THIRD AMENDATORY AGREEMENT

THIS AMENDATORY AGREEMENT (this "Amendatory Agreement") is made and entered by and between the **CITY AND COUNTY OF DENVER**, a municipal corporation organized pursuant to the Constitution of the State of Colorado (the "City"), and **TOWN OF MORRISON,** a Colorado municipal corporation whose address is 321 Colorado Highway 8, Morrison, CO 80465 (the "Town" and, together with the City, the "Parties").

BACKGROUND:

WHEREAS, the City and Town entered into an Intergovernmental Agreement dated June 14, 2016, as amended by that certain Amendatory Agreement dated October 10, 2017, and that certain Second Amendatory Agreement dated August 24, 2018 (collectively, the "Agreement") for Town to undertake and perform certain engineering services and an investigation and analysis of the Town's wastewater system as it relates to collection and treatment of wastewater from City's Red Rocks Amphitheatre; and

WHEREAS, the City and Town wish to amend the Agreement to extend the term modify the scope of work to be performed by the Town, facilitate acquisition of identified improvements necessary to ensure long-term treatment of wastewater in an efficient and economical manner, and to increase the compensation paid to the Town in order to acquire needed wastewater system improvements.

NOW, THEREFORE, in consideration of the premises and the mutual covenants and agreements contained in the Agreement and herein contained the parties agree as follows:

1. Capitalized terms used herein and not otherwise defined shall have the meanings ascribed to them in the Agreement.

2. Section 4 of the Agreement, entitled "**Payment Procedures and Term**," is hereby amended to read in its entirety as follows:

"Payment Procedures and Term

a. **Term:** The Agreement commenced on June 14, 2016 and will expire on December 31, 2019. The Town shall complete any work in progress as of the expiration date unless the work is earlier completed.

b. Engineering Services Payments: The total cost for the Engineering Services shall not exceed $554,900.00. The City is exclusively responsible for the Town's actual Engineering Services costs attributable to Red Rocks, including, but not limited to, the Town's oversight of the Engineering Services, as agreed upon by the Town and the City. Upon completion of the Engineering Services, the Town will provide copies of all of the deliverables

produced by the Engineering Services, along with an invoice for the Town's actual costs for the same, not to exceed $554,900.00.

c. **Wastewater Improvements Acquisition Costs:** The acquisition price for the Wastewater Improvements, as more particularly described in **Exhibit B** attached hereto (the "Wastewater Improvements") shall not exceed Nine Hundred Forty-Six Thousand Dollars and No Cents ($946,000.00). The parties agree that to exceed the maximum amount identified above for the Wastewater Improvements, Town and City will each require a written amendment of the Agreement approved by the governing bodies of City and Town. Town at all times shall undertake to complete the Wastewater Improvements at the lowest responsible cost while fulfilling all of its obligations pursuant to this Agreement. The procedure for payment made by the City to the Town for the Wastewater Improvements, shall be as follows:

1. The Town shall submit requisitions, for its actual costs incurred, in the form set forth in **Exhibit C** attached hereto and incorporated herein, in addition to any supporting documentation required by the City. The Town may submit requisitions as needed, but no more frequently than one requisition per month.

2. The City shall promptly, but no later than 30 days after receipt of a satisfactory requisition, pay to Town all actual amounts owed pursuant to this Agreement.

d. **Maximum Contract Amount:** Notwithstanding any other provision of this Agreement, the City's total maximum payment obligation pursuant to this Agreement will not exceed One Million Five Hundred Thousand Nine Hundred Dollars and No Cents ($1,500,900.00). The City is not obligated to execute an agreement or any amendments to this Agreement for further services or assets, including any services performed or assets provided by Town beyond those specifically described in **Exhibit A-2** and **Exhibit B** ("Scope of Work"). Any services or assets beyond those described in the Scope of Work are performed or secured at Town's risk and without authorization under this Agreement."

3. A new Section 25 shall be added to the Agreement, entitled "**Nature and Scope of the Wastewater Facilities**," as follows:

"**Nature and Scope of the Wastewater Facilities**

The wastewater facilities to be acquired by City from Town are depicted on the plans attached hereto as **Exhibit D** (collectively the "Wastewater Facilities"). Any changes to the plans depicted in **Exhibit D** may be made subsequent to the date of this Third Amendatory Agreement by the mutual written agreement of the parties so long as the Wastewater Facilities sold by Town to City pursuant to this Agreement are

substantially-similar in purpose and cost as the improvements described in **Exhibit D** which are modified or altered."

4. A new Section 26 shall be added to the Agreement, entitled "**Acquisition and Installation Obligations**," as follows:

   "**Acquisition and Installation Obligations**

   Town agrees to install, and the City agrees to acquire from the Town upon completion of installation to City's reasonable satisfaction, the Wastewater Improvements which Town shall ensure will be fully operational and available to the City no later than July 1, 2019 ("Completion Date"). The Completion Date is an essential term of this Agreement, and the Parties agree that time is of the essence. If Town is unable to complete all Wastewater Improvements to City's reasonable satisfaction on or before the Completion Date, then until completion and acceptance by City, the City shall not be subject to any costs or penalties related to exceeding effluent concentration quantities or effluent quality standards pursuant to the Intergovernmental Agreement, dated July 15, 2004, as amended, concerning transmission and treatment of wastewater between the Town and the City (the "2004 IGA")."

5. A new Section 27 shall be added to the Agreement, entitled "**Operation and Maintenance Agreement**," as follows:

   "Operation and Maintenance Agreement

   The parties acknowledge that this Agreement affects the responsibilities of the parties arising from the 2004 IGA and represents good faith cooperation to establish an improved wastewater collection and treatment process for Red Rocks Amphitheatre (the "Red Rocks Amphitheatre wastewater facilities"). The City and Town agree to negotiate in good faith an amendment to the 2004 IGA prior to July 1, 2019, concerning maintenance and operation of wastewater systems servicing City property following expiration of this Agreement."

6. A new Section 28 shall be added to the Agreement, entitled "**Ownership and Use of City and Town Property**," as follows:

   "Ownership and Use of City and Town Property

   All of the Wastewater Improvements located on City's property shall be the sole and exclusive property of the City upon acquisition by the City (the "City Wastewater Facilities"). All of the Wastewater Improvements not located on City's property shall be the sole and exclusive property of the Town (the "Town Wastewater Facilities"). The City Wastewater Facilities and the Town Wastewater Facilities are further

described on **Exhibit E**. Town and City agree to cooperate in good faith and execute any reasonable documentation related to confirmation or establishment of the rights described in this section.

Notwithstanding anything to the contrary contained in this Agreement or in the Town's Charter, ordinances, or otherwise, the Town will not permit any use of the City Wastewater Facilities by any person or entity except the City.

The Town further agrees that if any portion of the Wastewater Facilities are to be installed on non-City property, the Town will, at the Town's sole expense, acquire appropriate easement(s) therefore over, in and upon such property, including full right(s) of ingress and egress during installation, operation, repair, maintenance and/or replacement of said Wastewater Improvements. Instruments evidencing such easements shall be in a form acceptable to the City and shall be supported by such title evidence as City shall reasonably require. Notwithstanding the above, the Town shall request a Temporary Construction Access Permit for, the installation of any Wastewater Improvements on property owned by the City and designated as a park. Such Temporary Construction Access Permit(s) shall be conditioned upon execution of the City's standard form of agreement for such access."

7. A new Section 29 shall be added to the Agreement, entitled "**Final Site Conditions**," as follows:

"**Final Site Conditions**

Town and City agree that at the conclusion of installation of the Wastewater Improvements, but in no event later than December 31, 2019, all debris, litter, tools, spoils, and excess materials shall be removed by Town to City's satisfaction ("Cleanup Commitment"). The Parties expressly agree as to the importance of the Cleanup Commitment occurring in a timely manner. To satisfy its Cleanup Commitment, all disturbed roads, sidewalks, parking lots and natural areas shall be restored by Town to the condition which existed prior to installation of the Wastewater Improvements. Asphalt paving and aggregate base course shall be restored to a minimum depth matching existing paving, removed fencing shall be reinstalled, and natural areas shall be restored and revegetated in a manner acceptable to the City (including grading to match adjacent property and control of noxious weeds in accordance with **Exhibit D**)."

8. A new Section 30 shall be added to the Agreement, entitled "**Responsibility, Ownership, Risks & Financial Interests**," as follows:

"**Responsibility, Ownership, Risks & Financial Interests**

a. Town Interests. It is understood and agreed that Town shall have the sole responsibility, including all costs and other financial liabilities, for the installation, operation, use, maintenance, repair, and replacement of the

Wastewater Facilities during the Term. It is further understood that Town shall have no property interest of any kind, including any lease or easement, in the City's real property or the City Wastewater Facilities.

b. City Interests. It is understood and agreed that City shall have no responsibility or liability, of any sort, with respect to the installation, operation, use, maintenance, repair, or replacement of the Wastewater Facilities, including any damages or costs arising from accidents, defects or system failures associated with the Wastewater Facilities during the Term. It is further understood and agreed that City shall have no ownership interest in the Town Wastewater Facilities."

9. A new Section 31 shall be added to the Agreement, entitled "**Acquisition Requirements**" as follows:

"Acquisition Requirements. The following requirements shall be applicable with respect to the Wastewater Improvements.

a. Notice and Permits. No work or access to City property shall occur unless sufficient prior written notice describing the timing and work to be performed is provided to City or City consents to such access in writing (for purposes of this paragraph e-mail notification is sufficient).

b. Applicable Laws. Town shall be responsible for obtaining and maintaining, or causing to be obtained and maintained, all required permits, licenses or other governmental authorizations and approvals necessary to perform the Wastewater Improvements, including all permits and approvals required by federal, state, and local agencies. Town shall, at all times during the Term of this Agreement, ensure or cause to be ensured compliance with all laws, statutes, rules, regulations, and orders as well as the terms and conditions of this Agreement. Failure to substantially comply with the requirements of this paragraph shall be legal grounds under this Agreement for work to be ordered to cease or to be restricted, as deemed appropriate by City, until compliance is fully achieved and any penalties or fines are paid.

c. Insurance, Bonds and Indemnification. Town shall obtain and maintain, or require its contractor(s) and subcontractor(s) to obtain and maintain: a) insurance in the amounts and types of coverage appropriate for the Wastewater Improvements; and b) one hundred percent (100%) payment and performance bonds from a surety acceptable to City. City shall be named as an additional insured on all insurance coverages, except professional liability coverage, and City shall be named as an obligee on all bonds. In addition, all contractor(s) and subcontractor(s) shall be required to include an indemnification and "hold harmless" clause, approved by and for the benefit of City, to protect City against claims, actions, and demands arising from or related to the work performed by the contractor(s) and subcontractor(s) or

failure to pay mechanic(s) or materialmen. Failure to comply with the requirements of this paragraph shall be legal grounds under this Agreement for the Wastewater Improvements work to be ordered to cease or to be restricted, as deemed appropriate by City in its sole discretion, until compliance is achieved and any unpaid claims are resolved to City's satisfaction. The obligations described in this paragraph shall survive the expiration and/or termination of this Agreement.

d. Liens and Claims. Town shall not permit any mechanic's or materialman's liens or any other liens to be imposed and remain for more than thirty (30) days upon any City-owned property, or any part thereof, by reason of any work or labor performed or materials furnished by any person or legal entity to or on behalf of Town, either pursuant to C.R.S. Section 38-26-107 or by any other authority. Town shall promptly pay when due, and shall require its contractor(s) and subcontractor(s) to pay when due, all bills, debts and obligations incurred in connection with work performed pursuant to this Agreement and shall not permit the same to become delinquent. Town shall not permit any lien, judgment, execution or adjudication of bankruptcy which will in any way impair the rights of the City under this Agreement. Town shall timely obtain and submit all documentation or other certifications necessary to demonstrate, to the City's satisfaction, that all liens and claims for labor, materials, equipment, or other services or goods have been released and waived, and that all City-owned property is free of any potential liens or claims associated with work performed in connection with this Agreement. Failure to comply with the requirements of this paragraph shall be legal grounds under this Agreement for work to be ordered to case or to be restricted, as deemed appropriate by City, until compliance is achieved and any unpaid liens or claims are paid or otherwise resolved. The obligations described in this paragraph shall survive the expiration and/or termination of this Agreement.

e. Contracts. Town has no authority to bind the City on any contractual matters. The City shall have no liability or financial obligation to or for any contractor, subcontractor, supplier, or other person or entity with which Town contracts or has a contractual arrangement in connection with this Agreement.

f. Warranties. Town shall obtain, for the benefit of City, a three year warranty, in form and amount acceptable to City, with respect to the City Wastewater Improvements from the date the City Wastewater Improvements are completed and accepted by City in a written acknowledgement that all work related to the City Wastewater Improvements pursuant to this Agreement has been completed. City shall not unreasonably delay confirmation that the City Wastewater Improvements have been completed and shall discuss with Town any items City believes are outstanding or unsatisfactory upon Town's written request."

10. A new Section 32 shall be added to the Agreement, entitled "**Environmental Requirements**" as follows:

"Environmental Requirements. The following requirements shall be applicable with respect to the Wastewater Improvements and any other work performed by Town or its agents in connection with this Agreement.

a. Compliance. Town shall obtain all necessary federal, state, and local environmental permits and comply with all applicable federal, state, and local environmental permit requirements related to the Wastewater Improvements. Town shall comply with all applicable local, state, and federal environmental guidelines, rules, regulations, statutes, laws and orders (collectively, "Environmental Requirements"), including, but not limited to Environmental Requirements related to the storage, use, transportation, and disposal of Hazardous Materials. The term "Hazardous Materials" shall mean asbestos and asbestos-containing materials, special wastes, polychlorinated biphenyls (PCBs), any petroleum products, natural gas, radioactive source material, pesticides, any hazardous waste as defined at 42 U.S.C. Section 6903 (5) of the Solid Waste Disposal Act, any hazardous substance as defined at 42 U.S.C. Section 9601 (14) of the Comprehensive Environmental Response, Compensation and Liability Act, any chemical substance as defined at 15 U.S.C. Section 2602 (s) of the Toxic Substances Control Act, and any federal, state or local law, ordinance, rule or regulation promulgated in connection with such statutes or any similar law ordinance, rule or regulation which relates to Hazardous Materials now or in the future to City's reasonable satisfaction.

b. Noise, Water and Air Pollution. Town shall minimize and control noise, water and air pollution, water discharges, and soil erosion related to activities allowed under this Agreement.

c. Storage and Disposal. All materials, chemicals and supplies not otherwise addressed in this section shall be properly contained, managed and stored within enclosed structures. All residue, debris, waste, trash and litter generated by or associated with the Wastewater Improvements shall be properly contained within enclosed structures and lawfully and promptly disposed of."

11. A new Section 33 shall be added to the Agreement, entitled "**Property Damages and Physical Security**" as follows:

"Property Damages, Physical Security and Nondisturbance

a. Town agrees and promises that any real or personal property of City damaged or destroyed not in accordance with this Agreement shall be promptly repaired or replaced by Town, at Town's sole cost, to the reasonable satisfaction of

City, or in lieu of such repair or replacement, Town agrees and promises to pay City an amount, acceptable to City in its sole discretion that City deems sufficient to compensate City for the loss sustained and costs incurred by City.

b. Town shall be solely responsible for adequately securing the Wastewater Improvements from public access ("Security Measures"). The Security Measures shall include, but not be limited to, installation of fencing in a form and manner acceptable to the City which prevents unauthorized access to the Wastewater Improvements on City Property.

c. All areas affected by the Wastewater Improvements shall be maintained by Town, at its sole expense, in a safe and clean manner to City's reasonable satisfaction and Town shall undertake all necessary efforts to minimize any and all disruptions to City's use of City property."

12. A new Section 34 shall be added to the Agreement, entitled **"Inspections"** as follows:

"Inspections

Town shall ensure that City is authorized to enter upon all property not owned by City where Wastewater Improvements are located at all reasonable hours to inspect the Wastewater Improvements and City may inspect any and all Wastewater Improvements on City property at any time."

13. A new Section 35 shall be added to the Agreement, entitled "**Termination"** as follows:

"**Termination**

City has the right to terminate this Agreement for substantial breach or violation of the terms, conditions, warranties and promises of this Agreement, provided Town has not cured the breach or violation within sixty (60) days of the date of written notice from City. No such termination shall be effective if within the sixty (60) day notice period, the Town has either: (i) cured the alleged breach, or (ii) with respect to any alleged breach that will require longer than sixty (60) days to cure, the Town has initiated and continues to diligently pursue a cure of the alleged breach. If the Agreement is terminated by City, the City shall pay Town for work actually performed prior to the notice of breach or violation. Any notice of breach or violation shall be in writing and delivered to Town."

14. A new Section 36 shall be added to the Agreement, entitled "**Force Majeure**" as follows:

"Force Majeure

If either party is unreasonably delayed, disrupted or interfered with by the presence of any reasonably perceived hazardous material, labor dispute, fire, adverse weather conditions not reasonably anticipated, any written or oral order, directive, interpretation or determination made by any governmental entity having jurisdiction, unavoidable casualties or any other causes reasonably beyond the delayed party's control (each a "Force Majeure Event"), then the delayed party's time shall be extended for such duration as reasonably requested by the delayed party upon the delayed party's submission of its request for an extension of time with an explanation of the Force Majeure Event and upon agreement by the non-delaying party that a Force Majeure Event exists. Notwithstanding the foregoing, neither party may rely on the other party's actions as a basis for reasonable delay and if Town is unable to complete all Wastewater Improvements on or before the Completion Date described in Section 26, even if a Force Majeure Event occurs, the City shall not be subject to any costs or penalties related to exceeding effluent concentration quantities or effluent quality standards pursuant to the 2004 IGA."

15. Section 5 of the Agreement, entitled "**No Obligation for Future Changes**" is hereby deleted and amended to read as follows:

"Intentionally Omitted"

16. The Parties agree that this Amendatory Agreement shall be deemed effective as of January 1, 2018.

17. Except as herein amended, the Agreement is affirmed and ratified in each and every particular.

[BALANCE OF PAGE INTENTIONALLY LEFT BLANK]

Contract Control Number:

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:

By_____

By_____

By_____

Contract Control Number: THTRS-201628380-03

Contractor Name: TOWN OF MORRISON

By: Sean Forey

Name: SEAN FOREY
(please print)

Title: MAYOR
(please print)

TOWN OF MORRISON SEAL COLORADO

ATTEST: [if required]

By: Lyndsey Paavilainen

Name: Lyndsey Paavilainen
(please print)

Title: Town Clerk
(please print)

Exhibit B – Preliminary Costs

Red Rocks Wastewater Improvements

Engineer's opinion of probable cost. Actual cost will replace estimate once bid is awarded.

Capital Costs			**$946,000**
General Conditions (Division 1)			$68,600
Sitework (Division 2)			$51,000
Sitework Specialty (Division 2)			$1,100
Sitework Specialty - Jack & Bore 8" Pipeline (Division 2)			$25,000
Concrete (Division 3)			$14,000
Miscellaneous Metals (Division 5)			$13,300
Process (Division 11-15)			$112,800
Electrical and I&C			$51,200
	Subtotal, Direct Cost of Labor and Materials		$337,000
Prime Contractor Allowances		30.0%	$101,000
Subcontractor Allowances		20.0%	$67,000
		Subtotal	$505,000
Insurances and Bonds		5.0%	$25,000
Overhead and Profit		21.0%	$106,000
		Subtotal	$636,000
Contingencies		20.0%	$127,000
		Subtotal	$763,000
Engineer and Permitting		15.0%	$114,000
		Subtotal	$877,000
WRF Programming Upgrades (Including Engineering Fees)			$68,500
TOTAL CAPITAL COST			**$945,500**

Exhibit C

Red Rocks Wastewater Payment Requisition

TO: City and County of Denver
Attn: Denver Arts & Venues, Tad Bowman
4600 Humboldt
Denver, CO 80216

FROM: Town of Morrison
321 Highway 8
Morrison, CO 80465

Payment Requisition No.		Payment Terms			Due Date
		30 day Net			

Item #	Description	Estimated Cost	Actual Cost	Previously Requested	This Request
Wastewater Improvements					
1	General Conditions (Division 1)	$183,320			
2	Sitework (Division 2)	$92,520			
3	Concrete (Division 3)	$16,800			
4	Misc. Metals (Division 5)	$15,960			
5	Process (Divisions 11 - 15)	$135,360			
6	Electrical and I&C (Division 16)	$61,440			
7	Insurance, Bond, OH&P	131,000.00			
8	Engineering, Permits & Project Management	$135,000			
9	WRF Programming Upgrades	$68,500			
Project Contingency	20%	127,000.00			
CO#					
1	Engineering & Design				
2	Extension of Power (Excel)				
3	Easement Acquisition and Surveying				
	Project Contingency Remaining	127,000.00			
	Total Estimate	$966,900			
		Subtotal			
		Requisition Total			

The Town of Morrison will provide with each Payment Requisition relevant invoices evidencing the direct and actual costs for each aspect of the installation of the wastewater improvements and ancillary costs. The Town of Morrison will notify the City in advance of the need to access Project Contingency and provide a summary of the anticipated funds with the Requisition.

The Town of Morrison hereby certifies that all information contained in this Payment Requisition is true and correct.

_____

Town of Morrison **Date**

Exhibit D

Stantec

TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

ISSUED FOR BID

JANUARY, 2019

Project Number: 205305149

PROJECT VICINITY MAP

0 500' 1000'

GENERAL NOTES:

1. THE TYPE, SIZE AND LOCATIONS (HORIZONTALLY AND VERTICALLY) OF THE EXISTING UNDERGROUND UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY IN THE FIELD THE EXISTENCE, TYPE, SIZE AND LOCATION OF ALL EXISTING UNDERGROUND UTILITIES THAT MAY BE AFFECTED BY THE CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING THE CONSTRUCTION. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES FROM THE DRAWINGS. CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR ALL CONSEQUENCES THAT MAY RESULT IN IF THE CONTRACTOR DIDN'T NOTIFY THE ENGINEER OR DIDN'T NOTIFY IN A TIMELY MANNER.

2. THE EXISTING STRUCTURES AND UNDERGROUND UTILITY LINES SHOWN ON THE DRAWINGS ARE PREPARED BASED ON ABOVE GROUND FIELD SURVEYS AND RECORD DRAWINGS. BUT THEY MAY NOT BE INCLUSIVE. SOME OF THE EXISTING STRUCTURES AND UNDERGROUND UTILITY LINES MAY NOT BE SHOWN ON THE DRAWINGS. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER ANY FINDINGS OF UNDERGROUND UTILITY LINES AND STRUCTURES THAT ARE NOT SHOWN ON THE DRAWINGS.

3. ALL EXISTING STRUCTURES, UTILITIES, ROADWAYS, TREES, FENCES, BENCHMARKS, CONTROL POINTS AND DITCHES THAT ARE NOT DESIGNATED FOR REMOVAL OR ABANDONMENT SHALL BE PROTECTED FROM DAMAGE FROM CONSTRUCTION ACTIVITIES. IF THEY ARE DAMAGED AS A RESULT OF THE CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND PERFORM REPAIRS IMMEDIATELY TO THE EXISTING CONDITIONS OR BETTER, TO BE ACCEPTABLE BY THE OWNER.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A SAFE WORKING ENVIRONMENT AND FULLY IN COMPLIANCE WITH OSHA AND OTHER RELEVANT REGULATORY REQUIREMENTS THROUGHOUT THE PROJECT.

5. GROUNDWATER MAY BE ENCOUNTERED AT THE PROJECT SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING APPROPRIATE PERMITS AND PROPER DEWATERING AND DISCHARGE IN ACCORDANCE WITH REGULATORY REQUIREMENTS.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SALVAGING REMOVED EQUIPMENT AND MATERIALS AS DIRECTED BY THE OWNER OR ITS REPRESENTATIVE AND PROPERLY DISPOSING OF ANY UNWANTED MATERIALS AND EQUIPMENT REMOVED FROM THIS PROJECT.

7. CONTRACTOR SHALL COORDINATE AND SCHEDULE WITH AFFECTED UTILITY PROVIDERS FOR CONNECTIONS AND TERMINATIONS AS REQUIRED BY THE UTILITY PROVIDERS.

8. THE CONTRACTOR MUST KEEP ALL EQUIPMENT OPERATION A MINIMUM OF 10 FT FROM THE EXISTING OVERHEAD ELECTRIC LINES. IF THIS IS NOT FEASIBLE, OR CONDITION WARRANTS ADDITIONAL PROTECTION FROM THE ELECTRIC LINES, THE CONTRACTOR MUST CONTACT THE ELECTRIC SUPPLIER TO ARRANGE PROTECTIVE COVERING.

9. ALL MATERIALS AND WORKMANSHIP ARE SUBJECT TO INSPECTION AND EXAMINATION OF THE OWNER. THE OWNER RESERVES THE RIGHT TO ACCEPT OR REJECT ANY MATERIALS OR WORKMANSHIP THAT DOES NOT CONFORM TO THE OWNER'S STANDARDS AND SPECIFICATIONS.

10. THE CONTRACTOR SHALL KEEP AT LEAST ONE COPY OF SIGNED PLANS AND SPECIFICATIONS AND REQUIRED PERMITS AT THE JOB SITE AT ALL TIMES THROUGHOUT THE PROJECT.

11. CONTRACTOR SHALL IMMEDIATELY NOTIFY RELEASE OF SEWAGE OR DROPPING DEBRIS TO THE SANITARY SEWER COLLECTION SYSTEM TO THE OWNER. CONTRACTOR SHALL TAKE IMMEDIATE ACTION TO CONTAIN OR PREVENT SEWAGE OVERFLOW FROM THE SEWER SYSTEM. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS TO MITIGATE THE RELEASE AND PAY ALL PENALTIES INCURRED FROM THE REGULATORY AGENCIES.

12. ALL DISCREPANCIES FOUND BETWEEN DRAWINGS AND SPECIFICATION AND SITE CONDITIONS OR ANY INCONSISTENCIES OR AMBIGUITIES ON THE DRAWINGS AND SPECIFICATIONS SHALL BE REPORTED IMMEDIATELY BY THE CONTRACTOR TO THE ENGINEER, IN WRITING, WHO WILL PROMPTLY CORRECT DISCREPANCIES OR INCONSISTENCIES OR CLARIFY AMBIGUITIES IN WRITING.

13. LOCATIONS AND NUMBER OF PIPE SUPPORTS SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE PIPE SUPPORTS SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFICATION AND DETAILS. SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.

14. MECHANICAL AND ELECTRICAL EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES, AND REVEALS THAT ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS, BUT ARE REQUIRED SHALL BE PROVIDED PRIOR TO PLACING CONCRETE. STRUCTURAL SHOP DRAWINGS SHALL BE USED IN COORDINATION WITH MECHANICAL, ELECTRICAL, ARCHITECTURAL, PROCESS AND CIVIL SHOP DRAWINGS.

15. STRUCTURAL DIMENSIONS THAT CONTROLLED OR RELATED TO MECHANICAL, PROCESS AND ELECTRICAL EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR AND REFLECTED ON SHOP DRAWINGS.

16. ASSUME TYPICAL WORK HOURS 5AM - 3PM; DAILY SCHEDULE SHALL BE COORDINATED WITH TOWN AND RED ROCKS; DURING CONCERT SEASON, NO WORK AFTER 3PM

LIST OF DRAWINGS

REVISION	SHEET NO	DRAWING NO.	TITLE
		GENERAL	
C	1	G-000	COVER SHEET
C	2	G-001	PROJECT LOCATION MAP, SHEET INDEX, DESIGN CRITERIA, AND GENERAL NOTES
C	3	G-002	PROJECT ABBREVIATIONS AND GENERAL SYMBOLS
		CIVIL	
C	4	CS-100	OVERALL SITE PLAN
C	5	CD-101	EXISTING SITE DEMOLITION PLAN
C	6	CS-102	GRADING, EROSION AND SEDIMENT CONTROL PLAN
C	7	CS-200	WASTEWATER COLLECTION SYSTEM PLAN AND PROFILE COMMINUTOR VAULT
C	8	CS-201	WASTEWATER COLLECTION SYSTEM PLAN AND PROFILE EXISTING BASIN BYPASS
C	9	CS-202	WASTEWATER COLLECTION SYSTEM PLAN AND PROFILE SOUTH SIDE ALIGNMENT
C	10	CS-500	COMMINUTOR VAULT PLAN SECTIONS AND ISOMETRIC
C	11	CS-501	FLOW METER MANHOLE AND SAMPLING STATION DETAILS
C	12	CS-502	ODOR CONTROL PLAN AND DETAILS
C	13	CS-503	CIVIL DETAILS
		ELECTRICAL	
C	14	E-001	GENERAL ELETRICAL NOTES AND ABBREVIATIONS
C	15	ED-100	OVERALL ELECTRICAL SITE
C	16	E-101	EXISTING SITE ELECTRICAL DEMOLITION PLAN
C	17	E-102	SITE POWER AND CONTROL PLAN
C	18	E-103	GENERAL ELECTRICAL DETAILS & SCHEDULES
		ELECTRICAL INSTRUMENTATION	
C	19	GI-1	GENERAL INSTRUMENTATION AND CONTROL SYMBOLS AND NOMENCLATURE - I
C	20	GI-2	GENERAL INSTRUMENTATION AND CONTROL SYMBOLS AND NOMENCLATURE - II
C	21	GI-3	GENERAL INSTRUMENTATION AND CONTROL SYMBOLS AND NOMENCLATURE - III
C	22	GI-4	GENERAL INSTRUMENTATION AND CONTROL SAMPLE WIRING DIAGRAM - I
C	23	GI-5	GENERAL INSTRUMENTATION AND CONTROL INSTALLATION DETAIL-I
C	24	GI-6	GENERAL INSTRUMENTATION AND CONTROL INSTALLATION DETAIL-II
C	25	GI-7	GENERAL INSTRUMENTATION AND CONTROL INSTALLATION DETAIL-III
C	26	I-1	INSTRUMENTATION AND CONTROL NETWORK DIAGRAM
C	27	I-2	INSTRUMENTATION AND CONTROL COMMUNITOR VAULT P&ID
C	28	I-3	INSTRUMENTATION AND CONTROL BYPASS MANHOLE AND FLUME VAULT P&ID

Stantec
1560 Broadway # 1800
Denver, CO U.S.A.
www.stantec.com

Revision	By	Appd.	YY.MM.DD
C. ISSUED FOR BID	S.J.E.	S.J.E.	19.01.23
B. 60% DESIGN PACKAGE	S.J.H.	S.J.E.	18.12.03
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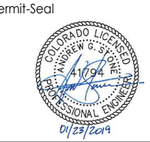
Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
PROJECT LOCATION MAP, SHEET INDEX
DESIGN CRITERIA AND GENERAL NOTES

Permit-Seal



Project Number: 205305149
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Drawing No. G-001

Revision C

Sheet 2 of 28

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2019/01/23 11:18 AM By: Hoover, Stu

ABBREVIATIONS

A

A	AMPERE
A.F.F.	ABOVE FINISHED FLOOR
ABAND.	ABANDON
AB	AIR BLOWER
AC	AIR COMPRESSOR
A.C.	ALTERNATING CURRENT
A/C	AIR CONDITIONING
ACSTB	ACOUSTIC
AD	ACCESS DOOR
A.D.	AREA DRAIN
AER	TANK AERATOR
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
A.I.	AREA INLET
AIC	AMPS INTERRUPTING
AIR	PROCESS AIR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AL	ALUMINUM
ALK	ALKALINITY CHEMICAL
ALM	ALUM
ALT	ALTERNATE
AMP	AMPERE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AP	ACCESS PANEL
APPD	APPROVED
APPROX.	APPROXIMATE
ARCH	ARCHITECTURAL
ARV	AIR RELEASE VALVE
ASB	ASBESTOS
ASPH	ASPHALT
ATAD	AUTOTHERMAL THERMOPHILIC AEROBIC DIGESTION
ATC	ACOUSTICAL TILE CEILING
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AVE	AVERAGE
AV	AIR VALVE
AWC	ACOUSTICAL WALL COVERING
AWG	AMERICAN WIRE GAUGE
∠	ANGLE

B

BI	BATT INSULATION
BDY	BOUNDARY
BD	BOARD
BEJ	BRICK EXPANSION JOINT
BFV	BUTTERFLY VALVE
BIT	BITUMINOUS
BL	BUILDING LINE
BLDG	BUILDING
BLC	BOILER CIRCULATION PUMP
BLK	BLOCK
BLR	BOILER
BM	BEAM
B.M.	BENCH MARK
B.O.	BOTTOM OF
BOT	BOTTOM
BRCG	BRACING
BRDG	BRIDGING
BRG	BEARING
BRK	BRICK
BRK	BRACKET
BS	BAR SCREEN
BT	BENT
BTU	BRITISH THERMAL UNIT
BV	BALL VALVE
BWR	BACKWASH RETURN
BWS	BACKWASH SUPPLY
BWW	BACKWASH WASTE

C

C	CONDUIT
CA	COMPRESSED AIR
CB	CIRCUIT BREAKER
CND	CONDUIT
CAP	CAPACITY
CC	CENTER TO CENTER
CB	CATCH BASIN
CEM	CEMENT
CFM	CUBIC FEET PER MINUTE
CHIM	CHIMNEY

C (CONT.)

C.I.	CURB INLET
CI	CAST IRON
CIR	CIRCULAR
CJ	CONTROL JOINT
CKD	CHECKED
CKT	CIRCUIT
CLS	CHLORINE
CL	CENTER LINE
CLG	CEILING
CLKG	CAULKING
CLOS	CLOSED
CLR	CLEARANCE
CLWG	CLEAR WIRE GLASS
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNITS
CN	CENTRATE
CNT	CENTRIFUGE
CNV	CONVEYOR
CNTR	COUNTER
C.O.	CLEANOUT
COMP	COMPRESSIBLE
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
C.J	CONSTRUCTION JOINT
CONT	CONTINUOUS
COR	CORNER
CPP	CORRUGATED POLYETHYLENE PIPE
C.P.	CONTROL POINT
CP	CHEMICAL FEED PUMP
CPR	COPPER
C.P.S.	CYCLES PER SECOND (HERTZ)
C/S	COUNTER SINK
CS	CARBON STEEL
C.T.	CERAMIC TILE
CT	CHEMICAL TANK
CTR	CENTER
C.Y.	CUBIC YARDS
C.V.	CEILING VENT
CV	CHECK VALVE
CW	COLD WATER

D

D	DRAIN
DC	DIRECT CURRENT
DEG	DEGREE
DEPR	DEPRESSION
DEPT	DEPARTMENT
DET	DETAIL
DF	DRINKING FOUNTAIN
DH	DUCT HEATER
DIA	DIAMETER
DIAG	DIAGONAL
DIP	DUCTILE IRON PIPE
DN	DOWN
DR	DOOR
D	DRAIN
DS	DOWN SPOUT
DSL	DIGESTER SLUDGE
DV	DIAPHRAGM VALVE
DWG	DRAWING
DWLS	DOWELS

E

E	EAST
EA.	EACH
E.A.	EXHAUST AIR
EF	EACH FACE
EFF	EFFLUENT
EFP	EFFLUENT FILTER PUMP
EJ	EXPANSION JOINT
EL.	ELEVATION
ELEC.	ELECTRIC OR ELECTRICAL
ENCL	ENCLOSURE
ENT	ENTRANCE
EQ.	EQUAL OR EQUALIZATION
EQUIP	EQUIPMENT
EST	ESTIMATE
EW	EACH WAY
EXC	EXCAVATE
EXH	EXHAUST

E (CONT.)

EX.	EXISTING
EXP	EXPANSION PUMP
EXPD	EXPOSED
EXPN	EXPANSION
EXT	EXTERIOR

F

F	FAHRENHEIT
FCA	FLANGE COUPLING ADAPTER
FCG	FACING
FCJ	FLOOR CONSTRUCTION JOINT
FCV	FLOW CONTROL VALVE
FD	FLOOR DRAIN
FE	FINAL EFFLUENT
FNDN	FOUNDATION
F.E.S.	FLARED END SECTION
F.F.	FINISH FLOOR
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISH
FIX.	FIXTURE
FLE	FILTER ELEMENT
FLR	FLOOR
FLSH	FLASHING
FLEX	FLEXIBLE
FLG	FLOORING
FL	FLANGE
FLOC	FLOCCULATOR
F.L.	FLOW LINE
FPM	FEET PER MINUTE
FR	FRAME
FRP	FIBERGLASS REINFORCED PIPE
FT	FEET
FTG	FOOTING
FTW	FILTER TO WASTE
FVNR	FULL VOLTAGE NON-REVERSING
FW	FINISHED WATER

G

G	GAS
GA	GAGE OR GAUGE
GALV	GALVANIZED
G.B.	GRADE BREAK
GBV	GLOBE VALVE
G.C.O.	GROUND CLEANOUT
GEN	GENERAL
GFI	GROUND FAULT INTERRUPTOR
GI	GALVANIZED IRON
GL	GLASS
GND	GROUND
GPM	GALLONS PER MINUTE
GRD	GRADE
GR	GRIT
GP	GRIT PUMP
GRS	GALVANIZED RIGID STEEL CONDUIT
GRT	GRATING
GS	GRIT SEPARATOR
GV	GATE VALVE
GW	GRIT WASHER
GWB	GYPSUM WALLBOARD
GWT	GLAZED WALL TILE
GYP	GYPSUM

H

HB	HOSE BIBB
HCP	HEAT CIRCULATION PUMP
HD	HEAD
HDPE	HIGH DENSITY POLYETHYLENE
HDR	HEADER
HDRL	HANDRAIL
HDW	HARDWARE
HEX	HEAT EXCHANGER
H.P.	HORSE POWER
HPR	HIGH PRESSURE
HRR	HOT WATER RETURN
HRS	HOT WATER SUPPLY
HORZ.	HORIZONTAL
HP	HIGH POINT
HT	HEIGHT
HTG	HEATING
HTR	HEATER

H (CONT.)

H.W.	HEADWALL
HW	HOT WATER
HWH	HOT WATER HEATER
HWR	HOT WATER RETURN
HWS	HOT WATER SERVICE
HWC	HOT WATER CIRCULATION
HWL	HIGH WATER LEVEL
HYD	HYDRAULIC
HZ	HERTZ

I

I	IRON
IC	INTERCOM
I.D.	INSIDE DIAMETER
I.E.	INVERT ELEVATION
IN.	INCH
INSUL	INSULATION
INT	INTERIOR
INV	INVERT

J

JB	JUNCTION BOX
JCT	JUNCTION
JST	JOIST
JT	JOINT

K

K	KEY
KCM	KILO CIRCULAR MIL
KGV	KNIFE GATE VALVE
KL	KEY LOCK
KP	KICK PLATE
KV	KILOVOLTS
KVA	KILOVOLT AMPERES
KVAR	KILOVOLT AMPERES REACTIVE
KW	KILOWAT

L

LAB	LABORATORY
LAV	LAVATORY
LBR	LUMBER
LBS	POUNDS
LD	LOAD
LDG	LOADING
LEN	LENGTH
LIN	LINEAR
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LM	LIQUID FLOW METER
LNG	LONG
LONG.	LONGITUDINAL
LP	LOW POINT
L.R.	LONG RADIUS
LSG	LIQUID SLUDGE GAS
LT	LIGHT
LTG	LIGHTING
LWL	LOW WATER LEVEL

M

MACH.	MACHINE
MAS	MASONRY
MTL	MATERIAL
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MER	MECHANICAL EQUIPMENT ROOM
MET	METAL
MFG	MANUFACTURING
MG	MOTOR GENERATOR
MH	MANHOLE
M.J.	MECHANICAL JOINT
MIN	MINIMUM
MLQ	MIXED LIQUOR
MM	MAGNETIC FLOW METER
MO	MASONRY OPENING
M	MOTOR
MSTC	MASTIC
MT	METAL THRESHOLD
MTD	MOUNTED
MV	MUD VALVE

N

N	NORTH
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MFG. ASSOCIATION
NO	NUMBER
N.O.	NORMALLY OPEN
NPW	NON-POTABLE WATER
N.R.	NOT REQUIRED
NV	NEEDLE VALVE

O

O.C.	ON CENTERS
O/	OVER
OCEW	ON CENTER EACH WAY
OD	OUTSIDE DIAMETER
OF	OVERFLOW
OFF	OFFICE
OG	OFF GAS
OH	OVERHEAD
OL	OVERLOAD
OPNG	OPENING
OPP	OPPOSITE
OPS	OPERATIONS

P

P	POLE
P.C.	POINT OF CURVATURE
P.C.C.	POINT OF COMPOUND CURVE
P.C.R.	POINT OF CURB RETURN
P.R.C.	POINT OF REVERSE CURVE
PC	PIECE
PERF	PERFORATED
P.E.	PLAIN END
PE	PRIMARY EFFLUENT
PH	PHASE
P.I.	POINT OF INTERSECTION
PL	PLATE
PTFM	PLATFORM
PLBG	PLUMBING
PLG	PILING
PLY	PLYWOOD
PNL	PANEL
PNV	PINCH VALVE
POL	POLYMER
POLY	POLYETHYLENE
PPM	PARTS PER MILLION
PRE.	PRELIMINARY
PREFAB	PREFABRICATED
PREFIN	PREFINISHED
PROJ	PROJECT
PRV	PRESSURE REDUCING VALVE
PS	PRIMARY SLUDGE
PST	PUMP STATION
PSC	PRIMARY SCUM
PSF	POUNDS/SQUARE FOOT
PSI	POUNDS/SQUARE INCH
P.T.	POINT OF TANGENCY
PT	POINT
PTD	PAINTED
PTE	PRELIMINARY TREATMENT EFFLUENT
PTN	POTENTIAL (VOLTAGE)
PV	PLUG VALVE
PVC	POLYVINYL-CHLORIDE
PVMT	PAVEMENT

Q

QT	QUART
Q.T.	QUARRY TILE
QTRS	QUARTERS
1/4RD	QUARTER ROUND
QZ	QUARTZ RESTRIKE

R

RAD	RADIUS
RAS	RETURN ACTIVATED SLUDGE
RC	REMOTE CONTROL
RCP	REINFORCED CONCRETE PIPE
RD	ROUND
R.D.	ROOF DRAIN
RECP	RECEPTACLE
RECT.	RECTIFIER

R (CONT.)

REF	REFERENCE
REFR	REFRIGERATOR
REG	REGISTER
RGS	REGISTER
REINF	REINFORCEMENT
REM	REMOVABLE
REQD	REQUIRED
REV	REVISIONS
RE:	REFER
RFG	RIGID GALV. STEEL
RGH	ROUGH
RIO	REMOTE INPUT/OUTPUT RACK
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	RAW SEWAGE
RSP	RETURN SLUDGE PUMP
RSR	RISER
RUB	RUBBER
RVP	PRESSURE RELIEF VALVE
RW	RAW WATER

S

S	SOUTH
SAN	SANITARY SEWER
SCH	SCHEDULE
SCR	SCREENINGS
SCP	SCUM PUMP
SD	SANITARY DRAIN
S.D.	SUBDRAIN
SE	SECONDARY EFFLUENT
SEC	SECTION
SEQ	SEQUENCE
SG	SLIDE GATE
SHLD	SHOULDER
SHT.	SHEET
SIM	SIMILAR
SL	RAW SLUDGE
SLG	SLUICE GATE
SMA	SURFACE MECH. MIXER
SMT	SUBSURFACE TURBINE MIXER
SMX	SUBSURFACE MIXER
SN	SUPERNATANT
SP	STATIC PRESSURE
SPEC	SPECIFICATIONS
SPF	SOUNDPROOF
SPH	SPACE HEATER
SPL	SPECIAL
SQ	SQUARE
SS	STAINLESS STEEL
SSC	SECONDARY SCUM
STA	STATION
STD	STANDARD
STGR	STRINGER
STL	STEEL
STM	STORM SEWER
STN	STONE
STOR	STORAGE
STP	SLUDGE TRANSFER PUMP
STR	STRUCTURAL
STWY	STAIRWAY
SFL	SUB FLOOR
SUSP	SUSPENDED
SW	SWITCH
SWBD	SWITCHBOARD
SWS	SURFACE WASH SYSTEM
SYM	SYMMETRICAL
SYS	SYSTEM

T

TAN	TANGENT
T.B.	THRUST BLOCK
TD	TANK DRAIN
T.E.	TOP ELEVATION
TE	THICKENER EFFLUENT
TEL	TELEPHONE
T/G	TONGUE AND GROOVE
TEMP	TEMPORARY
TMP	TEMPERATURE
TERM	TERMINAL
TG	TOGGLE
TH	THRESHOLD
THK	THICK
THRD	THREADED
T.O.	TOP OF
T.O.C.	TOP OF CURB

T (CONT.)

T.O.F.	TOP OF FLOOR
TOIL	TOILET
TOPO	TOPOGRAPHY
T.O.P.	TOP OF PIPE
T.O.S.	TOP OF SLAB
T.O.W.	TOP OF WALL
TRMT	TREATMENT
TSC	THICKENER SCUM
TSL	THICKENER SLUDGE
TSTAT	THERMOSTAT
TV	TELESCOPE VALVE
TYP	TYPICAL
TVSS	TRANSIET VOLTAGE SURGE SUPRESSOR

U

UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES
UNEX	UNEXCAVATED
UNFIN	UNFINISHED
U.N.O.	UNLESS NOTED OTHERWISE
UPC	UNINTERRUPTIBLE POWER SYSTEM
UT	UTILITY
UV	ULTRA-VIOLET DISINFECTIONS

V

V	VOLT
VCP	VITRIFIED CLAY PIPE
VD	VAULT DOOR
VENT.	VENTILATION
VERT (V)	VERTICAL
VLV	VALVE
VOL	VOLUME
V.P.C.	Vertical Point Of Curvature
V.P.I.	Vertical Point Of Intersection
V.P.T.	Vertical Point Of Tangency
VS	VENT STACK
VT	VINYL-TILE
V.T.R.	VOLTAGE TRANSFORMER
VTR	VENT THROUGH ROOF
VWM	VERIFY WITH MFG.

W

W	WEST
WR	WIRE
W/	WITH
WAS	WASTE ACTIVATED SLUDGE
WD	WOOD
W.D.	WASTE DRAIN
WDW	WINDOW
WF	WIDE FLANGE
WH	WALL HYDRANT
WHM	WATTHOUR METER
WI	WROUGHT IRON
WKSH	WORK SHOP
W/O	WITHOUT
WP	WEATHER PROOF
WPF	WATER PROOF
WPFG	WATER PROOFING
WSE	WATER SURFACE ELEVATION
WSP	WASTE ACTIVATED SLUDGE
WT	WEIGHT
WWF	WELDED WIRE FABRIC
WWM	WOVEN WIRE MESH

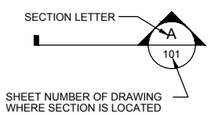
X

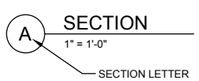
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

Y

YD	YARD
Y.D.	YARD DRAIN

SECTION IDENTIFICATION





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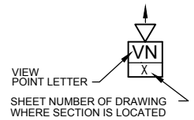

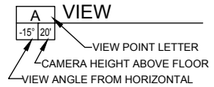

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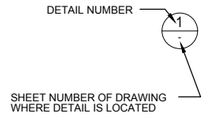

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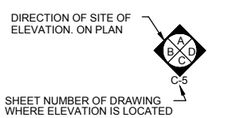

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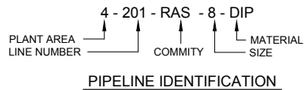

SITE/UTILITY LEGEND

EXISTING	NEW	
		AREA INLET
		CURB INLET INLET
		CLEAN-OUT
		FLARED END SECTION
		MANHOLE
		AIR/VACUUM VALVE
		BLOW OFF VALVE
		BACK FLOW PREV. VALVE
		VALVE
		FIRE HYDRANT
		11.25° BEND
		22.5° BEND
		45° BEND
		90° BEND
		CROSS
		TEE
		PLUG
		THRUST BLOCK
		EDGE OF GRAVEL/DIRT
		EDGE OF ASPHALT
		EASEMENT
		RIGHT-OF-WAY
		FLOWLINE
		SECTION LINE
—S—	—S—	SANITARY SEWER
		RAILROAD
—W—	—W—	WATERLINE
—O—	—O—	FENCE(OTHER)
—x—	—x—	FENCE(BARB WIRE)
—UE—	—UE—	BURIED ELECTRICAL
—OE—	—OE—	OVERHEAD ELECTRICAL
—T—	—T—	TELEPHONE
—FO—	—FO—	FIBER OPTIC
—C—	—C—	CABLE
—G—	—G—	GAS
		STORM SEWER

EROSION CONTROL LEGEND

GS	GROOVING SLOPES INTERCEPTOR TRENCH
SF	SILT FENCE
SBIF	STRAW BALE INLET FILTER
CE	CONSTRUCTION ENTRANCE
SBB	STRAW BALE BARRIER
SBC	STRAW BALE CHECK STRUCTURE
IP	GRAVEL INLET PROTECTION

GENERAL SYMBOLS LEGEND

- PIPE END (SIDE VIEW)
- PIPE END (END VIEW)
- CENTERLINE
- ELEVATION BULLET
- GROUNDWATER LEVEL
- SURFACE WATER LEVEL
- KEYED NOTE
- POINT OF CONNECTION
- DEMOLITION

MATERIALS LEGEND

- EARTH
- CONCRETE (PLAN)
- CONCRETE (SECTION)
- CRUSHED ROCK
- GRAVEL
- CMU
- ASPHALT
- RIPRAP
- SAND (SECTION)
- GROUT (SECTION)
- BRICK
- METAL
- GLAZED/CERAMIC TILE
- STONE
- GRATING (PLAN)
- GRATING (SECTION)
- CHECKERED PLATE
- DEMOLITION

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Title
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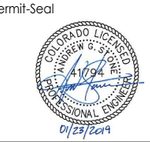

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Drawing No. G-002
Revision C
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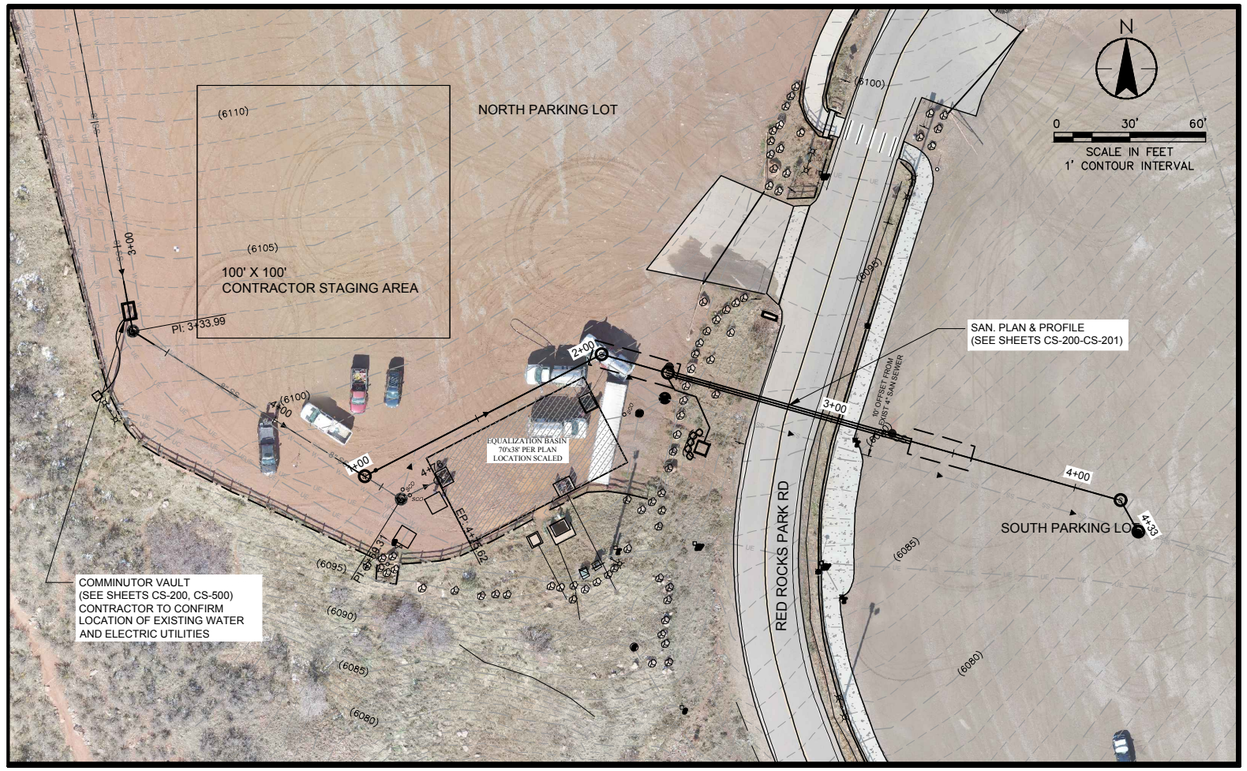
2019/01/23 11:21 AM By: Hoover, Stu

CONTROL POINTS
HORIZONTAL SYSTEM: LOCAL
VERTICAL DATUM: NAVD88

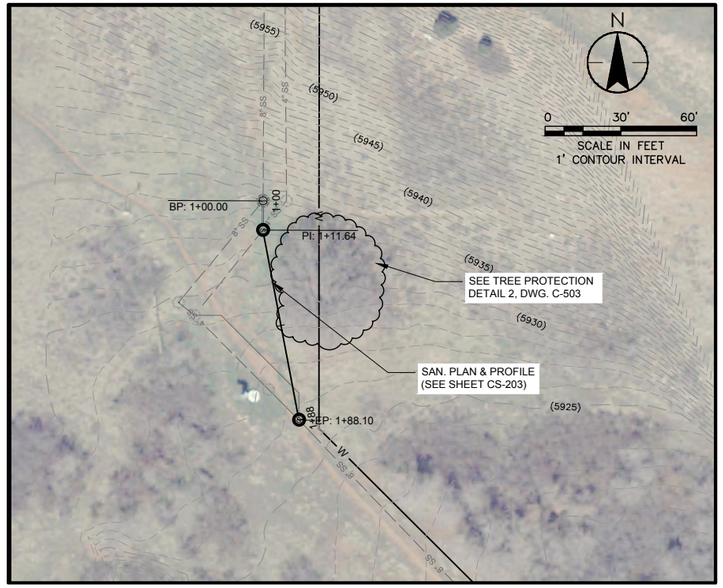
CP 7000 - FOUND 2" ALUM. CAP STAMPED "JACOBS CONTROL POINT - 7000"
N: 18764.37'
E: 6982.14'
ELEV: 6055.62'

CP 601 - SET 60D NAIL
N: 19035.70'
E: 6730.59'
ELEV: 6094.68'

CP 604 - SET 60D NAIL
N: 18426.88'
E: 6661.22'
ELEV: 6055.14'



ENLARGED PLAN



SOUTHSIDE ALIGNMENT
ENLARGED PLAN

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Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
OVERALL SITE PLAN

Permit-Seal

Project Number: 205305149
File Name: 05149-CS-100-RR_OVERALL.dwg

Dwn.	Chkd.	Dsgn.	YY.MM.DD
S.L.H.	S.J.E.	A.S.	18.12.03

Drawing No. CS-100
Revision C
Sheet 4 of 28

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2019/01/23 11:27 AM By: Hoover, Stu

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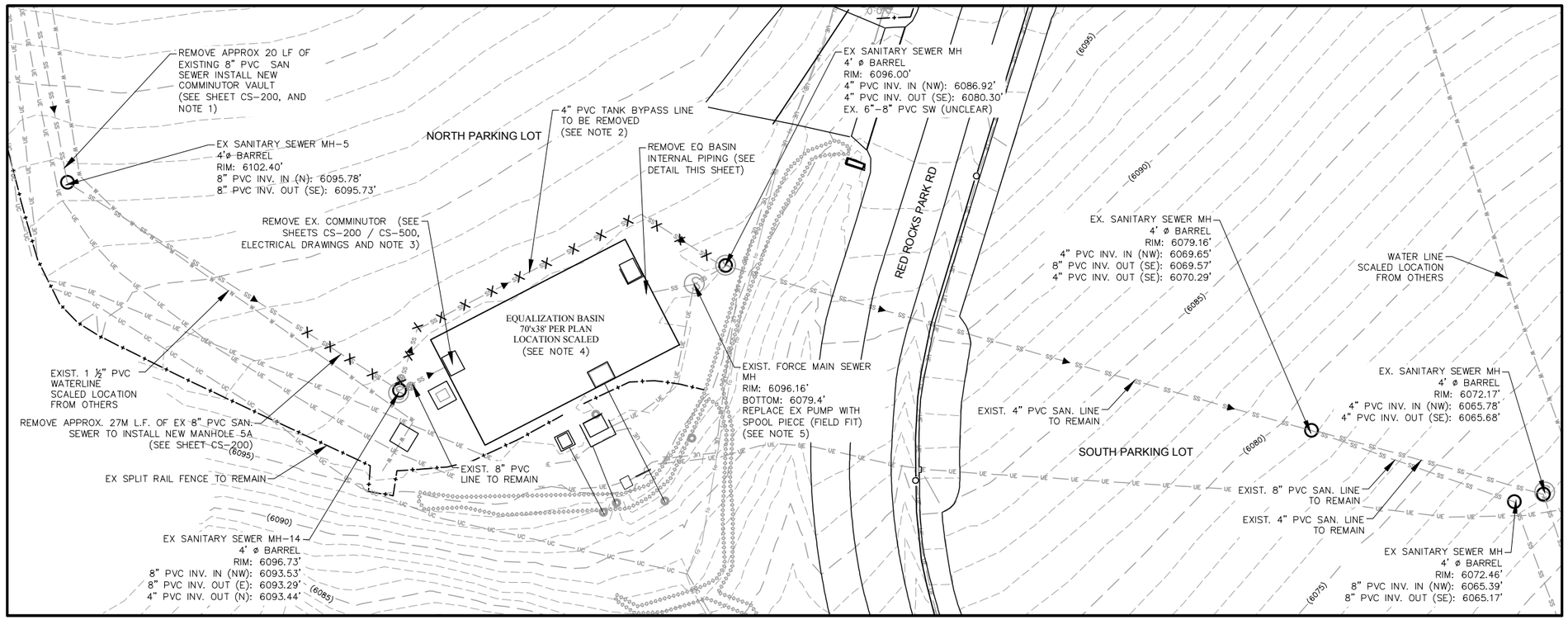

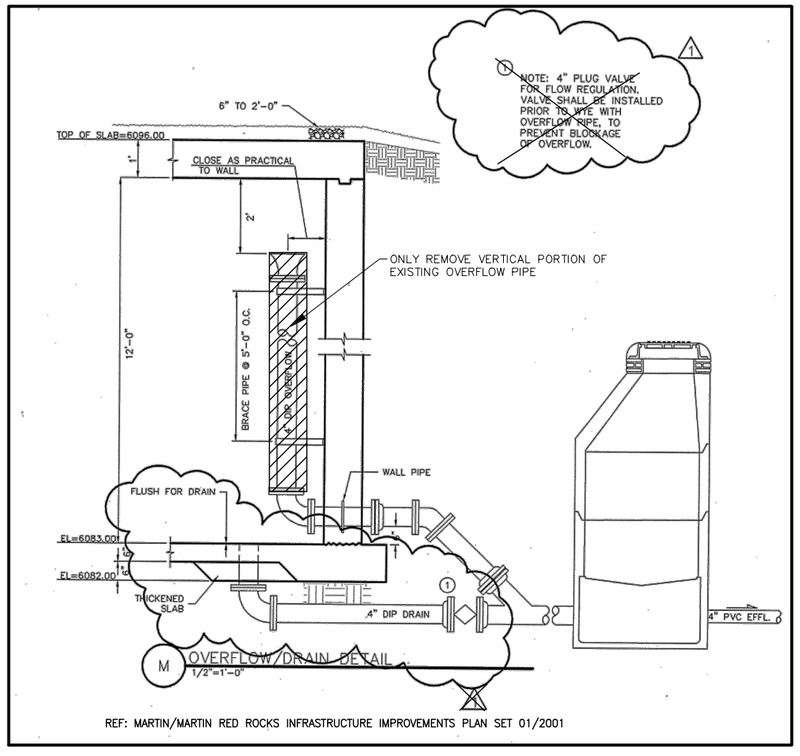

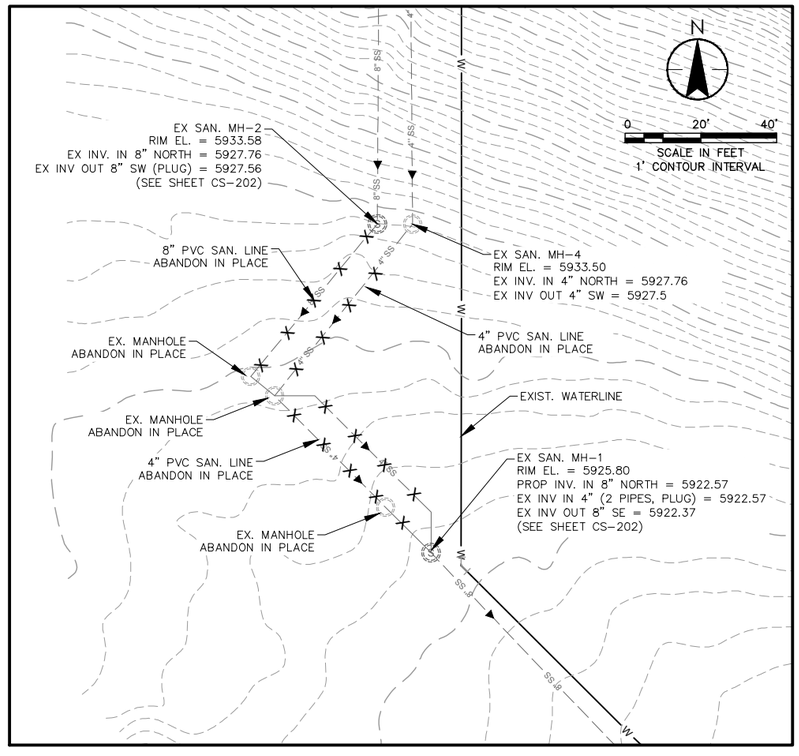

DEMOLITION NOTES:

1. REMOVE APPROX. 20 LF OF 8-INCH PVC UPSTREAM OF EX. MH-5 FOR PROPOSED COMMINUTOR VAULT. LOCATE EXISTING 1.5-INCH W/L AND UNDERGROUND ELECTRIC LINES PRIOR TO EXCAVATION AND COORDINATE TEMPORARY SHUT DOWN OF THESE UTILITIES WITH OWNER.
2. REMOVE EXISTING 4-INCH EQ BASIN BYPASS AND REPLACE WITH 8-INCH PVC AS SHOWN ON CS-200-201
3. REMOVE EXISTING COMMINUTOR IN EQ BASIN AND SAVE FOR OWNER
4. REMOVE EXISTING AERATOR AND RELATED EQUIPMENT IN EQ BASIN AND SAVE FOR OWNER.
5. REMOVE EXISTING PUMP IN MH IMMEDIATELY DOWNSTREAM OF EQ BASIN AND REPLACE WITH FIELD FIT SPOOL PIECE
6. REMOVE VERTICAL OVERFLOW PIPE IN EQ BASIN (SEE DETAIL THIS SHEET)
7. ALL CUT ENDS OF PIPE ABANDONED IN PLACE SHALL BE SOLID-GROUTED TO PREVENT FUTURE SINK HOLES.
8. WORK ON THE SOUTH END OF THE PROJECT WILL REQUIRE TREE PROTECTION. SEE DETAIL SHEET CS-102

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Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
EXISTING SITE DEMOLITION PLAN

Permit-Seal

Project Number: 205305149
File Name: 05149-CD-101-RR_DEMO.dwg

S.L.H.	S.J.E.	A.S.	18.12.03
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. CD-101
Revision C
Sheet 5 of 28

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2019.01.23 11:31 AM By: Hoover, Stu

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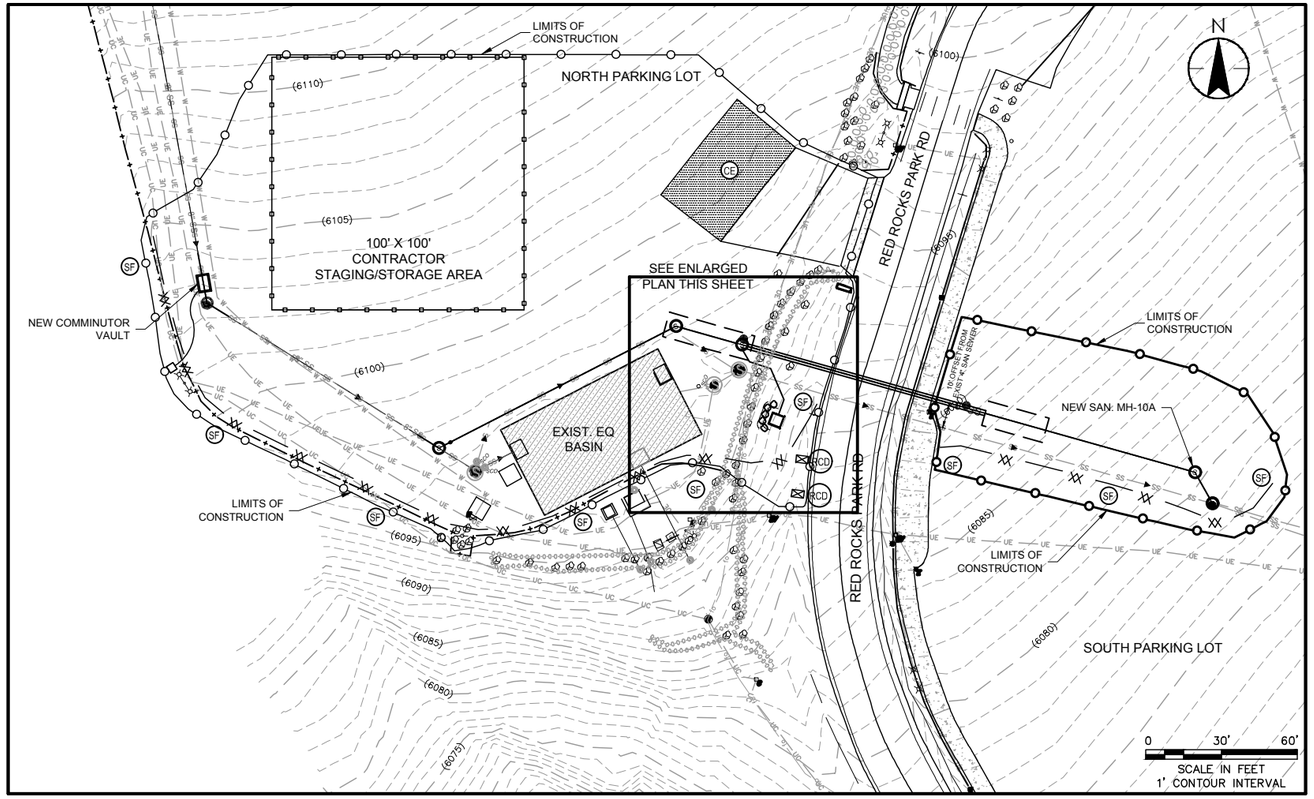
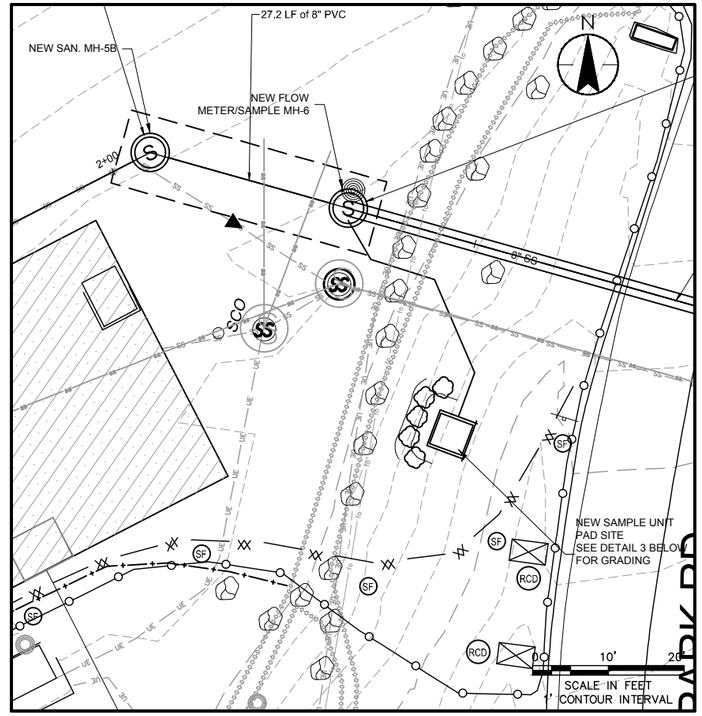


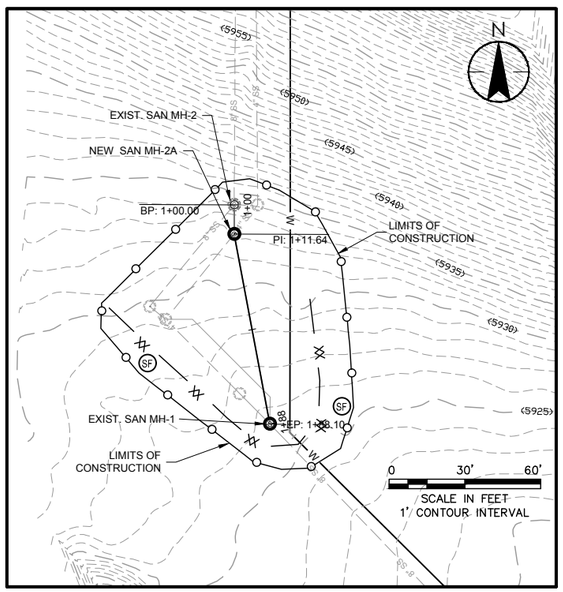


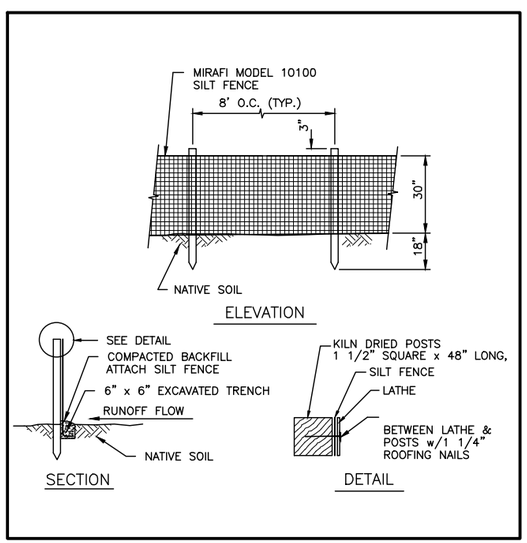
ENLARGED PLAN

EROSION CONTROL LEGEND

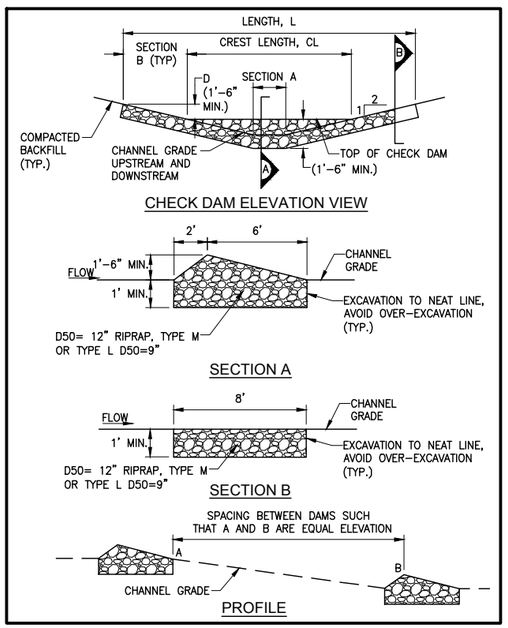
- SF — XX — SILT FENCE
- CE — CONSTRUCTION ENTRANCE
- RCD — ROCK CHECK DAM
- LIMITS OF CONSTRUCTION

NOTE: CONTRACTOR TO PROVIDE SECURITY FENCE FOR STAGING/STORAGE AREA. THE AREA SHOWN IS APPROXIMATE AND SHALL BE COORDINATED WITH OWNER TO DETERMINE FINAL SIZE AND LOCATION.

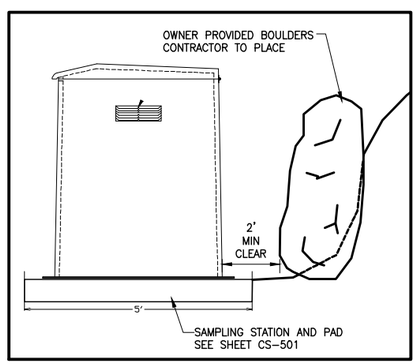




1 DETAIL
SILT FENCE (SF)
N.T.S.



2 DETAIL
ROCK CHECK DAM (RCD)
N.T.S.



3 DETAIL
SAMPLE STATION GRADING
N.T.S.

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Client/Project
TOWN OF MORRISON
WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS
OFFICE
Title
GRADING, EROSION AND SEDIMENT CONTROL PLAN

Permit-Seal

COLORADO LICENSED ANDREW G. STONE 41094 PROFESSIONAL ENGINEER
01/23/2019

Project Number: 205305149
File Name: 05149-CS-102-RR_EROS.dwg

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Drawing No. CS-102
Revision C
Sheet 6 of 28

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2019.01.23 11:35 AM By: Hoover, Stu

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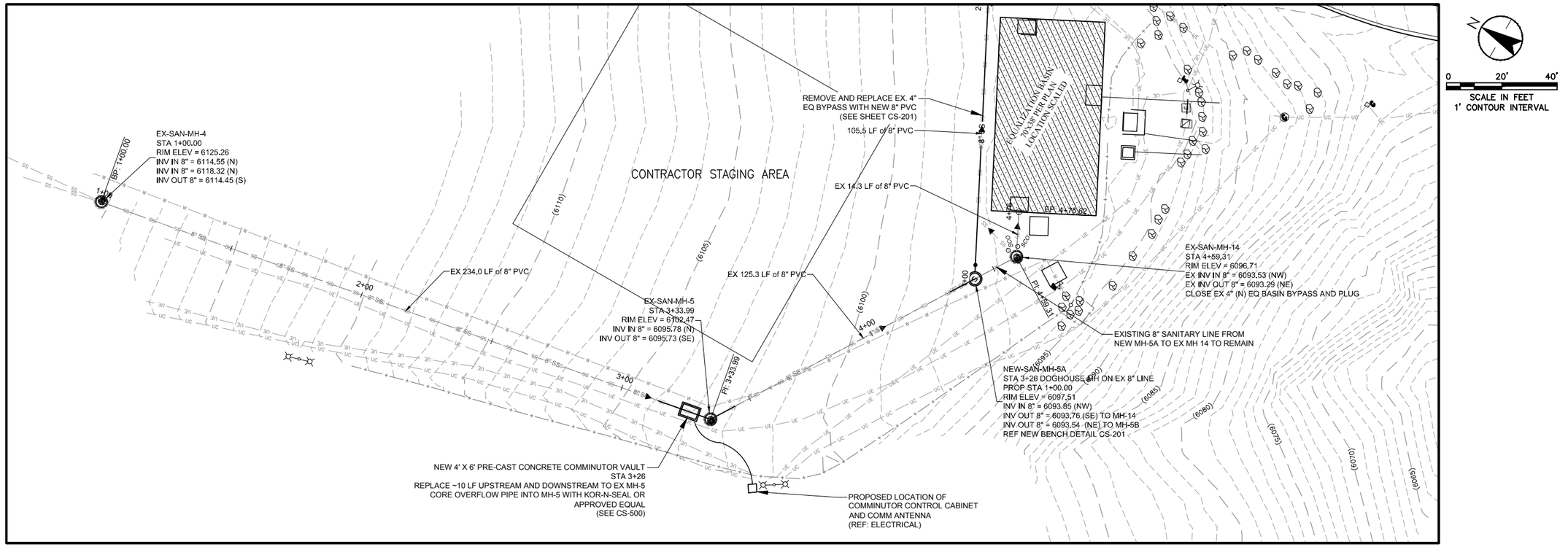

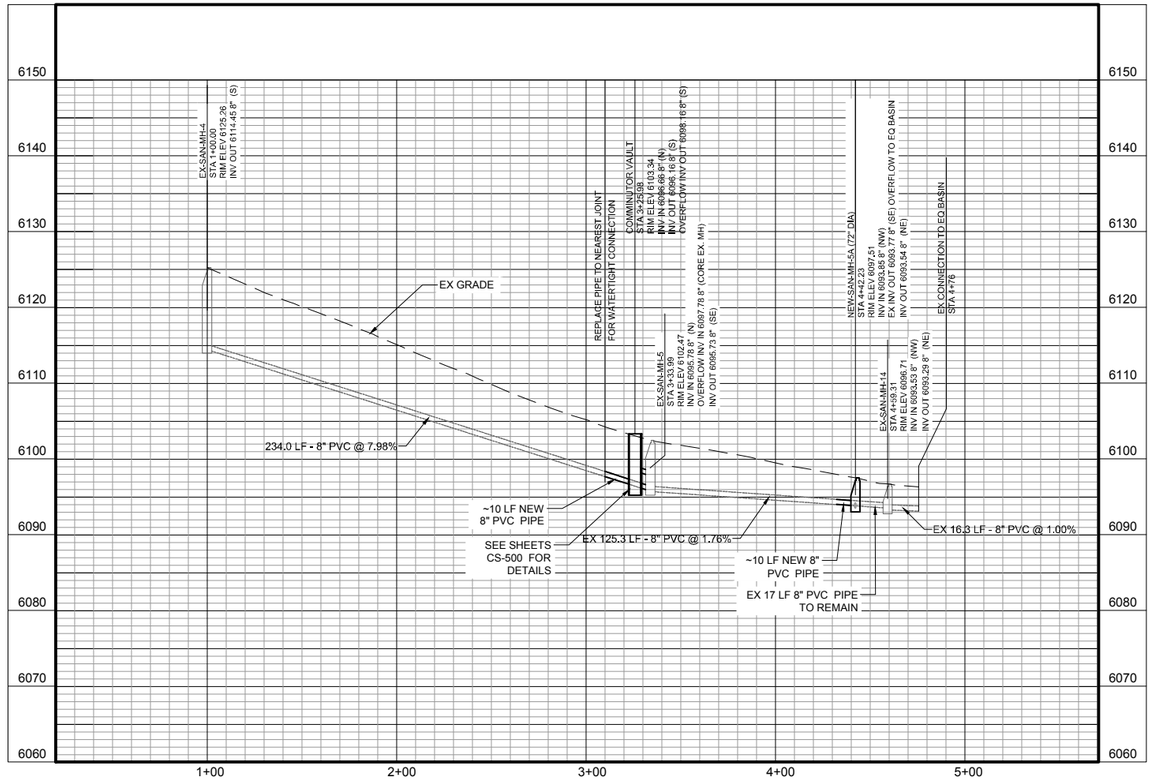

CONSTRUCTION NOTES:

1. REMOVE AND STOCKPILE EXISTING PARKING LOT ROAD BASE FOR RE-USE

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Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
WASTEWATER COLLECTION SYSTEM PLAN AND PROFILE
COMMINUTOR VAULT

Permit-Seal

COLORADO LICENSED
ANDREW G. STONE
41094
PROFESSIONAL ENGINEER
01/23/2019

Project Number: 205305149
File Name: 05149-CS-200-RR_SAN_PLN_PROF.dwg

S.L.H.	S.J.E.	A.S.	18.12.03
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. CS-200
Revision C
Sheet 7 of 28

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2019.01.23 11:39 AM By: Hoover, Stu

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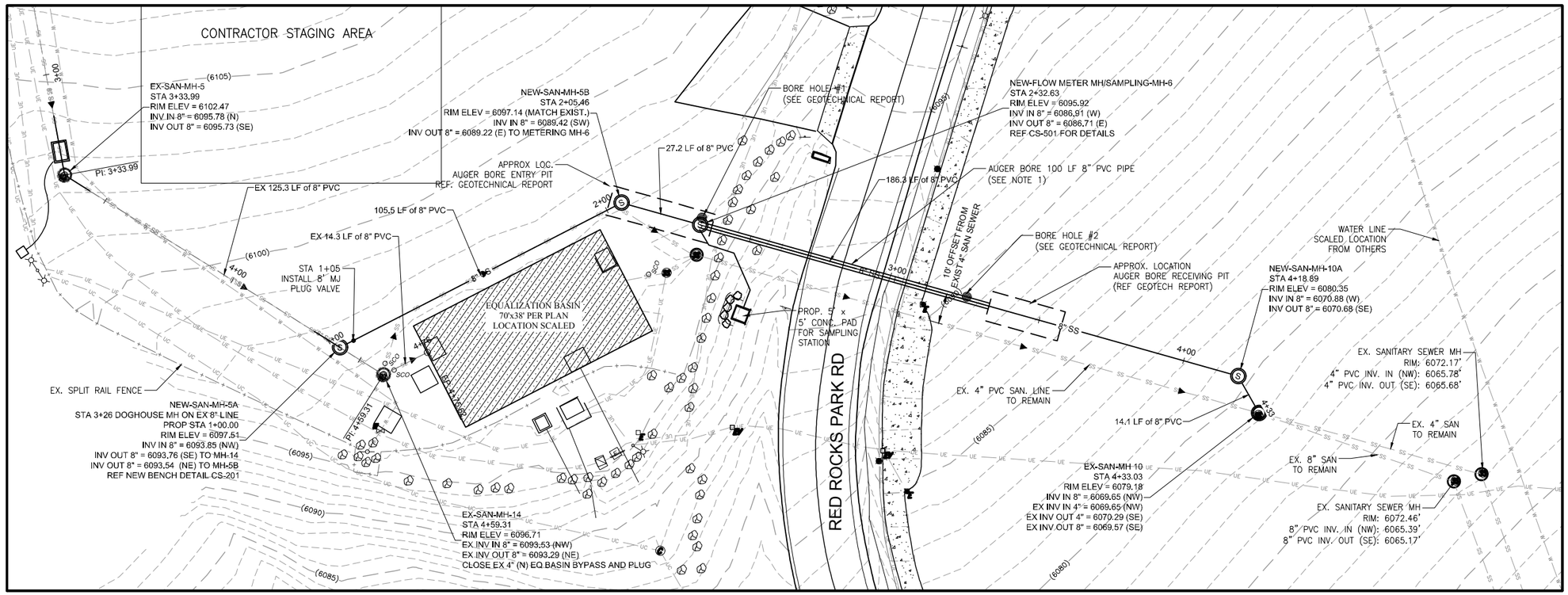

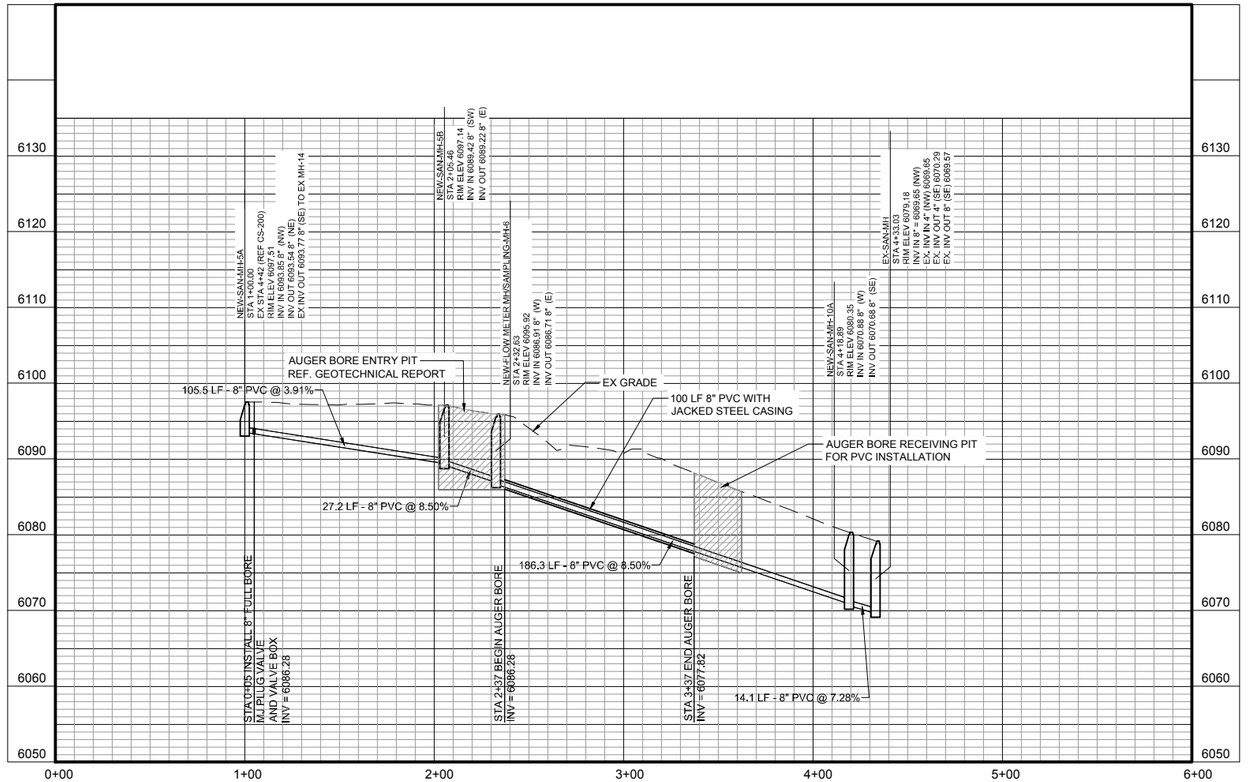

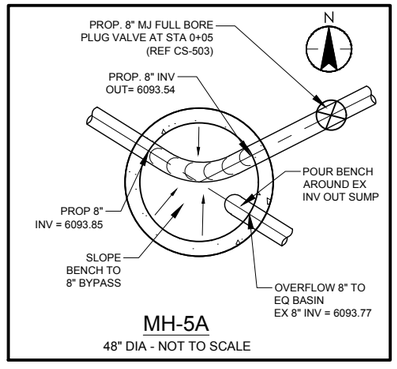

CONSTRUCTION NOTES:

1. SEE LITHOS GEOTECHNICAL DATA REPORT FOR SOILS DATA AT UPSTREAM AND DOWNSTREAM PIT LOCATIONS.
2. CONTRACTOR TO ENSURE BORING DOES NOT CONFLICT WITH EXISTING GEOGRID UNDER ROAD (APPROX 2–3 FT DEEP)
3. CONTRACTOR STAGING AREA SUBJECT TO CHANGE DURING CONCERT SEASON. COORDINATE WITH OWNER
4. WHERE POSSIBLE, CONTRACTOR TO DIVERT WASTE FROM LANDFILLS

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Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
WASTEWATER COLLECTION SYSTEM PLAN AND PROFILE
EXISTING EQ BASIN BYPASS

Permit-Seal
COLORADO LICENSED
ANDREW S. GUTH
41094
PROFESSIONAL ENGINEER
01/23/2019

Project Number: 205305149
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Drawing No. CS-201
Revision C
Sheet 8 of 28

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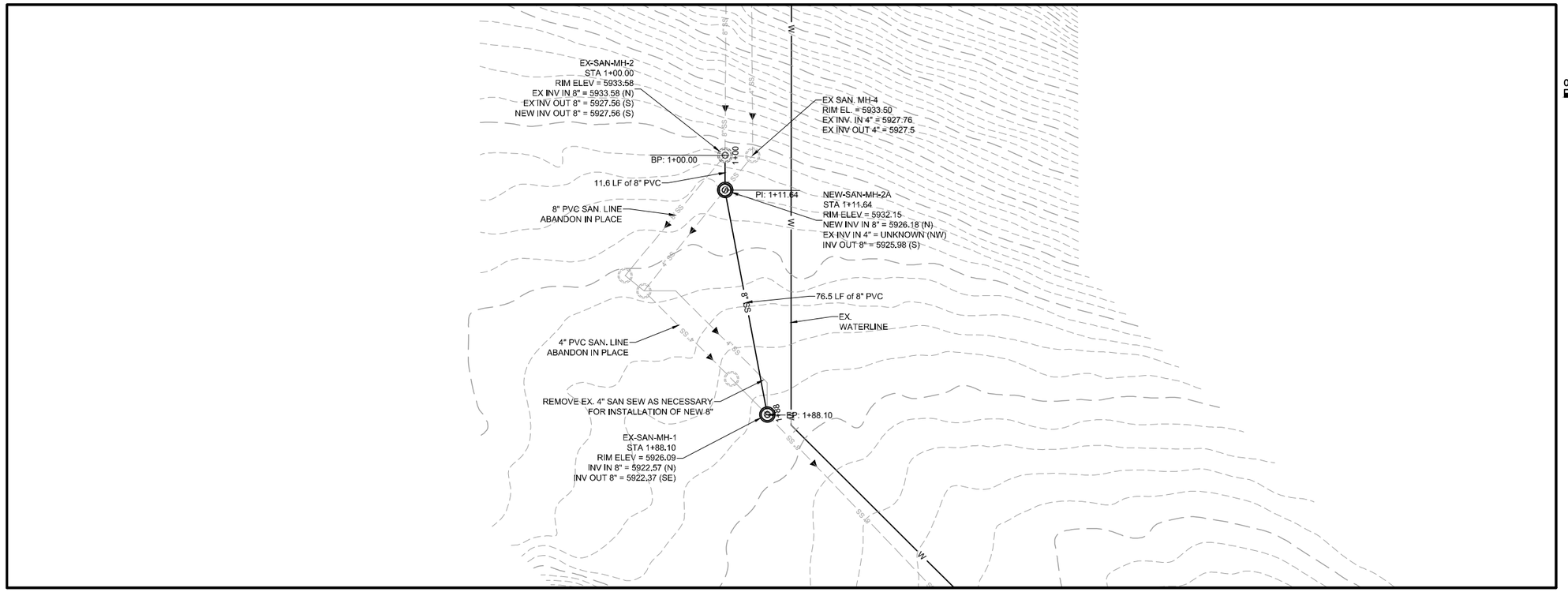
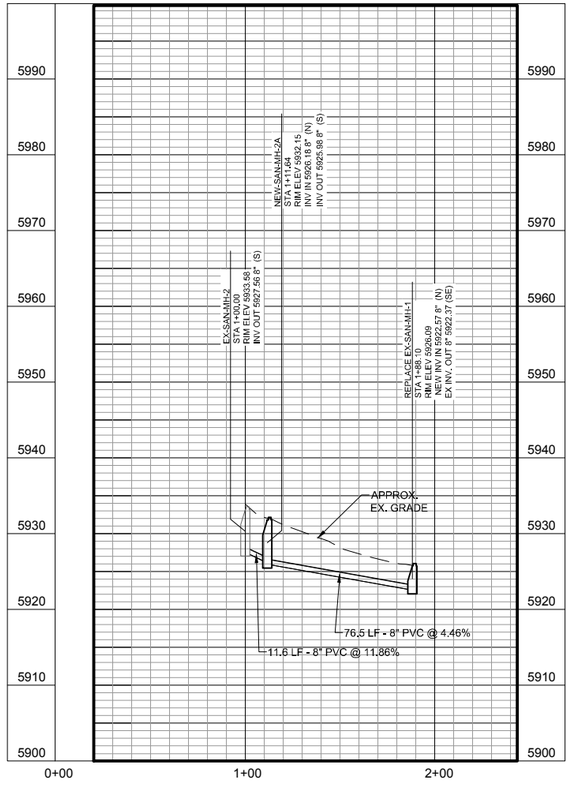
2019.01.23 11:39 AM By: Hoover, Stu

ORIGINAL SHEET - ANSI D





GENERAL NOTES:

1. ORIGINAL CONSTRUCTION ENCOUNTERED SOME SOLID ROCK AT THE BOTTOM OF THE EXCAVATION FROM EX MH-2 TO THE SOUTHWEST. CONTRACTOR TO INCLUDE ALLOWANCE IN BID FOR POTENTIAL ROCK MITIGATION IN THIS AREA.
2. TREES IN THE AREA OF CONSTRUCTION ARE TO REMAIN. SEE TREE PROTECTION DETAIL ON DRAWING CS-503
3. SITE RESTORATION INCLUDES LAYING OF SEED MIX ON THIS SHEET

Red Rocks Seed Mix

Common Name	Scientific Name	PLS Full Seed Rate	%	PLS lbs/Acre
Blue grama	*Bouteloua gracilis*	30	30	3.75
Green needlegrass	*Nassella viridula*	15	10	4.58
Big bluestem	*Andropogon gerardii*	0.6	20	2.5
Sideoats Grama	*Bouteloua curtipendula*	9	20	7.5
Western Wheatgrass	*Pascopyrum (Agropyron) smithii*	16	20	1.67
			100	20

Drill Seeded Rate: 9.63 PLS#/Acre
Broadcast Rate: 19.26 PLS#/Acre
Small Areas Rate: 38.52 PLS#/Acre

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WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

Title
WASTEWATER COLLECTION SYSTEM PLAN AND PROFILE
SOUTH SIDE ALIGNMENT

Permit-Seal

COLORADO LICENSED
ANDREW S. STONE
41794
PROFESSIONAL ENGINEER
01/23/2019

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Drawing No. CS-202
Revision C
Sheet 9 of 28

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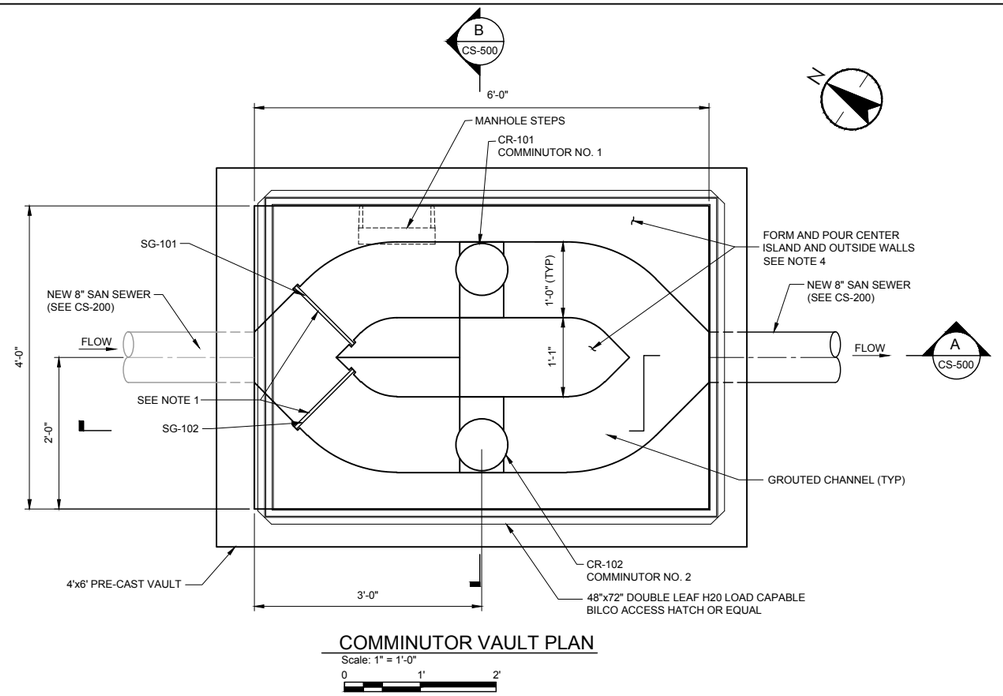
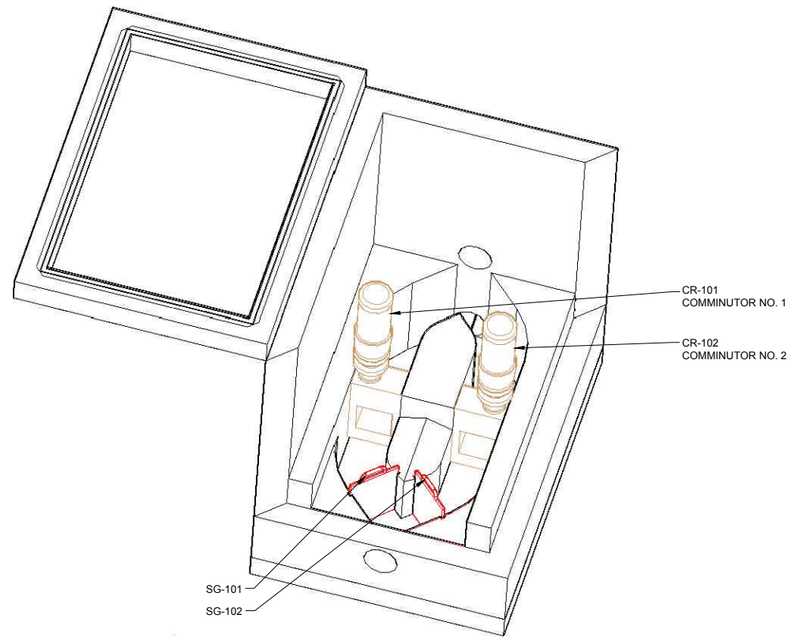


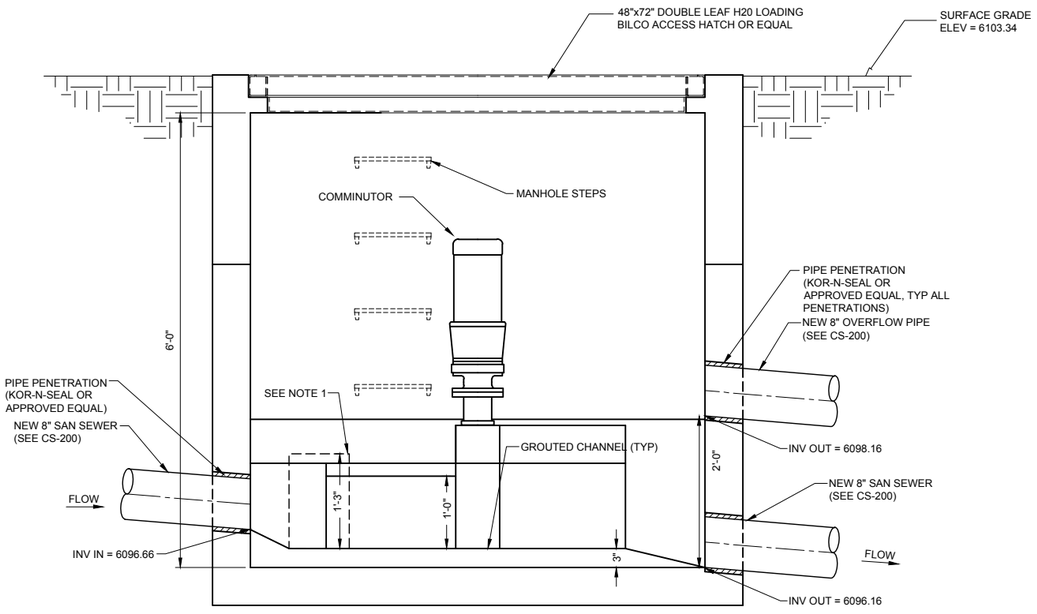
COMMINUTOR VAULT PLAN

Scale: 1" = 1'-0"

0 1' 2'



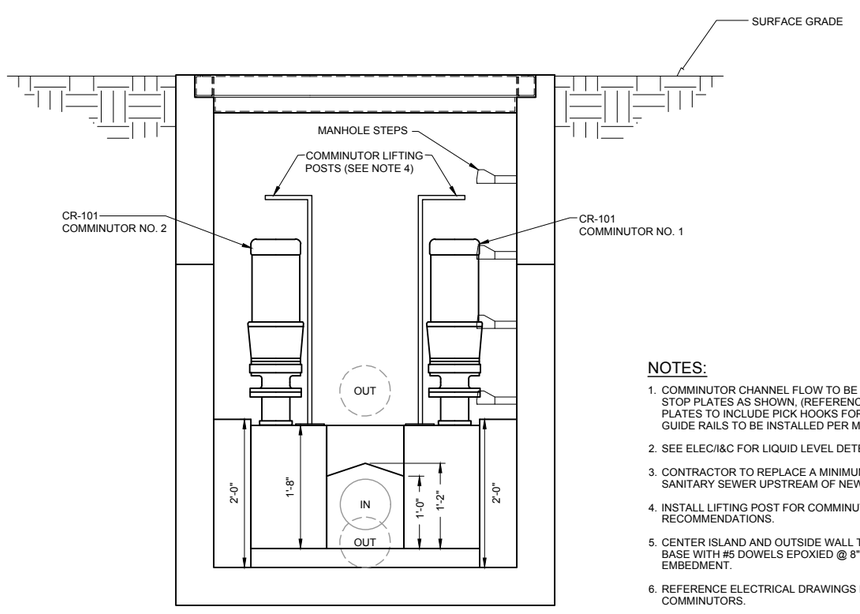
ISOMETRIC VIEW



A SECTION

Scale: 1" = 1'-0"

0 1' 2'



B SECTION

Scale: 1" = 1'-0"

0 1' 2'

NOTES:

1. COMMINUTOR CHANNEL FLOW TO BE CONTROLLED WITH 12" X 15" S.S. STOP PLATES AS SHOWN. (REFERENCE SPECIFICATIONS). STOP PLATES TO INCLUDE PICK HOOKS FOR REMOVAL. STOP PLATES AND GUIDE RAILS TO BE INSTALLED PER MDG'S. RECOMMENDATIONS.
2. SEE ELEC/I&C FOR LIQUID LEVEL DETECTION SYSTEM IN CHANNELS.
3. CONTRACTOR TO REPLACE A MINIMUM OF ONE STICK OF EXISTING 8" SANITARY SEWER UPSTREAM OF NEW VAULT (~10 LF)
4. INSTALL LIFTING POST FOR COMMINUTORS PER MANUFACTURER RECOMMENDATIONS.
5. CENTER ISLAND AND OUTSIDE WALL TO BE CONNECTED TO PRE-CAST BASE WITH #5 DOWELS EPOXIED @ 8" O.C. WITH 6" MINIMUM EMBEDMENT.
6. REFERENCE ELECTRICAL DRAWINGS FOR POWER CONNECTIONS TO COMMINUTORS.

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Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
COMMINUTOR VAULT PLAN
SECTIONS AND ISOMETRIC

Permit-Seal

COLORADO LICENSED
ANDREW G. STONE
41094
PROFESSIONAL ENGINEER
01/23/2019

Project Number: 205305149
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Drawing No. CS-500

Revision C

Sheet 10 of 28

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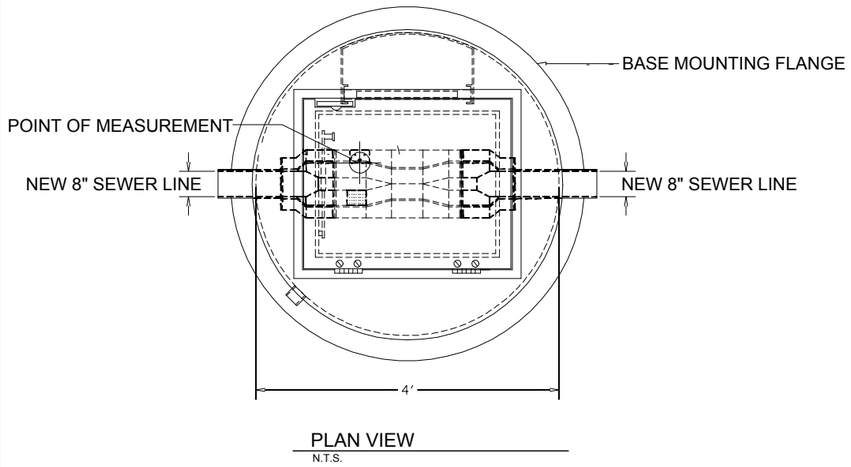
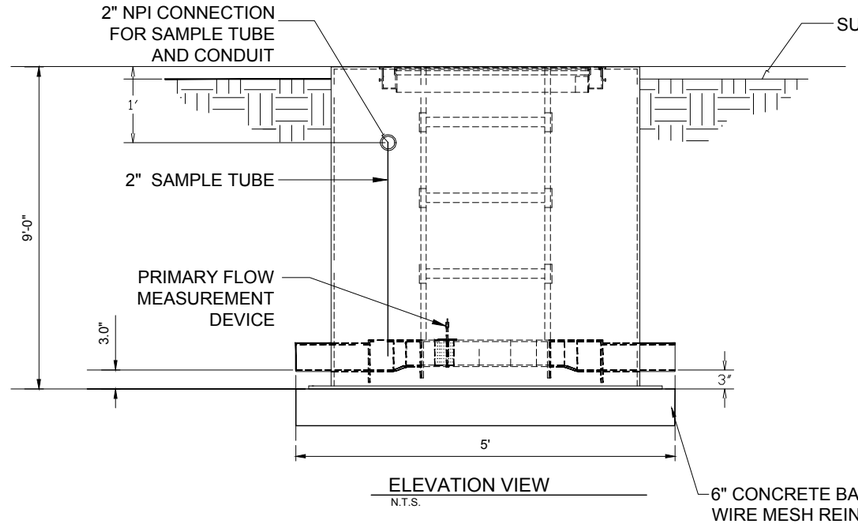


PLAN VIEW
N.T.S.



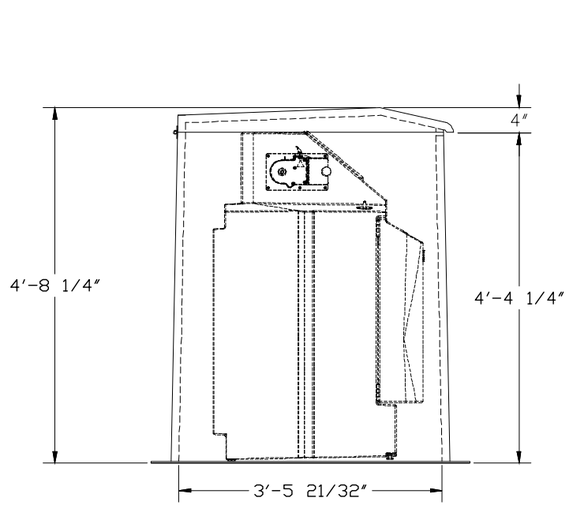
ELEVATION VIEW
N.T.S.

NOTES:

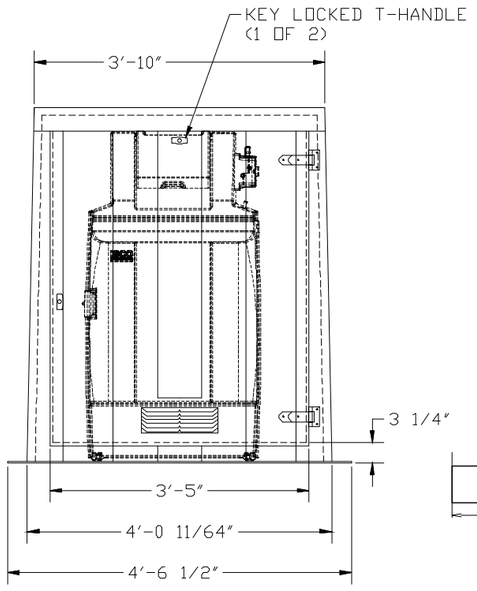
1. FLOW MEASUREMENT MANHOLE TO BE TRACOM MODEL NO. MH-48-TRAPL60- OR APPROVED EQUAL.
2. FLOW METER TO BE ISCO 4210 ULTRASONIC OR APPROVED EQUAL
3. DESIGN RATE OF FLOW THROUGH FLOW MEASUREMENT MANHOLE IS 2 GPM TO 250 GPM.

INCLUDED EQUIPMENT:
PACKAGED METERING MANHOLE, 4'-0" DIAMETER X 5'- 0" DEEP WITH:
-DOME-TOP WITH HOLD-OPEN ARM AND STAPLE FOR USER-SUPPLIED PADLOCK
-60° V EXTRA LARGE TRAPEZOIDAL FLUME (0.0850 – 663.4 GPM)
-INLET AND OUTLET END ADAPTERS
-8" PIPE STUBS WITH FLEXIBLE PVC BOOTS
-STAFF GAUGE (1/10' AND 1/100' INCREMENTS)
-FIXED POSITIONED, STAINLESS STEEL MOUNTING BRACKET
-2" NPT COUPLING (FOR PASSAGE OF SAMPLING LINE AND ULTRASONIC CABLE)
-INTEGRAL BASE MOUNTING FLANGE WITH POLYSTYRENE PAD
-FRP LADDER WITH REINFORCED LADDER RUNGS HAVING A PHOTOLUMINESCENT NON-SLIP TOP SURFACE
-SAMPLER TUBE – T-316 STAINLESS STEEL REMOVABLE SAMPLE TUBE (3/8" DIA) WITH MOLDED-IN SIDE CAVITY.

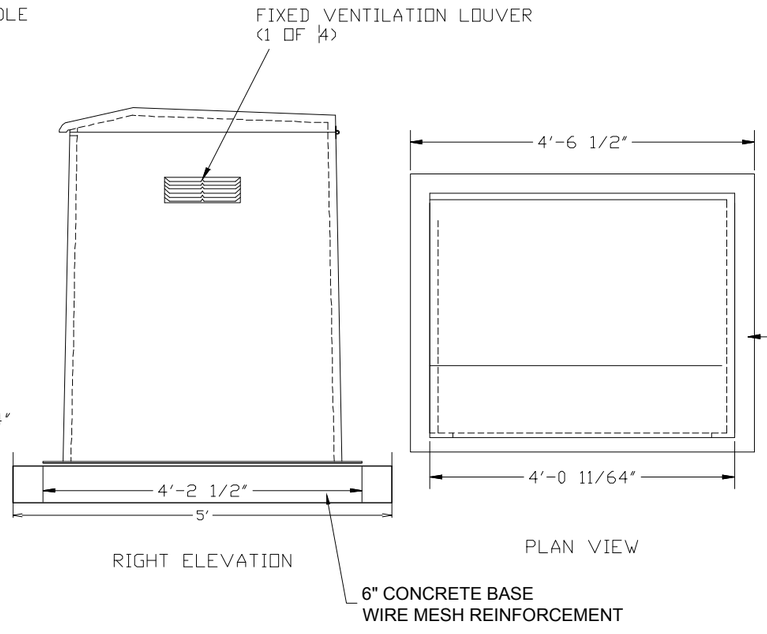
FLOW METERING MANHOLE



LEFT ELEVATION



FRONT ELEVATION



RIGHT ELEVATION

PLAN VIEW

NOTES:

1. REFRIGERATED SAMPLE STATION TO BE TELEDYNE ISCO MODEL 5800 OR APPROVED EQUAL.
2. ENCLOSURE TO BE TRACOM MODEL 200-095 ENCLOSURE OR EQUAL.

REFRIGERATED SAMPLER STATION

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TOWN OF MORRISON
WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS
OFFICE
Title
FLOW METER MANHOLE
AND SAMPLING STATION DETAILS

Permit-Seal

Project Number: 205305149
File Name: 05149-CS-501-RR_METER_MH.dwg

Dwn.	Chkd.	Dsgn.	YY-MM-DD
S.L.H.	S.J.E.	A.S.	18.12.03

Drawing No. CS-501
Revision C
Sheet 11 of 28

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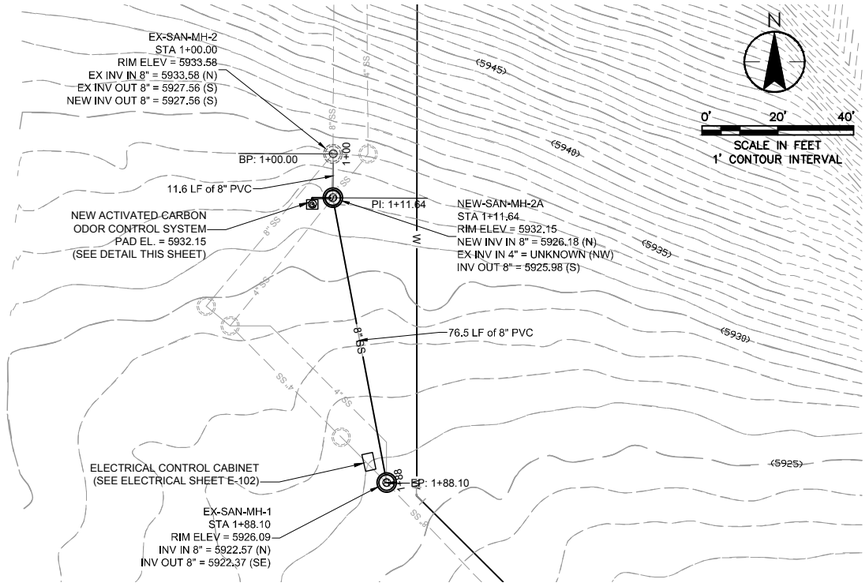
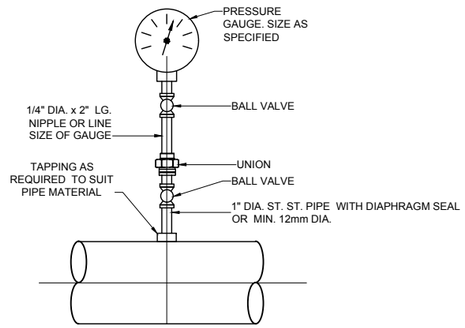
2019.01.23 11:44 AM By: Hoover, Stu

ORIGINAL SHEET - ANSI D



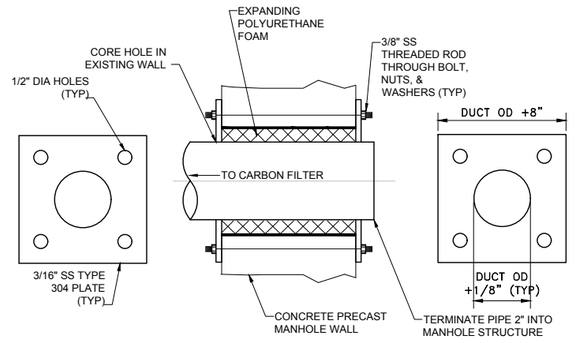
NOTES:

1. SEE ELECTRICAL SHEET E-102 FOR POWER COORDINATION.



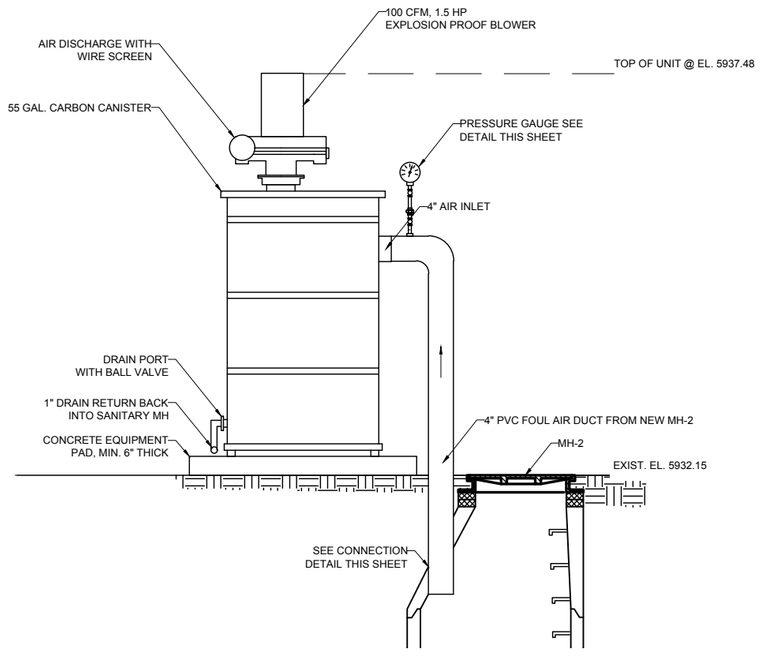
PRESSURE GAUGE CONNECTION ON AIR DUCT DETAIL

SCALE: NONE



TYPICAL DUCT CONNECTION AT MANHOLE WALL

SCALE: NONE



ACTIVATED CARBON ODOR CONTROL SYSTEM

SCALE: NONE

Stantec
1500 Broadway #1800
Denver, CO U.S.A.
www.stantec.com

No.	Revision	By	Appd.	YY.MM.DD
C.	ISSUED FOR BID	S.J.E.	S.J.E.	19.01.23
B.	60% DESIGN PACKAGE	S.J.E.	S.J.E.	18.12.03
A.	30% DESIGN PACKAGE	S.J.E.	S.J.E.	18.07.20
No.	Issued	By	Appd.	YY.MM.DD

Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
ODOR CONTROL
PLAN AND DETAILS

Permit-Seal

Project Number: 205305149
File Name: 05149-CS-502-RR_ODOR_CONTROL.dwg

T.J.L.	S.J.E.	A.S.	18.12.03
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Drawing No. CS-502

Revision C

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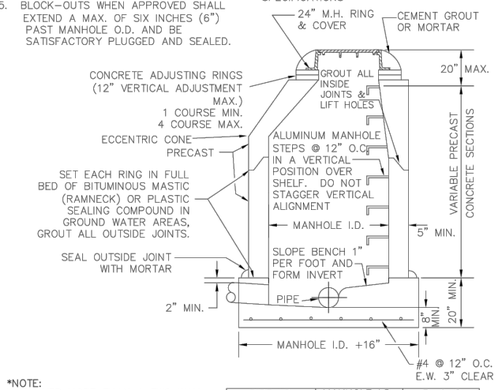
2019.01.23 11:47 AM By: Hoover, Stu

ORIGINAL SHEET - ANSI D

NOTES:
1. MANHOLE BARREL MINIMUM DIAMETER SHALL CONFORM TO TABLE BELOW
2. SHAPING FOR SMOOTH MANHOLE INVERTS MUST BE DONE BY FORMING OR SHAPING BASE CONCRETE. SEE DETAIL S-3
3. MANHOLE STEPS SHALL BE PLASTIC COATED STEEL OR ALUMINUM.
4. PRECAST CONCRETE BARREL SECTIONS SHALL CONFORM TO ASTM C-478
5. BLOCK-OUTS WHEN APPROVED SHALL EXTEND A MAX. OF SIX INCHES (6") PAST MANHOLE O.D. AND BE SATISFACTORY PLUGGED AND SEALED.
6. CONCRETE MANHOLES TO BE BE POURED IN PLACE.
7. ALL MORTAR GROUT SHALL BE MIXED WITH TYPE II CEMENT.
8. BENCH MUST HAVE A BRUSHED, NON-SKID SURFACE.
9. OUTFALL OR DROP MANHOLES SHALL BE LINED WITH SIKARD NO. 62 OR APPROVED EQUAL, COATED WITH MIN. 20 MIL APPLIED IN 4-7 MIL LAYER, PER MANUFACTURERS SPECIFICATIONS



*NOTE:
WHENEVER MORE THAN A TWO WAY MANHOLE OF MAX. PIPE I.D. IS REQUIRED THE MANHOLE SHOULD BE INCREASED TO LARGER DIA., E.G. 18"X18"X18", REQUIRES 5'-0" I.D.

PIPE I.D.	MANHOLE I.D.	R & C.
18" & SMALLER	4'-0"	24"
21" TO 30"	5'-0"	30"
33" TO 42"	6'-0"	30", 36" w/ 24" INNER-COVER
60" & LARGER	SPECIAL DESIGN	

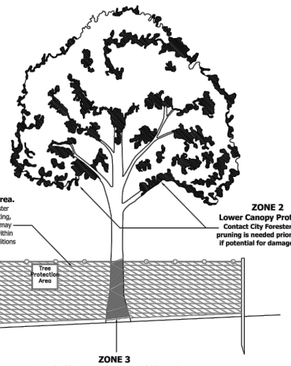
TOWN OF MORRISON

STANDARD MANHOLE DETAIL

DATE: MAY 2012
DETAIL NO. S-1

1 DETAIL
STANDARD MANHOLE DETAIL
N.T.S.

TREE PROTECTION AREA
The area inside a perimeter established at the Critical Root Zone (CRZ). The CRZ is equal to the dripline, furthest extent of tree canopy, or is equal to one foot radially from the tree for every one inch of trunk diameter at breast height (DBH = 4.5' above soil line), or whichever is greater.



ZONE 1
Denotes perimeter of tree protection area.
The following must be authorized by the City Forester prior to work commencement: Any digging, excavating, trenching, changing of grade, or other actions that may potentially impact the rooting environment. Work within the CRZ must take place in accordance with the conditions established by the City Forester.

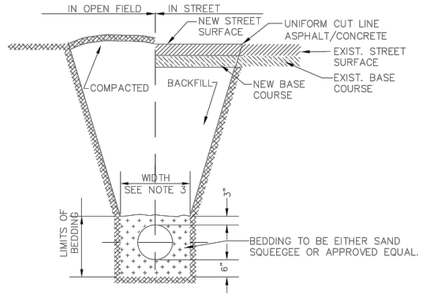
ZONE 2
Lower Canopy Protection
Contact City Forester if any pruning is needed prior to work if potential for damage exists.

ZONE 3
Required if construction occurs within ten feet or less (permitted inside the CRZ only if equipment is operated exclusively on existing hardscape and no soil compaction takes place).

NOTES
1. Denver's Tree Retention and Protection Specifications shall be followed throughout duration of project.
2. Damage to protected trees is subject to penalty per City Ordinance.
3. The Tree Protection Area shall not be modified or removed prior to consent of the City Forester.
4. Entrance to the Tree Protection Area is not permitted without consent of the City Forester.
5. Materials, debris, equipment, and site amenities shall not be stored within the Tree Protection Area.
6. Zone One Tree Protection Area fencing shall be "orange safety fencing," min. 48" in height, top secured to metal T-posts with 14-gauge wire woven through top of fencing for entire length.
   - T-posts shall be placed so that wire & fence are taut.
   - Chain link fencing is also acceptable.
   - "Tree Protection Area" signs shall be maintained in the condition and as posted by City Forester's Office.

REVISIONS MARK	BULLETIN	DATE	PREPARED BY DENVER FORESTRY PARKS AND RECREATION DEPARTMENT	CITY AND COUNTY OF DENVER 201 W. COLFAX AVE. DENVER, COLORADO 80202	STANDARD TREE DETAIL FOR TREE PROTECTION AREA	NOT TO SCALE DATE: Mar 2014 DIAGRAM P-3

2 DETAIL
TREE PROTECTION DETAILS
N.T.S.



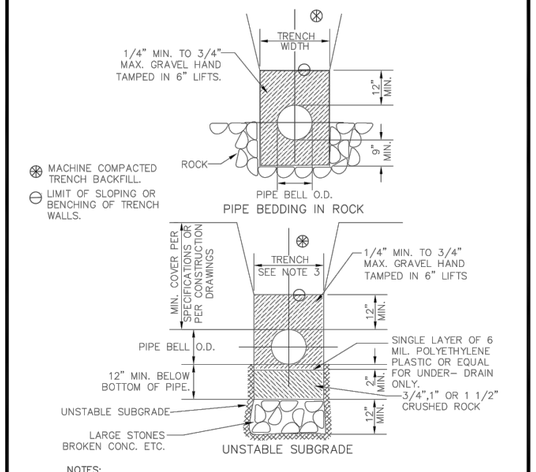
NOTES:
1. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKERS AND PROTECTION OF OTHER UTILITIES IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS.
2. PIPE SHALL BE BEDDED FROM SIX INCHES (6") BELOW THE BOTTOM OF THE PIPE TO THREE INCHES (3") ABOVE THE TOP OF THE PIPE.
3. TRENCH WIDTH SHALL NOT BE MORE THAN SIXTEEN INCHES (16") NOR LESS THAN TWELVE INCHES (12") WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE.
4. COMPACTION FOR THE TOP TWO AND A HALF FEET (2.5') OF TRENCH ZONE SHALL BE 95% S.P.D. IN STREET R.O.W., 90 % S.P.D. OUTSIDE RIGHT-OF-WAY THE REMAINDER OF THE TRENCH SHALL BE 90% S.P.D.

TOWN OF MORRISON

STANDARD BEDDING DETAIL

DATE: MAY 2012
DETAIL NO. S-7

3 DETAIL
STANDARD BEDDING DETAIL
N.T.S.



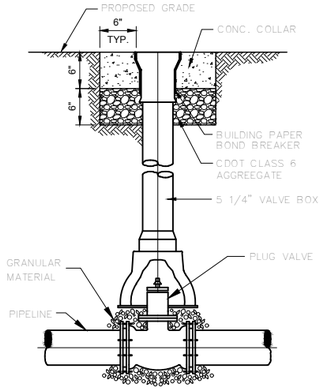
NOTES:
1. MINIMUM COVER TO BE BELOW FINAL STREET GRADE WHEN AVAILABLE.
2. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE PROTECTION OF OTHER UTILITIES AND TO MEET LOCAL, STATE, AND FEDERAL REQUIREMENTS.
3. TRENCH WIDTH SHALL NOT BE MORE THAN SIXTEEN INCHES (16") OR LESS THAN TWELVE INCHES (12") WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE LAID THEREIN. (BELL OR COUPLING O.D., IF APPLICABLE.)

TOWN OF MORRISON

SPECIAL BEDDING DETAIL

DATE: MAY 2012
DETAIL NO. S-8

4 DETAIL
SPECIAL BEDDING DETAIL
N.T.S.



5 DETAIL
VALVE BOX
N.T.S.

Stantec
1560 Broadway #1800
Denver, CO U.S.A.
www.stantec.com

Revision	By	Appd.	YY.MM.DD
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A. 30% DESIGN PACKAGE	S.J.E.	S.J.H.	18.07.20
Issued	By	Appd.	YY.MM.DD

Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
CIVIL DETAILS

Permit-Seal

Project Number: 205305149
File Name: 05149-CS-503-RR_DETAILS.dwg

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Drawing No. CS-503
Revision C
Sheet 13 of 28

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2019.01.23 11:50 AM By: Hoover, Stu

ORIGINAL SHEET - ANSI D

DRAWING SCHEDULE

SHEET	DESCRIPTION	01-24-2019
E-001	GENERAL ELECTRICAL NOTES AND ABBREVIATIONS	●
E-100	OVERALL ELECTRICAL SITE	●
ED-101	EXISTING SITE ELECTRICAL DEMOLITION PLAN	●
E-102	SITE POWER AND CONTROL PLAN	●
E-103	GENERAL ELECTRICAL DETAILS & SCHEDULES	●
	TOTAL SHEETS IN ISSUE:	05

GENERAL PROJECT NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENTLY ADOPTED NEC AND LOCAL CODES.
2. DATA PRESENTED ON THESE DRAWINGS ARE AS ACCURATE AS PLANNING CAN DETERMINE, BUT FIELD VERIFICATION OF ALL DIMENSIONS, LOCATIONS, LEVELS, ETC. TO SUIT FIELD CONDITIONS IS REQUIRED. REVIEW ALL CIVIL DETAILS AND ADJUST WORK TO MEET THE REQUIREMENTS OF CONDITIONS SHOWN. DISCREPANCIES BETWEEN DIFFERENT PLANS OR BETWEEN DRAWINGS AND SPECIFICATIONS, OR REGULATIONS AND CODES GOVERNING THE INSTALLATION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING.
3. ALL WORK SHALL BE COMPLETED IN A NEAT AND WORKMANLIKE MANNER AND IN ACCORDANCE WITH NECA STANDARDS.
4. ALL WORK SHALL BE SUBJECT TO INSPECTION AND POSSIBLE REJECTION IF NOT IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS AND INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
5. ANY REJECTED WORK SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER.
6. PROVIDE REPRODUCIBLE RECORD DRAWINGS OF ALL COMPLETED WORK.
7. MINIMUM SEPARATIONS FOR OTHER UTILITIES ARE AS FOLLOWS UNLESS OTHERWISE REQUIRED BY THE LOCAL UTILITIES. POWER OR OTHER FOREIGN CONDUIT: 3" CONCRETE, 4" MASONRY, 12" WELL TAMPED EARTH. PIPES (OIL, GAS, ETC.) 6" WHEN CROSSING, 12" WHEN PARALLEL. STORM DRAIN: 6" WHEN CROSSING, 12" WHEN PARALLEL. WATER, SANITARY SEWER: 18" WHEN CROSSING, 5' WHEN PARALLEL.
8. IT IS CONTRACTOR'S RESPONSIBILITY TO CALL 1-800-227-2600 PRIOR TO DIGGING. IT IS ALSO THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL NON-UTILITY UNDERGROUND ITEMS.
9. DAMAGE TO ANY UTILITIES SHALL BE REPAIRED IMMEDIATELY IN COMPLIANCE WITH THE DAMAGED UTILITY OWNER AND INSPECTED PRIOR TO BACKFILL. THE CONTRACTOR SHALL COORDINATE WITH LOCAL UTILITIES PRIOR TO INSTALLATION OF NEW DUCTBANK.
10. THE CONTRACTOR SHALL REMOVE FROM THE JOB SITE ALL DISCARD AND ABANDONED MATERIALS FROM DEMOLITION AND INSTALLATION. THIS INCLUDES BUT IS NOT LIMITED TO CONDUIT, FASTENERS, BOXES, & ETC. MATERIALS EMBEDDED IN GRADE AND / OR CONCRETE MAY BE ABANDONED IN PLACE. ALL ABANDONED CONDUIT SHALL BE CAPPED.
11. DO NOT SPLICE FEEDER CONDUCTORS UNLESS PRIOR APPROVAL HAS BEEN OBTAINED FROM THE ENGINEER.
12. THE MAXIMUM NUMBER OF CONDUIT BENDS SHALL NOT BE GREATER THAN 270 DEGREES BETWEEN PULLING STRUCTURES. THIS INCLUDES THE AGGREGATE OF ALL HORIZONTAL AND VERTICAL CHANGES.
13. ALL CONDUIT, INNERDUCT, PULLBOXES AND VAULTS SHALL BE LABELED PER THE SPECIFICATIONS.
14. EACH CONDUIT AND INNERDUCT SHALL BE PROVIDED WITH A 1250 LBS. PULL ROPE.

ELECTRICAL LEGEND

AUGUST 2011

- PANELBOARD: SURFACE MOUNTED
- PANELBOARD: FLUSH MOUNTED
- SWITCHBOARD OR DISTRIBUTION PANEL
- XF TRANSFORMER
- PULLBOX / VAULT
- MOTOR STARTER
- COMBINATION MOTOR STARTER
- COMBINATION MOTOR STARTER PROVIDED BY OTHERS
- F DISCONNECT SWITCH - FUSIBLE (FUSED PER EQUIP. NAMEPLATE)
- N DISCONNECT SWITCH - NON-FUSIBLE
- DISCONNECT SWITCH PROVIDED BY OTHERS
- VARIABLE FREQUENCY DRIVE
- VARIABLE FREQUENCY DRIVE PROVIDED BY OTHERS
- CB ENCLOSED CIRCUIT BREAKER
- GROUND ROD
- SHUNT TRIP STATION OR EMERGENCY PUSHBUTTON
- M REMOTE METER

- $ SINGLE POLE SWITCH 48" AFF (UNO)
- $_3 THREE WAY SWITCH 48" AFF (UNO)
- $_4 FOUR WAY SWITCH 48" AFF (UNO)
- $_K KEY OPERATED SWITCH 48" AFF (UNO)
- $_L SWITCH WITH LIGHTED HANDLE
- $_M MANUAL MOTOR STARTER
- $_P SWITCH WITH PILOT LIGHT 48" AFF (UNO)
- $_T TIME WALL SWITCH 48" AFF (UNO)
- D DIMMER OPERATED SWITCH 48" AFF (UNO)
- OCCUPANCY SENSOR - WALL MOUNTED 48" AFF (UNO)
- OCS = 360°
- OCS = 180°
- OCS = 90°

  OCCUPANCY SENSOR - CEILING MOUNTED. ARROWS INDICATE COVERAGE, DIRECTION & PATTERN. PROVIDE WITH POWER PACK PER MFG REQUIREMENTS.
- CONTROL STATION
- CONTACTOR OR RELAY
- PC PHOTOELECTRIC CELL (ON ROOF FACING NORTH UNO)
- TC TIMECLOCK

- CONDUIT/RACEWAY IN WALL OR ABOVE CEILING
- CONDUIT/RACEWAY BELOW GRADE OR BELOW FLOOR
- CONDUIT/RACEWAY UP
- CONDUIT/RACEWAY DOWN
- BREAK OR RUN CONTINUES
- —OH— OVERHEAD SERVICE
- — P — PRIMARY
- — S — SECONDARY
- — C — COMMUNICATIONS OR SIGNAL
- — T — TELEPHONE
- —TV— TELEVISION
- — • — LOW VOLTAGE AND/OR CONTROL WIRING
- -✳-✳- EMERGENCY CIRCUIT
- CONDUIT/RACEWAY STUB OUT: MARK AND CAP (SITE)
- CONDUIT/RACEWAY SLEEVE

- SINGLE RECEPTACLE: 20A, 125V, NEMA 5-20, +18" AFF (UNO)
- DUPLEX RECEPTACLE: 20A, 125V, NEMA 5-20, +18" AFF (UNO)
- DUPLEX RECEPTACLE: HALF SWITCHED
- DUPLEX RECEPTACLE: FLOOR MOUNTED
- QUAD RECEPTACLE: 20A, 125V, NEMA 5-20, +18" AFF (UNO)
- QUAD RECEPTACLE: FLOOR MOUNTED
- ISOLATED GROUND TYPE RECEPTACLE (ORANGE TRIANGLE) - 20A, 125V, NEMA 5-20IG, +18" AFF (UNO)
- DUPLEX RECEPTACLE GFI TYPE - 20A, 125V, NEMA 5-20 GFI +18" AFF (UNO)
- DUPLEX RECEPTACLE: ABOVE COUNTER (VERIFY HEIGHT)
- SPECIAL PURPOSE RECEPT.: SEE DWGS FOR NEMA CONFIG.
- DUPLEX RECEPTACLE: CEILING MOUNTED
- MULTI-OUTLET ASSEMBLY: SPACING PER DWGS

- DATA / VOICE OUTLET: 18" AFF (UNO) - 1 VOICE, 1 DATA JACK, 2 BLANKS
- DATA / VOICE OUTLET: FLOOR MOUNTED
- DATA / VOICE OUTLET: ABOVE COUNTER (VERIFY HEIGHT)
- MULTI-OUTLET ASSEMBLY: SPACING PER DWGS
- TELEPHONE OUTLET: 18" AFF (UNO)
- DATA OUTLET: 18" AFF (UNO)
- S SPEAKER
- TV TELEVISION OUTLET: 18" AFF (UNO)
- TELEPHONE TERMINAL BOARD (TTB)
- VC VOLUME CONTROL
- GROUNDING BAR

- a b LIGHTING FIXTURE - LOWERCASE LETTER DENOTES SWITCHING (a = CENTER LAMP, b = OUTER LAMPS)
- WALL MOUNTED FIXTURE
- RECESSED DOWNLIGHT
- SURFACE LUMINAIRE
- POLE MOUNTED LIGHT (# OF HEADS INDICATED ON DRAWING)
- FLUORESCENT STRIP FIXTURE
- BOLLARD
- RECESSED DOWNLIGHT (WALL WASH)
- TRACK LIGHTING
- EMERGENCY LIGHTING UNIT
- EXIT SIGN FIXTURE - SHADED AREA DENOTES LIGHTED FACE - ARROWS DENOTE DIRECTION
- EMERGENCY FIXTURE

- T THERMOSTAT (PROVIDED BY MECH. CONTRACTOR UNO)
- J JUNCTION BOX (SIZE AS REQUIRED UNO)
- 3 SHEET NOTE DESIGNATION
- F1 FIXTURE DESIGNATION: F1=TYPE (SEE FIXTURE SCH.)
- 3 REVISION DELTA: NUMBER REPRESENTS REVISION
- 1253 FEEDER DESIGNATION
- AHU 2 EQUIPMENT CONNECTION

20	SINGLE POLE CIRCUIT BREAKER
20/2	TWO POLE CIRCUIT BREAKER
20/3	THREE POLE CIRCUIT BREAKER
20A	ARC FAULT CIRCUIT BREAKER
20C	CONTROLLABLE CIRCUIT BREAKER
20G	GFI CIRCUIT BREAKER

L	= LIGHTING
R	= RECEPTACLES
E	= EQUIPMENT
M	= MOTOR
M1	= LARGEST MOTOR
K	= KITCHEN EQUIP
H	= ELECTRIC HEAT

- GF GROUND FAULT INTERRUPTER DEVICE
- M METERING DEVICE
- MM REMOTE METER
- ST SHUNT TRIP DEVICE
- TRANSFORMER
- CURRENT TRANSFORMER
- G GENERATOR
- # MOTOR - # INDICATES HP
- INTERRUPTER SWITCH
- GFI GROUND FAULT RELAY W/ CT OR SENSOR
- FUSE
- CIRCUIT BREAKER
- DRAWOUT CIRCUIT BREAKER
- A 3 TRANSFER SWITCH (A=AUTOMATIC, M=MANUAL) # FOR POLES 2, 3 OR 4
- SPD SURGE PROTECTION DEVICE

- NORMALLY OPEN (NO) CONTACT
- NORMALLY CLOSED (NC) CONTACT
- C COIL - VOLTAGE PER CONTROL DIAGRAMS
- PILOT LIGHT (LED) PUSH-TO-TEST. LETTER INDICATES COLOR (R=RED, G=GREEN, A=AMBER, Y=YELLOW)
- PILOT LIGHT (LED) NON PUSH-TO-TEST
- THERMAL OVERLOAD
- MAGNETIC OVERLOAD
- PUSH BUTTON NORMALLY OPEN (NO)
- PUSH BUTTON NORMALLY CLOSED (NC)
- H O A HAND-OFF-AUTO (HOA) SELECTOR SWITCH
- LIMIT SWITCH NORMALLY OPEN (NO)
- LIMIT SWITCH NORMALLY CLOSED (NC)
- R PUSH BUTTON ILLUMINATED (LED)

- TICS = NO. OF #12 WIRES (UNO) IF MORE THAN TWO WITHIN RACEWAY. GROUNDING CONDUCTOR (NOT SHOWN) ALWAYS REQUIRED.
  - ISOLATED GROUNDING CONDUCTOR
  - NEUTRAL CONDUCTOR
  - PHASE CONDUCTOR(S)
- BRANCH CIRCUIT (WHEN TIC MARKS ARE NOT SHOWN) = (1) PHASE, (1) NEUTRAL AND (1) GROUNDING CONDUCTOR
- HOMERUN TO PANELBOARD OR DEVICE
- HA-[1,3,5,3N]G HOMERUN CIRCUIT DESIGNATION
  - GROUNDING CONDUCTOR
  - NEUTRAL CONDUCTOR (N=1, 2N=2 NEUTRALS, 3N=3 NEUTRALS)
  - PHASE CONDUCTOR(S)
  - PANELBOARD DESIGNATION
- HA-(1.3.5)G HOMERUN CIRCUIT DESIGNATION (3 PHASE CIRCUIT SHOWN)
  - GROUNDING CONDUCTOR
  - PHASE CONDUCTOR(S)
  - PANELBOARD DESIGNATION

A	AMPS
ADA	AMERICANS WITH DISABILITIES ACT
AFC	ABOVE FINISHED CEILING
AFCI	ARC-FAULT CIRCUIT INTERRUPTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AMP INTERRUPTING CAPACITY
AL	ALUMINUM
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BC	BARE COPPER
BKR	BREAKER
C	CONDUIT/RACEWAY
CEC	CALIFORNIA ENERGY COMMISSION
CKT	CIRCUIT
CLG	CEILING
CO	CONDUIT/RACEWAY ONLY
CT	CURRENT TRANSFORMER
CU	COPPER
DB	DISTRIBUTION BOARD
DDC	DIRECT DIGITAL CONTROLLER
DPDT	DOUBLE-POLE, DOUBLE-THROW
DPST	DOUBLE-POLE, SINGLE-THROW
DWG	DRAWING
(E)	EXISTING TO REMAIN
ELEC	ELECTRICAL
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
(F)	FUTURE
FLA	FULL LOAD AMPS
FMC	FLEXIBLE METAL CONDUIT (STEEL)
FPEN	FUSE PER EQUIP. NAMEPLATE
GFI	GROUND FAULT INTERRUPT
GFR	GROUND FAULT RELAY
GND	GROUND
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTO SWITCH
HP	HORSEPOWER
HSKP	HOUSEKEEPING
IMC	INTERMEDIATE METAL CONDUIT
J-BOX	JUNCTION BOX
K	kcmil (300K = 300 kcmil)
KVA	KILOVOLT AMPS
KW	KILOWATT
LTG	LIGHTING
IG	ISOLATED GROUND
MCB	MAIN CIRCUIT BREAKER
MCM	THOUSAND CIRCULAR MILS
MFG	MANUFACTURER
MLO	MAIN LUGS ONLY
MS	MOTOR STARTER
MSB	MAIN SWITCHBOARD
MTS	MANUAL TRANSFER SWITCH
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHTLIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
NVE	NV ENERGY
P	POLE
PH/Ø	PHASE
PV	PHOTOVOLTAIC
PNL	PANEL
PTC	PV USA TEST CONDITIONS
PWR	POWER
(R)	RELOCATED
RAC	RIGID ALUMINUM CONDUIT
RFC	RIGID FIBERGLASS CONDUIT
RSC	RIGID STEEL CONDUIT
SE	SERVICE ENTRANCE
SPD	SURGE PROTECTION DEVICE
SPDT	SINGLE-POLE, DOUBLE-THROW
SPST	SINGLE-POLE, SINGLE-THROW
STC	STANDARD TEST CONDITIONS
SW	SWITCH
TE	TELECOM
TTB	TELEPHONE TERMINATION BOARD
TYP	TYPICAL
UL	UNDERWRITER'S LABORATORY
UNO	UNLESS NOTED OTHERWISE
UNSW	UNSWITCHED
UPS	UNINTERRUPTED POWER SUPPLY
V	VOLTS
VA	VOLT AMPS
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS
WP	WEATHER PROOF
(X)	EXISTING TO BE REMOVED
XFMR OR XF	TRANSFORMER

NOTE: THIS IS A MASTER SYMBOL LIST. IT MAY BE THAT NOT ALL SYMBOLS SHOWN ARE USED WITHIN THIS SET OF PLANS. HEIGHTS GIVEN ARE TO CENTER LINE OF DEVICE.

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C. ISSUED FOR BID	S.J.E.	S.J.E.	19.01.23
B. 60% DESIGN PACKAGE	S.L.H.	S.J.E.	18.12.03
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Issued	By	Appd.	YY.MM.DD

Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
GENERAL ELECTRICAL NOTES AND ABBREVIATIONS

Permit-Seal
COLORADO LICENSED
KAREN E. PURVIS
41898
01/23/2019
PROFESSIONAL ENGINEER

Project Number: 205305149
File Name:

PKT	AW	AW	01.23.19
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. E-001
Revision C
Sheet 14 of 28

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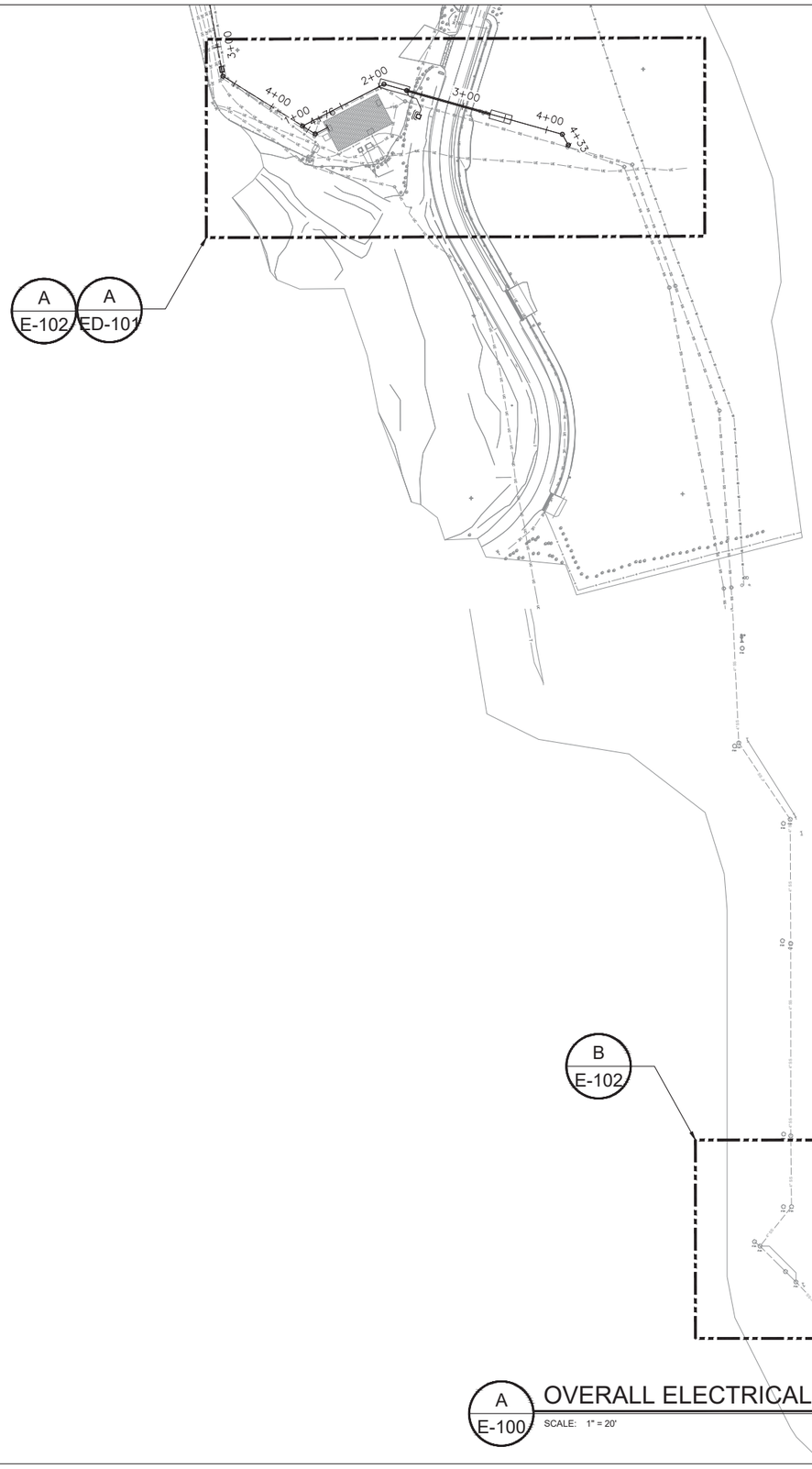

A E-100 OVERALL ELECTRICAL SITE PLAN

SCALE: 1" = 20'

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Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
OVERALL ELECTRICAL SITE

Permit-Seal

COLORADO LICENSED
ANDREW J. WHITE
41898
01/23/2019
PROFESSIONAL ENGINEER

Project Number: 205305149

File Name:

PKT	AW	AW	01.23.19
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Drawing No. E-100

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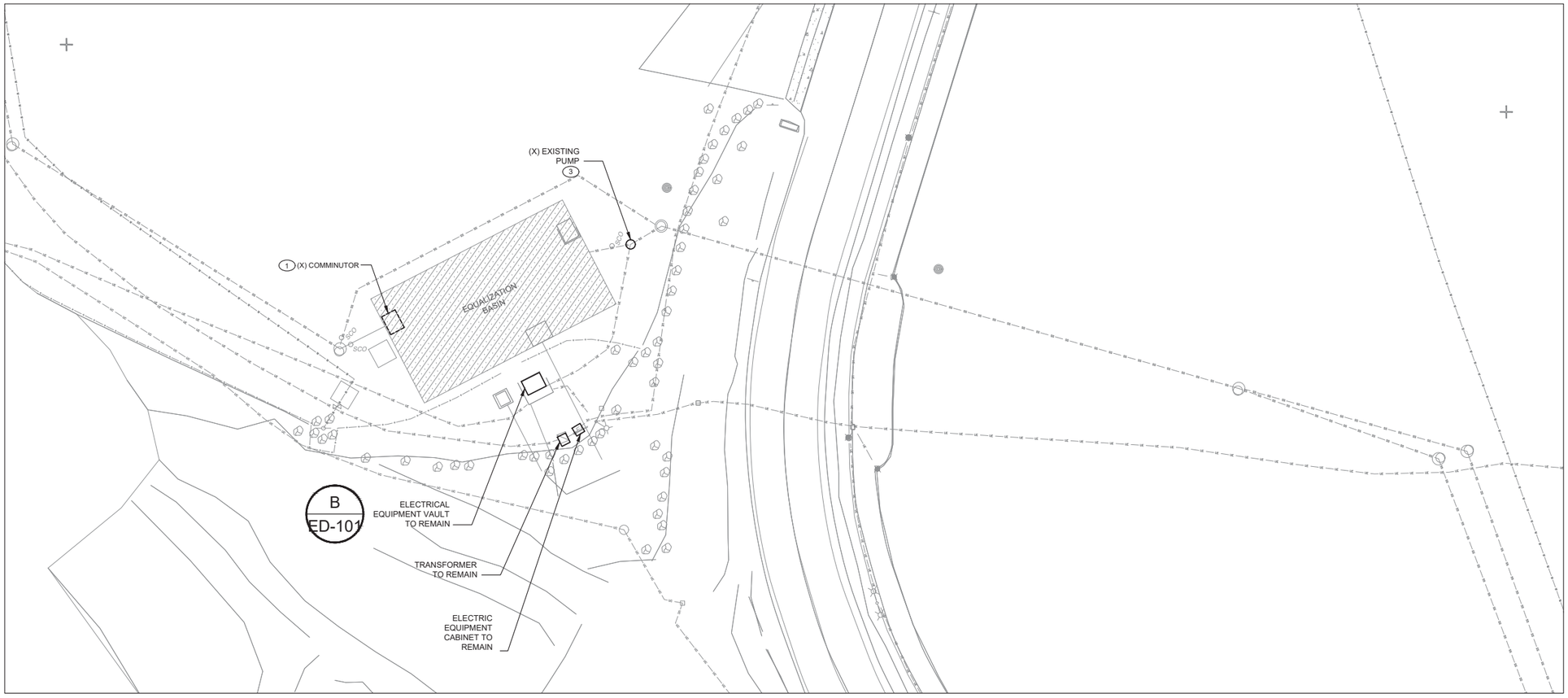
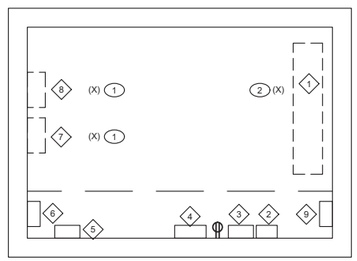


A ED-101 ENLARGED EQUALIZATION BASIN AREA - DEMOLITION PLAN

SCALE: 1" = 20'

ELECTRICAL EQUIPMENT VAULT

1	AERATOR EAST & WEST CONTROLLER CABINET (TO BE REMOVED)
2	(2) J-BOXES
3	LS2 LIGHTING CONTACTOR CABINET
4	ELECTRIC PANEL LP-1 (A)
5	J-BOX
6	J-BOX
7	COMMINUTOR PANEL (TO BE REMOVED)
8	COMMINUTOR CONTROL PANEL (TO BE REMOVED)
9	SIEMENS SITRANS FM MAG 6000



B ED-101 ENLARGED ELECTRICAL EQUIPMENT VAULT

SCALE: NTS

GENERAL NOTES - DEMOLITION

1. THIS DRAWING REPRESENTS THE EXISTING LIGHTING, POWER AND COMMUNICATIONS SYSTEMS WITHIN THE EXISTING BUILDING (AREA TO BE REMODELED). THE CONTRACTOR IS RESPONSIBLE FOR REMOVING, RELOCATING AND REWIRING ALL EQUIPMENT AS INDICATED ON THE DRAWINGS, INCLUDING EQUIPMENT THAT LIES WITHIN WALLS AND CEILINGS TO BE DEMOLISHED OR REMODELED.
2. (X) AND/OR DASHED LINES INDICATE EXISTING EQUIPMENT TO BE REMOVED, (R) AND/OR DASHED LINES INDICATE EXISTING EQUIPMENT TO BE RELOCATED, (E) AND/OR SOLID LINES INDICATE EXISTING EQUIPMENT TO REMAIN UNLESS NOTED OTHERWISE.
3. SALVAGEABLE ITEMS REMOVED DURING DEMOLITION SHALL BE OFFERED TO OWNER PRIOR TO DISPOSAL OR REMOVAL FROM SITE.
4. EXISTING CIRCUITS AS INDICATED ARE BASED ON CASUAL FIELD OBSERVATION AND INFORMATION PER RECORD DRAWINGS AND SHALL BE FIELD VERIFIED BY ELECTRICAL CONTRACTOR PRIOR TO START OF DEMOLITION WORK.
5. THE CONTRACTOR SHALL SALVAGE AND REUSE EXISTING BOXES AND CONDUIT WHERE POSSIBLE. DAMAGED CONDUIT, FITTINGS BOXES, ETC. MAY NOT BE RE-USED. NEW CIRCUITING AS INDICATED ON THE DRAWINGS IS SHOWN FOR INTENT ONLY AND MAY VARY BASED ON ACTUAL FIELD CONDITIONS (NEW CIRCUITING SHALL MATCH EXISTING WHERE POSSIBLE TO UTILIZE EXISTING HOME-RUN CONDUITS, ETC.). KEEP AS-BUILT DRAWINGS CURRENT WITH ANY DEVIATION IN CIRCUITING FROM WHAT IS INDICATED WITHIN THESE PLANS.
6. THE CONTRACTOR SHALL REMOVE FROM THE JOB SITE ALL DISCARDED AND ABANDONED MATERIALS LEFT OVER FROM DEMOLITION AND INSTALLATION. THIS INCLUDES, BUT IS NOT LIMITED TO, CONDUIT, FASTENERS AND BOXES. MATERIALS EMBEDDED IN GRADE AND / OR CONCRETE MAY BE ABANDONED IN PLACE. ALL ABANDONED CONDUIT SHALL BE CAPPED.
7. CONTRACTOR SHALL FIELD VERIFY EXISTING CIRCUITS FEEDING EXISTING EQUIPMENT PRIOR TO SITE DEMOLITION PHASE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CIRCUIT INTEGRITY FOR ALL EXISTING EQUIPMENT TO REMAIN.

SHEET NOTES

1. EXISTING COMMUNITOR AND ALL ASSOCIATED CONTROLS, CONDUIT, WIRE, DISCONNECT SWITCH ETC. SHALL BE REMOVED. REMOVE CONDUIT AND WIRE BACK TO TERMINATION POINTS OR POWER SOURCE. (PANEL LP-1(A) SEE DRAWING E-103.
2. EXISTING AERATOR CONTROLLER CABINET AND ALL ASSOCIATED CONTROLS, CONDUIT, WIRE, DISCONNECT SWITCHES SHALL BE REMOVED. REMOVE CONDUIT AND WIRE BACK TO TERMINATION POINT OR POWER SOURCE.
3. EXISTING PUMP AND ALL ASSOCIATED CONTROLS, CONDUIT, WIRE, DISCONNECT SWITCHES SHALL BE REMOVED. REMOVE CONDUIT AND WIRE BACK TO TERMINATION POINT OR POWER SOURCE.

N

0 20' 40'

1" = 20'
1' CONTOUR INTERVAL

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Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
EXISTING SITE ELECTRICAL DEMOLITION PLAN

Permit-Seal
COLORADO LICENSED
ANDREW W. PUMMILL
41898
01/23/2019
PROFESSIONAL ENGINEER

Project Number: 205305149
File Name:

PKT	AW	AW	01.23.19
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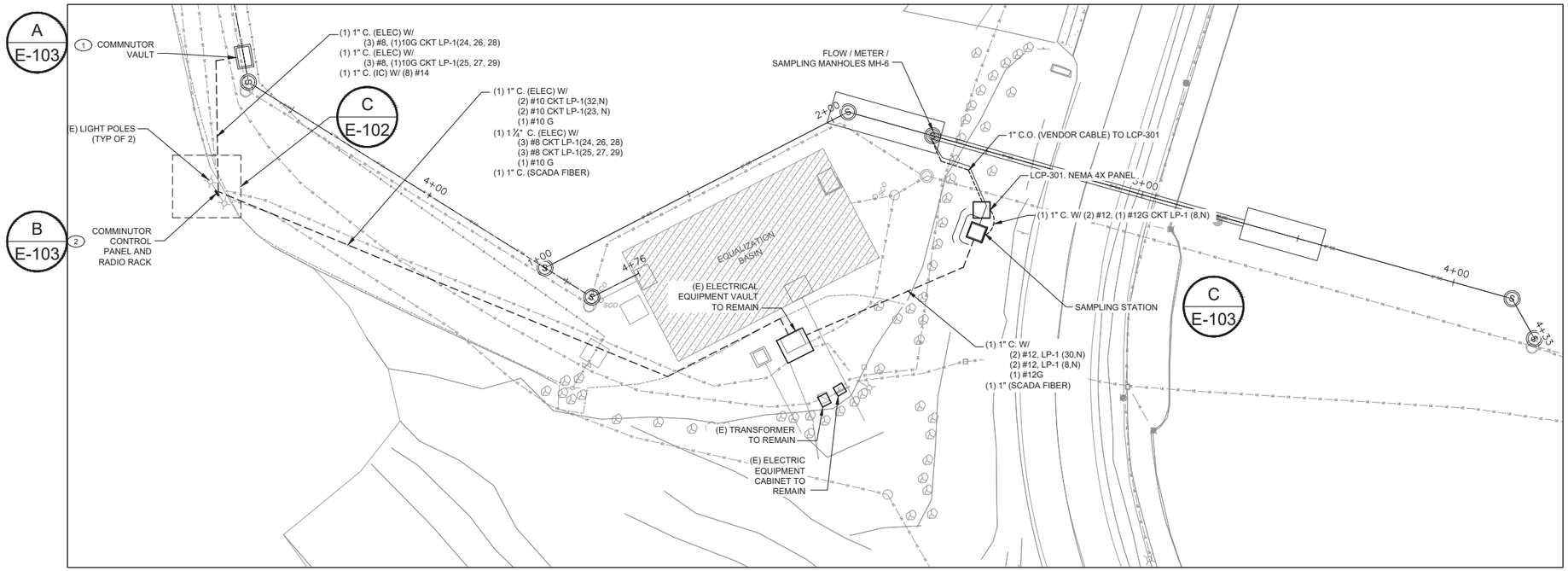
Drawing No. ED-101

Revision C

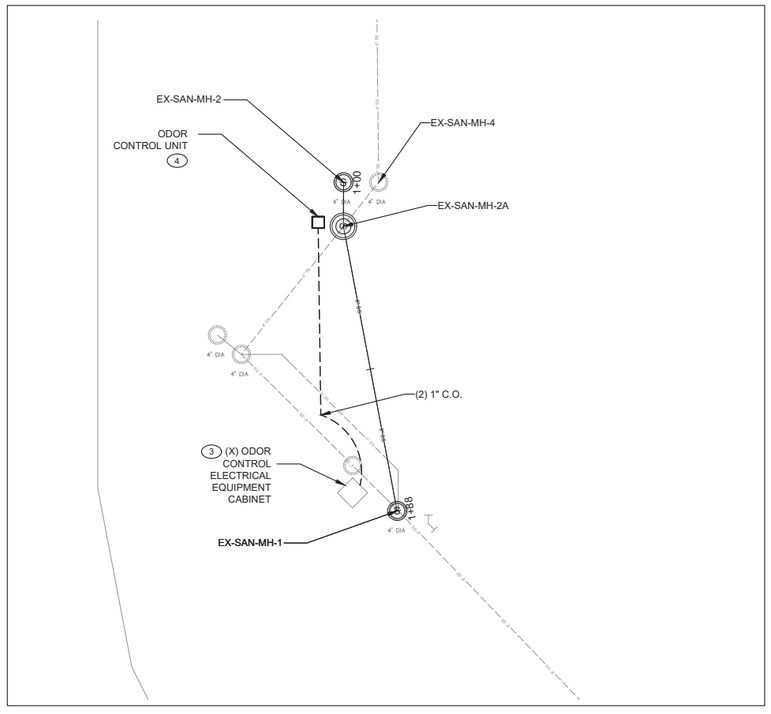
Sheet 16 of 28

ORIGINAL SHEET - ANSI D



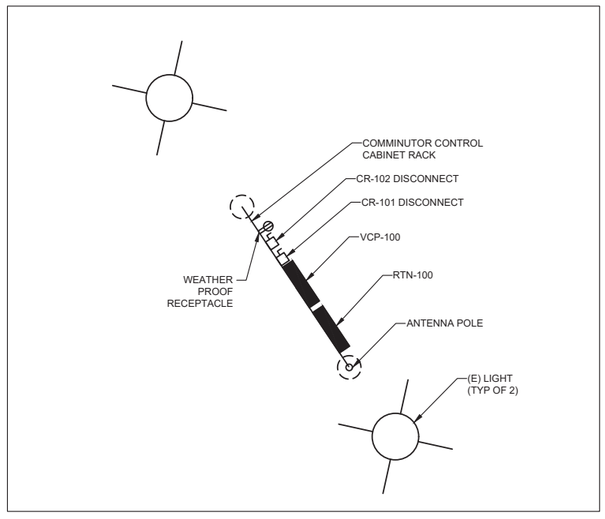
A E-102 ENLARGED EQUALIZATION BASIN AREA - NEW WORK

SCALE: 1" = 20'



B E-102 ENLARGED SOUTHSIDE ALIGNMENT - NEW WORK

SCALE: 1" = 20'



C E-102 COMMINUTOR RADIO CABINET AND CONTROL RACK AREA ENLARGEMENT

SCALE: NTS

GENERAL NOTES

1. (E) AND/OR DASHED LINES INDICATE EXISTING EQUIPMENT, (R) AND/OR DASHED LINES INDICATE RELOCATED EQUIPMENT, (N) AND/OR SOLID LINES INDICATE NEW EQUIPMENT UNLESS NOTED OTHERWISE.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CALL 1-800-227-2600 FOR LOCATES PRIOR TO DIGGING. IT IS ALSO THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL NON-UTILITY UNDERGROUND ITEMS.
3. THE MAXIMUM NUMBER OF CONDUIT BENDS SHALL NOT BE GREATER THAN 270 DEGREES BETWEEN PULLING STRUCTURES. THIS INCLUDES THE AGGREGATE OF ALL HORIZONTAL AND VERTICAL CHANGES.
4. ALL CONDUIT, INNERDUCT, PULLBOXES AND VAULTS SHALL BE LABELED PER THE SPECIFICATIONS.
5. EACH CONDUIT AND INNERDUCT SHALL BE PROVIDED WITH A 1250 LBS. PULL ROPE.
6. COORDINATE LOCATION OF BELOW-GRADE CONDUITS, DUCT BANKS, ETC. WITH CIVIL ENGINEER AND OTHER TRADES PRIOR TO ROUGH-IN.
7. ALL RECEPTACLES WITH WEATHER PROOF DESIGNATION SHALL BE PROVIDED WITH 'WHILE IN USE' COVERS.
8. PROVIDE #10 CU CONDUCTORS IN 3/4" CONDUIT MINIMUM, UNLESS NOTED OTHERWISE, FOR ALL SITE LIGHTING AND SITE RECEPTACLE CIRCUITS.
7. CONTRACTOR SHALL FIELD VERIFY EXISTING CIRCUITS FEEDING EXISTING EQUIPMENT PRIOR TO SITE DEMOLITION PHASE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CIRCUIT INTEGRITY FOR ALL EXISTING EQUIPMENT TO REMAIN.
8. REPAIR AND REPLACE ALL LANDSCAPING AND SITEWORK DISTURBED BY EXCAVATION INCLUDING BUT NOT LIMITED TO IRRIGATION LINES, LAWNS, PLANTING, ETC.

SHEET NOTES

1. POWER TO NEW COMMINUTOR VAULT SHALL BE FED FROM (E) ELECTRIC EQUIPMENT VAULT PANEL - LP-1. (A)
2. NEW COMMINUTOR EQUIPMENT ALARM PANELS SHALL BE LOCATED AT (E) LIGHT POLE. SEE CIVIL FOR FINAL LOCATION.
3. EXISTING ODOR CONTROL UNIT/CABINET WITH PV/SOLAR PANEL TO REMOVED. PROVIDE NEW COMPLETE PV/SOLAR SYSTEM INCLUDING PANELS, INVERTER, BATTERIES, CABINET(S) SUPPORT STRUCTURE, AND CONCRETE BASES FOR NEW ODOR CONTROL UNIT SYSTEM
4. NEW ODOR CONTROL UNIT SEE CIVIL DRAWINGS.

N

0 20' 40'

1" = 20'

1' CONTOUR INTERVAL

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Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
SITE POWER AND CONTROL PLAN

Permit-Seal

COLORADO LICENSED
ROBERT D. PURKEY
41898
01/23/2019
PROFESSIONAL ENGINEER

Project Number:	205305149
File Name:	

PKT	AW	AW	01.23.19
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. E-102

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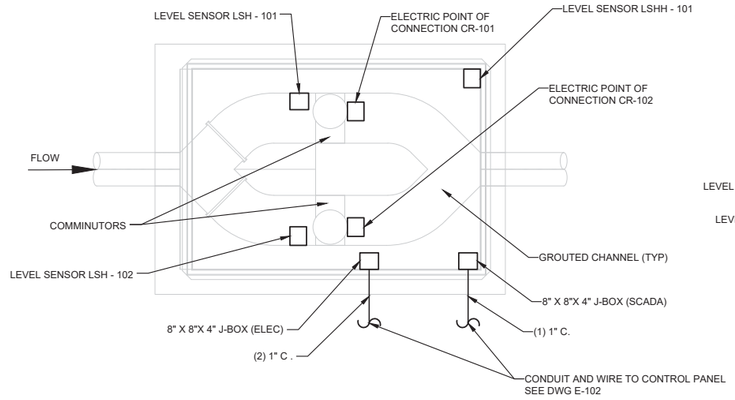
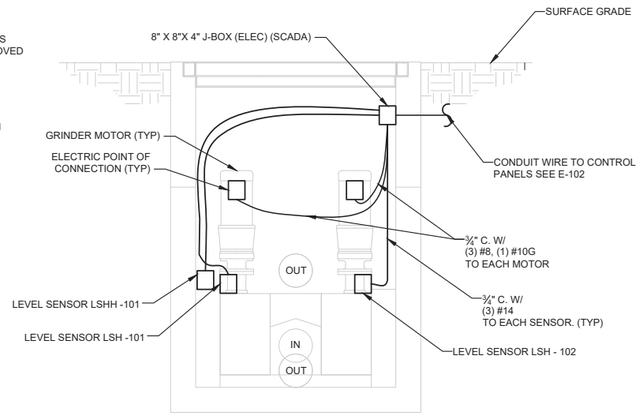
DETAIL NOTES:

1. ALL ELECTRICAL AND EQUIPMENT WITHIN VAULT MUST COMPLY WITH NEC ARTICLE 500.
2. PROVIDE LIQUID-TIGHT FLEXIBLE METAL CONDUIT CONNECTION TO MOTORS AND SENSORS. PROVIDE SUFFICIENT SLACK TO ALLOW MOTOR TO BE REMOVED WHILE CONNECTED.



PLAN VIEW



SECTION VIEW

A E-103 COMMINUTOR VAULT

SCALE: NTS

15-Jan-19				PANEL:	(E)LP-1 (A)			LOCATION:			EQ BASIN - VAULT	
TYPE	DESCRIPTION	LOAD	BKR	CIR	A	B	C	CIR	BKR	LOAD	DESCRIPTION	TYPE
M	EQ PUMP (5HP)	2331	100/2	1	4206			2	35/2	1875	LS1 POLE LIGHTS	L
M	X	2331	X	3		4206		4	X	1875	X	L
R	GFCI RECPT	360	20	5			407	6	20	47	EXHAUST FAN (1/20HP)	M
M	SUMP(3/4HP)	349	20	7	349			8	20		SPARE	
L	LS2 POLE LIGHTS	2500	40/2	9		2760		10	20	260	NORTH RECPTS	R
L	X	2500	X	11			2760	12	20	260	SOUTH RECPTS	R
R	TANK & RECPT/BU LIFT PUM	180	20	13	780			14	20	600	PESTRIAN LIGHTS	L
	SPARE		50/2	15		0		16	20/2		SURGE PROTECT. DEVICE	M
	SPARE		X	17			0	18	X		X	M
L	LED POLE SOUTH	72	20	19	2572			20	35/2	2500	LS1 POLE LIGHTS	L
L	LIGHTING CONTROL	72	20	21		2572		22	X	2500	X	L
	SPARE		20	23			2331	24	20/2	2331	**MUFFIN MONST COMP (5HP**	M
	SPARE		20	25	2331			26	X	2331	**X**	M
	SPARE		50/2	27		0		28	20/2		**COMMINUTOR CONTROL**	M
	SPARE		X	29			0	30	X		**X**	M
M	MOTOR HEATER	500	20	31	500			32	20		**COMMINUTOR CONTROL**	M
L	LS2 POLE LIGHTS	2500	40/2	33		4375		34	40/2	1875	LS2 POLE LIGHTS	L
L	X	2500	X	35			4375	36	X	1875	X	L
M	SUPPLY FAN (2HP)	932	15/2	37	2807			38	30/2	1875	LS1 POLE LIGHTS	L
M	X	932	X	39		2807		40	X	1875	X	L
	SPACE			41			0	42			SPACE	
					13545	16720	9873					

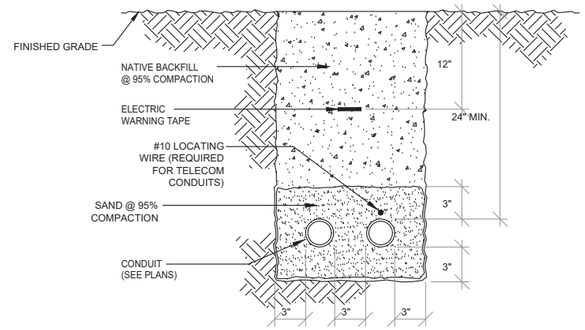
COPPER BUS SIZE:	400	**GROUND:**		STANDARD	**NOTES:**
VOLTAGE:	208	**MOUNTING:**		SURFACE	FED FROM 50 KVA XFMR
PHASE:	3	**ENCLOSURE:**		NEMA 1	
WIRE:	4	**# OF 1-POLE CIRCUITS**		42	
LUGS:	MLO	**CONNECTED KVA:**		40.1	
BREAKER AIC RATING:	400	**CONNECTED AMPS:**		111.4	
NEUTRAL:	100%	**NET KVA:**		40.1	
FEEDER OCPD SIZE:	400	**NET AMPS:**		111.4	

(1) EXISTING EQUIPMENT CIRCUITS TO BE REMOVED AND CIRCUIT BREAKERS

23-Jan-19				PANEL:	(N)LP-1 (A)			LOCATION:			EQ BASIN - VAULT	
TYPE	DESCRIPTION	LOAD	BKR	CIR	A	B	C	CIR	BKR	LOAD	DESCRIPTION	TYPE
M	EQ PUMP (5HP)	2331	100/2	1	4206			2	35/2	1875	LS1 POLE LIGHTS	L
M	X	2331	X	3		4206		4	X	1875	X	L
R	GFCI RECPT	360	20	5			407	6	20	47	EXHAUST FAN (1/20HP)	M
M	SUMP(3/4HP)	349	20	7	549			8	20	**200**	**LCP-301**	**E**
L	LS2 POLE LIGHTS	2500	40/2	9		2760		10	20	260	NORTH RECPTS	R
L	X	2500	X	11			2760	12	20	260	SOUTH RECPTS	R
R	TANK & RECPT/BU LIFT PUM	180	20	13	780			14	20	600	PESTRIAN LIGHTS	L
	SPARE		50/2	15		0		16	20/2		SURGE PROTECT. DEVICE	M
	SPARE		X	17			0	18	X		X	M
L	LED POLE SOUTH	72	20	19	2572			20	35/2	2500	LS1 POLE LIGHTS	L
L	LIGHTING CONTROL	72	20	21		2572		22	X	2500	X	L
E	**RADIO CABINET**	**500**	**20**	**23**			1770	24	**30/3**	**1270**	**MUFFIN MONST CR-101**	M
M	**MUFFIN MONST CR-102**	**1270**	**30/3**	**25**	2540			26	**X**	**1270**	**X**	M
M	**X**	**1270**	**X**	**27**		2540		28	**X**	**1270**	**X**	M
M	**X**	**1270**	**X**	**29**			2470	30	**20**	**1200**	**SAMPLING STATION**	E
M	MOTOR HEATER	500	20	31	680			32	20	180	**REC COMMINUTOR**	R
L	LS2 POLE LIGHTS	2500	40/2	33		4375		34	40/2	1875	LS2 POLE LIGHTS	L
L	X	2500	X	35			4375	36	X	1875	X	L
M	SUPPLY FAN (2HP)	932	15/2	37	2807			38	30/2	1875	LS1 POLE LIGHTS	L
M	X	932	X	39		2807		40	X	1875	X	L
	SPACE			41			0	42			SPACE	
					14134	19260	11782					

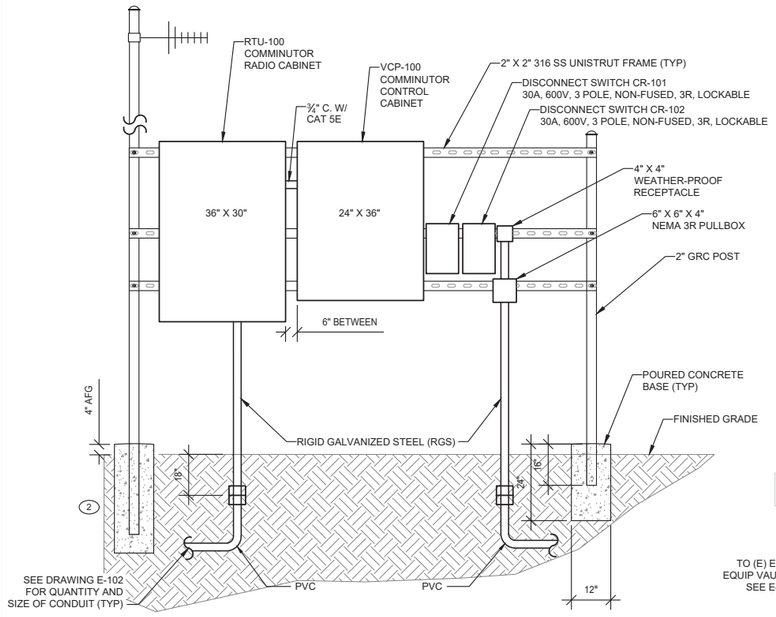
COPPER BUS SIZE:	400	**GROUND:**		STANDARD	**NOTES:**
VOLTAGE:	208	**MOUNTING:**		SURFACE	
PHASE:	3	**ENCLOSURE:**		NEMA 1	
WIRE:	4	**# OF 1-POLE CIRCUITS**		42	
LUGS:	MLO	**CONNECTED KVA:**		45.2	
BREAKER AIC RATING:	400	**CONNECTED AMPS:**		125.4	
NEUTRAL:	100%	**NET KVA:**		45.2	
FEEDER OCPD SIZE:	400	**NET AMPS:**		125.4	

(1) INSTALL NEW CIRCUIT BREAKER. BREAKER SHALL MATCH PANEL MANUFACTURER AND AIC RATING.

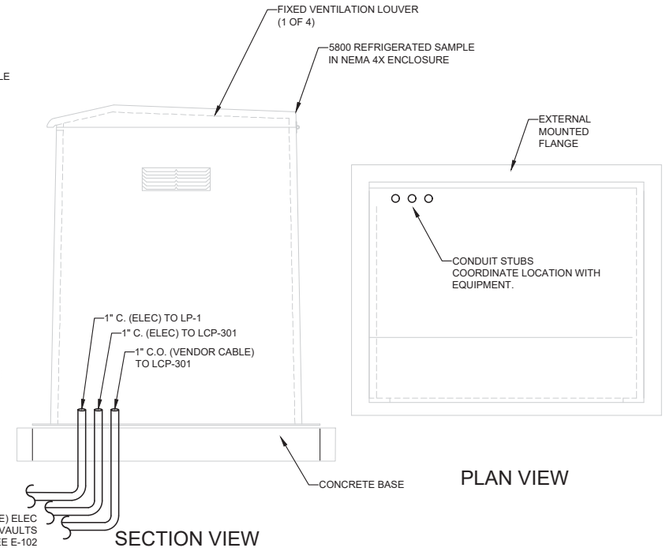


D E-103 TYPICAL 2 CONDUIT TRENCH DETAIL

SCALE: AS SHOWN



SECTION VIEW



PLAN VIEW

B E-103 COMMINUTOR CONTROL AND RADIO CABINET RACK

SCALE: AS SHOWN

C E-103 REFRIGERATED SAMPLER STATION

SCALE: NTS

DETAIL NOTES:

1. SEE RTU ANTENNA WITH GROUNDING SYSTEM DETAIL ON DRAWING GI-8
2. POURED CONCRETE ANCHOR BASE. DIAMETER AND DEPTH AS DETERMINED BY VENDOR TO MEET WORE & LOAD REQUIREMENTS.

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TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
GENERAL ELECTRICAL DETAILS & SCHEDULES

Permit-Seal

COLORADO LICENSED · KAREN J. PRIBYL · 41898 · 01/23/2019 · PROFESSIONAL ENGINEER

Project Number: 205305149
File Name:

PKT	AW	AW	01.23.19
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. E-103
Revision C
Sheet 18 of 28

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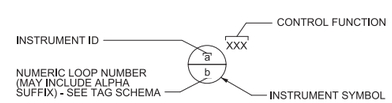
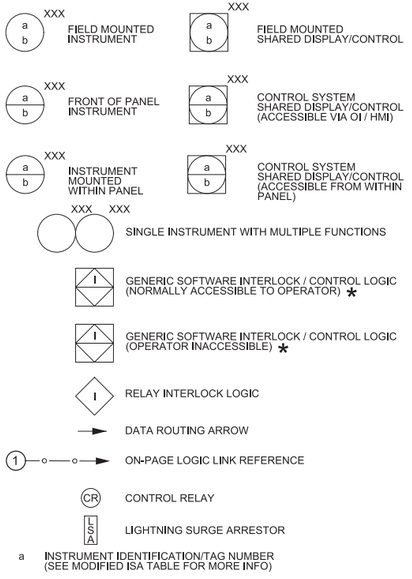
INSTRUMENTATION CALL - OUT



INSTRUMENT SYMBOLS



a INSTRUMENT IDENTIFICATION/TAG NUMBER (SEE MODIFIED ISA TABLE FOR MORE INFO)

b INSTRUMENT LOOP NUMBER

XXX CONTROL FUNCTION

XXXV PRIMARY ELECTRICAL POWER (e.g, 24VDC, 120VAC, 220VAC, 480VAC)

NOTE1: IF INSTRUMENT POWER NOT INDICATED, REFER TO INSTRUMENT SCHEDULE FOR CONFIRMATION.

* REFER TO SPEC SECTION 409300 (PROJECT CONTROL PHILOSOPHY) FOR DETAILS.

CONTROL FUNCTION DESIGNATIONS

AHC	AUTO / HOLD / CLOSE	OLH	OFF / LOW / HIGH
A/M	AUTO / MANUAL	O/O	ON / OFF
AS	AIR SUPPLY	O/R	OVERRIDE
BEAR	BEARING	OOR	OUT OF RANGE
CLSD	CLOSED	OSC	OPEN / STOP / CLOSE
CV	CONTROL VARIABLE	PID	PROPORTIONAL / INTEGRAL / DERIVATIVE
DEV	DEVIATION	POT	POTENTIOMETER
E-STOP	EMERGENCY STOP	PV	PROCESS VARIABLE
ETM	ELAPSED TIME METER	RDY	READY
FOR	FORWARD / OFF / REVERSE	R/L	RAISE / LOWER
HML	HIGH / MID / LOW	RSL	RAISE / STOP / LOWER
HOA	HAND / OFF / AUTO	RST	RESET
HOR	HAND / OFF / REMOTE	RTD	RESISTANCE TEMPERATURE DETECTOR
LEAK	MOISTURE INSTRUSION	SD	SHUTDOWN
LOR	LOCAL / OFF / REMOTE	SEL	SELECT
L/R	LOCAL / REMOTE	SP	SET POINT
LSR	LOCAL / STOP / REMOTE	S/R	START / RESET
MOA	MANUAL / OFF / AUTO	S/S	START / STOP
MN	MAINTENANCE / NORMAL	STR	START
O/C	OPEN / CLOSE	STP	STOP
OCA	OPEN / CLOSE / AUTO	TMR	TIMER
OL	OVERLOAD	WIND	WINDING

NOTE:

1. REFER TO DRAWING GI-2 FOR ANALYTICAL INSTRUMENT DESIGNATIONS.

INSTRUMENT SYMBOLS - CONT

COMPUTING OR CONVERTING FUNCTIONS

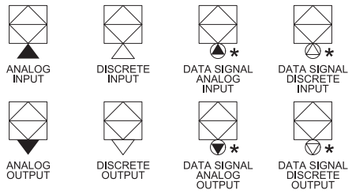
COMPUTING

SUMMING	DERIVATIVE	EXPONENTIAL
MULTIPLYING	AVERAGING	BIAS
DIVIDING	RATIO	HIGH LIMITING
SQ ROOT EXTRACTION	DIFFERENCE	LOW LIMITING
PROPORTIONAL	HIGH SELECTING	LINEARIZER
INTEGRAL	LOW SELECTING	

CONVERTING

E	VOLTAGE	R	RESISTANCE (ELECT)	A	ANALOG
I	CURRENT	D	DIGITAL	B	BINARY
P	PNEUMATIC			H	HYDRAULIC

PLC / REMOTE I/O POINTS



* FIELD NETWORK INTERFACE. SEE SPECIFICATION FOR MORE INFORMATION

INSTRUMENTATION LINE SYMBOLOGY

NEW WORK (UNSCREENED)

EXISTING (SCREENED)

EXISTING TO BE DEMOLISHED

FUTURE EQUIPMENT (DASH)

VENDOR SKID LIMIT

INSTRUMENT LINE DEFINITIONS (UNLESS SPECIFICALLY NOTED OTHERWISE PER DRAWING LEGEND)

DATA LINK OR SYSTEM BUS BETWEEN DEVICES

ELECTRIC (PULSE SIGNAL)

ELECTRICAL SIGNAL

ULTRASONIC SIGNAL

HYDRAULIC SIGNAL

MECHANICAL LINK

PNEUMATIC SIGNAL

PROCESS

AS AIR SUPPLY

COMMUNICATION LINE DEFINITIONS (UNLESS SPECIFICALLY NOTED OTHERWISE PER DRAWING LEGEND)

COAX

P PROFIBUS

F FOUNDATION FIELD BUS

M MODBUS (RS485)

SINGLE MODE FIBER

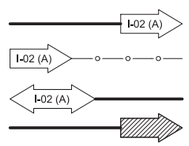
X MULTIMODE FIBER

VENDOR SIGNAL CABLE

D DEVICENET (THIN - DROP)

D DEVICENET (THICK - TRUNK)

SIGNAL AND PROCESS OFF-PAGE CONNECTORS



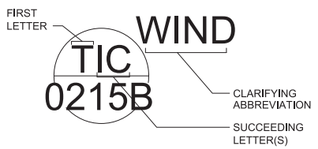
NOTE: REFER TO INSTRUMENTATION LINE SYMBOLOGY FOR PROCESS AND LOGIC LINESTYLE DEFINITION.

ISA TABLE (MODIFIED)

	FIRST LETTER		SUCCEEDING LETTER(S)		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION				
C	CONDUCTIVITY			CONTROL	CLOSED
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			FORWARD
G			GAUGE, GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOISTURE	MOMENTARY			MIDDLE, INTERMEDIATE
N	TORQUE		ISOLATE	ISOLATOR	
O			ORIFICE, RESTRICTION		OPEN
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		REVERSE
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	INTRUSION	X AXIS			
Y	EVENT, STATE, OR PRESENCE	Y AXIS		COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, FINAL CONTROL ELEMENT	

TAG SCHEMA

TYPICAL INSTRUMENT & CONTROL VALVE TAGGING



TYPICAL EQUIPMENT TAG FORMAT

P-0215B

TYPICAL VALVE TAG / SPEC FORMAT

V-0215B — VALVE TAG

TYPICAL INSTRUMENT & CONTROL VALVE TAGGING

TIC-0215B — INSTRUMENT SCHEDULE (FULL TAG)

TIC-0215B — P&ID (PARTIAL TAG)

TIC — INSTRUMENT / VALVE ID

0215 — TAG NUMBER

B — SUFFIX

TYPICAL EQUIPMENT TAG FORMAT

P-0215B — EQUIPMENT SCHEDULE (FULL TAG)

P-0215B — P&ID (PARTIAL TAG)

P — EQUIPMENT ID

0215 — TAG NUMBER

B — SUFFIX

TYPICAL MANUAL VALVE TAG FORMAT

V-0215B — MANUAL VALVE SCHEDULE (FULL TAG)

V-0215B — P&ID (PARTIAL TAG)

V — VALVE

0215 — TAG NUMBER

B — SUFFIX

NOTE: REFER TO GENERAL SHEET GI-3 FOR STANDARD EQUIPMENT CALLOUTS.

NOTE: REFER TO GENERAL SHEET GI-3 FOR STANDARD VALVE CALLOUTS.

SHEET NUMBER TAG FORMAT

I-01_A — SHEET SCHEDULE (FULL TAG)

I-01 — P&ID BORDER (PARTIAL TAG)

I — DISCIPLINE CODE

01 — SHEET NUMBER

A — REVISION

TYPICAL PIPE LINE TAG FORMAT

1234-MP-PV01-5 — PIPE LINE SCHEDULE (FULL TAG)

1234 — LINE NUMBER

MP — SERVICE

PV01 — PIPE SPEC

5 — PIPE SIZE

EQUIPMENT SKID TAG FORMAT

X-0210 — SKID TAG

X — SKID

0210 — SKID NUMBER

TIE-IN POINT TAG FORMAT

TP-0123 — SPECIFICATION NUMBER

TP — TIE-IN POINT

0123 — TAG NUMBER

ABBREVIATIONS

AI	ANALOG INPUT
AO	ANALOG OUTPUT
ATM	ATMOSPHERE
ATC	AUTO TRANSFER CONTROLLER
CT	CONTACT TIME
CP	CONTROL PANEL
DI	DISCRETE INPUT
DCS	DISTRIBUTED CONTROL SYSTEM
DO	DISCRETE OUTPUT
DOL	DIRECT ONLINE STARTER
FC	FAIL CLOSED
FOC	FIBER OPTIC CABLE
FOT	FIBER OPTIC TRANSCEIVER
FVNR	FULL VOLTAGE NON-REVERSING STARTER
GN	HEALTHY
HMI	HUMAN MACHINE INTERFACE
LC	LOCKED CLOSED
LCP	LOCAL CONTROL PANEL
LCS	LOCAL CONTROL STATION
LO	LOCKED OPEN
LSA	LIGHTNING SURGE ARRESTOR
MCC	MOTOR CONTROL CENTER
MCP	MAIN CONTROL PANEL
MMF	MULTIMODE FIBER
MS	MOTOR STARTER
MTR	MOTOR
MK##	MARK (MECH DETAIL REFERENCE)
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
OI	OPERATOR INTERFACE
OIT	OPERATOR INTERFACE TERMINAL
PC	PERSONAL COMPUTER
PLC	PROGRAMMABLE LOGIC CONTROLLER
PCN	PLANT CONTROL NETWORK
PDU	POWER DISTRIBUTION UNIT
PMP	ALARM
RD	PUMP
RIO	REMOTE I/O
RVSS	REDUCED VOLTAGE SOLID-STATE STARTER
RTU	REMOTE TERMINAL UNIT
SEQ	SEQUENCE
SMF	SINGLE MODE FIBER
SSM	SOLID STATE METER
STP	SHIELDED TWISTED PAIR
TC	THERMOCOUPLE
UPS	UNINTERRUPTABLE POWER SUPPLY
UTP	UNSHIELDED TWISTED PAIR
VCP	VENDOR CONTROL PANEL
VFD	VARIABLE FREQUENCY DRIVE
VSD	VARIABLE SPEED DRIVE
YL	WARNING

GENERAL INSTRUMENTATION NOTES

1. THE SYMBOLS AND NOMENCLATURE SHEETS ARE REPRESENTATIVE OF A GENERAL STANDARD, THEREFORE, IT SHOULD BE UNDERSTOOD THAT NOT ALL INFORMATION PRESENTED WILL BE RELEVANT TO THIS PROJECT.
2. ADDITIONAL INSTRUMENTATION AND CONTROL SYMBOLS MAY BE USED AS REQUIRED. SYMBOLS AND NOMENCLATURE WILL BE EITHER BASED ON ISA STANDARD 5.1-INSTRUMENTATION SYMBOLS AND IDENTIFICATION OR DEFINED ELSEWHERE IN THE P&ID SET.
3. SEE ELECTRICAL AND PROJECT GENERAL SHEETS FOR ADDITIONAL SYMBOLS AND ABBREVIATIONS.
4. TO CAPTURE THE COMPLETE PROCESS CONTROL INTENT, THE P&IDS MUST TO BE REVIEWED IN CONJUNCTION WITH THE PROJECT CONTROL PHILOSOPHY (SPEC SECTION 409300), THE PROJECT I/O AND INSTRUMENT SCHEDULES AND OTHER SECTIONS REFERENCED HEREIN.

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Client/Project
TOWN OF MORRISON
WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
GENERAL INSTRUMENTATION AND CONTROL SYMBOLS AND NOMENCLATURE - I

Permit-Seal

COLORADO LICENSED CHARLES BANKS 53254 11/23/18 PROFESSIONAL ENGINEER

Project Number: 205305149

File Name: GI-01.dgn

S.F.		S.N.	
Dwn.	Chkd.	Dsgn.	YY.MM.DD

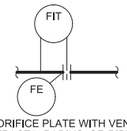
Drawing No. GI-1

Revision C

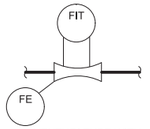
Sheet 19 of 28

ORIGINAL SHEET - ANSI D

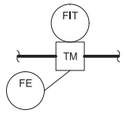
FLOW INSTRUMENTS



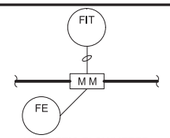
ORIFICE PLATE WITH VENA CONTRACTA, RADIUS, OR PIPE TAPS CONNECTED TO DIFFERENTIAL-PRESSURE -TYPE FLOW TRANSMITTER



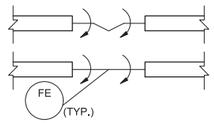
VENTURI TUBE WITH (DIFFERENTIAL PRESSURE) FLOW TRANSMITTER



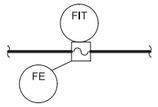
THERMAL MASS FLOW METER



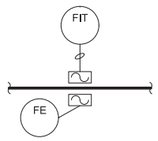
MAGNETIC FLOWMETER WITH REMOTE FLOW TRANSMITTER



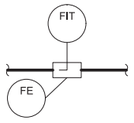
WEIR (V-NOTCH AND RECTANGULAR TYPE)



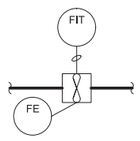
TRANSIT TIME ULTRASONIC FLOWMETER (INLINE INSERT TYPE)



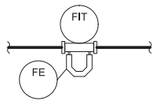
TRANSIT TIME ULTRASONIC FLOWMETER (CLAMP ON TYPE)



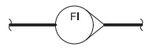
SINGLE PORT PITOT TUBE OR PITOT-VENTURI TUBE



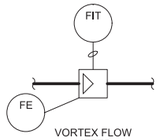
TURBINE OR PROPELLER TYPE FLOW METER



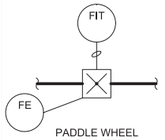
CORIOLIS FLOWMETER



VARIABLE AREA FLOW INDICATOR (ROTAMETER)

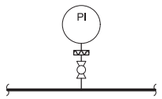


VORTEX FLOW METER

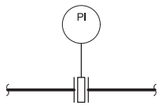


PADDLE WHEEL FLOW METER

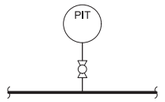
PRESSURE OR VACUUM INSTRUMENTS



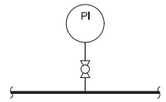
PRESSURE GAUGE WITH DIAPHRAGM SEAL



PRESSURE GAUGE WITH LIQUID FILLED ANNULAR SEAL SYSTEM



PRESSURE INDICATING TRANSMITTER



PRESSURE INDICATOR DIRECT - CONNECTED

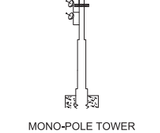
POSITION INSTRUMENTS

LIMIT SWITCH ON MOTORIZED VALVE INDICATING CLOSED POSITION

VALVE POSITION TRANSMITTER ON PNEUMATIC ACTUATED VALVE

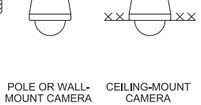
TEMPERATURE INSTRUMENTS

BIMETALLIC TYPE THERMOMETER, GLASS THERMOMETER, OR OTHER LOCAL UNCLASSIFIED TEMPERATURE INDICATOR

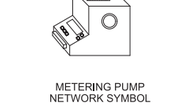


THERMOCOUPLE, RESISTANCE BULB (RTD) OR THERMISTOR (TH) TEMPERATURE TRANSMITTER WITH THERMOWELL

WEIGHT INSTRUMENTS

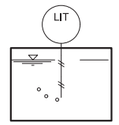


STRAIN GAUGE CONNECTED TO SEPARATE WEIGHT TRANSMITTER (TAG STRAIN GAUGE WE)

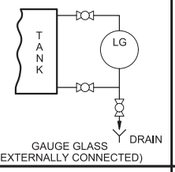


HYDRAULIC ACTUATED WEIGHT TRANSMITTER

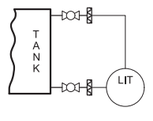
LEVEL INSTRUMENTS



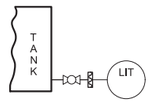
LEVEL TRANSMITTER BUBBLER TYPE



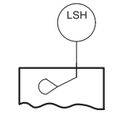
GAUGE GLASS (EXTERNALLY CONNECTED)



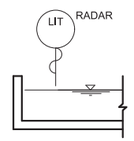
LEVEL TRANSMITTER, SEALED DIFFERENTIAL PRESSURE TYPE, (MOUNTED ON TANK)



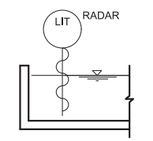
LEVEL TRANSMITTER PRESSURE ACTUATED



LEVEL DETECTION SWITCH FLOAT ACTUATED TYPE



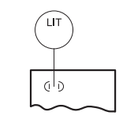
LEVEL TRANSMITTER NON-CONTACTING RADAR TYPE



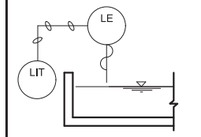
LEVEL TRANSMITTER GUIDED WAVE RADAR TYPE

LEVEL DETECTION SWITCH VIBRATING FORK TYPE

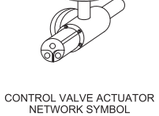
LEVEL DETECTION SWITCH CONDUCTANCE TYPE



LEVEL TRANSMITTER CAPACITANCE OR DIELECTRIC OR RF ADMITTANCE TYPE



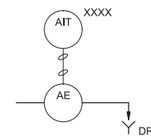
LEVEL TRANSMITTER NON-CONTACTING ULTRASONIC TYPE REMOTE MOUNTED



LEVEL TRANSMITTER HYDROSTATIC TYPE

LEVEL TRANSMITTER RADIOACTIVE OR SONIC TYPE WITH INTEGRAL SENSOR

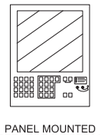
ANALYTICAL INSTRUMENTS



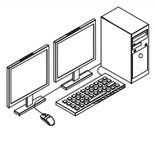
FLOW THROUGH ANALYZING ELEMENT WITH REMOTE TRANSMITTER

ALK	ALKALINITY
CL_2	CHLORINE CONCENTRATION
CO	CARBON MONOXIDE
COMB	COMBUSTIBLE GAS
COND	CONDUCTIVITY
DO	DISSOLVED OXYGEN
HC	HYDROCARBON
H_2O_2	HYDROGEN PEROXIDE
H_2S	HYDROGEN SULFIDE
LEL	LOWER EXPLOSIVE LIMIT
NO_3 / NO_2	NITRATE / NITRITE
NH_3 / NH_4	AMMONIA / AMMONIUM
O_2	OXYGEN CONCENTRATION
O_3	OZONE
ORP	OXIDATION - REDUCTION POTENTIAL
PC	PARTICLE COUNTER
pH	HYDROGEN ION CONCENTRATION
SCU	STREAMING CURRENT UNIT
SO_2	SULFUR DIOXIDE
TKN	TOTAL KJELDAHL NITROGEN
TN	TOTAL NITROGEN
TOC	TOTAL ORGANIC CARBON
TURB	TURBIDITY
TSS	TOTAL SUSPENDED SOLIDS
UVI	ULTRA VIOLET INTENSITY
UVT	ULTRA VIOLET TRANSMITTANCE

NETWORK AND CONTROL COMPONENTS SYMBOL LIBRARY


PANEL MOUNTED OPERATOR INTERFACE


DESKTOP / CONSOLE WORKSTATION


DUAL SCREEN WORKSTATION

LAPTOP

TOWER UPS

PANEL UPS

RACK MOUNT UPS

PRINTER

VARIABLE FREQUENCY DRIVE

STARTER

POWER MONITOR / MPRM

DIN-RAIL MOUNTED MODULAR INDUSTRIAL ETHERNET SWITCH

FIBER TRANSCEIVER

AB REMOTE I/O CHASSIS (POWER SUPPLY NOT SHOWN)

AB COMPACTLOGIX® PLC

AB CONTROLLOGIX® PLC

SIEMENS PLC

RACK MOUNT SERVER

RACK MOUNT KVM SWITCH

RACK MOUNT DIGITAL VIDEO RECORDER (DVR)

RACK MOUNT 15 PORT MEDIA CONVERTER CHASSIS

RACK MOUNT ROUTER

RACK MOUNT ETHERNET SWITCH REDUNDANT POWER SUPPLY

RACK MOUNT 24 PORT ETHERNET SWITCH

RACK MOUNT NETWORK ACCESSIBLE STORAGE

RACK MOUNT FIBER OPTIC PATCH PANEL

RACK MOUNT FIREWALL APPLIANCE

FOUNDATION FIELDBUS MEGABLOCKS

LEASED LINE MODEM

RACK MOUNTED INDUSTRIAL HARDENED SWITCH

YAGI ANTENNA

OMNI ANTENNA

SATELLITE ANTENNA

LATTICE TOWER

MONO-POLE TOWER

POLE OR WALL-MOUNT CAMERA CEILING-MOUNT CAMERA

METERING PUMP NETWORK SYMBOL

CONTROL VALVE ACTUATOR NETWORK SYMBOL

IP PHONE

ACTIVE TERMINATOR PASSIVE TERMINATOR

GAS DETECTOR NETWORK SYMBOL

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Client/Project
TOWN OF MORRISON
WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS
OFFICE
Title
GENERAL INSTRUMENTATION AND CONTROL SYMBOLS AND NOMENCLATURE - II

Permit-Seal
COLORADO LICENSED GARAJAN SANJAYA 53254 PROFESSIONAL ENGINEER

Project Number: 205305149
File Name: GI-02.dgn

S.F.		S.N.	
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. GI-2
Revision C
Sheet 20 of 28

PROCESS ABBREVIATIONS

AMMONIUM SULFATE	AS
AIR	A
AQUEOUS AMMONIA	AA
ALUM	AL
AIR VENT	AV
AUTOMATIC SPRINKER RISER	ASR
BLEND	B
BYPASS	BP
BACKWASH WATER	BW
CONDENSATE	C
CALCIUM HYDROXIDE (HYDRATED LIME)	CAH
CALCIUM OXIDE (QUICK LIME)	CAO
CARBON SOURCE	CA
CHANNEL AGITATION WATER	CAW
MEMBRANE CLEANING CONCENTRATE RETURN	CCR
CHEMICAL DRAIN	CD
CONDENSER WATER RETURN	CDR
CONDENSER WATER SUPPLY	CDS
CHILLED WATER RETURN	CHR
CHILLED WATER SUPPLY	CHS
CHILLED WATER	CHW
CHEMICAL INHIBITOR SOL	CIS
CHLORINE GAS	CLG
CHLORINE LIQUID	CLL
CHLORINE SOLUTION	CLS
COAGULANT	COA
CAUSTIC SODA	CS
CHEMICAL CONTAINMENT	CP
CLEANING PERMEATE RETURN	CPR
CIRCULATED SLUDGE	CSL
CITRIC ACID	CTA
CHLORINATOR VENT AND DETECTION	CV
CHEMICAL DRAIN VENT	CVT
COAGULATED WATER	CW
COOLING WATER RETURN	CWR
COOLING WATER SUPPLY	CWS
DEFOAMING CHEMICAL	DC
DOMESTIC COLD WATER	DCW
DIESEL FUEL OIL	DFO
DISINFECTED MEMBRANE FILTRATE	DMF
DEIONIZED WATER	DI
DEMINERALIZED WATER	DMW
DECANT	DN
DRY POLYMER SOLUTION	DPOL
DRAIN	DR
DIGESTED SLUDGE	DSL
DOMESTIC HOT WATER RETURN	DWR
DOMESTIC HOT WATER SUPPLY	DWS
ENGINE EXHAUST	EE
ENGINE COOLING WATER RETURN	EWR
ENGINE COOLING WATER SUPPLY	EWS
FLUOROSILICIC ACID	FA
FILTER AIR WASH	FAW
FILTER BACKWASH	FBW
FINAL EFFLUENT	FE
FERRIC CHLORIDE	FC
FERRIC SULFATE	FES
FUEL GAS	FG
FILTER INFLUENT	FI
FORCE MAIN	FM
FIRE PROTECTION	FP
FROTH	FR
FROTH SPRAY	FS
FILTER SURFACE WASHWATER	FSW
FILTER TO WASTE	FTW
FILTERED WATER	FW
FILTER WASTE WASHWATER	FWW
GRIT	G
GRANULAR ACTIVATED CARBON	GAC
GASEOUS OXYGEN	GOX
GRAY WATER	GW
HYDROCHLORIC ACID	HCA
HYDROGEN PEROXIDE	HP
HYDROFLUROSILICIC ACID	HFA
POTABLE HOT WATER	HW
HEATING WATER RETURN	HWR
HEATING WATER SUPPLY	HWS
INSTRUMENT AIR	IA
IRRIGATION WATER	IRW
LANDFILL GAS	LFG
LUBE OIL	LO
LIQUID OXYGEN	LOX
LIQUEFIED PETROLEUM	LP
LIQUEFIED PETROLEUM GAS	LPG
LIQUID POLYMER	LPOL
MEMBRANE CONCENTRATE	MC
MEMBRANE CLEANING RETURN	MCR
MEMBRANE CLEANING SUPPLY	MCS
MEMBRANE CLEANING WASTE	MCW
MECHANICAL DEWATERING POLYMER	MDP
MEMBRANE FEED	MF
MEMBRANE FILTRATE	MF
MEMBRANE BACKWASH WASTE	MBW
METHANE GAS	MG
MIXED LIQUOR	ML
MIXED LIQUOR RECYCLE	MLR
MEMBRANE PERMEATE	MP
MAKE-UP WATER	MW
NITROGEN	N
NATURAL GAS	NG
OVERFLOW	OF
OFFGAS	OG
OXIDATION TOWER EFFLUENT	OTE
OXYGEN (GAS)	OX
OZONE	OZ
PLANT AIR	PA
POWDERED ACTIVATED CARBON	PAC
POLYALUMINUM CHLORIDE	PCL
PHOSPHORIC ACID	PHA
PLANT DRAIN	PDR
PRIMARY EFFLUENT	PE
PLANT INFLUENT	PI
PLANT EFFLUENT	PLE
PLANT OVERFLOW	PO
ANIONIC POLYMER	POA
CATIONIC POLYMER	POC
FILTER AID POLYMER	POF
NONIONIC POLYMER	PON
THICKENER POLYMER	POT
PRESSURIZED RECYCLE	PRR
PRESSATE	PRS
POTASSIUM PERMANGANATE	PTP
POTABLE WATER	PW
RETURN ACTIVATED SLUDGE	RAS
RECLAIMED WATER	REW
REFRIGERANT LIQUID	RFL
REFRIGERANT SUCTION	RFS
REFRIGERANT SUCTION	RSL

PROCESS ABBREVIATIONS

RETURN SECONDARY SLUDGE	RSS
RAW WATER	RW
RAW WATER RETURN	RWR
RAW WATER SUPPLY	RWS
RECLAIMED WASHWATER	RWW
SAMPLE	SAM
SCUM	S
SCREENED EFFLUENT	SE
SCREENINGS	SC
SUBNATANT	SBN
SUBNATANT OVERFLOW	SBO
SANITARY DRAIN	SD
SODIUM BISULFITE	SDB
SODIUM HYDROXIDE (CAUSTIC SODA)	SDH
STORM DRAIN	SDR
SANITARY DRAIN VENT	SDV
SECONDARY EFFLUENT	SE
SLUDGE FILTRATE	SF
SULFURIC ACID	SFA
SOFT WATER	SFW
SLUDGE GAS	SG
SODIUM HYPOCHLORITE	SH
SCALE INHIBITOR	SI
SLUDGE	SLG
SUPERNATANT	SN
SAND SLURRY	SND
SULFUR DIOXIDE (GAS OR LIQUID)	SO
SULFUR DIOXIDE SOLUTION	SOS
SULFUR DIOXIDE GAS UNDER VACUUM	SOV
SPARE	SP
SUMP PUMP DISCHARGE	SPD
SANITARY SEWER	SS
SODIUM SILICOFLUORIDE	SSF
STEAM	STM
SUBDRAIN	SUBD
STRUCTURE UNDERDRAIN	SU
STRUCTURE UNDERDRAIN COLLECTOR	SUC
SERVICE WATER	SW
TRICKLING FILTER EFFLUENT	TFE
TRICKLING FILTER INFLUENT	TFI
TRICKLING FILTER RECYCLE	TFR
THICKENED SLUDGE	TS
THICKENED SUPERNATANT	TSN
TREATED WATER	TW
UNDERDRAIN	UD
UTILITY WATER (NON-POTABLE WATER)	UW
USED WASHWATER	UWW
VENT	V
VACUUM	VC
WASTE ACTIVATED SLUDGE	WAS
WASTE LUBE OIL	WLO
WASTE SECONDARY SLUDGE	WSS

HVAC

- AIR CONDITIONING UNIT
- DUCT AIR FILTER
- AIR HANDLING UNIT
- NON-MOTORIZED DAMPER
- MOTORIZED DAMPER
- DEHUMIDIFIER
- DUCT SMOKE DETECTOR
- EVAPORATIVE COOLER
- HEATER
- HVAC BOILER
- HVAC FAN
- VENT FAN
- HVAC LOUVER
- THERMOSTAT
- STEAM GENERATOR
- UNIT HEATER
- WATER HEATER
- AFTER COOLER

VALVE ABBREVIATIONS

GATE VALVE	GV
BALL VALVE	BV
BUTTERFLY VALVE	FV
CHECK VALVE	CV
DIAPHRAGM VALVE	DC
GLOBE VALVE	OV
NEEDLE VALVE	NV
PLUG VALVE	PV
SPECIALITY VALVES	XV

VALVES

- 3 WAY MULTI-PORT VALVE
- 4 WAY MULTI-PORT VALVE
- AIR VACUUM, AIR RELEASE, OR COMBINATION AIR VACUUM AND AIR RELEASE ASSEMBLY
- ANGLE VALVE
- BACK-PRESSURE VALVE
- BACKFLOW PREVENTER VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- CONE VALVE
- DIAPHRAGM VALVE
- FLAP VALVE
- GATE VALVE
- GLOBE VALVE
- HOSE BIBB VALVE
- NEEDLE VALVE
- PINCH VALVE
- PLUG VALVE
- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- SLEEVE VALVE
- TELESCOPING VALVE
- FLOAT VALVE

VALVE AND GATE ACTUATORS

- DIAPHRAGM ACTUATOR
- E/H = ELECTROHYDRAULIC
P = PNEUMATIC
S = SOLENOID
- MOTOR ACTUATOR
- PISTON ACTUATOR
- WEIGHT BALANCED ACTUATOR

GATES

- SLIDE GATE
- STOP GATE OR SHEAR GATE

WASTEWATER EQUIPMENT

- BELT FILTER PRESS
- SHAFTLESS CONVEYOR
- SCREW CONVEYOR
- CENTRIFUGE
- GRAVITY BELT THICKENER
- BELT CONVEYOR
- SLUDGE GRINDER
- RACK BAR SCREEN
- ROTARY DRUM SCREEN

PUMPS & COMPRESSORS

- SLUDGE DIAPHRAGM PUMP
- HORIZONTAL CENTRIFUGAL PUMP
- GENERIC PUMP
- CHEMICAL METERING PUMP
- DRUM PUMP
- ROTARY GEAR PUMP
- SPLIT-CASE PUMP
- HOSE / PERISTALTIC PUMP
- PLUNGER / PISTON PUMP
- PROGRESSIVE CAVITY PUMP
- ROTARY LOBE PUMP
- SUBMERSIBLE SUMP PUMP
- SUBMERSIBLE TURBINE PUMP
- VERTICAL TURBINE PUMP
- VERTICAL CENTRIFUGAL PUMP
- INCLINED ARCHIMEDES SCREW PUMP
- VERTICAL SUMP PUMP
- RECIPROCATING COMPRESSOR
- ROTARY SCREW COMPRESSOR

EQUIPMENT ABBREVIATIONS

AIR COMPRESSOR	ACP
AIR COMPRESSOR PACKAGE	ACPP
AIR DAMPER	AD
AIR DRYER	ADR
AIR FILTER	AF
AFTER COOLER	AFC
AIR HANDLING UNIT	AHU
AIR RELEASE VALVE	ARV
BACK FLOW PREVENTER	BFP
BACK PRESSURE VALVE	BPV
BLOWER	B
BULK STORAGE TANK	BTK
CARTRIDGE FILTER	CF
CLEAN IN PLACE	CIP
CONVEYOR	CN
DAY TANK	DTK
DEGASIFIER	DG
ELECTRIC FAN / EXHAUST	EF
EYE WASH	EW
FLOW CONTROL VALVE	FCV
FILTER (GENERAL)	FTR
SLIDE GATE / SLUICE GATE	G
HEATER	H
LINE FILTER (STRAINER)	LF
LEVEL CONTROL VALVE	LCV
MECHANICAL EQUIPMENT (GENERAL)	ME
MIXER	MX
MOTOR OPERATOR VALVE	MOV
PRESSURE CONTROL VALVE	PCV
PNEUMATIC OPERATOR VALVE	POV
PRESSURE REDUCING OR REGULATING VALVE	PRV
PRESSURE SAFETY VALVE	PSV
PUMP	P
RUPTURE DISK	RD
SLIDE GATE	SG
SOLENOID OPERATOR VALVE	SOV
TEMPERATURE CONTROL VALVE	TCV
TANK	TK
VALVE (MANUAL)	V
POSITION CONTROL VALVE	ZCV

PIPING ACCESSORIES

- ANNULAR SEAL
- ATMOSPHERIC VENT
- BLIND FLANGE
- CAP - BREATHER
- CAP - SCREW / THREADED
- CAP - WELDED
- CAP - QUICK DISCONNECT
- CHLORINE INJECTOR OR CHEMICAL EDUCTOR
- DIAPHRAGM SEAL
- DRAIN
- EXPANSION CHAMBER WITH RUPTURE DISK
- EDUCTOR
- FLANGED
- FLEXIBLE CONNECTION - BELLOWS TYPE
- FLAME ARRESTOR
- FLOOR CLEANOUT
- FILTER
- HUB DRAIN
- INLINE MIXER
- PIPE MATERIAL CHANGE
- PULSATION DAMPENER
- REDUCER - CONCENTRIC
- REDUCER - ECCENTRIC
- REMOVABLE SPOOL PIECE
- UNION
- RUPTURE DISK
- STRAINER - BASKET TYPE
- STRAINER - DUPLEX BASKET TYPE
- STRAINER - WYE TYPE
- SLOPE
- TRAP
- WALL CLEANOUT
- TIE-IN POINT

MISCELLANEOUS

- BRIDGE CRANE
- CALIBRATION COLUMN
- CONTAINER SCALE
- CARTRIDGE FILTER
- DEMISTOR
- FIRE HYDRANT
- GAS BOTTLE
- HEAT EXCHANGER - PLATE TYPE
- HEAT EXCHANGER - STRAIGHT TYPE
- HEAT EXCHANGER - U TUBE
- HEATER
- HORN
- PANEL-MOUNTED HORN
- BEACON
- MISCELLANEOUS EQUIPMENT
- MIXER
- MOTOR SYMBOL
- HORIZONTAL PRESSURE VESSEL
- VERTICAL PRESSURE VESSEL
- RADIO ANTENNA
- REFRIGERATOR DRYER
- SAMPLE COOLER
- AUTO-BACKWASHING STRAINER
- TANK WITH CONE SHAPED ROOF
- TANK WITH DOME ROOF
- TANK WITH FLOATING COVER
- TANK, VESSEL, OR BIN
- TEMPERING TANK
- TOTE TANK
- WATER LEVEL
- GENERATOR
- SPRINKLER

BLOWERS

- AERATOR
- BLOWER
- POSITIVE DISPLACEMENT BLOWER
- SINGLE STAGE CENTRIFUGAL BLOWER

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Client/Project
TOWN of MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
GENERAL INSTRUMENTATION AND CONTROL
SYMBOLS AND NOMENCLATURE - III

Permit-Seal

COLORADO LICENSED
DARIAN SANDOVAL
53254
PROFESSIONAL ENGINEER

Project Number: 205305149
File Name: GI-03.dgn

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Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. GI-3
Revision C
Sheet 21 of 28

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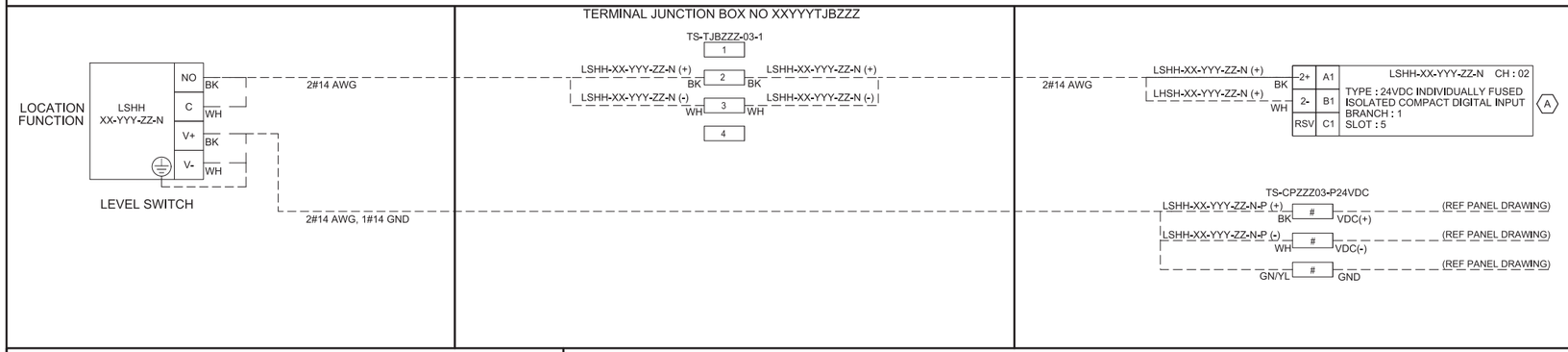
2018/12/05 12:13 PM By: Richer, Samantha
ORIGINAL SHEET - ANSI D

FIELD

FIELD DEVICE | FIELD JUNCTION BOX | CONTROL PANEL

SAMPLE DISCRETE WIRING DIAGRAM (HARDWIRE)



GENERAL SHEET NOTES

1. WIRING INTERNAL TO THE CONTROL PANEL(BETWEEN THE FIELD TERMINALS AND THE CONTROLLER), SHALL BE FURNISHED, INSTALLED,TERMINATED, LABELED, AND TESTED BY THE CONTROL PANEL SUPPLIER. CONTROL PANEL SUPPLIER SHALL ALSO POPULATE THE BRANCH / SLOT / CHANNEL OF EACH POINT.
2. SHEATH CUTBACK TO BE MINIMIZED WHERE APPLIED.
3. REFER TO SPECIFICATION SECTION 26_05_18 FOR CABLE AND WIRING GUIDELINES
4. CABLES SHALL HAVE APPROVED CABLE MARKERS AT BOTH ENDS, TAGGED AS SHOWN.
5. INTERNAL JUNCTION BOX WIRES SHALL BE FERRULED AND LABELED.
6. SPARE CONDUCTORS SHALL BE TERMINATED AND LABELED AS SPARE.

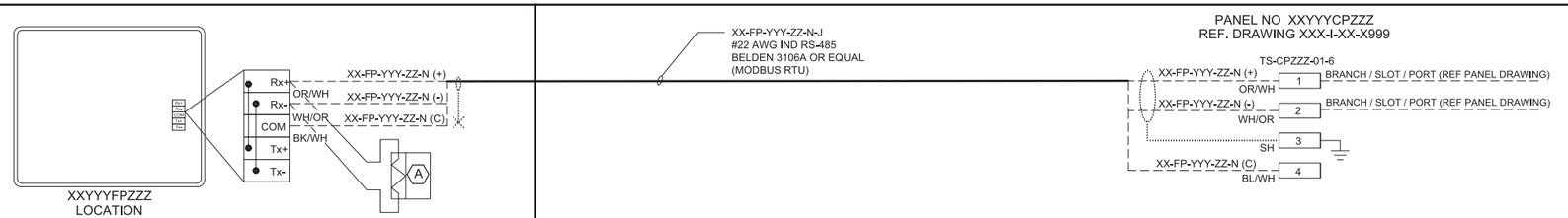
SHEET KEYNOTES

A. DO NOT TERMINATE FIELD WIRING ON ANY UNMARKED OR "RSV" TERMINALS.

FIELD

FIELD DEVICE | CONTROL PANEL

SAMPLE WIRING DIAGRAM (MODBUS RTU)



GENERAL SHEET NOTES

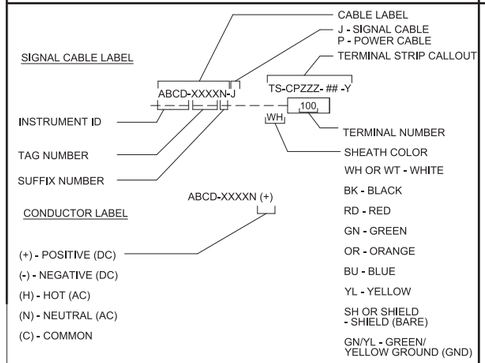
1. REFER TO SPECIFICATION SECTION 40_95_10 FOR MODBUS RTU NETWORK EQUIPMENT SUPPLY AND INSTALLATION REQUIREMENTS.
2. SHEATH CUTBACK TO BE MINIMIZED WHERE APPLIED.
3. MODBUS CABLE ROUTING SHALL BE ISOLATED FROM ALL POWER CABLING.
4. WIRING INTERNAL TO THE CONTROL PANEL(BETWEEN THE FIELD TERMINALS AND THE CONTROLLER), SHALL BE FURNISHED, INSTALLED,TERMINATED, LABELED, AND TESTED BY THE CONTROL PANEL SUPPLIER. CONTROL PANEL SUPPLIER SHALL ALSO POPULATE THE BRANCH / SLOT / PORT OF EACH NETWORK. CONTROL PANEL SUPPLIER TO GROUND ALL SHIELDS WITHIN THE CONTROL PANEL.
5. CABLES SHALL HAVE APPROVED CABLE MARKERS AT BOTH ENDS, TAGGED AS SHOWN.

SHEET KEYNOTES

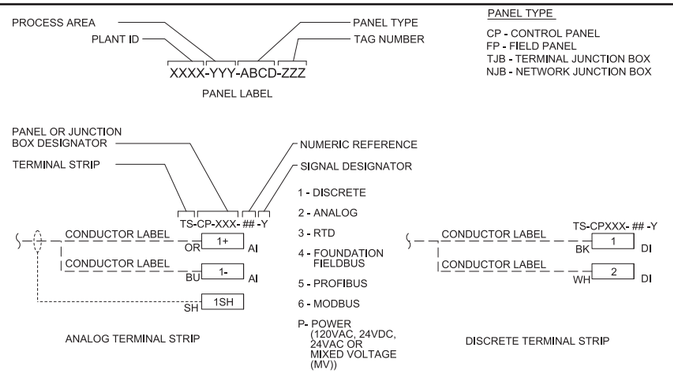
A. MODBUS PASSIVE TERMINATING RESISTOR CONNECTED AT THE END OF SEGMENT AS SHOWN IF DEVICE DOES NOT INCLUDE INTEGRAL TERMINATION.

LEGENDS

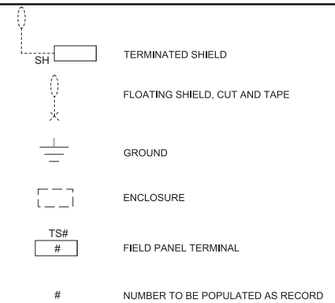
SIGNAL CABLE / CONDUCTOR LABEL



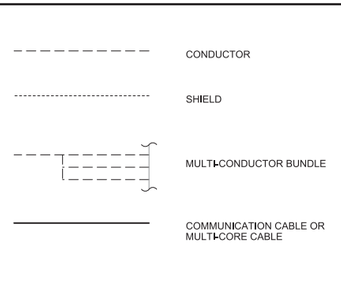
PANEL AND TERMINAL STRIP LABEL



MISCELLANEOUS SYMBOLS



WIRING DIAGRAM LINE SYMBOLOGY



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A	30% DESIGN PACKAGE	S.L.H.	S.J.E.	18.02.20
B	60% DESIGN PACKAGE	S.L.H.	S.J.E.	18.12.03
C	ISSUED FOR BID	S.L.H.	S.J.E.	19.01.23

Client/Project
TOWN OF MORRISON
WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS
OFFICE
Title
GENERAL INSTRUMENTATION AND CONTROL
SAMPLE WIRING DIAGRAM - I

Permit-Seal

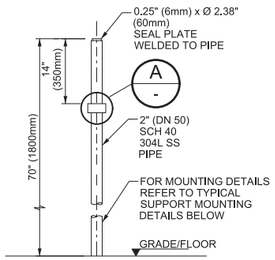
Project Number: 205305149
File Name: GI-04.dgn

S.F.		S.N.	
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. GI-4
Revision C
Sheet 22 of 28

C:\Users\rafischer\Desktop\CAD Exports\Morrison\205149_ANSI_22X34_VERT-RED ROCKS.dwg
2018/12/05 12:13 PM By: Richer, Samantha

ORIGINAL SHEET - ANSI D



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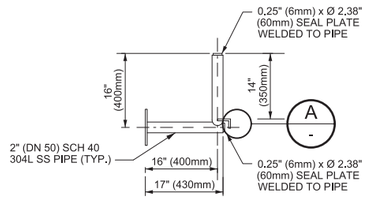

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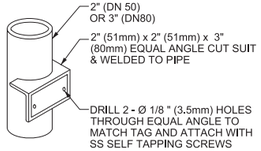
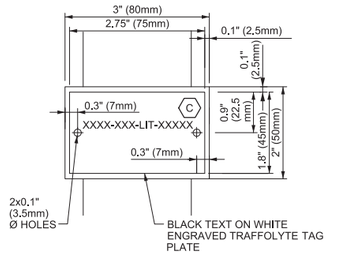
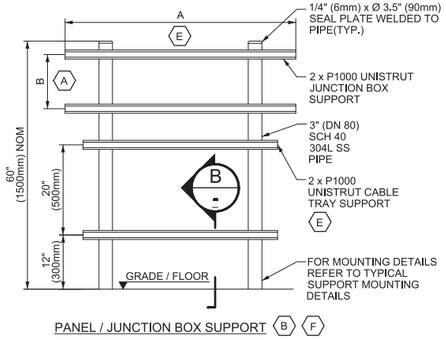


A - DETAIL

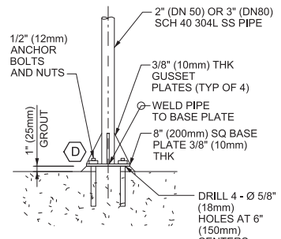


INSTRUMENT TAG AND MOUNTING PLATE (B) (F)

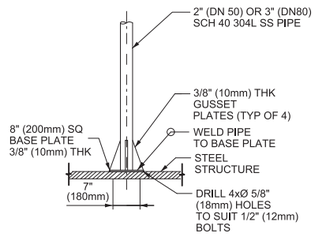
SINGLE INSTRUMENT SUPPORT (B) (F)



PANEL / JUNCTION BOX SUPPORT (B) (F)

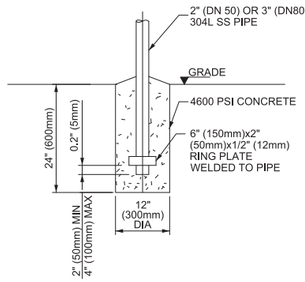


CONCRETE SLAB MOUNTING



STEEL STRUCTURE MOUNTING

B - DETAIL



YARD MOUNTING

TYPICAL SUPPORT MOUNTING DETAILS

GENERAL NOTES:

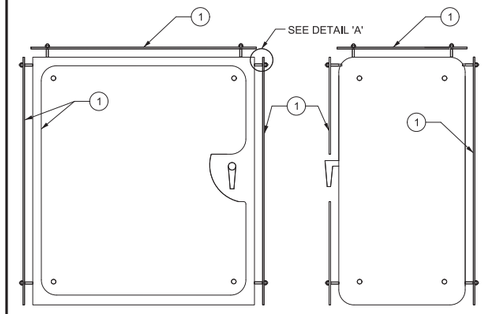
1. INSTRUMENT DISPLAY SHALL BE SITUATED 48" (1220mm) ABOVE GRADE. REQUEST FOR DEVIATION SHALL BE SUBMITTED IN WRITING TO THE ENGINEER FOR APPROVAL.
2. REFER TO WEATHER SHIELD INSTALLATION DETAILS I-702 FOR WEATHER SHIELD SPECIFICS AND ADDITIONAL INSTALLATION REQUIREMENTS.
3. AFTER FABRICATION REMOVE ALL SHARP EDGES, BURRS ETC.
4. ALL WELDS SHALL BE 0.2" (6mm) CONTINUOUS FILLET WELDS FULL PERIMETER UNLESS NOTED OTHERWISE.
5. STANDS ARE TYPICAL; SITE MODIFICATION MAY BE NECESSARY TO ACCOMMODATE INSTALLATION.

KEYNOTES:

A. DIMENSION "B" TO SUIT JUNCTION BOX MOUNTING BRACKETS.
B. ALL HEAT AFFECTED WELD AREAS TO BE PAINTED WITH ZINC CHROMATE.
C. REFER TO PROJECT INSTRUMENT SCHEDULE FOR TAG NUMBERING DETAILS.
D. BASEPLATES TO BE FIXED TO CONCRETE USING 1/2" (12mm) 316 SS ANCHOR BOLTS (QTY=4) USING MULTI EPOXY ADHESIVE ANCHORS. IF CONCRETE THICKNESS IS INSUFFICIENT FOR MOUNTING VERTICAL BASE PLATES, EMPLOY A THROUGH BOLTED CONNECTION.
E. DIMENSION "A" LENGTH AND CABLE TRAY SUPPORT LENGTH AS REQUIRED TO SUIT NUMBER OF JUNCTION BOXES OR CONTROL PANELS.
F. SUPPORT ASSEMBLY SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.

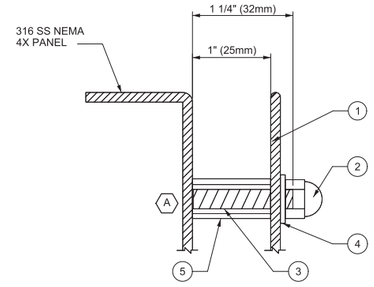
INSTRUMENT STAND

REV 120117 I-701



OUTDOOR-MOUNTED CONTROL PANEL SUNSHIELD (FRONT VIEW)

OUTDOOR-MOUNTED CONTROL PANEL SUNSHIELD (SIDE VIEW)



DETAIL"A"

GENERAL NOTES:

1. SUNSHIELD SHALL BE REQUIRED FOR ALL OUTDOOR CONTROL PANELS NLESS SPECIFICALLY NOTED OTHERWISE.
2. SUNSHIELD PANEL CORNERS MUST BE ROUNDED AND ALL EDGES GROUND SMOOTH, COMPLETELY DE-BURRED.

KEYNOTES:

A. STAINLESS STEEL STUDS SHALL BE WELDED ONTO PANEL EXTERIOR. PENETRATION OF THE PANEL TO SUPPORT SUNSHIELD INSTALLATION WILL NOT BE ACCEPTABLE.

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	SUPPLY	MATERIAL/ RATING (WATER)	MATERIAL/ RATING (CHEMICAL)
1	5	SUN-SHIELD PANEL	MANF	316 SS	316 SS
2	20	1/4" (8mm) ACORN NUT	MANF	316 SS	316 SS
3	20	1/4" (8mm)x1 1/4" (32mm) LONG STUD	MANF	316 SS	316 SS
4	20	1/4" (8mm) IDx3/4" (20mm) OD FLAT WASHER	MANF	316 SS	316 SS
5	20	SPACER 1/4" (8mm)x1" (25mm) LONG	MANF	UV-RESISTANT BLACK NYLON	UV-RESISTANT BLACK NYLON

PANEL SUNSHIELD

REV 120117 I-703

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Client/Project
TOWN OF MORRISON
WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS
OFFICE
Title
GENERAL INSTRUMENTATION AND CONTROL INSTALLATION DETAIL - I

Permit-Seal

COLORADO LICENSED 53254 PROFESSIONAL ENGINEER

Project Number: 205305149
File Name: GI-05.dgn

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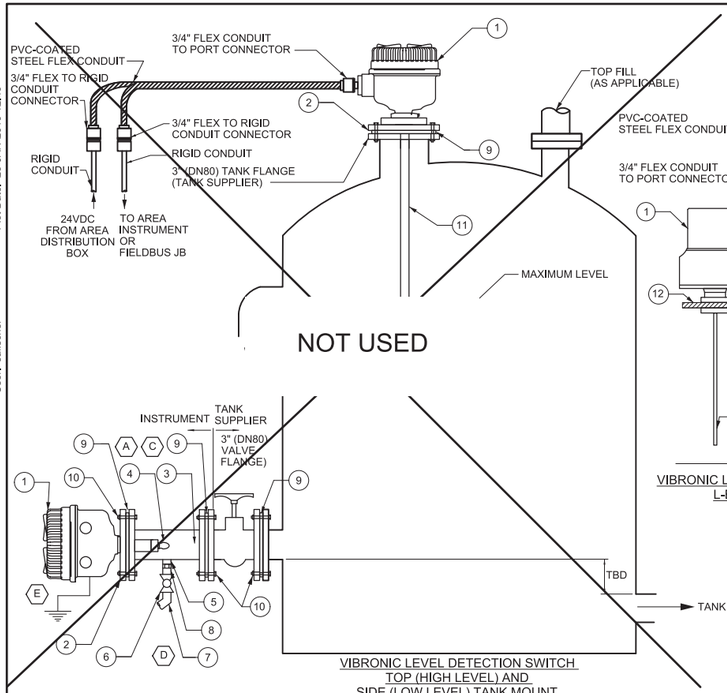
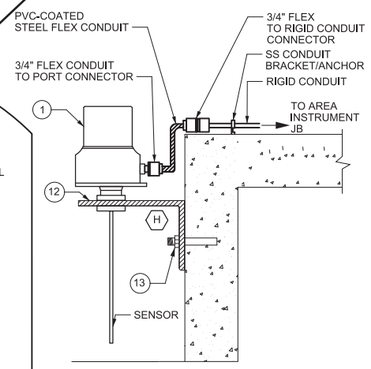
Drawing No. GI-5
Revision C
Sheet 23 of 28





VIBRONIC LEVEL DETECTION SWITCH
L-BRACKET MOUNT

VIBRONIC LEVEL DETECTION SWITCH
TOP (HIGH LEVEL) AND
SIDE (LOW LEVEL) TANK MOUNT

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	SUPPLY	MATERIAL/ RATING (WATER)	MATERIAL/ RATING (CHEMICAL)
1	1	ELECTRONIC HOUSING WITH 1" NPT SENSOR.	MANF	EPOXY COATED ALUMINUM	EPOXY COATED ALUMINUM
2	1	3" (DN80) ANSI 150 BLIND FLANGE WITH 1" NPT TAP FOR INSTRUMENT	MANF	PVC	PVC
3	1	3" (DN80) ANSI 150 SCH 80 PIPE SPOOL	MANF	PVC	PVC
4	1	VIBRATING SENSING FORK	MANF	316 SS	⟨F⟩
5	1	1" (DN25) ANSI RATED SOCKOLET	MANF	PVC	PVC
6	1	1" (DN25) SPOOL DRAIN BALL VALVE	MANF	PVC	PVC
7	1	1" (DN25) 45° DRAIN ELBOW	MANF	PVC	PVC
8	1	1" (DN25) SCH 40 DRAIN PIPE	CONT	PVC	PVC
9	1	SOFT GASKET	CONT	EPDM	EPDM
10	AR	BOLT, WASHER AND NUT	CONT	316 SS	316 SS
11	1	SENSOR EXTENSION, LENGTH AS REQUIRED	CONT	316 SS	⟨G⟩
12	1	ANGLE BRACKET	MANF	316 SS	316 SS
13	1	1/2" 316 SS ANCHOR BOLTS AND NUTS	CONT	316 SS	316 SS

GENERAL NOTES:

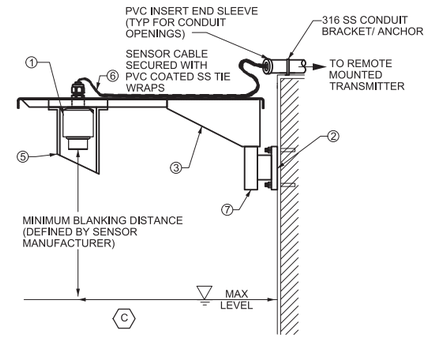
1. INSTALLATION OF SENSOR SHALL BE SUCH THAT SENSING FORK DOES NOT COME INTO CONTACT WITH ENTERING/FILLING LIQUIDS, VESSEL WALL, PROCESS BUILD UP, OR ANY OTHER PHYSICAL OBSTRUCTION.
2. PROVIDE MECHANICAL SUPPORT AND FITTINGS FOR ROUTED CONDUIT.
3. MECHANICALLY PROTECT CABLING WITHIN RIGID GS CONDUIT TO WITHIN 18" (450 MM) OF THE SENSOR MOUNT AND TO WITHIN 12" (300 MM) OF THE TRANSMITTER CABLE CONDUIT CONNECTION AS APPLICABLE.
4. CONTRACTOR AND VENDOR FURNISHED CABLING SHALL BE RATED WATERTIGHT AND FOR CONTINUOUS UV EXPOSURE WITHOUT DEGRADATION.
5. INSTRUMENT ENCLOSURE RATING SHALL CONFORM TO SECTION 260000.
6. FLEX CONDUIT IS TYPICALLY LIMITED TO 18".

⟨⟩ KEYNOTES:

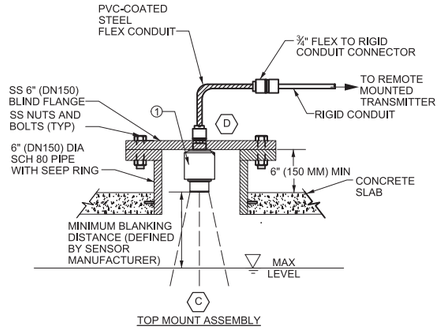
A. MINIMUM INSERTION LENGTH AND MINIMUM REQUIRED SENSOR CLEARANCES PER INSTRUMENT MANUFACTURER.
B. FOR HIGH LEVEL DETECTION (TOP OR SIDE MOUNT), LOCATE SENSOR 2" (50 MM) BELOW OVERFLOW PIPE LIP.
C. CONTRACTOR SHALL SIZE FLANGED SPOOL PIECE TO ACCOMMODATE INSTRUMENT SENSOR PER INSTRUMENT MANUFACTURER SPECIFICATIONS. SPOOL PIECE SHALL INCLUDE 1" (DN25) TAP FOR DRAIN LINE WITH ISOLATION BALL VALVE.
D. DRAIN TO SAFE LOCATION.
E. INSULATED MULTI-STRANDED COPPER GROUND CABLE (10MM²) INSTALLED AS REQUIRED.
F. 316 SS MUST BE COMPATIBLE WITH THE CHEMICAL USED. IF NOT, THEN THE WETTED PARTS SHALL BE OF AN ALLOY THAT IS COMPATIBLE WITH THE CHEMICAL USED.
G. 316 SS OR HASTELLOY STEEL MUST BE COMPATIBLE WITH THE CHEMICAL USED. IF NOT, THEN THE WETTED PARTS SHALL BE OF AN ALLOY THAT IS COMPATIBLE WITH THE CHEMICAL USED.
H. MANUFACTURER SUPPLIED L-BRACKET TAPPED FOR PROBE FITTING.

VIBRATION LEVEL SWITCH

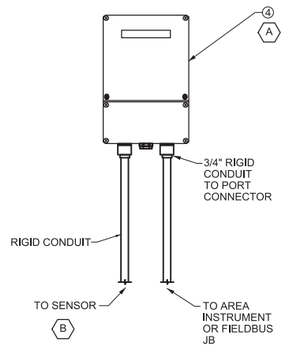
I-957



WALL MOUNT ASSEMBLY



TOP MOUNT ASSEMBLY



REMOTE TRANSMITTER

GENERAL NOTES:

1. PROVIDE MECHANICAL SUPPORT AND FITTINGS FOR ROUTED CONDUIT.
2. MECHANICALLY PROTECT CABLING WITHIN RIGID GS CONDUIT TO WITHIN 18" (450 MM) OF THE SENSOR MOUNT AND TO WITHIN 12" (300 MM) OF THE TRANSMITTER CABLE GLANDS AS APPLICABLE.
3. CONTRACTOR AND VENDOR FURNISHED CABLING SHALL BE RATED WATERTIGHT AND FOR CONTINUOUS UV EXPOSURE WITHOUT DEGRADATION.
4. INSTRUMENT ENCLOSURE RATING SHALL CONFORM TO SECTION 26 27 16.
5. FLEX CONDUIT IS TYPICALLY LIMITED TO 36" (1 METER).

⟨⟩ KEYNOTES:

A. REFER TO INSTALLATION DETAILS I-948 AND I-949 FOR REMOTE TRANSMITTER MOUNTING DETAILS.
B. SENSOR CABLE SPLICE OF ANY KIND SHALL NOT BE ACCEPTABLE.
C. INSTALLATION SHALL ALLOW FOR UNOBSTRUCTED SIGNAL PROPAGATION ASSUMING A MAXIMUM RADIUS OF 1/6 TANK DIAMETER (FOR CLOSED VESSEL) OR 36" (1 METER) FOR CONCRETE STRUCTURES. TALLER VESSELS/STRUCTURES SHALL BE AS PER THE INSTRUMENT MANUFACTURER'S RECOMMENDATION.
D. DRILL AND TAP MATING BLIND FLANGE FOR INSTRUMENT.

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	SUPPLY	MATERIAL/ RATING (WATER)	MATERIAL/ RATING (CHEMICAL)
1	1	ULTRASONIC FLOW SENSOR	MANF	PVDF	N/A
2	AR	⅜" SS ANCHOR BOLTS AND MOUNTING HARDWARE	CONT	316 SS	N/A
3	AR	POSITIONABLE CANTILEVER MOUNTING ARM (WALL)	CONT	304 SS	-
4	1	INDICATING/TRANSMITTER UNIT (REMOTE MOUNT)	MANF	POLYCARBONATE	N/A
5	1	PROTECTIVE SENSOR COVER	MANF	PVDF	N/A
6	AR	SENSOR SIGNAL CABLE	MANF	PER VENDOR	N/A
7	1	304 SS MOUNTING BRACKET	CONT	304 SS	N/A

ULTRASONIC OPEN CHANNEL
FLOW TRANSMITTER

I-933

ORIGINAL SHEET - ANSI D

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Client/Project
TOWN OF MORRISON
WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS
OFFICE
Title
GENERAL INSTRUMENTATION AND CONTROL INSTALLATION DETAIL - II

Permit-Seal

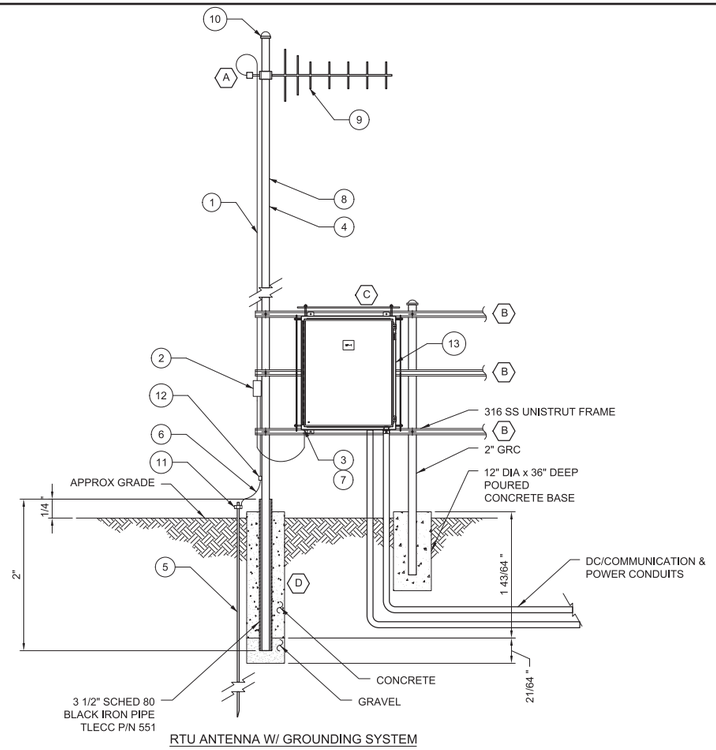
COLORADO LICENSED
JOHANJAN SAMADI
53254
12/31/19
PROFESSIONAL ENGINEER

Project Number: 205305149
File Name: GI-05.dgn

S.F.		S.N.	
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. GI-6
Revision C
Sheet 24 of 28

ORIGINAL SHEET - ANSI D



RTU ANTENNA W/ GROUNDING SYSTEM

GENERAL NOTES:

1. NUMBER OF ELEMENTS FOR ANTENNA TO BE DETERMINED BY SYSTEM INTEGRATOR.
2. SEE DETAIL I-703 FOR SUNSHIELD MOUNTING DETAIL.
3. ROUND TAPERED ALUMINUM ANTENNA POLE SHALL BE AS DESIGNED AND MANUFACTURED BY THE SYSTEM INTEGRATOR MODEL RTA-15 SERIES WITH STANDARD ANODIZED ALUMINUM FINISH. ANTENNA POLE BASE DIAMETER, MATERIAL, GAUGE, AND INSTALLATION REQUIREMENTS (TO MEET BUILDING CODE WIND LOAD REQUIREMENTS) SHALL BE PER MANUFACTURER RECOMMENDATION. POLE SHALL BE EQUIPPED WITH FACTORY INSTALLED VIBRATION DAMPENER.
4. MOUNT PANEL TO STRUTS WITH 316 STAINLESS STEEL CLAMPS, U-BOLTS, WASHERS, AND PACERS.
5. PANEL SHALL BE MOUNTED NO LESS THAN 2FT ABOVE GRADE. CONTRACTOR SHALL FURNISH SUPPORTS OF APPROPRIATE LENGTH TO ACCOMODATE INSTALLATION.

KEYNOTES:

A. PROVIDE WEATHERPROOF SEAL BETWEEN CABLE AND ANTENNA SUPPORT EXTENSION.

B. COORDINATE RACK WITH COMMINUTOR CABINET RACK. REFER TO E-103.

C. REFER TO INSTALLATION DETAIL I-703.

D. POURED CONCRETE ANCHOR BASE DIAMETER AS DETERMINED BY VENDOR TO MEET THE 2018 JEFFERSON COUNTY ULTIMATE WIND LOAD REQUIREMENTS OF 135MPH.

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	SUPPLY	MATERIAL/ RATING (WATER)	MATERIAL/ RATING (CHEMICAL)
1	1	TIMES LMR 400DB COAX CABLE 30FT	CONT	PER VENDOR	N/A
2	1	GROUND KIT 1/4" - 3/8" ANDREW 223158-4	CONT	COPPER	N/A
3	1	POLYPHASER IS B50LN-C2 (BULKHEAD MOUNTING)	CONT	PER VENDOR	N/A
4	1	SLEEVE FOR 2" MAST	CONT	PER VENDOR	N/A
5	1	GROUND ROD 5/8" X 8'	CONT	PER VENDOR	N/A
6	10	#6 SOLID BARE COPPER WIRE	CONT	PER VENDOR	N/A
7	4	N MALE CRIMP CONNECTOR LMR 400DB	CONT	316 SS	N/A
8	1	2" SCHEDULE 80 ALUMINUM PIPE 20FT	CONT	PER VENDOR	N/A
9	1	YAGI UHF ANTENNA W/1"-2" MOUNTING MAXRAD BMOY4405	CONT	PER VENDOR	N/A
10	1	2" WEATHER HEAD	CONT	PER VENDOR	N/A
11	2	GROUND ROD CLAMP 5/8"	CONT	PER VENDOR	N/A
12	1	2" ALUMINUM GROUND PIPE CLAMP	CONT	PER VENDOR	N/A
13	1	36" X 30" X 10" ENCLOSURE, NEMA 4X	CONT	316 SS	N/A

RTU ANTENNA WITH GROUNDING SYSTEM

I-999

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WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS
OFFICE

Title
GENERAL INSTRUMENTATION AND CONTROL
INSTALLATION DETAIL - III

Permit-Seal

COLORADO LICENSED
SARAH JANE
53254
11/23/19
PROFESSIONAL ENGINEER

Project Number: 205305149
File Name: GI-05.dgn

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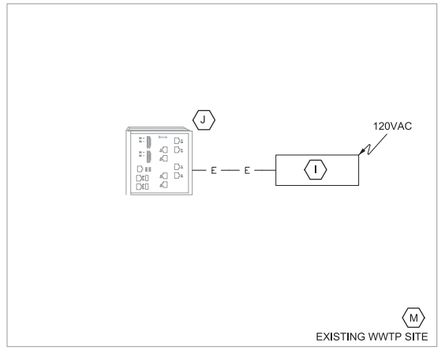
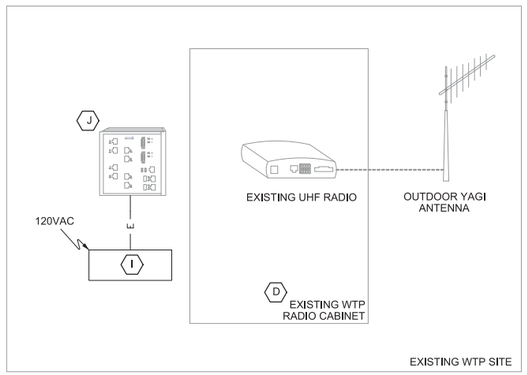
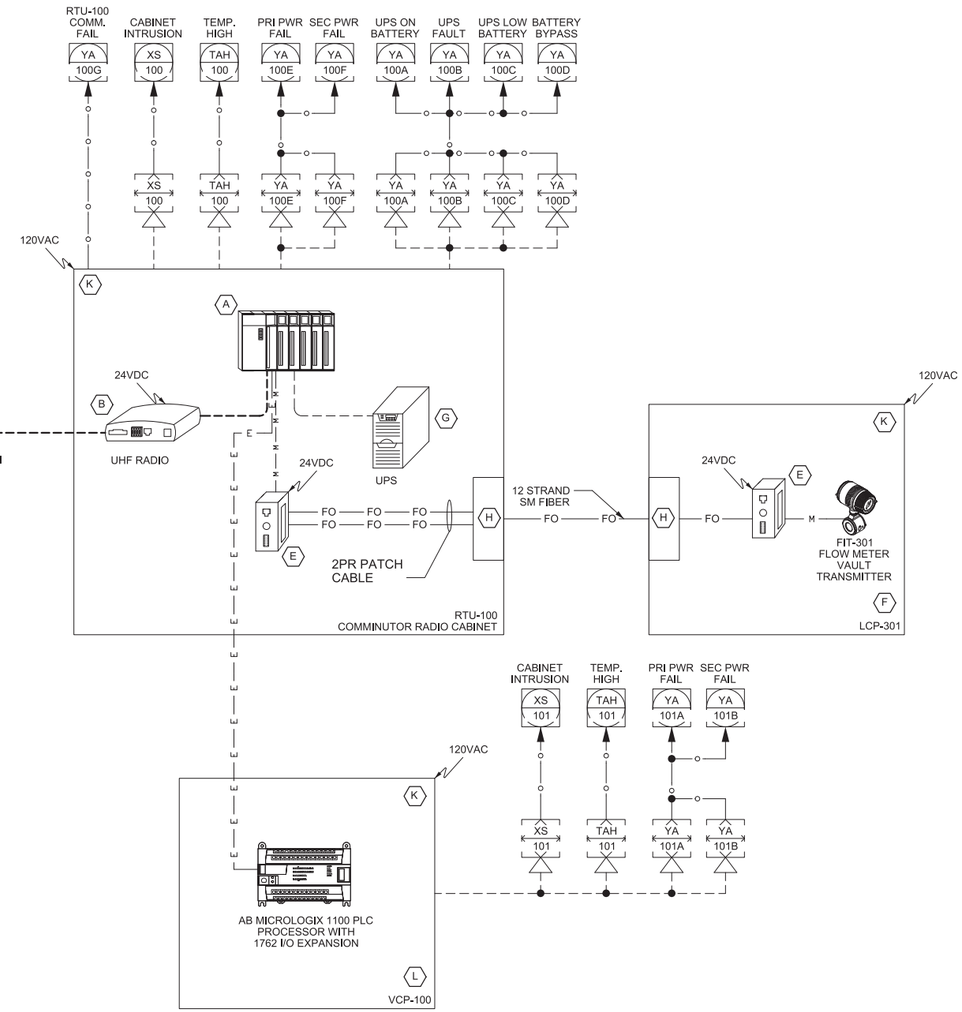
Drawing No. GI-7

Revision C
Sheet 25 of 28







GENERAL SHEET NOTES

1. REFER TO SECTION 40 95 10 FOR HARDWARE REQUIREMENTS, 40 92 50 FOR RTU REQUIREMENTS, AND 40 92 00 FOR PANEL REQUIREMENTS.

SHEET KEYNOTES

A. CONTRACTOR FURNISHED, INSTALLED, AND CONFIGURED MOTOROLA ACE3600 RTU WITH 5 I/O SLOT FRAME.

B. CONTRACTOR FURNISHED, INSTALLED, AND CONFIGURED 450MHz UHF RADIO SYSTEM.

C. CONTRACTOR FURNISHED AND INSTALLED NEMA 4X, 316 SS CABINET.

D. CONTRACTOR TO CONFIGURE EXISTING RADIO SYSTEM TO COMMUNICATE WITH RTU-100.

E. CONTRACTOR FURNISHED AND INSTALLED MODBUS-RTU TO SINGLE MODE FIBER TRANSCEIVER.

F. CONTRACTOR FURNISHED NEMA 4X 316SS ENCLOSURE HOUSING FLOW METER TRANSMITTER AND FIBER TRANSCEIVER.

G. CONTRACTOR FURNISHED AND INSTALLED UPS SHALL BE SIZED TO SUPPORT ALL NETWORK COMPONENTS ON FULL LOAD BATTERY POWER FOR A MINIMUM PERIOD OF 30MINUTES. UPS SHALL BE SECURELY SHELF MOUNTED.

H. CONTRACTOR FURNISHED AND INSTALLED DIN RAIL MOUNTED FIBER PATCH PANEL.

I. CONTRACTOR FURNISHED AND INSTALLED WATCHGUARD FIREBOX T30 VPN CONFIGURED TO COMMUNICATE WITH EXISTING WTP SITE.

J. EXISTING ETHERNET SWITCH.

K. FURNISH AND INSTALL REDUNDANT 24VDC POWER SUPPLY.

L. COMMINUTOR VENDOR FURNISHED AND INSTALLED NEMA 4X, 316 SS CABINET.

M. CONTRACTOR TO CONFIGURE THE EXISTING CONTROL SYSTEM TO MONITOR AND CONTROL DATA FROM RTU-100. CREATE NEW DISPLAY SCREENS AND TRENDS PER SECTION 40 91 00 AND 40 90 10.

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Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
INSTRUMENTATION AND CONTROL NETWORK DIAGRAM

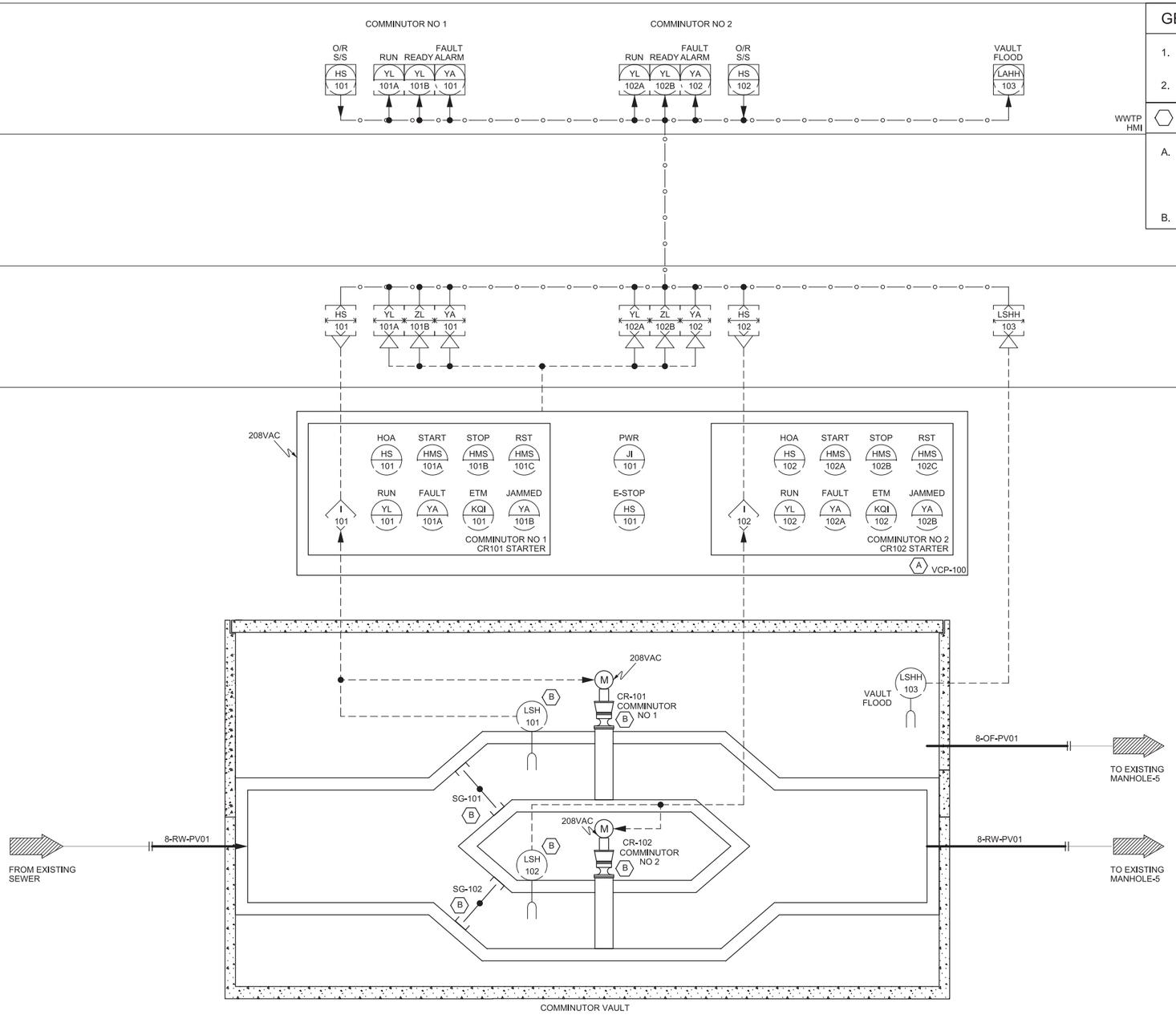
Permit-Seal

COLORADO LICENSED
SARAH L. HOPKINS
53254
11/23/18
PROFESSIONAL ENGINEER

Project Number: 205305149
File Name: I-01.dgn

S.F.		S.N.	
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. I-1
Revision C
Sheet 26 of 28



GENERAL SHEET NOTES

1. REFER TO SECTION 40 95 10 FOR HARDWARE REQUIREMENTS AND 40 92 00 FOR PANEL REQUIREMENTS.
2. REFER TO SECTION 40 95 20 FOR SOFTWARE REQUIREMENTS.

SHEET KEYNOTES

A. COMMINUTOR VENDOR FURNISHED LOCKABLE NEMA 4X 316 SS CONTROL PANEL WITH DEAD FRONT KIT. WHEN PLACED IN AUTO, COMMINUTOR SHALL BE CONFIGURED TO START/STOP BASED ON LEVEL SWITCH OR OVERRIDE REMOTE START/STOP. REFER TO SECTION 46 24 16 FOR DETAILS.

B. COMMINUTOR VENDOR FURNISHED.

Stantec
1500 Broadway # 1800
Denver, CO U.S.A.
www.stantec.com

Revision	By	Appd.	YY.MM.DD
C. ISSUED FOR IMD	S.L.H.	S.J.E.	19.01.23
B. 60% DESIGN PACKAGE	S.L.H.	S.J.E.	18.12.03
A. 30% DESIGN PACKAGE	S.L.H.	S.J.E.	18.07.20
Issued	By	Appd.	YY.MM.DD

Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
INSTRUMENTATION AND CONTROL
COMMINUTOR VAULT P&ID

Permit-Seal

COLORADO LICENSED SAMANTHA RICHER 53254 PROFESSIONAL ENGINEER

Project Number: 205305149
File Name: I-02.dgn

S.F.		S.N.	
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. I-2
Revision C
Sheet 27 of 28

Plot Date: 23-JAN-2019 12:49
User: saffischer
C:\Users\saffischer\Desktop\CAD Export\Morrison\I051-[PROJ_NO]_2234_VER-[VERSION].dwg
File: I-02.dgn Model: Layout1 ColorTable: bw.ctb DesignScript: MWH_Iplot_Pentable_2016.pen PlotScale: 0.08333:1
2018/12/05 12:13 PM By: Richer, Samantha
ORIGINAL SHEET - ANSI D

FLOW METERING/SAMPLING

PRGM COMP-LETE YL 301 | PMP FAULT YA 301A | DIST FAULT YA 301B | BOTTLE FULL YA 301C | FLOW FI 301 | TOTAL FLOW FQI 301

WWTP HMI

WWTP HMI

YL 301 | YA 301A | YA 301B | YA 301C | FIT 301 | FQI 301

RTU-100 COMMINUTOR RADIO CABINET

RTU-100 COMMINUTOR RADIO CABINET

FIELD

FIELD

120VAC

FC 301

AE 301

A

B

D

120VAC

FIT 301

C

LCP-301

ULT

LE 301

C

FROM EXISTING MANHOLE-5

MANHOLE-5A

TO EXISTING EQ BASIN

PV-XXXX 8VP

8-RW-PV01

FLUME

FLOW METERING/SAMPLING MANHOLE-6

TO NEW MANHOLE-10A

SHEET KEYNOTES

A. REFRIGERATED AUTO SAMPLER PER SECTION 40 91 12. CONFIGURED TO SAMPLE BASED ON FLOW RATE.

B. NEMA 4X 316SS ENCLOSURE HOUSING AUTO SAMPLER.

C. FURNISHED BY THE PACKAGED METERING MANHOLE VENDOR PER SECTION 33 05 16.

D. SAMPLER INTERFACE CABLE FURNISHED BY PACKAGED METERING MANHOLE VENDOR.

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Revision	By	Appd.	YY.MM.DD
C. ISSUED FOR IMD	S.L.H.	S.J.E.	19.01.23
B. 60% DESIGN PACKAGE	S.L.H.	S.J.E.	18.12.03
A. 30% DESIGN PACKAGE	S.L.H.	S.J.E.	18.07.20
Issued	By	Appd.	YY.MM.DD

Client/Project
TOWN OF MORRISON

WASTEWATER SYSTEM IMPROVEMENTS
RED ROCKS EQUALIZATION BASIN IMPROVEMENTS

OFFICE

Title
INSTRUMENTATION AND CONTROL
BYPASS MANHOLE AND FLUME VAULT P&ID

Permit-Seal

COLORADO LICENSED 53251 PROFESSIONAL ENGINEER

Project Number: 205305149
File Name: I-03.dgn

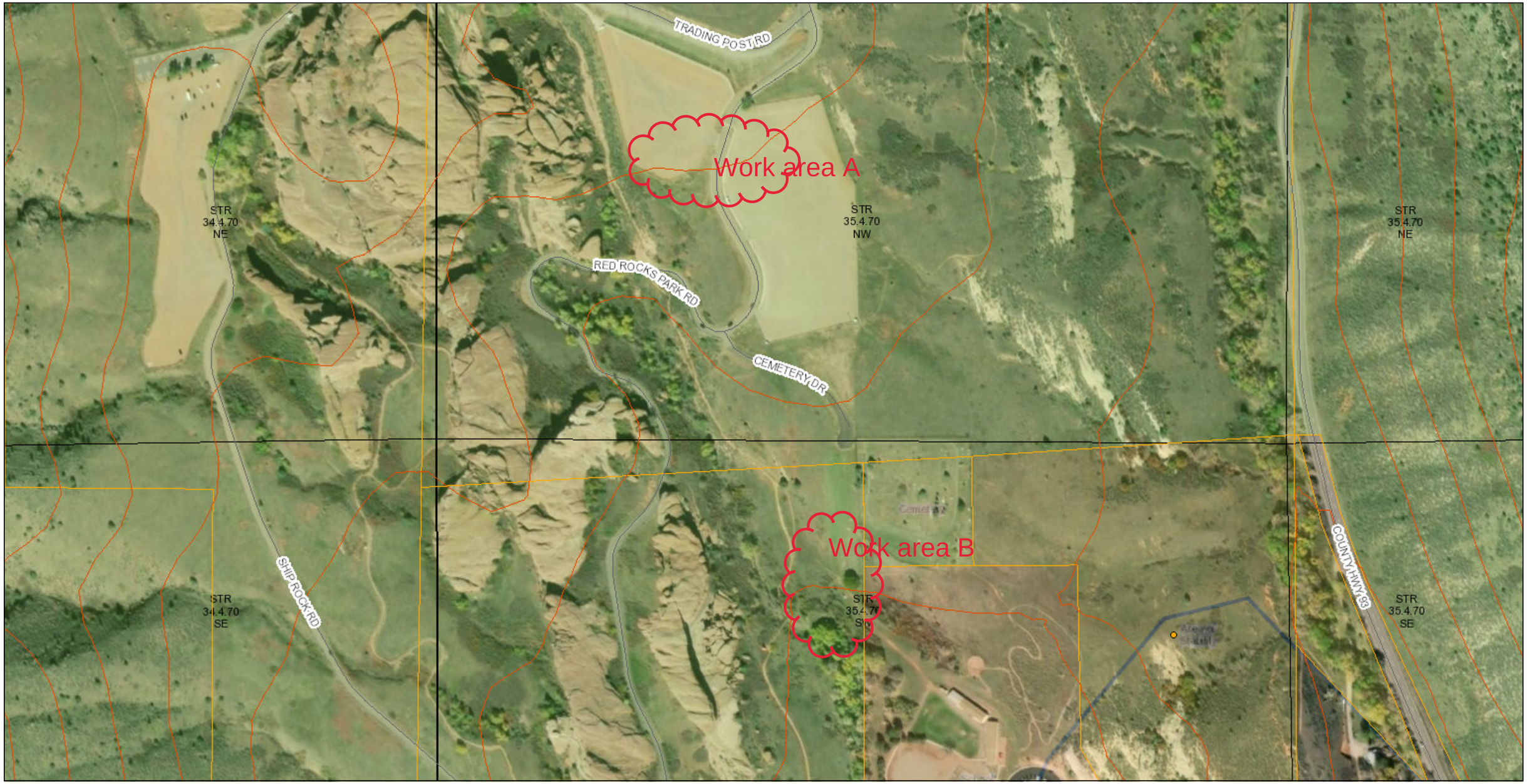
S.F.		S.N.	
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. I-3

Revision C

Sheet 28 of 28

Jefferson County Parcel Map - Exhibit E



N

0 0.1 0.2 mi

JEFFERSON COUNTY COLORADO

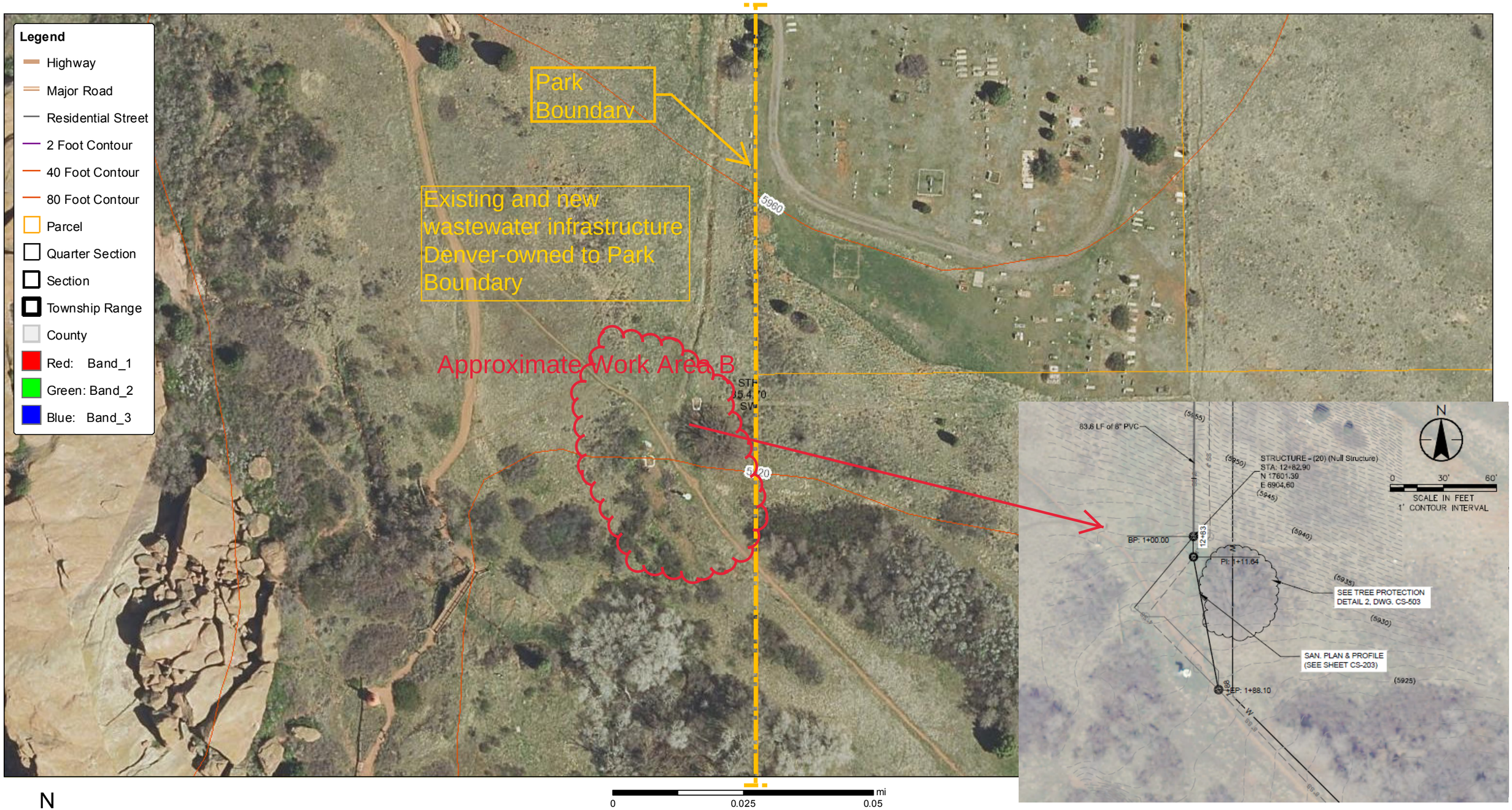
Jefferson County Parcel Map Exhibit E - Work Area A

N

0 0.055 0.11 mi

JEFFERSON COUNTY COLORADO

Jefferson County Parcel Map Exhibit E - Work Area B



JEFFERSON COUNTY COLORADO