  - 6. The Contractor must allow sufficient time in the schedule to perform all required inspection and testing.
  - 7. All rework due to nonconformance, failing tests or rework to test covered work prior to proper inspection and testing shall be borne by the Contractor.
  - 8. All re-inspections and re-testing costs due to non-conformances or failing tests or revisiting to test covered or incomplete work shall be borne by the Contractor at a cost of \$100 per hour in addition to all direct and indirect costs associated with testing.
  - 9. Periodic welding inspection shall include the minimum of fitting inspection and final inspection at all times.

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10. Inspections and tests conducted by the SIA shall not relieve in any way the Contractor of the Contractor's responsibility and obligation to meet all specifications and referenced standards. Employment of the SIA does not relieve the Contractor of providing the required Quality Control program.
11. When inspections or tests by the SIA prove that the item or material does not meet all applicable specifications and requirements, the cost incurred for the re-testing or re-inspection shall be borne by the Contractor. Reference Article 5.1 of this Section.
12. Samples will only be considered if taken at random. The Contractor shall permit representatives of the City to witness the selection of samples. Inspection or tests of items or materials that fail shall be sufficient cause to terminate further inspections/tests of the same brand, make or source of that product.
13. The Contractor is obligated to correct any item deemed deficient at no additional cost to DEN.

### 1.3 SUBMITTALS

- A. All submittals shall comply with requirements of Section 013300 "Submittals" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for submittal requirements.

### 1.4 CONTRACTOR SUBMITTAL OF PROPOSED CONTRACTOR'S TESTING AGENCIES

- A. Projects requiring Special Inspection where the Contractor is utilizing certified shop to produce material. DEN requires that testing be performed to satisfy the certification be no less than the following: All material and workmanship meets the requirements of a Contractor Material Testing Agency.
- B. The Contractor shall employ the services of a Testing Agency for process control and acceptance by the subcontractors and suppliers or material delivery for Contractor convenience or contractual obligations with others.
- C. The Contractor's Testing Agency must be accredited agency to perform any test required to be submitted for compliance with a Contract requirement or for use of data by DEN agencies for any official use, for examples and not to grant any obligation on the DEN Project Management Team, any payment reduction factor calculation. Any dispute or requirement to recalibrate testing equipment or machine, proof of compliance of material that was installed in contrary to manufacturer recommendation, any apparent defect due to adverse weather, improper installation, incomplete material record.
- D. Contractor's testing agency must be a qualified entity that has performed testing on similar jobs in size and complexity and has been accredited by AASHTO or CCRL or an approved equal to perform the tests required in the Contract. The CTA may also provide technicians to perform the required inspections. However, inspection and testing cannot be performed simultaneously by the same technician.

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- E. The Contractor shall not submit for acceptance to the DEN Project Manager any testing agency or laboratory utilized in the design or construction document preparation or presently employed by DEN as part of DEN Quality Assurance.
- F. For consideration of acceptance, the Contractor shall submit to the DEN Project Manager the following items received from the CTA:
1. Affidavit of current accreditation from a national certification and/or accreditation program.
  2. Evidence that the CTA Laboratory is accredited to perform the testing required in the Contract Documents.
  3. Resumes and evidence of professional engineer registration and licensing in the State of Colorado for the personnel reviewing and signing test reports.
  4. Resumes and current certifications verifying that SIA management and supervisory personnel, laboratory staff, field testing technicians, and inspecting technicians are qualified in accordance with ASTM C 1077, D 3666, D 3740, and E 329 requirements to perform the Work. NICET, ACI, WAQTC, LabCAT, CDOT, NRMCA, PCA, AWS, ASNT certifications, or a degree in a related engineering field with construction field experience can demonstrate qualifications. A list summarizing all management, supervisory, laboratory, field testing, and inspection personnel assigned to the Project including the testing and/or inspection each individual will be performing, certifications held by each individual, and the expiration date of each certification.
  5. A matrix indicating each technical specification section, paragraph, quantity and type of sampling and/or testing required.
  6. Copies of all laboratory, field testing, and inspection report forms.

## 1.5 SUBMITTAL OF REPORTS

- A. Test results shall be submitted by the Special Inspector and/or DEN Testing Agency to the DEN Project Manager after completion of inspections/tests by the SIA/OTA and prior to incorporation of the items into the Work unless the test or inspection must be done during or after installation.
- B. All field test results including but not limited to fresh concrete properties and in-place moisture-density shall be reported in legible draft form to the DEN/PMT Inspection and the Contractor Quality Control Manager immediately at the test site. Any failing test shall be reported separately to the DEN/PMT Inspector or DEN Project Manager within two (2) hours after the discovery.
- C. The Contractor's Quality Control Manager or his/her Authorized representative must keep track and official record of all tests passed, failed, or defected. The Contractor shall be fully responsible to show passing tests of all required elements. The lack of any passing test record of any required element does not waive the requirement to of testing or inspection as required by the Contract Documents and the IBC. The Contractor shall bear all costs associated with recovering missing tests including but not limited to the cost of the cost of disassembling, testing or inspecting, reassembling, and any indirect time or cost impacts of a missing required test or inspection.

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- D. Typed test reports shall be provided by the testing agency to the DEN Project Manager as specified in Part 1 of this Section Weekly Summary Reports. The test reports shall be numbered sequentially in chronological order. Individual tests shall be numbered sequentially. The reports and tests shall also be organized per specification section. All test results must be reviewed and signed by a registered licensed engineer in the State of Colorado. The signature represents that the test procedures used are in strict conformance with the applicable testing standard, the calculated data are true and accurate, the tools and equipment used were in calibration, the sample was not contaminated and the persons running the test were qualified.
- E. A plan of work and administrative procedure shall be established to assure that all test and inspections frequency required are performed and all defects are tracked and retested and re-inspected to meet all applicable specifications, codes, and standards.
- F. The Contractor shall track all tests performed on the daily reports and shall submit a statement for each phase of the Work showing all elements of Quality have been completed and all defects are addressed or scheduled to be addressed prior to covering the Work.
- G. Reports of inspections and test activities are record documents and shall be maintained in a manner that provides integrity of item identification, acceptability, and traceability. Reports shall identify the following:
1. Contractor's name.
  2. DEN Contract number and title.
  3. Testing Agency name.
  4. Name of items inspected/tested including a physical description and, as applicable, model and make.
  5. Quantity of items.
  6. Inspection/test procedure used. If national standards are used, any deviation from these standards.
  7. Date the sample was taken and the date the test was made.
  8. Location, by coordinates, building grid or station number, of where tests and/or samplings were performed including environmental condition where applicable. Include plan drawing indicating location of test and work item sampled or tested.
  9. Name of inspector/tester.
  10. In the event the testing or sampling is a re-test or re-sampling, reference the previous respective testing or sampling report.
  11. Specified requirements in the Contract that the item must meet. Include reference to technical specification section and paragraphs.
  12. Acceptability.
  13. Deviations/nonconformance.
  14. Corrective action.
  15. Evaluation of results.
  16. All information required for the specific test as specified in the applicable ASTM standard.
  17. Signature of authorized evaluator.

## 1.6 WEEKLY SUMMARY REPORTS

- A. The SIA/OTA shall prepare and submit to the DEN Project Manager a weekly summary report each week that summarizes by specification section all work activities and results for the quality control tests and inspections conducted during that period.
- B. The weekly summary report shall be submitted within two (2) weeks from the end of the reporting period. At a minimum, the weekly summary report shall identify all inspections, test types, test locations, testers, test results, specifications, whether the test passed or failed, quantity of materials placed and the number of tests performed for each material, and the material supplier, installer and Contractor.
- C. Re-tests shall be identified in a fashion that easily correlates to the failing test. Any failed tests that have not been corrected when the report is published shall be highlighted and noted in the cover letter of the report. The SIA shall identify costs of re-testing or additional site visits required due to scheduling changes by the Contractor. A current Corrective Action Report log (CAR) shall also be included in the weekly summary report.
- D. The weekly report shall be submitted per Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" requirements.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 CORRECTION OR REMOVAL OF NONCONFORMING MATERIAL

- A. The Contractor is obligated to correct or remove nonconforming materials, whether in place or not. If necessary, the DEN Project Manager will send written notification to the Contractor to correct or remove the defective materials from the Project. If the Contractor fails to respond, the DEN Project Manager may order correction, removal, and/or replacement of defective materials by others, in which case the Contractor shall bear all costs incurred by such actions.

### 3.2 PERFORMANCE

- A. If the DEN Project Manager determines that the SIA or its personnel are not effectively enforcing or performing the testing and documentation requirements specified in the Contract, the DEN Project Manager will, state in writing, the requirement for the Contractor to remove and replace SIA or such personnel at no cost to DEN.

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### 3.3 CONTROL OF MEASURING AND TEST EQUIPMENT

- A. The SIA shall select measuring and test equipment in such a manner as to provide proper type, range, accuracy, calibration, and tolerance for determining compliance with specified requirements. Measuring and test devices shall be calibrated, adjusted and maintained at prescribed intervals prior to use based upon equipment stability and other conditions affecting measurement.
- B. Provisions shall be made for the proper handling and storage of equipment. Calibration shall be accomplished using certified standards that have a known traceable relationship to the National Institute of Standards and Technology. Every calibrated measuring and test device shall show the current status, date of last calibration and the due date for the next calibration. Calibration records shall be maintained onsite as quality records and shall be made available for inspection upon the DEN Project Manager's request.

## PART 4 - MEASUREMENT

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for Work under the Section. DEN Project Management Team staff will track all costs and remark the conditions and track all associated impacts for credits to the City. The contractor record of the same is only valid if signed by the DEN Project Manager or authorized representative.

## PART 5 - PAYMENT

### 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for Work under this Section.
- B. Refer to Title 17 - Inspection and Defects in the General Contract Conditions, 2011 Edition, for guidance on payment methods.

## END OF SECTION 014545

## SECTION 015050 - MOBILIZATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Section 012910 "Schedule of Values"

#### 1.2 SUMMARY

- A. The Work specified in this Section consists of preparatory work and operations including, but not limited to the following:
  - 1. Those necessary for the movement of personnel, equipment, supplies, and incidentals to the work site.
  - 2. For the establishment of all offices, buildings and other facilities necessary for the Work on the Project.
  - 3. For all other work and operations that must be performed or costs incurred prior to beginning work on the various Contract items on the work site.

#### 1.3 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.
- B. Submit a Mobilization Schedule a minimum of fourteen (14) days prior to first billing for mobilization.

#### 1.4 DELIVERY

- A. Delivery to the work site of construction tools, equipment, materials, and supplies shall be accomplished in conformance with all local governing regulations.

### PART 2 - PRODUCTS

#### 2.1 PRODUCTS

- A. Provide construction tools, equipment, materials, and supplies of the type and quantities that will facilitate the timely execution of the Work.

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**PART 3 - EXECUTION**

3.1 EXECUTION AND REMOVAL

- A. Provide personnel, products, construction materials, equipment, tools, and supplies at the work site at the time they are required and scheduled to be installed or utilized.

**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. Refer to Section 013210 - Schedule, for details regarding mobilization scheduling, billing, and payment.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. Refer to Article 1104 - Changes in the Work, Contract Price or Contract Time of the General Contract Conditions, 2011 Edition.

**END OF SECTION 015050**



## SECTION 015210 - TEMPORARY FACILITIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.
  - 2. Section 312319 "Dewatering" for disposal of ground water at Project site.
  - 3. Section 321216 "Asphalt Paving" for construction and maintenance of asphalt pavement for temporary roads and paved areas.
  - 4. Section 321313 "Concrete Paving" for construction and maintenance of cement concrete pavement for temporary roads and paved areas.

#### 1.3 DESCRIPTION

- A. The Work specified in this Section consists of furnishing, installing, operating, maintaining, and removing temporary construction barriers, enclosures, and field facilities including the Contractor's construction offices, staging areas, yards, storage areas, electrical power, telephone, water, fire protection, and sanitary service.
- B. Construction Offices, Construction Yards and Storage Areas:
  - 1. The Contractor's offices, construction yards laydown and storage areas shall be located as shown on the Contract Drawings and/or as designated by the DEN Project Manager. All construction offices, staging areas, and material storage areas are to occur within these areas.
  - 2. Any activity that is expected to result in disturbance of the ground surface equal to or greater than one acre or part of a larger project that is expected to disturb equal to or greater than one acre, is required to be identified in their Erosion Control permit. These areas include, but are not limited to, laydowns, borrow areas, stockpiles, and storage areas regardless of the location.
  - 3. All areas of ground disturbance are required to be stabilized in accordance with State, local, and airport rules and regulations prior to permit termination and/or closure of the Contract.

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4. The Contractor shall restore any area on DEN property that becomes contaminated as a result of its operations in accordance with Airport Rule and Regulation 180. Restoration shall be either to applicable standards under Federal and State law or to such other levels as may be required by the Manager of Aviation, at the Manager's sole discretion.
5. All temporary facility sites must be inspected prior to Contract closeout.
  - a. The DEN Project Manager or authorized representative shall conduct an inspection of contractor areas used during the life of the project. These areas include but are not limited to, staging areas, laydown areas, borrow areas, and contractor yards and offices.
6. The DEN Project Manager will ensure these areas have been properly stabilized in accordance with DEN Rules and Regulations and required permits. Site must be restored to the condition in which the City initially provided to the Contractor. A representative from DEN Environmental Services shall be present during the final walk through.
7. Contractor materials shall be managed in accordance with all applicable Environmental Regulations.
8. Temporary facilities which the Contractor desires to locate in secondary laydown and staging areas adjacent to the Work or within the project limits are subject to approval by the DEN Project Manager. If approved, these areas must also be included as part of their erosion control permit.
9. Access to and security of the Contractor's construction offices, yard, temporary facilities, and storage areas shall be as shown on the Contract Drawings or as specified in the Contract Special Conditions.
10. Contractor Field Office:
  - a. The Contractor shall acquire all necessary permits for installation and construction work related to the Contractor's field office and fencing.
  - b. The Contractor shall provide, as part of the Contractor's on-site field office, a conference room for weekly meetings. Minimum size to accommodate ten (10) people with the currently approved schedule posted on a wall. The conference room shall have network connection with a monitor and one (1) available telephone.
  - c. Jack the mobile office unit off its wheels and provide support. Enclose the underside of the trailer with weatherproof skirting.
  - d. Install tie downs in compliance with all applicable codes.
  - e. Provide access to the field office and easily accessible space for parking six (6) full size passenger automobiles as a minimum. Grade the field office site, access roadway, and parking area for drainage, and surface with gravel paving or crushed stone.
  - f. Water and sewer lines to the field office, if installed, shall be installed so they will not freeze.
11. All Contractor Storage Yards must be fenced. Submit fencing plan and typical details to DEN Project Manager at least seven (7) days before planned execution for review and acceptance.
12. In accordance with Denver Fire Department Requirements, all Temporary Facilities shall have signage that lists the following information:

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- a. Company Name
- b. Contact Telephone Number
- c. Facility Address

C. Electrical Service

1. Provide lighting and power for field offices, storage facilities and other construction facilities and areas.
2. Provide power centers for electrically operated and controlled construction facilities including tools, equipment, testing equipment, interior construction lighting, heating, cooling and ventilation equipment.
3. Provide night security lighting at secured areas within construction limits at offices, storage facilities, temporary facilities and excavated areas.
4. Provide battery operated or equivalent emergency lighting facilities at construction areas where normal light failures would cause employees to be subjected to hazardous conditions. Test such facilities monthly and maintain a record of these tests for the DEN Project Manager's review.
5. Contractor shall bear all costs of temporary electric service permits, fees, and deposits required by the governing authorities, and connection charges and temporary easements including installation, maintenance, and removal of equipment.

D. Telephone/Communications Service:

1. The Contractor shall furnish, install, and maintain at least two (2) telephones in the Contractor's main field office. These phones shall be manned at all times by the Contractor's personnel or by an answering machine when personnel are not in the field office.
2. Comply with requirements of Division 26 Sections.

E. Water Service:

1. The Contractor shall make all connections and extensions required and shall make use of water in direct support of the Work. The Contractor shall install an approved Water Department tap at the City's water source prior to obtaining any water. The Contractor shall arrange and pay for its supply/distribution system from the City's point of connection. The location and alignment of the Contractor's temporary supply/distribution system must be approved by the DEN Project Manager prior to its installation. The Contractor shall leave in place all above ground and underground water distribution facilities unless otherwise directed by the DEN Project Manager.
2. The Contractor shall not use in place fire hydrants or standpipes as sources for construction water or potable water.
3. Comply with requirements of Division 22 Sections.

F. Fire Protection:

1. Furnish, install, and maintain temporary portable fire protection equipment throughout the construction period at all buildings (including the project site), maintenance shops, and fuel storage on all large construction equipment and at the location of any flammable materials or construction materials.

2. Comply with requirements of Division 21 Sections.

G. Sanitary Service:

1. Furnish, install, and maintain temporary sanitary facilities and services throughout the construction period.
2. Ensure that separate or single user toilets shall be provided to ensure privacy between the sexes.
3. Provide general washing facilities adequate for the number of employees.
4. Provide special washing facilities adequate for the number of employees engaged in the application of paints, coating, and other volatile or hazardous materials.

1.4 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.
- B. Submit a shop drawing within five (5) days of the Notice to Proceed that shows the following:
  1. Temporary facilities equipment and materials (include manufacturer's literature).
  2. Details and layout of temporary installations including fences, roads, parking, buildings, storage areas, signage, and drainage plans.
  3. Lighting plan showing temporary lighting facilities, electrical service panel location, electrical circuit diagram, and anticipated light level on the working roadway, pathway, or construction surface.
  4. As-built description of any temporary underground utilities referenced to the Airport grid and benchmark system within five (5) days of completion of the installation.
  5. Copies of all permits for all temporary facilities.

1.5 QUALITY CONTROL

- A. Provide products for, and the execution of, the Work of this Section that will satisfy the requirements of all applicable codes. Provide products that satisfy the requirements of the applicable codes.

**PART 2 - PRODUCTS**

2.1 ELECTRICAL SERVICE

- A. Provide temporary power and lighting equipment consisting of fixtures, transformers, panel boards, groundings, lamps, switches, poles, conduits and wiring sized and capable of continuous service and having adequate capacity to ensure a complete operating system. Comply with NEMA and Division 26 requirements.

## 2.2 TELEPHONE/COMMUNICATIONS SERVICE

- A. Provide equipment that is compatible with that of the current DEN service provider and the telephone exchange to which the Contractor connects.

## 2.3 POTABLE WATER SERVICE

- A. Provide sanitary materials and equipment that satisfies the requirements of codes and regulations pertaining to temporary water systems. Bottled products may be used if those products comply with codes. Clearly label portable containers having a dispensing tap and used only for drinking water. Provide single service disposable cups and a sanitary container for dispensing cups. A trash receptacle shall be provided and maintained beside each portable water supply.
- B. If paints, coatings and other volatile or hazardous materials injurious to humans will be applied as part of the Contract, provide washing facilities with warm water of approximately 120 degrees F.

## 2.4 FIRE PROTECTION

- A. Fire extinguishers shall be UL rated and shall comply with the International Fire Code with City of Denver amendments.

## 2.5 SANITARY SERVICE

- A. Provide materials and equipment adequate for the intended purposes, which will neither create unsanitary conditions nor violate the codes applicable to temporary sanitary facilities. Enclosures for toilet and washing facilities shall be weatherproof, sight proof, ventilated and sturdy, and shall be maintained in clean conditions.
- B. Provide portable type toilet facilities that satisfy the requirements of OSHA.
- C. Provide washing facilities as needed. Furnish soap, single-service paper towels, towel dispenser, and towel receptacle.

## PART 3 - EXECUTION

### 3.1 ELECTRICAL SERVICE

- A. The approximate location of primary power lines is shown on the Construction Drawings. The Contractor shall locate electrical service where it will not interfere with equipment, storage spaces, traffic, and prosecution of the Work or the work of others. Installation shall present a neat and orderly appearance and shall be structurally sound. Maintain service in a manner that will ensure continuous electrical service and safe working conditions.
- B. Comply with requirements of Division 26 Sections.

### 3.2 TELEPHONE/COMMUNICATION SERVICE

- A. Install temporary telephone service in a neat and orderly manner, and make structurally and electrically sound to ensure continuous service. Modify, relocate, and extend, as work progress requires. Place conduit and cable where those products will not interfere with traffic, work areas, materials, handling equipment, storage areas, and the work of other contractors. Service lines may be aerial.

### 3.3 WATER SERVICE

- A. Install the systems in a neat and orderly manner. Make them structurally and mechanically sound. Provide continuous service. Modify, relocate, and extend the systems as the Work progresses.
- B. Comply with requirements of Division 22 Sections.
- C. Locate systems where they will be convenient to work stations, sanitary facilities, and first aid station but will not interfere with traffic, work areas, materials handling equipment, storage areas, or the work of other contractors.
- D. Provide sanitary bubbler drinking fountains if potable water service is available. Disinfect water piping before using for the potable water service.
- E. Install vacuum breakers, backflow preventers, and similar devices in a manner and location that will prevent temporary water from returning to the water mains.
- F. Do not incorporate any part of temporary water distribution system into the permanent water distribution system.

### 3.4 FIRE PROTECTION

- A. Install products in conformance with the requirements of the applicable Denver Fire Department and OSHA regulations.
  - 1. Provide functional, approved fire extinguishers that are clearly identified for fire and an accessible supply of water during the period of construction. These fire extinguishers shall remain in place until permanent fire protection systems are functional.
- B. Instruct construction personnel as to location and use of temporary fire protection equipment.
- C. Comply with requirements of Division 21 Sections.

### 3.5 SANITARY SERVICE

- A. Place temporary sanitary and washing facilities in a neat and orderly manner within the limits of the Work and convenient to the workstations. Make these facilities structurally and mechanically sound. Modify, relocate, and extend the facilities as required by progress of the Work.
- B. Service toilets at those time intervals that will minimize the accumulation of wastes and prevent creation of unsanitary conditions, but not less than once a week.
- C. The waste from the sanitary and wash facilities shall be disposed of in accordance with all applicable rules, regulations, and laws and with the least environmental impact.

### 3.6 FENCING

- A. Contact all utility service companies prior to planning fence location and post locations for certification of current utilities. Locate pothole posts planned within five (5) feet of known utilities.

### 3.7 SIGNAGE

- A. Contractor shall not provide any signage for temporary facilities without prior approval from the DEN Project Manager.

### 3.8 REMOVAL

- A. The Contractor shall locate all temporary facilities including the underground utilities so they can be completely removed without damaging permanent work or the work site of other contractors.

## PART 4 - MEASUREMENT

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

## PART 5 - PAYMENT

### 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this section.

## END OF SECTION 015210

## **SECTION 015215 - FIELD OFFICES**

### **PART 1 - GENERAL**

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Work specified in this Section consists of furnishing, installing and maintaining a field office at the work site for the City's use.
- B. DEN shall provide field offices at the location specified by the Contract Documents.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION (NOT USED)**

### **PART 4 - MEASUREMENT**

#### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

### **PART 5 - PAYMENT**

#### 5.1 PAYMENT

- A. No separate payment will be made for work under this Section.

### **END OF SECTION 015215**



## SECTION 015525 - TRAFFIC CONTROL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Work specified in this Section consists of furnishing plans and designs for traffic control and haul routes, implementing these plans with all necessary personnel and equipment. Installation may require but not be limited to signage, cones, flaggers, signal lights, lighting and temporary roads.
- B. All Work must be in conformance with the "Manual of Uniform Traffic Control Devices for Streets and Highways" (MUTCD) and CDOT Standard Plans regarding traffic control.
- C. The Contractor must coordinate the Contractor's proposed traffic control needs with the needs of other contractors on the airport construction site in writing through the DEN Project Manager.
- D. Refer to Article 805 – Protection of Street and Road System in the General Contract Conditions, 2011 Edition.

#### 1.3 QUALITY CONTROL

- A. Temporary signal work shall conform to CDOT Standard Plans and the current version of the CDOT Standard Specifications.
- B. Designate a qualified person to inspect and test traffic control devices daily and to ascertain that those devices are continuously operating, serviceable, in place, and clean.
- C. Provide certified personnel who will be responsible for design, implementation, and inspection of traffic control needs.

#### 1.4 SUBMITTALS

- A. Refer to Technical Specifications Sections 013300 "Submittals" and 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.

- B. Submit a Traffic Control Plan (TCP) that includes, at a minimum, the following list of items for approval before starting Work. Submit an updated TCP when necessary to modify traffic operation or undertake a construction activity that creates a different traffic pattern:
1. Traffic blockade and reductions anticipated to be caused by construction operations.
  2. Temporary detours.
  3. A Method of Handling Traffic (MHT) must be submitted and approved by the DEN Project Manager, which at a minimum will show and describe proposed location, dates, hours, and duration of detours, vehicular traffic routing, and management, traffic control devices for implementing detours and details of barricades.
- C. Submit Haul Route Plan for both on- and off-site hauls. The Haul Route Plan shall be submitted 30 days prior to hauling any permanent material. The Plan shall be updated as the Contractor's plans change.
- D. Specific Traffic Considerations: The DEN Project Manager may require the Contractor to revise the Traffic Control Plan to address traffic considerations not included in the Contractor's plan.
- E. Shutdown requests for any impact to traffic must be submitted for approval a minimum of five days before the intended shutdown. These requests will be made through the DEN Project Manager.

## PART 2 - PRODUCTS

### 2.1 TRAFFIC CONTROL DEVICES

- A. Devices including signs, delineators, striping, barriers, barricades, and high-level warning devices shall conform to the latest revision of the MUTCD and the latest revision of the Colorado Department of Transportation Standard Plans.

## PART 3 - EXECUTION

### 3.1 TEMPORARY TRAFFIC CONTROL DEVICES

- A. Place temporary control devices in a manner that allows for the smooth flow of traffic at the posted speed limit, limiting hazards or abrupt changes in direction.
- B. Place traffic cones or delineators as directed by the MUTCD. Operate warning lights between sunset and sunrise.
- C. Place control devices so that approaching traffic is alerted to hazards and variances to normal traffic patterns.
- D. Clean and repair damaged devices or replace them with new devices as required.

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### 3.2 TEMPORARY TRAFFIC STRIPING AND PAVEMENT MARKINGS

- A. Full-compliance striping is required at all times per the MUTCD.
- B. Temporary signs must be replaced with permanent signing within three days per the MUTCD.

### 3.3 FLAGGERS

- A. Furnish flaggers where required for safety and by the MHT.

### 3.4 CONSTRUCTION VEHICULAR TRAFFIC

- A. Restrict construction vehicles to approved haul routes.
- B. Haul routes on the airfield must be approved by Security.

### 3.5 CONTROLLING VEHICULAR AND PEDESTRIAN FLOW ADJACENT TO WORK SITE

- A. Ensure that construction operations will not impede normal traffic. Where work is in the area of pedestrian or occupant activity, the Contractor shall detail a plan for managing pedestrian traffic safely. Refer to Title 8 - Protection of Persons and Property, Section 801.1 in the General Contract Conditions, 2011 Edition.

### 3.6 SIGNS

- A. Refer to Title 8, Article 802 - Protective Devices and Safety Precautions in the General Contract Conditions, 2011 Edition.
  - 1. The Contractor must contact the DEN Project Manager a minimum of five (5) working days in advance of construction for installation, relocation, or removal of regulatory parking signs.
- B. Coordinate and pay any expense associated with the furnishing and installation of all parking regulatory signs, such as "No Stopping Any Time," etc., at the work site.
- C. Furnish and install any necessary advance detour or guidance signing.
- D. Authorize, modify, and install regulatory parking controls and vehicle turn restrictions.
- E. Implement those traffic control modifications outside of the traffic control zone that are necessary to manage diverted traffic.

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**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 PAYMENT

- A. Payment for Traffic Control under these schedules will be for work performed under the applicable unit price item or lump sum bid item.

**END OF SECTION 015525**

## SECTION 015719 - TEMPORARY ENVIRONMENTAL CONTROLS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Specifications Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Title 8 - Protection of Persons and Property in the General Contract Conditions, 2011 Edition, specifically the following articles:
  - 1. Article 806 - Protection of Drainage Ways
  - 2. Article 807 - Protection of Environment
  - 3. Article 808 - Hazardous and Explosive Materials or Substances
  - 4. Article 809 - Archaeological and Historical Discoveries
- C. Denver Municipal Airport System Rules and Regulations, Part 180-Environmental Management.
- D. DEN Environmental Management System (EMS)

#### 1.2 SUMMARY

- A. The Work specified in this Section consists of identifying, and avoiding or mitigating adverse environmental impacts to air, water, soil, and other natural resources caused by construction activities.
  - 1. The Contractor, in conducting any activity on airport property or in conducting work for an airport project not on airport property, shall comply with all applicable airport, local, state, and federal rules, regulations, statutes, laws, and orders.
  - 2. Work shall not commence on any project until all FAA approvals have been received, applicable permits have been issued and signed by permittee, and all inspection requirements have been satisfied in accordance with State and local permitting requirements.

#### 1.3 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.
- B. Within ten (10) days after Notice to Proceed on a task order, the Contractor shall submit the following if applicable, unless waived by the DEN Project Manager:
  - 1. Submittals pertaining to water quality management:
    - a. Construction Activities Stormwater Discharge Permit

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- 1) City and County of Denver
    - a) Sewer Use & Drainage Permit (SUDP)
    - b) Construction Activities Stormwater Discharge Permit (CASDP)
  - 2) Colorado Department of Public Health and Environment (CDPHE) Colorado Discharge Permit System (CDPS) Authorization to Discharge (Contractor need not submit a copy of the general permit or the general permit rationale)
    - a) CDPS General Permit for Stormwater Discharges Associated with Construction Activities
    - b) CDPS General Permit for Associated with Non-Extractive Industrial Activity
    - c) CDPS General Permit for Construction Dewatering Discharges (Prior to obtaining a CDPS General Permit for Construction Dewatering Discharges permit, the Contractor shall submit a draft permit application and the final permit application for DEN review and approval PRIOR to submittal to CDPHE. The Contractor need not submit a copy of the general permit or the general permit rationale.
  - 3) Upon request the contractor shall provide the following documentation
    - a) Stormwater Management Plan (SWMP)
    - b) CASDP Inactivation Request
    - c) CDPS Notice of Termination
    - d) Permit Transfer Application
    - e) Modification Application
    - f) Discharge Monitoring Reports (DMRs)
    - g) A copy of the well permit from the state Division of Water Resources for every new well that diverts or for the monitoring of groundwater. (A draft copy of the Notice of Intent for any borehole structure filed with the state Division of Water Resources).
    - h) Section 404 related permitting (Prior to obtaining a permit issued by the US Army Corps of Engineers, the contractor shall submit a draft copy of the application and coordinate with efforts DEN Environmental Services).
  - 4) Revisions or amendments to the CASMP by the Contractor: At the completion of the Project, after final stabilization has been achieved and accepted in accordance with CASDP requirements, the Contractor shall submit a copy of the CASDP Inactivation Request.
2. Submittals pertaining to sewage holding tanks associated with buildings and trailers: For purposes of this Section, the generic term "sewage holding tank" means "individual sewage disposal system (ISDS)", "privy vault", "septic tank", or "septic system":

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- a. Draft copy of the permit application for a sewage holding tank.
  - b. Copy of the Sewer Use & Drainage Permit issued by the Denver Department of Public Works.
  - c. Copy of the ISDS permit issued by the Denver Department of Environmental Health.
3. Submittals pertaining to air quality management:
- a. Copy of any permit issued by the CDPHE Air Pollution Control Division (APCD)
4. Submittals pertaining to storage tanks and containers:
- a. Copy of the approved application issued by the State of Colorado, Department of Labor and Employment, Division of Oil and Public Safety, for installation of petroleum, or other regulated substances, storage tanks located on airport property and used for the Project.
  - b. Copy of permits issued by the Denver Fire Department for storage tank installations, storage tank removals, and hazardous materials use/storage.
  - c. Copy of Spill Prevention, Control, and Countermeasure (SPCC) Plan for petroleum storage tanks and containers with capacity of 55 gallons of oil or greater located on airport property and used for the Project.
5. Copies of any other plans, permits, permit applications, correspondence with regulatory agencies, including violations, waste manifests, results of laboratory analyses, or other environmental documentation required for the Project not previously identified herein.

#### 1.4 RELATED DOCUMENTS

- A. Code of Federal Regulations (CFR) Publications, including, but not limited to, the following:
1. 33 CFR 323 - Permits for discharges of dredged or fill materials into waters of the United States.
  2. 40 CFR - Protection of Environment.
  3. 49 CFR 171-180 Hazardous Materials Transportation Regulations.
- B. Colorado Revised Statutes, including, but not limited to, the following:
1. Water Quality Control, Title 25, Article 8.
  2. Air Quality Control, Title 25, Article 7.
  3. Hazardous Waste, Title 25, Article 15.
  4. Noise Abatement, Title 25, Article 12.
  5. Petroleum Storage Tanks, Title 8, Article 20.5.
  6. Liquefied Petroleum Gas (LPG) Storage Tanks, Title 8, Article 20, Part 4.
  7. Solid waste regulations.
- C. City and County of Denver Executive Orders, including, but not limited to, the following:

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1. Executive Order No. 115 - Required Use of Denver-Arapahoe Disposal Site (Landfill).
  2. Executive Order No. 123 - Greenprint Denver Office and Sustainability Policy.
  3. Denver Revised Municipal Code, Title II, Sections 48-44 and 48-93 - Solid Waste.
- D. City and County of Denver Construction Sites Program.
- E. City and County of Denver Construction Activities Stormwater Management Plans Information Guide.
- F. Any other applicable rules, regulations, ordinances, and guidance must be followed as applicable.
- G. Refer to Section 013300 "Submittal Procedures" and 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.
- H. Refer to Section 017419 "Construction Waste Management" for waste management requirements

**PART 2 - PRODUCTS**

## 2.1 PRODUCTS

- A. Products required for the Work shall meet all Environmental Requirements.
- B. At a minimum, products for erosion and sediment control must conform to the technical requirements contained in the City and County of Denver "Construction Activities Stormwater Manual" and the current version of the "Urban Drainage and Flood Control District's Urban Storm Drainage Criteria Manual, Volume 3: Best Management Practices".

**PART 3 - EXECUTION**

## 3.1 AIR POLLUTION CONTROLS

- A. The Contractor shall use appropriate control measures to comply with applicable air quality permit requirements. Additionally, the Contractor must be aware of the following procedures and techniques while conducting construction activities on DEN property. NOTE: Application of dust control measures should be discussed and outlined in the Dust Control Plan.
1. Apply water as needed to the construction site haul roads, disturbed surface areas and public access roads as needed to suppress dust. The use of chemical stabilizer can be requested by the Contractor. The type of stabilizer to be used and locations of use must be included in the Dust Control Plan, which must be approved by the DEN Project Manager prior to application.



2. The Contractor shall suspend all earthmoving activities if wind speed exceeds 30 mph. For purposes of this Section, the generic term "earthmoving" means clearing, grubbing, excavation, topsoil removal, backfilling, embankment work, grading, trenching, drilling, and installation of borings. Contractors are expected to check wind speeds with the airport's ramp tower to demonstrate compliance with this requirement. In addition, the Project may be shut down if two of three of the Runway Visual Range (RVR) instruments read visibility of 2,400 feet or less. The instruments are used by FAA Control Tower personnel to ensure safe aircraft operations. Costs for shutdowns due to wind velocities or RVR readings shall not be grounds for delay or extra cost claims.

- B. Burning of materials is strictly prohibited on DEN property.

### 3.2 WATER POLLUTION CONTROLS

- A. The Contractor shall conduct construction activities in accordance with all applicable permit requirements. In addition, the Contractor shall comply with the following procedures and requirements while conducting activities on DEN property:
1. Water encountered during construction cannot be discharged to the stormwater system or placed onto the ground surface without a permit AND prior written approval by the DEN Project Manager. If groundwater or stormwater is anticipated to be encountered and the Contractor desires to discharge it to the stormwater system or onto the ground surface, then the Contractor must obtain an appropriate CDPS discharge permit in advance of the discharge unless this activity is specifically authorized under the CDPS Construction Stormwater Permit.
  2. If water is encountered and the Contractor desires to discharge these waters to the sanitary sewer system, then the Contractor must obtain approval from DEN Environmental Services in advance of the discharge.
  3. The Contractor shall ensure that stormwater that comes in contact with storage areas does not become impacted and discharged to the stormwater sewer system or to an impervious surface. Furthermore, any materials in storage areas shall not be stored directly on the ground. Refer to Section 264200 "Cathodic Protection" for cathodic protection requirements.
  4. The Contractor shall not operate any valves, sluice gates or other drainage appurtenances related to any DEN sewer system without the prior approval of both the DEN Project Manager and DEN Environmental Services. Any violation of this directive may result in the payment of a financial penalty by the Contractor if the State of Colorado assesses such a penalty.

### 3.3 EROSION CONTROL AND SEDIMENTATION CONTROL

- A. This Work consists of constructing, installing, maintaining and removing, if required, temporary and permanent control measures during the life of the Contract (and possibly afterward) until the Contractor achieves final stabilization of the site to prevent or minimize erosion, sedimentation, and pollution of any state waters in accordance with all Environmental Requirements.

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- B. The Contractor is responsible for compliance with all requirements in accordance with the CASDP, the City and County of Denver Construction Sites Program, the approved CASMP, and CDPS-issued permits.
- C. Temporary facilities, including but not limited to storage areas, laydowns, borrow areas, and contractor offices and work yards, shall be managed in accordance with Section 015210 "Temporary Facilities".
- D. Clean soil fill may be stockpiled in any area that has been previously approved and signed off by the DEN Section Manager of Construction, Design and Planning, and Environmental Services. Soil stockpiles are considered a potential pollutant source and must be addressed in the CASMP and/or SWMP.
- E. Make immediately available, upon the DEN Project Managers request, all labor, material, and equipment judged appropriate by the DEN Project Manager to maintain suitable erosion and sediment control features. These actions requested by the DEN Project Manager take precedence over all other aspects of project construction that have need of the same labor, material and equipment, except those aspects required to prevent loss of life or severe property damage.

### 3.4 CONSTRUCTION OF CONTROL MEASURES FOR EROSION AND SEDIMENTATION

- A. The Contractor must install control measures in accordance with the most recent version of the "Urban Drainage and Flood Control District's Urban Storm Drainage Criteria Manual, Volume 3: Best Management Practices and the City and County of Denver Construction Activities Stormwater Manual".
  - 1. Deviations from these two documents are allowed with written consent from the City and County of Denver NPDES Inspector.

### 3.5 STORAGE OF OIL, FUELS, OR HAZARDOUS SUBSTANCES

- A. The Contractor shall prevent oil or other hazardous substances, as defined in federal and state regulations, from entering the ground, drainage or local bodies of water, and shall provide containment, diversionary structures, or equipment to prevent discharged oil from reaching a watercourse and take immediate action to contain and clean up any spill of oily substances, petroleum products, or hazardous substances. The Contractor shall provide one or more of the following preventive systems at each petroleum storage site:
  - 1. Dikes, berms, or retaining walls capable of containing at least 100% of the volume of the largest single tank and equipped with sufficient freeboard to contain precipitation events. The secondary containment must be "sufficiently impermeable" to prevent a release to the environment.
  - 2. Culverting, curbing, guttering, or other similar structures capable of containing at least 100% of the volume of the largest single tank and freeboarding from precipitation.

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- B. The provision of such preventive systems shall be subject to acceptance by the DEN Project Manager prior to tank installation and shall follow the SPCC regulations (40 CFR Part 112).
- C. Prior to bringing any containers of 55-gallon or above capacity onto DEN property for storage of oil, fuel, or other petroleum substances, the Contractor may be required to prepare an SPCC Plan that conforms to 40 CFR Part 112. The plan must include a certification either from a Professional Engineer or self-certification, if applicable, as well as management approval from the legally responsible Contractor representative.

## 3.6 SPILL RESPONSE AND NOTIFICATION

- A. The Contractor is responsible for all spills that may result from its activities. For ANY suspected or confirmed release or spill of oil, fuel, solid waste, hazardous waste, unknown materials, lavatory waste, or miscellaneous chemicals, etc., that occurs as the result of the Contractor's activities on DEN property, the Contractor is required to take immediate action to mitigate the release or spill and report it to the DEN Project Manager and to the DEN Communications Center at (303) 342-4200.
- B. The Contractor is responsible for notifying the appropriate regulatory agency in the event suspected and/or confirmed releases are identified, in accordance with regulatory requirements.

## 3.7 SITE REMEDIATION AND RESTORATION

- A. The Contractor shall be required to perform any necessary site assessment and remediation activities required by applicable regulatory agency.
- B. During routine construction activities, the Contractor is required to manage soils using typical construction techniques. The Contractor must differentiate between soils and wastes, including contaminated soils versus clean soils, and determine those materials that can remain on DEN property and those that must be transported off site for disposal.
- C. During all construction activities that require the management of soils, the Contractor must notify the DEN Project Manager and DEN Environmental Services (ES) that soils being managed may be impacted by industrial activities conducted at the airport. "Process knowledge" pertaining to previous use and/or impact for the locations under construction can be used to determine whether impacted soils are probable. Also, common indices such as soil staining and odor can be used as a determination for the probable condition. If probable contamination conditions are suspected, the Contractor will notify the DEN Project Manager and DEN ES immediately. At that time, which may be before the Work is initiated where indicative conditions exist, all work will cease until a sampling and analysis approach is determined and implemented by the proper responder.

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- D. If the site conditions warrant based on evidence of spillage or contamination, process knowledge, and/or visual or olfactory observations, the Contractor may be required to conduct sampling and analysis to confirm that no remedial action is required. Prior to conducting any removal activities, the Contractor must provide a Scope of Work to the DEN Project Manager describing the proposed site assessment activities.
- E. The impacted project will modify its operation to include a segregation area where probable impacted soils can be placed, stored, and sampled for characterization. Should the soil materials be determined to exceed the applicable standards, the DEN Project Manager, in conjunction with DEN ES, will be responsible for the proper disposal of these materials. Materials that are determined to contain contamination levels below the applicable standards can be considered clean soils and placed back into the excavation or reused elsewhere on DEN property. In accordance with Part 3 of this Section, materials removed that are suitable for recycling will be placed within areas designated on DEN to store these materials.
- F. The Contractor shall restore any area on the Airport that becomes contaminated as a result of its operations. Restoration shall be either to applicable standards under federal and state law or to such other levels as may be required by the Manager of Aviation, at the Manager's sole discretion. Such restoration shall be completed at the earliest possible time, and the Contractor's restoration shall be subject to inspection and approval by the Manager of Aviation or duly authorized representative. See DEN Rules & Regulations - Part 180.

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT****5.1 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section.
- B. The Contractor shall be responsible for payment of all fees associated with review of environmental permit applications and processing of environmental permits.

**END OF SECTION 015719**

## SECTION 015810 - TEMPORARY SIGNS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes requirements for the following:
  - 1. Construction signage visible to the public.
  - 2. Temporary directional, informational, or regulatory signage.
- B. Related Requirements:
  - 1. Section 015210 "Temporary Facilities" for requirements for temporary facilities.

#### 1.3 SUBMITTALS

- A. Submit temporary sign finishes, materials and paint, etc., for review and approval by DEN Project Manager prior to any fabrication.

#### 1.4 QUALITY CONTROL

- A. Construction and other temporary signage visible to the public must be commercial grade quality, professionally fabricated, and installed based on the location of the sign. The Contractor is responsible to maintain this signage until it is no longer needed, and to remove signage from the site.

### PART 2 - PRODUCTS

#### 2.1 GENERAL

- A. Interior signs that are visible and not physically accessible to the public may be made of rigid board, such as "Gator Board", with vinyl messages. All edges must be finished and all fasteners concealed.
- B. Interior signs that are visible and physically accessible by the public must be vandal-proof. Acceptable examples of vandal-proof signs are messages applied second surface with concealed tamperproof fasteners.

- C. Exterior signs must be vandal-proof and fabricated of weatherproof materials.

### **PART 3 - EXECUTION**

#### **3.1 HARDWARE**

- A. Interior Signs: Attach with suitable adhesive and/or tape which may be removed without damage to finishes.
- B. Exterior Signs: Must be secured to withstand site conditions and varying weather conditions.

#### **3.2 SIGN FINISHES, MATERIALS, AND PAINT**

- A. Provide temporary signage to reflect permanent sign design and/or as directed by the DEN Signage Design Project Manager. Submit temporary sign finishes, materials and paint, etc., for review and approval prior to any fabrication.

#### **3.3 MAINTENANCE**

- A. The Contractor shall maintain temporary signage until it is no longer needed, as determined by DEN Project Manager.

#### **3.4 REMOVAL**

- A. The Contractor shall remove all temporary signs, and clean and refurbish affected areas to their original, or intended, condition.

### **PART 4 - MEASUREMENT**

#### **4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

### **PART 5 - PAYMENT**

#### **5.1 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section.

## SECTION 016000 - PRODUCT REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
1. Section 012300 "Alternates" for products selected under an alternate.
  2. Section 012510 "Substitutions" for requests for substitutions.
  3. Section 014225 "Reference Standards" for applicable industry standards for products specified.

#### 1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
  2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
  3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.



#### 1.4 SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number, title, and Drawing numbers and titles.
1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
  2. DEN Project manager's Action: If necessary, DEN Project Manager will request additional information or documentation for evaluation within one week of receipt of a comparable product request. DEN Project Manager will notify of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
    - a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
    - b. Use product specified if DEN Project Manager does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

#### 1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
  2. If a dispute arises between contractors over concurrently selectable but incompatible products, DEN Project Manager will determine which products shall be used.

#### 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.



3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

## 1.7 PRODUCT WARRANTIES

- A. Refer to Title 18 - Warranties, Guarantees and Corrective Work of the General Contract Conditions, 2011 Edition.
- B. Submittal Time: Comply with requirements in Section 017720 "Contract Closeout."

## PART 2 - PRODUCTS

### 2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged, and unless otherwise indicated, are new at time of installation.
  1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
  4. Where products are accompanied by the term "as selected," DEN Project Manager will make selection.

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5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
  6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  3. Products:
    - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.
    - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
  4. Manufacturers:
    - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.
    - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
  5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match DEN Project Manager's sample", provide a product that complies with requirements and matches DEN Project Manager's sample. DEN Project Manager's decision will be final on whether a proposed product matches.

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1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012510 "Substitutions" for proposal of product.

- D. Visual Selection Specification: Where Specifications include the phrase "as selected by DEN Project Manager from manufacturer's full range" or similar phrase, select a product that complies with requirements. DEN Project Manager will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: DEN Project Manager will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, DEN Project Manager may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
  2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  3. Evidence that proposed product provides specified warranty.
  4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
  5. Samples, if requested.

## 2.3 MATERIALS

- A. General: Comply with requirements specified in other Sections.
1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in Section 018113.13 "Sustainable Design Requirements - LEED for New Construction and Major Renovations," Section 018113.16 "Sustainable Design Requirements - LEED for Commercial Interiors," Section 018113.19 "Sustainable Design Requirements - LEED for Core and Shell Development."
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to DEN Project Manager for the visual and functional performance of in-place materials.

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**PART 3 - EXECUTION (Not Used)**

**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 016000**

## SECTION 016610 - STORAGE AND PROTECTION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Work specified in this Section consists of providing storage and protection of the materials, products and supplies which are to be incorporated into the construction and indicating such storage areas on the working drawings with the location and dates when such areas will be available for each purpose.
- B. Related Requirements:
  - 1. Section 015210 "Temporary Facilities" for requirements for temporary facilities.

#### 1.3 SUBMITTALS

- A. Refer to Technical Specifications Sections 013300 "Submittal Procedures" and 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures. Submit concurrently with submittals required in Section 013223 "Construction Layout, As-built and Quantity Surveys".
- B. Submit working drawings showing locations of storage areas not indicated on the Contract Drawings.
- C. Submit descriptions of proposed methods and locations for storing and protecting products.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Materials required for the storage and protection of the items specified shall be durable, weatherproof and either factory finished or painted to present an appearance acceptable to the DEN Project Manager and the City. Storage facilities shall be uniform in appearance with similar materials used to the maximum extent possible.

**PART 3 - EXECUTION****3.1 GENERAL REQUIREMENTS OF EXECUTION**

- A. Palletize materials, products, and supplies that are to be incorporated into the construction and stored off the ground. Material and equipment shall be stored only in those areas that are indicated as storage areas on the Contract Drawings and on the reviewed and accepted working drawings.
1. Store these items in a manner which will prevent damage and which will facilitate inspection.
  2. Leave seals, tags, and labels intact and legible.
  3. Maintain access to products to allow inspection.
  4. Protect products that would be affected by adverse environmental conditions.
- B. Periodically inspect stored products to ensure that products are being stored as stipulated and that they are free from damage and deterioration.
1. Any damaged or deteriorated materials must be replaced immediately to avoid delays in the project schedule.
- C. Do not remove items from storage until they are to be incorporated into the Work.
- D. The Contractor shall ensure that all protective wrappings and coverings are secure and ballasted to prevent any items from deterioration and/or subsequent dislodgment. All items on the work site that are subject to becoming windborne shall be ballasted or anchored.

**3.2 HANDLING AND TRANSPORTATION**

- A. Handling:
1. Avoid bending, scraping, or overstressing products. Protect projecting parts by blocking with wood, by providing bracing or by other approved methods.
  2. Protect products from soiling and moisture by wrapping or by other approved means.
  3. Package small parts in containers such as boxes, crates, or barrels to avoid dispersal and loss. Firmly secure an itemized list and description of contents to each container.
- B. Transportation:
1. Conduct the loading, transporting, unloading, and storage of products so that they are kept clean and free from damage.

### 3.3 STORAGE

- A. Store items in a manner that shall prevent damage to the DEN's property. Do not store hydraulic fluids, gasoline, liquid petroleum, gases, explosives, diesel fuel, and other flammables in excavations. Petroleum products and chemicals must be stored in closed containers within secondary containment.
- B. Provide sheltered weather-tight or heated weather-tight storage as required for products subject to weather damage.
- C. Provide blocking, platforms or skids for products subject to damage by contact with the ground.
- D. All material shall be stored according to the manufacturer's recommendations. Any material that has to be stored within specified temperature or humidity ranges shall have a 24-hour continuously written recording made of the applicable condition. Should the recording show that the material was not stored within the recommended ranges the material shall be considered defective and in nonconformance. If a certification from the manufacturer's engineering design representative is provided stating that the actual variations are acceptable and will in no way harm the material or affect warranties, then the deficiency will be considered corrected.
- E. Store hazardous material separately, with all material marked with a label showing the hazard and how to treat exposure to the material. Store incompatible materials separately.
- F. Extra materials that are left over at the completion of the Work shall be removed from the Project site by the Contractor unless they are required to be delivered to DEN as per Contract Document requirements for maintenance stock.

### 3.4 LABELS

- A. Storage cabinets and sheds that will contain flammable substances and explosive substances shall be labeled "FLAMMABLE - KEEP FIRE AWAY" and "NO SMOKING" with conspicuous, bold lettering and conforming to OSHA requirements. Flammable substances shall be stored in flammable storage cabinets that conform to OSHA requirements.

## PART 4 - MEASUREMENT

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

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**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. The cost of the Work described in this Section shall be included in the applicable unit price item, work order, or lump sum bid item.
- B. Reference Section 012910 "Schedule of Values" for additional requirements for the possible payment of stored material.

**END OF SECTION 016610**



## SECTION 017330 - CUTTING AND PATCHING

### PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
- 1.2 Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.
- 1.3 Refer to Article 316, Cutting and Patching the Work in the General Contract Conditions, 2011 Edition
- 1.4 SUMMARY
- 1.5 Section Includes:
- A. Project information.
  - B. Work covered by Contract Documents.
  - C. Phased construction.
  - D. Work by DEN.
  - E. Work under separate contracts.
  - F. Future work.
  - G. Purchase contracts.
  - H. DEN-furnished products.
  - I. Contractor-furnished, DEN-installed products.
  - J. Access to site.
  - K. Coordination with occupants.
  - L. Work restrictions.
  - M. Specification and drawing conventions.
  - N. Miscellaneous provisions.

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- 1.6 Related Requirements:
- A. Section 015210 "Temporary Facilities" for limitations and procedures governing temporary use of DEN's facilities.
  - B. Section 015719 "Temporary Environmental Controls" for environmental control requirements.
  - C. Section 024119 "Selective Demolition" for selective demolition of structures and other elements.
  - D. Section 099123 "Interior Painting" for interior painting of areas of cutting and patching.
- 1.7 Alternates: Refer to Division 01 Section 012300 "Alternates" for description of Work in this Section affected by Alternates.
- 1.8 DEFINITIONS
- 1.9 Cutting: Removal of existing construction to permit installation of or to perform other Work.
- 1.10 Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.
- 1.11 SUBMITTALS
- 1.12 Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.
- 1.13 Cutting and Patching Proposal: Submit a proposal describing procedures at least thirty (30) calendar days before the time cutting and patching will be performed, requesting approval to proceed. Obtain approval of cutting and patching proposal by DEN Project Manager before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work. The proposal shall include at least the following information:
- A. Identification of the Contract and the Contractor's name.
  - B. Description of proposed work:
    - 1. Scope of cutting, patching, alteration, or excavation.
    - 2. The necessity for cutting or alteration.
    - 3. Drawing showing location of the requested cutting or alteration, along with radar or x-ray report.
    - 4. Trades that will execute the work.

5. Products proposed to be used.
  6. Extent of refinishing to be done.
  7. Alternatives to cutting and patching.
- C. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
- D. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted and proposed dates of interruption of service. Additionally, verify and locate anything in or behind the area prior to cutting.
- E. Proposed Dust Control and Noise Control Measures: Submit a statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.
- F. Effect on the work and other surrounding work or on structural or weatherproof integrity of Project.
- G. Written concurrence of each contractor or entity whose work will be affected.
- H. Cost proposal, when applicable.

#### 1.14 QUALITY CONTROL

1.15 Operational Elements: Do not cut and patch ANY operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance, decreased operational life or safety unless approved by the DEN Project Manager. Operations elements may include, but are not limited to the following:

- A. Primary operational systems and equipment.
- B. Air or smoke barriers.
- C. Fire protection systems.
- D. Control systems.
- E. Communication systems.
- F. Conveying systems.
- G. Electrical wiring systems.
- H. Operating systems of special construction as described in Divisions 13 and 26.
- I. HVAC systems.

- 1.16 Miscellaneous Elements: Do not cut and patch ANY of the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or those results in increased maintenance, decreased operational life or safety unless approved by the DEN Project Manager. Miscellaneous elements may include, but are not limited to the following:
- A. Water, moisture, or vapor barriers.
  - B. Membranes and flashings.
  - C. Exterior curtain wall construction.
  - D. Equipment supports.
  - E. Piping, ductwork, vessels and equipment.
  - F. Noise control and vibration control elements and systems.
  - G. Stud walls.
  - H. Roofing system
- 1.17 Visual Elements: Do not cut and patch ANY construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would reduce, in DEN's sole opinion, the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactorily manner.
- A. If possible, retain the original installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage the original installer or fabricator, engage another recognized, experienced, and specialized firm as approved by the DEN Project Manager. Visual elements may include, but are not limited to:
    - 1. Stonework and stone masonry.
    - 2. Ornamental metal.
    - 3. Matched-veneer woodwork.
    - 4. Preformed metal panels.
    - 5. Firestopping.
    - 6. Window wall systems.
    - 7. Terrazzo.
    - 8. Flooring.
    - 9. Wall coverings and finishes.
    - 10. HVAC enclosures, cabinets, or covers.

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1.18 Cutting and Patching Conference: Before proceeding, meet at the Project site with all parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.19 WARRANTY

1.20 Existing Warranties: Remove, replace, patch and repair materials and surfaces cut or damaged during cutting and patching operations by methods and with materials so as not to void existing warranties.

A. All effort shall be made to engage the original installer or fabricator to patch the exposed Work listed below that is damaged during selective demolition. If it is impossible to engage the original installer or fabricator, engage another recognized, experienced and specialized firm as approved by the DEN Project Manager:

1. Processed concrete finishes.
2. Stonework and stone masonry.
3. Ornamental metal.
4. Matched-veneer woodwork.
5. Preformed metal panels.
6. Firestopping.
7. Window wall systems.
8. Terrazzo.
9. Flooring.
10. Wall coverings and finishes.
11. HVAC enclosures, cabinets, or covers.

1.21 MATERIALS

1.22 General: All patching material shall be of the type specified for the material being patched. Comply with requirements specified in other specifications Sections.

1.23 Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually and texturally match existing adjacent surfaces to the fullest extent possible.

A. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials as approved by the DEN Project Manager.

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## **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION**

#### 3.1 EXAMINATION

3.2 Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

- A. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers. Provide additional substrates or materials if required to achieve desired final results of patching work.
- B. Immediately notify the DEN Project Manager, in writing, of unsuitable, unsafe, or unsatisfactory conditions.
- C. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.
- D. Proceed with patching only after construction operations requiring cutting are complete and inspected by the DEN Project Manager.

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### 3.3 PREPARATION

3.4 Temporary Support: Provide temporary support of Work to be cut to ensure structural value or integrity.

3.5 Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

3.6 Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.7 Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid or minimize interruption of services to occupied areas. Do not interrupt services in without approval from the appropriate authority. Refer to the appropriate Shutdown specification/procedures for applicable services.

### 3.8 POLLUTION CONTROLS

3.9 Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations. Reference Section 015719 "Temporary Environmental Controls" for requirements.

- A. Do not use water when it may damage existing construction or create hazardous or objectionable conditions such as ice, flooding, and pollution.
- B. Wet mop floors to eliminate trackable dirt and wipe down walls and doors of demolition enclosures. Vacuum carpeted areas. Professionally clean carpeted areas if required.
- C. For outdoor concrete saw cutting operations, slurry waste must be vacuumed up immediately to prevent migration off-site to pervious surfaces, surface waters or drains.

3.10 Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

- A. Concrete slurry waste must be disposed of properly in accordance with applicable airport, local and state rules and regulations.

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- 3.11 Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to the condition existing before selective demolition operations began.
- 3.12 PERFORMANCE
- 3.13 General: Employ skilled workers to perform cutting and patching. Execute cutting and demolition by methods that will prevent damage to other work and will provide a proper surface to receive patching.
- A. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
  - B. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerance, and finishes.
  - C. Restore work that has been cut or removed; install new products to provide complete work in accordance with requirements of the Contract Documents.
  - D. Fit work airtight and fire safe to pipes, sleeves, ducts, conduit, and other penetrations through surfaces as required by the Contract Documents.
- 3.14 Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and other similar operations, including excavation, using methods least likely to damage elements retained to adjoining construction. If possible, review proposed procedures with original installer and comply with original installer's written recommendations.
- A. In general, use ground fault hand or small power tools designed (to short if metal is hit) for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to the size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - B. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - C. Concrete: Use a cutting machine such as an abrasive saw or a diamond-core drill.
  - D. Proceed with patching after construction operations requiring cutting are complete.
- 3.15 Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other specification Sections.
- A. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.



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- B. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing. For continuous surfaces, refinish entire unit to the nearest break line. For an assembly, refinish entire unit.
- C. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
1. Where patching occurs on a painted surface, apply primer and intermediate paint coats over the patch and apply the final coat over the entire unbroken surface containing the patch. Provide additional coats until the patch blends with adjacent surfaces.
- D. Ceilings: Patch, repair or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

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- 3.16 Fire Rated Construction: Where rated elements are cut, reconstruct to approved designs to provide original fire rating.
- 3.17 CORE DRILLING
- 3.18 The Contractor shall execute a minimum of x-rays or ground penetrating radar (GPR) at each location planned for core drilling prior to submittal to the DEN Project Manager and to utility representatives for approval for core drilling. The request for approval shall be submitted a minimum seven (7) days before Core Drilling. The request for approval shall indicate on the x-ray or radar information regarding alternate locations or core drilling to avoid structural members and any embedded conduit. Embedded conduit may be metallic or plastic. The x-ray or radar system shall be capable of detecting both types of conduit.
- 3.19 Core drilled "cores" and the core-drilled opening shall be inspected by DEN Project Manager Representatives prior to installation of any systems in new openings.
- 3.20 The request for approval shall indicate on the x-ray or radar information regarding alternate locations or core drilling to avoid structural members and any embedded conduit. Embedded conduit may be metallic or plastic. The x-ray or radar system shall be capable of detecting both types of conduit.
- 3.21 X-ray activities may not be performed during hours of activity or occupancy in the area of the x-ray system. The Contractor shall provide all manpower and barriers required to secure the areas affected by x-ray activities.

**PART 4 - MEASUREMENT**

- 4.1 METHOD OF MEASUREMENT
- 4.2 No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

- 5.1 METHOD OF PAYMENT
- 5.2 No separate payment will be made for work under this Section.

**END OF SECTION 017330**

## SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This section describes the requirements for the disposal, recovery, reuse or recycling of non-hazardous and non-asbestos containing construction and demolition waste for both LEED and non-LEED projects. Note that LEED projects may have more specific requirements than identified in this section.
- B. Waste materials shall be managed in accordance with all local, state, and federal regulations.
- C. Related Requirements:
1. Section 013300 "Submittal Procedures" for submittal procedures.
  2. Section 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.
  3. Section 015719 "Temporary Environmental Controls" for environmental control procedures.
  4. Section 018113 "Sustainable LEED Requirements" for LEED requirements.
  5. Section 024116 "Structure Demolition" for disposition of waste resulting from demolition of buildings, structures, and site improvements.
  6. Section 024119 "Selective Structure Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements.
  7. Section 042000 "Unit Masonry" for disposal requirements for masonry waste.
  8. Section 311000 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

### 1.3 DEFINITIONS

- A. Solid Waste: means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, air pollution control facility, or other discarded material; including solid, liquid, semisolid, or contained gaseous material resulting from industrial operations, commercial operations or community activities. Solid waste does not include any solid or dissolved materials in domestic sewage, or agricultural wastes, or solid or dissolved materials in irrigation return flows, or industrial discharges which are point sources subject to permits under the provisions of the "Colorado Water Quality Control Act", Title 25, Article 8, CRS or materials handled at facilities licensed pursuant to the provisions on "Radiation Control Act" in Title 25, Article 11, CRS. Solid waste does not include:
1. Materials handled at facilities licensed pursuant to the provisions on radiation control in Article 11 of Title 25, C.R.S.
  2. Excluded scrap metal that is being recycled.
  3. Shredded circuit boards that are being recycled.
- B. Salvaged Materials: Defined as materials that exist on the site that can be reused, either on site or by another entity
- C. Recyclable Materials: Defined as materials that exist on site or are generated during the construction process that can be recycled and/or remanufactured into another material. Recyclable waste includes, but is not limited to, the following:
1. Concrete.
  2. Asphalt
  3. Ferrous and non-ferrous metals.
  4. Untreated wood, engineered wood.
  5. Gypsum wallboard.
  6. Corrugated cardboard, paper goods.
  7. Plastic.
  8. Glass, insulation.
  9. Carpet.
  10. Paints, fabric.
  11. Rubber.
  12. Stone and brick.
- D. Hazardous Waste: Per 6 CCR 1007-3, those substances and materials defined or classified as such by the Hazardous Waste Commission pursuant to 25-15-302, C.R.S., as amended. Also, see hazardous waste definition per 40 CFR 261.3.
- E. Asbestos Containing Materials: Per 5 CCR 1001-10: Regulation No. 8, The Control of Hazardous Air Pollutants, Part B The Control of Asbestos- material containing more than 1% asbestos

### 1.4 SUBMITTALS

- A. The Contractor shall submit a list of materials and products used with Safety Data Sheets (SDS). Examples include chemicals, solvents, fuels, building materials, etc.

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**CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL**

1. A hardcopy or electronic link to the SDS for all materials and products used, if applicable.
  2. Identify storage methods for materials, including measures to segregate incompatible materials.
- B. The Contractor shall submit a Waste Management Plan to the DEN Project Manager and DEN Environmental Services. Minimum Waste Management Plan requirements include the following:
1. A list of all waste streams generated by the project
    - a. For each waste stream listed, the Contractor shall identify the handling/transportation method, the disposal method, and the disposal facility utilized.
    - b. If the Contractor anticipates generation of hazardous waste, the Contractor shall provide its USEPA (generator) identification number.
  2. Pollution Prevention Measures
    - a. Describe best practices that will reduce waste. For example, waste reduction measures, requiring vendors to deliver materials in reusable packaging, etc.
  3. Waste Management Plan Training.
  4. Storage of materials.
  5. Spill response.
- C. Approval of Contractor's Waste Management Plan does not relieve the contractor of responsibility for compliance with applicable environmental regulations.
1. The contractor shall maintain a record of the amounts of construction and demolition waste generated, recycled, reused, salvaged, or disposed of, in pounds for review.
  2. Hauling manifest records shall be maintained and available for review. Manifest forms are available from the DEN Project Manager

**PART 2 - PRODUCTS**

- 2.1 A list of all materials and products used. Examples include chemicals, solvents, solvents, fuels, curing compounds, etc.
- A. A hardcopy or electronic link to SDSs for all materials and products used.
  - B. Identify storage methods, including measures to segregate incompatible materials.
  - C. Refer to the Waste Management Plan

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**PART 3 - EXECUTION**

- A. The Contractor shall not wash down equipment in such a manner as to flush grease, oils, detergents, and other contaminants onto the project site or onto airport property unless the waste is properly contained, treated, and disposed of.
- B. DEN maintains two dry concrete and asphalt recycling yards used for the accumulation and crushing of asphalt and concrete. The South Yard is located on 71st Ave just east of Jackson Gap Street. The North Yard is located on the south side of 110th, west of Queensburg Street.
- C. Concrete washwater cannot be discharged to surface waters or to storm sewer systems. Colorado Discharge Permit System (CDPS) coverage conditionally authorizes discharges to the ground of concrete wash water from washing of tools and concrete mixer chutes when appropriate best management practices (BMPs) are implemented.
1. A bermed containment area that allows discharge water to infiltrate or evaporate;
    - a. Alternatives to bermed containment areas include portable concrete washout bins, and industrial washout containment systems where the accumulated waste is removed from the site and disposed of properly.
  2. Use of the washout site should be temporary (less than one year);
  3. The washout site should not be located in an area where shallow groundwater may be present, such as near natural drainages, springs, or wetlands
  4. Upon termination of the washout site, accumulated solid waste, which includes concrete waste and contaminated soils, must be removed from the site and disposed of properly.
- D. Rejected loads and/or other wet concrete or asphalt materials are PROHIBITED TO BE PLACED ANYWHERE on DEN property. These materials must be returned to the facility of origination or other permitted facility for proper disposal.
- E. Concrete saw cutting slurry must be properly contained and disposed of.
- F. Unknown or questionable materials encountered during construction activities, must immediately be reported to the DEN Communications Center at (303) 342-4200 and the DEN Project Manager.

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

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## **PART 5 - PAYMENT**

### 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 017419**

## SECTION 017420 - CLEANING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Work specified in this section consists of maintaining a clean, orderly, hazard free work site during construction, and final cleaning for the City's Final Acceptance. Failure to maintain the work site will be grounds for withholding monthly payments until corrected to the satisfaction of the DEN Project Manager.
- B. Refer to Article 325, Cleanup During Construction in the General Contract Conditions, 2011 Edition

#### 1.3 JOB CONDITIONS

A. Safety Requirements

1. Maintain the work site in a neat, orderly, and hazard-free manner in conformance with all federal, state, and local rules, codes, regulations, and orders, including all OSHA requirements, until Final Acceptance of the Work. Keep catwalks, underground structures, work site walks, sidewalks, roadways, and streets, along with public and private walkways adjacent to the work site, free from hazards caused by construction activities. Inspect those facilities regularly for hazardous conditions caused by construction activities.

B. Hazards Control:

1. Store waste materials in properly labeled waste containers. This includes solid wastes, hazardous wastes, universal wastes, etc.
2. Store volatile wastes in covered metal containers and remove those wastes from work site daily.
3. Do not accumulate wastes that create hazardous conditions.
4. If volatile and noxious substances are being used in spaces that are not naturally ventilated adequately, provide artificial ventilation.
5. Hazard controls shall conform to the applicable federal, state, and local rules and regulations.
6. Provide appropriate waste receptacles in all areas in which employees are working. Waste receptacles shall be kept covered at all times. All materials on site shall be anchored and covered to prevent any objects from becoming wind-borne.



C. Access:

1. Maintain the work site to permit access by other City contractors as required and to allow access by emergency personnel.

1.4 SUBMITTALS

A. Washing Plan: The Contractor shall prepare a plan describing the specific procedures and materials to be utilized for any equipment, vehicle, etc., washing activities. The plan must be submitted to the DEN Project Manager and approved by the DEN Project Manager and Environmental Services.

1. Outdoor washing at DEN is not allowed unless the materials will be collected or managed in a manner to ensure that they will not enter the municipally owned separate storm sewer system (MS4). The materials can only be disposed at a location pre-approved by DEN Environmental Services (refer to DEN SWMP). Failure to comply with this requirement would result in the discharge of non-stormwater.
  - a. Outdoor wash materials that contain soaps or other cleaning chemicals must be collected and disposed of off site
2. Indoor washing must be conducted in accordance with the Best Management Practices (BMPs) detailed in the DEN SWMP. Refer to Section 015719 "Environmental Controls". In addition, all indoor washing must be conducted in a manner that ensures that there are no prohibited discharges to the sanitary sewer system.
  - a. All wash-water that will be disposed of into the sanitary sewer must comply with City and County Denver rules and regulations pertaining to prohibited discharges.

**PART 2 - PRODUCTS**

2.1 CLEANING MATERIALS

- A. Utilize the type of cleaning materials recommended by the manufacturer for the surfaces to be cleaned.
- B. Maintain current Safety Data Sheets (SDS) on site for all chemicals. DEN Environmental Services must approve the chemicals used prior to discharge to the sanitary sewer system.
- C. Ensure proper disposal of all wastes generated from the use of these materials. The Contractor must ensure compliance with all environmental regulations. No wastes can be disposed of on DEN property.

**PART 3 - EXECUTION****3.1 INTERIM CLEANING**

- A. Clean the work site every shift/workday for the duration of the construction Contract. Maintain structures, grounds, storage areas and other areas of work site, including public and private properties immediately adjacent to work site, free from accumulations of waste materials caused by construction operations. Place waste materials in covered metal containers. All hard concrete, steel, wood, and finished walking surfaces shall be swept clean daily.
- B. Remove or secure loose material on open decks and on other exposed surfaces at the end of each workday or more often in a manner that will maintain the work site hazard free. Secure material in a manner that will prevent dislodgment by wind and other forces.
- C. Sprinkle waste materials with water or acceptable chemical palliative to prevent blowing of dust.
- D. Promptly empty waste containers when they become full and legally dispose of the contents at dumping areas off the City's property.
- E. Control the handling of waste materials. Do not permit materials to be dropped or thrown from structures.
- F. Immediately remove spillage of construction related materials from haul routes, work site, private property, public rights of way, or on the Denver International Airport site.
- G. Clean only when dust and other contaminants will not precipitate upon newly painted surfaces.
- H. Cleaning shall be done in accordance with manufacturer's recommendation.
- I. Cleaning shall be done in a manner and using such materials as to not damage the Work.
- J. Clean areas prior to painting or applying adhesive.
- K. Clean all heating and cooling systems prior to operations. If the Contractor is allowed to use the heating and cooling system, it shall be cleaned prior to testing.
- L. Clean all areas that will be concealed prior to concealment.
- M. Dispose of all fluids according to the approved Washing Plan.

**3.2 FINAL CLEANING**

- A. Refer to Article, Clean-up Upon Completion in the General Contract Conditions, 2011 Edition. Additionally, the Contractor, shall at a minimum, complete the following:

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1. Inspect interior and exterior surfaces, including concealed spaces, in preparation for completion and acceptance.
2. Remove dirt, dust, litter, corrosion, solvents, discursive paint, stains, and extraneous markings.
3. Remove surplus materials, except those materials intended for maintenance.
4. Remove all tools, appliances, equipment, and temporary facilities used in the construction.
5. Remove detachable labels and tags. File them with the manufacturer's specifications for that specific material for the City's records.
6. Repair damaged materials to the specified finish or remove and replace.
7. After all trades have completed their work and just before Final Acceptance, all catch basins, manholes, drains, strainers and filters shall be cleaned; roadway, driveways, floors, steps and walks shall be swept. Interior building areas shall be vacuum cleaned and mopped.
8. Final cleanup applies to all areas, whether previously occupied and operational or not.
9. Dispose of all fluids according to the approved Washing Plan.

**PART 4 - MEASUREMENT**

## 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

## 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 017420**

## SECTION 017515 - SYSTEM STARTUP, TESTING AND TRAINING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Provide complete startup, testing, and operator training services to ensure operability of all systems supplied.
- B. Coordinate all start-up and testing with DEN Commissioning Authority or DEN Asset Management through the DEN Project Manager.

#### 1.3 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures. Submit the following:
  - 1. Test procedures.
  - 2. Test reports.
  - 3. Training outline.
- B. Submit Qualification Data: For facilitator.
- C. Attendance Record: For each training module submit the following:
  - 1. Module title
  - 2. Module description
  - 3. Length of instruction time
  - 4. Participant names
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

#### 1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

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- B. Instructor Qualifications: A factory-authorized service representative, experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required. Recordings shall be high-resolution 1080p with a minimum framerate of 60Hz
- D. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Section 014510 "Contractor Quality Control". Review methods and procedures related to demonstration and training including, but not limited to, the following:
  - 1. Inspect and discuss locations and other facilities required for instruction.
  - 2. Review and finalize instruction schedule and verify availability of educational materials, instructor's personnel, audiovisual equipment, and facilities needed to avoid delays. Ensure that students are notified at least 14 days prior to the start of instruction.
  - 3. Review required content of instruction.
  - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

## 1.5 COORDINATION

- A. Coordinate instruction schedule with DEN's operations. Adjust schedule as required to minimize disrupting DEN's operations and to ensure availability of DEN's personnel. As required, include multiple classed to accommodate various shifts
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by DEN Project Manager.

**PART 2 - PRODUCTS (NOT USED)****PART 3 - EXECUTION****3.1 FIELD TESTS AND ADJUSTMENTS**

- A. All electrical and mechanical equipment including the interfaces with control systems and the communication system, and all alarm and operating modes for each piece of equipment, shall be tested by the Contractor to the satisfaction of the DEN Project Manager before any facility is put into operation. Tests shall be as specified herein and shall be made to determine whether the equipment has been properly assembled, aligned and connected. Any changes, adjustments, or replacements required to make the equipment operate as specified shall be carried out by the Contractor as part of the Work.
1. At least thirty (30) days before the time allowed in the construction schedule for commencing startup and testing procedures, the Contractor shall submit to the DEN Project Manager six (6) copies of the detailed procedures the Contractor proposes for testing and startup of all electrical and mechanical equipment. These procedures are submitted for review and acceptance by DEN.
  2. The Contractor's startup and testing procedures shall include detailed descriptions of all pre-operational hardware, electrical, mechanical and instrumentation used for testing work.
    - a. Each control device, item of electrical, mechanical and instrumentation equipment, and all control circuits shall be considered in the testing procedures which shall be designed in a logical sequence to ensure that all equipment has been properly serviced, aligned, connected, wired, calibrated and adjusted prior to operation.
    - b. Motors shall be tested in accordance with ANSI/IEEE Publication 112. The Contractor is advised that failure to observe these precautions may place the acceptability of the subject equipment in question, and the Contractor may either be required to demonstrate that the equipment has not been damaged, or replace it as determined by the DEN Project Manager.
  3. Testing procedures shall be designed to duplicate as nearly as possible all conditions of operations and shall be carefully selected to ensure that the equipment is not damaged. All filters shall be in place during startup and testing.
    - a. Once the DEN Project Manager has accepted the testing procedures, the Contractor shall provide checkout, alignment, adjustment and calibration signoff forms for each item of equipment and each system that will be used.
    - b. The Contractor and the DEN Project Manager shall use the signoff forms in the field jointly to ensure that each item of electrical, mechanical and instrumentation equipment and each system has been properly installed and tested. The Contractor shall cooperate with project-wide systems contractors where startup and testing is to be conducted concurrently.

4. Any special equipment needed to test equipment shall be provided by the Contractor to the City at no cost for a period of thirty (30) days during startup.
- B. Before starting up the equipment, the Contractor shall properly service it and other items, which normally require service in accordance with the maintenance instructions. The Contractor shall be responsible for lubrication and maintenance of equipment and replacement filters throughout the entire equipment "break-in" period described by the manufacturer.
1. The Contractor shall be responsible for the startup, adjustment, preliminary maintenance, and checkout of all equipment and instrumentation. All systems shall be carefully checked for conformance with the design criteria.
  2. If any equipment or system does not operate as specified in the Contract, the Contractor shall immediately replace or repair components until it operates properly.
  3. The Contractor shall submit a test report to the DEN Project Manager within thirty (30) days after completion of the system startup period.

### 3.2 SYSTEMS STARTUP AND TESTING

- A. The Contractor shall be responsible for a 30-day startup period during which time all hardware, electrical and mechanical equipment, communications, alarm systems, and associated devices shall be energized and operated under local and automatic controls. The Contractor shall be present during the startup period with adequate labor and support personnel to adjust equipment and troubleshoot system failures that might arise.
- B. When a piece of electrical or mechanical equipment is found to be in conflict with specific criteria, an experienced representative of the manufacturer shall adjust the item.
- C. If adjustments fail to correct the operation of a piece of equipment or fixture, the Contractor shall remove the equipment or fixture from the Project site and replace it with a workable replacement that meets the specification requirements.
- D. The 30-day startup period shall commence thirty (30) days prior to the Contract completion date and shall be completed prior to final payment. If, during the startup, any system fails to operate in accordance with Contract requirements, the failure shall be corrected and the startup period shall begin again.
1. At the end of the startup period, all filters shall be replaced with new ones.
  2. The City may provide, at its option, a Commissioning Representative to observe or participate in the startup and testing of any system. The Contractor shall coordinate with the Commissioning Representative relating to scheduling, reporting, forms, methods, and procedures of the startup and testing.

**3.3 FINAL INSTRUCTIONS AND OPERATION TRAINING**

- A. After startup and testing is completed, the Contractor shall demonstrate to the City's personnel the proper manner of operating the equipment, programming messages, making adjustments, responding to alarms and emergency signals, and maintaining the system.
- B. The Contractor shall provide on-the-job training by a suitably qualified instructor to designated personnel and shall instruct them in the operation and maintenance of the systems. In the event qualified instructors on the Contractor's staff are not available, the Contractor shall arrange with the equipment manufacturer for such instruction at no additional cost to the City.
- C. The Contractor shall provide a minimum of eight (8) hours of operator training to the Airport per shift. Classes shall accommodate up to five (5) people at a time with up to two (2) separate courses (one for each shift).
- D. The Contractor shall provide a syllabus to the DEN Project Manager at least seven (7) calendar days prior to the start of each course that outlines topics to be covered, the proposed time allotted to each topic, and the target audience of the training session (technical, casual operator, overview, etc.). The Contractor shall not commence any training courses until the syllabus has been reviewed and approved by the DEN Project Manager.
- E. The Contractor shall video record all training sessions and provide to the DEN Project Manager. The Contractor shall provide video recordings in format as required in Section 017900 "Demonstration and Training".
- F. The Contractor shall provide an annotated syllabus to the DEN Project Manager that indicates topics contained on each tape.
- G. The contractor shall provide instruction for obtaining live help for questions relating operation and troubleshooting

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT****5.1 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section.
- B. No contractual item requiring startup or testing will be paid until the conditions of this Section are completely satisfied.



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**END OF SECTION 017515**

## **SECTION 017720 - CONTRACT CLOSEOUT**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Special Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Work specified in this Section includes procedures required prior to Final Acceptance of the Work in addition to those specified in Title 20 – Final Completion and Acceptance of The Work in the General Contract Conditions, 2011 Edition, and Technical Specification Section 017840 "Contract Record Documents".
- B. This Section also includes procedures and penalties to ensure prompt completion of the Project Closeout.
- C. Related Sections:
  - 1. Title 20 of the General Contract Conditions, 2011 Edition..
  - 2. Section 017840 "Contract Record Documents" for required record documents.
  - 3. Form CM-75, Closeout Checklist
- D. SUBMITTALS
  - 1. Submit written Certification to the DEN Project Manager that, in the opinion of the Contractor, the Work is complete.
  - 2. Submit final survey within 60 days after issuance of Substantial Completion.
  - 3. Submit a Final Statement of Accounting to the DEN Project Manager.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION FOR FINAL INSPECTION**

- A. Before requesting inspection for Final Acceptance of the Work by the City, the Contractor shall inspect, clean, and repair the Work as required.
- B. The Contractor shall ensure that all items on the Closeout Checklist have been addressed and accepted by the DEN Project Manager.

### 3.2 FINAL INSPECTION

- A. The Contractor shall submit written certification to the DEN Project Manager when, in the opinion of the Contractor, the Work is complete. Such communication shall certify that:
1. The Work has been inspected by the Contractor for conformance with the Contract Documents.
  2. The Work has been completed in conformance with the Contract Documents, including all punchlist items.
  3. The Work is ready for final inspection by the City.
  4. All as-built documents have been submitted and accepted.
  5. All damaged or destroyed real, personal, public, or private property impacted by the Work has been repaired or replaced.
  6. All Warranties and Bonds have been completed, executed, submitted, and accepted.
  7. All personnel badges and vehicle permits have been returned to DEN Airport Security.
- B. The DEN Project Manager will inspect the Work in accordance with the Section 2002.1 of the City and County of Denver's Department of Aviation's General Contract Conditions.
- C. If the DEN Project Manager finds incomplete or defective Work:
1. The DEN Project Manager may, at the DEN Project Manager's sole discretion, either terminate the inspection, or prepare a punchlist and notify the Contractor in writing, listing the incomplete or defective Work.
  2. The Contractor shall take immediate steps to remedy all identified deficiencies and resubmit a written certification to the DEN Project Manager that Work is complete.
  3. The DEN Project Manager will then re-inspect the Work.

### 3.3 REINSPECTION FEES

- A. Should the DEN Project Manager be required to perform re-inspections of the Work due to the Contractor prematurely claiming the status of the Work to be complete:
1. The Contractor shall compensate the City for such additional services at the rate of \$125.00 per man-hour, with a minimum charge of \$250.00.
  2. The City shall deduct the amount of such compensation from the final payment to the Contractor.

### 3.4 FINAL SURVEY FEES

- A. The Contractor shall complete and submit the final survey within 60 days after issuance of Substantial Completion. If the Contractor fails to complete and submit the final survey within this time frame it is understood that DEN will arrange for a qualified surveying company to complete this work at the Contractor's expense. All costs associated with DEN arranging for and completing the final survey will be deducted from the final payment including compensation due the City for the DEN Project Manager's time to manage this work.
1. The DEN Project Manager's rate of compensation shall be set at \$150.00 per man-hour.
  2. Survey submittals needing to be revised may extend the 60-day time frame at the DEN Project Manager's discretion.
  3. Costs, including the DEN Project Manager's, for the review of the resubmitted survey shall be deducted from the final payment.

### 3.5 LATE CLOSEOUT FEES

- A. Within 100 days after issuance of substantial completion, all documentation required by this Contract to achieve Project Closeout shall be submitted. Failure to submit all required documentation shall result in fees to compensate the City for project management work while the project remains open.
1. Fees at the rate of \$450 per day.
  2. The resubmittal of required documents may extend the 100-day time frame at the DEN Project Manager's discretion.

### 3.6 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a Final Statement of Accounting to the DEN Project Manager.
- B. The Final Statement of Accounting shall reflect all adjustments to the Contract amount and shall include the following:
1. The original Contract Value.
  2. Additions and deductions resulting from the following:
    - a. Approved Change Orders.
    - b. Allowances.
    - c. Final quantities for unit price items, including required backup for the quantities.
    - d. Deductions for corrected work.
    - e. Penalties.
    - f. Deductions for liquidated damages.
    - g. Deductions for re-inspection payments.
    - h. Other adjustments.
  3. Total Contract Value, as adjusted.

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4. Previous payments.
5. Sum remaining due.

- C. If required, the DEN Project Manager will prepare a final Change Order, reflecting the approved adjustments to the Contract Value that were not included in previously issued Change Orders.

### 3.7 FINAL APPLICATION FOR PAYMENT

- A. The Contractor shall submit the final application for payment in accordance with the procedures and requirements detailed in Article 2003, Final Settlement in the General Contract Conditions, 2011 Edition.

## PART 4 - MEASUREMENT

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

## PART 5 - PAYMENT

### 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

## END OF SECTION 017720

## SECTION 017825 - OPERATION AND MAINTENANCE DATA

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Work specified in this Section consists of preparing and submitting operation and maintenance data for mechanical, electrical, and other specified equipment/products.
- B. Coordinate all the requirements of the required data with DEN Asset Management.

#### 1.3 SUBMITTALS

- A. Refer to Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.
- B. All submittals must be provided in electronic data as indicated by the DEN Building Information Modeling (BIM) Design Standards Manual (DSM) and as required by the DEN BIM and DEN Asset Management groups.
- C. Submit one (1) electronic copy and three (3) bound hard copies of the proposed Operation and Maintenance Data Manual not less than [30] [90] days prior to [system startup] [acceptance tests and final inspection].
  - 1. The submitted copies shall provide the Information following the MasterFormat standard. Equipment/Data shall be organized using Section formatting within the 50 MasterFormat Divisions.
- D. Submit one (1) electronic copy and three (3) bound hard copies of Operation and Maintenance Data Manual within ten days after [system startup] [commissioning] is complete. These copies shall incorporate any comments made on the previous submittals, along with final readings on all settings and gauges taken while the system is in fully satisfactory operation.

#### 1.4 CONTINUOUS UPDATING PROGRAM

- A. Furnish to DEN AIM Asset Management one (1) electronic copy of the Contractor's letter indicating that suppliers have been notified to provide updated operation and maintenance data, service bulletins, and other information pertinent to the equipment, as it becomes available.

**PART 2 - PRODUCTS**

- A. The following products are the requirements of hard copies:
1. Paper size: 8-½ inches x 11 inches.
  2. Paper: White bond, at least 20-pound weight.
  3. Text: Typewritten.
  4. Printed data: Manufacturer's catalog cuts, brochures, operation, and maintenance data. Clear reproductions thereof will be acceptable. If this data is in color, all final manuals must contain color data.
  5. Drawings: 8½ inches x 11 inches, bound with the text. Larger drawings are acceptable provided they are folded to fit into a pocket inside the rear cover of the manual. Reinforce edges of large drawings.
  6. Prints of drawings: Black ink on white paper, sharp in detail and suitable for making reproductions.
  7. Flysheets: Separate each portion of the manual with colored, neatly prepared flysheets briefly describing the contents of the ensuing portion.
  8. Covers: Provide 40 to 50 mil, clear plastic, front and plain back covers for each manual. The front covers shall contain the information required in paragraph 3.2 below.
  9. Bindings: Conceal the binding mechanism inside the manual. Lockable 3-ring binders shall be provided.
  10. Training Videos: Provide in digital electronic format as per current DEN requirements.
    - a. Refer to Section 017900 - Demonstration and Training for video requirements.

**PART 3 - EXECUTION****3.1 GENERAL**

- A. Assemble each operation and maintenance manual using the manufacturer's latest standard commercial data, and include all additional information that is unique to the Project.

**3.2 COVER**

- A. Include the following information on the front cover and on the inside cover sheet:
1. Operation and maintenance instructions.
  2. Title of structure or facility.
  3. Title and number of Contract.
  4. Contractor's name and address.
  5. General subject of the manual.

### 3.3 CONTENTS OF THE MANUAL

- A. Table of Contents, which references, at a minimum, three heading levels.
- B. Index of Equipment/Data with entries for equipment type and MasterFormat Division and Section.
- C. A Master Index that contains index entries for all submitted Operation and Maintenance Data Manuals.
  - 1. Equipment/Data shall be indexed by equipment type and MasterFormat Division and Section.
  - 2. Name, address, and telephone numbers of Contractor, suppliers and installers along with the manufacturer's order number and description of the order.
  - 3. Name, address, and telephone numbers of manufacturer's nearest service representatives.
  - 4. Name, address, and telephone number of nearest parts vendor and service agency.
  - 5. Copy of guaranties and warranties issued to, and executed in the name of, the City.
  - 6. Anticipated date the City assumes responsibility for maintenance.
  - 7. Description of system and component parts including theory of operation.
  - 8. Pre operation check or inspection list.
  - 9. Procedures for starting, operating, and stopping equipment.
  - 10. Post operation check or shutdown list.
  - 11. Inspection and adjustment procedures.
  - 12. Troubleshooting and fault isolation procedures for on-site level of repair.
  - 13. Emergency operating instructions.
  - 14. Accepted test data.
  - 15. Maintenance schedules and procedures.
  - 16. Test procedures to verify the adequacy of repairs.
  - 17. One (1) copy of each wiring diagram.
  - 18. One (1) copy of each piping diagram.
  - 19. Location where all measurements are to be made.
  - 20. One (1) copy of each duct diagram.
  - 21. One (1) copy of control diagram.
  - 22. One (1) copy of each accepted shop drawing.
  - 23. One (1) copy of software programs imputable or changeable on site.
  - 24. Ordering information.
  - 25. Training course material used to train DEN staff, including slides and other presentation material.
  - 26. Provide the following information, unless the item is covered in the Manufacturer's Operation and Manual:
    - a. Manufacturer's parts list with catalog names, numbers, and illustrations.
    - b. A list of components that are replaceable by the City.
    - c. An exploded view of each piece of the equipment with part designations.
    - d. List of manufacturer's recommended spare parts, current prices, and recommended quantities for two years of operation.



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OPERATION AND MAINTENANCE DATA

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- e. List of special tools and test equipment required for the operation, maintenance, adjustment, testing and repair of the equipment, instruments and components.
- f. Scale and corrosion control procedures.
- g. Disassembly and re-assembly instructions.
- h. Troubleshooting and repair instructions.
- i. Calibration procedures.

**PART 4 - MEASUREMENT**

## 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

## 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 017825**

## SECTION 017835 - WARRANTIES AND BONDS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Work specified in this Section consists of preparing and submitting warranties and bonds required by the Contract and these Specifications.

#### 1.3 SUBMITTALS

- A. Refer to Technical Specifications Section 013300 "Submittal Procedures" and Section 013325 "Shop and Working Drawings, Product Data and Samples" for submittal procedures.

- 1. All warranties shall be executed specifically to the City.
- 2. Photocopies or reproductions of stock manufacturer's warranties will not be accepted, although electronic copies are acceptable when the manufacturer's warranty is contained in the O&M manual.

- B. Submit samples of warranties and bonds for review by the City prior to execution of Work. Do not submit final warranties until sample warranties have been approved by the City.

- 1. Submit the warranties and bonds required by the Contract Documents.
- 2. Prepare and submit a list of all warranties and bonds on the following forms:

- a. CM-10: Contractor Warranty
- b. CM-11: Contractor/Sub-Contractor Warranty

- C. Submit executed warranties and bonds

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**PART 2 - PRODUCTS (NOT USED)****PART 3 - EXECUTION****3.1 WARRANTIES AND BONDS**

- A. Submit executed warranties and bonds required by the Contract Documents, as detailed in Title 15 - Performance and Payment Bonds and Title 18 - Warranties, Guarantees, and Corrective Work in the General Contract Conditions, 2011 Edition.

1. Prepare and submit a list of all warranties and bonds on the following forms:

- a. CM-10, Contractor Warranty
- b. CM-11, Contractor/Sub-Contractor Warranty

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT****5.1 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section.

**END OF SECTION 017835**

## SECTION 017840 - CONTRACT RECORD DOCUMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The Work specified in this Section consists of maintaining, marking, recording, and submitting Contract record documents that include shop drawings, warranties, Contract Documents, and contractor records.
- B. Refer to DEN Building Information Modeling (BIM) Design Standards Manual (DSM) and Approved BIM execution for data format and file types acceptable for different type of data.
- C. Related Requirements:
1. Section 013100 "Project Management and Coordination".
  2. Section 013223 "Construction Layout, As-built and Quantity Surveys".
  3. Section 013300 "Submittal Procedures".
  4. Section 013325 "Shop and Working Drawings, Product Data and Samples".
  5. Section 017720 "Contract Closeout".
  6. Section 017825 "Operation and Maintenance Data".

#### 1.3 SUBMITTALS

- A. Each submittal of record documents shall contain the following information:
1. Date.
  2. Project title and numbers.
  3. Contractor's name and address.
  4. Title and number of each record document.
  5. Certification that each document as submitted is complete and accurate.
  6. Signature of the Contractor or the Contractor's authorized representative.
- B. At the completion of this Contract, deliver all record documents including the following:
1. As-built shop drawings, diagrams, illustrations, schedules, charts, brochures and other similar data.
  2. Warranties, guarantees, and bonds.
  3. Contract Documents.
  4. Contractor records.

- C. As-built Contract Drawings shall be submitted with each monthly progress payment application, and a complete set shall be submitted prior to final payment.
1. The Contractor shall provide a single electronic copy of each Contract drawing sheet which has been used to produce work during the payment period or work that payment is being requested on, which records the current as-built conditions of work, including the posting of any change orders or change directives not shown on the Contract Documents at the time of Contract signing.
    - a. The Contractor must show as-built work completed through the payment application date including but not limited to utilities, empty conduit, conduit for actual electrical lines, plumbing, HVAC, location of anchor bolts and support points for use by others.
    - b. The Contractor shall be liable for any costs incurred by the City or a third party due to errors or lack of information provided on the as-built drawings.
    - c. All markings on drawings shall be legible to identify the portion of work completed.
    - d. For projects utilizing BIM system by the Contractor or a consultant of the Contractor, all data formats shall be compatible and as approved by the BIM execution plan as required in the DEN BIM DSM.

#### 1.4 QUALITY CONTROL

- A. Submit electronically scanned copies of all documents required by Chapter 17 "Special Inspection and Testing" of the International Building Code 2009 as amended by City and County of Denver 2011. Keep scale and clarify dimension where electronic copies are not as originally scaled and dimensioned.
- B. For projects utilizing BIM for Revit, follow approved BIM execution plan and DEN BIM DSM for record documents, formats, and quality control and assurance procedures.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION**

#### 3.1 MAINTENANCE OF DOCUMENTS

- A. The Contractor must follow all the procedures established in the Contract Documents and DEN BIM DSM.
- B. The Contractor shall maintain at the work site on a current basis one (1) record copy of all drawings, specifications, addenda, change orders, approved shop drawings, working drawings, product data and samples in good order and marked currently to record all changes made during construction.
- C. Maintain at the field office one copy of the following record documents:

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1. Contract Documents:

- a. Contract Drawings with all clarifications, requests for information, directives, changes, and as-built conditions clearly posted.
- b. Contract Specifications with all clarifications, requests for information, changes, directives and record of manufacturer actually used along with product trade name.
- c. Reference Standards in accordance with Section 014225 "Referenced Standards".
- d. Affirmative Action Plan and documents.
- e. One (1) set of drawings to record the following:
  - 1) Horizontal and vertical location of underground utilities affected by the Work.
  - 2) Location of internal utilities; include valves, controls, conduit, duct work, switches, pressure reducers, size reducers, transitions, crosses, tees, filters, motors, heaters, dampers, regulators, safety devices, sensors, access doors and appurtenances that are concealed in the construction shall be shown with dimensions given from a visible and recognizable reference to the item being located in all three dimensions. The drawings shall also reference the applicable submittal for the item being located.
  - 3) Field changes of dimensions and details including as-built elevations and location (station and offset).
  - 4) Details not on original Contract Drawings but obtained through requests for information or by other communications with the City.

2. Contractor Records:

- a. Daily Quality Control Reports.
- b. Certificates of compliance for materials used in construction.
- c. Completed inspection list.
- d. Inspection and test reports.
- e. Test procedures.
- f. Qualification of personnel.
- g. Approved submittals.
- h. Material and equipment storage records.
- i. Safety Plan
- j. Erosion, sediment, hazardous and quality plans.
- k. Hazardous material records.
- l. First report of injuries.

3.2 RECORDINGS

- A. Label each document page or article "PROJECT RECORD" in two-inch high letters.
- B. Keep record documents current daily.
- C. Legibly mark copies of the Contract Drawings to record actual construction.

D. Legibly mark up each Section of the specifications and Contract Drawings to record:

1. Manufacturer, trade name, catalog number and supplier of each product and item actually installed
2. Changes made by change orders, requests for information, substitutions, and variations approved by submittals.

3.3 DOCUMENT MAINTENANCE

- A. Follow all the required processes of the approved BIM Execution Plan as approved by DEN for this specific project or in formats acceptable to DEN BIM management system.
- B. Do not use record documents for construction purposes.
- C. Make documents available for inspection by the DEN Project Manager and any others having jurisdiction.

3.4 MONTHLY REVIEW

- A. Prior to any application for payment, the DEN Project Manager or the DEN Project Manager's designated representative will inspect the record documents to ensure that they are being maintained and contain the most current correct data with particular attention to as-built drawings.
- B. If, during the inspection, the DEN Project Manager determines that the documents are not being maintained and kept current as to as-built conditions, an amount may be withheld from the payment request and deducted from the Contract value to cover the City's cost of collecting and recording the as-built Contract data. This cost will be determined based on \$100.00 per man-hour of effort.

**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 017840**

## SECTION 017900 - DEMONSTRATION AND TRAINING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing City's personnel, including the following:
  - 1. Demonstration of operation of systems, subsystems, and equipment.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.
  - 3. Demonstration and training video recordings.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructor's names for each training module. Include learning objective and outline for each training module.
  - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two (2) copies within seven (7) days of end of each training module.
  - 1. Identification: On each copy, provide an applied label with the following information:
    - a. Name of Project.



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- b. Name and address of videographer.
  - c. Name of Architect.
  - d. Name of Construction Manager.
  - e. Name of Contractor.
  - f. Date of video recording.
2. Closed Caption: Videos shall contain a visible text version of all speech provided in the recording.
  3. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
  4. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
  5. At completion of training, submit complete training manual(s) for City's use [prepared and bound in format matching operation and maintenance manuals] [in PDF electronic file format] [preapproved electronic media].

#### 1.5 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A professional instructor/trainer who is experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 014510 "Contractor Quality Control". Review methods and procedures related to demonstration and training including, but not limited to, the following:
  1. Inspect and discuss locations and other facilities required for instruction.
  2. Review and finalize instruction schedule and verify availability of educational materials, instructor's personnel, audiovisual equipment, and facilities needed to avoid delays.
  3. Review required content of instruction.
  4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

## 1.6 COORDINATION

- A. Coordinate instruction schedule with City's operations. Adjust schedule as required to minimize disrupting City's operations and to ensure availability of City's personnel.
  - 1. Include multiple classes to accommodate various shifts, as necessary.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by DEN Project Manager.

## PART 2 - PRODUCTS

### 2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
  - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Performance and design criteria if Contractor is delegated design responsibility.
    - c. Operating standards.
    - d. Regulatory requirements.
    - e. Equipment function.
    - f. Operating characteristics.
    - g. Limiting conditions.
    - h. Performance curves.
  - 2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Operations manuals.
    - c. Maintenance manuals.
    - d. Project record documents.
    - e. Identification systems.
    - f. Warranties and bonds.

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- g. Maintenance service agreements and similar continuing commitments.
3. Emergencies: Include the following, as applicable:
  - a. Instructions on meaning of warnings, trouble indications, and error messages.
  - b. Instructions on stopping.
  - c. Shutdown instructions for each type of emergency.
  - d. Operating instructions for conditions outside of normal operating limits.
  - e. Sequences for electric or electronic systems.
  - f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
  - a. Startup procedures.
  - b. Equipment or system break-in procedures.
  - c. Routine and normal operating instructions.
  - d. Regulation and control procedures.
  - e. Control sequences.
  - f. Safety procedures.
  - g. Instructions on stopping.
  - h. Normal shutdown instructions.
  - i. Operating procedures for emergencies.
  - j. Operating procedures for system, subsystem, or equipment failure.
  - k. Seasonal and weekend operating instructions.
  - l. Required sequences for electric or electronic systems.
  - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
  - a. Alignments.
  - b. Checking adjustments.
  - c. Noise and vibration adjustments.
  - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
  - a. Diagnostic instructions.
  - b. Test and inspection procedures.
7. Maintenance: Include the following:
  - a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.
  - d. Procedures for routine cleaning
  - e. Procedures for preventive maintenance.
  - f. Procedures for routine maintenance.
  - g. Instruction on use of special tools.
8. Repairs: Include the following:

- a. Diagnosis instructions.
- b. Repair instructions.
- c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
- d. Instructions for identifying parts and components.
- e. Review of spare parts needed for operation and maintenance.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017825 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

#### **3.2 INSTRUCTION**

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and City for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct City's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  1. Contractor will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
  2. City will furnish an instructor to describe City's operational philosophy.
  3. DEN Project Manager will furnish Contractor with names and positions of DEN participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  1. Schedule training with City, through DEN Project Manager, with at a minimum of thirty (30) days advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral performance-based test.
- F. Cleanup: Collect used and leftover educational materials and remove from Project site give to City. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

### 3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Video Recordings: Submit video recordings in an electronic format acceptable to DEN Project Manager by posting to Web-based photographic documentation service provider's Web site. Recordings shall be high-resolution 1080p with a minimum framerate of 60Hz
1. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
  2. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project:
    - a. Name of Contractor/Installer.
    - b. Business address.
    - c. Business phone number.
    - d. Point of contact.
    - e. E-mail address.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
1. Film training session(s) in segments not to exceed 15 minutes.
    - a. Produce segments to present a single significant piece of equipment per segment.
    - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
    - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
1. Furnish additional portable lighting as required.
- E. Narration: Describe scenes on video recording by audio narration by microphone or dubbing audio narration off-site after video recording is recorded. Include description of items being viewed.

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1. Closed Caption: Videos shall contain a visible text version of all speech provided in the recording.
  2. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
  3. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
- F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- G. Failure of Video Recordings: If video recordings submitted by Contractor do not comply with Project requirements, or have audio and/or video problems, Contractor will be required to repeat training and video recording in compliance with this Section in order to re-create the training video.

**PART 4 - MEASUREMENT**

## 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

## 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section.

**END OF SECTION 017900**

## SECTION 018113.16 - SUSTAINABLE DESIGN REQUIREMENTS - LEED FOR COMMERCIAL INTERIORS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes general requirements and procedures for compliance with certain USGBC LEED prerequisites and credits needed for Project to obtain LEED[-Certified] [ Silver] [ Gold] [ Platinum] certification based on the USGBC's "LEED 2009 for Commercial Interiors."
1. Other LEED prerequisites and credits needed to obtain LEED certification depend on product selections and may not be specifically identified as LEED requirements. Compliance with requirements needed to obtain LEED prerequisites and credits may be used as one criterion to evaluate substitution requests and comparable product requests.
  2. Additional LEED prerequisites and credits needed to obtain the indicated LEED certification depend on Architect's design and other aspects of Project that are not part of the Work of the Contract.
  3. A copy of the LEED Project checklist is attached at the end of this Section for information only.
  4. Specific requirements for LEED are also included in other Sections.

#### 1.3 DEFINITIONS

- A. Chain-of-Custody Certificates: Certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship." Certificates shall include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.
- B. Regionally Manufactured Materials: Materials that are manufactured within a radius of **500 miles** from Project site. Manufacturing refers to the final assembly of components into the building product that is installed at Project site.
- C. Regionally Extracted and Manufactured Materials: Regionally manufactured materials made from raw materials that are extracted, harvested, or recovered within a radius of **500 miles** from Project site.

- D. Recycled Content: The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.
1. "Post-consumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.
  2. "Pre-consumer" material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

#### 1.4 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect, DIA Project Manager and the USGBC regarding LEED credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures until the USGBC has made its determination on the project's LEED certification application. Document responses as informational submittals.

#### 1.5 ACTION SUBMITTALS

- A. General: Submit additional LEED submittals required by other Specification Sections.
- B. LEED submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated LEED requirements.
- C. LEED Documentation Submittals:
1. Credit EA 3: Product data and wiring diagrams for sensors and data collection system used to provide continuous metering of building energy-consumption performance over a period of time of not less than one year of postconstruction occupancy.
  2. Credit MR 2: Comply with Section 017419 "Construction Waste Management and Disposal."
  3. Credit MR 3.1[ and Credit MR 3.2]: Receipts for salvaged and refurbished materials used for Project, indicating sources and costs for salvaged and refurbished materials.
  4. Credit MR 4: Product data and certification letter from product manufacturers indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating material costs for each product having recycled content.
  5. Credit MR 5: Product data indicating location of material manufacturer for regionally manufactured materials. Include statement indicating cost for each regionally manufactured material.



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- a. Include statement indicating distance from manufacturer to Project for each regionally manufactured material.
  - b. Include statement indicating location of and distance from Project to point of extraction, harvest, or recovery for each raw material used in regionally extracted and manufactured materials.
6. Credit MR 7: Product data and chain-of-custody certificates for products containing certified wood. Include statement indicating cost for each certified wood product.
7. Credit IEQ 3.1:
- a. Construction indoor-air-quality management plan.
  - b. Product data for temporary filtration media.
  - c. Product data for filtration media used during occupancy.
  - d. Construction Documentation: Six photographs at three different times during the construction period, along with a brief description of the SMACNA approach employed, documenting implementation of the indoor-air-quality management measures, such as protection of ducts and on-site stored or installed absorptive materials.
8. Credit IEQ 3.2:
- a. Signed statement describing the building air flush-out procedures including the dates when flush-out was begun and completed and statement that filtration media was replaced after flush-out.
  - b. Product data for filtration media used during flush-out and during occupancy.
  - c. Report from testing and inspecting agency indicating results of indoor-air-quality testing and documentation showing compliance with indoor-air-quality testing procedures and requirements.
9. Credit IEQ 4.1: Product data for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used.
10. Credit IEQ 4.2: Product data for paints and coatings used inside the weatherproofing system indicating VOC content of each product used.
11. Credit IEQ 4.4: Product data for products containing composite wood or agrifiber products or wood glues indicating that they do not contain urea-formaldehyde resin.
- 1.6 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For LEED coordinator.
  - B. Project Materials Cost Data: Provide statement indicating total cost for materials used for Project. Costs exclude labor, overhead, and profit. Include breakout of costs for the following categories of items:
    1. Furniture.
    2. Plumbing.

3. Mechanical.
4. Electrical.
5. Specialty items such as elevators and equipment.
6. Wood-based construction materials.

C. LEED Action Plans: Provide preliminary submittals within 14 days of date established for commencement of the Work indicating how the following requirements will be met:

1. Credit MR 2: Waste management plan complying with Section 017419 "Construction Waste Management and Disposal."
2. Credit MR 3.1[ and Credit MR 3.2]: List of proposed salvaged, refurbished, and reused materials. Identify each material that will be salvaged, refurbished, or reused, including its source, cost, and replacement cost if the item was to be purchased new.
3. Credit MR 4: List of proposed materials with recycled content. Indicate cost, post-consumer recycled content, and pre-consumer recycled content for each product having recycled content.
4. Credit MR 5: List of proposed regionally manufactured materials.
  - a. Identify each regionally manufactured material, including its source and cost.
  - b. Identify each regionally extracted and manufactured material, including its source and cost.
5. Credit MR 7: List of proposed certified wood products. Indicate each product containing certified wood, including its source and cost of certified wood products.
6. Credit IEQ 3.1: Construction indoor-air-quality management plan.

D. LEED Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with LEED action plans for the following:

1. Credit MR 2: Waste reduction progress reports complying with Section 017419 "Construction Waste Management and Disposal."
2. Credit MR 3.1[ and Credit MR 3.2]: Salvaged, refurbished, and reused materials.
3. Credit MR 4: Recycled content.
4. Credit MR 5: Regionally manufactured materials.
5. Credit MR 7: Certified wood products.

## 1.7 QUALITY ASSURANCE

A. LEED Coordinator: Engage an experienced LEED-Accredited Professional to coordinate LEED requirements. LEED coordinator may also serve as waste management coordinator.

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**PART 2 - PRODUCTS****2.1 MATERIALS, GENERAL**

- A. Provide products and procedures necessary to obtain LEED credits required in this Section. Although other Sections may specify some requirements that contribute to LEED credits, the Contractor shall determine additional materials and procedures necessary to obtain LEED credits indicated.

**2.2 SALVAGED, REFURBISHED, AND REUSED MATERIALS**

- A. Credit MR 3.1[ and Credit MR 3.2]: Not less than 5 percent of building materials (by cost) shall be salvaged, refurbished, or reused materials. The following materials may be salvaged, refurbished, or reused materials:

1. <Insert list of materials>.

**2.3 RECYCLED CONTENT OF MATERIALS**

- A. Credit MR 4: Building materials shall have recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content for Project constitutes a minimum of 10 percent of cost of materials used for Project.

1. Cost of post-consumer recycled content plus one-half of pre-consumer recycled content of an item shall be determined by dividing weight of post-consumer recycled content plus one-half of pre-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.
2. Do not include plumbing, mechanical and electrical components, and specialty items such as elevators and equipment in the calculation.

**2.4 REGIONAL MATERIALS**

- A. Credit MR 5, Option 1: Not less than 20 percent of materials (by cost) shall be regionally manufactured materials.
- B. Credit MR 5, Option 2: Not less than 10 percent of materials (by cost) shall be regionally extracted and manufactured materials.

**2.5 CERTIFIED WOOD**

- A. Credit MR 7: Not less than 50 percent (by cost) of wood-based materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

1. Wood-based materials include, but are not limited to, the following materials when made from wood, engineered wood products, or wood-based panel products:
  - a. Rough carpentry.
  - b. Miscellaneous carpentry.
  - c. Heavy timber construction.
  - d. Wood decking.
  - e. Metal-plate-connected wood trusses.
  - f. Structural glued-laminated timber.
  - g. Finish carpentry.
  - h. Architectural woodwork.
  - i. Wood paneling.
  - j. Wood veneer wall covering.
  - k. Wood flooring.
  - l. Wood lockers.
  - m. Wood cabinets.
  - n. Furniture.

## 2.6 LOW-EMITTING MATERIALS

- A. Credit IEQ 4.1: For field applications that are inside the weatherproofing system, adhesives and sealants shall comply with the following VOC content limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  1. Wood Glues: 30 g/L.
  2. Metal-to-Metal Adhesives: 30 g/L.
  3. Adhesives for Porous Materials (Except Wood): 50 g/L.
  4. Subfloor Adhesives: 50 g/L.
  5. Plastic Foam Adhesives: 50 g/L.
  6. Carpet Adhesives: 50 g/L.
  7. Carpet Pad Adhesives: 50 g/L.
  8. VCT and Asphalt Tile Adhesives: 50 g/L.
  9. Cove Base Adhesives: 50 g/L.
  10. Gypsum Board and Panel Adhesives: 50 g/L.
  11. Rubber Floor Adhesives: 60 g/L.
  12. Ceramic Tile Adhesives: 65 g/L.
  13. Multipurpose Construction Adhesives: 70 g/L.
  14. Fiberglass Adhesives: 80 g/L.
  15. Contact Adhesive: 80 g/L.
  16. Structural Glazing Adhesives: 100 g/L.
  17. Wood Flooring Adhesive: 100 g/L.
  18. Structural Wood Member Adhesive: 140 g/L.
  19. Single-Ply Roof Membrane Adhesive: 250 g/L.
  20. Special-Purpose Contact Adhesive (contact adhesive that is used to bond melamine covered board, metal, unsupported vinyl, rubber, or wood veneer 1/16 inch or less in thickness to any surface): 250 g/L.
  21. Top and Trim Adhesive: 250 g/L.
  22. Plastic Cement Welding Compounds: 250 g/L.

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23. ABS Welding Compounds: 325 g/L.
  24. CPVC Welding Compounds: 490 g/L.
  25. PVC Welding Compounds: 510 g/L.
  26. Adhesive Primer for Plastic: 550 g/L.
  27. Sheet-Applied Rubber Lining Adhesive: 850 g/L.
  28. Aerosol Adhesive, General-Purpose Mist Spray: 65 percent by weight.
  29. Aerosol Adhesive, General-Purpose Web Spray: 55 percent by weight.
  30. Special-Purpose Aerosol Adhesive (All Types): 70 percent by weight.
  31. Other Adhesives: 250 g/L.
  32. Architectural Sealants: 250 g/L.
  33. Nonmembrane Roof Sealants: 300 g/L.
  34. Single-Ply Roof Membrane Sealants: 450 g/L.
  35. Other Sealants: 420 g/L.
  36. Sealant Primers for Nonporous Substrates: 250 g/L.
  37. Sealant Primers for Porous Substrates: 775 g/L.
  38. Modified Bituminous Sealant Primers: 500 g/L.
  39. Other Sealant Primers: 750 g/L.
- B. Credit IEQ 4.2: For field applications that are inside the weatherproofing system, paints and coatings shall comply with the following VOC content limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
1. Flat Paints and Coatings: VOC not more than 50 g/L.
  2. Nonflat Paints and Coatings: VOC not more than 150 g/L.
  3. Dry-Fog Coatings: VOC not more than 400 g/L.
  4. Primers, Sealers, and Undercoaters: VOC not more than 200 g/L.
  5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
  6. Zinc-Rich Industrial Maintenance Primers: VOC not more than 340 g/L.
  7. Pretreatment Wash Primers: VOC not more than 420 g/L.
  8. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
  9. Clear Wood Finishes, Lacquers: VOC not more than 550 g/L.
  10. Floor Coatings: VOC not more than 100 g/L.
  11. Shellacs, Clear: VOC not more than 730 g/L.
  12. Shellacs, Pigmented: VOC not more than 550 g/L.
  13. Stains: VOC not more than 250 g/L.
- C. Credit IEQ 4.4: Composite wood, agrifiber products, and adhesives shall not contain urea-formaldehyde resin.

**PART 3 - EXECUTION****3.1 REFRIGERANT REMOVAL**

- A. Prerequisite EA 3: Remove CFC-based refrigerants from existing HVAC&R equipment indicated to remain and replace with refrigerants that are not CFC based. Replace or adjust existing equipment to accommodate new refrigerant as described in HVAC Sections.

### 3.2 MEASUREMENT AND VERIFICATION

- A. Credit EA 3: Implement measurement and verification plan consistent with [Option B: Energy Conservation Measure Isolation] [Option D: Calibrated Simulation, Savings Estimation Method 2] in the EVO's "International Performance Measurement and Verification Protocol (IPMVP), Volume III: Concepts and Options for Determining Energy Savings in New Construction," and as further defined by the following:
- B. If not already in place, install metering equipment to measure energy usage. Monitor, record, and trend log measurements.
- C. Evaluate energy performance and efficiency by comparing actual to predicted performance.
- D. Measurement and verification period shall cover at least one year of postconstruction occupancy.

### 3.3 CONSTRUCTION WASTE MANAGEMENT

- A. Credit MR 2: Comply with Section 017419 "Construction Waste Management and Disposal."

### 3.4 CONSTRUCTION INDOOR-AIR-QUALITY MANAGEMENT

- A. Credit IEQ 3.1: Comply with SMACNA's "SMACNA IAQ Guideline for Occupied Buildings under Construction."
  - 1. If Owner authorizes use of permanent heating, cooling, and ventilating systems during construction period as specified in Section 015000 "Temporary Facilities and Controls," install filter media having a MERV 8 according to ASHRAE 52.2 at each return-air inlet for the air-handling system used during construction.
  - 2. Replace all air filters immediately prior to occupancy.
- B. Credit IEQ 3.2:[ Comply with one of the following requirements:]
  - 1. After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total volume of **14000 cu. ft.** of outdoor air per **sq. ft.** of floor area while maintaining an internal temperature of at least **60 deg F** and a relative humidity no higher than 60 percent.
  - 2. If occupancy is desired prior to flush-out completion, the space may be occupied following delivery of a minimum of **3500 cu. ft.** of outdoor air per **sq. ft.** of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of **0.30 cfm per sq. ft.** of outside air or the design minimum outside air rate determined in Prerequisite IEQ 1, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of **14000 cu. ft./sq. ft.** of outside air has been delivered to the space.

3. Air-Quality Testing:

- a. Conduct baseline indoor-air-quality testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air," and as additionally detailed in the USGBC's "LEED Reference Guide for Green Interior Design and Construction."
- b. Demonstrate that the contaminant maximum concentrations listed below are not exceeded:
  - 1) Formaldehyde: 27 ppb.
  - 2) Particulates (PM10): 50 micrograms/cu. m.
  - 3) Total Volatile Organic Compounds (TVOC): 500 micrograms/cu. m.
  - 4) 4-Phenylcyclohexene (4-PH): 6.5 micrograms/cu. m.
  - 5) Carbon Monoxide: 9 ppm and no greater than 2 ppm above outdoor levels.
- c. For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting noncomplying building areas, take samples from same locations as in the first test.
- d. Air-sample testing shall be conducted as follows:
  - 1) All measurements shall be conducted prior to occupancy but during normal occupied hours, and with building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.
  - 2) Building shall have all interior finishes installed including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Nonfixed furnishings such as workstations and partitions are encouraged, but not required, to be in place for the testing.
  - 3) Number of sampling locations varies depending on the size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per **25,000 sq. ft.** or for each contiguous floor area, whichever is larger, and shall include areas with the least ventilation and greatest presumed source strength.
  - 4) Air samples shall be collected between **3 and 6 feet** from the floor to represent the breathing zone of occupants, and over a minimum four-hour period.



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**PART 4 - MEASUREMENT**

4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Lump Sum Contract price.

**END OF SECTION 018113.16**



## SECTION 024116 - STRUCTURE DEMOLITION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of buildings and structures and site improvements.
2. Demolition and removal of site improvements adjacent to a building or structure to be demolished.
3. Abandoning in-place or Removing below-grade construction.
4. Disconnecting, capping or sealing, and abandoning in-place or removing site utilities.
5. Salvaging items for reuse by Owner.

B. Related Sections:

1. Section 011000 "Summary" for use of the premises and phasing requirements.
2. Section 013233 "Photographic Documentation" for preconstruction photographs taken before building demolition.
3. Section 024119 "Selective Demolition" for partial demolition of buildings, structures, and site improvements.
4. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade site improvements not part of building demolition.
5. Section 330500 "Common Work Results for Utilities" for shutting off, disconnecting, removing, and sealing or capping utilities.

- C. Alternates: Refer to Division 01 Section 012300 "Alternates" for description of Work in this Section affected by Alternates.

#### 1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.

- C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.

#### 1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
1. Carefully salvage in a manner to prevent damage and promptly return to Owner.
- C. Coordinate with Owner's archaeologist or historical adviser, who will establish special procedures for removal and salvage.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified refrigerant demolition firm or professional engineer or recovery technician.
- B. Proposed Protection measures: Submit informational report, including Drawings, that indicates the measures proposed for protecting individuals and property. Indicate proposed locations and construction of barriers.
1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings.
- C. Schedule of Building Demolition Activities: Indicate the following:
1. Detailed sequence of demolition work, with starting and ending dates for each activity.
  2. Temporary interruption of utility services.
  3. Coordination for shutoff and capping or re-routing and continuation of utility services.
  4. Locations of temporary protection and means of egress, including for other tenants affected by building demolition operations.
  5. Coordination of Owner's continuing occupancy of adjacent buildings and partial use of premises.
- D. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
- E. Predemolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before the Work begins.

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- F. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
- G. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

## 1.6 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized experience in demolition work similar in material and extent to that indicated for this Project.
- B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.
- E. Predemolition Conference: Conduct conference at Project site or location and time as determined by DEN Project Manager.
  - 1. Inspect and discuss condition of construction to be demolished.
  - 2. Review structural load limitations of existing structures.
  - 3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review and finalize protection requirements.
  - 5. Review procedures for noise control and dust control.
  - 6. Review procedures for protection of adjacent buildings.
  - 7. Review items to be salvaged and returned to Owner.

## 1.7 PROJECT CONDITIONS

- A. Buildings to be demolished will be vacated and their use discontinued before start of the Work.
- B. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
  - 1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
  - 2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.

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- a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- C. Owner assumes no responsibility for buildings and structures to be demolished.
1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
  2. Before building demolition, Owner will remove the following items:
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
1. Hazardous materials will be removed by Owner before start of the Work.
  2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify DEN Project Manager. Hazardous materials will be removed by Owner under a separate contract.
- E. Hazardous Materials: Hazardous materials are present in buildings and structures to be demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
1. Hazardous material remediation is specified elsewhere in the Contract Documents.
  2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
  3. Owner will provide material safety data sheets for materials that are known to be present in buildings and structures to be demolished because of building operations or processes performed there.
- F. On-site storage or sale of removed items or materials is not permitted.
- 1.8 COORDINATION
- A. Arrange demolition schedule so as not to interfere with Owner's on-site operations or operations of adjacent occupied buildings.
- 1.9 CONSTRUCTION WASTE MANAGEMENT
- A. Construction waste shall be managed in accordance with provisions of Section 017419 "Construction Waste Management and Disposal". Documentation shall be submitted to satisfy the requirements of that Section.

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**PART 2 - PRODUCTS [ Not Used]****2.1 SOIL MATERIALS**

- A. Satisfactory Soils: Comply with requirements in Section 312000 "Earth Moving."

**PART 3 - EXECUTION****3.1 DEMOLITION CONTRACTOR**

- A. Demolition Contractor: Subject to compliance with requirements, provide one of the following:
1. Name of Contractor prequalified to perform the Work of this Section.
  2. or approved equal.

**3.2 EXAMINATION**

- A. Survey existing conditions and correlate with requirements indicated to determine extent of building demolition required.
- B. Verify that utilities have been disconnected and capped before starting demolition operations.
- C. Review Project Record Documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- D. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations. Comply with Section 013233 "Photographic Documentation."
- E. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to DEN Project Manager.
- F. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.
1. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- G. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

### 3.3 PREPARATION

- A. Refrigerant: Remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction before starting demolition.
- B. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures to be demolished.
1. Owner will arrange to shut off indicated utilities when requested by Contractor.
  2. Arrange to shut off indicated utilities with utility companies.
  3. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
  4. Cut off pipe or conduit a minimum of **24 inches** below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
- C. Existing Utilities: See plumbing and electrical Sections for shutting off, disconnecting, removing, and sealing or capping utilities. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.
1. Remove and recycle, when possible, refrigerant from air-conditioning equipment before starting demolition.
- D. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
1. Strengthen or add new supports when required during progress of demolition.
- E. Salvaged Items: Comply with the following:
1. Clean salvaged items of dirt and demolition debris.
  2. Pack or crate items after cleaning. Identify contents of containers.
  3. Store items in a secure area until delivery to Owner.
  4. Transport items to storage area [designated by Owner] [designated by tenant] [indicated on Drawings].
  5. Protect items from damage during transport and storage.

### 3.4 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during demolition. When permitted by DEN Project Manager, items may be removed to a suitable, protected storage location during demolition [and cleaned] and reinstalled in their original locations after demolition operations are complete.

- C. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations.
1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
  2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
    - a. Provide at least 72 hours' notice to DEN Project Manager if shutdown of service is required during changeover.
- D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 015210 "Temporary Facilities."
1. Protect adjacent buildings and facilities from damage due to demolition activities.
  2. Protect existing site improvements, appurtenances, and landscaping to remain.
  3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
  4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
  6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
  7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.
- E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

### 3.5 DEMOLITION, GENERAL

- A. General: Demolish indicated buildings and structures and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
  2. Maintain fire watch during and for at least <Insert number> hours after flame cutting operations.
  3. Maintain adequate ventilation when using cutting torches.
  4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Engineering Surveys: During demolition, perform surveys to detect hazards that may result from building demolition activities.



- C. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from [Owner] [tenant] and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
  2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- D. Explosives: Use of explosives is not permitted.

### 3.6 DEMOLITION BY MECHANICAL MEANS

- A. Remove buildings and structures and site improvements intact when permitted by authorities having jurisdiction.
- B. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- C. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.
- D. Salvage: Items to be removed and salvaged are indicated on Drawings.
1. Doors and door hardware.
  2. Windows.
  3. Cabinets.
  4. Mirrors.
  5. Chalkboards.
  6. Tackboards.
  7. Marker boards.
  8. Plumbing fixtures.
- E. Concrete: Cut concrete full depth at junctures with construction indicated to remain, using power-driven saw, then remove concrete between saw cuts.
- F. Masonry: Cut masonry at junctures with construction indicated to remain, using power-driven saw, then remove masonry between saw cuts.
- G. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished at junctures with construction indicated to remain, then break up and remove.



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- H. Structural Steel: Dismantle field connections without bending or damaging steel members. Do not use flame-cutting torches unless otherwise authorized by DEN Project Manager or authorities having jurisdiction.
- I. Transport steel trusses and joists as whole units without dismantling them further.
- J. Carpet and Pad: Remove in large pieces and roll tightly after removing demolition debris, trash, adhesive, and tack strips.
- K. Building Components: Remove metal gratings, metal ladders, doors, windows, door hardware, cabinets, mirrors, chalkboards and marker boards, tackboards, toilet accessories, plumbing fixtures and light fixtures, as whole units, intact and undamaged.
- L. Elevators: Remove as whole units as much as practical.
- M. Equipment: Disconnect equipment at nearest fitting connection to services, complete with service valves. Remove as whole units, complete with controls.
- N. Below-Grade Construction: Abandon foundation walls and other below-grade construction. Cut below-grade construction flush with grade.
- O. Below-Grade Construction: Demolish foundation walls and other below-grade construction that are within footprint of new construction and extending 5 feet outside footprint indicated for new construction. Abandon below-grade construction outside this area.
1. Remove below-grade construction, including basements, foundation walls, and footings, to at least 6 inches below grade.
- P. Below-Grade Construction: Demolish foundation walls and other below-grade construction.
1. Remove below-grade construction, including basements, foundation walls, and footings, to at least 6 inches below grade.
- Q. Existing Utilities: Abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.
- R. Existing Utilities: Demolish existing utilities and below-grade utility structures that are within 5 feet outside footprint indicated for new construction. Abandon utilities outside this area.
1. Fill abandoned utility structures with satisfactory soil materials according to backfill requirements in Section 312000 "Earth Moving."
  2. Piping: Disconnect piping at unions, flanges, valves, or fittings.
  3. Wiring Ducts: Disassemble into unit lengths and remove plug-in and disconnecting devices.
- S. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.

1. Piping: Disconnect piping at unions, flanges, valves, or fittings.
2. Wiring Ducts: Disassemble into unit lengths and remove plug-in and disconnecting devices.

### 3.7 DEMOLITION BY EXPLOSIVES

- A. Explosives: Use of explosives is not permitted.
- B. Explosives: Perform explosive demolition according to governing regulations.
  1. Obtain written permission from authorities having jurisdiction before bringing explosives to, or using explosives on, Project site.
  2. Do not damage adjacent structures, property, or site improvements when using explosives.
- C. Comply with recommendation in specialty explosives consultant's report.

### 3.8 SITE RESTORATION

- A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.
- B. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with [satisfactory soil materials] [recycled pulverized concrete] [recycled pulverized masonry] according to backfill requirements in Section 312000 "Earth Moving."
- C. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

### 3.9 REPAIRS

- A. Promptly repair damage to adjacent buildings caused by demolition operations.
- B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

### 3.10 RECYCLING DEMOLISHED MATERIALS

- A. General: Separate recyclable demolished materials from other demolished materials to the maximum extent possible. Separate recyclable materials by type.
  1. Provide containers or other storage method approved by DEN Project Manager for controlling recyclable materials until they are removed from Project site.

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2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  3. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
  4. Store components off the ground and protect from the weather.
  5. Transport recyclable materials off Owner's property and legally dispose of them.
- B. Recycling Haulers and Markets: List below is provided for information only. Subject to compliance with requirements, provide one of the following:
- C. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling building demolition materials shall accrue to Owner.
- D. Asphalt: Grind asphalt to maximum 4-inch size.
- E. Asphalt: Break up and transport asphalt to asphalt recycling facility.
- F. Concrete: Remove reinforcement and other metals from concrete and sort with other metals. Pulverize concrete to maximum 4-inch size.
- G. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
1. Pulverize masonry to maximum 4-inch size.
  2. Clean and stack undamaged, whole masonry units on wood pallets.
- H. Wood Materials: Sort and stack members according to size, type, and length. Separate dimensional and engineered lumber, panel products, and treated wood materials.
- I. Metals: Separate metals by type.
1. Structural Steel: Stack members according to size, type of member, and length.
  2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- J. Roofing: Separate organic and glass-fiber shingles and felts. Remove nails, staples, and accessories.
- K. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- L. Carpet and Pad: Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency.
- M. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs.
- N. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinkler heads, and other components by type and size.
- O. Lighting Fixtures: Separate lamps by type and protect from breakage.

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- P. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- Q. Conduit: Reduce conduit to straight lengths and store by type and size.

**3.11 DISPOSAL OF DEMOLISHED MATERIALS**

- A. Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain on Owner's property, remove demolition waste materials from Project site and legally dispose of them in an EPA-approved landfill acceptable to authorities having jurisdiction. See Section 017419 "Construction Waste Management and Disposal" for recycling and disposal of demolition waste.
1. Do not allow demolished materials to accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Do not burn demolished materials.
- C. Disposal: Transport demolished materials and dispose of at designated spoil areas on Owner's property.
- D. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

**3.12 CLEANING**

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.
1. Clean roadways of debris caused by debris transport.

**PART 4 - MEASUREMENT****4.1 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT****5.1 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Lump Sum Contract price.

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**END OF SECTION 024116**

## SECTION 024119 - SELECTIVE DEMOLITION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.
4. Repair procedures for selective demolition operations.

B. Related Requirements:

1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 024116 "Structure Demolition" for demolition of buildings and structures.
3. Section **230505 "Selective Demolition for Mechanical" for demolition of fire suppression, plumbing, and HVAC systems.**
4. Section 260505 "Selective Demolition for Electrical" for demolition of electrical systems.
5. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements.

- C. Alternates: Refer to Division 01 Section 012300 "Alternates" for description of Work in this Section affected by Alternates.

#### 1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

#### 1.4 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain DEN's property, demolished materials shall become the Contractor's property and shall be removed from the Project site.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
  - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

#### 1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at location and time as determined by DEN Project Manager.
  - 1. Inspect and discuss condition of construction to be selectively demolished.
  - 2. Review structural load limitations of existing structure.
  - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
  - 5. Review areas where existing construction is to remain and requires protection.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data:
  - 1. For firms and persons specified in Section 014510 "Contractor Quality Control" to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
  - 2. For refrigerant recovery technician.
- B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property [, for environmental protection] [, for dust control] [and] [, for noise control], and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate. Indicate proposed locations and construction of barriers.
- C. Submit Schedule of Selective Demolition Activities. Indicate the Following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure DEN's and tenant's on-site operations are uninterrupted.
  - 2. Interruption of utility services. Indicate how long utility services will be interrupted.

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3. Do not interrupt utility services without prior written request and approval from DEN Project Manager and authorities having jurisdiction.
  4. Coordination for shutoff, capping, and continuation of utility services.
  5. Use of elevator and stairs.
  6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- D. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
- E. Predemolition Photographs or Video: Submit before Work begins.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- G. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.
- 1.7 CLOSEOUT SUBMITTALS
- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
- C. As-Built Plans: Submit complete as-built plans of all Work, including interface with other Work, in accordance with requirements as specified in Section 013300 "Submittal Procedures".
- 1.8 QUALITY ASSURANCE
- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI A10.6 and NFPA 241.
- C. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- 1.9 FIELD CONDITIONS
- A. When there are occupied portions of buildings immediately adjacent to selective demolition area, conduct selective demolition so DEN's or tenant's operations will not be disrupted.



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1. Provide not less than 72 hours' notice to DEN Project Manager of activities that will affect DEN's or tenant's operations.
- B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.
- C. DEN assumes no responsibility for condition of areas to be selectively demolished. DEN will maintain conditions existing at time of inspection for bidding purpose as far as practical.
- D. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
  1. Before selective demolition, Owner will remove the following items:
- E. Notify DEN Project Manager of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- F. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  1. Hazardous materials will be removed by Owner before start of the Work.
  2. If suspected hazardous materials are encountered, do not disturb; immediately notify DEN Project Manager. Hazardous materials will be removed by Owner under a separate contract.
- G. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
  1. Hazardous material remediation is specified elsewhere in the Contract Documents.
  2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
  3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.
- H. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by **12 inches** or more.
- I. Storage or sale of removed items or materials on-site is not permitted.
- J. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
  1. Maintain fire-protection facilities in service during selective demolition operations.

## 1.10 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.
  - 1. If possible, retain original installer or fabricator to patch the exposed Work listed below that is damaged during selective demolition. If it is impossible to engage the original installer or fabricator, engage another recognized experienced and specialized firm.
    - a. Ornamental metal.
    - b. Preformed metal panels.
    - c. Firestopping.
    - d. Terrazzo.
    - e. Wall covering.
    - f. ProCoat paint finishes.
    - g. HVAC enclosures, cabinets, or covers.

## 1.11 CONSTRUCTION WASTE MANAGEMENT

- A. Construction waste shall be managed in accordance with provisions of Section 017419 "Construction Waste Management and Disposal". Documentation shall be submitted to satisfy the requirements of that Section.

## PART 2 - PRODUCTS

### 2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
- B. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that, when installed, will match the visual and functional performance of existing materials, as approved by DEN Project Manager.
- C. Use materials whose installed performance equal or surpass that of existing materials.
- D. Comply with material and installation requirements specified in individual specification sections.

## 2.2 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.
- C. LEED Requirements for Building Reuse:
  - 1. Credit MR 1.1[ and Credit MR 1.2]: Maintain existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing, excluding window assemblies and nonstructural roofing material) not indicated to be demolished; do not demolish such existing construction beyond indicated limits.
  - 2. Credit MR 1.3: Maintain existing interior nonstructural elements (interior walls, doors, floor coverings, and ceiling systems) not indicated to be demolished; do not demolish such existing construction beyond indicated limits.
  - 3. Credit MR 1.2[ and Credit MR 1.3]: Maintain existing nonshell, nonstructural components (walls, flooring, and ceilings) not indicated to be demolished; do not demolish such existing construction beyond indicated limits.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- E. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to DEN Project Manager.
- F. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
  - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

2. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- G. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and preconstruction videotapes.
1. Comply with requirements specified in Section 013233 "Photographic Documentation."
  2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
  3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.
- 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS
- A. No system component shall be abandoned in place.
- B. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."
  2. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by the DEN Project Manager and authorities having jurisdiction.
- C. Existing Services/Systems to Be Removed, or Relocated: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
1. Arrange to shut off indicated utilities and obtain prior written approval with DEN Project Manager and utility companies.
  2. If services/systems are required to be removed, or relocated, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
    - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    - b. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    - c. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    - d. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

- e. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
- D. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

### 3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Comply with requirements for access and protection specified in Section 015210 "Temporary Facilities."
  2. Do not close or obstruct roads, streets, walks, walkways, or other adjacent occupied or used facilities without written authorization from the DEN Project Manager and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
  3. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
  4. Protect existing site improvements, appurtenances, and landscaping.
  5. Erect a plainly visible fence around drip lines of individual trees or around perimeter drip lines of groups of trees.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  4. Cover and protect furniture, furnishings, and equipment that have not been removed.
  5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
1. Strengthen or add new supports when required during progress of selective demolition.

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- D. Temporary Enclosures: Provide temporary enclosures for protection of existing buildings and construction projects, both in progress and completed, from exposure, foul weather and other construction operations. Provide temporary weather tight enclosures for building exteriors.
1. Where heating or cooling is needed and permanent enclosures are not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
  2. Contractor shall be responsible for any damage to existing conditions due to inadequate temporary enclosures or due to failure of temporary enclosures.
- E. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

### 3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
  5. Maintain adequate ventilation when using cutting torches.
  6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  9. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."
- B. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without DEN Project Manager's approval.
1. Building Structure and Shell: 75 percent.

2. Nonshell Elements: 50 percent.
3. Nonshell Elements: 40 percent.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to DEN.
4. Transport items to DEN's storage area as designated by the DEN Project Manager.
5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Paint equipment to match new equipment, with coatings of equal color, finish and performance of new equipment.
3. Pack or crate items after cleaning and repairing. Identify contents of containers.
4. Protect items from damage during transport and storage.
5. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by DEN Project Manager, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

### 3.5 PATCHING AND REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.
- B. Patching: Comply with Specification Section 017330 "Cutting and Patching".
- C. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
1. Completely fill holes and depressions in existing masonry walls that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.
- D. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.



- E. Floors and Walls: Where walls or partitions that are demolished extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
1. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements as specified in other sections of these specifications.
  2. Where patching occurs on a painted surface, apply primer and intermediate paint coats over the patch and apply a final paint coat over the entire unbroken surface containing the patch. Provide additional coats until the patch blends with adjacent surfaces.
  3. Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
- F. Ceilings: Patch, repair or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

### 3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least **3/4 inch** at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.
- F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
1. Remove existing roof membrane, flashings, copings, and roof accessories.
  2. Remove existing roofing system down to substrate.



### 3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
1. Do not allow demolished materials to accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
  4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
  5. Disposal shall be in accordance with Division 32 requirements.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

### 3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

### 3.9 SELECTIVE DEMOLITION SCHEDULE

- A. Existing Items to be Removed:
- B. Existing Items to Be Removed and Salvaged:
- C. Existing Items to Be Removed and Reinstalled:
- D. Existing Items to Remain:

## PART 4 - MEASUREMENT

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

## SECTION 142100 - ELECTRIC TRACTION ELEVATORS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes electric traction passenger and service elevators.
- B. Related Requirements:
1. The contractor is to provide the cost and project management of all related work for completion of this scope of work for a turn-key project.
  2. Section 015210 "Temporary Facilities" for temporary use of elevators for construction purposes.
  3. Section 033000 "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
  4. Section 042000 "Unit Masonry" for setting sleeves, inserts, and anchoring devices in masonry and for grouting elevator entrance frames installed in masonry walls.
  5. Section 051200 "Structural Steel Framing" for the following:
    - a. Attachment plates, angle brackets, and other preparation of structural steel for fastening guide-rail brackets.
    - b. Divider beams.
    - c. Hoist beams.
    - d. Structural-steel shapes for subsills.
  6. Section 055000 "Metal Fabrications" for the following:
    - a. Attachment plates and angle brackets for supporting guide-rail brackets.
    - b. Divider beams.
    - c. Hoist beams.
    - d. Structural-steel shapes for subsills.
    - e. Pit ladders.
    - f. Cants in hoistways made from steel sheet.
  7. Section 055213 "Pipe and Tube Railings" for railings between adjacent elevator pits.
  8. Section 057000 "Decorative Metal" for combination hall push-button stations.
  9. Section 099113 "Exterior Painting" for field painting of hoistway entrance doors and frames.

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10. Section 099123 "Interior Painting" for field painting of hoistway entrance doors and frames.
- 11.
12. Section 142113 "Electric Traction Freight Elevators" for electric traction elevators used primarily for carrying freight and inaccessible to the general public.
13. Section 221429 "Sump Pumps" for sump pumps, sumps, and sump covers in elevator pits.
14. Section 271500 "Communications Horizontal Cabling" for telephone service for elevators[ and for Internet connection to elevator controllers for remote monitoring of elevator performance].
15. [Section 283111 "Digital, Addressable Fire-Alarm System"] [Section 283112 "Zoned (DC Loop)] Fire-Alarm System" for smoke detectors in elevator lobbies to initiate emergency recall operation[ and heat detectors in shafts and machine rooms to disconnect power from elevator equipment before sprinkler activation] and for connection to elevator controllers.

C. Alternates:

1. Refer to Division 01 Section 012300 "Alternates" for description of Work in this Section affected by Alternates , where applicable
2. For hydraulic elevator conversion alternate (see section 142400, Hydraulic Elevators), provide alternate pricing for conversion of the existing hydraulic elevator(s) to traction elevator(s) following the Electric Traction Elevators modernization specification section 142100. Include the following:
  - a. Remove all existing hydraulic elevator equipment including jack unit, pump unit, feedline, controller, wiring and all other eliminated or equipment to be replaced.
  - b. Provide new machine room-less (MRL) gearless machine in the elevator overhead or an overhead gearless machine if an existing overhead machine room exists.
  - c. Retain or replace existing platform, sling, crosshead, rails, brackets, buffers, entrance frames, hall sills and other equipment as required to accommodate the new installation of the MRL elevator.
  - d. Provide all related work/work by others for removal, reconfiguration and installation of the new traction/MRL elevator. Retain existing pit dimensions and minimize the overhead modifications in the overall MRL replacement design. Include pit hole sealing and reconfiguration for installation of the new counterweights and buffers.
  - e. Provide equipment interface hoistway and machine room layout drawings for proper replacement equipment engineering and obtaining applicable permits.
  - f. All other items to follow 142100 specification sections.

1.3 REFERENCES

A. American National Standards Institute (ANSI):

1. A117.1 - Accessible and Usable Buildings and Facilities.

B. American Society for Testing and Materials (ASTM):

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1. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
2. A366/366M - Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
3. A786A/786M - Rolled Steel Floor Plates.
4. A793 - Rolled Floor Plate, Stainless Steel.
5. B36/36M - Brass Plate, Sheet, Strip, and Rolled Bar.
6. B151 - Nickel-Zinc Alloy (Nickel Silver) and Copper-Nickel Rod and Bar.
7. B151M - Copper-Nickel-Zinc Alloy (Nickel Silver) and Copper-Nickel Rod and Bar (Metric).
8. B455 - Copper-Zinc-Alloy (Leaded Brass) Extruded Shapes.
9. B632/632M - Aluminum-Alloy Rolled Tread Plate.
10. C1107 - Packaged Dry, Hydraulic-Cement Grout (Non-shrink).

C. American Society of Mechanical Engineers (ASME):

1. A17.1 - Safety Code for Elevators and Escalators. Provide the latest version of the ASME A17.1 as enforced by the local authority having jurisdiction (AHJ). Please note that DIA-DEN has chosen to include the two (2) way text and video communication and three dimensional (3D) electronic safety edge (for passenger elevators) requirements of the ASME A17.1 2019 Code. All elevators must include these provisions.

D. National Electrical Manufacturers Association (NEMA):

1. LD3 - High Pressure Decorative Laminates.

E. U.S. Architectural & Transportation Barriers Compliance Board:

1. ADA Accessibility Guidelines - August 1994 - American Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities.

#### 1.4 ALLOWANCES

A. Elevator Car Allowances: Provide finished passenger and service elevator cars under the Elevator Car Allowance specified in Section 012100 "Allowances" – estimated at \$25,000 per elevator. Allowance includes furnishing and installing the following:

1. Car wall finishes including trim.
2. Car floor finishes.
3. Car ceiling finishes.
4. Car door and hoistway door finishes – to be included in the base proposal and excluded from the cab interior allowance.
5. Car doorsills if part of the modernization process, to be included in the base proposal and excluded from the cab interior allowance.
6. Car light fixtures.
7. Handrails.
8. Cutouts and other provisions for installing elevator signal equipment in cars – includes cladding of front returns, transoms, inside car jambs if applicable.

## 1.5 DEFINITIONS

- A. Definitions in ASME A17.1/CSA B44 apply to work of this Section.
- B. Service Elevator: A passenger elevator that is also used to carry freight and without bi-parting freight doors.
- C. Electric Traction Elevators: Elevators in which cars are hoisted by wire ropes using electrically driven traction sheaves and are defined to include driving machines; cars; hoistway doors; guide rails; guide-rail brackets; roping; buffers; counterweights; signals; control systems; electrical wiring within elevator system; and devices for operations, safety, security, required performance at rated speed and capacity, and for complete elevator installation.
  - 1. Current seismic risk zone for Denver International Airport (DIA) is zone 1 and all equipment is to meet such requirements.
- D. Defective Elevator Work: Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

## 1.6 ACTION SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for car enclosures, hoistway entrances, and operation, control, and signal systems.
  - 1. Include data substantiating that materials comply with requirements.
- B. Shop Drawings:
  - 1. Include plans, elevations, sections, and large-scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment.
  - 2. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support, locations of equipment and signals, and maximum and average power demands.
  - 3. Include large-scale layout of car-control station and standby power operation control panel.
- C. Samples for Initial Selection: For finishes involving color selection.
- D. Samples for Verification: For exposed car, hoistway door and frame, and signal equipment finishes; **3-inch**- square Samples of sheet materials; and **4-inch** lengths of running trim members.

## 1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Seismic Qualification Certificates: For elevator equipment, accessories, and components, from manufacturer.
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
  - 4. Current seismic risk zone for Denver International Airport (DIA) is zone 1 and all equipment is to meet such requirements.
- C. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room or control closet layout and dimensions, as shown on Drawings, and electrical service including standby power generator if applicable, as shown and specified, are adequate for elevator system being provided. Existing conditions known at the time of pricing the project will be provided to the purchaser. Unknown, unforeseen or hidden conditions will be provided to the purchaser as soon as such conditions are determined and/or known including additional costs, if applicable.

## 1.8 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.
  - 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.
- B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.
- C. Manufacturer shall furnish a letter stating all components are designed by an Engineer and are suitable for the intended purpose.
- D. Signage directly related to the operation of the elevator
- E. Maintenance manuals for each different electric traction elevator, including operation and maintenance instructions, parts listing with sources indicated, recommended parts inventory listing, emergency instructions, and similar information. Include all diagnostic and repair information available to manufacturer's and Installer's maintenance personnel. Submit for Owner's information at project closeout as specified in Division 01.

- F. As-Built Plans: Submit complete as-built plans of all Work, including interface with other Work, in accordance with requirements as specified in Section 013300 "Submittal Procedures".

#### 1.9 QUALITY ASSURANCE

- A. Installer Qualifications: Engage the elevator manufacturer or an experienced Installer approved by the elevator manufacturer who has completed elevator installations similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Regulatory Requirements: In addition to local governing regulations, comply with the applicable provisions of the following:
1. ASME A17.1, "Safety Code for Elevators and Escalators," referred to as the "Code." Provide the latest version of the ASME A17.1 as enforced by the local authority having jurisdiction (AHJ). Please note that DIA-DEN has chosen to include the two (2) way text and video communication and three dimensional (3D) electronic safety edge (for passenger elevators) requirements of the ASME A17.1 2019 Code. All elevators must include these provisions.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging. Store materials, components, and equipment off ground, under cover, and in a dry location prior to installation of the equipment.

#### 1.11 COORDINATION

- A. Coordinate installation of sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.
- B. Coordinate locations and dimensions of other work relating to electric traction elevators including pit ladders; sumps and floor drains in pits; entrance subsills; electrical service; and electrical outlets, lights, and switches in hoistways, pits, and machine rooms.

#### 1.12 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to provide replacement moving walk components/parts as part of the project. The contractor is to provide a comprehensive spare parts list to the purchaser for approval. All parts will be provided to the purchaser prior to final completion of each project task order. Bidders are to include a \$15,000 per unit spare parts allowance with their proposals.



### 1.13 CONSTRUCTION WASTE MANAGEMENT

- A. Construction waste shall be managed in accordance with provisions of Section 017419 "Construction Waste Management and Disposal". Documentation shall be submitted to satisfy the requirements of that Section.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. thyssenkrupp Elevator
  2. KONE Inc.
  3. Otis Elevator Co.
  4. Schindler Elevator Corp.
  5. or approved equal.
- B. Source Limitations: Obtain elevators from single manufacturer/provider.
1. Major elevator components, including driving machines, controllers, signal fixtures, door operators, car frames, cars, and entrances, shall be manufactured/provided by single manufacturer/provider.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with ASME A17.1/CSA B44. Provide the latest version of the ASME A17.1 as enforced by the local authority having jurisdiction (AHJ). Please note that DIA-DEN has chosen to include the two (2) way text and video communication and three dimensional (3D) electronic safety edge (for passenger elevators) requirements of the ASME A17.1 2019 Code. All elevators must include these provisions.
- B. Accessibility Requirements: Comply with Section 407 in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.
- C. Seismic Performance: Current seismic risk zone for Denver International Airport (DIA) is zone 1 and all equipment is to meet such requirements.
1. Provide earthquake equipment required by ASME A17.1/CSA B44.



## 2.3 MATERIALS AND COMPONENTS, GENERAL

- A. General: Provide manufacturer's standard elevator systems. Where components are not otherwise indicated, provide standard components, published by manufacturer as included in standard pre-engineered or engineered (as applicable) elevator systems and as required for a complete system.
- B. Elevator Machines: Geared or Gearless type.
1. Provide variable-voltage, variable-frequency regenerative ac-type gearless hoisting machine as a preferred product. Use geared machine only where speed, capacity and/or configuration limits application to geared machine type.
  2. Where elevator speed is 100 ft./min. (0.5 m/s) or less, provide variable-voltage geared machine unless otherwise specified.
  3. All machines are to have dual brakes, sheave clamp or rope gripping device per Code.
- C. Power Control: Except as otherwise indicated, where variable voltage is required, provide solid-state power converters for use with motors on elevator machines (ac).
1. Provide line filters or chokes to prevent electrical peaks or spikes from feeding back into building power system from solid-state converters.
  2. Provide all gearless control systems with an isolation transformer.
- D. Power Supply: Provide equipment rated at 480 V, 60 Hz, 3-phase, 208 V, 60 Hz, 3-phase or 240 V, 60 Hz, 3-phase) – match existing power supply.
- E. Inserts: For new installation projects, furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work where installation of devices is specified in another Specification Section.
- F. Machine Beams: Provide framing to support the elevator hoisting machine and deflector sheaves from the building structure. Comply with Division 05 for materials and fabrication. For modernization equipment, all new machinery equipment is to interface with the existing machine beams where possible including adapter and blocking beams.
- G. Guide Shoes/Rollers: Provide either sliding shoes or rollers for speeds of 200 ft./min. (1.02 m/s) and less, and spring-loaded rollers for speeds in excess of 200 ft./min. (1.02 m/s). All guide types are to be properly rated for the applicable speed and capacity of each passenger or service elevator
- H. Car Frame and Platform: For new installation projects, provide welded or bolted steel units. For modernization equipment, retain as necessary and check for any unusual wear. Advise purchaser of any need for replacement equipment or repair of the existing components.

## 2.4 ELEVATORS

- A. Elevator System, General: Manufacturer's standard elevator systems. Unless otherwise indicated, manufacturer's standard components shall be used, as included in standard elevator systems and as required for complete system.
- B. Elevator Description:
1. Group Number: Per Project.
  2. Elevator Number(s): Per Project.
  3. Emergency Elevator Number(s): Per Project, as applicable.
  4. Service Elevator Number(s): Per Project, as applicable
  5. Machine Location: Retain existing location, unless directed otherwise.
  6. Machine Type: Provide new geared or Gearless traction.
  7. Rated Load: Retain existing capacity rating
  8. Freight Loading Class for Service Elevator(s): Class A – Retain existing classification for all service and passenger cars
  9. Rated Speed: Retain existing speed, unless directed otherwise.
  10. Operation System Retain existing operation unless directed otherwise.
  11. Auxiliary Operations:
    - a. Standby power generator operation (if elevator is connected to a standby power generator).
    - b. Battery-powered lowering (if elevator is not connected to standby power generator).
    - c. Automatic dispatching of loaded car.
    - d. Nuisance call cancel.
    - e. Independent service for all single cars and/or for all in a group.
    - f. Load-weighing device/loaded-car bypass.
    - g. Distributed parking.
  12. Security Features: Card-reader operation (base), Keyswitch operation (at purchaser's request), and Car-to-lobby feature (at purchaser request).
  13. Dual Car-Control Stations: Provide two car-control stations in each elevator; equip only one with required keyswitches if any. Provide dual car stations where possible. Side slide opening elevators are to receive single car stations.
  14. Car Enclosures:
    - a. Inside Width - from sidewall to sidewall retain existing dimensions
    - b. Inside Depth - from back wall to front wall (return panels) retain existing dimensions
    - c. Inside Height - to underside of ceiling retain existing dimensions
    - d. Front Walls (Return Panels): Satin stainless steel, No. 4 finish
    - e. Car Fixtures: Satin stainless steel, No. 4 finish
    - f. Side and Rear Wall Panels: Design to be determined with cab interior allowance and through submittal process.
    - g. Reveals: Design to be determined with cab interior allowance and through submittal process.
    - h. Door Faces (Interior): Satin stainless steel, No. 4 finish
    - i. Doorsills: Nickel silver

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- j. Ceiling: Design to be determined with cab interior allowance and through submittal process.
  - k. Handrails: Design to be determined with cab interior allowance and through submittal process.
  - l. Floor: Design to be determined with cab interior allowance and through submittal process.
  - m. Floor prepared to receive new flooring as included in the base cab interior design allowance.
15. Hoistway Entrances:
- a. Width: retain existing dimensions.
  - b. Height: retain existing dimensions.
  - c. Type: retain existing configuration/type
  - d. Frames: Retain existing configuration/type. Refinishing costs to be included in base price, if requested.
  - e. Doors: - Retain existing configuration/type. Refinishing or replacement costs to be included in base price, if requested.
  - f. Sills Retain existing configuration/type. Replacement costs with nickel silver to be included in base price, if requested.
16. Hall Fixtures - [Satin stainless steel, No. 4 finish
17. Additional Requirements:
- a. Provide the following engraving: "CERTIFICATE ON FILE IN DIA MAINTENANCE ADMINISTRATION AIRPORT OFFICE BUILDING".

## 2.5 TRACTION SYSTEMS

- A. Elevator Machines: Provide variable-voltage, variable-frequency (3VF), ac-type geared or gearless hoisting machines and solid-state power converters.
- 1. Provide regenerative 3VF-AC system.
  - 2. Limit total harmonic distortion of regenerated power to 5 percent per IEEE 519.
  - 3. Provide means for absorbing regenerated power when elevator system is operating on standby power (regen disable feature).
  - 4. Provide line filters or chokes to prevent electrical peaks or spikes from feeding back into building power system.
  - 5. Provide all gearless control systems with an isolation transformer.
- B. Fluid for Hydraulic Buffers: If using hydraulic buffers, use only fire-resistant fluid. For modernization projects, remove all fluid, clean, refill and tag each buffer.
- C. Inserts: For new installation projects, furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work. Device installation is specified in another Section.

- D. Machine Beams: For new installation projects, provide framing to support elevator hoisting machine and deflector sheaves from the building structure. Comply with Section 055000 "Metal Fabrications" for materials and fabrication. For modernization equipment, all new machinery equipment is to interface with the existing machine beams where possible including adapter and blocking beams.
- E. Car Frame and Platform: For new installation projects, provide Bolted- or welded-steel units. For modernization equipment, retain as necessary and check for any unusual wear. Advise purchaser of any need for replacement equipment or repair of the existing components.
- F. Guide Shoes/Rollers: Provide either sliding shoes or rollers for speeds of 200 ft./min. (1.02 m/s) and less, and spring-loaded rollers for speeds in excess of 200 ft./min. (1.02 m/s). All guide types are to be properly rated for the applicable speed and capacity of each passenger or service elevator.

## 2.6 OPERATION SYSTEMS

- A. General: Provide manufacturer's standard microprocessor operation system with on board diagnostics as required to provide type of operation indicated.
- B. Future Monitoring Provisions:
  - 1. Provide Lift-Net interface provisions within the solid-state elevator control system for potential future use by the airport.
  - 2. Provide BACNET interface provisions only within the solid-state elevator control system for potential future use by the airport.
- C. Group Automatic Operation with Demand-Based Dispatching: Where group operation exists, provide reprogrammable group automatic system that assigns cars to hall calls based on a dispatching program designed to minimize passenger waiting time. System automatically adjusts to demand changes for different traffic conditions including heavy incoming, heavy two-way, heavy outgoing, and light off-hours as variations of normal two-way traffic.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. thyssenkrupp Elevator
    - b. KONE Inc .
    - c. Otis Elevator Co.; .
    - d. Schindler Elevator Corp.; .
- D. Destination-Based Group Automatic Operation (destination dispatch, DD): If purchaser requests DD operation, provide reprogrammable group automatic system that assigns elevators leaving the main lobby in the up direction to a selected group of floors and directs passengers to an elevator serving their destination floor. System dispatches cars in a regulated sequence for optimum system efficiency; dispatch is based on origin and destination of calls. System automatically adjusts to changes in demand for different traffic conditions including heavy incoming, heavy two-way, heavy outgoing, and light off-hours as variations of normal two-way traffic.

1. Products: Subject to compliance with requirements, provide the latest touchscreen DD system from one of the following suppliers:
  - a. thyssenkrupp Elevator
  - b. KONE Inc.;
  - c. Otis Elevator Co.;
  - d. Schindler Elevator Corp.;
  
- E. Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated:
  1. Single-Car Standby Power Operation: For elevators connected to an emergency standby power generator and on activation of standby power, car is returned to a designated floor and parked with doors open. Car can be manually put in service on standby power, either for return operation or for regular operation, by switches in control panel located at main lobby or a fire command station. Manual operation causes automatic operation to cease.
  2. Single-Car Battery-Powered Lowering: For elevators not connected to an emergency standby power generator, if power fails and car is at a floor, it remains at that floor, opens its doors, and shuts down. If car is between floors, it is lowered to the next floor below, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.
  3. Group Standby Power Operation: For elevators connected to an emergency standby power generator and on activation of standby power, cars are returned to a designated floor and parked with doors open. One car is returned at a time, with priority given to loaded cars. If a car cannot be returned after two attempts, it is removed from the system. When all cars have been returned or removed from the system, one car is automatically placed in service. If car selected for service cannot operate within 60 seconds, the system removes car from service and places another car in service. Cars can be manually put in service on standby power, either for return operation or for regular operation, by switches in control panel located at main lobby or applicable fire command station. Manual operation causes automatic operation to cease.
  4. Group Battery-Powered Lowering: For elevators not connected to an emergency standby power generator and if power fails, cars that are at a floor remain at that floor, open their doors, and shut down. Cars that are between floors are lowered one at a time to the next floor below, open their doors, and shut down. System includes rechargeable battery and automatic recharging system.
  5. Automatic Dispatching of Loaded Car: When car load exceeds 80 percent of rated capacity, doors begin closing.
  6. Nuisance Call Cancel: When car calls exceed a preset number while car load is less than a predetermined weight, all car calls are canceled. Preset number of calls[ and predetermined weight] can be adjusted.
  7. Loaded-Car Bypass: When car load exceeds 80 percent of rated capacity, car responds only to car calls, not to hall calls.

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8. Distributed Parking: When cars are not required for response to calls, they are parked with doors closed and distributed in predetermined zones throughout the building. One zone shall include the main floor (to be determined by purchaser) and adjacent floors; remaining floors shall be divided into approximately equal zones.
  9. Independent Service: Keyswitch in car-control station removes car from group operation and allows it to respond only to car calls. Key cannot be removed from keyswitch when car is in independent service. When in independent service, doors close only in response to door close button.
  10. Fire recall position
- F. Security Features: Provide the following security features, where indicated. Security features shall not affect emergency firefighters' service.
1. Card-Reader Operation: For secured elevators, the system uses proximity ID card readers at the car-control stations and hall push-button stations to authorize calls. The security system determines which landings and at what times calls require authorization by card reader. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, other security access system equipment and elevator controllers for continued use following the completion of the modernization process. Allow space as indicated for card reader in car on the main and/or auxiliary car operating panel as determined by the purchaser.
    - a. When the security system is activated, car calls to restricted landings do not register unless the ID card is first presented to the proximity card reader. Security access system determines which landings are restricted and which of those are accessible to cardholder.
    - b. When operating on Independent Service, the proximity ID card reader must be swiped prior to a call being registered by the operator.
    - c. Security access system equipment is specified in Section 281300 "Access Control " and is to be kept strictly confidential.
  2. Car-to-Lobby Feature: If applicable and requested by the purchaser, this feature activated by keyswitch at main lobby causes a car or all cars in a group to return immediately to lobby and open doors for inspection. On deactivation by keyswitch, calls registered before keyswitch activation are completed and normal operation is resumed.

## 2.7 DOOR REOPENING DEVICES

- A. Infrared Array: Provide an industry-standard three (3) dimensional (3D) door reopening device with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more light beams shall cause doors to stop and reopen.



- B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

## 2.8 CAR ENCLOSURES

- A. General: For new installation projects or modernization projects where new car enclosures are included in the scope of work, provide enameled-steel car enclosures to receive removable wall panels, with removable car roof/ceiling and Code-required ceiling access door/panel. For all modernization projects, provide new car door(s) new closed-loop AC linear drive, power door operators and full car side equipment (header, gate switch, restrictor, clutch, hangers, track(s), etc.) and ventilation/disinfectant systems (see below).
1. For all projects, provide standard railings complying with ASME A17.1/CSA B44 on car tops where required by ASME A17.1/CSA B44.
  2. See "Allowances" Paragraph in "Summary" Article for items to be provided under the Elevator Car Allowance. Provide items not included in the Elevator Car Allowance as needed for finished car including materials and finishes specified below.
  3. Install a Code-compliant toe guard/platform apron on each car opening. Paint black and place elevator number on the front side.
  4. Provide proactive elevator cab health systems in each elevator including:
    - a. Elevator cab ventilation system – Provide an air purifying device with Needlepoint Bipolar Ionization (NPBI) technology. Use the GPS-FC24-AC™ unit by Global Plasma Solutions, Inc. (GPS®) or approved equal.

Elevator cab disinfectant system – Provide an advanced Photocatalytic Oxidation (PCO) unit designed specifically for elevators. Use the CASPR 200e unit by the CASPR™ Group or approved equal.

- B. Materials and Finishes: Manufacturer's standards, but not less than the following:
1. Subfloor: For modernization projects, retain or if required by purchaser, exterior, underlayment grade plywood, not less than **5/8-inch** nominal thickness.
  2. Floor Finish: Included in the base elevator car allowance. Design/type to be determined by the purchaser.
  3. Enameled-Steel Wall Panels: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by DEN Project Manager from manufacturer's full range.
  4. Stainless-Steel Wall Panels: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
  5. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to **1/2-inch** fire-retardant-treated particleboard with manufacturer's standard protective edge trim. Panels have a flame-spread index required by the ASTM E 84. Plastic-laminate color, texture, and pattern as selected by DEN Project Manager from plastic-laminate manufacturer's full range.
  6. Fabricate car with recesses and cutouts for signal equipment.
  7. Fabricate car doorframe integrally with front wall of car.

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8. Enameled-Steel Doors: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by DEN Project Manager from manufacturer's full range.
9. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet or by laminating stainless-steel sheet to exposed faces and edges of enameled cold-rolled steel doors using adhesive that fully bonds metal to metal without telegraphing or oil-canning.
10. Sills: Extruded metal, with grooved surface, **1/4 inch** thick.
11. Luminous Ceiling: LED light fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic.
12. Metal Ceiling: Flush panels, with LED downlights in the center of each panel. Align ceiling panel joints with joints between wall panels where possible and align the removal ceiling panel with the top of canopy/car access panel for emergency access.
13. Handrails: Manufacturer's standard handrails, of shape, metal, and finish indicated.

## 2.9 HOISTWAY ENTRANCES

- A. Hoistway Entrance Assemblies: Retain existing for modernization projects and refinish as required by the purchaser.
- B. Hoistway/hall door equipment: Replace all wearing components with identical replacement components and perform the following:
  1. Clean, sand and otherwise refurbish the existing hoistway landing-side tracks;
  2. Install new interlocks at each landing
  3. Install new hanger rollers/hangers at each landing
  4. Install new pick-up rollers/assemblies at each landing
  5. Install new closers/spirators at each landing
  6. Install new gibs with fire tabs at each landing (2 per door panel)
  7. Install new Z-bracket fire tabs at each landing (1 per door panel)
  8. Install new relating cables and linkage at all landings as needed
- C. Sections noted below with this section are for new installation projects
- D. Manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Frame size and profile shall accommodate hoistway wall construction.
  1. Where gypsum board wall construction is indicated, frames shall be self-supporting with reinforced head sections.
- E. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies shall comply with NFPA 80 and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction based on testing at as close-to-neutral pressure as possible according to [NFPA 252] [or] [UL 10B].
  1. Fire-Protection Rating: [1 hour] [1-1/2 hours] <Insert rating>[ with 30-minute temperature rise of **450 deg F**].



- F. Materials and Fabrication: Manufacturer's standards, but not less than the following:
1. Enameled-Steel Frames: Formed from cold- or hot-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by DEN Project Manager from manufacturer's full range.
  2. Primed-Steel Frames: Formed from cold- or hot-rolled steel sheet. Provide with factory-applied, rust-resistant primer for field painting.
  3. Steel Subframes: Formed from cold- or hot-rolled steel sheet, with factory-applied enamel finish or rust-resistant primer. Fabricate to receive applied finish as indicated.
  4. Stainless-Steel Frames: Formed from stainless-steel sheet.
  5. Star of Life Symbol: Identify emergency elevators with star of life symbol, not less than **3 inches** high, on both inside surfaces of hoistway doorframes.
  6. Stainless-Steel Doors and Transoms: Flush, hollow-metal construction; fabricated from stainless-steel sheet or by laminating stainless-steel sheet to exposed faces and edges of enameled cold-rolled steel doors using adhesive that fully bonds metal to metal without telegraphing or oil-canning.
  7. Sight Guards: Provide sight guards on doors matching door edges – finish to match existing car door finish.
  8. Sills: Extruded metal, with grooved surface, **1/4 inch** thick.
  9. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M.

## 2.10 SIGNAL EQUIPMENT

- A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements with long-life LEDs.
- B. General: Where purchaser requests DD, provide signal equipment designed for destination-based system. Fabricate lighted elements with long-life LEDs.
- C. Car-Control Stations: Where existing, provide manufacturer's standard applied/swing car-control stations. Include call buttons for each landing served and other buttons, switches, and controls required for specified car operation. Provide operating device symbols as required by the applicable codes. Mount in return panel adjacent to car door unless otherwise indicated.
1. Mark buttons and switches for required use or function. Use both tactile symbols and Braille.
  2. Provide "No Smoking" sign matching car-control station, either integral with car-control station or mounted adjacent to it, with text and graphics as required by authorities having jurisdiction.
  3. Mount controls as shown or scheduled and at heights complying with ANSI A117.1.
  4. Mount controls as shown or scheduled and at heights complying with ADA Accessibility Guidelines.
  5. Provide 2 car control stations in each passenger elevator; equip only 1 with required keyswitches, if any.

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- D. Emergency Communication System: Elevators at DEN shall be equipped with a Talk-a-Phone model ETP103 OEM elevator telephone installed per manufacturer's instructions behind the control panel in each elevator car. DEN technologies will provide cabling and an analog telephone line from the DIA PABX system for each telephone. Telephones are powered from the PABX system, which in turn is backed up by battery. The PABX is programmed to rung down calls from the elevators to the 24/7 police positions at the airport communications centers. Elevator telephones are polled once per day using Talk-a-Phone Talk-a-Lert software to confirm health and status of the telephones. Technicians are dispatched to repair or replace any telephone that fails during a polling cycle. Telephone products from other vendors shall not be permitted, as they cannot be polled.
- E. Provide and install the two (2) way text and video communication requirements of the ASME A17.1 2019 Code. All elevators must include provisions for this feature.
- F. Firefighters' Two-Way Telephone Communication Service: Provide flush-mounted cabinet in each car and required conductors in traveling cable for firefighters' two-way telephone communication service.
- G. Car-Top Alarm: Provide switches on top emergency exits that will cause alarm to sound when cover is opened.
- H. Car Position Indicator: Provide digital-type car position indicator, located within each car-control station. Also, provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served. Include travel direction arrows if not provided in car-control station.
- I. Hall Push-Button Stations: Provide hall push-button stations at each landing to match existing quantity and location. For each group of passenger elevators, locate between 2 elevators at center of group or at location most convenient for approaching passengers.
1. Provide units with flat faceplate for mounting with body of unit recessed in wall.
  2. Equip units with buttons for calling elevator and for indicating desired direction of travel.
  3. Provide 2-button stations at intermediate landings. Provide 1-button stations with direction indication at terminal landings.
  4. For DD systems only: Equip units with touch screens for calling elevator and for indicating direction of travel or destination as required by system. Provide a signaling system to verify floor selection, where destination registration is required, and to direct passengers to appropriate car.
    - a. Provide a means for passengers to indicate that they have disabilities so control system can allow extra room in assigned car.
    - b. Provide for connecting units that require destination registration to building security access system so a card reader can be used to register calls.
- J. Hall Lanterns: Units with LED-illuminated arrows; but provide single arrow at terminal landings. Match materials, finishes, and mounting method of hall push-button stations. Provide one of the following:

1. Place lanterns either above or beside each hoistway entrance, unless otherwise shown. Mount at minimum of **72 inches** above finished floor.
  2. With each lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
- K. Car Voice Annunciator: All elevators are to be provided with a fully programmable voice annunciator with standard female (or programmable with female and male voices) English prompts for announcing floors, emergency and operational messages. The system should be capable for allowing custom messages should the purchaser wish to add such messages to the system via the change order process. .
- L. Hall Annunciator: With each hall lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
- 1.
- M. Hall Position Indicators: Provide digital-display-type position indicators, located above each hoistway entrance at main egress/ground floor. Match materials, finishes, and mounting method of hall push-button stations.
1. Integrate ground-floor hall lanterns with hall position indicators.
- N. Standby Power Elevator Selector Switches: Provide switches, as required by ASME A17.1/CSA B44, where indicated. Adjacent to switches, provide illuminated signal that indicates when normal power supply has failed. For each elevator, provide illuminated signals that indicate when they are operational and when they are at the designated emergency return level with doors open.
- O. Fire-Command-Center Annunciator Panel: When required by local AHJ provide panel containing illuminated position indicators for each elevator, clearly labeled with elevator designation; include illuminated signal that indicates when elevator is operational and when it is at the designated emergency return level with doors open. Provide standby power elevator selector switch(es), as required by ASME A17.1/CSA B44, adjacent to position indicators. Provide illuminated signal that indicates when normal power supply has failed.
- P. Emergency Pictorial Signs: Fabricate from materials matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire, elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station unless otherwise indicated.
- 2.11 FINISH MATERIALS
- A. General: Provide the following materials for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated.
  - B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish.

- C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, commercial steel, Type B, pickled.
- D. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.
- E. Textured Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304 with embossed texture rolled into exposed surface.
- F. Stainless-Steel Bars: ASTM A 276, Type 304.
- G. Stainless-Steel Tubing: ASTM A 554, Grade MT 304.
- H. Aluminum Extrusions: **ASTM B 221**, Alloy 6063.
- I. Nickel Silver Extrusions: ASTM B 151/B 151M, Alloy UNS No. C74500 or No. C77600.
- J. Plastic Laminate: High-pressure type complying with NEMA LD 3

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Examine hoistways, hoistway openings, pits, and machine rooms as constructed; verify critical dimensions; and examine supporting structure and other conditions under which elevator work is to be installed.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work. Existing conditions known at the time of pricing the project will be provided to the purchaser. Unknown, unforeseen or hidden conditions will be provided to the purchaser as soon as such conditions are determined and/or known including additional costs, if applicable.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions and recommendations.
- B. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators. Comply with Section 059990 "Welding".
- C. Coordination: Coordinate elevator work with work of other trades for proper time and sequence to avoid construction delays. Use established benchmarks, lines, and levels to ensure dimensional coordination of the Work.

- D. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts to minimize vibration transmission to structure and structure-borne noise due to elevator system.
- E. Lubricate operating parts of systems, including ropes, as recommended by manufacturers.
- F. Alignment: For new installation projects, coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.
- G. Leveling Tolerance: **1/8 inch**, up or down, regardless of load and travel direction.
- H. Where new sills are being installed, set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.
- I. Locate hall signal equipment for elevators as follows unless otherwise indicated:
  - 1. For groups of elevators, locate hall push-button stations between two elevators at center of group or at location most convenient for approaching passengers.
  - 2. Place hall lanterns either above or beside each hoistway entrance.
  - 3. Mount hall lanterns at a minimum of **72 inches** above finished floor.

### 3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies.
- B. Operating Test: Load each elevator to rated capacity and operate continuously for 30 minutes over full travel distance, stopping at each level and proceeding immediately to the next. Record temperature rise of elevator machine during 30-minute test period. Record failure to perform as required.
- C. Advise Owner, DEN Project Manager, and authorities having jurisdiction a minimum of 72 hours in advance of dates and times that tests are to be performed on elevators.

### 3.4 PROTECTION

- A. Temporary Use: Do not use elevators for construction purposes unless approved by DEN Project Manager, and unless cars are provided with temporary enclosures, either within finished cars or in place of finished cars, to protect finishes from damage. Comply with the following requirements for each elevator used for construction purposes:
  - 1. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.

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2. Provide strippable protective film on entrance and car doors and frames.
3. Provide padded wood bumpers on entrance doorframes covering jambs and frame faces.
4. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
  - a. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so that no evidence remains of correction work. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required and approved by DEN Project Manager.
5. Do not load elevators beyond their rated weight capacity.
6. Engage elevator Installer to provide full maintenance service. Include preventive maintenance, repair, or replacement of worn or defective components, lubrication, cleanup, and adjustment as necessary for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
7. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

### 3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate elevator(s).
  1. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies. Train DEN personnel in procedures to follow in identifying sources of operational failures or malfunctions. Confer with DEN Project Manager on requirements for a complete elevator maintenance program.
  2. Schedule training with Owner, through DEN Project Manager, with at least seven (7) days advance notice.
- B. Check operation of each elevator with DEN Project Manager's personnel present before date of Substantial Completion and again not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

## PART 4 - MEASUREMENT

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

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## **PART 5 - PAYMENT**

### 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Lump Sum Contract price.

**END OF SECTION 142100**



## SECTION 142400 - HYDRAULIC ELEVATORS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes hydraulic passenger and service elevators.
- B. Related Requirements:
1. The contractor is to provide the cost and project management of all related work for completion of this scope of work for a turn-key project.
  2. Section 015000 "Temporary Facilities and Controls" for temporary use of elevators for construction purposes.
  3. Section 033000 "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
  4. Section 042000 "Unit Masonry" for setting sleeves, inserts, and anchoring devices in masonry and for grouting elevator entrance frames installed in masonry walls.
  5. Section 051200 "Structural Steel Framing" for the following:
    - a. Attachment plates, angle brackets, and other preparation of structural steel for fastening guide-rail brackets.
    - b. Divider beams.
    - c. Hoist beams.
    - d. Structural-steel shapes for subsills that are part of steel frame.
  6. Section 055000 "Metal Fabrications" for the following:
    - a. Attachment plates and angle brackets for supporting guide-rail brackets.
    - b. Divider beams.
    - c. Hoist beams.
    - d. Structural-steel shapes for subsills.
    - e. Pit ladders.
    - f. Cants in hoistways made from steel sheet.
  7. Section 055213 "Pipe and Tube Railings" for railings between adjacent elevator pits.
  8. Section 057000 "Decorative Metal" for combination hall push-button stations.
  9. Section 099113 "Exterior Painting" for field painting of hoistway entrance doors and frames.



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10. Section 099123 "Interior Painting" for field painting of hoistway entrance doors and frames.
11. Section 142413 "Hydraulic Freight Elevators" for hydraulic elevators used primarily for carrying freight and inaccessible to the general public.
12. Section 221429 "Sump Pumps" for sump pumps, sumps, and sump covers in elevator pits.
13. Section 271500 "Communications Horizontal Cabling" for telephone service for elevators.
14. [Section 283111 "Digital, Addressable Fire-Alarm System"] [Section 283112 "Zoned (DC Loop) Fire-Alarm System"] for smoke detectors in elevator lobbies to initiate emergency recall operation[ and heat detectors in shafts and machine rooms to disconnect power from elevator equipment before sprinkler activation] and for connection to elevator controllers.
15. Section 31200 "Earth Moving" for excavating well hole to accommodate cylinder assembly.

C. Alternates:

1. Refer to Division 01 Section 012300 "Alternates" for description of Work in this Section affected by Alternates, where applicable.
2. Provide alternate pricing for conversion of the existing hydraulic elevator(s) to traction elevator(s) following the Electric Traction Elevators modernization specification section 142100. Include the following:
  - a. Remove all existing hydraulic elevator equipment including jack unit, pump unit, feedline, controller, wiring and all other eliminated or equipment to be replaced.
  - b. Provide new machine room-less (MRL) gearless machine in the elevator overhead or an overhead gearless machine if an existing overhead machine room exists.
  - c. Retain or replace existing platform, sling, crosshead, rails, brackets, buffers, entrance frames, hall sills and other equipment as required to accommodate the new installation of the MRL elevator.
  - d. Provide all related work/work by others for removal, reconfiguration and installation of the new traction/MRL elevator. Retain existing pit dimensions and minimize the overhead modifications in the overall MRL replacement design. Include pit hole sealing and reconfiguration for installation of the new counterweights and buffers.
  - e. Provide equipment interface hoistway and machine room layout drawings for proper replacement equipment engineering and obtaining applicable permits.
  - f. All other items to follow 142100 specification sections.

### 1.3 REFERENCES

A. American National Standards Institute (ANSI):

1. A117.1 - Accessible and Usable Buildings and Facilities.

B. American Society for Testing and Materials (ASTM):

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1. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
2. A366/366M - Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
3. A786A/786M - Rolled Steel Floor Plates.
4. A793 - Rolled Floor Plate, Stainless Steel.
5. B36/36M - Brass Plate, Sheet, Strip, and Rolled Bar.
6. B151 - Nickel-Zinc Alloy (Nickel Silver) and Copper-Nickel Rod and Bar.
7. B151M - Copper-Nickel-Zinc Alloy (Nickel Silver) and Copper-Nickel Rod and Bar (Metric).
8. B455 - Copper-Zinc-Alloy (Leaded Brass) Extruded Shapes.
9. B632/632M - Aluminum-Alloy Rolled Tread Plate.
10. C1107 - Packaged Dry, Hydraulic-Cement Grout (Non-shrink).

C. American Society of Mechanical Engineers (ASME):

1. A17.1 - Safety Code for Elevators and Escalators. Provide the latest version of the ASME A17.1 as enforced by the local authority having jurisdiction (AHJ). Please note that DIA-DEN has chosen to include the two (2) way text and video communication and three dimensional (3D) electronic safety edge requirements (for passenger elevators) of the ASME A17.1 2019 Code. All elevators must include these provisions.

D. National Electrical Manufacturers Association (NEMA):

1. LD3 - High Pressure Decorative Laminates.

E. U.S. Architectural & Transportation Barriers Compliance Board:

1. ADA Accessibility Guidelines - August 1994 - American Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities.

#### 1.4 ALLOWANCES

A. Elevator Car Allowances: Provide finished passenger and service elevator cars under the Elevator Car Allowance specified in Section 012100 "Allowances" – estimated at \$25,000 per elevator. Allowance includes furnishing and installing the following:

1. Car wall finishes including trim.
2. Car floor finishes.
3. Car ceiling finishes.
4. Car and hoistway door finishes – to be included in the base proposal and excluded from the cab interior allowance.
5. Car doorsills if part of the modernization process, to be included in the base proposal and excluded from the cab interior allowance.
6. Car light fixtures.
7. Handrails.
8. Cutouts and other provisions for installing elevator signal equipment in cars – includes cladding of front returns, transoms, inside car jambs if applicable.

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## 1.5 UNIT PRICES

- A. Unit Prices: Rock excavation for cylinder well holes is paid for under the unit price indicated in the Contract and as specified in Section 012200 "Unit Prices." Contractors are to exclude costs relating to an industry-standard "rock clause" as such costs for obstructions, hole cave-ins, etc. will be addressed separately if they occur.

## 1.6 DEFINITIONS

- A. Definitions in ASME A17.1/CSA B44 apply to work of this Section.
- B. Service Elevator: A passenger elevator that is also used to carry freight and without bi-parting freight doors.
- C. Hydraulic Elevators: Elevators in which cars are hoisted by hydraulic means including hydraulic fluid and are defined to include driving pump units; valves; jack assemblies, cars; hoistway doors; guide rails; guide-rail brackets; feed lines, buffers; signals; control systems; electrical wiring within elevator system; and devices for operations, safety, security, required performance at rated speed and capacity, and for complete elevator installation.
- D. Defective Elevator Work: Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

## 1.7 ACTION SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for car enclosures, hoistway entrances, and operation, control, and signal systems.
1. Include data substantiating that materials comply with requirements.
- B. Shop Drawings:
1. Include plans, elevations, sections, and large-scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment.
  2. Include large-scale layout of car-control station[ and standby power operation control panel].
  3. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support, locations of equipment and signals, and maximum and average power demands.
- C. Samples for Initial Selection: For finishes involving color selection.

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- D. Samples for Verification: For exposed car, hoistway door and frame, and signal equipment finishes; **3-inch**- square Samples of sheet materials; and **4-inch** lengths of running trim members.

## 1.8 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Seismic Qualification Certificates: For elevator equipment, accessories, and components, from manufacturer.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
  4. Current seismic risk zone for Denver International Airport (DIA) is zone 1 and all equipment is to meet such requirements.
- C. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service including standby power generator if applicable, as shown and specified, are adequate for elevator system being provided. Existing conditions known at the time of pricing the project will be provided to the purchaser. Unknown, unforeseen or hidden conditions will be provided to the purchased as soon as such conditions are determined and/or known including additional costs, if applicable.

## 1.9 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.
1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.
- B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.
- C. Manufacturer shall furnish a letter stating all components are designed by an Engineer and are suitable for the intended purpose.
- D. Signage

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- E. Maintenance manuals for each different hydraulic elevator, including operation and maintenance instructions, parts listing with sources indicated, recommended parts inventory listing, emergency instructions, and similar information. Include all diagnostic and repair information available to manufacturer's and Installer's maintenance personnel. Submit for Owner's information at project closeout as specified in Division 01.
- F. As-Built Plans: Submit complete as-built plans of all Work, including interface with other Work, in accordance with requirements as specified in Section 013300 "Submittal Procedures".

#### 1.10 QUALITY ASSURANCE

- A. Installer Qualifications: Engage the elevator manufacturer or an experienced Installer approved by the elevator manufacturer who has completed elevator installations similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Regulatory Requirements: In addition to local governing regulations, comply with the applicable provisions of the following:
  - 1. ASME A17.1, "Safety Code for Elevators and Escalators," referred to as the "Code." Provide the latest version of the ASME A17.1 as enforced by the local authority having jurisdiction (AHJ). Please note that DIA-DEN has chosen to include the two (2) way text and video communication and three dimensional (3D) electronic safety edge requirements (for passenger elevators) of the ASME A17.1 2019 Code. All elevators must include these provisions.

#### 1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location prior to the installation of the equipment.

#### 1.12 COORDINATION

- A. Coordinate installation of sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.
- B. Furnish well casing and coordinate delivery with related excavation work.
- C. Coordinate locations and dimensions of other work relating to hydraulic elevators including pit ladders; sumps and floor drains in pits; entrance subsills; electrical service; and electrical outlets, lights, and switches in hoistways, pits, and machine rooms.

### 1.13 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to provide replacement moving walk components/parts as part of the project. The contractor is to provide a comprehensive spare parts list to the purchaser for approval. All parts will be provided to the purchaser prior to final completion of each project task order. Bidders are to include a \$15,000 per unit spare parts allowance with their proposals.

### 1.14 CONSTRUCTION WASTE MANAGEMENT

- A. Construction waste shall be managed in accordance with provisions of Section 017419 "Construction Waste Management and Disposal". Documentation shall be submitted to satisfy the requirements of that Section.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. thyssenkrupp Elevator
  2. thyssenkrupp ElevatorKONE Inc.
  3. Otis Elevator Co.
  4. Schindler Elevator Corp.
  5. or approved equal.
- B. Source Limitations: Obtain elevators, including electric traction passenger elevators specified in Section 142100 "Electric Traction Elevators" from single manufacturer/provider.
1. Major elevator components, including pump-and-tank units, plunger-cylinder assemblies, controllers, signal fixtures, door operators, car frames, cars, and entrances, shall be manufactured/provided by single manufacturer/provider.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with ASME A17.1/CSA B44. Provide the latest version of the ASME A17.1 as enforced by the local authority having jurisdiction (AHJ). Please note that DIA-DEN has chosen to include the two (2) way text and video communication and three dimensional (3D) electronic safety edge requirements (for passenger elevators) of the ASME A17.1 2019 Code. All elevators must include these provisions.
- B. Accessibility Requirements: Comply with Section 407 in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.

- C. Seismic Performance: Current seismic risk zone for Denver International Airport (DIA) is zone 1 and all equipment is to meet such requirements.
1. Provide earthquake equipment required by ASME A17.1/CSA B44.
  2. Provide a seismic rupture/safety valve in the pit next to the hydraulic jack assembly and in line with the feed line for any freight elevator with an existing underground feed line.

## 2.3 MATERIALS AND COMPONENTS, GENERAL

- A. General: Provide manufacturer's standard elevator systems. Where components are not otherwise indicated, provide standard components, published by manufacturer as included in standard pre-engineered or engineered (as applicable) elevator systems and as required for a complete system.
- B. Power Supply: Provide 480 V, 60 Hz, 3-phase, 208 V, 60 Hz, 3-phase or 240 V, 60 Hz, 3-phase – match existing power supply.
- C. Inserts: For new installation projects, furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work where installation of devices is specified in another Specification Section.
- D. Guide Shoes/Rollers: Provide either sliding shoes or rollers for speeds of 200 ft./min. (1.02 m/s) and less, and spring-loaded rollers for speeds in excess of 200 ft./min. (1.02 m/s). All guide types are to be properly rated for the applicable speed and capacity of each passenger or service elevator
- E. Car Frame and Platform: For new installation projects, provide welded or bolted steel units. For modernization equipment, retain as necessary and check for any unusual wear. Advise purchaser of any need for replacement equipment or repair of the existing components.

## 2.4 ELEVATORS

- A. Elevator System, General: Manufacturer's standard elevator systems. Unless otherwise indicated, manufacturers' standard components shall be used, as included in standard elevator systems and as required for complete system.
- B. Elevator Description:
1. Group Number: Per Project.
  2. Elevator Number(s): Per Project.
  3. Emergency Elevator Number(s): Per Project, as applicable.
  4. Service Elevator Number(s): Per Project, as applicable.
  5. Type: Retain existing hydraulic plunger/cylinder type and configuration
  6. Rated Load: Retain existing capacity rating
  7. Freight Loading Class for Service Elevators: Class A. – Retain existing classification for all service and passenger cars
  8. Rated Speed: Retain existing speed



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Operation System: Retain existing operation unless directed otherwise.

10. Auxiliary Operations:
  - a. Standby power generator operation (if elevator is connected to a standby power generator).
  - b. Battery-powered lowering (if elevator is not connected to standby power generator).
  - c. Automatic dispatching of loaded car.
  - d. Nuisance call cancel.
  - e. Independent service for all single cars and/or for all in group.
  - f. Distributed parking (for group operation, if applicable).
11. Security Features: Card-reader operation (base), Keyswitch operation (at purchaser's request) and Car-to-lobby feature (at purchaser's request).
12. Dual Car-Control Stations: Provide two car-control stations in each elevator; equip only one with required keyswitches, if any. Provide dual car stations where possible. Side slide opening elevators are to receive single car stations.
13. Car Enclosures:
  - a. Inside Width: retain existing dimensions
  - b. Inside Depth: - from back wall to front wall (return panels) - retain existing dimensions
  - c. Inside Height: to underside of ceiling - retain existing dimensions
  - d. Front Walls (Return Panels): Satin stainless steel, No. 4 finish
  - e. Car Fixtures: Satin stainless steel, No. 4 finish
  - f. Side and Rear Wall Panels: Design to be determined with cab interior allowance and through submittal process.
  - g. Reveals: Design to be determined with cab interior allowance and through submittal process.
  - h. Door Faces (Interior): Satin stainless steel, No. 4 finish
  - i. Doorsills: Nickel silver
  - j. Ceiling: Design to be determined with cab interior allowance and through submittal process.
  - k. Handrails: Design to be determined with cab interior allowance and through submittal process.
  - l. Floor: Design to be determined with cab interior allowance and through submittal process.
  - m. Floor prepared to receive new flooring as included in the base cab interior design allowance.
14. Hoistway Entrances:
  - a. Width: retain existing dimensions
  - b. Height: retain existing dimensions
  - c. Type: retain existing configuration/type
  - d. Frames: Retain existing configuration/type. Refinishing costs to be included in base price, if requested.
  - e. Doors: Retain existing configuration/type. Refinishing or replacement costs to be included in base price, if requested.
  - f. Sills: Retain existing configuration/type. Replacement costs with nickel silver to be included in base price, if requested.



15. Hall Fixtures : Satin stainless steel, No. 4 finish
16. Additional Requirements:

2.5 Provide the following engraving: "CERTIFICATE ON FILE IN DIA MAINTENANCE ADMINISTRATION AIRPORT OFFICE BUILDING".SYSTEMS AND COMPONENTS

- A. Pump Units: Positive-displacement type with a maximum of 10 percent variation between no load and full load and with minimum pulsations.
  1. Depending on the capacity, speed and other duty requirements, the pump shall be submersible type with submersible squirrel-cage induction motor, and shall be suspended inside oil tank from vibration isolation mounts or shall be tank-top-mounted type with fan-cooled, squirrel-cage induction motor, and shall be mounted on oil tank with vibration isolation mounts and enclosed in prime-painted steel enclosure lined with 1-inch- thick, glass-fiber insulation board].
  2. Motor shall have solid-state starting.
- B. Hydraulic Silencers: System shall have hydraulic silencer containing pulsation-absorbing material in blowout-proof housing at pump unit.
- C. Piping: Size, type, and weight of piping as recommended by elevator manufacturer, with flexible connectors to minimize sound and vibration transmissions from power unit.
  1. Cylinder units shall be connected with dielectric couplings.
  2. For new installation projects, Casing for Underground Piping: Schedule 40 PVC pipe complying with ASTM D 1785, joined with PVC fittings complying with ASTM D 2466 and solvent cement complying with ASTM D 2564.
  3. For modernization projects, retain existing feed lines unless damaged and replace all Victaulic fitting seals.
- D. Hydraulic Fluid: Elevator manufacturer's standard fluid with additives as needed to prevent oxidation of fluid, corrosion of cylinder and other components, and other adverse effects.
- E. OPTIONAL - Hydraulic Fluid: Nontoxic, biodegradable, fluid made from vegetable oil with antioxidant, anticorrosive, antifoaming, and metal-passivating additives and approved by elevator manufacturer for use with elevator equipment.
  1. Product: Subject to compliance with requirements, provide "Hydro Safe" by Hydro Safe Oil Division, Inc. or Enviromax by thyssenkrupp Elevator.
- F. Inserts: For new installation projects, furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work. Device installation is specified in another Section.

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- G. Protective Cylinder Casing: For new installation projects or modernization projects with replacement hydraulic jack assemblies, provide PVC or HDPE pipe casing complying with ASME A17.1/CSA B44, of sufficient size to provide not less than **1-inch** clearance from cylinder and extending above pit floor. Casing shall have means of monitoring effectiveness to comply with ASME A17.1/CSA B44.
- H. Corrosion-Protective Filler: For new installation projects or modernization projects with replacement hydraulic jack assemblies, provide a nontoxic, petroleum-based gel formulated for filling the space between hydraulic cylinder and protective casing. Filler shall be electrically nonconductive, displace or absorb water, and gel or solidify at temperatures below **60 deg F**.
1. Products: Subject to compliance with requirements, provide one of the following:
- Hydro Safe Oil Division, Inc.; No-Ox-Id Liquid Elevator Casing Filler E-800.
  - Union-Gard, a division of Dome Services L.L.C.; Union-Gard 160.
  - Insert manufacturer's name; product name or designation.
  - or approved equal.
- I. Car Frame and Platform: For new installation projects, provide welded or bolted steel units.
- J. Guides . Shoes/Rollers: Provide either sliding shoes or rollers for speeds of 200 ft./min. (1.02 m/s) and less, and spring-loaded rollers for speeds in excess of 200 ft./min. (1.02 m/s). All guide types are to be properly rated for the applicable speed and capacity of each freight elevator.

## 2.6 OPERATION SYSTEMS

- A. General: Provide manufacturer's standard microprocessor operation system with on board diagnostics as required to provide type of operation indicated.
- B. Future Monitoring Provisions:
- Provide Lift-Net interface provisions within the solid-state elevator control system for potential future use by the airport.
  - Provide BACNET interface provisions only within the solid-state elevator control system for potential future use by the airport.
- C. Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated:
- Single-Car Standby Power Operation: For elevators connected to an emergency standby power generator and on activation of standby power, car is returned to a designated floor and parked with doors open. Car can be manually put in service on standby power, either for return operation or for regular operation, by switches in control panel located at main lobby or applicable fire command station . Manual operation causes automatic operation to cease.

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2. **Single-Car Battery-Powered Lowering:** For elevators not connected to an emergency standby power generator, if power fails, car is lowered to the lowest floor, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.
3. **Group Standby Power Operation:** For elevators connected to an emergency standby power generator and on activation of standby power, cars are returned to lowest floor and parked with doors open. If a car cannot be returned, it is removed from the system. One car is selected for service on standby power by a switch located at main lobby or applicable fire command station
  4. **Group Battery-Powered Lowering:** For elevators not connected to an emergency standby power generator and if power fails, cars are lowered to the lowest floor, open their doors, and shut down. System includes rechargeable battery and automatic recharging system.
  5. **Nuisance Call Cancel:** When car calls exceed a preset number while car load is less than a predetermined weight, all car calls are canceled. Preset number of calls[ and predetermined weight] can be adjusted.
  6. **Independent Service:** Keyswitch in car-control station removes car from group operation and allows it to respond only to car calls. Key cannot be removed from keyswitch when car is in independent service. When in independent service, doors close only in response to door close button.
  7. **Fire recall position**
- D. **Security Features:** Provide the following security features, where indicated. Security features shall not affect emergency firefighters' service.
1. **Card-Reader Operation:** For secured elevators, the system uses proximity ID card readers at the car-control stations and hall push-button stations to authorize calls. The security system determines which landings and at what times calls require authorization by card reader. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, other security access system equipment, and elevator controllers for continued use following the completion of the modernization process. Allow space as indicated for card reader in car on the main and/or auxiliary car operating panel as determined by the purchaser.
    - a. When the security system is activated, car calls to restricted landings do not register unless the ID card is first presented to the proximity card reader. Security access system determines which landings are restricted and which of those are accessible to cardholder.
    - b. When operating on Independent Service, the proximity ID card reader must be swiped prior to a call being registered by the operator.
    - c. Security access system equipment is specified in Section 281300 "Access Control " and is to be kept strictly confidential.

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2. Car-to-Lobby Feature: If applicable and requested by the purchaser, this feature, activated by keyswitch at main lobby causes a car or all cars in a group to return immediately to lobby and open doors for inspection. On deactivation by keyswitch, calls registered before keyswitch activation are completed and normal operation is resumed.

## 2.7 DOOR REOPENING DEVICES

- A. Infrared Array: Provide in industry-standard three (3) dimensional (3D) door reopening device with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more light beams shall cause doors to stop and reopen.
- B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

## 2.8 CAR ENCLOSURES

- A. General: For new installation projects or modernization projects where new car enclosures are included in the scope of work, provide enameled-steel car enclosures to receive removable wall panels, with removable car roof/ceiling and Code-required ceiling access doors. For all modernization projects, provide new car door(s), new closed-loop AC linear drive power door operators and full car side equipment (header, gate switch, restrictor, clutch, hangers, track(s), etc.) and ventilation/disinfectant systems (see below).
  1. For all projects, provide standard railings complying with ASME A17.1/CSA B44 on car tops where required by ASME A17.1/CSA B44.
  2. See "Allowances" Paragraph in "Summary" Article for items to be provided under the Elevator .Car Allowance. Provide items not included in the Elevator Car Allowance as needed for finished car including materials and finishes specified below.
  3. Install a Code-compliant toe guard/platform apron on each car opening. Paint black and place elevator number on the front side.
  4. Provide proactive elevator cab health systems in each elevator including:
    - a. Elevator cab ventilation system – Provide an air purifying device with Needlepoint Bipolar Ionization (NPBI) technology. Use the GPS-FC24-AC™ unit by Global Plasma Solutions, Inc. (GPS®) or approved equal.
    - b. Elevator cab disinfectant system – Provide an advanced Photocatalytic Oxidation (PCO) unit designed specifically for elevators. Use the CASPR 200e unit by the CASPR™ Group or approved equal.
- B. Materials and Finishes: Manufacturer's standards, but not less than the following:
  1. Subfloor: For modernization projects, retain or if required by purchaser, exterior, underlayment grade plywood, not less than **5/8-inch** nominal thickness.

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2. Floor Finish: Included in the base elevator car allowance. Design/type to be determined by the purchaser.
3. Enameled-Steel Wall Panels: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by DEN Project Manager from manufacturer's full range.
4. Stainless-Steel Wall Panels: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
5. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to [1/2-inch fire-retardant-treated particleboard with manufacturer's standard protective edge trim. Panels have a flame-spread index required by the ASTM E 84. Plastic-laminate color, texture, and pattern as selected by DEN Project Manager from plastic-laminate manufacturer's full range.
6. Fabricate car with recesses and cutouts for signal equipment.
7. Fabricate car doorframe integrally with front wall of car.
8. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated [from stainless-steel sheet or by laminating stainless-steel sheet to exposed faces and edges of enameled cold-rolled steel doors using adhesive that fully bonds metal to metal without telegraphing or oil-canning.
9. Sills: Extruded metal, with grooved surface, 1/4 inch thick.
10. Luminous Ceiling: LED light fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic.
11. Metal Ceiling: Flush panels, with LED downlights in the center of each panel. Align ceiling panel joints with joints between wall panels where possible and align the removal ceiling panel with the top of canopy/car access panel for emergency access.
12. Handrails: Manufacturer's standard handrails, of shape, metal, and finish indicated.

## 2.9 HOISTWAY ENTRANCES

- A. Hoistway Entrance Assemblies: Retain existing entrance frames for modernization projects and refinish as required by the purchaser.
- B. Hoistway/hall door equipment: Replace all wearing components with identical replacement components and perform the following:
  1. Clean, sand and otherwise refurbish the existing hoistway landing-side tracks;
  2. Install new interlocks at each landing
  3. Install new hanger rollers/hangers at each landing
  4. Install new pick-up rollers/assemblies at each landing
  5. Install new closers/spirators at each landing
  6. Install new gibs with fire tabs at each landing (2 per door panel)
  7. Install new Z-bracket fire tabs at each landing (1 per door panel)
  8. Install new relating cables and linkage at all landings as needed
- C. Sections noted below with this section are for new installation projects
- D. Manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Frame size and profile shall accommodate hoistway wall construction.

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1. Where gypsum board wall construction is indicated, frames shall be self-supporting with reinforced head sections.
- E. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies shall comply with NFPA 80 and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction based on testing at as close-to-neutral pressure as possible according to [NFPA 252] [or] [UL 10B].
1. Fire-Protection Rating: [1 hour] [1-1/2 hours] <Insert rating>[ with 30-minute temperature rise of 450 deg F].
- F. Materials and Fabrication: Manufacturer's standards, but not less than the following:
1. Enameled-Steel Frames: Formed from cold- or hot-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by DEN Project Manager from manufacturer's full range.
  2. Primed-Steel Frames: Formed from cold- or hot-rolled steel sheet. Provide with factory-applied, rust-resistant primer for field painting.
  3. Steel Subframes: Formed from cold- or hot-rolled steel sheet, with factory-applied enamel finish or rust-resistant primer. Fabricate to receive applied finish as indicated.
  4. Stainless-Steel Frames: Formed from stainless-steel sheet.
  5. Star of Life Symbol: Identify emergency elevators with star of life symbol, not less than 3 inches high, on both inside surfaces of hoistway doorframes.
  6. Stainless-Steel Doors[ and Transoms]: Flush, hollow-metal construction; fabricated [from stainless-steel sheet] [or] [by laminating stainless-steel sheet to exposed faces and edges of enameled cold-rolled steel doors using adhesive that fully bonds metal to metal without telegraphing or oil-canning].
  7. Sight Guards: Provide sight guards on doors matching door edges – finish to match existing car door finish.
  8. Sills: Extruded metal, with grooved surface, 1/4 inch thick.
  9. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M.

## 2.10 SIGNAL EQUIPMENT

- A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements with long-life LEDs.
- B. Car-Control Stations: Where existing, provide manufacturer's standard applied/swing car-control stations. Include call buttons for each landing served and other buttons, switches, and controls required for specified car operation. Provide operating device symbols as required by the applicable codes. Mount in return panel adjacent to car door unless otherwise indicated.
1. Mark buttons and switches for required use or function. Use both tactile symbols and Braille.
  2. Provide "No Smoking" sign matching car-control station, either integral with car-control station or mounted adjacent to it, with text and graphics as required by authorities having jurisdiction.



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Mount controls as shown or scheduled and at heights complying with ANSI

- A117.1.
4. Mount controls as shown or scheduled and at heights complying with ADA Accessibility Guidelines.
  5. Provide 2 car control stations in each passenger elevator; equip only 1 with required keyswitches, if any.
- C. Emergency Communication System: Elevators at DEN shall be equipped with a Talk-a-Phone model ETP103 OEM elevator telephone installed per manufacturer's instructions behind the control panel in each elevator car. DEN technologies will provide cabling and an analog telephone line from the DIA PABX system for each telephone. Telephones are powered from the PABX system, which in turn is backed up by battery. The PABX is programmed to rung down calls from the elevators to the 24/7 police positions at the airport communications centers. Elevator telephones are polled once per day using Talk-a-Phone Talk-a-Lert software to confirm health and status of the telephones. Technicians are dispatched to repair or replace any telephone that fails during a polling cycle. Telephone products from other vendors shall not be permitted, as they cannot be polled.
- D. Provide and install the two (2) way text and video communication requirements of the ASME A17.1 2019 Code. All elevators must include provisions for this feature.
- E. Firefighters' Two-Way Telephone Communication Service: Provide [flush-mounted cabinet in each car and required conductors in traveling cable for firefighters' two-way telephone communication service.
- F. Car-Top Alarm: Provide switches on top emergency exits that will cause alarm to sound when cover is opened.
- G. Car Position Indicator: Provide digital-type car position indicator, located within each car-control station. Also, provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served. Include travel direction arrows if not provided in car-control station.
- H. Hall Push-Button Stations: Provide hall push-button station at each landing to match existing quantity and location. For each group of passenger elevators, locate between 2 elevators at center of group or at location most convenient for approaching passengers.
1. Provide units with flat faceplate for mounting with body of unit recessed in wall.
  2. Equip units with buttons for calling elevator and for indicating applicable direction of travel.
  3. Provide 2-button stations at intermediate landings. Provide 1-button stations with direction indication at terminal landings.
- I. Hall Lanterns: Units with LED-illuminated arrows; but provide single arrow at terminal landings. Match materials, finishes, and mounting method of hall push-button stations. Provide one of the following:
1. Place lanterns either above or beside each hoistway entrance, unless otherwise shown. Mount at minimum of **72 inches** above finished floor.

2. With each lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
- J. Car Voice Annunciator: All elevators are to be provided with a fully programmable voice annunciator with standard female (or programmable with female and male voices) English prompts for announcing floors, emergency and operational messages. The system should be capable for allowing custom messages should the purchaser wish to add such messages to the system via the change order process.
  - K. Hall Annunciator: With each hall lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
  - L. Hall Position Indicators: Provide digital-display-type position indicators, located above each hoistway entrance at main egress/ground floor. Provide units with flat faceplate for mounting and with body of unit recessed in wall. Match materials, finishes, and mounting method of hall push-button stations.
    1. Integrate ground-floor hall lanterns with hall position indicators.
  - M. Standby Power Elevator Selector Switches: Provide switches, as required by ASME A17.1/CSA B44, where indicated. Adjacent to switches, provide illuminated signal that indicates when normal power supply has failed. For each elevator, provide illuminated signals that indicate when they are operational and when they are at the designated emergency return level with doors open.
  - N. Fire-Command-Center Annunciator Panel: When required by local AHJ provide panel containing illuminated position indicators for each elevator, clearly labeled with elevator designation; include illuminated signal that indicates when elevator is operational and when it is at the designated emergency return level with doors open. Provide standby power elevator selector switch(es), as required by ASME A17.1/CSA B44, adjacent to position indicators. Provide illuminated signal that indicates when normal power supply has failed.
  - O. Emergency Pictorial Signs: Fabricate from materials matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station unless otherwise indicated.
- 2.11 FINISH MATERIALS
- A. General: Provide the following materials for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated.
  - B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish.
  - C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, commercial steel, Type B, pickled.



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- D. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.
- E. Textured Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304 with embossed texture rolled into exposed surface.
- F. Stainless-Steel Bars: ASTM A 276, Type 304.
- G. Stainless-Steel Tubing: ASTM A 554, Grade MT 304.
- H. Aluminum Extrusions: **ASTM B 221**, Alloy 6063.
- I. Nickel Silver Extrusions: ASTM B 151/B 151M, Alloy UNS No. C74500 or No. C77600.
- J. Plastic Laminate: High-pressure type complying with NEMA LD 3

**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Verify critical dimensions and examine supporting structure and other conditions under which elevator work is to be installed.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work. Existing conditions known at the time of pricing the project will be provided to the purchaser. Unknown, unforeseen or hidden conditions will be provided to the purchaser as soon as such conditions are determined and/or known including additional costs, if applicable.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.2 INSTALLATION**

- A. Excavation for Cylinder: For new installation projects, drill well hole in each elevator pit to accommodate installation of cylinder; comply with applicable requirements in Section 312000 "Earth Moving." Contractors are to exclude costs relating to an industry-standard "rock clause" as such costs for obstructions, hole cave-ins, etc. will be addressed separately if they occur.
- B. For new installation projects or modernization projects with replacement hydraulic jack assemblies, provide well casing as necessary to retain well-hole walls.
- C. For new installation projects or modernization projects with replacement hydraulic jack assemblies, install cylinder in protective casing within well hole. Before installing protective casing, remove water and debris from well hole and provide permanent waterproof seal at bottom of well casing.

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1. Fill void space between protective casing and cylinder with corrosion-protective filler.
  2. Align cylinders and fill space around protective casing with fine sand.
- D. For new installation projects or modernization projects with replacement hydraulic jack assemblies, install cylinder plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor. Seal between [well] [protective] casing and pit floor with **4 inches** of nonshrink, nonmetallic grout.
- E. For new installation projects or modernization projects with replacement hydraulic jack assemblies, install cylinder plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor and braced at intervals as needed to maintain alignment. Anchor cylinder guides at spacing needed to maintain alignment and avoid overstressing guides.
- F. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS workmanship and welding operator qualification standards.
- G. Coordination: Coordinate elevator work with work of other trades for proper time and sequence to avoid construction delays. Use established benchmarks, lines, and levels to ensure dimensional coordination of the Work.
- H. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts to minimize vibration transmission to structure and structure-borne noise due to elevator system.
- I. Install piping above the floor, where possible. Install underground piping in casing.
- J. Lubricate operating parts of systems as recommended by manufacturers.
- K. Alignment: For new installation projects, coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay installation of sills and frames until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.
- L. Leveling Tolerance: **1/4 inch**, up or down, regardless of load and travel direction.
- M. For new installation projects or modernization projects with replacement sills, set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.
- N. Locate hall signal equipment for elevators as follows, unless otherwise indicated:
1. For groups of elevators, locate hall push-button stations between two elevators at center of group or at location most convenient for approaching passengers.
  2. Place hall lanterns either above or beside each hoistway entrance.
  3. Mount hall lanterns at a minimum of **72 inches** above finished floor.

### 3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies.
- B. Operating Test: Load each elevator to rated capacity and operate continuously for 30 minutes over full travel distance, stopping at each level and proceeding immediately to the next. Record temperature rise of elevator machine during 30-minute test period. Record failure to perform as required.
- C. Advise Owner, DEN Project Manager, and authorities having jurisdiction a minimum of 72 hours in advance of dates and times that tests are to be performed on elevators.

### 3.4 PROTECTION

- A. Temporary Use: Do not use elevators for construction purposes unless approved by DEN Project Manager, and unless cars are provided with temporary enclosures, either within finished cars or in place of finished cars, to protect finishes from damage. Comply with the following requirements for [each] elevator used for construction purposes:
  - 1. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
    - a. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.
    - b. Provide strippable protective film on entrance and car doors and frames.
    - c. Provide padded wood bumpers on entrance doorframes covering jambs and frame faces.
    - d. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so that no evidence remains of correction work. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required and approved by DEN Project Manager.
  - 2. Do not load elevators beyond their rated weight capacity.
  - 3. Engage elevator Installer to provide full maintenance service. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleanup, and adjustment as necessary for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
  - 4. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

### 3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate elevator(s).
  - 1. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies. Train DEN personnel in procedures to follow in identifying sources of operational failures or malfunctions. Confer with DEN Project Manager on requirements for a complete elevator maintenance program.
  - 2. Schedule training with Owner, through DEN Project Manager, with at least seven (7) days advance notice.
- B. Check operation of[ each] elevator with Owner's personnel present before date of Substantial Completion[ and again not more than one month before end of warranty period]. Determine that operation systems and devices are functioning properly.

## PART 4 - MEASUREMENT

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

## PART 5 - PAYMENT

- A. METHOD OF PAYMENT
- B. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Lump Sum Contract price.

## END OF SECTION 142400

## SECTION 143100 – ESCALATORS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes high-traffic/heavy-duty (NON-APTA) [interior and exterior escalators. Escalator modernization projects where the existing truss will be retained and refurbished will follow the specifications to the highest degree possible since some items/sections may not apply.

- B.** Related Requirements:

1. The contractor is to provide the cost and project management of all related work for completion of this scope of work for a turn-key project.
2. Section 033000 "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
3. Section 051200 "Structural Steel Framing" for attachment plates, angle brackets, and other preparation of structural steel to support escalator trusses.
4. Section 083113 "Access Doors and Frames" for wall and ceiling access panels and access doors in escalator enclosures.
- 5.

- C. Alternates: Refer to Division 01 Section 012300 "Alternates" for description of Work in this Section affected by Alternates. Contractors are to provide alternate pricing for the following items:

1. LED under handrail lighting – full length of each escalator – both sides;

#### 1.3 DEFINITIONS

- A. Definitions in ASME A17.1/CSA B44 apply to work of this Section.
- B. High-Traffic Escalators: Designed specifically for high-traffic-volume use that produces dense occupancy resulting in structural, machinery, and brake loads much higher than normal. All running equipment to have heavier duty rating over standard escalator units.

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- C. Defective Escalator Work: Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

#### 1.4 REFERENCES

- A. American National Standards Institute (ANSI):

1. A117.1 - Accessible and Usable Buildings and Facilities.

- B. American Society for Testing and Materials (ASTM):

1. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
2. A366/366M - Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
3. A786A/786M - Rolled Steel Floor Plates.
4. A793 - Rolled Floor Plate, Stainless Steel.
5. B36/36M - Brass Plate, Sheet, Strip, and Rolled Bar.
6. B151 - Nickel-Zinc Alloy (Nickel Silver) and Copper-Nickel Rod and Bar.
7. B151M - Copper-Nickel-Zinc Alloy (Nickel Silver) and Copper-Nickel Rod and Bar (Metric).
8. B455 - Copper-Zinc-Alloy (Leaded Brass) Extruded Shapes.
9. B632/632M - Aluminum-Alloy Rolled Tread Plate.
10. C1107 - Packaged Dry, Hydraulic-Cement Grout (Non-shrink).

- C. American Society of Mechanical Engineers (ASME):

1. A17.1 - Safety Code for Elevators and Escalators. Provide the latest version of the ASME A17.1 as enforced by the local authority having jurisdiction (AHJ).

- D. National Electrical Manufacturers Association (NEMA):

1. LD3 - High Pressure Decorative Laminates as applicable.

- E. U.S. Architectural & Transportation Barriers Compliance Board:

1. ADA Accessibility Guidelines - August 1994 - American Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities – as applicable.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, safety features, finishes, and similar information.

1. Include data substantiating that materials comply with requirements.

- B. Shop Drawings:

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1. Include plans, elevations, sections, and details indicating coordination with building structure and relationships with other construction.
  2. Indicate maximum loads imposed on building structure at points of support, and power requirements.
  3. Indicate access and ventilation for escalator machine space.
- C. Samples for Initial Selection: For exposed materials involving color selection.
- D. Samples for Verification: For exposed escalator finishes, 3-inch- square Samples of sheet materials, and 4-inch lengths of running trim members.
- E. Delegated-Design Submittal: For escalators.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Seismic Qualification Certificates: For escalator equipment, accessories, and components, from manufacturer.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
  4. Current seismic risk zone for Denver International Airport (DIA) is zone 1 and all equipment is to meet such requirements.
- C. Manufacturer Certificates: Signed by manufacturer certifying that escalator layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for escalator system being provided.

## 1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For escalators to include in emergency, operation, and maintenance manuals.
1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.
- B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted escalator use.
- C. As-Built Plans: Submit complete as-built plans of all Work, including interface with other Work, in accordance with requirements as specified in Section 013300 "Submittal Procedures".

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**1.8 QUALITY ASSURANCE**

- A. Installer Qualifications: Escalator manufacturer or an authorized representative who is trained and approved by manufacturer on the specific equipment installed/modernized

**1.9 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location prior to installation of the equipment.

**1.10 COORDINATION**

- A. Coordinate installation of sleeves, block outs, escalator equipment with integral anchors, and other items that are embedded in concrete or masonry for escalator equipment. Furnish templates, sleeves, escalator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.
- B. Coordinate locations and dimensions of other work relating to escalators including sumps and floor drains in pits; electrical service; and electrical outlets, lights, and switches in pits.

**1.11 WARRANTY**

- A. Manufacturer's Special Warranty: Manufacturer agrees to provide replacement escalator components/parts as part of the project. The contractor is to provide a comprehensive spare parts list to the purchaser for approval. All parts will be provided to the purchaser prior to final completion of each project task order. Bidders are to include a \$15,000 per unit spare parts allowance with their proposals.

**1.12 CONSTRUCTION WASTE MANAGEMENT**

- A. Construction waste shall be managed in accordance with provisions of Section 017419 "Construction Waste Management and Disposal". Documentation shall be submitted to satisfy the requirements of that Section.

**PART 2 - PRODUCTS****2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. KONE Inc.
  2. Otis Elevator Co.
  3. Schindler Elevator Corp.



4. thyssenkrupp Elevator

- B. Source Limitations: Obtain escalators and if applicable, moving walks, specified in another Section, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with the latest ASME A17.1/CSA B44 code in effect by the local authority having jurisdiction (AHJ).
- B. Braking Performance: Provide brakes that stop escalator in up-running mode at a rate no greater than **3 ft./s<sup>2</sup>**.
- C. Braking Performance: Provide brakes that produce a stopping force on escalator in up-running mode that is one-third that used in down-running mode.
- D. Step/Skirt Performance Index: Not more than 0.15.
- E. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design escalators.
- F. Seismic Performance: Current seismic risk zone for Denver International Airport (DIA) is zone 1 and all equipment is to meet such requirements.
- G. Structural and Mechanical Performance for High-Traffic Escalators: For the purposes of structural design, driving machine and power transmission calculations, and brake calculations, design high-traffic escalators for loads not less than one and one-half times the design loads required by ASME A17.1/CSA B44.
- H. Structural Performance of Balustrades, Deck Barricades, and Handrails: Provide components and assemblies capable of withstanding the effects of loads indicated in ASCE/SEI 7 for handrail assemblies and guardrail systems.

2.3 ESCALATORS

- A. Escalators, General: Manufacturer's standard escalators complying with requirements. Unless otherwise indicated, manufacturer's standard, heavy-duty rated (NON-APTA) components shall be used, as included in standard escalator systems and as required for complete system.
- B. High-Traffic Escalators, General: Manufacturer's high-traffic escalators complying with requirements. Unless otherwise indicated, manufacturer's heavy-duty components shall be used, as included in standard high-traffic escalator systems and as required for complete system.
- C. Design and equip escalators to run in either direction.

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- D. Provide escalators with a Code-required minimum of two (2) - flat steps at top and bottom landings for new installation projects. Where additional space allows, provide three (3) flat steps. For escalator modernization projects, contractors/suppliers are to provide the greatest number of flat steps possible at top and bottom landings based on existing site conditions/dimensions.
- E. Rated Speed: [ 100FPM.

## 2.4 COMPONENTS

- A. Fabricate exposed metalwork, including deck covers, balustrade panels, and trim to provide surface flatness equivalent to stretcher-leveled standard of flatness and sufficient strength for indicated use; increase metal thickness or reinforce with concealed stiffeners, backing materials, or both, as necessary. Support joints with concealed stiffeners as needed to hold exposed faces of adjoining sheets in flush alignment.
- B. Transparent Balustrades: Manufacturer's standard profile or arrangement of moving handrails on guide rail that is supported by tempered glass panels, with deck covers, skirts, trim, and accessories. Prepared for exterior finish below the deck covers.
- C. Direction Indicator Lights: Provide red and green LED-illuminated indicator lights at least 2 inches in diameter in right or left-hand - balustrade newels at both upper and lower landings. Green light indicates entrance end, and red light indicates exit end. When escalator is stopped, red lights are illuminated at both ends.
- D. Guards at Ceiling Intersection: Clear plastic with smooth edges.
- E. Handrails: Smooth, jointless, reinforced neoprene.
  - 1. Color: Black in color with anti-microbial rating.
  - 2. Sterilization: Provide internally mounted UV-C handrail sterilization devices on each handrail from EHC Global, Inc. or approval equal. Provide display signs on each escalator entry and exit indicating the device is present/functional on the unit.
- F. Deck Covers and Trim: Provide #4 brushed/satin stainless steel finish for proper wear and tear and ease/cost of refinishing. Includes outer and common decking sections.
- G. Antislid Devices: Provide #4 brushed/satin stainless steel finish where applicable. Evenly space throughout the decking area from top to bottom.
- H. Balustrade Interior Panels: Provide #4 brushed/satin stainless steel finish for proper wear and tear and ease/cost of refinishing.
- I. Balustrade Exterior Panels and Escalator Soffits : Provide #4 brushed/satin stainless steel finish for proper wear and tear and ease/cost of refinishing.
- J. Skirt Panels if Applicable : Provide manufacturer's satin stainless steel with exposed surface coated with clear PTFE or standard low-friction material .

- K. Skirt Lighting: Provide LED skirt lighting evenly spaced and running the entire length of both skirts.
- L. Skirt Deflector Devices: Provide manufacturer's standard brush-type device running entire length of skirt panels.
- M. Steps: One-piece, die-cast aluminum with demarcation grooves at front and rear of tread surface.
1. Finish: Powder-coated, Manufacturer's standard graycolor
  2. Step Demarcation: **1-1/2- to 2-inch-** wide yellow stripe at sides and backs of step treads.
  3. Nosing Demarcation: **2-inch-** wide yellow stripe at nosings of step treads.
- N. Combs: Provide manufacturer's standard
1. Comb Color: Yellow
- O. Combplate Lights: Provide recessed, LED-illuminated light fixtures with flush lenses mounted in skirt panels at each side of combplates, designed to illuminate combplate steps.
- P. Floor Plates: Provide manufacturer's standard cast or extruded aluminum with grooved or patterned surface for interior escalators and manufacturer's standard stainless steel with abrasive material embedded in or metallically bonded to floor-plate surface for exterior escalators.

## 2.5 FEATURES

- A. Operational Control: Provide key-operated starter switches and key-operated switches for directional control located on exterior deck above newel base at both upper and lower landings of escalators.
- B. Future Monitoring Provisions:
1. Provide Lift-Net interface provisions within the solid-state escalator/walk control system for potential future use by the airport.
  2. Provide BACNET interface provisions only within the solid-state escalator/walk control system for potential future use by the airport.
- C. Fault Indicator: Provide escalators with a microprocessor unit that monitors safety devices, motor temperature, and escalator speed and records in nonvolatile memory the date, time, and device identification if a safety device is activated or escalator malfunctions.
1. Provide built-in unit to display recorded fault and operational information on the exterior surface of the escalator such as a skirt cap or balustrade/newel end.
- D. Reduced-Current Starting: Provide escalator motors with wye-delta or solid-state starting.

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- E. Energy-Saving Feature / "Sleep Mode" Operation: Provide escalator motors and controls designed for motors running on partial windings (at reduced power) when not under full load. Infrared triggering devices will be provided at both ends of the escalators allowing the escalator to reach full speed by the time a passenger breaks the infra-red beams and steps onto the step band. The unit will return to "sleep mode" operation after a specific time frame of no traffic (time frame to be set through a programmable/adjustable timer).
- F. Provide motors complying with NEMA MG 1, Insulation Class B.
- G. Brake-Saving Feature: Provide stopping mechanism that allows escalator to coast to a stop before applying brakes, unless stopping is initiated by a safety device.
- H. Equip step drive mechanism with automatic step-chain lubricators.
- I. Oil Drip Pan: Provide metal pan under full width and length of escalator to collect and hold oil and grease drippings from lubricated components. Design and fabricate drip pan to sustain a load of 250 lbf on a 1.0-sq. ft. area at any location without permanent deflection. Contractor to advise owner / purchaser if existing pan or truss sections supporting structure requires modification or repair to accommodate the replacement escalator as part of the surveying/submittal process where possible. If pan and/or truss is retained for an escalator modernization process, thoroughly degrease and clean the oil drip pan and associated truss sections as needed and paint with rust-inhibitive paint. Contractor to advise if existing pan or truss sections are damaged and require further repair.
- J. Overspeed Governor: Provide units with overspeed governor that is activated if speed of steps exceeds rated speed by more than 20 percent.
- K. Upper-Landing, Step Upthrust Device: Activated if a step is displaced against upthrust track at upper curve in passenger-carrying line of track system.
- L. Comb-Step Impact Device: Activated if a horizontal force in direction of travel is applied exceeding 400 lbf at either side or exceeding 800 lbf at center of front edge of combplate, or a resultant force in upward direction is applied exceeding 150 lbf at center of front edge of combplate.
- M. Comb-Step Impact Device: Activated if a horizontal force in direction of travel is applied exceeding 112 lbf at either side or exceeding 225 lbf at center of front edge of combplate, or a resultant force in upward direction is applied exceeding 150 lbf at center of front edge of combplate.
- N. Step Demarcation Lights: Provide a sealed, LED-illuminated, green hue step demarcation light per Code in both ends (exit and entry points) of the escalators. The demarcation lights will remain illuminated if the escalator is shut off with the keyswitches on each end of the unit.

## 2.6 EXTERIOR ESCALATORS

- A. Fabricate exposed components from stainless steel unless otherwise indicated.

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- B. For new installation/replacement outside escalators, hot-dip galvanize escalator trusses and other structural components to comply with ASTM A 123/A 123M. Use only stainless-steel or zinc-plated fasteners.
- C. Fabricate oil drip pan from galvanized-steel sheet. Provide drain and oil/water separator in oil drip pan.
- D. Provide drains, weeps, and drips to prevent water accumulation on horizontal surfaces and to direct water away from electrical equipment and moving parts.
- E. Provide enclosures complying with NEMA 250, Type 4 for electrical connections, switches, and equipment.
- F. Provide totally enclosed motors complying with NEMA MG 1, Insulation Class B.
- G. Equip step drive mechanism with automatic step-chain lubricators.
- H. Provide electric heaters with integral thermostats in escalator truss space to maintain temperature above **40 deg F**. Separate electrical disconnects for each heater will be provided by electrical contractors.
- I. Equip combplates with 400-W electric heaters to prevent ice and snow accumulation. Please note this feature will be electrically fed from disconnect added in the item above.

## 2.7 MATERIALS

- A. Standard Application - Stainless Steel: ASTM A 240/A 240M, [Type 304, except use Type 316 for exterior escalators.
  - 1. Satin Finish: No. 4 directional satin.
- B. Steel Sheet: Cold-rolled steel sheet, ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish.
- C. Clear Tempered Glass: ASTM C 1048, Condition A (uncoated surfaces), Type 1 (transparent glass, flat), Class 1 (clear), Quality q3 (glazing, select), Kind FT (fully tempered), 12.0 mm thick.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine escalator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine supporting structure, machine spaces, and pits; verify critical dimensions; and examine conditions under which escalators are to be installed.

## EXHIBIT I

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- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work based on conditions known at the time of pricing. Additional site conditions determined following the pricing process will be addressed separately.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions.
- B. Set escalators true to line and level, properly supported, and anchored to building structure. Use established benchmarks, lines, and levels to ensure dimensional coordination of the Work. Provide rigging required to perform the removal of the existing and setting of the new/modernization escalator equipment.
- C. Adjust installed components for smooth, efficient operation, complying with required tolerances and free of hazardous conditions. Lubricate operating parts, including bearings, tracks, chains, guides, and hardware. Test operating devices, equipment, signals, controls, and safety devices. Install oil drip pans and verify that no oil drips outside of pans.
- D. Repair damaged finishes so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

### 3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of escalator installation and before permitting escalator use, perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by authorities having jurisdiction.
  - 1. For escalators specified to comply with requirements more stringent than those of ASME A17.1/CSA B44, perform tests for compliance with specified requirements. Test safety devices that are not required by ASME A17.1/CSA B44 as well as those that are.
- B. Advise Owner, DEN Project Manager, and authorities having jurisdiction in advance of dates and times that tests are to be performed.

### 3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate the escalators.
  - 1. Schedule training with Owner, through DEN Project Manager, with at least seven (7) days advance notice.

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- B. Check operation of escalators with Owner's personnel present before date of Substantial Completion and again not more than one month before end of warranty period where applicable. Determine that operation systems and devices are functioning properly.

**PART 4 - MEASUREMENT**

## 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

## 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Lump Sum Contract price.

**END OF SECTION 143100**

## SECTION 143200 - MOVING WALKS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes interior and [exterior] moving walks.
- B. Related Requirements:
  - 1. The contractor is to provide the cost and project management of all related work for completion of this scope of work for a turn-key project.
  - 2. Section 033000 "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
  - 3. Section 051200 "Structural Steel Framing" for attachment plates, angle brackets, and other preparation of structural steel to support moving walk trusses.
  - 4. Section 083113 "Access Doors and Frames" for wall and ceiling access panels and access doors in moving walk enclosures.
- C. Alternates: Refer to Division 01 Section 012300 "Alternates" for description of Work in this Section affected by Alternates. Contractors are to provide alternate pricing for the following items:
  - 1. LED under handrail lighting – full length of each escalator – both sides;

#### 1.3 DEFINITIONS

- A. Definitions in ASME A17.1/CSA B44 apply to work of this Section.
- B. Moving Walks: Designed specifically for high-traffic-volume use that produces dense occupancy resulting in structural, machinery, and brake loads much higher than normal. All running equipment to have heavy duty rating.
- C. Defective Moving Walk Work: Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.



#### 1.4 REFERENCES

- A. American National Standards Institute (ANSI):
1. A117.1 - Accessible and Usable Buildings and Facilities.
- B. American Society for Testing and Materials (ASTM):
1. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  2. A366/366M - Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
  3. A786A/786M - Rolled Steel Floor Plates.
  4. A793 - Rolled Floor Plate, Stainless Steel.
  5. B36/36M - Brass Plate, Sheet, Strip, and Rolled Bar.
  6. B151 - Nickel-Zinc Alloy (Nickel Silver) and Copper-Nickel Rod and Bar.
  7. B151M - Copper-Nickel-Zinc Alloy (Nickel Silver) and Copper-Nickel Rod and Bar (Metric).
  8. B455 - Copper-Zinc-Alloy (Leaded Brass) Extruded Shapes.
  9. B632/632M - Aluminum-Alloy Rolled Tread Plate.
  10. C1107 - Packaged Dry, Hydraulic-Cement Grout (Non-shrink).
- C. American Society of Mechanical Engineers (ASME):
1. A17.1 - Safety Code for Elevators and Escalators. Provide the latest version of the ASME A17.1 as enforced by the local authority having jurisdiction (AHJ).
- D. National Electrical Manufacturers Association (NEMA):
1. LD3 - High Pressure Decorative Laminates as applicable.
- E. U.S. Architectural & Transportation Barriers Compliance Board:
1. ADA Accessibility Guidelines - August 1994 - American Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities – as applicable.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, safety features, finishes, and similar information.
1. Include data substantiating that materials comply with requirements.
- B. Shop Drawings:
1. Include plans, elevations, sections, and details indicating coordination with building structure and relationships with other construction.
  2. Indicate maximum loads imposed on building structure at points of support, and power requirements.
  3. Indicate access and ventilation for moving walk machine space.

- C. Samples for Verification: For exposed finishes, **3-inch-** square Samples of sheet materials and **4-inch** lengths of running trim members.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Manufacturer Certificates: Signed by manufacturer certifying that moving walk layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for moving walks being provided.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For moving walks to include in emergency, operation, and maintenance manuals.
1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.
- B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted use of moving walks.
- C. As-Built Plans: Submit complete as-built plans of all Work, including interface with other Work, in accordance with requirements as specified in Section 013300 "Submittal Procedures".

#### 1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Moving walk manufacturer or an authorized representative who is trained and approved by manufacturer on the specific equipment installed/modernized.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location prior to installation of the equipment.

#### 1.10 COORDINATION

- A. Coordinate installation of sleeves, block outs, moving walk equipment with integral anchors, and other items that are embedded in concrete or masonry for moving walk equipment. Furnish templates, sleeves, moving walk equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.

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- B. Coordinate locations and dimensions of other work relating to moving walks including sumps and floor drains in pits; electrical service; and electrical outlets, lights, and switches in pits.

#### 1.11 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to provide replacement moving walk components/parts as part of the project. The contractor is to provide a comprehensive spare parts list to the purchaser for approval. All parts will be provided to the purchaser prior to final completion of each project task order. Bidders are to include a \$15,000 per unit spare parts allowance with their proposals.

#### 1.12 CONSTRUCTION WASTE MANAGEMENT

- A. Construction waste shall be managed in accordance with provisions of Section 017419 "Construction Waste Management and Disposal". Documentation shall be submitted to satisfy the requirements of that Section.

### **PART 2 - PRODUCTS**

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. KONE Inc.
  2. Otis Elevator Co.
  3. Schindler Elevator Corp.
  4. thyssenkrupp Elevator
- B. Source Limitations: Obtain moving walks and if applicable, escalators, specified in another Section, from a single manufacturer.

#### 2.2 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with the latest ASME A17.1/CSA B44 code in effect by the local authority having jurisdiction (AHJ).
- B. Structural Performance of Balustrades, Deck Barricades, and Handrails: Provide components and assemblies capable of withstanding the effects of loads indicated in ASCE/SEI 7 for handrail assemblies and guardrail systems.

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## 2.3 MOVING WALKS

- A. Moving Walks, General: Manufacturer's standard pallet heavy-duty rated (NON-APTA) type moving walks complying with requirements. Unless otherwise indicated, manufacturer's standard components shall be used as included in standard moving walk systems and as required for complete system.
- B. Design and equip moving walks to run in either direction.
- C. Rated Speed **100 fpm**.

## 2.4 COMPONENTS

- A. Fabricate exposed metalwork, including deck covers, balustrade panels, and trim to provide surface flatness equivalent to stretcher-leveled standard of flatness and sufficient strength for indicated use; increase metal thickness or reinforce with concealed stiffeners, backing materials, or both, as necessary. Support joints with concealed stiffeners as needed to hold exposed faces of adjoining sheets in flush alignment.
- B. Transparent Balustrades: Manufacturer's standard profile or arrangement of moving handrails on guide rail that is supported by clear tempered glass panels, with deck covers, skirts, trim, and accessories. Prepared for exterior finish below the deck covers.
- C. Direction Indicator Lights: Provide red and green LED-illuminated indicator lights at least **2 inches** in diameter in right or left-hand balustrade newels at both entry and exit points. Green light indicates entrance end, and red light indicates exit end. When moving walk is stopped, red lights are illuminated at both ends.
- D. Handrails: Smooth, jointless, reinforced neoprene.
  - 1. Color: Black in color with anti-microbial rating.
  - 2. Sterilization: Provide internally mounted UV-C handrail sterilization devices on each handrail from EHC Global, Inc. or approval equal. Provide display signs on each escalator entry and exit indicating the device is present/functional on the unit.
- E. Deck Covers and Trim: Provide #4 brushed/satin stainless steel finish for proper wear and tear and ease/cost of refinishing. Includes outer and common decking sections.

Balustrade Interior Panels: Provide #4 brushed/satin stainless-steel finish for proper wear and tear and ease/cost of refinishing.

- F. Balustrade Exterior Panels: Provide #4 brushed/satin stainless steel finish for proper wear and tear and ease/cost of refinishing
- G. Skirt Panels, if Applicable: Provide manufacturer's satin stainless steel with exposed surface coated with clear PTFE or standard low-friction material .

1. Clearance between skirt panels or overhanging balustrade panels and treadway shall not exceed **1/16 inch**.
- H. Skirt Lighting: Provide LED skirt lighting evenly spaced and running the entire length of both skirts.
- I. Combs: Provide manufacturer's standard
  1. Comb Color: Yellow
- J. Combplate Lights: Provide recessed, LED-illuminated light fixtures with flush lenses mounted in interior balustrade panels at each side of combplates, designed to illuminate treadway at combplate.
- K. Floor Plates: Provide manufacturer's standard cast or extruded aluminum with grooved or patterned surface for interior escalators and manufacturer's standard stainless steel with abrasive material embedded in or metallically bonded to floor-plate surface for exterior escalators.

## 2.5 FEATURES

- A. Operational Control: Provide key-operated starter switches and key-operated switches for directional control located on exterior deck above newel base at both upper and lower landings of escalators.
- B. Future Monitoring Provisions:
  1. Provide Lift-Net interface provisions within the solid-state escalator/walk control system for potential future use by the airport.
  2. Provide BACNET interface provisions only within the solid-state escalator/walk control system for potential future use by the airport.
- C. Fault Indicator: Provide moving walks with a microprocessor unit that monitors safety devices, motor temperature, and moving walk speed and records in nonvolatile memory date, time, and device identification if a safety device is activated or moving walk malfunctions.
  1. Provide built-in unit to display recorded fault and operational information on the exterior surface of the escalator such as a skirt cap or balustrade/newel end.
- D. Reduced-Current Starting: Provide moving walk motors with wye-delta or solid-state starting.
- E. Energy-Saving Feature / "Sleep Mode" Operation: Provide moving walk motors and controls designed for motors running on partial windings (at reduced power) when not under full load. Infrared triggering devices will be provided at both ends of the escalators allowing the escalator to reach full speed by the time a passenger breaks the infra-red beams and steps onto the step band. The unit will return to "sleep mode" operation after a specific time frame of no traffic (time frame to be set through a programmable/adjustable timer).

- F. Brake-Saving Feature: Provide stopping mechanism that allows moving walks to coast to a stop before applying brakes, unless stopping is initiated by a safety device.
- G. Equip pallet drive mechanism with automatic pallet drive-chain lubricators.
- H. Oil Drip Pan: If applicable, provide metal pan under full width and length of moving walks to collect and hold oil and grease drippings from lubricated components. Design and fabricate drip pan to sustain a load of 250 lbf on a 1.0-sq. ft. area at any location without permanent deflection. Contractor to advise owner / purchaser if existing pan or truss sections supporting structure requires modification or repair to accommodate the replacement walk as part of the surveying/submittal process where possible.
- I. Comb-Step Impact Device: Activated if a horizontal force in direction of travel is applied exceeding 400 lbf at either side or exceeding 800 lbf at center of front edge of combplate, or a resultant force in upward direction is applied exceeding 150 lbf at center of front edge of combplate.
- J. Comb-Step Impact Device: Activated if a horizontal force in direction of travel is applied exceeding 112 lbf at either side or exceeding 225 lbf at center of front edge of combplate, or a resultant force in upward direction is applied exceeding 150 lbf at center of front edge of combplate.
- K. Step Demarcation Lights: Provide a sealed, LED-illuminated, green hue step demarcation light per Code in both ends (exit and entry points) of the moving walk. The demarcation lights will remain illuminated if the moving walk is shut off with the keyswitches on each end of the unit.

## 2.6 EXTERIOR MOVING WALKS

- A. Fabricate exposed components from stainless steel unless otherwise indicated.
- B. For new installation/replacement outside walks, hot-dip galvanize moving walk trusses and other structural components to comply with ASTM A 123/A 123M. Use only stainless-steel or zinc-plated fasteners for moving walk component assembly.
- C. Fabricate oil drip pan from galvanized steel sheet. Provide drain and oil/water separator in oil drip pan.
- D. Provide drains, weeps, and drips to prevent water accumulation on horizontal surfaces and to direct water away from electrical equipment and moving parts.
- E. Provide enclosures complying with NEMA 250, Type 4 for electrical connections, switches, and equipment.
- F. Provide totally enclosed fan-cooled motors complying with NEMA MG 1, Insulation Class B.
- G. Equip pallet drive mechanism with automatic pallet drive-chain lubricators.

- H. Provide electric heaters with integral thermostats in moving walk truss space to maintain temperature above **40 deg F**. Separate electrical disconnects for each heater will be provided by electrical contractors.
- I. Equip combplates with 400-W electric heaters to prevent ice and snow accumulation. Please note this feature will be electrically fed from disconnect added in the item above.

## 2.7 MATERIALS

- A. Standard Application - Stainless Steel: ASTM A 240/A 240M, Type 304, except use Type 316 for exterior moving walks .
  - 1. Satin Finish: No. 4 directional satin.
- B. .
- C. Steel Sheet: Cold-rolled steel sheet, ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish.
- D. Clear Tempered Glass: ASTM C 1048, Condition A (uncoated surfaces), Type 1 (transparent glass, flat), Class 1 (clear), Quality q3 (glazing, select), Kind FT (fully tempered), 12.0 mm thick.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine moving walk areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Examine supporting structure, machine spaces, and pits; verify critical dimensions; and examine conditions under which moving walks are to be installed.
- B. Prepare a written report, endorsed by Installer, listing conditions detrimental to performance of the Work based on conditions known at the time of pricing. Additional site conditions determined following the pricing process will be addressed separately.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions.
- B. Set moving walks true to line and level, or to indicated slope, properly supported, and anchored to building structure. Use established benchmarks, lines, and levels to ensure dimensional coordination of the Work. Provide rigging required to perform the removal of the existing and setting of the new/replacement moving walk equipment.



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- C. Adjust installed components for smooth, efficient operation, complying with required tolerances and free of hazardous conditions. Lubricate operating parts, including bearings, tracks, chains, guides, and hardware. Test operating devices, equipment, signals, controls, and safety devices. Install oil drip pans and verify that no oil drips outside of pans.
- D. Repair damaged finishes so no evidence remains of correction work. Return items to the shop that cannot be refinished in the field, make required repairs and refinish entire unit, or provide new units as required.

### 3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of moving walk installation and before permitting moving walk use, perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by authorities having jurisdiction.
  - 1. For moving walks specified to comply with requirements more stringent than those of ASME A17.1/CSA B44, perform tests for compliance with specified requirements.
- B. Advise Owner, DEN Project Manager, and authorities having jurisdiction in advance of dates and times that tests are to be performed.

### 3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate the moving walks.
  - 1. Schedule training with Owner, through DEN Project Manager, with at least seven (7) days advance notice.
- B. Check operation of moving walks with Owner's personnel present before date of Substantial Completion and again not more than one month before end of warranty period where applicable. Determine that operation systems and devices are functioning properly.

## **PART 4 - MEASUREMENT**

### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.



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## **PART 5 - PAYMENT**

### 5.1 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Lump Sum Contract price.

**END OF SECTION 143200**

**EXHIBIT J CONTRACT DRAWINGS**

**Incorporated by Reference**



# **INFORMAL COMPETITIVE PROCUREMENT**

## **On-Call Passenger Conveyance Modernization I**

*No. 201952239*

**Denver International  
Airport (DIA/DEN)**

*Proposal Submittal Package*

### **Submitted by:**

thyssenkrupp Elevator Corporation  
7367 S Revere Pkwy, Unit 2A  
Centennial, CO 80112





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*On-Call Passenger Conveyance Modernization I -  
ICP #201952239*



thyssenkrupp

**COVER LETTER**

**COST EFFECTIVENESS**

**UNDERSTANDING THE  
PROJECT**

**PROPOSED WORK PLAN  
& APPROACH**

**KEY PERSONNEL &  
ABILITY TO RESPOND**

**COMPANY EXPERIENCE &  
QUALIFICATIONS**

**ADDITIONAL  
INFORMATION**

**KEY PERSONNEL  
RESUMES**

**PROPOSAL FORMS**

**DSBO FORMS**

**FORM W-9**

**CERTIFICATE OF GOOD  
STANDING**



## **COVER LETTER**



thyssenkrupp

thyssenkrupp Elevator Corporation, 7367 S Revere Pkwy, Unit 2A, Centennial, CO 80112

Stephen Smith  
ET-AMS/FLD  
Modernization Department

Ms. LaQuisha Shaw - Contract Services  
Airport Office Building (AOB) / Room 8810  
Denver International Airport (DIA)  
8500 Pena Boulevard  
Denver, CO 80249

*Subject: On-Call Passenger Conveyance Modernization I - ICP #201952239*

Dear Ms. Shaw:

On behalf of thyssenkrupp Elevator Corporation, we are pleased to submit our proposal package for the above referenced solicitation at the Denver International Airport (DIA/DEN).

## **DIA PARTNERSHIP EXPERIENCE**

Over the past five (5) years, thyssenkrupp is proud to have been and continues to be a trusted partner with DIA/DEN for the servicing, new installation and modernization of various DIA/DEN vertical transportation projects. As with any project and large-scale airport operation, there have been challenges to overcome and critical lessons learned along the way as we navigate and continue to modify how to best provide for DIA/DEN's needs. This is precisely what places thyssenkrupp Elevator the best position to understand the scope of the project, create the most effective work plan, dedicate the appropriate resources and ensure that our team responds to any and all specific DIA/DEN situations. In the subsequent pages of our proposal, we will clearly define our approach, present a cost-effective plan and demonstrate why thyssenkrupp Elevator is the most qualified conveyance company for this project and an effective continuing partner.

## **BASE PROJECT APPROACH**

A project of this magnitude will require commitment, not only from our local Denver team, but also from our Regional, National and International groups. Each of these groups have been engaged on this specific project and will remain assets in the effective execution of the various DEN/DIA task orders. Much of the success both in the short term and long term will be determined by the level of continuity maintained from one (1) project to the next. With this in mind, we will continue to utilize **Britaney Tyler** as the dedicated *Regional Project Manager*, **Austin Barnes** (*Operation Manager*) as the superintendent, **Brian Baxter** for *Quality Control* as units turn over to Service, **Stephan Smith** for estimating and assisting in project management (*sales representative*) and **Rob Brandley** for Safety (*Safety Manager*) among various other team members. Our National and International Escalator group will remain highly involved and provide critical assistance before, during and after installation of any escalators or power walks. Additionally, two (2) of the industry's best elevator and escalator modernization technicians (*Henry Silva/Dwaine Appel*) will remain dedicated to this project and oversee the secondary modernization crews on a day-to-day basis.





## MBE / WBE COMMITMENT

As with prior DIA task orders, the thyssenkrupp Elevator DIA/DEN team remains committed to fulfil the 8% W/MBE requirements for this project and will employ **Reliant Construction** as our W/MBE partner to perform all subcontract/related work. Reliant has worked under thyssenkrupp for the past three (3) years at DIA/DEN and understands the security protocols, expectations for quality work and level of oversight that will be required for a successful project.

## PROPRIETARY / CONFIDENTIAL INFORMATION

Our proposal does contain confidential and proprietary information and thus respectfully should not be shared with any party outside the immediate persons employed by the City of Denver/DIA/DEN who are directly responsible for the evaluation of thyssenkrupp Elevator as it relates to this solicitation/ICP. Any financial information, such as the W-9, Bonding Capacities and Balance Sheets are proprietary information. Additionally, we consider any key personnel resumes to be confidential. The experience, education and other unique qualifications of thyssenkrupp's top performers (*who are being committed to this project*) represent our greatest assets. As such, it would be detrimental to our organization to give insights into these top performers should the details of their resumes be shared with our competitors.

For efficiency and expediency purposes, the thyssenkrupp Elevator proposal assumes that any contract awarded to thyssenkrupp relative to this solicitation will be contain similar terms and conditions as other recent contracts between the City of Denver/DIA/DEN and thyssenkrupp Elevator.

## IN CLOSING

The entire thyssenkrupp Elevator team wishes to thank you/your team for considering thyssenkrupp Elevator Corporation for this additional project. We look forward to hopefully working in close and continued collaboration with the staff of DIA/DEN to ensure a world-class project and provide minimal impact to the overall operation of the airport and its vendors/services. Please feel free to contact our team with any questions or information requests.

Sincerely,

*Stephan Smith*

Stephen Smith, Denver Sales Manager on behalf of:  
Lee Blevins  
Regional President - Southwest Region

*Cc: thyssenkrupp Elevator DIA/DEN Team / Project File*



April 17, 2020

Mr. Stephan Smith  
thyssenKrupp Elevator Corporation  
7367 S Revere Parkway, Unit 2a  
Centennial, CO 80112

Re: Signature Authority

Dear Mr. Smith:

I hereby designate you as empowered and duly authorized to execute for and in the name of thyssenKrupp Elevator Corporation, Contracts, Amendments, Lien Releases, Change Orders, and Bid Documents pursuant to or in connection with the sale of the Company's products and services in the normal and ordinary course of business.

This is a charge or trust and responsibility that I know you will discharge with discernment and meticulous vigilance.

Sincerely,

A handwritten signature in black ink that reads "Mark Hintz".

Mark Hintz  
Vice President Contracts Department



## **COST EFFECTIVENESS**



thyssenkrupp

## COST EFFECTIVENESS NARRATIVE

### Overall Project Cost Effectiveness Concept

As a current dedicated partner of DIA/DEN, thyssenkrupp Elevator has a unique and keen understanding of the importance of cost-effectiveness on this project and how our dedicated thyssenkrupp DIA/DEN project team can bring value, not only over the short term, but also for many years to come. Finding the most cost-effective method on this project involves a multi-faceted approach and isn't solely based on the monetary value of the equipment purchased. In addition to the equipment, our team continually analyses labor efficiencies, quality control, repurposing of rigging material/specialized tools (i.e. no extended or duplicate rental or purchase costs), DIA/DEN preferences/requirements/needs and effectively managing the project to mitigate any potential issues. As the current vertical transportation (VT) contractor for the initial *On-Call Conveyance Modernization* project over the past two (2) years, thyssenkrupp Elevator has been able to capitalize on the time to learn from areas of improvement, discover more efficient processes and accurately determine the correct, most applicable and customer-centric scope of work for each VT product line. This hands-on experience has proven invaluable to thyssenkrupp Elevator for meeting DIA/DEN's needs on the initial VT modernization/replacement project.

### Cost Effectiveness – Dedicated / Experienced Project Team

The local and regional thyssenkrupp Elevator philosophy on modernization project management has significantly evolved over the past several years to the benefit of both thyssenkrupp and our clients, especially in completing projects on budget and on time. Such changes to our project management efforts include the creation of a Regional Modernization Project Management department, headed by Anthony Makela based in our Centennial, CO offices. In addition, several professional and experienced project managers (PMs) have been added to the Regional Project Management team. The goal of creating this department is two-fold. The first goal is to get additional eyes on “major projects” such as the DIA/DEN projects and create effective lines of communication. A second goal is to free up our modernization operations team to allow them to focus on managing manpower, staying on track for committed milestones, engaging in regular site visits and responding to onsite client and installer questions/issues in real-time. The thyssenkrupp Elevator team believes that setting up a project correctly on the front end is paramount to the overall success of a project and client satisfaction in addition to helping facilitate a smooth transition from sales to the operation / project management team following the award of a contract.

From the initial receipt of this DIA/DEN project solicitation, the project management team, along with the sales and operation teams and the MBE/WBE subcontractor (*Reliant Construction*) have reviewed the provided documents including the project specifications, scope of work, addenda and sample contracts in order to ensure that the entire thyssenkrupp Elevator team (*and our subcontractor*) is aligned with the requirements and best strategy for the cost-effective execution of the VT modernization/replacement project for DIA/DEN. This process intentionally reduces the risk of errors and ensures that we are setting up a project correctly on the front end. Following the completion of site surveys and the corresponding estimate(s), the team will again review and discuss the various aspects of the units to be modernized/ replaced and the associated estimate to check for scope of work accuracy and completeness, cost-effectiveness and available labor efficiencies and schedule alignment (*with DIA/DEN*). Additional cost-effective considerations during this process include provide value engineering options for the DIA/DEN team to consider beyond the base proposal pricing. Upon award of the task order(s)/contract and prior to ordering the material, the local and regional team will have a “buy-out” meeting including our MBE/WBE subcontractor (*Reliant Construction*) to ensure the project management team understands the scope, the equipment, schedule, specific challenges, DIA/DEN requirements and project approach. Since the thyssenkrupp Elevator project management team instituted the “buy-out” process on a regular basis, we have collectively found that the additional layers of review / approval have drastically reduced the occurrence of most unaccounted costs and virtually eliminated any necessary change orders.



Throughout the project, the dedicated/assign project manager (PM) will work closely with the operations team, field technicians and Reliant Construction. In order to keep all lines of communication open and effective, the PM will be in daily communication with the onsite foreman, conduct weekly “three (3) week look ahead” meetings with Reliant and have weekly meetings with the internal thyssenkrupp team. In addition to the meetings, the PM and operations team will be onsite multiple times per week to inspect the quality of the work from both thyssenkrupp and Reliant and make sure that all tasks and procedures are being followed by the relevant installation teams. Our team approach to quality control stems from our sincere and institutional belief that we must avoid careless mistakes, poor workmanship and minimize issues at the source in order to deliver a quality final product for the DIA/DEN management, vendors and airport guests on budget.

### Cost Effectiveness - Timelines / Milestones

With thyssenkrupp Elevator’s experienced understanding of DIA/DEN’s organizational and business needs as it relates to which VT units will be modernized/replaced; the importance of requested/crucial timelines for specific task orders and the best product application for the effective operation of DIA/DEN modernized/replaced VT equipment, our dedicated team members are in the best position to be the most effective for the benefit of DIA/DEN, vendors and the traveling public. As with any major airport project, time is of the essence in ensuring costs are kept within budget and negative financial impacts of the VT modernization/ replacement work is minimized. This unique level of client and site condition wisdom provides the thyssenkrupp Elevator team with the necessary details to determine the proper amount of modernization crews that must be dedicated to each task order and how to best execute the modernization/installation process. Throughout the various project(s) we will commit our best elevator modernization mechanic (*Henry Silva*) and our best escalator modernization/ replacement mechanic (*Dwaine Appel*) to be the installation foreman for the two (2) different product lines. Each additional modernization/installation crew will be selected based on the scope of work and skill level of the team. For example, if the task order includes hydraulic to traction elevator conversions, we will select the crew best suited for that scope of work so that we can maintain a high level of quality and gain labor efficiencies to hit agreed upon milestones. Hitting the agreed-upon milestones is critical in order to avoid any additional financial impact to the airport and passenger disruption due to a conveyance unit being out of service longer than anticipated. As such, avoiding unnecessary delays and ensuring the quality of the installation will be driving factors in making sure we select the right teams. Based on the requirements of specific task orders, thyssenkrupp Elevator has committed to assign multiple installation crews to adequately staff the project – as many as is possible to effectively complete the work as DIA/DEN requests/requires.

### Cost Effectiveness - High-Quality Products Usage

The specific products used for this project will have a major impact on cost effectiveness throughout the life of the equipment. With that said, we have chosen to use thyssenkrupp’s proven and abundant solid-state TAC32 controller platform on the traction elevators, and in some cases, hydraulic elevators. There are several important factors to consider when selecting the equipment such as product life cycle, future support, proven reliability, serviceability and familiarity of the equipment by reputable and trained elevator technicians. The TAC32 controller family is a widely accepted and extremely reliable elevator controller - with thousands installed throughout North America and is still in the early stages of its product life cycle. This is a critical factor to consider because a controller in the late stages can eventually result in additional costs for obsolete components, longer unit downtimes and in some instances, it may cause an untimely and unplanned modernization. Moreover, familiarity with the elevator equipment plays a direct and effective role in an elevator technicians’ ability to install a quality product in a timely manner and minimizes delays due to our technicians having to learn about the equipment. This is also an important factor for servicing and repairing the elevator equipment beyond the installation/modernization process. The TAC32 platform is a very familiar product to reputable elevator technicians and allows product and replacement part standardization for the DIA/DEN VT equipment.



thyssenkrupp is scheduled to install various elevators with the TAC32 control equipment with new equipment installation (NI) projects in *The Great Hall* and *Concourse A* in addition to the initial *On-Call Conveyance Modernization* project currently underway at DIA/DEN. We believe that maintaining equipment continuity throughout the airport with future NI and modernization projects will help minimize future service-related costs, reduce the risk of delayed downtimes, and help ensure an appropriate stock of replacement parts are always on hand. Additionally, every TAC32 controller will come equipped with MAX, our new predictive maintenance tool. Additional product considerations for the modernization / replacement of escalators and powerwalks include heavier duty rated equipment, added safety features, the use of LED lighting, standardized components and replacement parts and the installation of MAX, thyssenkrupp Elevator's state-of-the-art monitoring and predictive maintenance tool.

### Cost Effectiveness – Proactive Use of the MAX Remote Monitoring System

Using cutting-edge technology designed jointly by Microsoft and thyssenkrupp Elevator, the MAX remote monitoring system was introduced to the industry with extremely positive feedback from our clients. The MAX system continuously collects data about the elevator and escalator equipment's components and sends it to a Microsoft Azure cloud system. The data is analysed and compared with data taken from other MAX-connected elevators and creates algorithms to predict whether your equipment requires additional maintenance or part replacements – thus minimizing the effective downtime of VT equipment and the financial impact of such equipment downtime (*i.e. increased movement of passengers, etc.*). When equipment fails or has specific fault issues logged, the MAX unit automatically sends an alert directly to the service technician, informing thyssenkrupp Elevator of the shutdown and in most cases before the client ever knows the unit is down/needs service. These alerts provide various data points including the noted fault while providing three (3) possible solutions to correct the issue which assists the technician with a more effective trouble-shooting starting point. One (1) of the noted three (3) suggested solutions is correct over 97% of the time. This information saves critical time often spent troubleshooting and allows for our technicians to quickly resolve the issue and thus, faster return to service for DIA/DEN. The data captured by the more than 16.5 million daily elevator trips in the U.S. creates predictive analytics models that will help thyssenkrupp and DIA/DEN better plan for future costs and scheduled disruptions. Moreover, increased equipment uptime translates into more passenger movement, less flight delays, improved traveller and vendor satisfaction and business continuity both for DIA/DEN and the vendors who pay rent/lease space from DIA/DEN. The MAX system will be installed on all modernized/replaced elevators, escalators and walks at no additional cost to DIA/DEN.

### Cost Effectiveness = Prior DIA/DEN Experience + Process Refinement

As noted throughout this proposal response, working on the current On-Call Conveyance Modernization project has allowed the thyssenkrupp Elevator team to further refine our processes, hone various labor efficiencies, maximize cost-savings, navigate through the complexities of completing work at DIA/DEN and best meet the needs and expectations of the DEN/DIA team and the traveling public. The thyssenkrupp Elevator team continues to proactively measure and address prior installation/project management time, execution and project management areas of improvement and have made the necessary adjustments to learn from such situations and execute more efficiently and cost-effectively. We routinely review the positive aspects and areas of needed improvement on our projects (*including the current DIA/DEN projects*) in order to create favourable and repeatable processes for every member of the team. Moreover, during weekly reviews of the various modernization/replacement projects, we analyse estimated vs actual labor costs and material spending so that we can make the necessary adjustments during the project and not wait until it is too late. This translates into improved pricing for DIA/DEN on additional/future projects and task orders. Ultimately, it is thyssenkrupp Elevator's goal to create a "win-win" situation for the project and to find the most cost-effective solution without compromising the quality that is expected and deserved by DIA/DEN.



## UNDERSTANDING THE PROJECT





## UNDERSTANDING THE PROJECT NARRATIVE

### Understanding the Work Involved / Performing the Scope of Work

DIA/DEN is a unique and bustling transportation hub with the high level of passenger traffic and year over year record-breaking growth the airport continues to experience. The traffic patterns at DIA/DEN are significantly different than that of an office building, retail shopping centers, hotel or sports venue. As such, the engineering, equipment specifications and the installation/modernization process must be tailored specifically to keep the VT equipment running consistently and reliably, passengers moving in a timely manner, air traffic departing on-time and minimize the impact on overall airport operations and stakeholders.

The elevator, escalator and power walk equipment at DIA/DEN work together to keep passengers moving in between various gates, the main Great Hall terminal, baggage claim and parking areas. Therefore, as the VT equipment ages and becomes more problematic to service and repair, it is understood that the necessary replacement/modernization process must occur with minimal impact on the airport, passengers, airlines and vendors and in the shortest time frame possible. As a result, the VT modernization/replacement contractor MUST employ effective pre-planning, site and equipment engineering, proactive project management and timely scheduling/execution of the modernizing/replacing of the various elevators, escalators and powerwalks at DIA/DEN. Moreover, the Code-required building-related work that is completed by the VT contractor's subcontractor must also be coordinated and completed within the various locations with the same care, timeliness and proactive design/execution process. This overall understanding and coordination will ensure timely turn-over for DIA/DEN use of all modernized/replaced VT equipment.

### Understanding the Work Complexities / Challenges

Replacing/modernizing elevators, escalators and power walks especially at DIA/DEN involves complex processes that must be well thought-out and designed for proper execution due to the various aspects noted within this narrative. The actual equipment replacement/modernization portion is just a part of the entire VT project process. Various complex aspects of the scope of work are unique to DEN/DIA including but not limited to:

- Modernization/conversion of existing hydraulic elevators to geared/gearless traction elevators for a smoother ride, increased reliability and quieter operation;
- Performing complete replacements of existing worn-out power walks and escalators in various areas of DIA/DEN;
- Performing in-truss escalator replacements of existing worn-out escalators in various areas of DIA/DEN when replacement is not viable or cost-effective;
- Proactive planning for the safe and effective delivery of equipment and materials and the installation process while working around the current conditions at the DIA/DEN airport including:
  - Working around aircraft, jet bridges and ramp equipment;
  - Following all airfield driving protocols;
  - Ensuring safe work procedures in all areas of DIA/DEN to protect airport travellers, employees, equipment and all team members;
  - Ensuring all DIA/DEN, FAA, TSA and DHS security requirements, laws and regulations are followed by thyssenkrupp Elevator team members and subcontractors – NO EXCEPTIONS;





- Interfacing with various DIA/DEN stakeholders including airport operations, management, security, concessions, airlines, etc. to ensure all relevant issues are addressed and eliminated or minimized;
- Planning material and major equipment movement during “off hours” when traveller movement is lowest – including crane, hoisting/rigging elements and VT equipment replacement components;
- Working within specific storage zones designated by DEN in the tunnels such that baggage, carts and other movement is not affected by the modernization/replacement process;
- Working with DIA/DEN to properly shut down VT units and put them back into service for enhanced passenger movement, security compliance and equipment reliability;
- Working with the onsite dedicated thyssenkrupp Elevator service and repair teams to ensuring alternate VT equipment is operational and safe prior to the planned VT units being taken out of service for the modernization/replacement process in addition to when the equipment is put back into service following the installation process;
- Working around the traveling public in various sterile areas and ensuring that the work area is safe and secure from public access including continual supervision and inventory management of necessary tools and equipment.
- Creation and use of proper, safe, secure and attractive barricading around work areas to minimize disruptions to the flow of the airport and unsightly work areas;
- **Continual Challenge Identification** - The need to continually identify existing and potential challenges/problems as a critical path item at DIA/DEN. A result of this process, the key players and stakeholders can be involved in the planning and execution of the installation work in such a way that the issues are addressed with minimal impact to the airport traveling public and overall operations;
- **Site Access Challenge** - Receiving deliveries on-site is quite complicated at DIA/DEN due to various items noted within this narrative. thyssenkrupp Elevator has the experience and “know-how” to address all access challenges.
  - The thyssenkrupp Elevator project management team is able to overcome the access challenge by planning with the DIA/DEN team well in advance so that the process/plan is mutually-agreed upon, timely, consistent, secure, safe and that the access milestone is kept on schedule to minimize/eliminate delays for the airport stakeholders;
  - Craning onsite is a particularly complex aspect that needs to be effectively planned for well in advance with the DIA/DEN team and therefore, safely and securely executed within the set time blocks to minimize the airport operations and gate closures. All such craning requests and plans must be submitted to DIA/DEN for approval as early as possible to set schedules in place.
  - Equipment shut down requests are another critical item for the overall airport operations and passenger movement. While the schedule for such equipment replacements/modernization will be agreed upon by all parties well in advance of any equipment shutdown, thyssenkrupp Elevator will still communicate all equipment shutdowns to the DIA/DEN team at least one (1) week in advance. This will allow the DIA/DEN team to verify that the equipment can indeed be shut down as planned/scheduled and to notify the various stakeholders of the process.
- **Communication Effectiveness Challenge** - As referenced in the prior “Cost Effectiveness” section, thyssenkrupp Elevator has established a dedicated project management (PM) team for the various VT modernization/replacement projects perform by our firm locally and regionally. This includes a dedicated PM team specific to the DIA/DEN projects with their main goal to provide complete transparency and effective communication on a regular basis.



- As part of the overall project management process, the PM and mod operations teams in the Denver/Centennial offices meet internally in addition to speaking with the field installation teams onsite daily to properly manage the DIA/DEN projects;
  - Weekly conference calls/meetings at a minimum would continue for all additional DIA/DEN projects and onsite meetings are always available due to the weekly site visits by the PM and mod operations representatives;
  - Moving forward for the DIA/DEN VT projects, thyssenkrupp Elevator will also arrange a monthly high-level meeting between our regional management team and relevant DIA/DEN management/stakeholders to provide for a set escalation process.
- **Weather Issue Challenge** - While thyssenkrupp Elevator proactively builds additional time for certain weather-related delays into its project schedules, most of the work included covered by the DIA/DEN VT task orders is within the confines of the terminals and related structures. Therefore, weather-related considerations typically involve material movement (i.e. into and out of the work areas, the airport, etc.) and generally can be planned for effectively. This typically translates into minimal delays and keeping the project on schedule.

### thyssenkrupp Elevator Problem Solving Philosophy / Approach

As a long-term partner with DIA/DEN in the service, repair, modernization and new installation segments of the VT business, thyssenkrupp Elevator's main issue resolution/problem solving philosophy involves transparency, clear and honest communication and looking for the best solution for all parties. This includes:

- Identifying all issues as opportunities for solutions and meeting DIA/DEN's and the travelling public's needs;
- Putting our collective selves into DIA/DEN's shoes/position (and that of the airport's stakeholders) to find the highest quality, safest yet most cost-effective solution to addressing any identified issue;
- Utilizing thyssenkrupp Elevator's vast local, regional, national and international resources to solve VT issues at DIA/DEN in a timely manner;

### thyssenkrupp Elevator Key Issue Resolution, Sensitivity, Experience

thyssenkrupp Elevator is uniquely positioned to fully understand the needs and requirements of the DIA/DEN team and the various airport stakeholders. It is the vast experience that thyssenkrupp has gained over the last five (5) + years working for DIA/DEN and various segments of the VT business that allows our team to approach our partnership, solutions, communication and approach to the overall relationship with the proper amount of wisdom, experience, prudence and a balance of sensitivity and professionalism – all items critical for effectively addressing and resolving important issues to the betterment of DIA/DEN and the end-users/traveling public.

thyssenkrupp Elevator continues to utilize our experience/overall partnership to DIA/DEN through:

- Executing the existing/current VT task orders nos. 1 & 2;
- Previously installing of 12 foreign-manufactured escalators on Concourse C at the request of DEN/DIA;
- Increased communication, team assignment to and coordination with the DIA/DEN projects both currently and with future task orders;
- Continual coordination with the thyssenkrupp Elevator service teams in charge of servicing and repair the various elevators, escalators and power walks to ensure consistency of products, installation and the warranty process.



## **PROPOSED WORK PLAN & APPROACH**



## PROPOSED WORK PLAN & APPROACH NARRATIVE

### Project Management Approach

While thyssenkrupp Elevator has provided many aspects of our proposed work plan and approach throughout the various sections of this ICP response document and all sections should be considered the overall proposed work plan and approach, the thyssenkrupp Elevator DIA/DEN project team has provided additional project management details for your consideration.

- **Project management control methods**
  - The thyssenkrupp Elevator DIA/DEN project team will conduct weekly project progress meetings with the DIA/DEN client project team;
  - The thyssenkrupp Elevator DIA/DEN project team will establish one (1) main point of contact to coordinate with the DIA/DEN client project team for support on both ends of the project;
    - Britaney Tyler (thyssenkrupp Elevator) and Jerry Uliano (DIA/DEN);
    - Establish one (1) clear and transparent message between thyssenkrupp Elevator and DIA/DEN;
    - The thyssenkrupp Elevator DIA/DEN project team will continue strong internal communication on project details and required tasks;
  - thyssenkrupp Elevator will conduct weekly subcontractor meetings
    - Regular project schedule discussion;
    - Project delay or onsite concerns discussed;
    - Conduct three (3) week look ahead schedule review with subcontractor(s);
    - Discuss best practices and ways to improve with subcontractor(s);
  - *Jobsite* - thyssenkrupp Elevator utilizes an internal system to further track all documentation, subcontractor costs, material costs, billing/payments, installation labor status, purchase orders, change orders and other project-specific details. This project visibility tool will be used on all DIA/DEN projects to ensure smooth project management and execution;
  - *Major Projects Tool* – thyssenkrupp Elevator utilizes an additional internal tool which allows the DIA/DEN project management team to manage the scope of work, track material needed and control costs. As with the Jobsite program, this tracking tool will be used on all DIA/DEN projects to ensure smooth project management and execution;
  - *Weekly Meetings* - Tony Makela, the Regional Modernization Manager will conduct weekly internal meetings with the thyssenkrupp Elevator DIA/DEN project team including Britaney Tyler, the Regional Project Manager assigned to the DIA/DEN project. Various aspects of the project including material



- engineering, submittals, deliveries, open tasks, issue resolution, client communication and schedule will be discussed during these meetings.
- *Quarterly Meetings* - The thyssenkrupp Elevator DIA/DEN project team will conduct quarterly internal project management meetings with the regional & national teams to discuss DIA/DEN project status and best practices on executing and completing all DIA/DEN projects on time and on budget.
  - *Quality Control Process* – One (1) important component of the thyssenkrupp Elevator quality control process is utilizing an adjuster on the modernized/replacement equipment and completion of an equipment turnover checklist that is required before the DIA/DEN project team will turn over the equipment to our DIA/DEN service department. These checklists provide the means for a successful turnover to DIA/DEN for use by the traveling public. This process involves representatives from the thyssenkrupp Elevator DIA/DEN project team, modernization installation team and the DIA/DEN service team branch manager, Brian Baxter reviewing the elevator/escalator equipment components covered by the modernization/replacement process and checking the operation, fit and finish of such items. The DIA/DEN service team does not take accept the equipment until any and all deficiencies are corrected.
  - *Proactive Use of DIA/DEN Reporting Tools* – The thyssenkrupp Elevator DIA/DEN project team currently interfaces with the DIA/DEN team through the Project Management Information System (PMIS), Unifier and Oracle Primavera P6.
    - Continued use of these tools will occur with future DIA/DEN projects;
    - Britaney, the dedicated thyssenkrupp Elevator DIA/DEN project manager has been trained on the required systems for proper usage and communication;
    - Britaney conducts daily system maintenance including checking the status of submittals/drawings, pay applications, RFIs, reports, etc;
    - Britaney will utilize the Oracle Primavera P6 system to provide monthly project schedule updates to the DIA/DEN client project team in addition to schedule milestone reviews moving forward (from task order no. 1);
    - The thyssenkrupp Elevator DIA/DEN project team has procured the required Oracle Primavera P6 software to ensure that all items are being provided to the DIA/DEN client project team per project contract agreements/task orders;
    - The thyssenkrupp Elevator DIA/DEN project team will continue to provide the three (3) week ahead schedules/reports using Microsoft Project;



- *Steps for Completing Work on Schedule*
  - The thyssenkrupp Elevator DIA/DEN project team will provide all field installation teams with task planners so they are aware of what hours are in the contract and what schedule they must meet or beat;
  - The thyssenkrupp Elevator DIA/DEN project team will conduct daily check-ins with the field installation teams and superintendent to ensure that all work is being completed on time and to quality standards and issues are identified and resolved quickly;
  - The thyssenkrupp Elevator DIA/DEN project team will conduct frequent site visits (weekly at a minimum) to further monitor the project, help drive the installation process and the adhering to the installation schedule;
  - The thyssenkrupp Elevator DIA/DEN project team will conduct an onsite equipment inventory with the field installation team before the modernization/replacement process on the various VT units begins to ensure that all material is on site and there will be no delays due to missing material or out of sequence installation work;
  - The thyssenkrupp Elevator DIA/DEN project team will conduct bi-weekly site visits with the subcontractor(s) at a minimum to ensure they are current on the project status and work completion expectations;
  - The thyssenkrupp Elevator DIA/DEN project team will provide constant communication with the DIA/DEN client project team to ensure the relevant airport stakeholders are aware of the project schedule, identify any potential or existing relevant issues and prevent or minimize any conflicts with DIA/DEN's overall facility operations (i.e. provide ample notice and request approval when larger/impactful activities need to be arranged (i.e. crane use, mobilization, material movement, etc.);
- *Coordination with DIA/DEN and other entities*
  - The thyssenkrupp Elevator DIA/DEN project team will facilitate weekly calls with DEN operations and the relevant stakeholders to ensure all parties are aware of schedule and any developments;
  - The thyssenkrupp Elevator DIA/DEN project team will facilitate daily discussions between the DIA/DEN operations team and thyssenkrupp Elevator field installation team(s);

## Organizational Approach

- *The thyssenkrupp Elevator DIA/DEN project team main point of contact:*
  - **Project Manager – Britaney Tyler (primary contact)**





- A contact list will be provided to the DIA/DEN client project team with additional points of contact and an escalation structure;
- See project resumes and organization chart for additional information;

### Effective Methods of Performing Modernization/Installation Work

- *Potential number of modernization/installation crews for DIA/DEN projects*
  - thyssenkrupp Elevator currently employs an average of 17 modernization crews within the State of Colorado;
  - thyssenkrupp Elevator currently employs an average of 15 new equipment installation crews within the State of Colorado;
  - Depending on the requirements of the DIA/DEN client project team, the relevant task order(s) scope of work and project timing, thyssenkrupp Elevator DIA/DEN project team may be able to assign between five (5) and eight (8) modernization/installation crews. Additional details on schedule, sequence, number of units, timing, scope of work, etc. will be discussed prior to task order award in order to determine the best approach for the DIA/DEN client project team.
- *Potential methods to accelerate the VT modernization program*
  - Modernize/replace additional VT units concurrently;
  - Increase VT installation crew assignment;
  - Increase number of VT units in each task order;
  - Order all materials upfront and then work through the labor with no delays in between task orders;

### Equipment Design/Engineering Process

- *Product application/specification*
  - Provide upgraded equipment for longer life span, quieter/smooth operation, increased safety, current code compliance and reliability;
  - Determine most comprehensive and cost-effective scope of work for each VT unit;
  - Specify/provide additional convenience and safety features where applicable (i.e. escalator, sleep mode, etc.);
  - Provide conversion of hydraulic elevators to traction elevators where feasible;
  - Use of consistent equipment for ease of servicing and replacement part commonality;
  - Provide recommended spare parts list and pricing for stock of parts;
  - Provide energy-efficient equipment (regenerative AC-3VF controls, sleep mode, LED lighting, auto-shut off fan/lighting options, etc.);



## **KEY PERSONNEL & ABILITY TO RESPOND**





## KEY PERSONNEL & ABILITY TO RESPOND NARRATIVE

### Key Personnel – DIA/DEN Projects – thyssenkrupp Elevator

Enclosed within this thyssenkrupp Elevator ICP response package following the “Additional Information” section as requested are resumes of seven (7) individuals slated for the current and upcoming DIA/DEN projects. The noted individuals are also listed below and are among a larger team of local, regional and national members who assist in the overall processing and execution of the DIA/DEN projects.

- **Britaney Tyler** – DIA/DEN Project Manager (*Primary Contact*)
- **Anthony “Tony” Makela** – DIA/DEN Project Management Oversight
- **Austin Barnes** – DIA/DEN Project Superintendent
- **Stephan Smith** – DIA/DEN Project Representative/Manager
- **Brian Baxter** – DIA/DEN Project Quality Control Manager
- **Robert Brandley** – DIA/DEN Project Safety Director
- **Jeffrey Massey** – DIA/DEN Project Oversight

We respectfully request that the DIA/DEN client project team reviews the included resumes as they provide additional detailed information as to what each thyssenkrupp Elevator team member will provide for the future DIA/DEN Conveyance projects. In addition, please find enclosed within this section an organizational chart for review/reference as requested.

Two (2) key field personnel will be part of ALL DIA/DEN projects due to their vast experience in field installation, troubleshooting and adjusting elevator, escalator and power walk equipment. They are:

- **Henry Silva** - Lead elevator modernization mechanic
- **Dwaine Appel** - Lead escalator modernization/ replacement mechanic

Additional field installation team members (i.e. mechanics and helpers) will be provided for each DIA/DEN task order based on the needs and requirements of the DIA/DEN client team and the scope of work. It is thyssenkrupp Elevator’s intention to keep consistent in both the level of work being performed at DIA/DEN and the installation crews assigned the various DIA/DEN projects. In other words, the thyssenkrupp Elevator DIA/DEN team is focused on keeping the various (and multiple) installation crews moving from one (1) unit to the next and from one (1) task order to the next. This process allows DIA/DEN to complete the most units possible in a consecutive and consistent manner without having to have installation crews pull off and re-mobilize between projects which is inefficient. Not only does this process keep installation crews assigned/dedicated to DIA/DEN projects for a longer and consecutive amount of time, it also allows for a more cost-effective per unit pricing. This built-in work efficiency also applies to the subcontractor scope of work noted below. The bottom line is that the thyssenkrupp Elevator DIA/DEN project team will work with the DIA/DEN client project team to determine the best number of crews for the various task orders.

The thyssenkrupp Elevator DIA/DEN project team will handle all VT-related equipment removal and installation/modernization work (i.e. elevators, escalators, power walks) including equipment product application, engineering, design, manufacturing, vendor/supplier



coordination, scheduling, installation, subcontractor coordination and inspection. As part of the subcontractor coordination process, the thyssenkrupp Elevator DIA/DEN team will work with the Reliant Construction team (see below) to complete the work by others/related work necessary for authority having jurisdiction (AHJ – Denver Fire Department, DFD) inspection. This work completion and inspection process is required for subsequent turn-over of the replaced/modernized equipment to DIA/DEN following final completion of each piece of equipment.

### **Key Personnel – DIA/DEN Projects – Reliant Construction (WBE/MBE subcontractor)**

In addition to the above noted key personnel assigned from the thyssenkrupp Elevator team, two (2) additional team members are a crucial part of the overall thyssenkrupp Elevator DIA/DEN project team and currently work with thyssenkrupp Elevator on DIA/DEN projects. They include representatives from Reliant Construction, thyssenkrupp Elevator's WBE/MBE subcontractor, who handles all related work/work by others (*i.e. fire-life-safety, electrical, barricades, cutting/patching, etc.*) for the various DIA/DEN VT task orders:

- **Brad Hix** – *Reliant Construction Representative / Oversight (subcontractor)*
- **Craig Somers** – *Reliant Construction Project Manager (subcontractor)*

As with the thyssenkrupp Elevator DIA/DEN project team identified above, copies of the two (2) noted Reliant Construction team members' resumes are included as requested following the "Additional Information" section. Reliant Construction's contact information is:

**Reliant Construction**  
 957 E. Fillmore Street  
 Colorado Springs, CO 80907  
 719-358-9216 (office)  
[www.reliant-construction.com](http://www.reliant-construction.com)



## Ability to Respond – DIA/DEN Projects

As noted within the various sections of this thyssenkrupp Elevator ICP response package, the level of experience, know-how and wisdom gained from working with at the DIA/DEN facility over the last several years has provided thyssenkrupp Elevator with an unparalleled and exclusive ability to respond to the needs and requests of the DIA/DEN client project team quickly and in the most effective manner possible.

As such, the thyssenkrupp Elevator DIA/DEN project team intimately and precisely understands the unique aspects and requirements of the VT equipment and DIA/DEN. With the continual record-breaking passenger traffic experienced by DIA/DEN and the age and application of the originally-installed VT equipment, the thyssenkrupp Elevator DIA/DEN project team approaches the equipment specifications with an eye to provide the most robust, reliable, Code-compliant, safe, smoothly-operating, quiet and cost-effective VT products possible. In addition, requesting and obtaining direct feedback during the task order pricing process from the DIA/DEN client project team as to needs, expectations, timing, limitations and concerns allows the thyssenkrupp DIA/DEN project team to best tailor our product application, pricing and overall approach for each task order. Such a partnership is critical to providing the highest quality and most cost-effective VT replacement/modernization process.

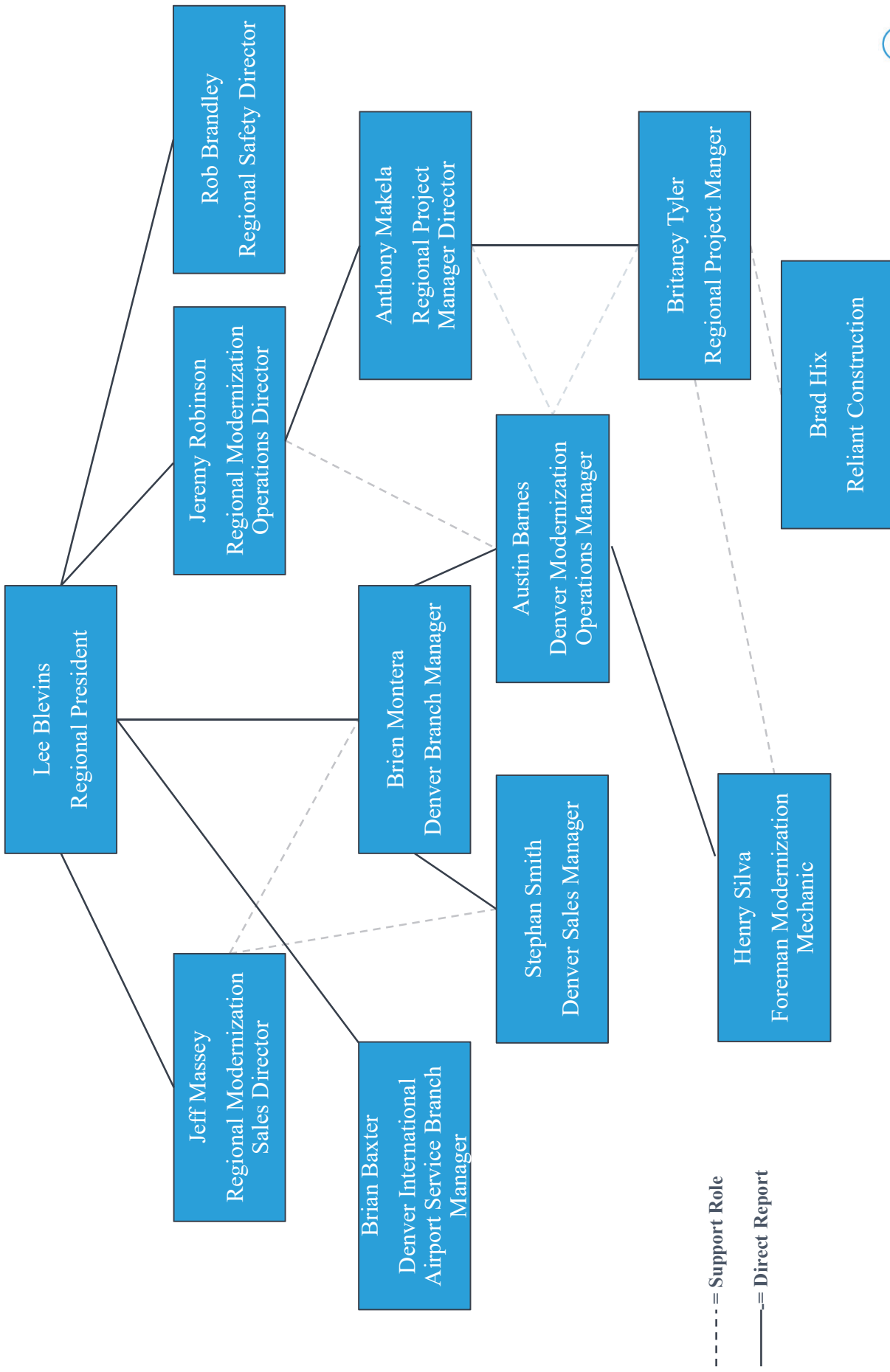
Moreover, with a set of projects/task orders of this magnitude, a regular and continual system of meetings and communication methods is critical for the transparency and free flow of information between the thyssenkrupp Elevator DIA/DEN project team AND the DIA/DEN client project team. In addition to the communication methods for the current DIA/DEN VT projects, the thyssenkrupp Elevator DIA/DEN project team requests that we collectively set forth additional communication steps and requirements. As part of the award process, thyssenkrupp and DIA/DEN representatives are requested to meet to set up a mutually agreeable communication system which would allow thyssenkrupp Elevator to respond quickly to any and all issues or requests. Some possible examples are:

- Weekly conference calls and/or site meetings;
- Weekly meeting minute reports;
- Monthly safety reports;
- Request for Information (RFI) forms;
- Three (3) week look-ahead schedules;
- Monthly DIA/DEN stakeholder – thyssenkrupp SW Regional and project team meetings;

The thyssenkrupp Elevator DIA/DEN project team is open to the above and additional potential ideas to provide the DIA/DEN client project team with the necessary information and tools to best represent their team, the traveling public, vendors and other airport stakeholders.

Moreover, as part of this project process, the thyssenkrupp Elevator DIA/DEN project team will work with the existing thyssenkrupp Elevator DIA/DEN service team branch manager to set aside some office space for the modernization project team to drop in and conduct necessary business without having to leave the airport facilities. This will expedite many project management tasks and provide more timely communication.

# Project Organizational Chart & Dedicated Resources





## **COMPANY EXPERIENCE & QUALIFICATIONS**



## COMPANY EXPERIENCE & QUALIFICATIONS NARRATIVE

### thyssenkrupp Elevator Key Qualifications

As the one of the largest elevator and escalator companies in the World, and with multiple equipment factories and support offices in the U.S., Germany, Spain, China and worldwide; thyssenkrupp Elevator has the existing infrastructure, dedicated personnel, expertise, design and engineering capability to provide DIA/DEN with the required level of vertical transportation (VT) project management and follow-through to ensure successful modernization and replacement projects.

Below is a list of some key highlights about thyssenkrupp's local, regional and national teams:

- ➔ thyssenkrupp Elevator currently maintains over 850 units at various airports across the country including DIA/DEN, George Bush Intercontinental Airport, Miami International Airport, Oakland International Airport, San Francisco International Airport and the United Terminal at Chicago O'Hare Airport.
- ➔ On average, thyssenkrupp Elevator installs over 400 new and modernized conveyance units each year in the state of Colorado. In addition, thyssenkrupp Elevator services and inspects over 8,000 conveyance units within Colorado through our six (6) offices in Centennial/Denver, Denver Downtown, DIA/DEN, Colorado Springs, Fort Collins and Eagle. We work daily with Denver Fire Department (DFD) representatives, multiple third-party inspectors and other AHJ authorities to schedule and execute timely inspections and turnover the conveyance units that we install, modernize and service/repair.
- ➔ Thyssenkrupp Elevator's National Elevator group has been a part of Escalator / Moving walk replacement and modernization projects at 10 international airports through the United States and Canada.
- ➔ Approximately 50% of the International Union of Elevator Constructors (IUEC) Local 25 field force is employed by thyssenkrupp Elevator across the State of Colorado. Having the preponderance of field technicians and installers within the State Colorado allows thyssenkrupp Elevator to put the right technicians in the right roles – whether it is service, repair, new installation or modernization.
- ➔ thyssenkrupp Elevator has committed to the VT modernization line of business through investing in our personnel. thyssenkrupp Elevator currently has the largest modernization department in the Colorado market, consisting of three (3) modernization sales representatives, one (1) sales manager, two (2) modernization superintendents, one (1) modernization operations manager, one (1) modernization coordinator, one (1) regional director of modernization sales, one (1) regional



modernization manager and four (4) dedicated regional project managers. This dedicated team far surpasses the nearest competitor in terms of number of available modernization resources, depth of experience, breadth of knowledge and geographical coverage.

- ➔ thyssenkrupp Elevator's ***exclusive*** International Technical Support (ITS) group staffs a fully-operational technical support team located in Coppell, TX and who are available 24/7 – 365 to assist the onsite elevator installation, modernization and service and repair team. The ITS team is unique to thyssenkrupp Elevator and provides full support of the field technicians through over the telephone diagnosis, use of simulator elevator equipment, ongoing classroom and onsite training, use of a vast technical document library, an extensive stock of replacement controller boards and timely board repairs and exchanges. In addition, ITS technical representatives are available to visit jobsites to assist in issue resolution/troubleshoot for the rare but unique occurrences. The ITS team allows thyssenkrupp Elevator to provide the most comprehensive and responsive VT service and repair in the industry.

### Sample Key Local and National Projects

#### ***1. Denver International Airport (DIA/DEN) Concourse C, Denver, CO***

- *Scope of work:* removal of four (4) existing escalators and the installation of eight (8) new escalators
- *Owner name and address:* Denver International Airport
- *Contact Person:* Mr. Jerry Uliano (303.342.4460)
- *Labor, Material, and Equipment Mark-up:* Up to 15%
- *Proposed vs. Actual Schedule:* ~6-month installation, ~10 months from date of award. Completed on or before the required contract date.
- *Initial Contract Amount vs. Actual Amount:* \$2M initial contract value. Change order of \$875k was added for installation of four (4) KONE escalators at the request of DIA/DEN.
- *Coordination between contractors:* thyssenkrupp Elevator was a subcontractor to a general contractor (GC) on this project. Coordination with other trades and the GC occurred daily and was facilitated by the thyssenkrupp Elevator assigned field foreman and the operations manager who attended regular progress meetings.
- *Outcome / Result:* thyssenkrupp Elevator was able to complete the installation of eight (8) new escalator units prior to the agreed upon completion date, even when accounting for an initial 30-day run-in period. Following completion of the eight (8) units, the thyssenkrupp Elevator team proceeded to install the four (4) KONE escalator units at the request of DIA/DEN. Following the turnover of the final four (4) installed escalators, some initial adjusting issues surfaced on the units including the need to replace some manufacturer-supplied components however, the thyssenkrupp Elevator team was able to successfully address the issues in a timely manner and all units continue to run efficiently.





## **2. On-Call Conveyance Modernization – Denver International Airport (DIA/DEN)**

- *Scope of work:*
  - *Task Order I* – modernization of five (5) elevators
  - *Task Order II* – removal and replacement of four (4) moving walks
  - *Task Order III* – modernization of eight (8) escalators and four (4) elevators
- *Owner name and address:* Denver International Airport (DIA/DEN)
- *Contact Person:* Jerry Uliano (303.342.4460)
- *Labor, Material, and Equipment Mark-up:* Up to 15%
- *Proposed vs Actual Schedule:* The project is ongoing and an on time and on budget completion is anticipated.
- *Initial Contract Amount:* \$10 million in three (3) separate task orders
- *Coordination between contractors:* thyssenkrupp is the prime/general contractor (GC) for this project and has hired Reliant Construction (WBE/MBE) to perform the subcontract related work. The goal is 8% MBE/WBE on this project and Reliant is consistently at or above that percentage. Thyssenkrupp Elevator’s project manager has weekly update meetings with Reliant and our onsite Foreman oversees the work the subcontractor performs.
- *Outcome / Result:* To date, thyssenkrupp Elevator is currently working on the 4<sup>th</sup> car and are slightly behind schedule due to a few logistical issues. However, the thyssenkrupp Elevator DIA/DEN project team anticipates making up time on the final two (2) elevators so that completion dates will align with original schedule. In a proactive move, the thyssenkrupp Elevator DIA/DEN project team changed the assigned project manager to Britaney Tyler and as a result, overall communication and project management was greatly improved by setting up bi-weekly update meetings with Jerry Uliano.

## **3. San Francisco International Airport, Terminal 1 and 2 – San Francisco, CA**

- *Scope of work:* modernization of eight (8) existing escalators, reusing existing escalator trusses
- *Owner name and Address:* San Francisco International Airport
- P.O. Box 8097, San Francisco, CA 94128
- *Contact:* Timothy Hatfield
- *Labor, Material, and Equipment Mark-up:* Up to 15%
- *Proposed vs Actual Schedule:* 14-month installation (completed in two phases) / completed prior to scheduled completion date
- *Initial Contract Amount:* ~\$2.5 million
- *Coordination between contractors:* thyssenkrupp Elevator was a subcontractor to a general contractor (GC) on this project. Coordination with other trades and the GC occurred daily and was facilitated by the thyssenkrupp Elevator assigned field foreman and the operations manager who attended regular progress meetings.
- *Outcome / Result:* These units were the first ESPower modernizations (full modernization, truss retention) for the San Francisco office. The first few escalator units required more time than the original schedule indicated as the crews became accustomed to the installation process. However, the final four (4) escalator units





were completed significantly ahead of schedule and the total project was completed prior to the scheduled completion date.

**4. Empower Investments (formerly known as Great West Life)**

- *Scope of work:* modernize five (5) gearless passenger elevators and one (1) gearless service elevator
- *Owner and Address:* Empower Investments – 8515 E Orchard Road, 1T2, Greenwood Village, CO 80111
- *Contact:* Jason Cormier 303-737-0402
- *Labor, Material, and Equipment Mark-up:* 15%
- *Proposed vs. Actual Schedule:* The initial installation schedule was an eight (8) month duration. The project was delayed by six (6) weeks due to delays in cab material design choice by the purchaser.
- *Initial Contract Amount:* Original contract value of \$955,000 + \$300,900 in purchaser-requested change orders to add new cab interiors and subcontract work to the scope of work.
- *Coordination between contractors:* thyssenkrupp was the prime/general contractor on this project and hired a subcontractor (Construction Brokers Inc. (CBI) as the related work/work by others subcontractor. thyssenkrupp Elevator representatives held weekly meetings with CBI to discuss/confirm upcoming work requirements, Job Hazard Analysis (JHAs) and pending inspection time frames. The thyssenkrupp Elevator onsite foreman effectively communicated daily with the subcontractors in the building.
- *Outcome / Result:* Following a few delays caused by decisions on cab interior designs and subsequent cab interior material delays beyond the control of thyssenkrupp Elevator, the overall project was a success. The purchaser is planning to modernize the 2nd of three (3) towers at their facility with thyssenkrupp Elevator in 2020.



## ADDITIONAL INFORMATION



## ADDITIONAL INFORMATION

### thyssenkrupp Elevator Advantages for DIA/DEN

- ➔ thyssenkrupp Elevator is an integral part of the DIA/DEN team as the existing vertical transportation (VT) service and repair provider at the airport;
- ➔ As the current VT service provider, the level of experience, familiarity of the airport layout, know-how and wisdom gained from working with at the DIA/DEN facility over the last several years has provided thyssenkrupp Elevator with an unparalleled and exclusive ability to respond to the needs and requests of the DIA/DEN project team quickly and in the most effective manner possible;
- ➔ With a full team onsite at DIA/DEN, thyssenkrupp Elevator team members are already part of the DIA/DEN security apparatus and approved for modernization, installation, service and repair work at the airport. This includes field installers, service/repair technicians, project management, operations supervision and office personnel;
- ➔ As the existing VT service and repair provider for DIA/DEN, thyssenkrupp Elevator has the necessary escalator and elevator equipment onsite, including rigging, tools, carts and other specialized equipment for quick access and lower overall equipment modernization/replacement costs;
- ➔ thyssenkrupp Elevator's 1<sup>st</sup> in the industry remote monitoring and predictive maintenance tool - **MAX** – designed in conjunction with Microsoft provides our modernization and new installation clients with a proactive and real-time system to monitor the status of their VT units. It further provides the thyssenkrupp Elevator service team with an incredible maintenance and equipment condition reporting tool which often predicts maintenance issues before they occur so that the thyssenkrupp Elevator service team can service and repair issues proactively. The system further provides responding service/repair technicians with a list of three (3) possible causes for a service call – which is accurate over 97% of the time. All of this information is stored in Microsoft's Azure cloud for future predictive maintenance use which ultimately benefits DIA/DEN with more preventive maintenance, faster repairs and increased equipment up-time. The **MAX** system is installed on all new/modernized/replaced elevator equipment at no cost to DEN/DIA and a web-based customer/user-interface is available.



- thyssenkrupp Elevator is an industry leader in converting hydraulic elevators into traction elevators – a DIA/DEN preferred strategy for hydraulic elevator modernizations/renewals;
- thyssenkrupp Elevator is very familiar with the process and requirements of the Denver Fire Department (DFD) authority having jurisdiction (AHJ) for VT inspections, fire-life-safety, code-compliance, upgrades, etc.
- thyssenkrupp Elevator is very familiar and currently interfaces with the various systems utilized by DIA/DEN including the Project Management Information System (PMIS), Unifier and Oracle Primavera P6;
- thyssenkrupp Elevator has a dedicated, local, cohesive and experienced project management team for the various DIA/DEN modernization/replacement projects which also utilizes the Denver-based regional management team for direct project support, problem solving and guidance. All team members are either onsite weekly or within 30 minutes of the DIA/DEN airport.
- The local thyssenkrupp Elevator team has full support of the national modernization and new installation teams for all DIA/DEN projects. The thyssenkrupp Elevator executive management monitors the various aspects of the existing DIA/DEN relationship and proactively works with the local teams to ensure proper responsiveness to DIA/DEN needs including equipment up time and enhanced/priority material shipment time frames.
- The current thyssenkrupp Elevator DIA/DEN modernization operations manager/superintendent, Austin Barnes, worked for multiple years in the field as a mechanic/adjuster/foreman. His extensive experience running and installing modernization projects from a field perspective is an important asset to the entire project management team when reviewing work on site, addressing various issues and ensuring projects are completed on time and on budget.

Citibank, NA  
Banking, Capital Markets and Advisory

388 Greenwich Street  
New York, NY 10013



DATE: March 16, 2020  
TO: Jeff Wilson, Director of Accounting  
COMPANY: ThyssenKrupp Elevator Corporation  
RE: BANK REFERENCE LETTER

This letter is provided at the request of ThyssenKrupp Elevator Corporation to inform of the following information based on Citi's records:

ThyssenKrupp Elevator Corporation, having an address at 2500 NORTHWINDS PARKWAY, Alpharetta, GA. has maintained DDA accounts with Citibank, N.A., its branches or affiliates ("Citi") since November 2000. The average activity on the account(s) can range in the low six figures, US Dollars or equivalent.

We confirm that this relationship has been maintained in a satisfactory manner.

Please let us know if we can be of further assistance.

***THIS LETTER IS DIRECTED TO ADDRESSEE ONLY AND MAY NOT BE DISTRIBUTED OR SHARED FURTHER. NO REPRESENTATION OR WARRANTY IS MADE HEREIN BY CITI CONCERNING THE ACCURACY OF THE CONTENTS OF THIS LETTER AND NO LEGAL RESPONSIBILITY SHALL BE ATTACHED TO CITI, RELATING TO THE (i) AFFAIRS (FINANCIAL OR OTHERWISE) OF THE COMPANY OR PERSON(S) REFERRED TO ABOVE, OR (ii) ADDRESSEE'S RELIANCE ON THIS LETTER.***

Sincerely,

A handwritten signature in black ink that reads "Daniel Gouger". The signature is written in a cursive style and is positioned above a horizontal line.

Daniel Gouger  
Relationship Manager

**WillisTowersWatson** 

October 28, 2019

Scott Silitsky  
ThyssenKrupp Elevator Corporation  
5701 Pine Island Road, Suite 390  
Tamarac, FL 33321

Website: [www.willistowerswatson.com](http://www.willistowerswatson.com)

Direct Line: 312-288-7187

Direct Fax: 312-234-0663

E-mail: [kimberly.bragg@willistowerswatson.com](mailto:kimberly.bragg@willistowerswatson.com)

**Re: ThyssenKrupp Elevator Corporation**  
**Project: Bonding Capacity**

To Whom It May Concern:

Federal Insurance Company is the surety for ThyssenKrupp Elevator Corporation since 1995, and Willis of Illinois, Inc., is their surety agent. We have executed bonds for this client since 2004. Federal Insurance Company's A.M. Best rating is A++ XV, and is listed on the US Department of Treasury Listing.

ThyssenKrupp Elevator Corporation financial strength and management capabilities have qualified them for bonding on any project which they have chosen to undertake. They currently have a single bond capacity of \$150,000,000.00 and an aggregate capacity of \$500,000,000.00. With available capacity under the overall surety program, is currently in excess of \$175,000,000.00. As such, we highly recommend them for your favorable consideration with respect to their bid.

Willis of Illinois, Inc. and Federal Insurance Company hold ThyssenKrupp Elevator Corporation in the highest regard. We heartily endorse their organization and will provide the requisite bonding should the project be awarded to ThyssenKrupp Elevator Corporation. This commitment is subject to acceptable contractual and underwriting terms and conditions.

Sincerely,

  
Kimberly Bragg, Attorney-In-Fact  
Federal Insurance Company 

Willis Towers Watson  
Kimberly Bragg  
233 S. Wacker Drive  
Suite 1800  
Chicago, Illinois 60606

CHUBB®

Power of Attorney  
Federal Insurance Company | Vigilant Insurance Company | Pacific Indemnity Company

Know All by These Presents, That FEDERAL INSURANCE COMPANY, an Indiana corporation, VIGILANT INSURANCE COMPANY, a New York corporation, and PACIFIC INDEMNITY COMPANY, a Wisconsin corporation, do each hereby constitute and appoint Kimberly Bragg

as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

Surety Bond Number: Prequalification  
Obligee: N/A

In Witness Whereof, said FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY have each executed and attested these presents and affixed their corporate seals on this 28th day of October, 2019.

*Dawn M. Chloros*

Dawn M. Chloros, Assistant Secretary

*Stephen M. Haney*

Stephen M. Haney, Vice President



STATE OF NEW JERSEY

County of Hunterdon ss.

On this 28th day of October, 2019 before me, a Notary Public of New Jersey, personally came Dawn M. Chloros, to me known to be Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY, the companies which executed the foregoing Power of Attorney, and the said Dawn M. Chloros, being by me duly sworn, did depose and say that she is Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of said Companies; and that she signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that she is acquainted with Stephen M. Haney, and knows him to be Vice President of said Companies; and that the signature of Stephen M. Haney, subscribed to said Power of Attorney is in the genuine handwriting of Stephen M. Haney, and was thereto subscribed by authority of said Companies and in deponent's presence.

Notarial Seal



KATHERINE J. ADELAAR  
NOTARY PUBLIC OF NEW JERSEY  
No. 2318885  
Commission Expires July 16, 2019

*Katherine J. Adelaar*  
Notary Public

CERTIFICATION

Resolutions adopted by the Boards of Directors of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY on August 30, 2016:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into in the ordinary course of business (each a "Written Commitment"):

- (1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise.
- (2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such person's written appointment as such attorney-in-fact.
- (3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (4) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to delegate in writing to any other officer of the Company the authority to execute, for and on behalf of the Company, under the Company's seal or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested."

I, Dawn M. Chloros, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY (the "Companies") do hereby certify that

- (i) the foregoing Resolutions adopted by the Board of Directors of the Companies are true, correct and in full force and effect,
- (ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U.S. Treasury Department; further, Federal and Vigilant are licensed in the U.S. Virgin Islands, and Federal is licensed in Guam, Puerto Rico, and each of the Provinces of Canada except Prince Edward Island; and
- (iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Whitehouse Station, NJ, this October 28, 2019.



*Dawn M. Chloros*

Dawn M. Chloros, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT:

Telephone (908) 903-3493 Fax (908) 903-3656 e-mail: surety@chubb.com

**THYSSENKRUPP ELEVATOR CORPORATION**

Balance Sheets  
September 30, 2019 and 2018  
(Dollars in thousands)

<b>Assets</b>	<b>2019</b> <b>(unaudited)</b>	<b>2018</b> <b>(unaudited)</b>
	<u>          </u>	<u>          </u>
Current assets:		
Cash and cash equivalents	\$ 8,796	8,823
Accounts receivable, net (note 1)	547,592	462,539
Notes receivable, related parties	—	—
Receivables from affiliates	251,319	449,820
Inventories	31,839	34,041
Costs and estimated earnings in excess of billings	30,403	30,732
Deferred income taxes	—	—
Prepaid expenses and other current assets	16,556	17,374
Total current assets	<u>886,505</u>	<u>1,003,329</u>
Property, plant, and equipment:		
Land	—	—
Buildings and leasehold improvements	8,318	9,821
Machinery and equipment	47,504	43,866
Furniture and fixtures	11,747	9,628
	<u>67,569</u>	<u>63,315</u>
Less accumulated depreciation	44,298	38,160
	<u>23,271</u>	<u>25,155</u>
Goodwill	1,037,635	986,033
Other intangible assets, net	63,114	48,037
Investments	59,780	7,630
Other assets	27,197	22,217
Total assets	<u>\$ 2,097,502</u>	<u>2,092,401</u>



**THYSSENKRUPP ELEVATOR CORPORATION**

Balance Sheets  
September 30, 2019 and 2018

(Dollars in thousands)

<b>Liabilities and Stockholder's Equity</b>	<b>2019</b> <b>(unaudited)</b>	<b>2018</b> <b>(unaudited)</b>
Current liabilities:		
Outstanding checks in excess of cash	\$ 11,048	8,675
Trade accounts payable	53,135	54,087
Payables to affiliates	—	—
Accrued expenses	177,791	157,014
Self-insured reserves, current portion	24,572	26,038
Deferred revenue	107,277	99,658
Billings in excess of costs and estimated earnings	535,959	485,140
Accrued income taxes	83,009	90,351
Other current liabilities	9,790	1,137
Total current liabilities	1,002,581	922,100
Notes payable, related party	—	—
Notes payable, other	—	—
Deferred income taxes	150,668	149,997
Self-insured reserves, less current portion	51,070	51,056
Pension liability	—	—
Other liabilities	14,214	25,368
Total liabilities	1,218,533	1,148,521
Stockholder's equity:		
Common stock, no par value. Authorized, 1,000 shares; issued and outstanding, 100 shares in 2016 and 2015	—	—
Additional paid-in capital	308,543	308,543
Retained earnings	570,426	635,337
Accumulated other comprehensive loss	—	—
Total stockholder's equity	878,969	943,880
Total liabilities and stockholder's equity	\$ 2,097,502	2,092,401

**THYSSENKRUPP ELEVATOR CORPORATION**

Statements of Income and Comprehensive Income

September 30, 2019 and 2018

(Dollars in thousands)

	<b>2019</b>	<b>2018</b>
	<b>(unaudited)</b>	<b>(unaudited)</b>
Revenues	\$ 2,707,255	2,566,139
Cost of revenues	<u>2,008,508</u>	<u>1,898,067</u>
Gross profit	698,747	668,072
Selling, general, and administrative expenses	447,056	405,432
Amortization of intangibles	<u>—</u>	<u>—</u>
Loss (Gain) on disposal of property, plant, and equipment	<u>1,147</u>	<u>14</u>
Operating profit	250,544	262,626
Other income (expense):		
Interest income	11,613	13,050
Interest expense	(46)	(663)
Other, net	<u>99,404</u>	<u>69,659</u>
Income before income taxes	361,515	344,672
Income taxes	<u>73,010</u>	<u>8,278</u>
Net income	<u>\$ 288,505</u>	<u>336,394</u>



## KEY PERSONNEL RESUMES



## KEY PERSONNEL RESUMES

The resume information contained in this section complements the “Key Personnel and Ability to Respond” and other narrative sections within this ICP submittal package. *These resumes are not included in the page limit as noted in section IV-2 B. of the ICP instructions to bidders.*

### Thyssenkrupp Elevator DIA/DEN project team resumes

#### **Britaney Tyler – DIA/DEN Project Manager (Primary Contact)**

- Title: Regional Modernization Project Manager – DEN/DIA project
- Cell: 720.440.0654
- Main responsibilities: Britaney is responsible for schedule creation and tracking, submittal processing, material ordering, material and field issue coordination, shipping confirmation, issue resolution facilitation, project closeout tasks, coordination with subcontractors and direct daily, monthly and weekly communication with the DIA/DEN Project Manager/team;
- Employed by thyssenkrupp Elevator: 7 years
- VT industry experience: 7 years
- Education: Currently Enrolled at Southern New Hampshire University (SNHU)
- Brief bio information:

Britaney is a 3rd generation thyssenkrupp employee who grew up in the elevator trade. She officially started with thyssenkrupp in 2013 and has worked in several high-profile markets, including Denver, Chicago, Boston and most recently, the United Kingdom. Britaney is currently a “major projects” Project Manager and is overseeing the current *DIA/DEN On-Call Conveyance Project*. In her current role, she is responsible for direct interface and communication with the DIA/DEN project management team, coordinating safety documentation, managing various financial aspects of the project, scheduling coordination and revisions and plays a support role for the field installation crews. Britaney has worked on various and numerous major projects over the years including River Point Tower (32 Elevators, 2 Escalators), Opima Tower, 9 West Walton and now the *DIA/DEN On-Call Conveyance Project*. As the DIA/DEN projects are important and high-profile projects for thyssenkrupp Elevator, Britaney will serve as the lead dedicated contact for all such projects to ensure that each are completed on time, on budget and to the ultimate satisfaction of the DIA/DEN project team and associated airport stakeholders.



## Thyssenkrupp Elevator DIA/DEN project team resumes (continued)

### **Anthony “Tony” Makela – DIA/DEN Project Management Oversight**

- Title: Regional Modernization Manager - Project Managers
- Cell: 303.434.4827
- Main responsibilities: As an integral member of the thyssenkrupp Elevator team assigned to the various DIA/DEN projects, Tony is responsible for managing/overseeing the project management of various DEN/DIA modernization projects. He supervises Britaney and ensures that all project management, material procurement, engineering, submittals and coordination efforts are completed with the assistance of assigned team members. Tony also serves as a secondary project contact/liaison between thyssenkrupp Elevator and the DIA/DEN project team.
- Employed by thyssenkrupp Elevator: 14 years
- VT industry experience: 14 years
- Education: International Union of Elevator Constructors (IUEC) mechanic/adjuster training
- Brief bio information:

Prior to becoming the Southwest (SW) Regional Modernization Manager in charge of all project managers, Tony held various roles including working as a modernization and new installation field installer, modernization operations manager, new installation superintendent and as a regional modernization operations director. In his current role as the Regional Modernization Manager managing all local and regional project managers (PMs), Tony continues to build, develop and manage a dedicated and effective regional project management team for the ultimate and direct benefit of thyssenkrupp Elevator clients. His current team of four (4) regional PM's are assigned to “major projects” and assist in project scope review, equipment ordering, submittals, surveys, customer communication, vendor/subcontractor coordination, project closeout and scheduling. Additionally, Tony has been a direct liaison between thyssenkrupp and the DIA/DEN project team throughout the initial *DIA/DEN On-Call Conveyance Project* and will continue to offer direct support to Britaney, the assigned project manager for all subsequent DIA/DEN projects. Tony has been involved in numerous major projects including the DIA/DEN Concourse C Escalator installation project, *DIA/DEN On-Call Conveyance Project*, The Blue Flame, various Boyd casino properties and the Westgate Casino / Hotel.



## Thyssenkrupp Elevator DIA/DEN project team resumes (continued)

### **Austin Barnes – DIA/DEN Project Superintendent**

- Title: Denver Modernization Operations Manager
- Phone: 512.486.1001 / Cell: 512.848.8021
- Main responsibilities: As another integral member of the thyssenkrupp Elevator team assigned to the various DIA/DEN projects, Austin is responsible as the *DIA/DEN On-Call Conveyance Project* superintendent for daily field/operational activity on the DIA/DEN projects including manpower allocation and supervision, safety, subcontractor coordination and schedule monitoring. Austin works closely with Britaney, the project manager, assigned field/installation crews, subcontractors, Tony Makela and the rest of the assigned thyssenkrupp Elevator team on the DIA/DEN projects.
- Employed by thyssenkrupp Elevator: 8 years
- VT industry experience: 14 years
- Education: International Union of Elevator Constructors (IUEC) mechanic/adjuster training
- Brief bio information:

Austin is currently the Modernization Operations Manager for the Denver/Colorado market and is responsible for the overall operational performance of all modernization projects. His team consists of two (2) modernization superintendents, one (1) modernization coordinator and 17 modernization field/installation crews (consisting of a mechanic and helper in each crew). Austin has taken on the role of superintendent for the current *DIA/DEN On-Call Conveyance Project* and works closely with Britaney, the project manager, assigned field/installation crews and subcontractors to ensure that scheduled milestones are met, create a safe working environment and provide the DIA/DEN project team with quality VT modernization/replacement products. His vast expertise with adjusting and troubleshooting VT equipment is a result of his numerous years as a foreman mechanic/adjuster, a modernization mechanic, new equipment installation foreman and modernization superintendent. This experience provides additional hands-on support to the field/installation crews assigned to the various DIA/DEN VT projects. Austin has worked on or managed several major projects including the current *DIA/DEN On-Call Conveyance Project*, DIA/DEN Concourse C Escalators, the Westin hotel at DIA/DEN and the Colorado Springs Airport.



## Thyssenkrupp Elevator DIA/DEN project team resumes (continued)

### **Stephan Smith – DIA/DEN Project Representative/Manager**

→ Title: Denver Sales Manager – Modernization, Service and Repair

→ Cell: 303.505.6090

Main responsibilities: As another integral member of the thyssenkrupp Elevator team assigned to the various DIA/DEN projects, Stephan assists Britaney and the team with various aspects of project pricing, booking, engineering, submittal and material procurement phases required for a smooth execution of the DIA/DEN projects. Stephan is available as needed for all project phases.

→ Employed by thyssenkrupp Elevator: 9 years

→ VT industry experience: 13 years

→ Education: Bachelor of Fine Arts, Louisiana State University (LSU)

→ Brief bio information:

Stephan is currently the Sales Manager for Denver and Denver Downtown offices including the Modernization and Service / Repair lines of business. He leads a team of nine (9) salespeople that are responsible for customer service facilitation, developing/growing the Colorado/Denver Markets and meeting annual goals. He has worked at thyssenkrupp for nearly 10 years as both an account representative and in a modernization sales role. During his time in modernization sales, Stephan has worked on large projects such as the current *DIA/DEN On-Call Conveyance Project*, Denver Art Museum, 700 Broadway and Palmer Center. Prior to joining thyssenkrupp Elevator, Stephan held positions of Business Developer and Account Manager with KONE in the New Orleans / Baton Rouge and Denver markets.

For the DIA/DEN projects, Stephan will directly assist the assigned project manager Britaney with various tasks including ensuring that the project material costs, expenses, subcontracting fees, inspection/permit fees and installation labor is correctly entered into the order entry system, the engineering process is initiated and the order entry and billing processes are set up correctly.



## Thyssenkrupp Elevator DIA/DEN project team resumes (continued)

### **Brian Baxter – DIA/DEN Project Quality Control Manager**

- Title: Denver Airport Branch Manager
- Cell: 303.257.7354
- Main responsibilities: Brian is responsible for working closely/directly with the modernization project management/operations team to coordinate post-modernization/replacement equipment turnovers (for DIA/DEN airport operation) and quality audits to ensure that there is a clean and effective transition from the modernization/replacement process to the overall proactive servicing and operation of the newly installed/modernized equipment.
- Employed by thyssenkrupp Elevator: 9 years
- VT industry experience: 18 years
- Education: BS Marketing, Iowa State University (ISU)
- Brief bio information:

Brian is currently the thyssenkrupp Elevator branch manager (BM) for the Denver International Airport service and repair operations team, where he is responsible for all field labor, cost control, personnel and direct communication with various DIA/DEN representatives and stakeholders. Under Brian's guidance while managing the thyssenkrupp service and repair teams at DIA/DEN, he has increased the overall unit up-time to 98% over the past three (3) years – an especially important milestone due to the age and use of the existing VT equipment and the continual and record-breaking passenger traffic experienced by DIA-DEN over the last several years. As part of Brian's proactive approach with the DIA/DEN's VT equipment, he has a unique role focusing on the quality of the equipment that DIA/DEN receives in the replacement/modernization process. As noted above, Brian works closely/directly with the modernization project management/operations team to coordinate post-modernization/replacement equipment turnovers (for airport operation) and quality audits to ensure that there is a clean and effective transition from the modernization/replacement process to the overall proactive servicing and operation of the newly installed/modernized equipment. Beyond Brian's current DIA/DEN BM position, he has worked as BM for the Denver Downtown office, a service account manager and a new installation sales representative.





## Thyssenkrupp Elevator DIA/DEN project team resumes (continued)

### **Robert Brandley – DIA/DEN Project Safety Director**

- Title: Regional Safety Director
- Cell: 702.481.6626
- Main responsibilities: Rob is responsible for auditing all DIA/DEN projects before and during the installation process to ensure that all safety related requirements are established and in place for the safety of the field installers/teams, subcontractors, DIA/DEN stakeholders and the traveling public. Rob will work in conjunction with the assigned thyssenkrupp DIA/DEN project team to ensure all safety processes are implemented and the project is completed with minimal risk to all parties.
- Employed by thyssenkrupp Elevator: 17 years
- VT industry experience: 17 years
- Education: 4-year automotive apprenticeship program including roles as:
  - Technician
  - 2-year apprenticeship agriculture mechanic
  - 4-year apprenticeship heavy-duty equipment technician
- Brief bio information:

Rob is currently the Regional Safety Director for the SW Region and is responsible for coordinating all safety training, jobsite condition audits, safety planning, safety response, external and internal regional safety communication and any other safety related activity. He works closely with all branch managers and operations manager in the SW Region to ensure that all employees, our clients and the general public are safe from a VT equipment and policy standpoint. Rob performs frequent jobsite safety audits, weekly/monthly/quarterly safety meetings, reviewing daily Job Hazard Analysis reports (JHAs) and conducting regular calls/visits with the thyssenkrupp Elevator field installation, service and repair technicians. Robert's past roles have included residential elevator installer, service superintendent and West Region Safety Director. Notable projects that Rob has overseen include The Drew and Encore projects in Las Vegas, 181 Fremont in San Francisco and the current *DIA/DEN On-Call Conveyance Project*.



## Thyssenkrupp Elevator DIA/DEN project team resumes (continued)

### **Jeffrey Massey – DIA/DEN Project Oversight**

- Title: Regional Director, Modernization Sales – SW Region
- Cell: 323.246.6122
- Main responsibilities: Jeffrey will be responsible for ensuring that all pre-installation sales and coordination efforts for the DIA/DEN projects are completed in a timely and effective manner. In an oversight capacity, Jeffrey will work with the PM and operations teams to facilitate the resolution of any project issues throughout the process and attend monthly meetings with the DIA/DEN customer project team and the assigned thyssenkrupp Elevator DIA/DEN project team to provide an escalation structure as needed. Jeffrey will be a regional representative and conduit for the DIA/DEN customer project team to ensure that the projects receive high level regional and national attention.
- Employed by thyssenkrupp Elevator: 6 years
- VT industry experience: 24 years
- Education: BA, Public Relations – University of Southern California (USC)
- Brief bio information:

Jeffrey is currently the Regional Director of Modernization Sales for the Southwest Region. In this role, Jeffrey works closely with each modernization salesperson, branch managers, project managers and his operational counterparts to ensure that key projects are surveyed, estimated, proposed, engineered, scheduled and executed in the most effective way possible. With his vast experience, Jeffrey offers keen insight and strategy on finding the best solutions and approach for each major project and meeting the client's needs. Jeffrey's past roles include Regional Director, Modernization Sales for the California region, Regional Modernization Sales Manager for KONE and a Project Manager/VT Consultant – Lerch Bates Inc. He is a certified QEI Inspector and managed several large modernization projects in his time as a consultant at Lerch Bates. Some of the major projects that Jeffrey has worked on include the McCarran International Airport, Los Angeles International Airport, *DIA/DEN On-Call Conveyance Project*, Colorado Springs Airport, Westgate Casino/Hotel and the Riverside Hotel and Casino.



## Thyssenkrupp Elevator DIA/DEN project team resumes (continued)

### **Brad Hix – Reliant Construction Representative / Oversight (WBE/MBE subcontractor)**

- Title: Vice President
- Phone: 719.358.9216 / Cell: 719.491.1178
- Main responsibilities: Brad is responsible for overseeing and coordinating all DIA/DEN project related work/work by others (i.e. cutting, patching, electrical, fire-life-safety, storage, barricades, etc.) as a WBE/MBE subcontractor to thyssenkrupp Elevator. Brad works in conjunction with the assigned thyssenkrupp Elevator DIA/DEN project team and his project management team to ensure that all related work/work by others is completed in a quality and timely manner so that the VT equipment is able to be inspected and turned over to the DIA/DEN client project team and the traveling public on time and on budget.
- Construction industry experience: 30 years
- Education: BS in Construction Management, Colorado State University (CSU)
- Brief bio information:

Brad is currently the Vice President of Reliant Construction, Inc (i.e. thyssenkrupp Elevator WBE/MBE subcontractor for related scope of work completion) where he directs and manages each related project throughout its duration and completion. He leads a team of his own construction project managers in an oversight capacity as they define scope of work, develop project plans, estimate costs, manage the designated scope(s) of work and coordinates with thyssenkrupp Elevator for proper completion of the necessary work at DIA/DEN. He has been actively involved as a strong partner with thyssenkrupp Elevator on the *DIA/DEN On-Call Conveyance Project* from initial inception. Previous roles Brad has held include CEO of the Tapa Company, Managing Partner of Torix General Contractors and President of Gateway Construction Company. His vast experience in the construction industry and his familiarity with various DIA/DEN work, communication and security protocols have provided thyssenkrupp great insight throughout several projects and allows the collective team to be successful in meeting DIA/DEN's needs/objectives.



## Thyssenkrupp Elevator DIA/DEN project team resumes (continued)

### **Craig Somers – Reliant Construction Project Manager (WBE/MBE subcontractor)**

- Title: Project Manager
- Cell: 719.358.9216
- Main responsibilities: Craig is responsible for daily subcontract project management and ensuring that all related work/work by others is completed in a quality and timely manner so that the VT equipment is able to be inspected and turned over to the DIA/DEN client project team and the traveling public on time and on budget. Craig is also the regular communication conduit between Reliant Construction and thyssenkrupp Elevator DIA/DEN project team.
- Construction industry experience: 20 years
- Education: Construction Management continuing education, Colorado State University (CSU)
- Brief bio information:

Craig has been in the construction industry for nearly 20 years working with several of the largest general contractors (GCs) in the State of Colorado. He is currently responsible for the day-to-day project management of the *DIA/DEN On-Call Conveyance Project* and the Colorado Springs Airport escalator replacement project – both for thyssenkrupp Elevator. In his current role, he is in regular communication with Britaney, the thyssenkrupp Elevator DIA/DEN project manager and Henry Silva (thyssenkrupp Elevator onsite foreman) to coordinate the various aspects of the related work/work by others and manage the overall installation schedule process. Craig also works directly with Brad Hix to ensure a quality and timely installation process occurs for all DIA/DEN projects. Past projects Craig has worked on include the Children’s Hospital, VA Replacement Medical Center and the JEFCA Airport Runway Expansion project.



## PROPOSAL FORMS

**VI. ATTACHMENT 2, PROPOSAL FORMS****Attachment 2, Part 1 Proposal Acknowledgement Letter****City and County of Denver  
Denver International Airport**Proposer: thyssenkrupp Elevator Corporation Date: April 17, 2020

Michael Sheehan – Senior Vice President, AIM  
Airport Finance Administration  
Airport Office Building (AOB)  
Denver International Airport  
8500 Pena Boulevard  
Denver, Colorado 80249-6340

In response to the Informal Competitive Procurement (ICP) dated March 2, 2020, for ICP NO. 201952239, the undersigned hereby declares that he/she has carefully read and examined the proposal documents and hereby proposes to perform and complete the work as required in the Scope of Work. Attached hereto are the completed responses to Parts 2, 3 and 4 of the Proposal Forms.

The undersigned agrees that this proposal constitutes a valid offer to negotiate a Contract with the City and County of Denver (City) to perform the work described in the proposal documents.

After final agreement on the terms of the Contract has been reached, the undersigned agrees to execute the Contract, which will be prepared by the City, in a timely manner.

The undersigned acknowledges receipt and consideration of the following addenda to the proposal documents:

Addenda Numbers: 1 and 2

The undersigned certifies that he/she has examined and is fully familiar with the proposal documents and has satisfied him/herself with respect to any questions regarding the ICP which could in any way affect the undersigned's understanding of the Scope of Work or any estimate of the cost thereof.

Signature: *Stephan Smith*Type or print name: Stephan Smith, Denver Sales Manager on behalf of: Lee BlevinsProposer's Business Address: 7367 S Revere Parkway, Unit 2a, Centennial, CO 80112E-mail address: Stephan.smith@thyssenkrupp.com

**Attachment 2, Part 2 Proposal Data Form**

**City and County of Denver  
Denver International Airport  
(Please use this form)**

Proposer Name: thyssenkrupp Elevator Corporation

Proposer Address: 7367 S Revere Parkway, Unit 2a, Centennial, CO 80112

Phone: 303-790-8566 Fax \_\_\_\_\_

Email: stephan.smith@thyssenkrupp.com

Federal Identification Number: 62-790-8566

Principal in Charge (Name & Title): Kevin Levalle - CEO / Lee Blevins - Regional President

Project Manager for this ICP (Name & Title): Britaney Tyler - Regional Project Manager

Equal Employment Opportunity Officer: Allen Hatch - Regional Human Resources Director

Name(s) of Professional and Public Liability Insurance Carrier(s):

Accord Corporation

\_\_\_\_\_

\_\_\_\_\_

**Parent Company Information  
(If Applicable)**

Name of Company: thyssenkrupp AG

Address: thyssenkrupp Allee 1, 45143 Essen Germany

Phone: 49-201-844-0 Fax: \_\_\_\_\_

Contact Person: Peter Walker

**Submittal is for (check one):**

- Sole Proprietorship
- Partnership
- Corporation

**If this is a corporation, then you are the (check one):**

- Subsidiary
- Parent Company

State of Incorporation: Delaware

**Is this a joint venture?**

- YES
- NO

*If this is a joint venture, a certified copy of the Joint Venture Agreement must accompany this proposal.*

Licenses to perform work (issuing authority, date and validity—please provide copies of all listed):

Colorado State License #08-000039

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**CERTIFICATION**

The undersigned certifies that to the best of his/her knowledge, the information presented in this Proposal Data Form is a statement of fact and that the Proposer has the financial capability to perform the work described in the Proposer's documents.

Signature Stephan Smith Title Regional President

Print Name Stephan Smith, Denver Sales Manager on behalf of: Lee Blevins

Date April 17, 2020



**Attachment 2, Part 3 Disclosure of Legal and Administrative Proceedings and Financial Condition****City and County of Denver  
Denver International Airport  
(Please use this form)**

If no disclosure required in accordance with III-15, please sign affirmation statement.

The undersign affirms that thyssenkrupp Elevator Corporation (Proposer) has not been involved in any legal or administrative proceedings which involve a claim in excess of Fifty Thousand Dollars (\$50,000.00); has not filed bankruptcy within the last ten (10) years; has not been debarred or suspended from bidding/proposing on any Federal, State or local government procurements; and neither the Proposer nor its key employees have been convicted of a bid/proposal-related crime, violation or felony in the last five (5) years.

Signature Stephan Smith Title Regional President

Print Name Stephan Smith, Denver Sales Manager on behalf of: Lee Blevins

Date April 17, 2020

If disclosure is required in accordance with III-15, please use the following space to provide information. If additional space is needed, please attach additional pages.

thyssenkrupp Elevator Corporation enters in 1000's of contracts annually and unfortunately, law suites do occur and exist; however, thyssenkrupp Elevator has adequate risk management, legal and insurance safeguards in place to protect itself and it's customers when required. All civil, judicial, or administrative proceedings have been brought in the normal and ordinary course of business. Not withstanding, thyssenkrupp Elevator represents and warrants that as of the date of this proposal, there are no suits, actions, proceedings, or investigations pending, or threatened against or involving thyssenkrupp before an court arbitrator, or government authority, domestically or internationally, which could reasonably result in any material adverse change in the contemplative business, condition, worth, or operations of thyssenkrupp or adversely affect the ability of thyssenkrupp to perform its obligations, and responsibilities under this agreement.



## DSBO FORMS



**DENVER**  
ECONOMIC DEVELOPMENT  
& OPPORTUNITY

**COMMITMENT TO MWBE  
PARTICIPATION  
(Goods/Services)**

**Division of Small Business Opportunity**  
Denver International Airport  
Compliance Unit  
Main Terminal, Level 6  
Denver, CO 80249  
Phone: 303-342-2180  
[DSBO@flydenver.com](mailto:DSBO@flydenver.com)

***The undersigned has satisfied the MWBE participant requirements in the following manner  
(Please check the appropriate box):***

The Bidder/Proposer is committed to the minimum 8 % **MWBE** utilization on the project, and will submit Letters of Intent (LOI) for each subcontractor/subconsultant listed in the Bid Forms as follows:

**Hard Bids:** With the bid when due.

**Request for Proposals:** With the proposal when due.

The Bidder/Proposer is unable to meet the project goal of \_\_\_\_\_% **MWBE**, but is committed to a minimum of \_\_\_\_\_% **MWBE** utilization on the project. The Bidder/Proposer understands that they must submit a detailed statement of their good faith effort under sealed bid procedures, as a matter of responsiveness, or with initial proposal as a matter of responsibility as in accordance with DRMC Section 28-128(a) of Ordinance 86 to the Division of Small Business Opportunity.

The Bidder/Proposer is a certified **MWBE** in good standing with the City and is committed to self-perform a minimum of \_\_\_\_\_% of the work on the contract. The self-performing Bidder/Proposer understands that they must submit a Letter of Intent (LOI) for themselves within its bid or initial proposals as a matter of responsibility as in accordance with DRMC Section 28-129(b) of Ordinance 86 to the Division of Small Business Opportunity.

Bidder/Proposer (Name of Firm): thyssenkrupp Elevator Corporation

Firm's Representative (Please print): Stephan Smith

Signature (Firm's Representative): *Stephan Smith*

Title: Sales Manager

Address: 7367 S Revere Parkway, Unit 2a

City: Centennial

State: CO

Zip: 80112

Phone: 303-505-6090

Fax:

Email: [stephan.smith@thyssenkrupp.com](mailto:stephan.smith@thyssenkrupp.com)

**A copy of the MWBE Certification letter must be attached to each Letter of Intent (LOI).**

**DENVER**ECONOMIC DEVELOPMENT  
& OPPORTUNITY

**List of Proposed  
MWBE  
Proposers, Subconsultants,  
Suppliers (Manufacturers) or  
Brokers**

Division of Small Business Opportunity

Denver International Airport

Compliance Unit

Main Terminal, Level 6

Denver, CO 80249

Phone: 303-342-2180

[DSBO@flydenver.com](mailto:DSBO@flydenver.com)City & County of Denver Contract No.: 201952239

The undersigned Proposer proposes to utilize all listed firms. The following MWBE(s) firms listed are **CURRENTLY** certified by the City and County of Denver. Only the level of MWBE participation listed at submittal will count toward satisfaction of the project goal. Only bona fide commissions may be counted for Brokers. MWBE prime Proposers must detail their submittal information below. Please copy and attach this page to list additional MWBE.

**Prime Proposer**

Business Name: thyssenkrupp Elevator Corporation

Address: 7367 S Revere Parkway, Centennial, CO

Contact Person: Stephan Smith

Type of Service: Conveyance

Dollar Amount: \$:35 million

Percent of  
Project:

**Certified MWBE Prime Proposer**

Business Name:

Address:

Contact Person:

Type of Service:

Dollar Amount: \$:

Percent of  
Project:

**Subconsultants, Suppliers Manufacturers or Brokers (check one box)**

 Subconsultant (√) Supplier (√) Manufacturer (√) Broker (√)

Business Name: Construction Consulting Solution DBA, Reliant Construction, Inc.

Address: 1520 N Union Blvd, Suite 202  
Colorado Springs, CO 80909

Type of Service: Subcontractor

Contact Person:  
Brad Hix

Dollar Amount: \$:TBD

Percent of  
Project: TBD Subconsultant (√) Supplier (√) Manufacturer (√) Broker (√)

Business Name:

Address:

Type of Service:

Contact Person:

Dollar Amount: \$:

Percent of  
Project: Subconsultant (√) Supplier (√) Manufacturer (√) Broker (√)

Business Name:

Address:

Type of Service:

Contact Person:

Dollar Amount: \$:

Percent of  
Project:

Subconsultants, Suppliers Manufacturers or Brokers (check one box)								
<input type="checkbox"/>	<input checked="" type="checkbox"/> Subconsultant (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Supplier (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Manufacturer (√)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Broker (√)
Business Name: Torin International								
Address: 4949 E Raines Road, Suite 101, Memphis, TN			Type of Service: Equipment Manufacturer					
Contact Person: Steven Tran			Dollar Amount: \$: TBD		Percent of Project: TBD			
<input type="checkbox"/>	<input checked="" type="checkbox"/> Subconsultant (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Supplier (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Manufacturer (√)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Broker (√)
Business Name: Innovation Industries								
Address: 3500 E Main Street, Russellville, AR			Type of Service: Equipment Manufacturer					
Contact Person: Anthony Keeling			Dollar Amount: \$: TBD		Percent of Project: TBD			
<input type="checkbox"/>	<input checked="" type="checkbox"/> Subconsultant (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Supplier (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Manufacturer (√)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Broker (√)
Business Name: SnapCab								
Address: 175 Titus Avenue, Warrington, PA			Type of Service: Equipment Manufacturer					
Contact Person: Eric Farah			Dollar Amount: \$: TBD		Percent of Project: TBD			
<input type="checkbox"/>	<input checked="" type="checkbox"/> Subconsultant (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Supplier (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Manufacturer (√)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Broker (√)
Business Name: Gulley Metal Services								
Address: 2895 S Raritan St., Englewood, CO			Type of Service: Subcontractor					
Contact Person: Nick Gulley			Dollar Amount: \$: TBD		Percent of Project: TBD			
<input type="checkbox"/>	<input checked="" type="checkbox"/> Subconsultant (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Supplier (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Manufacturer (√)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Broker (√)
Business Name:								
Address:			Type of Service:					
Contact Person:			Dollar Amount: \$:		Percent of Project:			
<input type="checkbox"/>	<input checked="" type="checkbox"/> Subconsultant (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Supplier (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Manufacturer (√)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Broker (√)
Business Name:								
Address:			Type of Service:					
Contact Person:			Dollar Amount: \$:		Percent of Project:			
<input type="checkbox"/>	<input checked="" type="checkbox"/> Subconsultant (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Supplier (√)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Manufacturer (√)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Broker (√)
Business Name:								
Address:			Type of Service:					
Contact Person:			Dollar Amount: \$:		Percent of Project:			





Office of Economic Development  
**Division of Small Business Opportunity**  
 Denver International Airport  
 Jeppesen Terminal, Level 6, West  
 Denver, CO 80249  
 Phone: 303-342-2180

**LETTER OF INTENT (LOI)  
 PURCHASING / GOODS & SERVICES  
 FOR GOALS & INDEPENDENT PARTNERSHIPS**

**INSTRUCTIONS FOR COMPLETION & SUBMISSION:**

- All lines must be completed or marked N/A for Not Applicable
- Submit the attached completed checklist with this letter
- Submit a copy of the certified firm current certification letter
- Email to [dsbo@flydenver.com](mailto:dsbo@flydenver.com)
- RFPs: LOIs must be submitted with Proposal.

**Bid/RFP No.:** 20195223

**Procurement Title:** On-Call Passenger Conveyance Modernization I

**A. The Following Section is to Be Completed by the Bidder/Proposer  
 This Letter of Intent Must be Signed by the Bidder/Proposer and M/WBE.**

Name of Bidder/Proposer: thyssenkrupp Elevator Corporation		Self-Performing (Certified Vendor Only) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Phone: 303-790-8566	
Contact Person: Stephan Smith		Email: <a href="mailto:stephan.smith@thyssenkrupp.com">stephan.smith@thyssenkrupp.com</a>		Fax: N/A
Address: 7367 S Revere Parkway, Unit 2a		City: Centennial	State: CO	Zip: 80112

**B. The Following Section is To Be Completed by the M/WBE, at any Tier  
 This Letter of Intent Must be Signed by the M/WBE and Bidder/Proposer**

Name of Certified Firm: Construction Consulting Solution DBA, Reliant Construction		Phone:		
Contact Person: Wendel Torres		Email: <a href="mailto:wendelt@reliant-construction.com">wendelt@reliant-construction.com</a>		Fax: N/A
Address: 957 E. Fillmore St		City: Colorado Springs	State: CO	Zip: 80907
Please check the designation(s) which apply to the certified firm.		M/WBE (x)	SBE ( )	

**A Copy of the M/WBE Letter of Certification must be Attached**

Identify the scope of the work to be performed or supply item that will be provided by the M/WBE. **On unit price bids only, identify which bid line items the M/WBE scope of work or supply corresponds to.**

- Subcontract work

Check one that applies to the M/WBE:

<input checked="" type="checkbox"/> Subconsultant	<input type="checkbox"/> Supplier	<input type="checkbox"/> Distributor	<input type="checkbox"/> Broker
<input type="checkbox"/> Packager	<input type="checkbox"/> Manufacturer	<input type="checkbox"/> Manufacturer's Rep	

**Bidder/Proposer** intends to utilize the aforementioned M/WBE for the Work/Material described above. The cost of the work/material and percentage of the total subconsultant M/WBE bid amount is:

\$ \_\_\_\_\_ 8 %

Bidder/Proposer Signature: <i>Stephan Smith</i>		Date: 4/17/20
Title: Sales Manager		
M/WBE or Self-Performing Firm's Signature: <i>Wendel P. Torres</i>		Date: 4/16/20
Title: President		

If the above named Bidder/Proposer is not determined to be the successful Bidder/Proposer, this **Letter of Intent** shall be null and void.



### Letter of Intent (LOI) Checklist

*All lines must be completed or marked N/A for Not Applicable  
Submit the attached completed checklist with this letter.*

<b>Completed ✓</b>	
<input checked="" type="checkbox"/>	Procurement Number & Project Name
<input type="checkbox"/>	<b>Section A:</b> Name of Bidder/Proposer, Contact Person, Address, City, State, Zip, Phone, Email
<input checked="" type="checkbox"/>	<b>Section B:</b> Name of Certified Firm, Contact Person, Address, City, State, Zip, Phone, Email
<input checked="" type="checkbox"/>	Designation checked for M/WBE or SBE
<input type="checkbox"/>	<b>Indirect Utilization:</b> Name of subconsultant/subconsultant, supplier or broker is indicated if using the participation of a 2 <sup>nd</sup> tier subconsultant/subconsultant, supplier or broker.
<input checked="" type="checkbox"/>	Scope of work performed or item supplied by <b>M/WBE or SBE</b>
<input type="checkbox"/>	Line items performed, if line-item bid.
<input checked="" type="checkbox"/>	Copy of <b>M/WBE, or SBE</b> Letter of Certification Attached
<input checked="" type="checkbox"/>	Designation checked for Subconsultant, Supplier, Distributor, Broker, Manufacturer, Manufacturer's Representative, or Packager
	<b>If project is a hard bid...</b>
<input type="checkbox"/>	Bidder has indicated dollar amount for value of work going to Subconsultant, Supplier, Distributor, Broker, Manufacturer, Manufacturer's Representative, or Packager
<input type="checkbox"/>	Bidder has indicated percentage for value of work going to Subconsultant, Supplier, Distributor, Broker, Manufacturer, Manufacturer's Representative, or Packager
	<b>If project is an RFP/RFQ...</b>
<input type="checkbox"/>	Consultant has indicated percentage for value of work going to Subconsultant, Supplier, Distributor, Broker, Manufacturer, Manufacturer's Representative, or Packager & contact name for M/WBE.
<input type="checkbox"/>	Fee amount if fee amount of work to be performed is requested.
<input checked="" type="checkbox"/>	Bidder/Proposer's Signature, Title & Date
<input checked="" type="checkbox"/>	M/WBE Firm's Signature, Title and Date

<b>REMEMBER</b>	<b>Bidder/Proposer must include the LOI at within the Bid/Proposal when submitted to Purchasing.</b>
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**The complete and accurate information that is required for the Letter of Intent is based on the following sections of the Ordinance: Section 28-126 through -137 and Section 28-151. Failure to complete this information on the Letter of Intent (LOI) may automatically deem a bid or proposal non-responsive.**



**Vendor Profile: Certifications**

[General](#) | 
 [Public Profile](#) | 
 [Users](#) | 
 [Commodity Codes](#) | 
 [Contacts](#) | 
 [Employees](#) | 
 **[Certifications](#)** | 
 [Contracts](#) | 
 [Workforce Comp/EEO](#) | 
 [Questionnaires](#)

**Construction Consulting Solutions, Inc., DBA Reliant Construction**System Vendor Number: **20484333**[Renew/Apply for Certification](#)[Submit Change Request](#)[Change Request List](#)[Request Missing Certification](#)**Current Certifications**

Type	Action	Effective	Renewal	Organization	Actions
DBE	New	2/13/2019	2/12/2020	City and County of Denver	<a href="#">View</a> <a href="#">Add Date Alert</a>
MWBE	New	2/13/2019	2/12/2020	City and County of Denver	<a href="#">View</a> <a href="#">Add Date Alert</a>
SBE	New	2/13/2019	2/12/2020	City and County of Denver	<a href="#">View</a> <a href="#">Add Date Alert</a>

Certification renewals and updates must be submitted to the certification agency with whom your renewal is due.

- For certification renewals and updates with City and County of Denver, you may [submit online](#).
- For all other agencies, you will need to contact the certifying agency outside of this system for instructions.

**Applications**

Status	Application Number	App Type	Organization	Dates	Contact	Actions
<b>Received &amp; In Process</b>	0024462	EBE/MBE/SBE/SBEC/WBE Renewal Application	City and County of Denver	Started: 2/25/2020 Submitted: 3/27/2020 Received: 4/3/2020	Wendel Torres	<a href="#">View</a>
<b>Processing Complete</b>	6449085	New Application	City and County of Denver	Started: 6/27/2018 Submitted: 11/13/2018 Received: 1/3/2019	Wendel Torres	<a href="#">View</a>

**Pending/In Process Certifications**

Type	Action	Application Date	Organization	Reviewer	Actions
DBE	No Change Affidavit	3/27/2020	City and County of Denver		
MWBE	Renewal	3/27/2020	City and County of Denver		
SBE	Renewal	3/27/2020	City and County of Denver		



Reference #	12817662
Status	Complete
Business Email Address	stephan.smith@thyssenkrupp.com
Enter Email Address of City and County of Denver contact person facilitating this solicitation.	jerry.uliano@flydenver.com
Please provide the City Agency that is facilitating this solicitation:	Denver International Airport
Project Name	On-Call Passenger Conveyance Modernization
Solicitation No. (Check Below if Not Applicable)	201952239
Name of Your Company	thyssenkrupp Elevator
What Industry is Your Business?	Other
If Other, Please Tell Us Your Industry:	Conveyance
Address	7367 S. Revere Parkway, Unit 2a
City	Centennial
State	Colorado
Zip Code	80112
Other (if not state, enter country, province, etc. here)	United States
Business Phone Number	7202743484
1. How many employees does your company employ?	Over 100
Number of Full Time:	100
Number of Part Time:	0
2. Do you have a Diversity and Inclusiveness Program?	Yes
2.1. Employment and retention?	Yes
2.2. Procurement and supply chain activities?	Yes
2.3. Customer Service?	Yes
3. Provide a detailed narrative of your	A recent statement from our CEO reads.. "All employees

company's diversity and inclusiveness principles and programs. This may include, for example, (i) diversity and inclusiveness employee training programs, equal opportunity policies, and the budget amount spent on an annual basis for workplace diversity; or (ii) diversity and inclusiveness training and information to improve customer service. (If Not Applicable, please type N/A below)

of thyssenkrupp Elevator Corporation have a responsibility to treat others with dignity and respect at all times. All employees are expected to exhibit conduct that reflects inclusions during work, at work functions on or off work site, and at all other company-sponsored and participative events"

Additionally, thyssenkrupp has signed the "Diversity Charter", is committed to the "UN Standards of Conduct of Business", and is a member of Proutemployer.

4. Does your company regularly communicate its diversity and inclusiveness policies to employees?

Yes

If you answered Yes to Question 4, how does your company regularly communicate its diversity and inclusiveness policies to employees? (Select all that apply)

- Employee Training
- Public EEO Postings
- Other (Weekly emails)

5. How often do you provide training and diversity and inclusiveness principles?

Annually

5.1 What percentage of the total number of employees generally participate?

76-100%

6. State how you achieve diversity and inclusiveness in supply and procurement activities. This may include, for example, narratives of training programs, equal opportunity policies, diversity or inclusiveness partnership programs, mentoring and outreach programs, and the amount and description of budget spent on an annual basis for procurement and supplier diversity and inclusiveness. (If Not Applicable, please type N/A below)

thyssenkrupp has mandatory annual diversity / inclusiveness training that must be completed by every employee. To date, we have 3300 disabled employees as part of our thyssenkrupp team around the world.

7. Do you have a diversity and inclusiveness committee?

Yes

7.1 If Yes, how often does it meet?

Quarterly

8. Do you have a budget for diversity and inclusiveness efforts?

Yes

9. Does your company integrate diversity and inclusion competencies into executive/manager performance evaluation plans?

Yes

I attest that the information represented

Check Here if the Above Statement is True.

herein is true, correct and complete, to the best of my knowledge.

Name of Person Completing Form	Stephan Smith
Today's Date	03-13-2020
NOTE: Attach additional sheets or documentation as necessary for a complete response.	Diversity_and_Inclusion_policy.pdf (49k)
Last Update	2020-03-13 11:00:18
Start Time	2020-03-13 10:33:02
Finish Time	2020-03-13 11:00:18
IP	66.194.145.20
Browser	Chrome
OS	Windows
Referrer	<a href="https://fs7.formsite.com/CCDenver/form161/index.html">https://fs7.formsite.com/CCDenver/form161/index.html</a>



## FORM W-9

# Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Go to [www.irs.gov/FormW9](http://www.irs.gov/FormW9) for instructions and the latest information.

Print or type. See Specific Instructions on page 3.

	<b>1</b> Name (as shown on your income tax return). Name is required on this line; do not leave this line blank. THYSSENKRUPP ELEVATOR CORPORATION	
	<b>2</b> Business name/disregarded entity name, if different from above N/A	
	<b>3</b> Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only <b>one</b> of the following seven boxes. <input type="checkbox"/> Individual/sole proprietor or single-member LLC <input checked="" type="checkbox"/> C Corporation <input type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____ <b>Note:</b> Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is <b>not</b> disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner. <input type="checkbox"/> Other (see instructions) ▶ _____	<b>4</b> Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) <u>5</u> Exemption from FATCA reporting code (if any) <u>E</u> <i>(Applies to accounts maintained outside the U.S.)</i>
	<b>5</b> Address (number, street, and apt. or suite no.) See instructions. 3100 Interstate North Circle SE, Suite 500	Requester's name and address (optional)
	<b>6</b> City, state, and ZIP code Atlanta, GA 30339	
	<b>7</b> List account number(s) here (optional)	

## Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

**Note:** If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

<b>Social security number</b>									
<b>or</b>									
<b>Employer identification number</b>									
6	2		1	2	1	1	2	6	7

## Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

**Certification instructions.** You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

<b>Sign Here</b>	Signature of U.S. person ▶ <i>David Turnage</i> David Turnage VP-Tax	Date ▶ <i>01/02/20</i>
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## General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

**Future developments.** For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to [www.irs.gov/FormW9](http://www.irs.gov/FormW9).

## Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
  - Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
  - Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
  - Form 1099-S (proceeds from real estate transactions)
  - Form 1099-K (merchant card and third party network transactions)
  - Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
  - Form 1099-C (canceled debt)
  - Form 1099-A (acquisition or abandonment of secured property)
- Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.
- If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.*





## thyssenkrupp Elevator Statement of Policy Diversity and Inclusion

Elevator Technology  
Human Resources

01.01.2020

Diversity & Inclusion Management is a fixed part of our HR policy. This is also demonstrated in our mission statement, our management principles, with our signing of the “Diversity Charter” as well as with our commitment to the “UN Standards of Conduct for Business” tackling discrimination against LGBTI people. Furthermore, Diversity is a business case: several studies confirm that diverse teams are more successful, innovative, creative and productive.

All employees of thyssenkrupp Elevator Corporation have a responsibility to treat others with dignity and respect at all times. All employees are expected to exhibit conduct that reflects inclusion during work, at work functions on or off the work site, and at all other company-sponsored and participative events. All employees are also required to attend and complete annual diversity awareness training to enhance their knowledge to fulfill this responsibility.

Any employee found to have exhibited any inappropriate conduct or behavior against others may be subject to disciplinary action.

Employees who believe they have been subjected to any kind of discrimination that conflicts with the company’s diversity policy and initiatives should seek assistance from a supervisor or an HR representative.

The Company’s policy on diversity and inclusion is supported in full by Kevin Lavallee, President & CEO of thyssenkrupp Elevator North America.

A handwritten signature in black ink that reads "Kevin Lavallee".

Kevin Lavallee

President & CEO North America

thyssenkrupp Elevator Corp.  
11605 Haynes Bridge Road, Ste. 650 Alpharetta, GA 30009  
(678) 319-3240



## **CERTIFICATE OF GOOD STANDING**



OFFICE OF THE SECRETARY OF STATE  
OF THE STATE OF COLORADO

CERTIFICATE OF FACT OF GOOD STANDING

I, Jena Griswold, as the Secretary of State of the State of Colorado, hereby certify that,  
according to the records of this office,

THYSSENKRUPP ELEVATOR CORPORATION

is an entity formed or registered under the law of Delaware, has complied with all  
applicable requirements of this office, and is in good standing with this office. This entity has  
been assigned entity identification number 19871598570.

This certificate reflects facts established or disclosed by documents delivered to this office on  
paper through 03/24/2020 that have been posted, and by documents delivered to this office  
electronically through 03/25/2020 @ 11:21:19.

I have affixed hereto the Great Seal of the State of Colorado and duly generated, executed, and issued this  
official certificate at Denver, Colorado on 03/25/2020 @ 11:21:19 in accordance with applicable law.  
This certificate is assigned Confirmation Number 12169912.



*Jena Griswold*

Secretary of State of the State of Colorado

\*\*\*\*\*End of Certificate\*\*\*\*\*

*Notice: A certificate issued electronically from the Colorado Secretary of State's Web site is fully and immediately valid and effective. However, as an option, the issuance and validity of a certificate obtained electronically may be established by visiting the Validate a Certificate page of the Secretary of State's Web site, <http://www.sos.state.co.us/biz/CertificateSearchCriteria.do> entering the certificate's confirmation number displayed on the certificate, and following the instructions displayed. Confirming the issuance of a certificate is merely optional and is not necessary to the valid and effective issuance of a certificate. For more information, visit our Web site, <http://www.sos.state.co.us/> click "Businesses, trademarks, trade names" and select "Frequently Asked Questions."*





**Submitted by:**

thyssenkrupp Elevator Corporation  
7367 S Revere Pkwy, Unit 2A  
Centennial, CO 80112