ROXBOROUGH WATER AND SANITATION DISTRICT

AS BUILT DRAWINGS
ACP 11/22/2019

RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

ROXBOROUGH WATER AND SANITATION DISTRICT
6222 NORTH ROXBOROUGH PARK ROAD
LITTLETON, CO 80125
PHONE: 303-979-7286
FAX: 303-933-3649

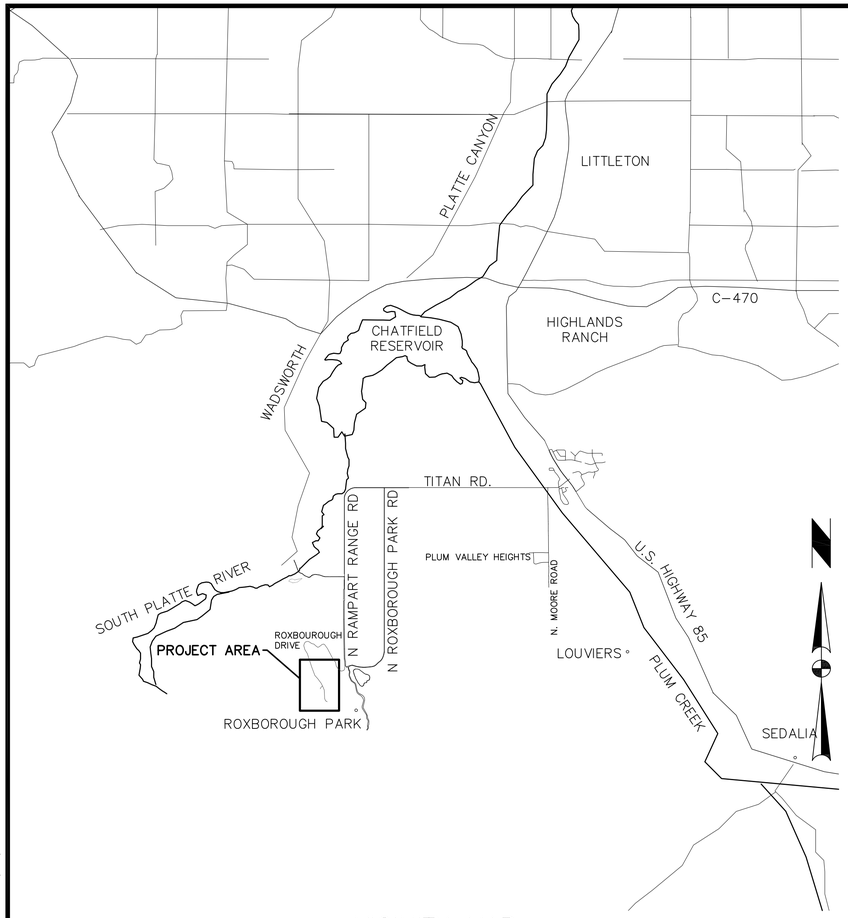
AS BUILT DRAWINGS
ACP 11/22/2019

TST INFRASTRUCTURE, LLC
61 INVERNESS DRIVE EAST, SUITE 100
ENGLEWOOD, CO 80112
PH: 303-799-5197 FAX: 303-768-0441

JOB#: 001.335.01
DATE: NOVEMBER 22, 2019

TST
Consulting Engineers

AS-BUILTS



VICINITY MAP

FULL SIZE SCALE: 1" = 10,000'

DRAWING INDEX

CIVIL

ELECTRICAL

INSTRUMENTATION AND CONTROLS

GESC

ABBREVIATIONS

&	AND
@	AT
°	DEGREE
Δ	DELTA
ø	DIAMETER
"	INCH
#	NUMBER
%	PERCENT
ABAND	ABANDON(ED)
AC	ASBESTOS CEMENT
ASSY	ASSEMBLY
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
AWG	AMERICAN WIRE GAUGE
AWWA	AMERICAN WATER WORKS ASSOCIATION
APPROX	APPROXIMATE(LY)
BMP	BEST MANAGEMENT PRACTICE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
℄	CENTERLINE
CDOT	COLORADO DEPARMENT OF TRANSPORTATION
CI	CAST IRON
COMBO	COMBINATION
CONC	CONCRETE
CONN	CONNECTION
CY	CUBIC YARD
DC	DOUGLAS COUNTY
DI	DUCTILE IRON
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
E	EAST
E:	EASTING
E.I.C.	EMERGENCY INTERCONNECT
ELEC	ELECTRICAL
EL	ELEVATION
ELL	ELBOW
ESMT.	EASEMENT
EX	EXISTING
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FLG	FLANGE
FNPT	FEMALE NATIONAL PIPE THREAD
FO	FIBER OPTIC
GEN	GENERATOR
GV	GATE VALVE
H	HEIGHT
HDD	HORIZONTAL DIRECTION DRILL
HORIZ	HORIZONTAL
HWL	HIGH WATER LEVEL
ID	INSIDE DIAMETER
IPS	INTERNATIONAL PIPE SIZE
INV.	INVERT
IR	IRRIGATION
JTS	JOINTS
L	LENGTH
LF	LINEAR FEET
LOC	LIMITS OF CONSTRUCTION
LWL	LOW WATER LEVEL
MAX	MAXIMUM
MATL	MATERIAL
MIN	MINIMUM
MJ	MECHANICAL JOINT
MNPT	MALE NATIONAL PIPE THREAD
MNST	MALE NATIONAL STANDARD THREAD
MP	METER PIT
N/A	NOT APPLICABLE
N.	NORTH
N:	NORTHING
NPT	NATIONAL PIPE THREAD
NAVD	NORTH AMERICAN VERTICAL DATUM
NTS	NOT TO SCALE
O.D.	OUTSIDE DIAMETER
OHE	OVERHEAD ELECTRIC
PCF	POUNDS PER CUBIC FOOT
PE	POLYETHYLENE
PH	PHONE
PL	PROPERTY LINE
PNT	POINT
POLY	POLYETHYLENE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
RCP	REINFORCED CONCRETE PIPE
RDCR	REDUCER
RMD	RAVENNA METROPOLITAN DISTRICT
ROW	RIGHT OF WAY
RWSD	ROXBOROUGH WATER AND SANITATION DISTRICT
SCHED	SCHEDULE
SS	SANITARY SEWER
S.	SOUTH
SQ	SQUARE
SAN	SANITARY SEWER
SF	SQUARE FEET
SHT	SHEET
SST	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
SY	SQUARE YARD
TB	THRUST BLOCK
TEMP	TEMPORARY
THK	THICK
TOP	TOP OF PIPE
TYP	TYPICAL
TRANS	TRANSFORMER
TWTS	TRACER WIRE TEST STATION
UGE	UNDERGROUND ELECTRIC
VERT	VERTICAL
VTC	VEHICLE TRACKING CONTROL
W	WEST
WL	WATERLINE
WTP	WATER TREATMENT PLANT
W/	WITH
W/O	WITHOUT
XING	CROSSING

SYMBOL LEGEND

EXISTING	NEW
EX WATER LINE FITTING	GEOTECHNICAL BORE SAMPLE LOCATION (BH-X)
EX WATER LINE VALVE	POTHOLE
EX SS CLEANOUT	WATER LINE FITTING
EX SS MANHOLE	WATER LINE VALVE
EX BOLLARD	ASPHALT SURFACE (MILL AND OVERLAY)
EX. LIGHT POLE	ASPHALT SURFACE (FULL DEPTH)
EX. CARSONITE MARKER	CONCRETE PATH
EX. FIRE HYDRANT	TEMP PATH
EX. ROAD SIGNS	
EX. TELE/ELEC UTILITY BOX	
EX. GAS UTILITY BOX	
EX POWER POLE	
EX GRAVEL DRIVE	
EX ASPHALT ROAD	
EX CONCRETE PATH	
RECYCLED ASPHALT	
EX CONIFEROUS TREE	
EX DECIDUOUS TREE	

LINE TYPE LEGEND

EXISTING	
SAN	EXISTING SEWER LINE
PW	EXISTING WATER LINE
UGE	EXISTING UNDERGROUND ELECTRIC
GAS	EXISTING GAS
PH	EXISTING UNDERGROUND TELEPHONE
RWL	EXISTING RAW WATER LINE
STM	EXISTING STORM SEWER
6220	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
X	EXISTING FENCELINE
	EXISTING EASEMENT BOUNDARY
	EXISTING PROPERTY BOUNDARY
AWL	EXISTING ABANDONED WATER LINE
FO	EXISTING FIBER OPTIC LINE

NEW	
	LIMITS OF CONSTRUCTION
X+XX	WATER LINE

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
VICINITY MAP AND INDEX SHEET

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: INDEX

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LEGEND

- EX WATER LINE
- PROJECT WATER LINE
- LOT / RIGHT-OF-WAY LINES
- SHEETS
- PRV MANHOLES

SITE 3 – EAST CONNECTION

SITE 1 – TRANSMISSION MAIN

SITE 6 – RAPHAEL PRV

SITE 2 – NORTH CONNECTION

RWSD LIFT STATION – 11290 CARETAKER ROAD

SITE 5 – DANTE PRV

SITE 4 – PRV RELOCATION

SITE 7 – 2" WATER LINE EXTENSION

FOX PAW TRAIL
LEONARDO PLACE
RAPHAEL LANE
ROXBOROUGH DR
ROXBOROUGH DR NORTH
WATERTON ROAD
CARETAKER ROAD
DANTE DRIVE
CICERO COURT
GALILEO WAY

C1
C2
C3-C4
C5
C15-C16
C21
C21
C22

PROJECT KEY MAP
1" = 300"

300 0 150 300 600
1 INCH = 300 FEET

AS-BUILTS

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REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

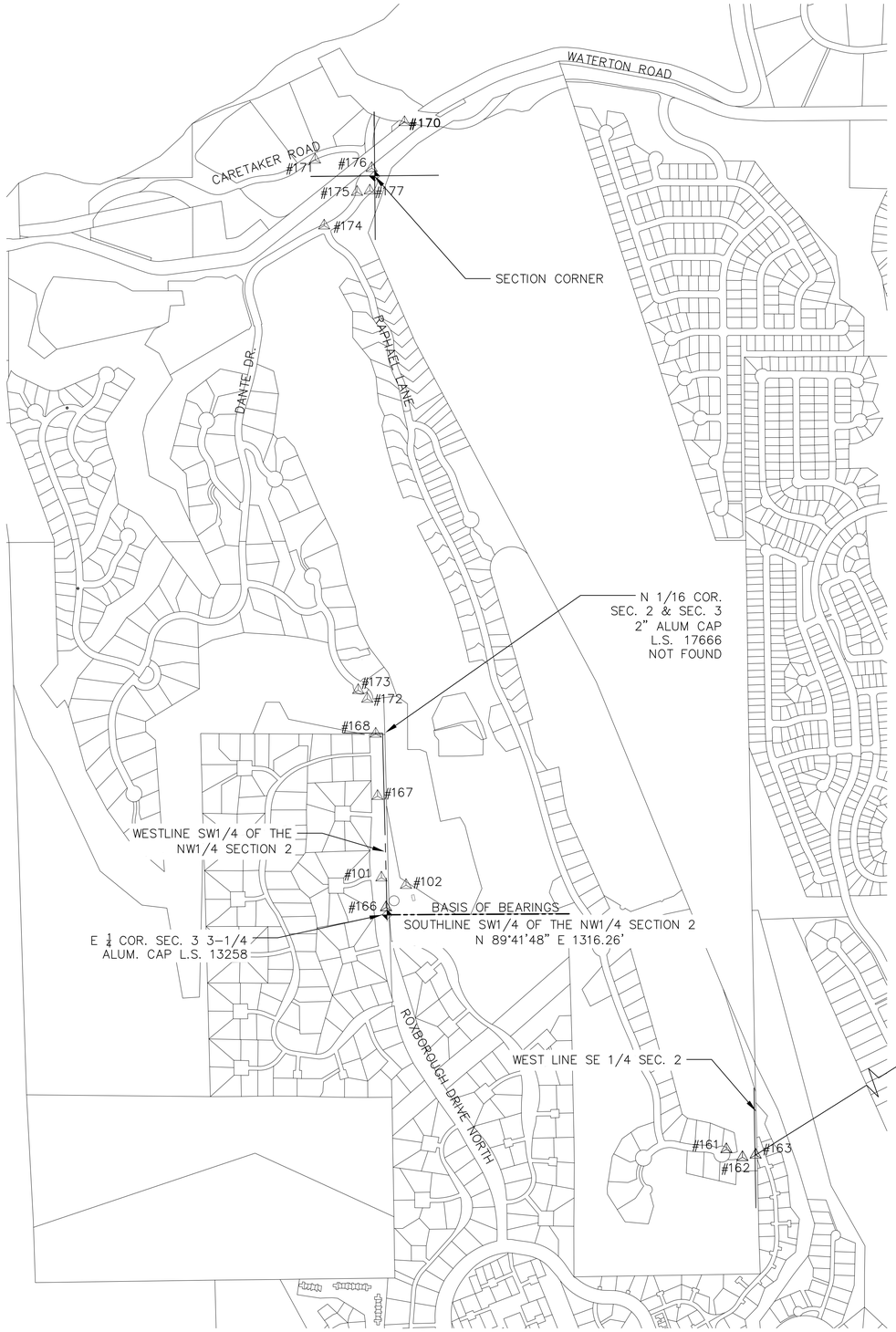
1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
PROJECT KEY MAP

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: KEY



GENERAL NOTES

1. BASIS OF BEARINGS: BEARINGS ARE BASED UPON GRID BEARINGS AS ESTABLISHED ON THE COLORADO STATE PLANE COORDINATES "CENTRAL" SYSTEM WHEREAS THE SOUTHLINE OF SW1/4 OF THE NW1/4 SECTION 2 BEARS N 89°41'48" E 1316.26'.
2. ALL DIMENSIONS ARE SHOWN IN U.S. SURVEY FEET. BEARINGS ARE SHOWN AS DEGREES, MINUTES AND SECONDS.
3. HORIZONTAL AND VERTICAL DATUM – SEE COORDINATES AND NOTE 5.
4. BASIS OF ELEVATIONS: ELEVATIONS ARE BASED UPON DOUGLAS COUNTY CONTROL POINT, BEING A 3" ALUMINUM CAP STAMPED "DC 2.056130 ". ELEVATION = 5745.84 FEET NAVD 88. (SURVEY CONTROL POINT #11)
5. TO CONVERT THE SHOWN GROUND COLORADO MODIFIED STATE PLANE COORDINATES (TRUNCATED) (ZONE CENTRAL 0502) TO GRID COLORADO STATE PLANE COORDINATES (NOT TRUNCATED) (ZONE CENTRAL 0502)

EXAMPLE:

GROUND COLORADO MODIFIED STATE PLANE COORDINATES (TRUNCATED) (ZONE CENTRAL 0502)

PNT	NORTHING	EASTING	ELEVATION	DESCRIPTION
11	597376.809	121548.531	5745.843	DC 2056310

597376.809 + 1,000,000 = 1597376.809 x 0.999685342 = 1596874.182
121548.531 + 3,000,000 = 3121548.531 x 0.999685342 = 3120566.311

GRID COLORADO STATE PLANE COORDINATES (ZONE CENTRAL 0502)

PNT	NORTHING	EASTING	ELEVATION	DESCRIPTION
11	1596874.182	3120566.311	5745.843	DC 2056310

GROUND SCALE FACTOR EQUALS 1.000314757
GRID SCALE FACTOR EQUALS 0.999685342
NORTHING TRUNCATED BY 1,000,000
EASTING TRUNCATED BY 3,000,000

POINT OF ORIGIN: 0,0

NAD 83 (92)
NAVD 88
GEOID 96 (USED PER EXISTING DOUGLAS COUNTY CONTROL)

NOTE:
HORIZONTAL LOCATIONS SHOWN FOR WATER LINES AND RELATED APPURTENACNES AND STRUCTURES ARE BASED SOLELY ON RECEIVED SURVEY FROM REDLINE PIPELINE

PRIMARY CONTROL DOUGLAS COUNTY / NGS (LAT/LONG):

PNT	LATITUDE	LONGITUDE	DESCRIPTION
10	39D27'12.35993"	-105D04'04.47409"	ROMANSKI
11	39D28'17.08156"	-105D04'22.48045"	DC 2056310
12	39D30'25.60794"	-105D04'20.30184"	COPP
13	39D27'22.54679"	-105D03'16.24950"	DC 2044120
14	39D28'11.80167"	-105D05'13.37423"	DC 2052137
15	39D26'44.21872"	-105D01'44.91540"	DC 2037106
17	39D26'09.54531"	-105D03'44.26712"	DC 2031125
18	39D30'26.60909"	-105D02'35.04502"	J305
21	39D28'40.08760"	-105D03'16.86375"	DC 2059120

PRIMARY CONTROL DOUGLAS COUNTY / NGS (GRID):

PNT	NORTHING	EASTING	DESCRIPTION
10	1590332.610	3122009.435	ROMANSKI
11	1596874.182	3120566.311	DC 2056310
12	1609878.818	3120675.927	COPP
13	1591381.538	3125786.901	DC 2044120
14	1596321.532	3116577.874	DC 2052137
15	1587539.824	3132970.542	DC 2037106
17	1583984.926	3123624.999	DC 2031125
18	1610020.277	3128924.995	J305
21	1599226.542	3125700.268	DC 2059120

SURVEY CONTROL

SITE CONTROL:

PNT	NORTHING	EASTING	ELEVATION	DESCRIPTION
101	597382.288	116179.950	5841.184	SURVEY POINT WITH 1" PLASTIC WASHER
102	597328.601	116357.919	5839.621	NAIL
166	597166.776	116213.327	5853.159	NO.5 REBAR WITH 1" BLUE PLASTIC CAP
167	597971.769	116152.228	5800.098	NO.5 REBAR WITH 1" BLUE PLASTIC CAP
168	598422.727	116138.627	5772.397	NAIL
172	598675.417	116077.513	5754.520	NAIL
173	598738.349	116012.221	5745.386	PK NAIL WITH 1" PLASTIC WASHER
170	602845.98	116347.02	5551.52	SURVEY POINT NAIL WITH 1" PLASTIC WASHER
171	602574.39	115700.31	5538.45	NO.5 REBAR WITH 1" BLUE PLASTIC CAP "TRUE NORTH"
174	602098.19	115765.92	5563.07	1" BRASS PLUG STAMPED TRUE NORTH
175	602341.65	116003.86	5558.14	CUT CROSS
176	602513.84	116109.46	5557.75	CUT CROSS
177	602351.32	116095.96	5557.53	CUT CROSS
161	595417.580	118674.720	5861.834	CUT CROSS
162	595360.470	118791.002	5854.675	NO.5 REBAR WITH 1" BLUE PLASTIC CAP STAMPED TRUE NORTH
163	595377.045	118886.509	5842.337	NO.5 REBAR WITH 1" BLUE PLASTIC CAP STAMPED TRUE NORTH

SURVEY LEGEND

- INDICATES SECTION CORNER/QUARTER CORNER
- INDICATES SURVEY CONTROL POINT
- INDICATES BENCHMARK

SURVEY CONTROL DIAGRAM
1" = 500'

500 0 250 500 1000
1 INCH = 500 FEET

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

SURVEY CONTROL DIAGRAM

DRAWING

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TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO. 001.335.01
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DRAWING NO. SCD

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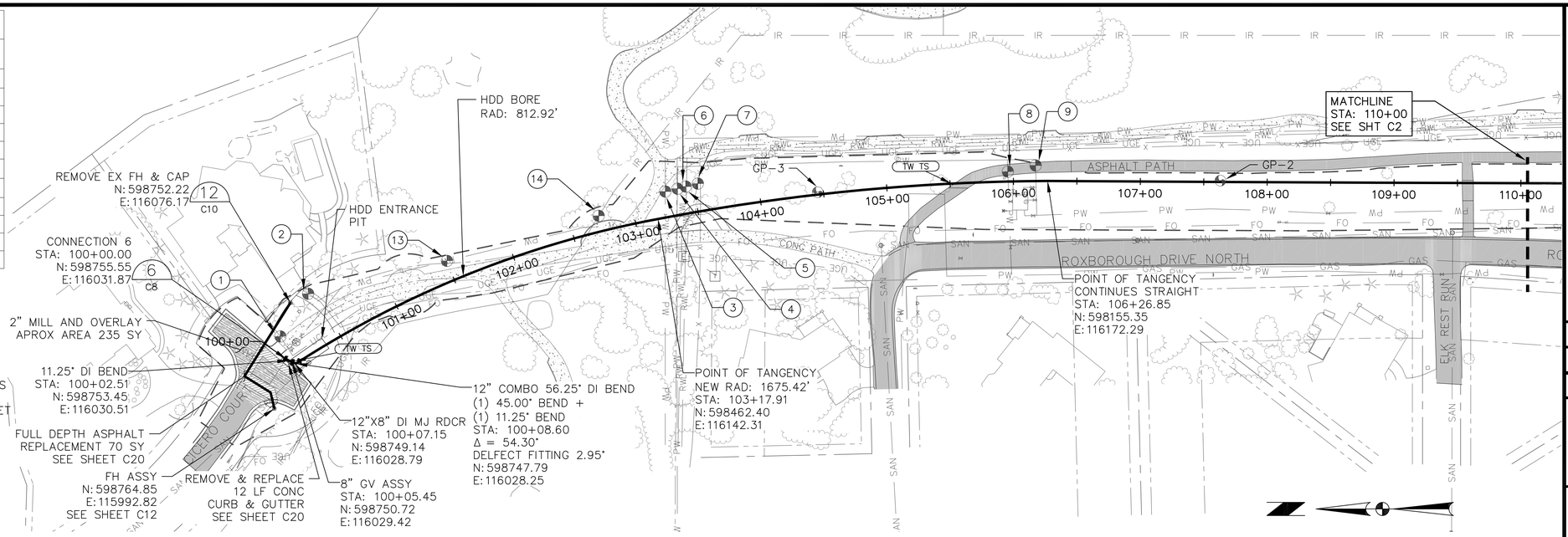
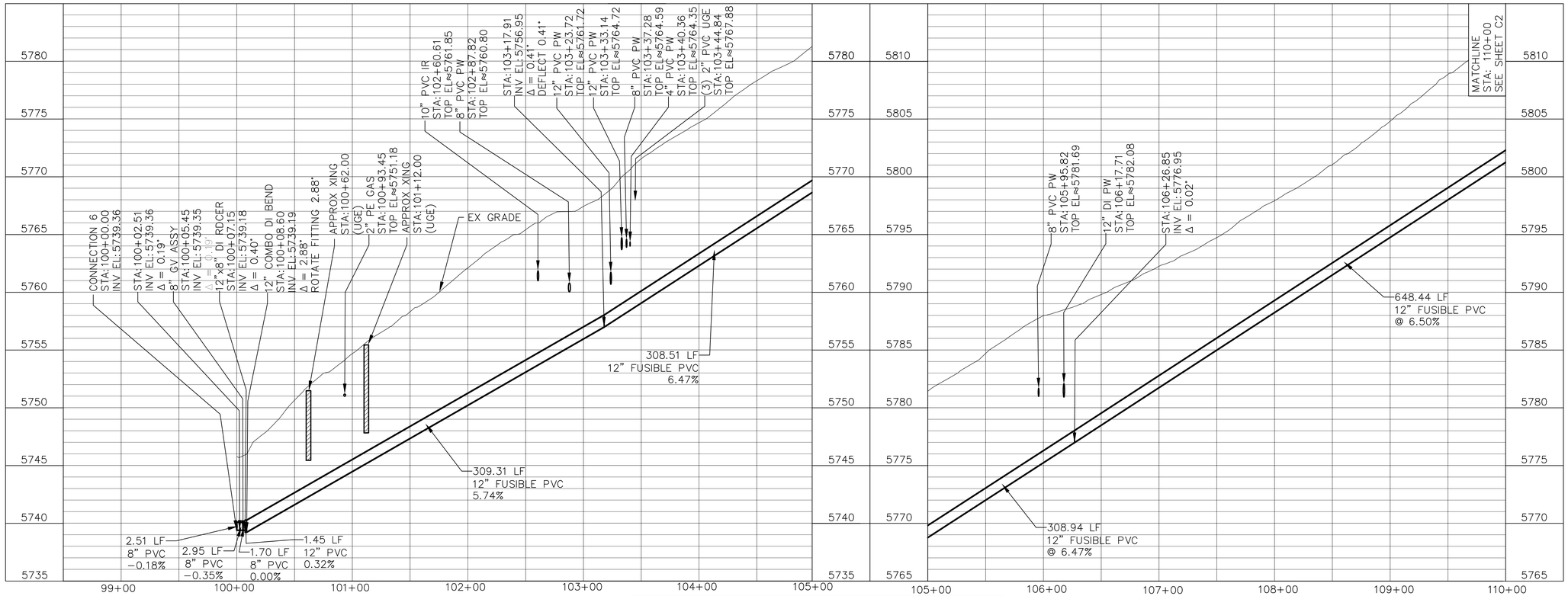
POTHOLE INFORMATION				
POTHOLE	UTILITY	DEPTH TOP	TOP EL	DIA/MATL
①	UGE	39"	±5743.00	(2) 4" PVC
②	GAS	37"	±5747.30	2" PE
③	PW	78"	±5761.72	12" PVC
④	PW	55"	±5764.72	12" PVC
⑤	PW	53"	±5764.59	8" PVC
⑥	PW	59"	±5764.35	4" PVC
⑦	UGE	33"	±5767.88	(3) 2" PVC
⑧	PW	70"	±5781.69	8" PVC
⑨	PW	74"	±5782.08	12" DI
⑬	PW	71"	±5752.00	8" PVC
⑭	IR	63"	±5760.80	10" PVC

NOTES:
1. CONTRACTOR SHALL VERIFY LOCATION, SIZE, AND MATERIAL OF EXISTING WATER LINES PRIOR TO MAKING CONNECTIONS
2. AT BEGINNING AND END OF BID ALTERNATE CONNECT HDD BORE TO PVC OPEN CUT CONSTRUCTION.
3. CONTRACTOR TO COORDINATE OPERATION OF EXISTING GATE VALVES WITH RWSD FOR SHUTDOWNS AND TIE-INS TO EXISTING SYSTEM.
4. THE MAXIMUM HDD BORE DEPTH SHALL BE 15 FEET EXCEPT BETWEEN STA 113+50 AND STA 115+50 WHERE THE DEPTH SHALL BE A MAXIMUM OF 18 FEET.



TRANSMISSION LINE – PLAN VIEW
SCALE: 1" = 50'

50 0 25 50 100
1 INCH = 50 FEET



TRANSMISSION LINE – PROFILE VIEW
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

AS-BUILTS

REVISIONS			
By	Date	Description	
ACP	11/22/2019	AS-BUILT	

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

TRANSMISSION LINE PLAN & PROFILE - SHEET 1 OF 2

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: C1

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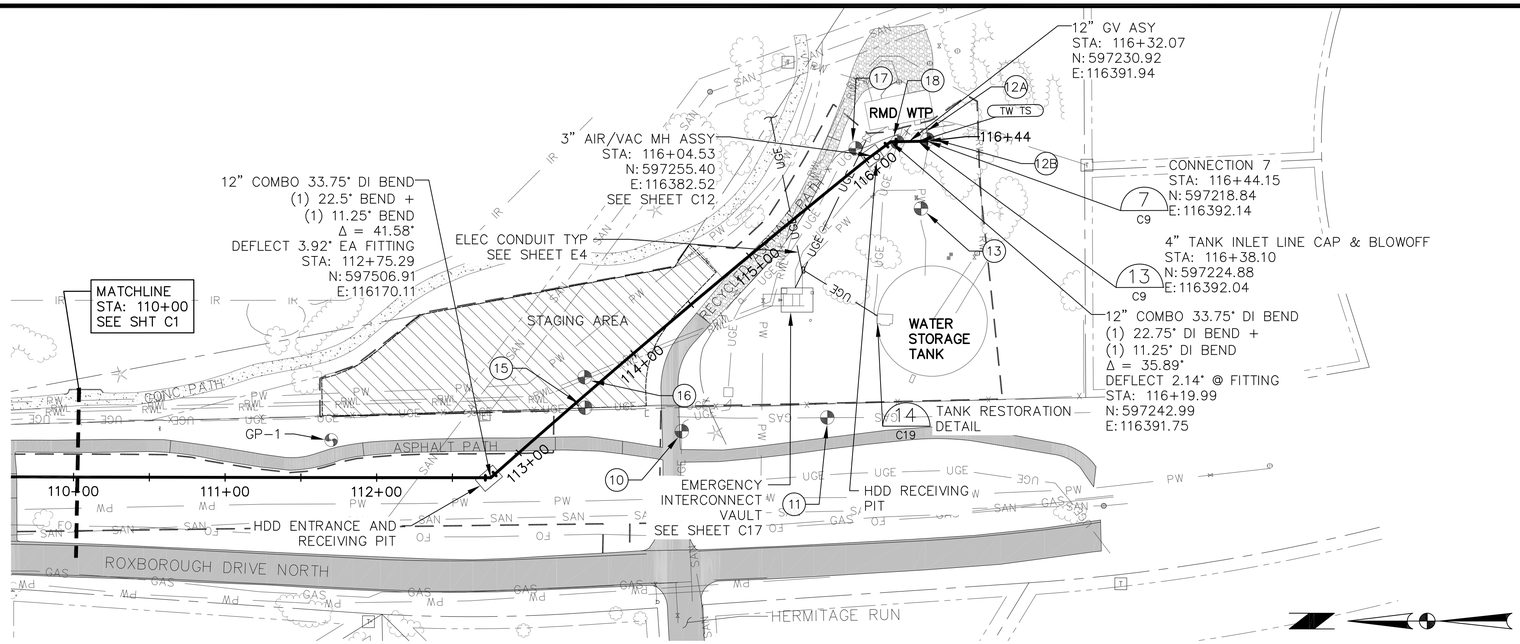
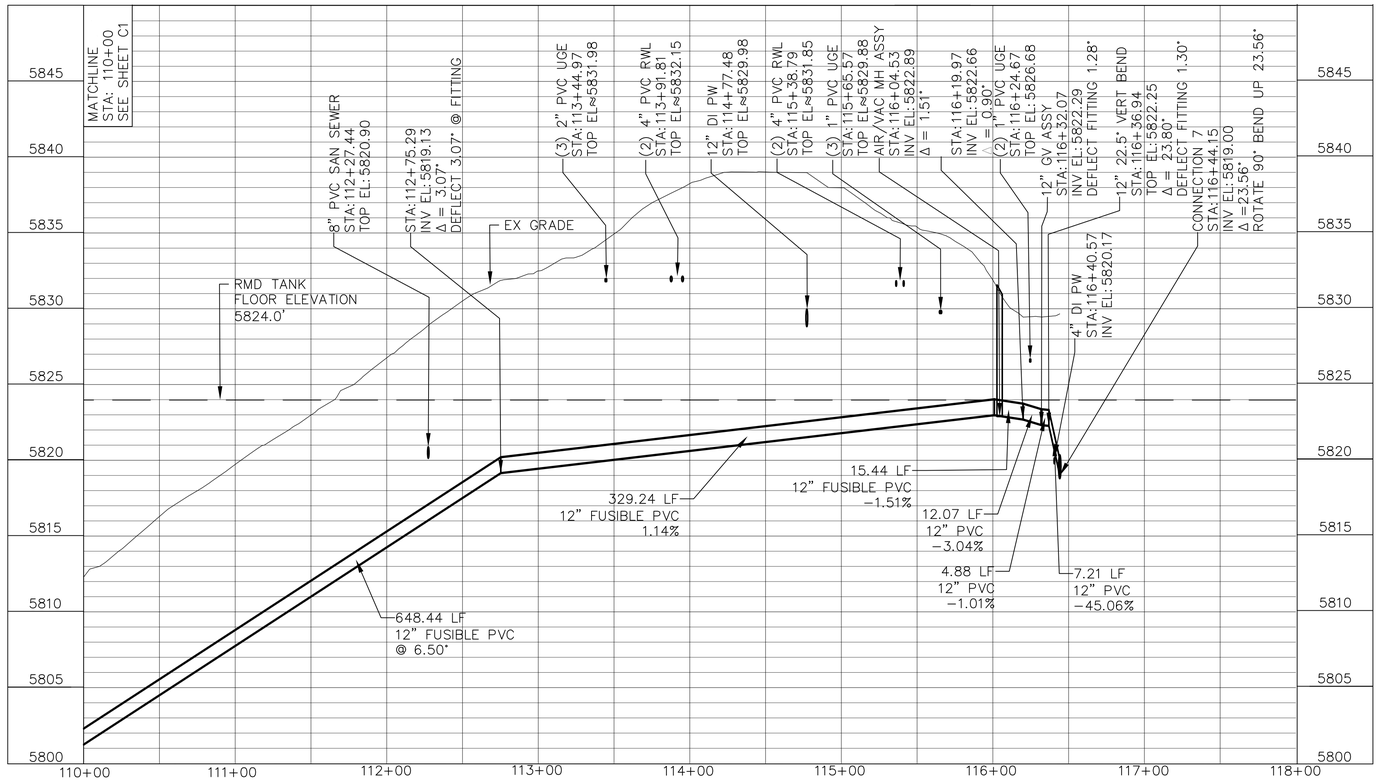


TRANSMISSION LINE – PLAN VIEW
SCALE: 1" = 50'

50 0 25 50 100
1 INCH = 50 FEET



TRANSMISSION LINE – PROFILE VIEW
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

POTHOLE INFORMATION				
POTHOLE	UTILITY	DEPTH TOP	UTILITY TOP EL	DIA/MATL
10	UGE	41"	±5837.10	(2) 8" PVC
11	GAS	39"	±5843.10	2" PE
12A	PW	113"	±5820.13	4" DI
12B	PW	113"	±5820.24	16" DI
13	PW	108"	±5820.20	16" DI
15	UGE	45"	±5831.98	(3) 2" PVC
16	RWL	84"	±5832.15	(2) 4" PVC
17	UGE	65"	±5829.88	(3) 1" PVC
18	UGE	34"	±5826.68	(2) 1" PVC

NOTES:
1. CONTRACTOR SHALL VERIFY LOCATION, SIZE, AND MATERIAL OF WATER LINES PRIOR TO MAKING CONNECTIONS.
2. AT BEGINNING AND END OF BID ALTERNATE CONNECT HDD BORE TO PVC OPEN CUT CONSTRUCTION.
3. CONTRACTOR TO COORDINATE OPERATION OF EXISTING GATE VALVES WITH RWSD FOR SHUTDOWNS AND TIE–INS TO SYSTEM.
4. WATER STORAGE TANK REQUIRES CLEANING, DISINFECTION, & PLACED INTO SERVICE. SEE SPECIFICATION 02676 FOR DETAILS.
5. THE MAXIMUM HDD BORE DEPTH SHALL BE 15 FEET EXCEPT BETWEEN STA 113+50 AND STA 115+50 WHERE THE DEPTH SHALL BE A MAXIMUM OF 18 FEET.

REVISIONS
Description: AS-BUILT
Date: 11/22/2019
By: ACP

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE
DRAWING
TRANSMISSION LINE PLAN & PROFILE - SHEET 2 OF 2

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
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DRAWING NO.: C2

AS-BUILTS

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NOTES:
1. CONTRACTOR SHALL VERIFY LOCATION, SIZE, AND MATERIAL OF WATER LINES PRIOR TO MAKING CONNECTIONS.
2. CONTRACTOR TO COORDINATE OPERATION OF EXISTING GATE VALVES WITH RWSD FOR SHUTDOWNS AND TIE–INS TO SYSTEM.
3. DO NOT DISTURB EXISTING BLOCK PAVER ROADWAY.
4. EXISTING IRRIGATION UTILITIES WILL BE PUT OUT OF SERVICE BY OWNER PRIOR TO EXCAVATION BY CONTRACTOR AND REPAIRED BY OWNER. CONTRACTOR TO CLEARLY MARK LOCATION + DEPTH OF ENCOUNTERED IRRIGATION LINES.

POTHOLE INFORMATION				
POTHOLE	UTILITY	DEPTH TOP	UTILITY TOP EL	DIA/MATL
10	WL	115"	±5549.00	12" DI
11	FO	17"	±5556.90	3" PVC
12	FO	65"	±5552.60	2" PVC
13	FO	88"	±5550.80	2" PVC
13B	FO	90"	±5550.70	4" PVC
14	WL	60"	±5553.00	8" PVC
15	ABND WL	85"	±5550.60	12" DI
16	UGE	27"	±5555.90	(3) 1" PVC
17	UGE	54"	±5552.30	(3) 1" PVC
18	GAS	35"	±5553.40	4" PE
19	UGE	36"	±5555.20	(2) 2" PVC
20	UGE	23"	±5555.30	(3) 1" PVC
21	FO	70"	±5550.40	2" PVC
22	FO	40"	±5553.00	4" PVC

CONNECTION 1
STA: 0+00.00
N: 602348.39
E: 115989.21
1 / C6

CONNECTION 3
STA: 10+72.57
N: 602315.23
E: 116035.02
3 / C7

FLOWFILL 210 LF
EX 12" PW.
ABANDONED IN PLACE

12" GV ASSY
STA: 0+04.31
N: 602345.31
E: 115992.23

CONNECTION 2
12" GV ASSY
STA: 4+06.56
N: 602507.11
E: 116158.21
2 / C6

RAVENNA
GUARD
HOUSE

SEE NOTE 3

DO NOT DAMAGE
EX CONC PATH

CAP

4+07

REMOVE & REPLACE
10 LF CONC CURB & GUTTER
SEE SHEET C20

2" MILL AND OVERLAY
APPROX AREA 160 SY

FULL DEPTH ASPHALT
APPROX AREA 50 SY
SEE SHEET C20

8" GV ASSY
STA: 10+70.68
N: 602313.91
E: 116036.38

8" SS

DANTE DR

REMOVE & REPLACE
20 LF CONC CURB & GUTTER
12 SY CONC SIDEWALK
SEE SHEET C20

12" 90° DI MJ BEND
STA: 4+01.87
ROTATE FITTING 18.03°
N: 602504.49
E: 116154.31

RELOCATE TREE
SEE SHEET C20

12" 45.00° DI BEND
STA: 3+46.35
Δ = 46.97°
DEFLECT 1.97° @ FITTING
N: 602458.33
E: 116185.14

RELOCATE TREE
SEE SHEET C20

NC–2

NORTH CONNECTION BYPASS
12" STA: 0+69.92
8" STA: 10+58.66
N: 602299.57
E: 116039.26
11 / C10

8" GV ASSY

8" 90.00° DI BEND
STA: 10+34.22
Δ = 90.00°
N: 602288.64
E: 116062.65

12" 90.00° DI BEND
STA: 1+08.16
Δ = 90.00°
N: 602272.89
E: 116066.65

NC–1

POND

VENT TYP

12" COMBO 33.75° DI BEND
(1) 22.50° BEND +
(1) 11.25 BEND
STA: 2+90.18
Δ = 30.39°
DEFLECT 3.36° @ FITTING
N: 602403.67
E: 116172.23

2" AIR/VAC MH ASSY
STA: 2+68.05
N: 602387.64
E: 116156.96

ELEC CONDUIT TYP
SEE SHEET E5

12" DI TEE
12" STA: 1+65.38
8" STA: 10+00.00
N: 602313.31
E: 116086.37

12" 90.00° DI BEND
STA: 1+50.59
Δ = 90.00°
N: 602302.82
E: 116096.73

12"X8" DI RDCR
STA: 10+03.17
N: 602311.12
E: 116084.07

NORTH CONNECTION PRV VAULT
STA: 10+00.00
TO STA: 10+34.22
9 / C13

NORTH CONNECTION WATER LINE – PLAN VIEW
SCALE: 1" = 20'

20 0 10 20 40
1 INCH = 20 FEET

AS-BUILTS

H:\Drawings\Roxborough\001.335.00 – Ravenna WS Impr Design\Sheets\Civil\C3 And C4.dwg, C3, 12/10/2019 10:09 AM

REVISIONS
By: ACP
Date: 11/22/2019
Description: AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

NORTH CONNECTION PLAN - SHEET 1 OF 1

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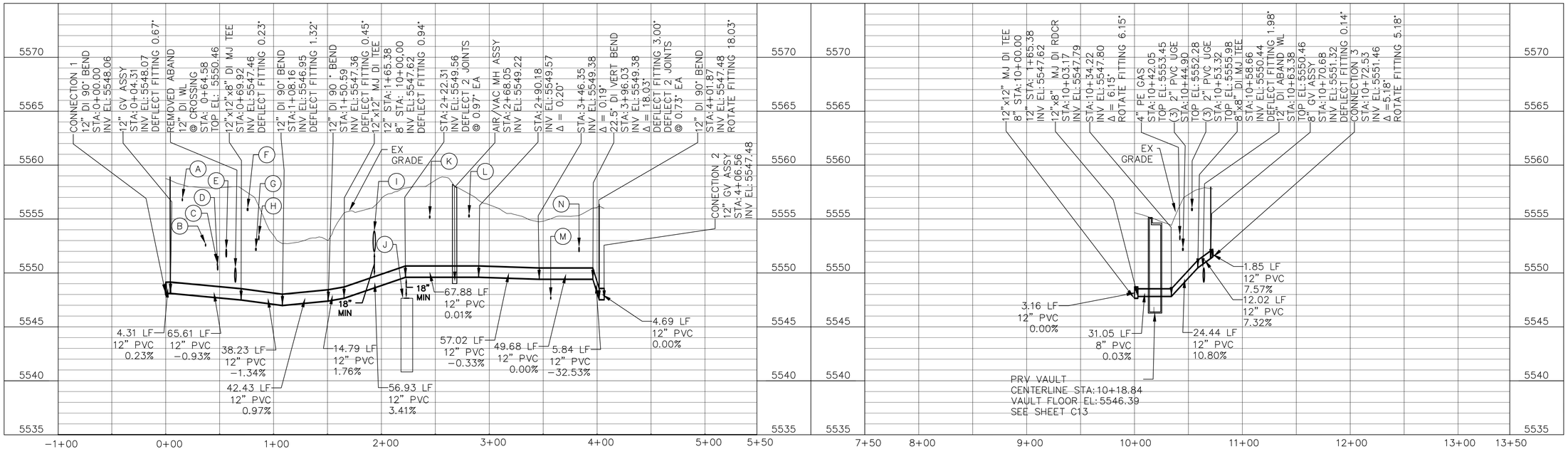
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: C3

PIPE XING LEGEND				
#	TOP EL	STA	UT	SIZE	MATL
A	5556.90	0+15.45	FO	2"	PVC
B	5552.60	0+36.96	FO	2"	PVC
C	5550.80	0+47.90	FO	2"	PVC
D	5550.70	0+48.18	FO	4"	PVC
E	5553.00	0+56.14	PW	8"	PVC
F	5555.90	0+75.95	UGE	(3) 1"	PVC
G	5552.30	0+83.63	UGE	(3) 1"	PVC
H	5553.40	0+86.35	GAS	4"	PE
I	5553.68	1+93.39	STM	18"	RCP
J	5547.70	2+16.10	STM	120"X72"	RCP
K	5555.20	2+44.82	UGE	(2) 2"	PVC
L	5555.30	2+81.24	UGE	(3) 1"	PVC
M	5547.76	3+57.00	FO	2"	PVC
N	5552.60	3+83.25	FO	4"	PVC



NORTH CONNECTION 12" WATER LINE – PROFILE VIEW
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

NORTH CONNECTION 8" WATER LINE – PROFILE VIEW
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

AS-BUILTS

REVISIONS			
	By	Date	Description
	ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

NORTH CONNECTION PROFILE - SHEET 1 OF 1

DRAWING

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DATE NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. C4

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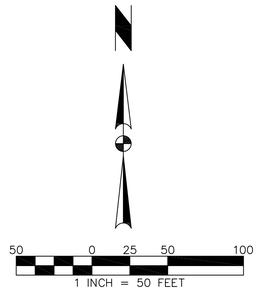
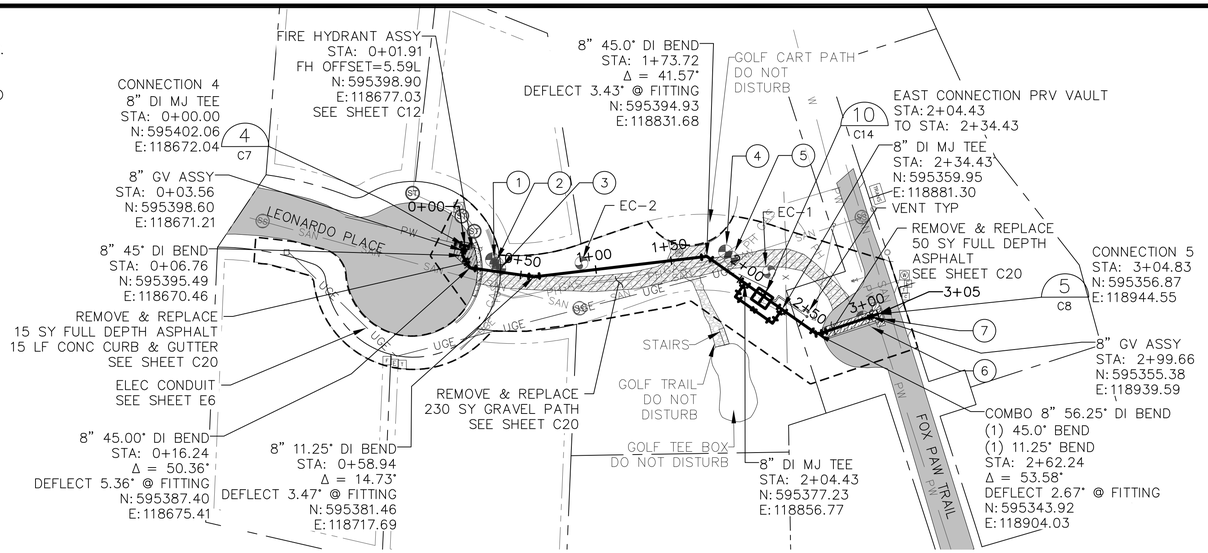
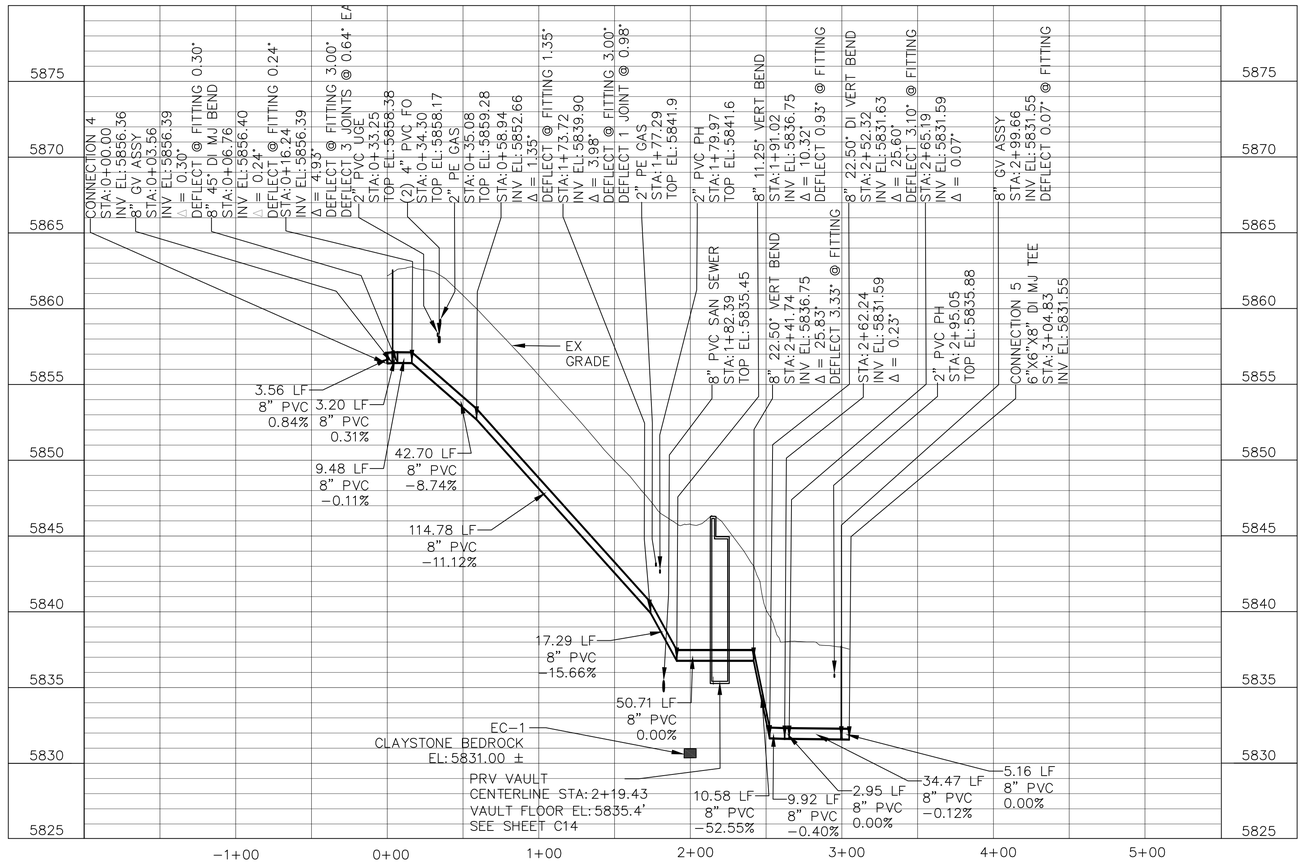
NOTES:
1. AVOID DISTURBANCE OF GOLF TEE BOX, TRAIL, & STAIRS.
2. EXISTING IRRIGATION UTILITIES WILL BE PUT OUT OF SERVICE BY OWNER PRIOR TO EXCAVATION BY CONTRACTOR AND REPAIRED BY OWNER. CONTRACTOR TO CLEARLY MARK LOCATION + DEPTH OF ENCOUNTERED IRRIGATION LINES.
3. CONTRACTOR SHALL VERIFY LOCATION, SIZE, AND MATERIAL OF WATER LINES PRIOR TO MAKING CONNECTIONS.
4. CONTRACTOR TO COORDINATE OPERATION OF EXISTING GATE VALVES WITH RWSD FOR SHUTDOWNS AND TIE-INS TO EXISTING SYSTEM.





EAST CONNECTION WATER LINE – PLAN VIEW
SCALE: 1" = 50'



EAST CONNECTION WATER LINE – PROFILE VIEW
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

POTHOLE INFORMATION

POTHOLE	UTILITY	DEPTH TOP	UTILITY TOP EL	DIA/MATL
1	UGE	49"	±5858.38	2" PVC
2	TELE	50"	±5858.17	(2) 4" PVC
3	GAS	36"	±5859.28	2" PE
4	GAS	45"	±5841.90	1" PE
5	PH	46"	±5841.60	2" PVC
6	CTV	23"	±5835.88	2" PVC
7	WL	67"	±5832.30	6" AC

AS-BUILTS

REVISIONS
Description: AS-BUILT
Date: 11/22/2019
By: ACP

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
EAST CONNECTION PLAN AND PROFILE - SHEET 1 OF 1

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Consulting Engineers

DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: C5

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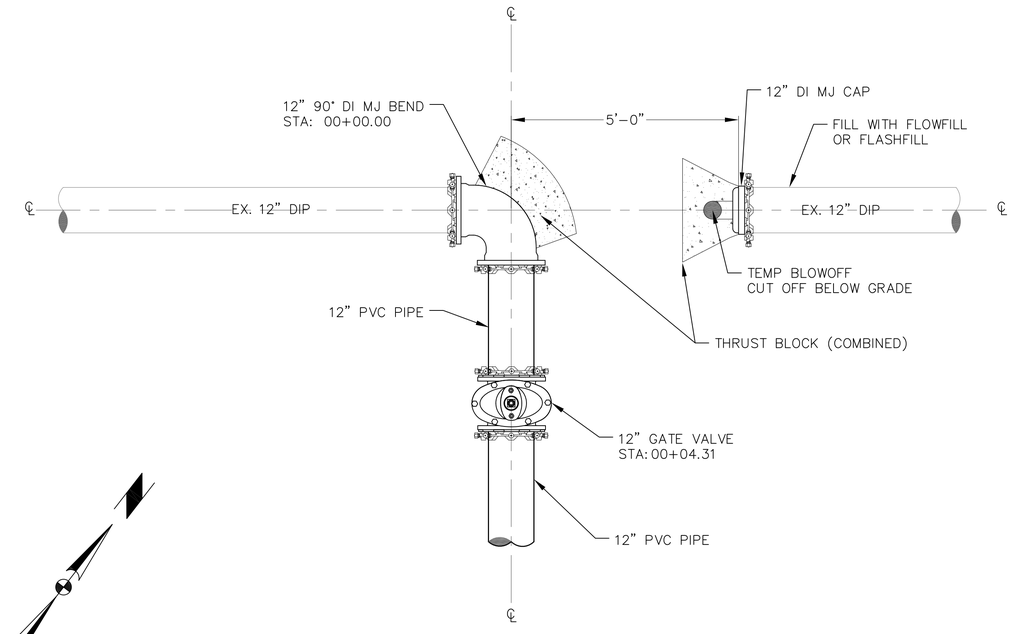
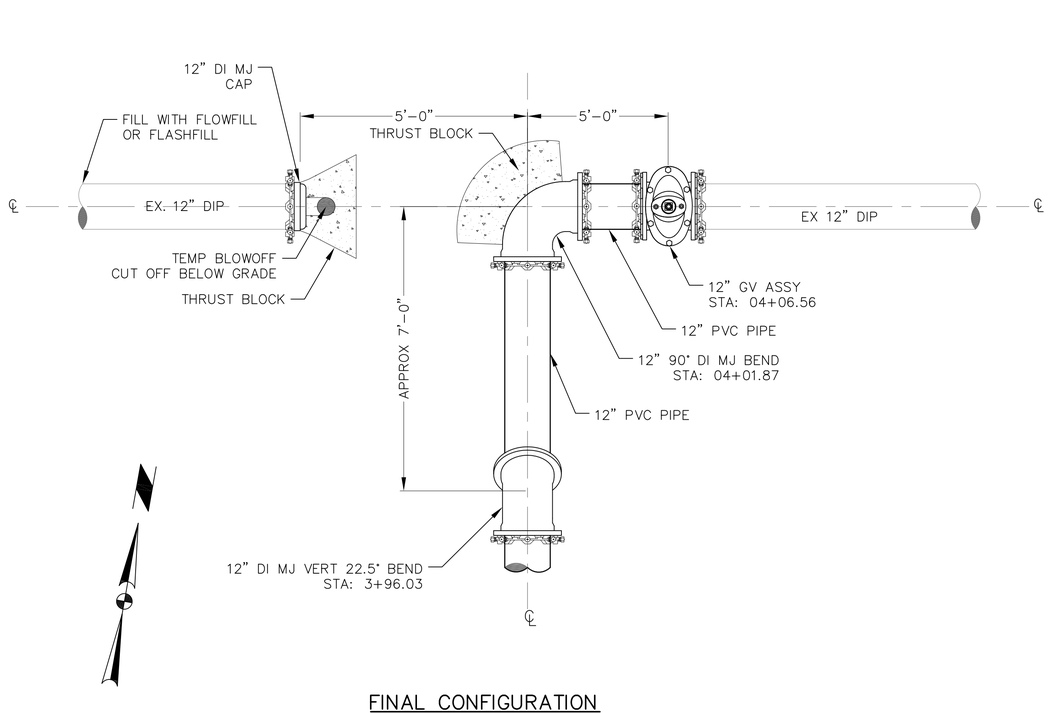
EXISTING CONFIGURATION

EXISTING CONFIGURATION



FINAL CONFIGURATION

1 C3 CONNECTION 1 DETAIL
1" = 20'



FINAL CONFIGURATION

2 C3 CONNECTION 2 DETAIL
1" = 20'

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE
1 INCH
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
WATER LINE CONNECTION DETAILS - SHEET 1 OF 4

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DATE: NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. C6

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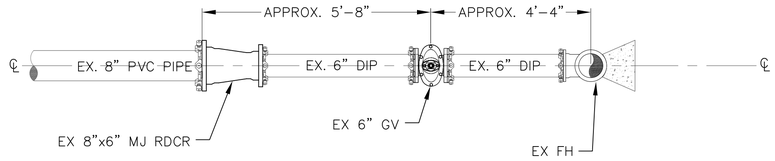

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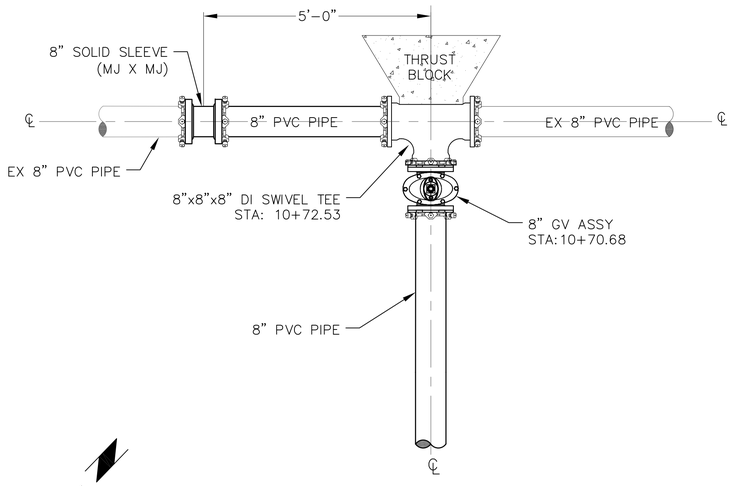
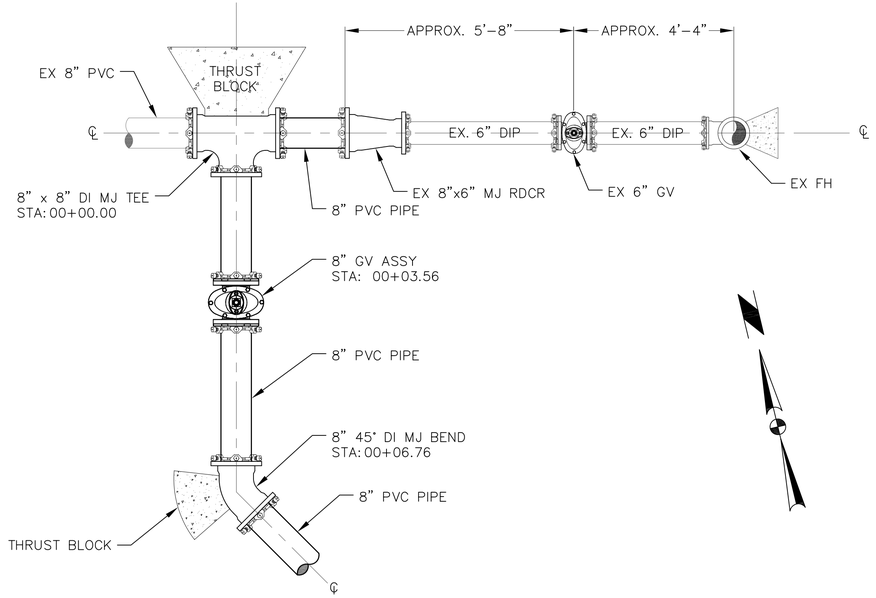


FINAL CONFIGURATION

3 / C3 — CONNECTION 3 DETAIL

1" = 20'



FINAL CONFIGURATION

4 / C5 — CONNECTION 4 DETAIL

1" = 20'

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB

CHECKED: MKM

DRAWN: SDH

BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE

1 INCH

1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING

WATER LINE CONNECTION DETAILS - SHEET 2 OF 4

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DATE: NOVEMBER 2019

JOB NO. 001.335.01

RWSD

DRAWING NO.

C7

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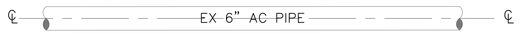

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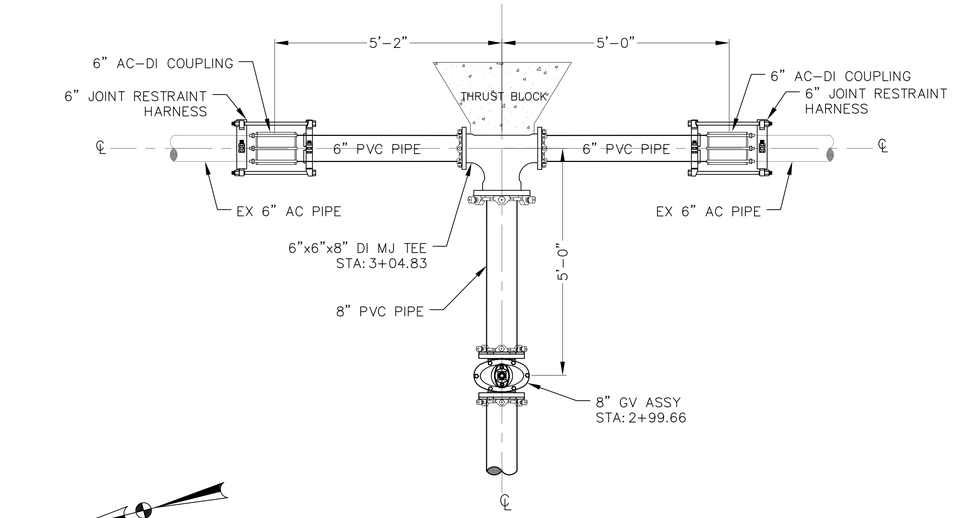
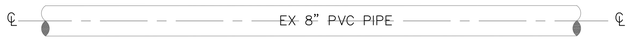


FINAL CONFIGURATION

5 / C5 CONNECTION 5 DETAIL
1" = 20'



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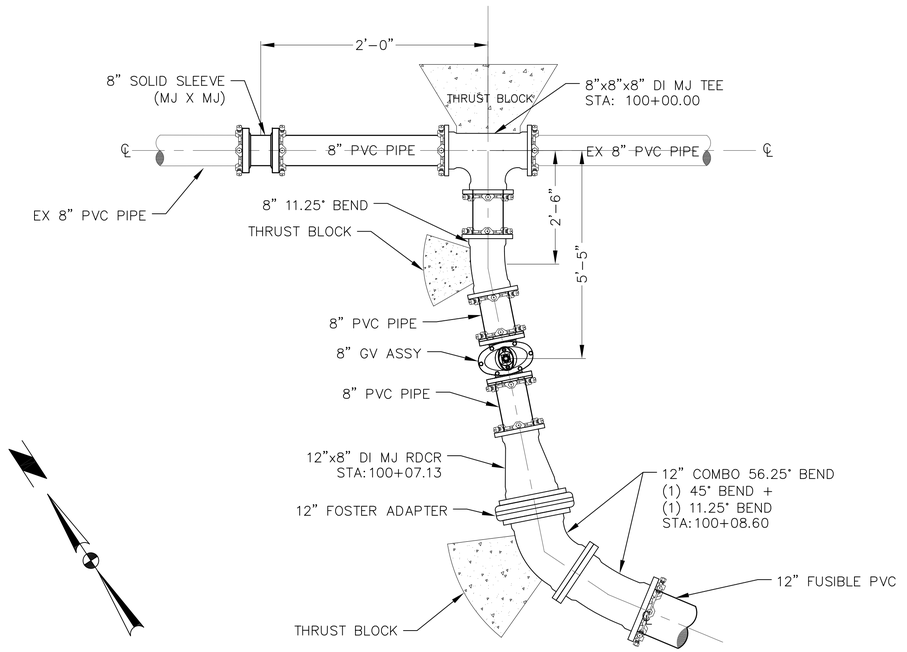

FINAL CONFIGURATION

6 / C1 CONNECTION 6 DETAIL
1" = 20'

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
WATER LINE CONNECTION DETAILS - SHEET 3 OF 4

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: C8

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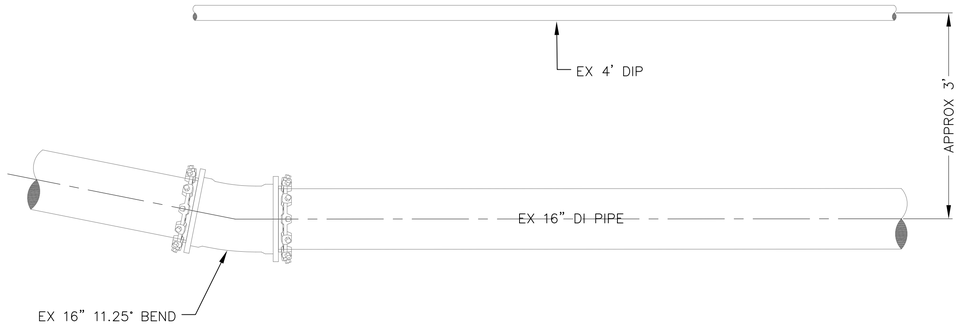
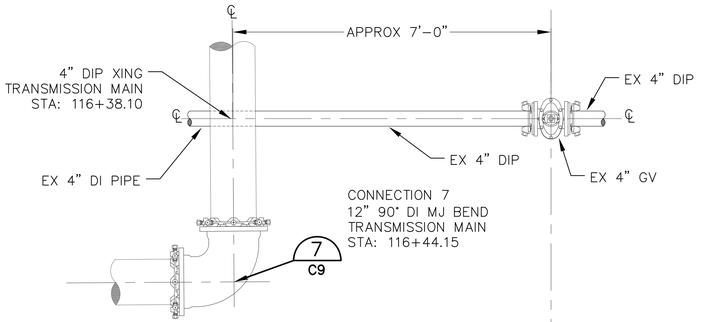
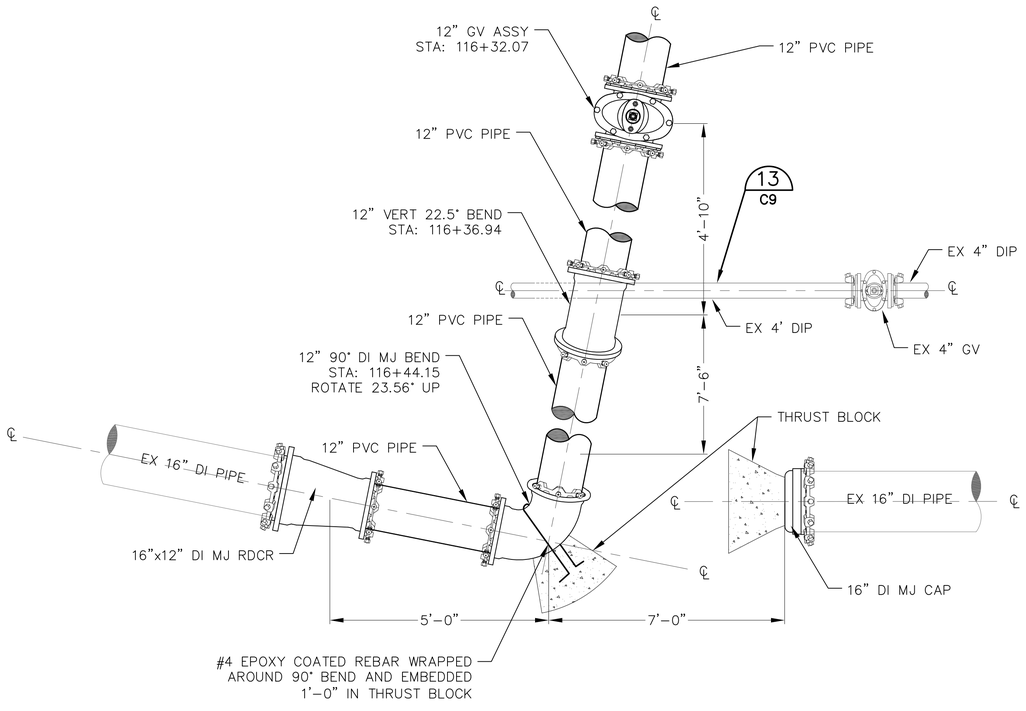




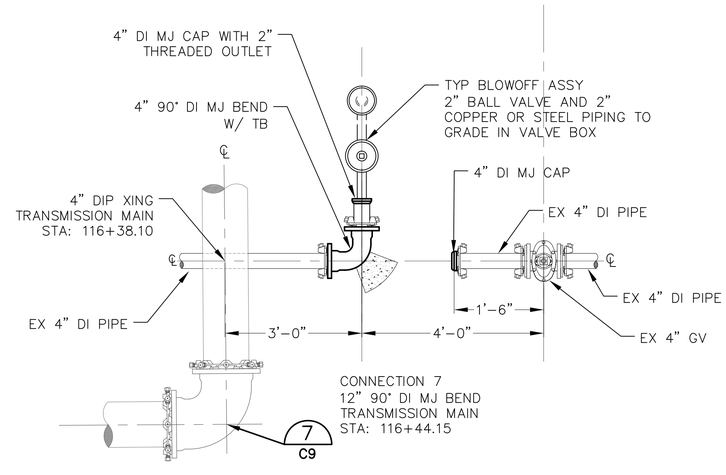
EXISTING CONFIGURATION

EXISTING CONFIGURATION



FINAL CONFIGURATION

7 / C2 *CONNECTION 7 DETAIL*
1" = 20'



FINAL CONFIGURATION

13 / C2 *4" TANK INLET LINE CAP & BLOWOFF DETAIL*
1" = 20'

AS-BUILTS

REVISIONS

Description	Date	By
AS-BUILT	11/22/2019	ACP

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
WATER LINE CONNECTION DETAILS - SHEET 4 OF 4

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DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: C9

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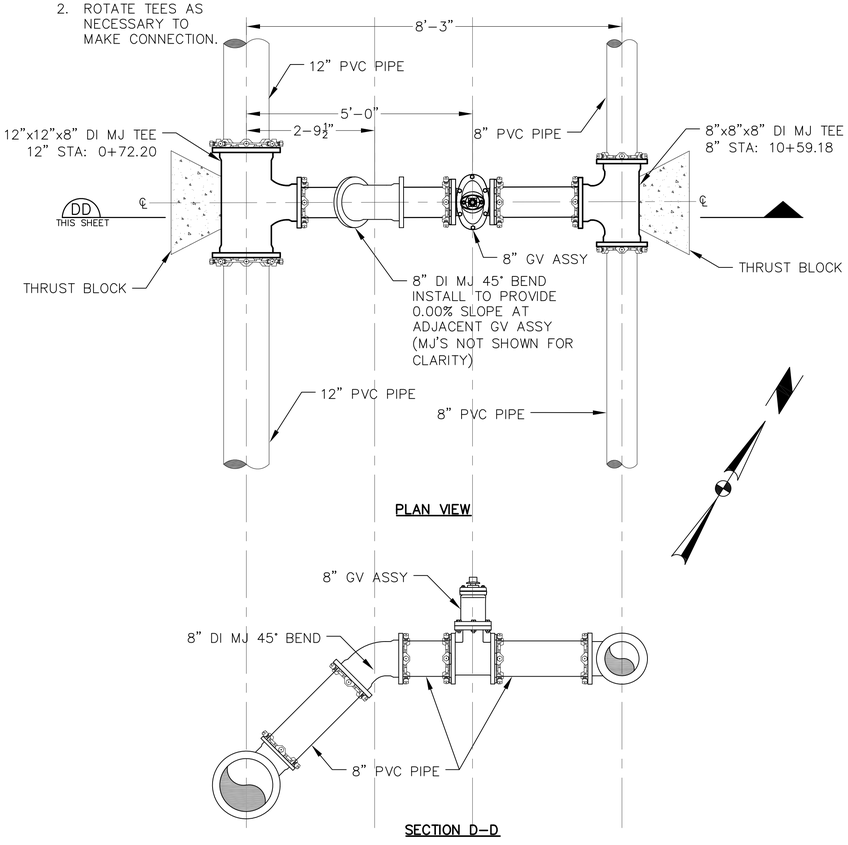
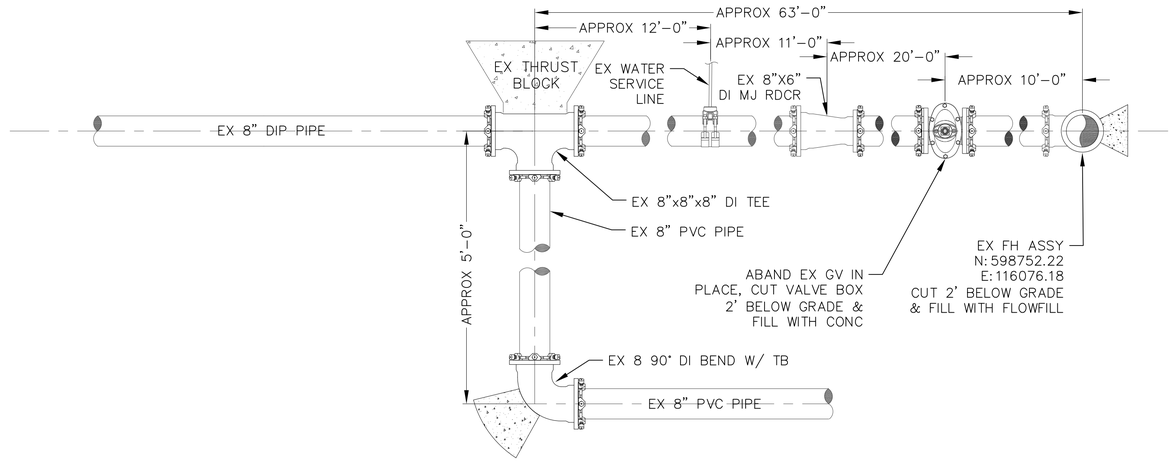
NOTE:
1. DEFLECT PIPES AT FITTINGS AS NECESSARY.
2. ROTATE TEES AS NECESSARY TO MAKE CONNECTION.



11 C3 *NORTH CONNECTION BYPASS DETAIL*
1" = 20'



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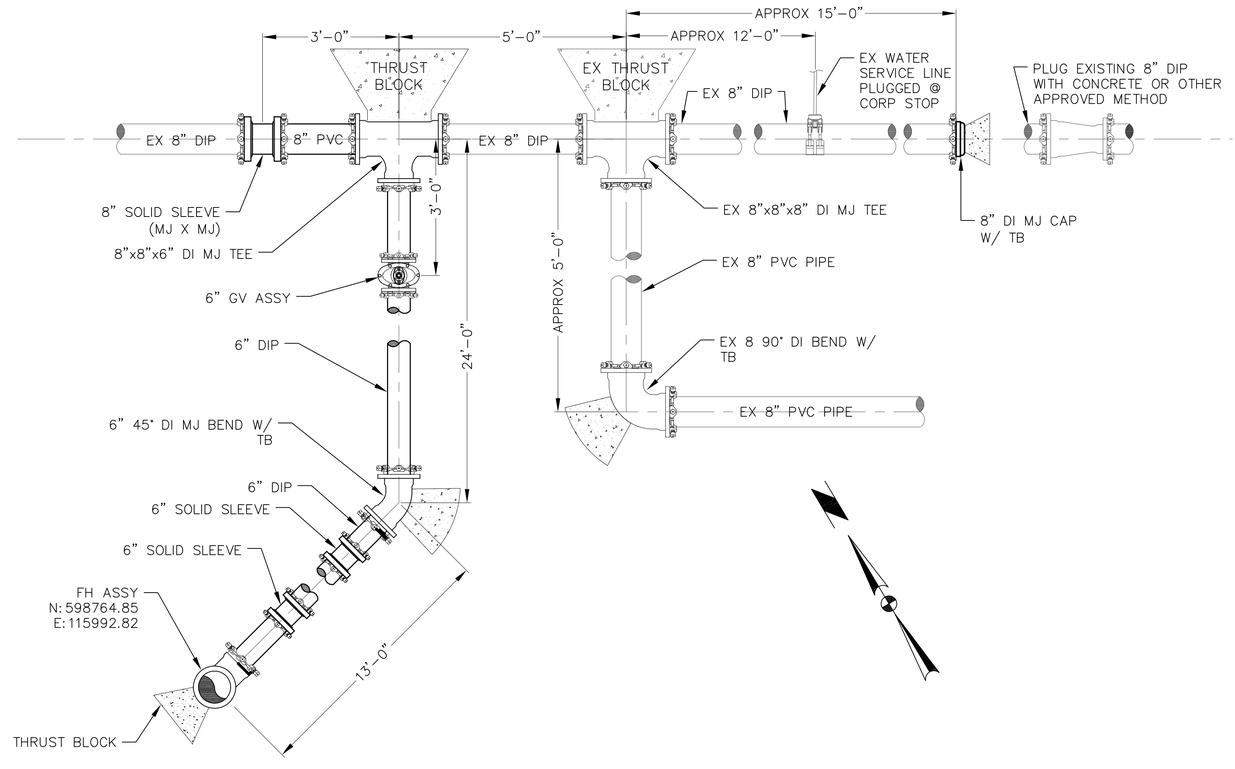

FINAL CONFIGURATION

12 C1 *TRANSMISSION MAIN FH REMOVAL/ NEW FH DETAIL*
1" = 20'

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH — BARS PLOT 1 INCH x 1 INCH AT FULL SCALE — 1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

CIVIL DETAILS - SHEET 1 OF 1

DRAWING

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DATE: NOVEMBER 2019
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DRAWING NO. C10

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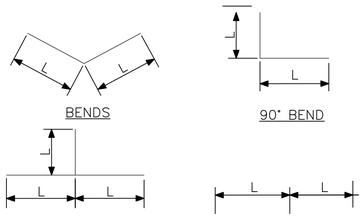


BENDS | 90° BEND | TEE | VALVE

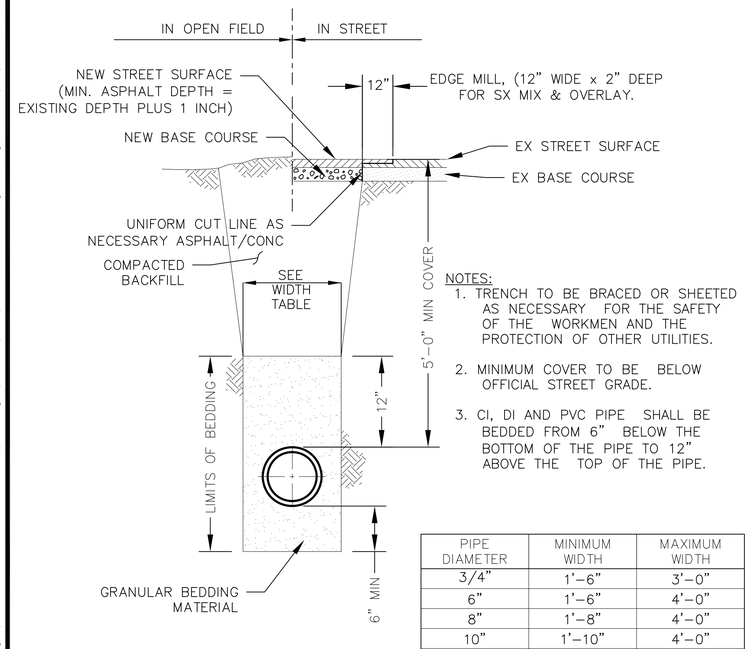
LENGTH OF RESTRAINED PIPE AT FITTINGS					
PIPE SIZE	4"	6"	8"	10"	12"
FITTING	LENGTH	LENGTH	LENGTH	LENGTH	LENGTH
TEE (BRANCH ONLY)	0'–0"	0'–0"	18'–0"	42'–0"	52'–0"
VALVE, PLUG OR 90 BEND	15'–0"	21'–0"	28'–0"	33'–0"	39'–0"
45 BEND	7'–0"	9'–0"	12'–0"	14'–0"	16'–0"
22–1/2 BEND	3'–0"	5'–0"	6'–0"	7'–0"	8'–0"
11–1/4 BEND	2'–0"	3'–0"	3'–0"	4'–0"	4'–0"
REDUCER (16"X12")	117'–0"				
REDUCER (12"X8")	84'–0"				
REDUCER (10"X8")	45'–0"				
ALL VERTICAL BENDS	72'–0"	72'–0"	96'–0"	114'–0"	134'–0"

NOTES:

1. USE MECHANICAL RESTRAINTS ON ALL BENDS, TEES, VALVES, AND WHERE SPECIFICALLY INSTRUCTED ON THE PLANS
2. L = LENGTH OF RESTRAINED PIPE MEASURED EACH WAY FROM VALVES AND FITTINGS.
3. RESTRAINT LENGTH ASSUMES MINIMUM GROUND COVER OF 5' FOR ALL WATERLINES.
4. BASED ON 160 P.S.I., INTERNAL PRESSURE PLUS 110 P.S.I. HAMMER.
5. COMBINATION FITTINGS ALLOW FOR ADDITION OF INDIVIDUAL RESTRAINED LENGTH VALUES TO ACHIEVE COMBINATION VALUE.

TYPICAL MECHANICAL JOINT RESTRAINT

NOT TO SCALE



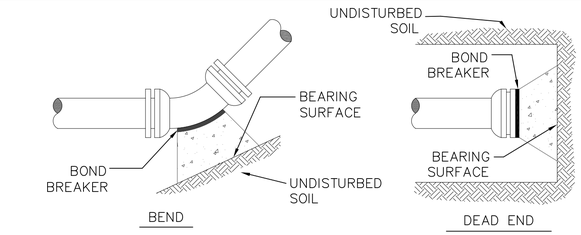
NOTES:

1. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKMEN AND THE PROTECTION OF OTHER UTILITIES.
2. MINIMUM COVER TO BE BELOW OFFICIAL STREET GRADE.
3. CI, DI AND PVC PIPE SHALL BE BEDDED FROM 6" BELOW THE BOTTOM OF THE PIPE TO 12" ABOVE THE TOP OF THE PIPE.

PIPE DIAMETER	MINIMUM WIDTH	MAXIMUM WIDTH
3/4"	1'–6"	3'–0"
6"	1'–6"	4'–0"
8"	1'–8"	4'–0"
10"	1'–10"	4'–0"
12"	2'–0"	4'–0"

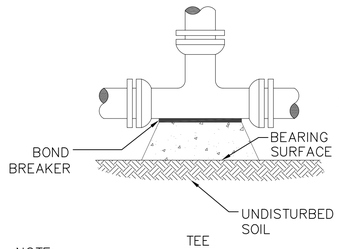
TYPICAL TRENCH SECTION DETAIL

NOT TO SCALE

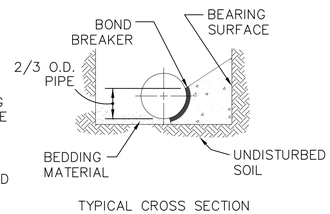


BEND

DEAD END



TEE



TYPICAL CROSS SECTION

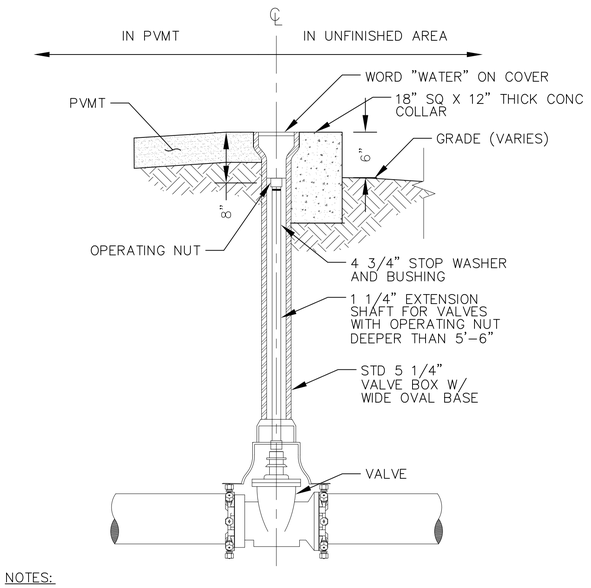
NOTE:

1. THE MINIMUM BEARING SURFACE AREAS SHOWN IN THE TABLE FOR OUTLET PIPING ARE BASED ON 160 PSI INTERNAL PIPE PRESSURE PLUS 110 PSI WATER HAMMER & AN ALLOWABLE SOIL BEARING CAPACITY EQUAL TO 250 PCF 5.5 DEPTH BELOW GRADE (TO MID–POINT OF THRUST BLOCK FACE). FOR DEPTH EQUAL TO 10 FEET OR MORE, USE 2500 PSF.
2. COMBINATION FITTINGS ALLOW FOR ADDITION OF INDIVIDUAL BEARING SURFACE VALUES TO ACHIEVE COMBINATION VALUE.

MINIMUM BEARING SURFACE AREA (SF)					
ø OF PIPE	FITTING				
	11 1/4°	22 1/2°	45°	90°	TEE
4"	0.50	1.00	1.96	3.61	3.61
6"	1.04	2.07	4.05	7.49	7.49
8"	1.78	3.55	6.96	12.86	12.86
12"	3.79	7.55	14.81	27.36	27.36

TYPICAL THRUST BLOCK DETAIL

NOT TO SCALE

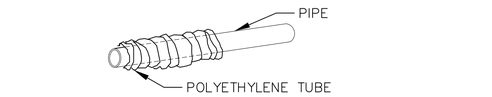


NOTES:

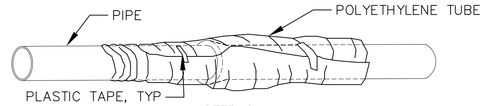
1. IF THE DEPTH OF THE OPERATING NUT IS DEEPER THAN 5'–6", AN OPERATING NUT EXTENSION SHALL BE ATTACHED TO THE OPERATING NUT. THE EXTENSION SHALL TERMINATE 8" BELOW FINISHED GRADE.
2. PROVIDE VALVE MARKER FOR ALL VALVE COVERS INSTALLED IN UNIMPROVED SURFACES.
3. ALL VALVES SHALL CONNECT TO NEW AND EXISTING PIPING WITH MECHANICAL JOINT RESTRAINTS.

TYPICAL GATE VALVE DETAIL

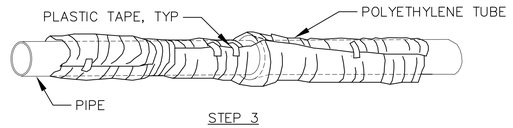
NOT TO SCALE



STEP 1



STEP 2



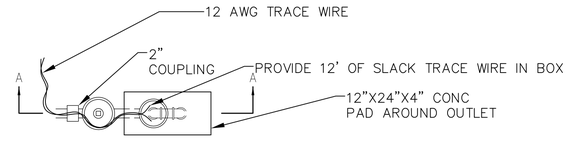
STEP 3

STEPS:

1. PLACE TUBE OF POLYETHYLENE MATERIAL ON PIPE PRIOR TO LOWERING IT INTO TRENCH.
2. PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.
3. OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF PIPE AND TAPED IN PLACE.

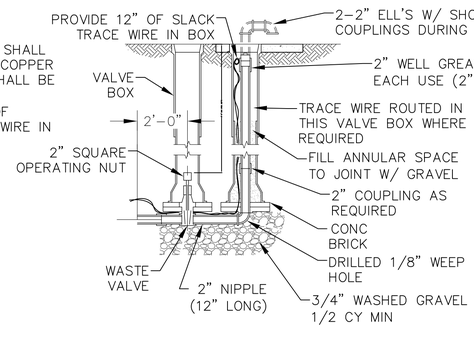
POLYETHYLENE ENCASEMENT DETAIL

NOT TO SCALE



NOTE:

1. ALL 2" PIPING SHALL BE THREADED COPPER
2. ALL VALVES SHALL BE BRASS
3. PROVIDE 12" OF SLACK TRACE WIRE IN BOX



SECTION A–A

TYPICAL BLOWOFF DETAIL

NOT TO SCALE

AS-BUILTS

REVISIONS

Description	Date	By
AS-BUILT	11/22/2019	ACP

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH — BARS PLOT 1 INCH x 1 INCH AT FULL SCALE — 1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

STANDARD CIVIL DETAILS - SHEET 1 OF 2

DRAWING

TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. C11

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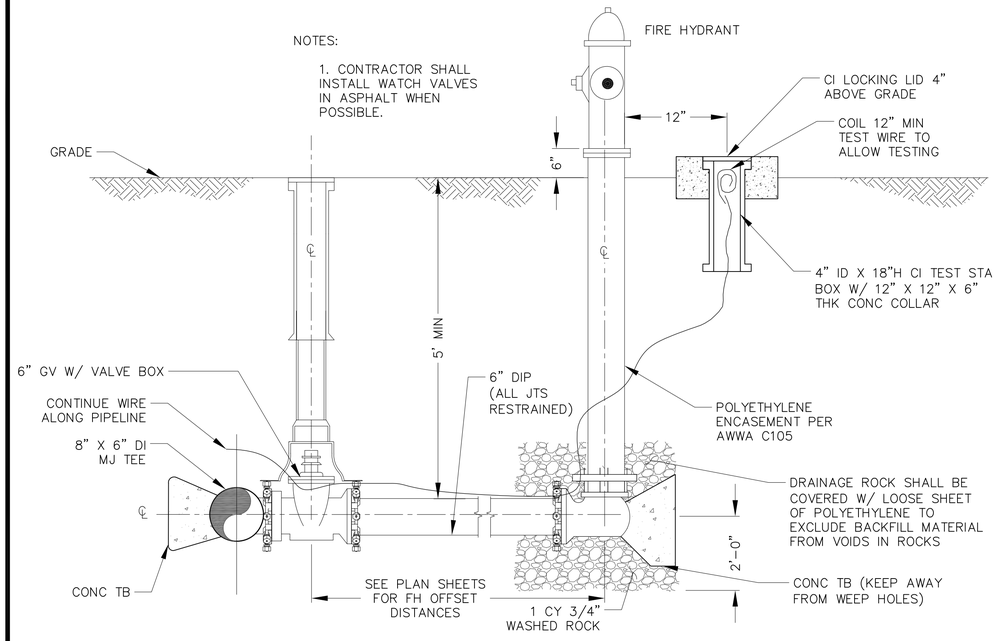
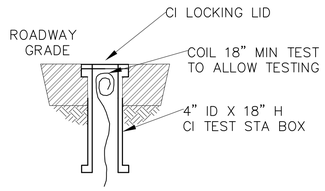
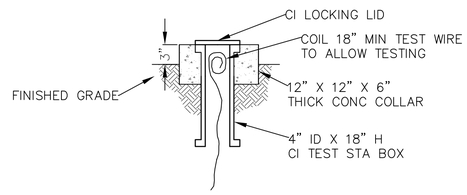


FIRE HYDRANT ASSEMBLY
NOT TO SCALE



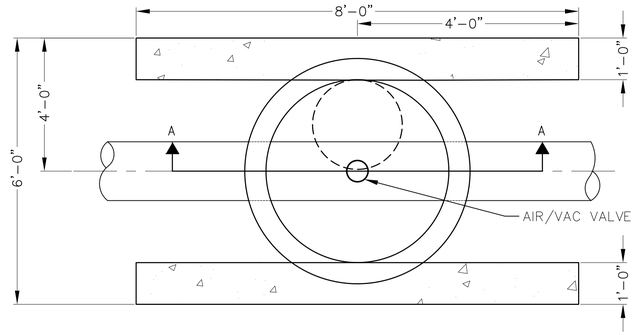
ROADWAY TRACER WIRE BOX DETAIL
NOT TO SCALE



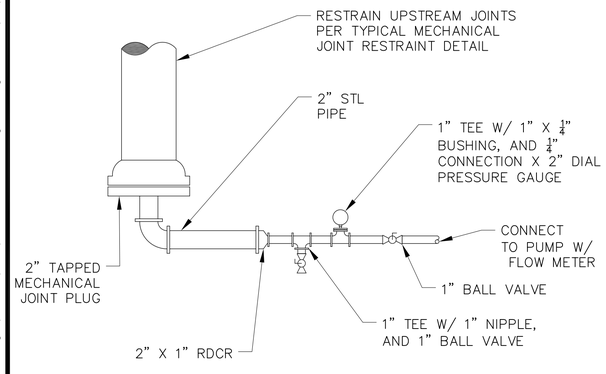
TYPICAL TRACER WIRE BOX DETAIL
NOT TO SCALE

NOTES:

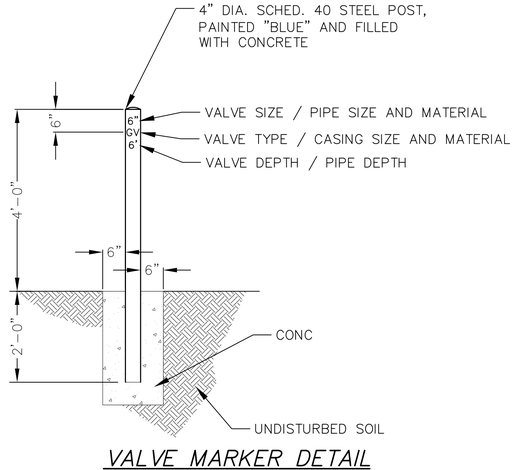
1. 1-1/2" ROCK SHALL BE PLACED IN BOTTOM OF MANHOLE TO CROWN OF PIPE ONLY.
2. ALL PIPE AND FITTINGS SHALL BE BRASS UNLESS OTHERWISE NOTED.
3. FOR ALL 2" AIR VALVES, ALL FITTINGS AND CONNECTIONS ARE NPT, UNLESS OTHERWISE NOTED.
4. VENT LOCATIONS SHALL BE AS SHOWN ON PLANS



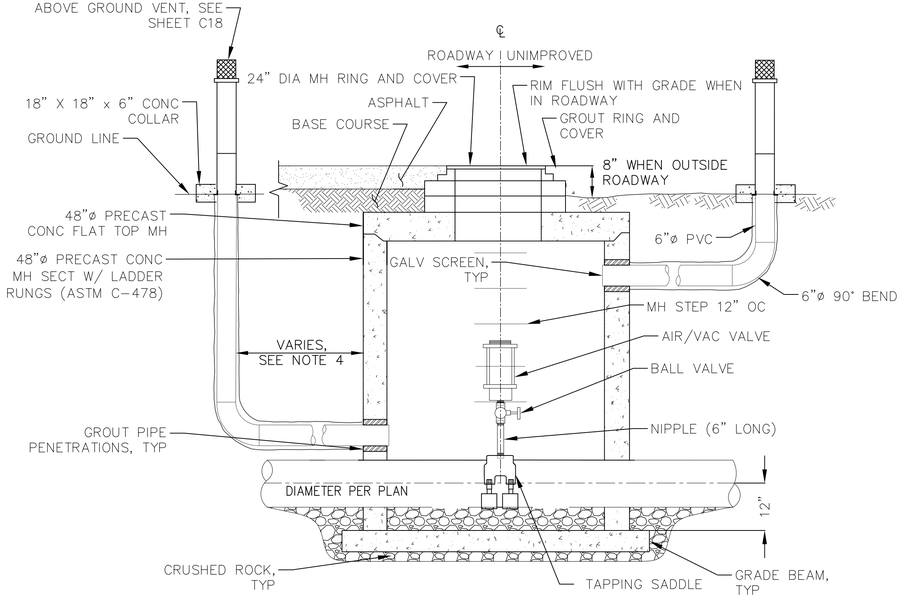
PLAN VIEW



TESTING ASSEMBLY DETAIL
NOT TO SCALE



VALVE MARKER DETAIL
NOT TO SCALE



AIR/VAC MANHOLE ASSEMBLY DETAIL
NOT TO SCALE

AS-BUILTS

REVISIONS

Description	Date	By
AS-BUILT	11/22/2019	ACP

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

STANDARD CIVIL DETAILS - SHEET 2 OF 2

DRAWING

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: C12

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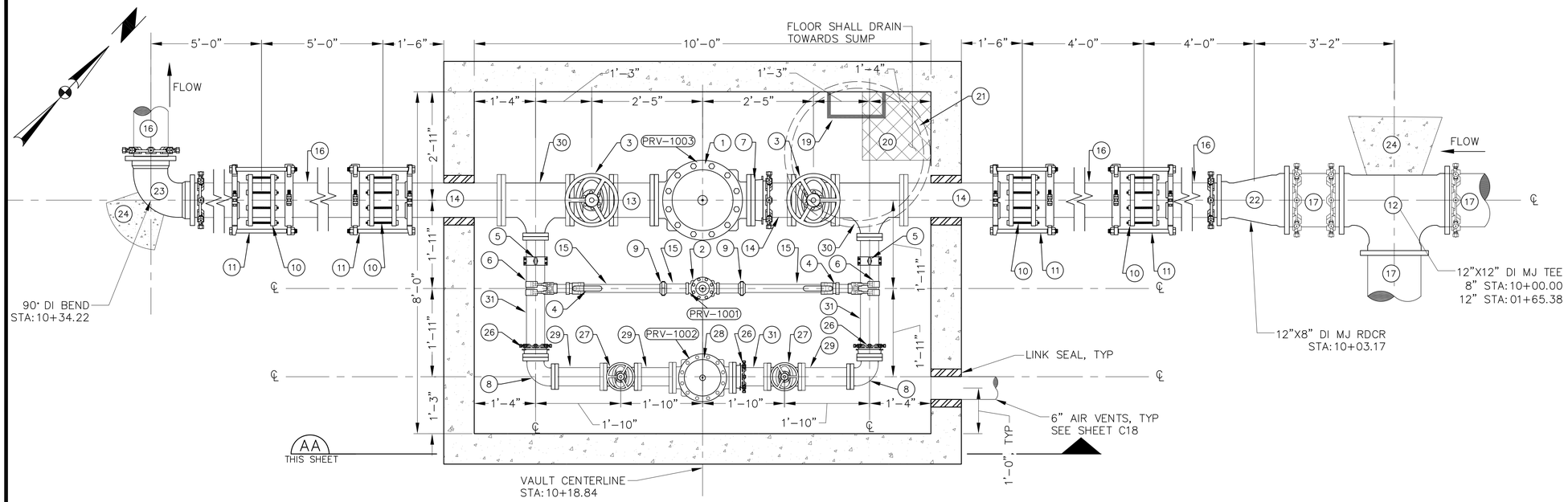
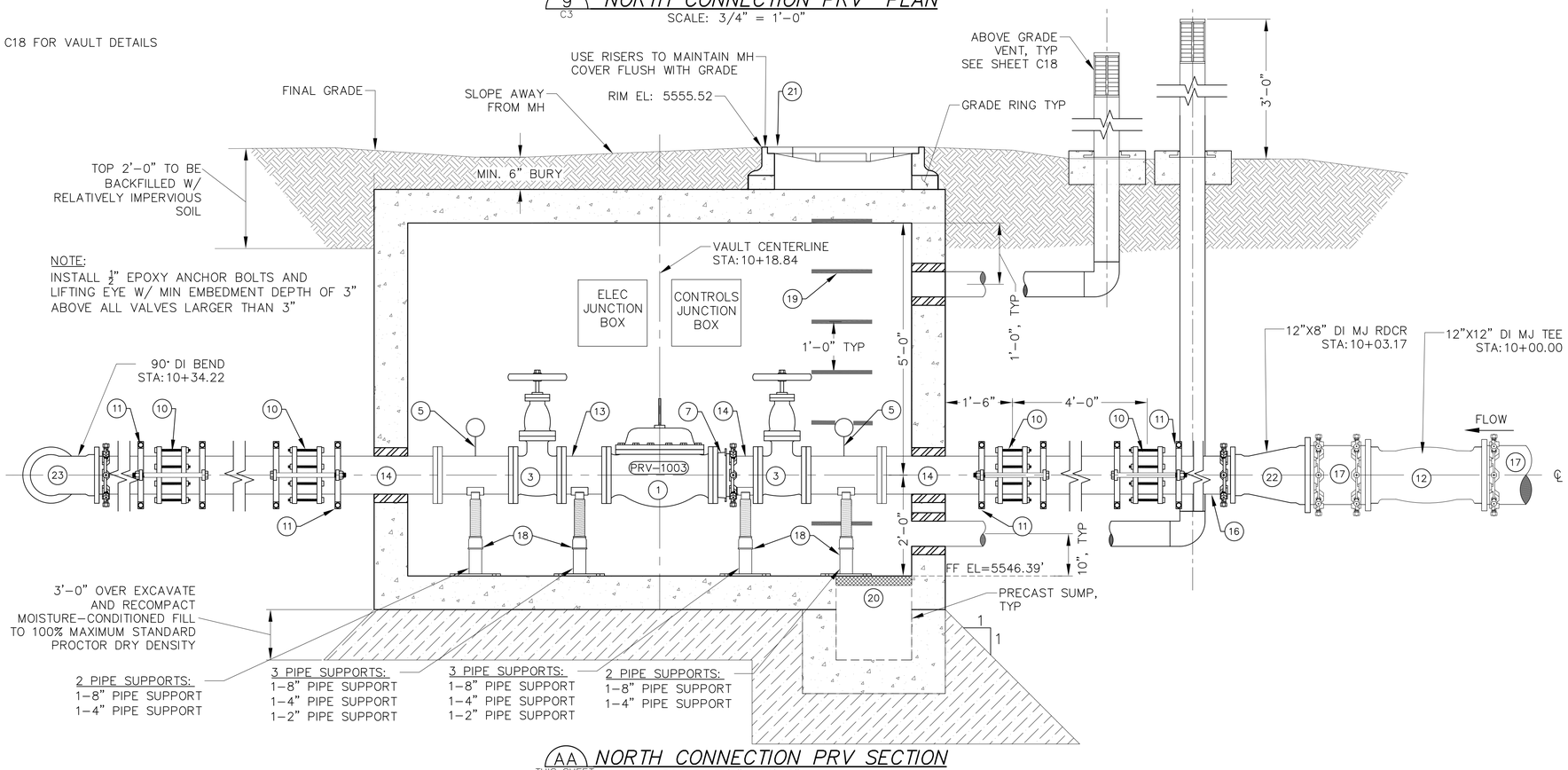


9 C3 *NORTH CONNECTION PRV PLAN*
SCALE: 3/4" = 1'-0"

NOTES:
1. SEE SHEET C18 FOR VAULT DETAILS



AA THIS SHEET *NORTH CONNECTION PRV SECTION*
SCALE: 3/4" = 1'-0"

ITEM	DESCRIPTION
1	PRV 1003 – 8" FLG
2	PRV 1001 – 2" NPT
3	8" FLG GV ASSY
4	2" SOLDER JOINT BRASS BALL VALVE
5	PRESSURE GAUGE ASSY
6	4" x 2" SERVICE SADDLE
7	8" RFCA
8	4" DI 90° FLG BEND
9	2" UNION
10	8" COUPLING
11	MIDSPAN PIPE RESTRAINT W/ RESTRAINT LUGS AND (2) 3/4" SST RODS
12	12"X12"X12" DI MJ TEE
13	8" FLG DIP SPOOL
14	8" FLG x PE DIP
15	2" COPPER PIPE
16	8" C-900 PVC
17	12" C-900 PVC
18	ADJUSTABLE PIPE SUPPORT
19	VAULT STEP
20	18" x 18" x 12" SUMP W/ FRP 1.5" x 1.5" MESH GRATE
21	24" IN 36" MANHOLE COVER
22	12"X8" MJ REDUCER
23	8" DI 90° MJ BEND
24	THRUST BLOCK
25	NOT USED
26	4" RFCA
27	4" FLG GV ASSY
28	PRV 1002 – 4" FLG
29	4" FLG DIP SPOOL
30	8"X8"X4" DI FLG TEE
31	4" FLG X PE DIP
32	2"X1" TEE

REVISIONS

Description	Date	By
AS-BUILT	11/22/2019	ACP

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

NORTH CONNECTION PRV VAULT - SHEET 1 OF 1

DRAWING

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: C13

AS-BUILTS

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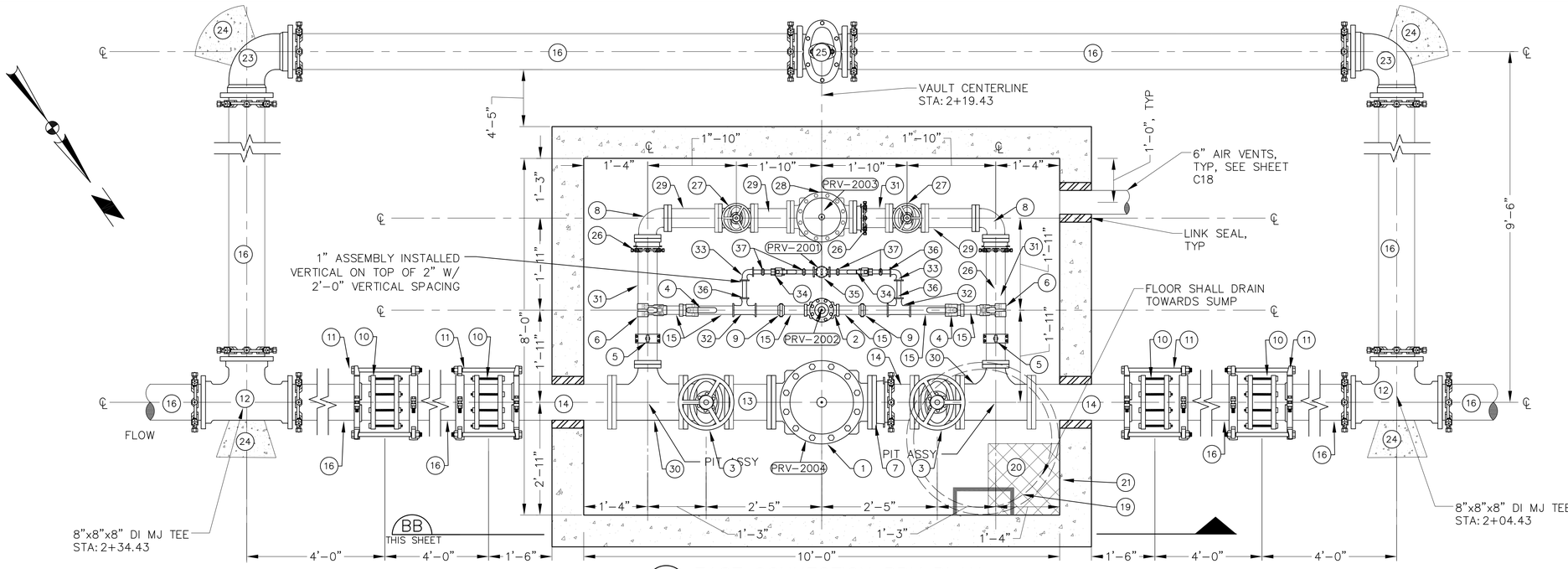
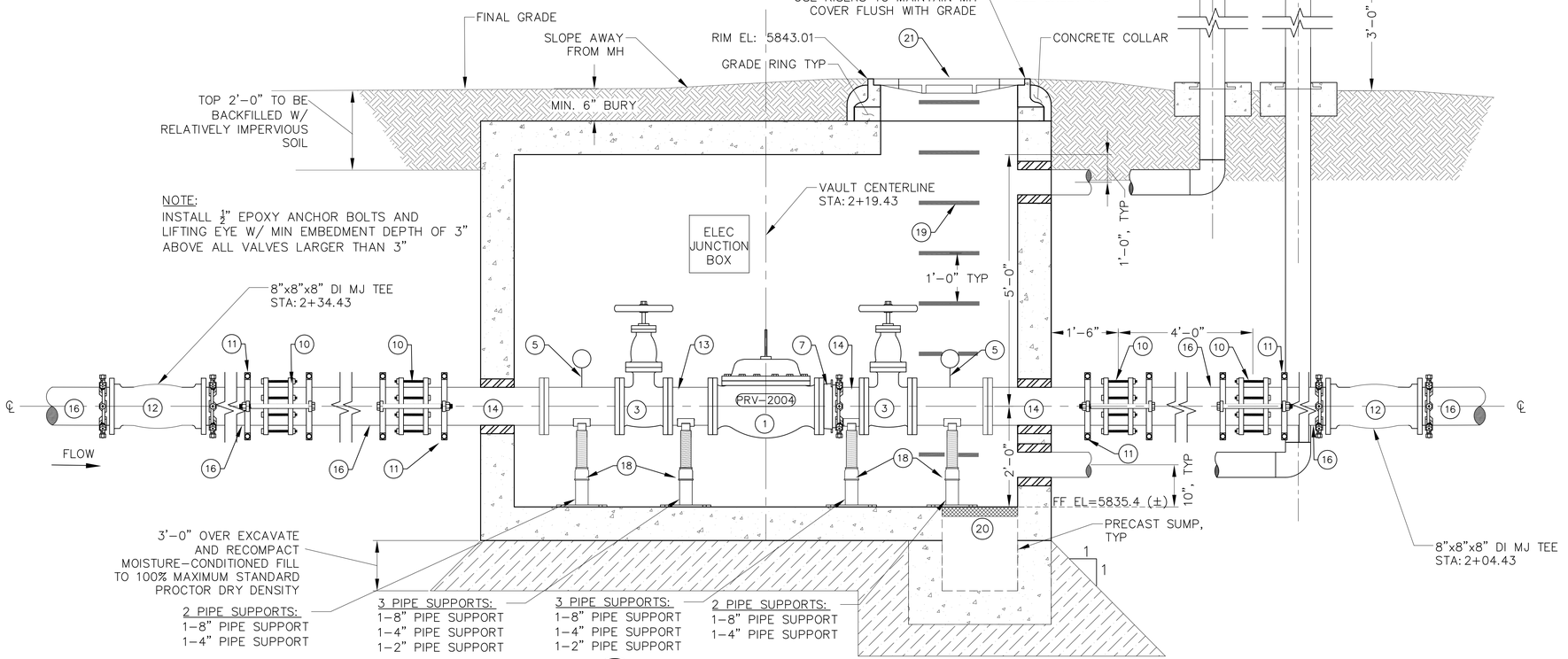


10 C5 *EAST CONNECTION PRV PLAN*
SCALE: 3/4" = 1'-0"

NOTES:
1. SEE SHEET C18 FOR VAULT DETAILS



BB THIS SHEET *EAST CONNECTION PRV PROFILE*
SCALE: 3/4" = 1'-0"

ITEM	DESCRIPTION
1	PRV 2004 – 8" FLG
2	PRV 2002 – 2" NPT
3	8" FLG GV ASSY
4	2" SOLDER JOINT BRASS BALL VALVE
5	PRESSURE GAUGE ASSY
6	4" x 2" SERVICE SADDLE
7	8" RFCA
8	4" DI 90° FLG BEND
9	2" UNION
10	8" COUPLING
11	MIDSPAN PIPE RESTRAINT W/ RESTRAINT LUGS AND (2) 3/4" SST RODS
12	8"x8"x8" DI MJ TEE
13	8" FLG DIP SPOOL
14	8" FLG x PE DIP
15	2" COPPER PIPE
16	8" C-900 PVC
17	NOT USED
18	ADJUSTABLE PIPE SUPPORT
19	VAULT STEP
20	18" x 18" x 12" SUMP W/ FRP 1.5" x 1.5" MESH GRATE
21	24" IN 36" MANHOLE COVER
22	NOT USED
23	8" DI 90° MJ BEND
24	THRUST BLOCK
25	BURIED 8" MJ GV ASSY
26	4" RFCA
27	4" FLG GV ASSY
28	PRV 2003 – 4" FLG
29	4" FLG SPOOL
30	8"X8"X4" DI FLG TEE
31	4" FLG X PE DIP
32	2"X1" TEE (SOLDER)
33	1" 90° BEND (SOLDER)
34	1" SOLDER JOINT BRASS BALL VALVE
35	PRV 2001 – 1" NPT
36	1" COPPER PIPE
37	1" SOLDER UNION

AS-BUILTS

REVISIONS			
	By	Date	Description
	ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH — BARS PLOT 1 INCH x 1 INCH AT FULL SCALE — 1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

EAST CONNECTION PRV VAULT - SHEET 1 OF 1

DRAWING

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. C14

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EX PRV RELOCATION
SCALE: 1" = 50'

AS-BUILTS

REVISIONS			
By	Date	Description	
ACP	11/22/2019	AS-BUILT	

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
1 INCH
BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
EX PRV RELOCATION PLAN - SHEET 1 OF 1

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. C15

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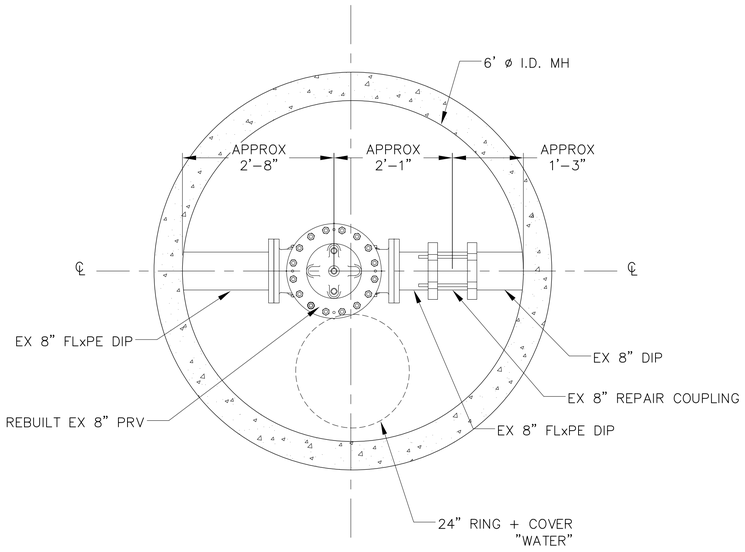
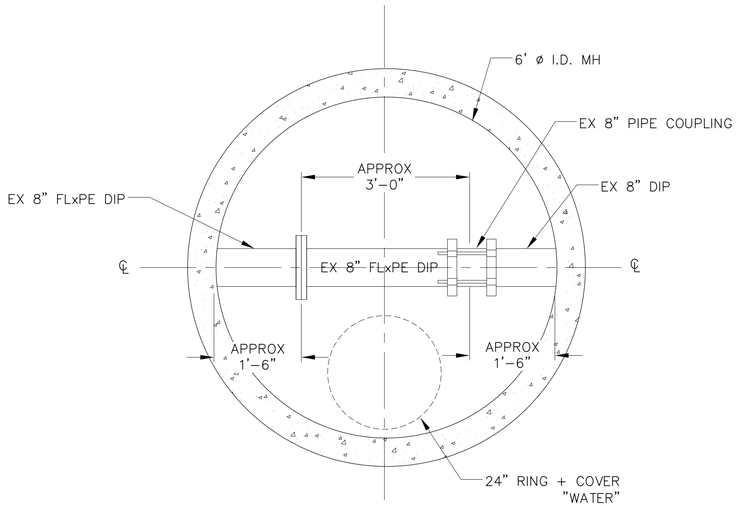
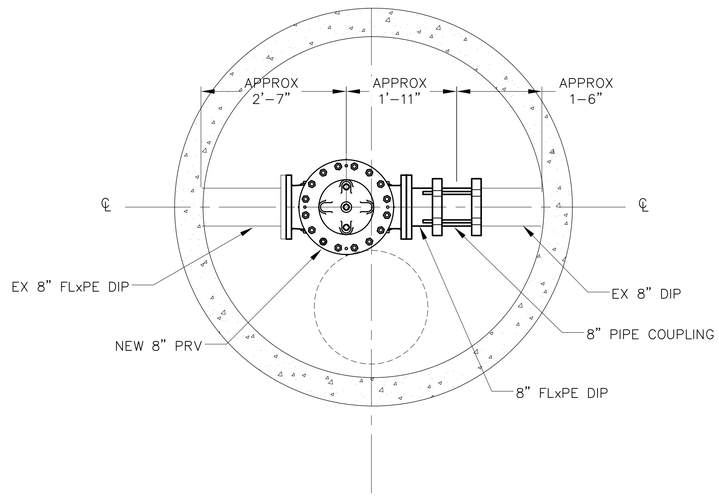
NOTES:
1. CONTRACTOR TO COORDINATE CLOSING OF ISOLATION VALVES W/ RWSD
2. PROVIDE AND INSTALL NEW BOLT AND GASKETS FOR INSTALLATION OF EX PRV & DIP IN NEW LOCATIONS



14 C15 *EXISTING PRV LOCATION PLAN*
3/4" = 1'-0"



EXISTING CONFIGURATION



FINAL CONFIGURATION

15 C15 *NEW PRV LOCATION PLAN*
3/4" = 1'-0"

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
EX PRV RELOCATION DETAILS - SHEET 1 OF 1

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: C16

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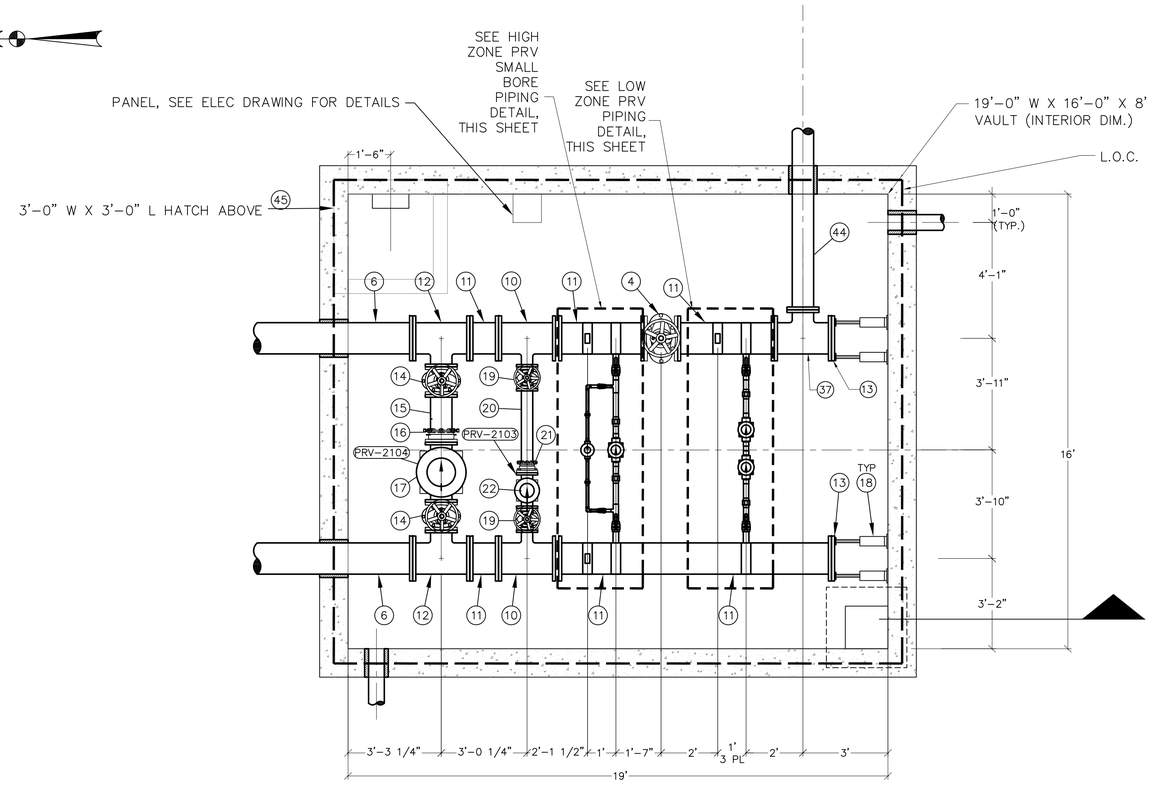
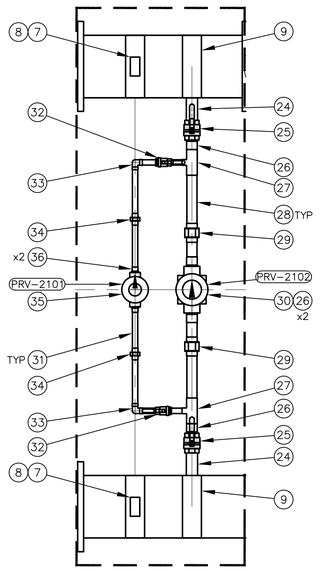
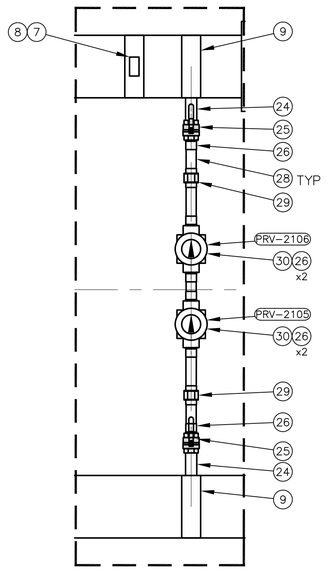


PLAN VIEW



HIGH ZONE SMALL BORE PRV PIPING
SCALE: 3/4" = 1'-0"



LOW ZONE PRV PIPING
SCALE: 3/4" = 1'-0"

NOTES:
1. ALL PIPES SHOWN ARE EXISTING AND SHALL BE PAINTED BY CONTRACTOR.
2. ALL PIPING WITHIN LIMITS OF PRECAST CONCRETE VAULT STRUCTURE SHALL BE PAINTED PER SPEC SECTION 09900–PAINTING.

BILL OF MATERIALS	
ITEM	DESCRIPTION
1	12" RESTRAINED MJ DUCTILE IRON SOLID SLEEVE COUPLING
2	12" PIPE, DI CL 52
3	TEE, 12" X 12" X 12" MJ DI
4	12" GATE VALVE
5	THRUST BLOCK
6	12" FLANGE X PLAIN END SPOOL
7	12" X ¾" SERVICE SADDLE
8	PRESSURE GAUGE/TRANSMITTER DETAIL
9	12" X 2" SERVICE SADDLE
10	12" X 12" X 4" FLANGED DUCTILE IRON TEE
11	12" FLANGE X FLANGE, DIP SPOOL
12	12" X 12" X 8" FLANGED DUCTILE IRON TEE
13	12" DIP BLIND FLANGE
14	8" FLANGED GATE VALVE
15	8" PIPE, FLNG X PL, DIP SPOOL
16	8" RESTRAINED FLANGED COUPLING ADAPTER
17	8" PRESSURE REDUCING VALVE, FLNG
18	ADJ PIPE SUPPORT, SEE SHEET C25
19	4" FLANGED GATE VALVE
20	4" FLANGE X PLAIN END DIP SPOOL
21	4" RESTRAINED FLANGED COUPLING ADAPTER
22	4" FLANGED PRESSURE REDUCING VALVE
23	8" PIPE, DI CL 52
24	2" NIPPLE, MPT, BRASS
25	2" BALL VALVE, FPT, BRASS
26	2" MALE ADAPTER, MPT X SOC, CU
27	2" X 2" X 1" COPPER SOLDER JOINT TEE
28	2" PIPE, CU TYPE M
29	2" UNION, SOC, CU
30	2" PRESSURE REDUCING VALVE, FPT
31	1" PIPE, CU TYPE M
32	1" BALL VALVE, SOC, BRASS
33	1" ELBOW, 90 SOC, CU
34	1" UNION, SOC, CU
35	1/2" PRESSURE REDUCING VALVE, FPT
36	1/2" MPT X 1" SOC MALE ADAPTER, MPT X SOC, CU
37	12" X 12" X 8" TEE, REDUCING, DI
38	8" RESTRAINED MJ DUCTILE IRON SOLID SLEEVE COUPLING
39	12" MEGALUG
40	8" MEGALUG
41	12" LINK SEAL
42	8" LINK SEAL
43	12" PIPE, PVC C905 SDR 14
44	8" PIPE, FLNG X PL SPOOL, DI
45	HATCH, 3' X 3' OPENING

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
EMERGENCY INTERCONNECT VAULT PAINTING PLAN - SHEET 1 OF 1

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. C17

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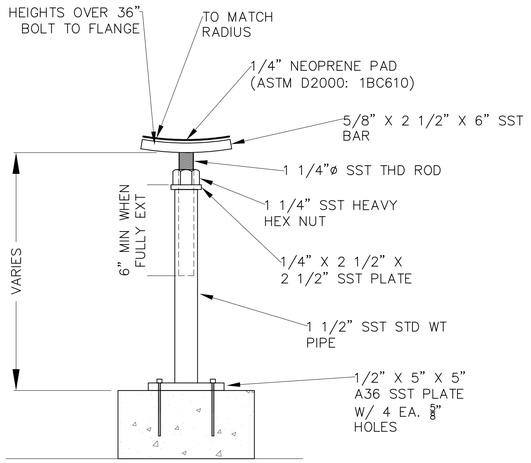
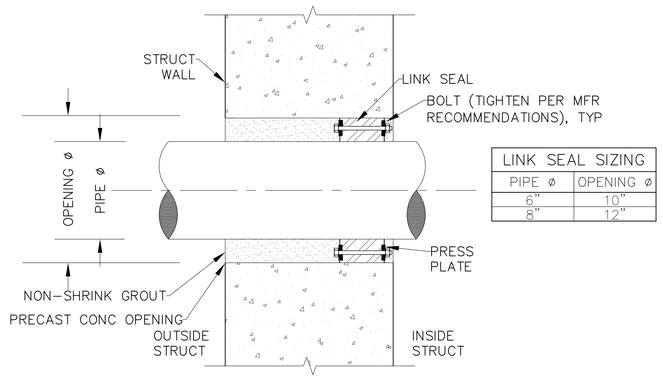
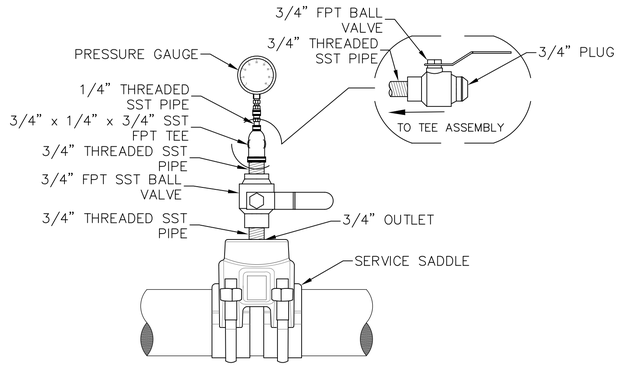


ADJUSTABLE PIPE SUPPORT DETAIL
NOT TO SCALE

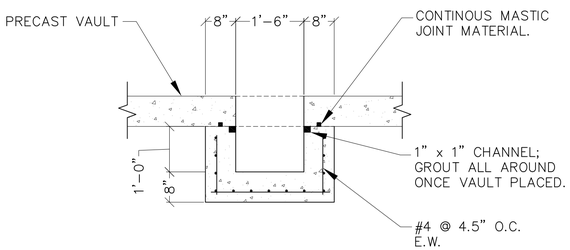


LINK SEAL SIZING	
PIPE ø	OPENING ø
6"	10"
8"	12"

LINK SEAL DETAIL
NOT TO SCALE

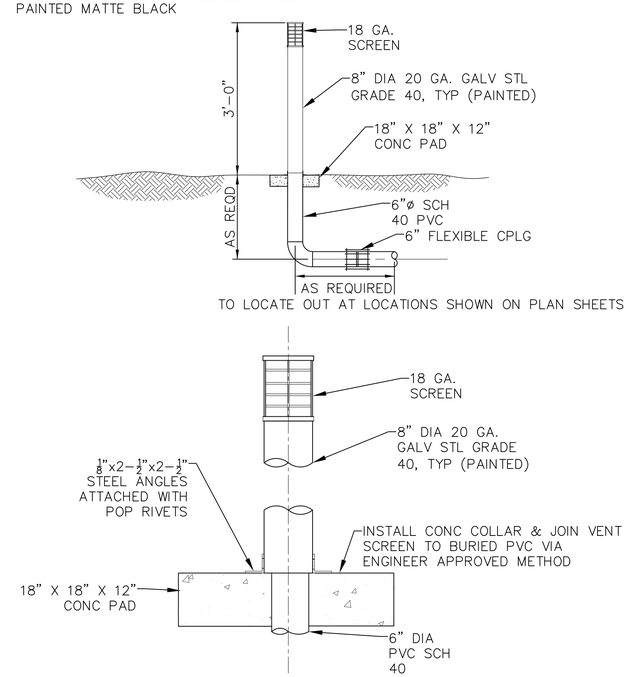


PRESSURE GAUGE ASSEMBLY
NOT TO SCALE



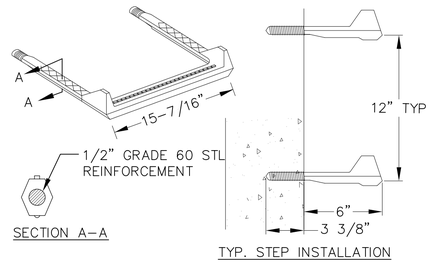
PRECAST 18" SQUARE SUMP
NOT TO SCALE

NOTES:
1. ABOVE GRADE VENTS SHALL BE PRIMED AND PAINTED MATTE BLACK



TO LOCATE OUT AT LOCATIONS SHOWN ON PLAN SHEETS

AIR VENT DETAIL
NOT TO SCALE



SECTION A-A

TYP. STEP INSTALLATION

NOTE:
USE COPOLYMER POLYPROPYLENE PLASTIC STEPS (TYP. FOR ALL STEPS)

MH/VAULT STEP
NOT TO SCALE

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
TYPICAL VAULT DETAILS - SHEET 1 OF 1

TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: C18

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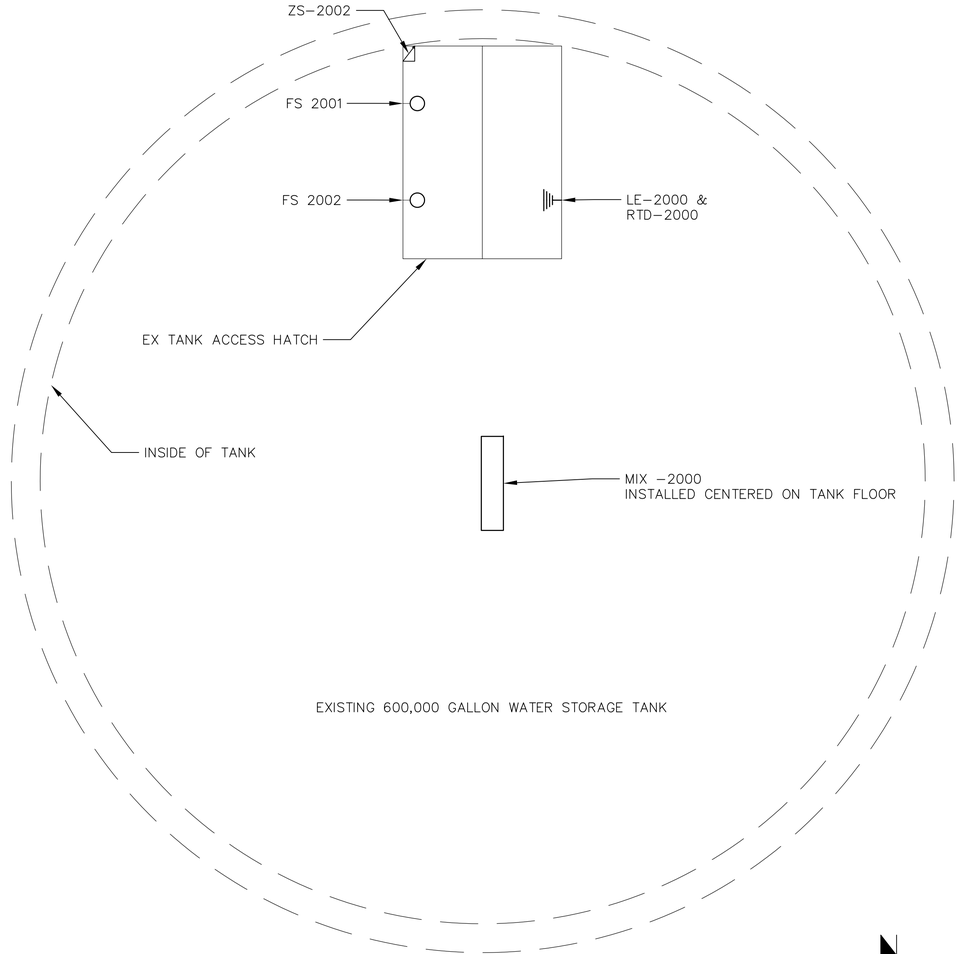
NOTES:
1. SEE SHEET E4 FOR ADDITIONAL DETAILS
2. INSTALL MIXER PER MANUFACTURES RECOMMENDATION



14 C2 *TANK RESTORATION DETAIL*
NOT TO SCALE

AS-BUILTS

REVISIONS

Description	Date	By
AS-BUILT	11/22/2019	ACP

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
1 INCH
BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
TANK RESTORATION DETAIL - SHEET 1 OF 1

TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. C19

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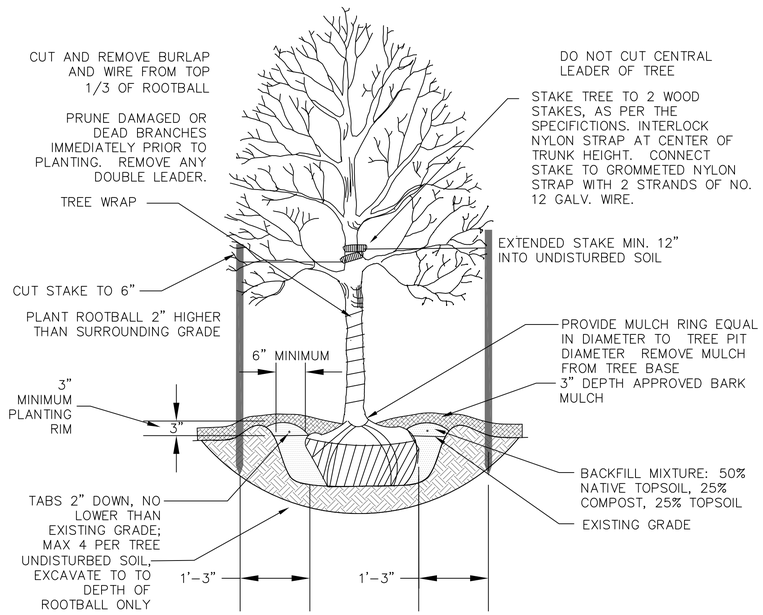
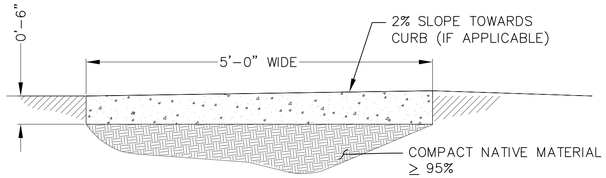


STAKING:	ROOTBALL SIZES:	TREE PIT DIAMETER:	MULCH RING DIAMETER:
SMALL TREE: 2 STAKES	1.5" CAL. = 1'-8"	1.5" CAL. = 7'-8"	1.5" CAL. = 7'-8"
PINE TREE: 3 STAKES	2" CAL. = 2'-0"	2" CAL. = 8'-0"	2" CAL. = 8'-0"
LARGE TREE: 4 STAKES	2.5" CAL. = 2'-4"	2.5" CAL. = 8'-4"	2.5" CAL. = 8'-4"
	3" CAL. = 2'-6"	3" CAL. = 8'-6"	3" CAL. = 8'-6"

NOTE:
TREES SHALL BE RELOCATED ONE TIME FROM EXISTING LOCATION TO A LOCATION DETERMINED BY PROPERTY OWNER WITHIN 500 FEET OF ORIGINAL TREE LOCATION.

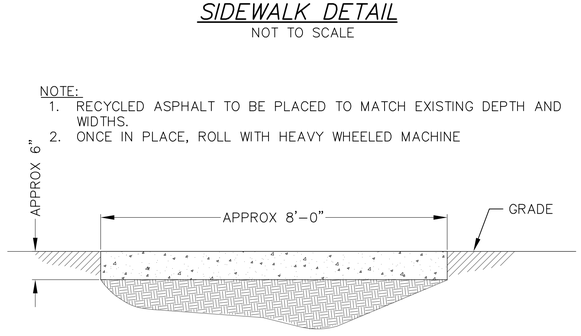
TREE RELOCATION DETAIL
NOT TO SCALE

NOTE:
1. CONCRETE MIX DESIGN PER SPEC SECTION 02800 – CONCRETE
2. PROVIDE TROWELED CONTRACTION JOINTS EVERY 8–10' TO MATCH EXISTING JOINTS



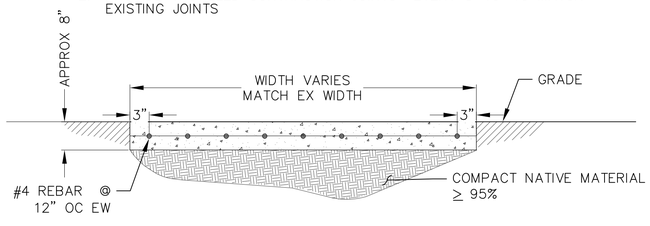
SIDEWALK DETAIL
NOT TO SCALE

NOTE:
1. RECYCLED ASPHALT TO BE PLACED TO MATCH EXISTING DEPTH AND WIDTHS.
2. ONCE IN PLACE, ROLL WITH HEAVY WHEELED MACHINE

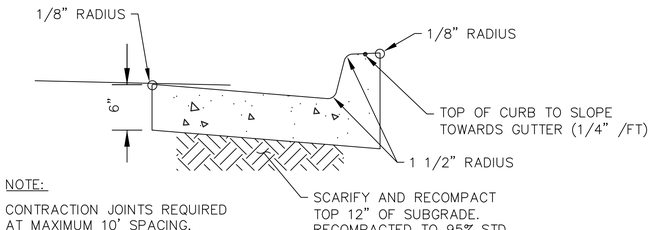


RECYCLED ASPHALT PATH DETAIL
NOT TO SCALE

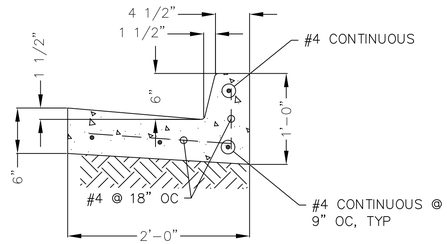
NOTE:
1. CONCRETE MIX DESIGN PER SPEC SECTION 02800 – CONCRETE
2. PROVIDE TROWELED CONTRACTION JOINTS EVERY 8–10' TO MATCH EXISTING JOINTS



CONCRETE PATH DETAIL
NOT TO SCALE

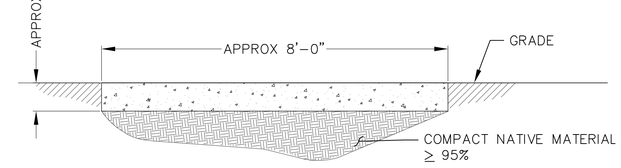


NOTE:
CONTRACTION JOINTS REQUIRED AT MAXIMUM 10' SPACING, MINIMUM 5' SPACING.



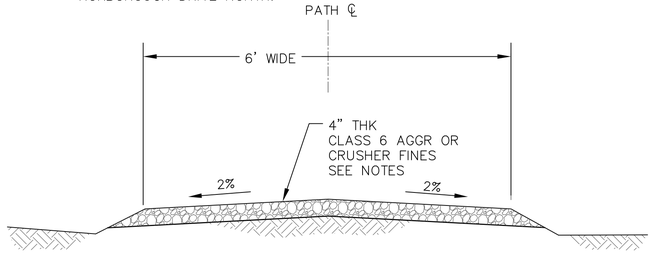
CURB AND GUTTER DETAIL
NOT TO SCALE

NOTE:
1. ASPHALT MIX DESIGN PER SPEC SECTION 02500 – ASPHALT PATCHING
2. SLOPE SIDES OF PATH AWAY FROM CENTERLINE TO AVOID POOLING OF SURFACE WATER



ASPHALT ROAD/PATH DETAIL
NOT TO SCALE

NOTE:
1. USE ROAD BASE FOR GOLF COURSE TEMPORARY GRAVEL PATH.
2. USE CRUSHER FINES FOR WALKING TEMPORARY GRAVEL PATH ADJACENT TO ROXBOROUGH DRIVE NORTH.



TEMPORARY GRAVEL PATH DETAIL
NOT TO SCALE

AS-BUILTS

REVISIONS			
By	Date	Description	
ACP	11/22/2019	AS-BUILT	

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING: SURFACE RESTORATION AND FLATWORK DETAILS - SHEET 1 OF 1

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. C20

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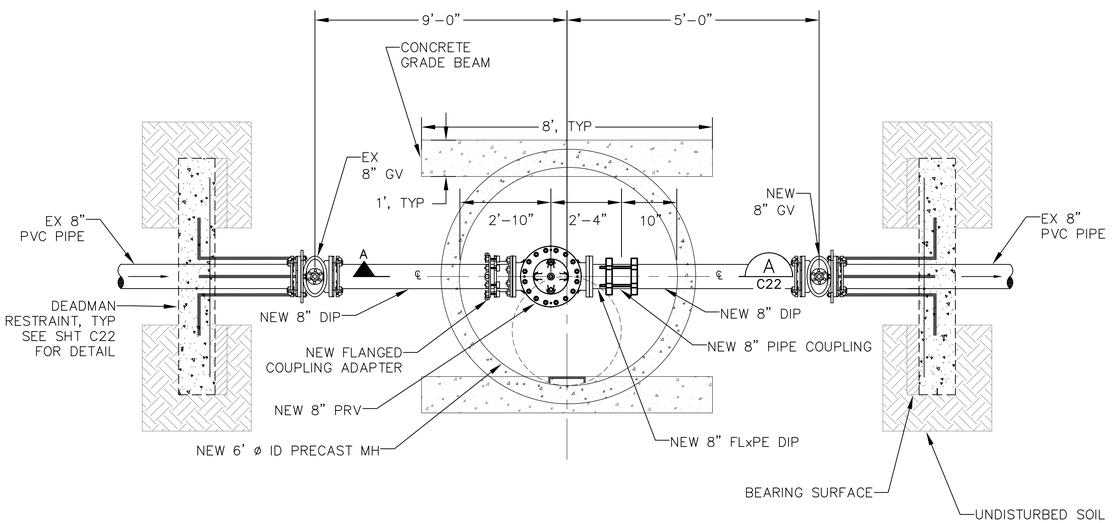
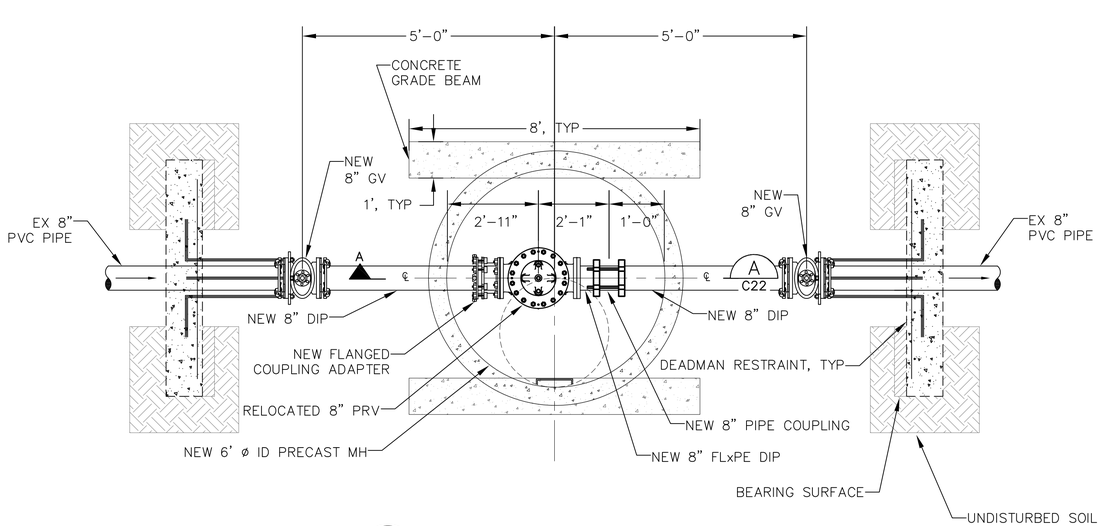
NEW DANTE DRIVE PRV
SCALE: 1" = 80'

NEW RAPHAEL LANE PRV
SCALE: 1" = 80'



1 *DANTE DRIVE PRV PLAN*
NOT TO SCALE



2 *RAPHAEL LANE PRV PLAN*
NOT TO SCALE

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JOC
CHECKED: JOC
DRAWN: MLK

1 INCH
1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
NEW PRESSURE REDUCING VALVE INSTALLATION

TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE NOVEMBER 2019
JOB NO. 001.335.01
ROXBOROUGH
DRAWING NO. C21

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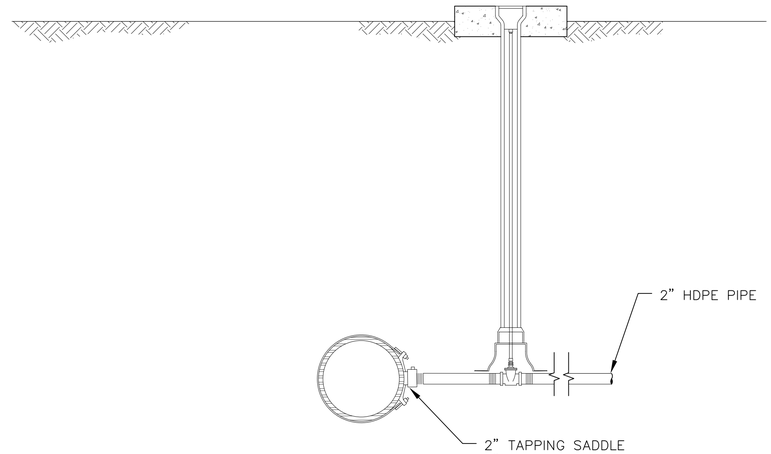
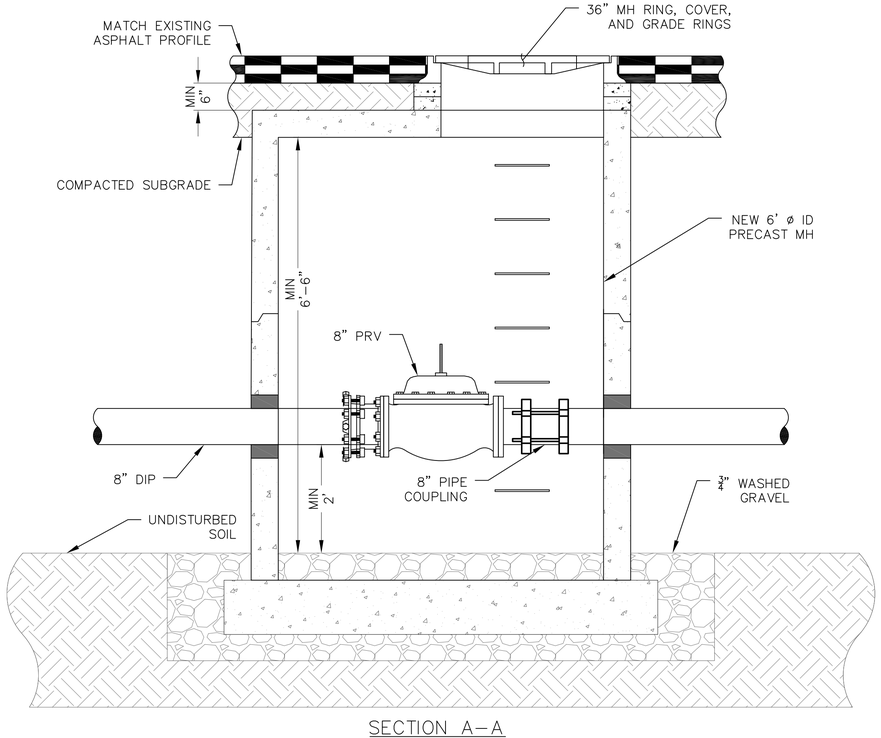
2" WATER LINE EXTENSION
SCALE: 1" = 80'

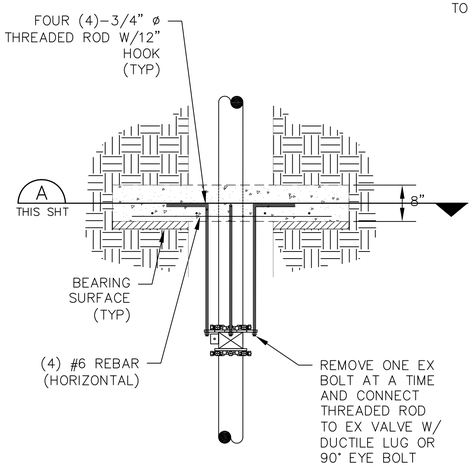


2" HDPE WATER LINE DETAIL
NOT TO SCALE



SECTION A–A

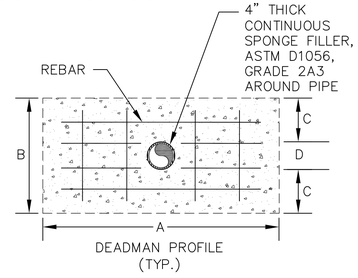
1 PRV SECTION
NOT TO SCALE



2 DEADMAN RESTRAINT DETAIL
C21 NOT TO SCALE

PROCEDURE
STEP 1: INSTALL DEADMAN AND THREADED RODS. ALLOW DEADMAN TO CURE.

STEP 2: CONNECT THREADED RODS TO EX VALVES AND NEW VALVES.



PIPE DIAM	MINIMUM BEARING SURFACE AREA (SF)	A	B	C	D
8"	12	84"	48"	19.5"	9"

NOTES:
1. DIM "A" IS BASED ON AN ASSUMED TRENCH WIDTH OF 48" AT DEADMAN LOCATION. IF WIDTH OF TRENCH IS GREATER, ADJST "A" TO TRENCH WIDTH.
2. THE MINIMUM BEARING SURFACE AREAS SHOWN IN THE TABLE FOR OUTLET PIPING ARE BASED ON 160 PSI INTERNAL PIPE PRESSURE PLUS 110 PSI WATER HAMMER & AN ALLOWABLE SOIL BEARING CAPACITY EQUAL TO 250 PCF 5.5 FOOT DEPTH BELOW GRADE (TO MID–POINT OF THRUST BLOCK FACE). FOR DEPTH EQUAL TO 10 FEET OR MORE, USE 2500 PSF.

A SECTION A–A DETAIL
THIS SHT NOT TO SCALE

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILTS

DESIGNED: JOC
CHECKED: JOC
DRAWN: JAF

1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

PRV DETAILS AND HDPE WATER LINE DETAILS

DRAWING

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. C22

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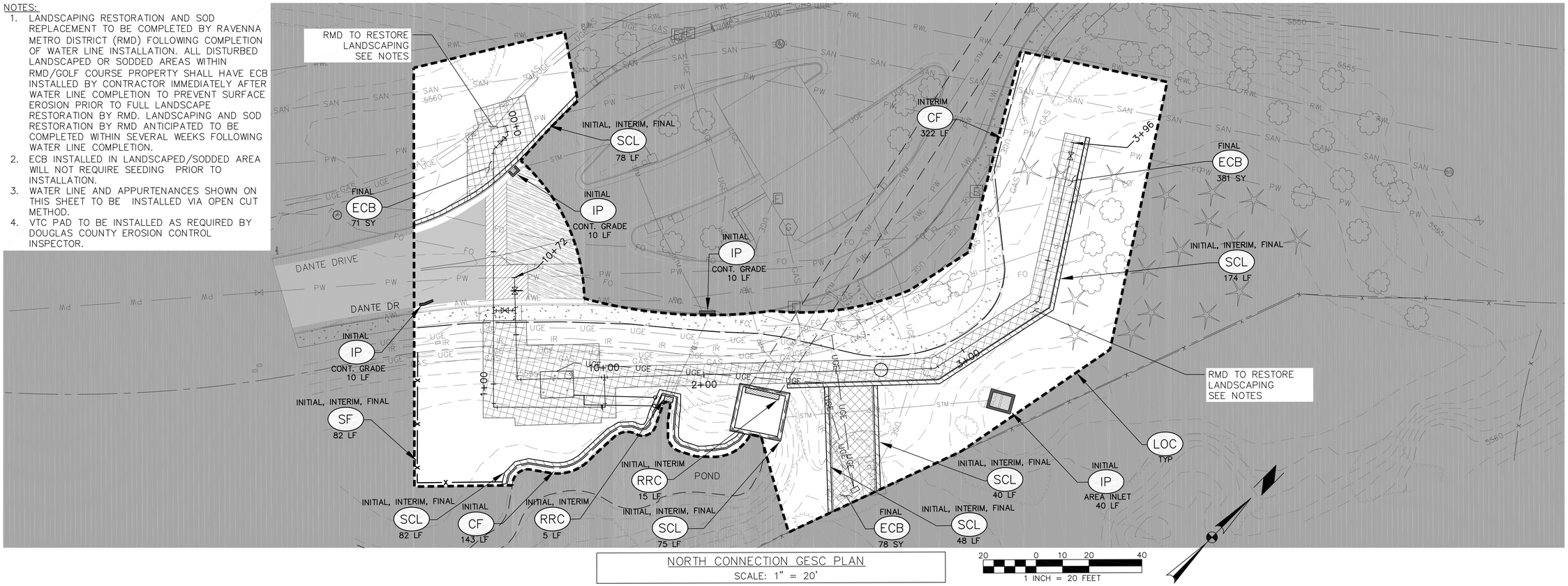
NOTES:

1. LANDSCAPING RESTORATION AND SOD REPLACEMENT TO BE COMPLETED BY RAVENNA METRO DISTRICT (RMD) FOLLOWING COMPLETION OF WATER LINE INSTALLATION. ALL DISTURBED LANDSCAPED OR SODDED AREAS WITHIN RMD/GOLF COURSE PROPERTY SHALL HAVE ECB INSTALLED BY CONTRACTOR IMMEDIATELY AFTER WATER LINE COMPLETION TO PREVENT SURFACE EROSION PRIOR TO FULL LANDSCAPE RESTORATION BY RMD. LANDSCAPING AND SOD RESTORATION BY RMD ANTICIPATED TO BE COMPLETED WITHIN SEVERAL WEEKS FOLLOWING WATER LINE COMPLETION.
2. ECB INSTALLED IN LANDSCAPED/SODDED AREA WILL NOT REQUIRE SEEDING PRIOR TO INSTALLATION.
3. WATER LINE AND APPURTENANCES SHOWN ON THIS SHEET TO BE INSTALLED VIA OPEN CUT METHOD.
4. VTC PAD TO BE INSTALLED AS REQUIRED BY DOUGLAS COUNTY EROSION CONTROL INSPECTOR.

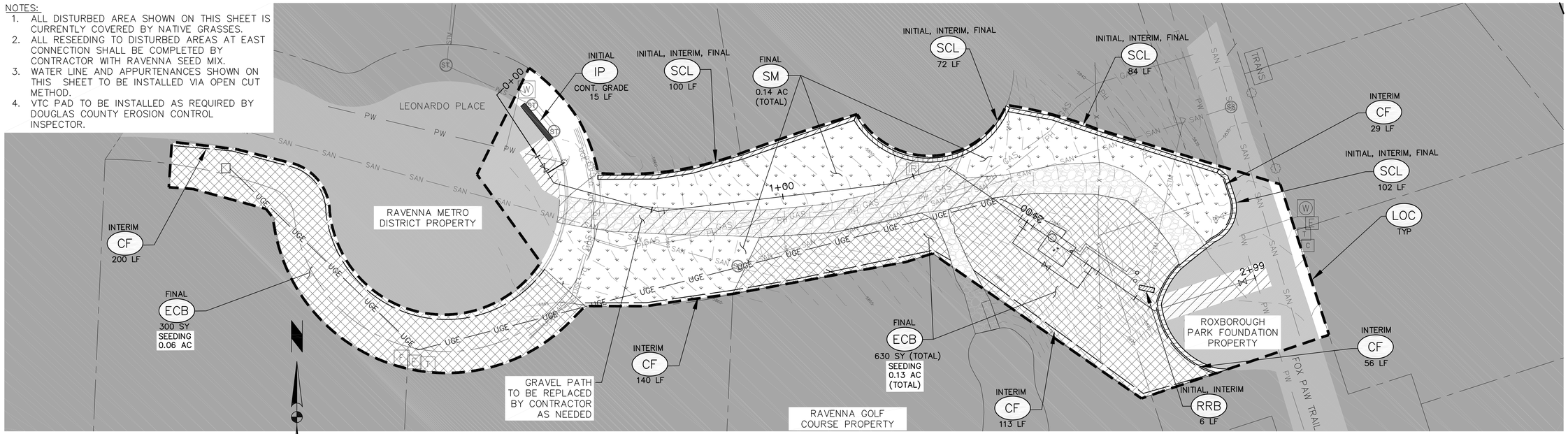


NORTH CONNECTION GESC PLAN
SCALE: 1" = 20'

20 0 10 20 40
1 INCH = 20 FEET

NOTES:

1. ALL DISTURBED AREA SHOWN ON THIS SHEET IS CURRENTLY COVERED BY NATIVE GRASSES.
2. ALL RESEEDING TO DISTURBED AREAS AT EAST CONNECTION SHALL BE COMPLETED BY CONTRACTOR WITH RAVENNA SEED MIX.
3. WATER LINE AND APPURTENANCES SHOWN ON THIS SHEET TO BE INSTALLED VIA OPEN CUT METHOD.
4. VTC PAD TO BE INSTALLED AS REQUIRED BY DOUGLAS COUNTY EROSION CONTROL INSPECTOR.



EAST CONNECTION GESC PLAN
SCALE: 1" = 20'

20 0 10 20 40
1 INCH = 20 FEET

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
NORTH AND EAST CONNECTION GESC PLAN

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. GESC2

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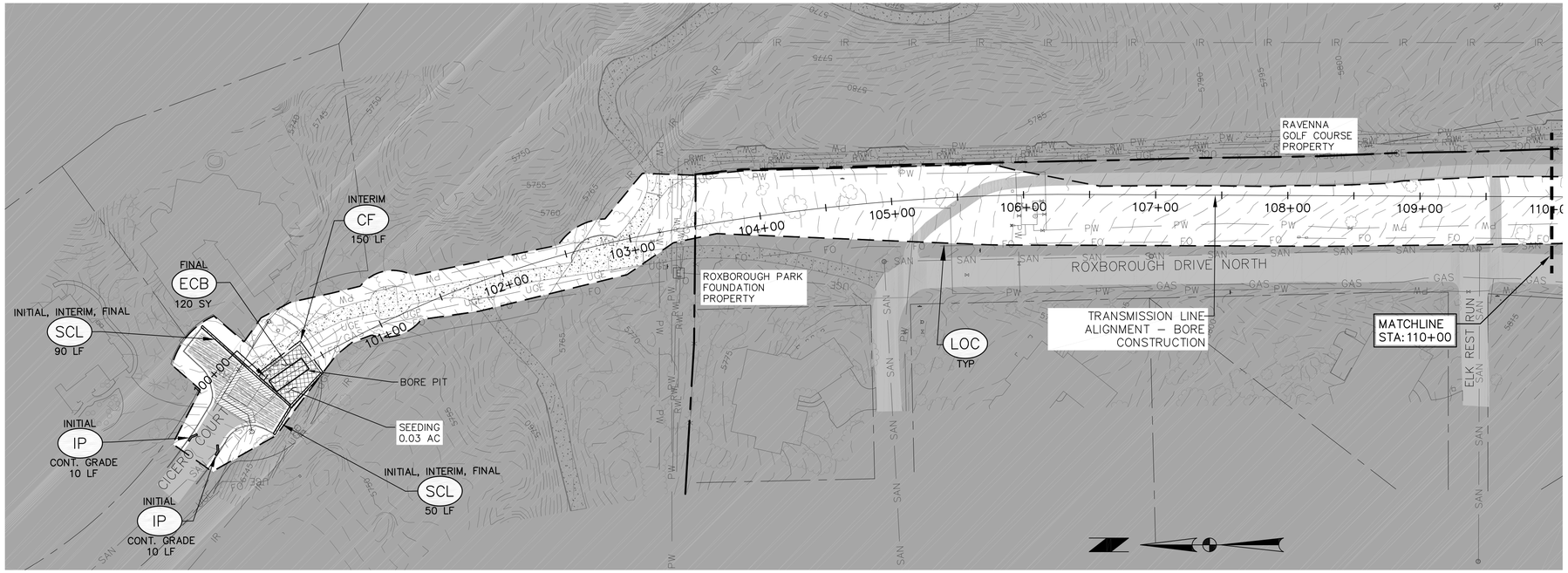
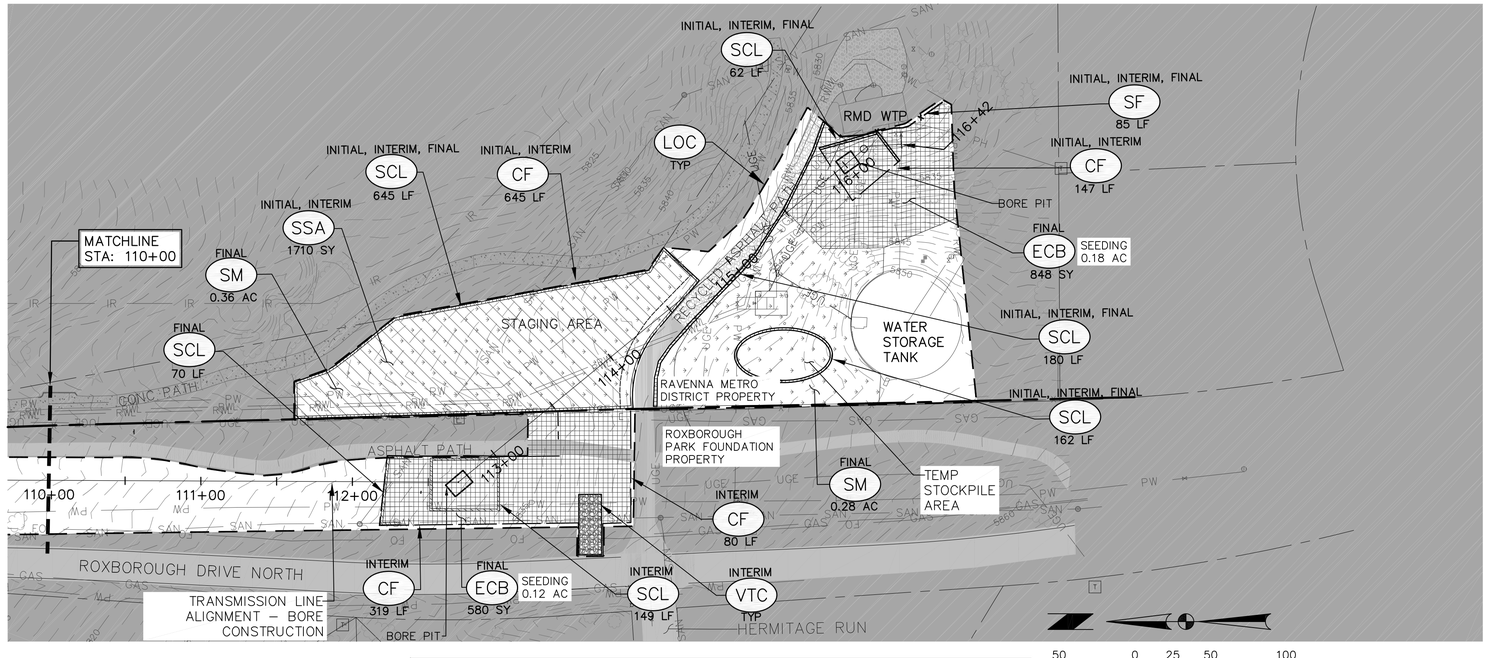


TRANSMISSION LINE GESC PLAN (BID ALTERNATE B)–BORE 1 OF 2
SCALE: 1" = 50'

50 0 25 50 100
1 INCH = 50 FEET

NOTES:
1. ALL DISTURBED AREA SHOWN ON THIS SHEET IS CURRENTLY COVERED BY NATIVE GRASSES.
2. SEEDING AND MULCHING ON RAVENNA PROPERTY TO REQUIRE RAVENNA SEED MIX. SEEDING AND MULCHING ON ROXBOROUGH PARK FOUNDATION (RPF) PROPERTY TO REQUIRE RPF SEED MIX.
3. BMPS SHOWN ON THIS SHEET TO BE INSTALLED IF BORED WATER LINE OPTION SELECTED BY OWNER.
4. ALL DISTURBED AREA SHALL BE SEEDED PRIOR TO PLACEMENT OF EROSION CONTROL BLANKET.



TRANSMISSION LINE GESC PLAN (BID ALTERNATE B)–BORE 2 OF 2
SCALE: 1" = 50'

50 0 25 50 100
1 INCH = 50 FEET

AS-BUILTS

REVISIONS

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
TRANSMISSION LINE GESC PLAN (BID ALTERNATE B) - BORE

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. GESC3

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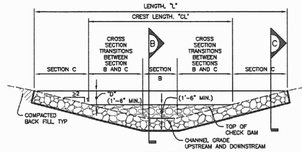
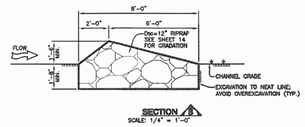
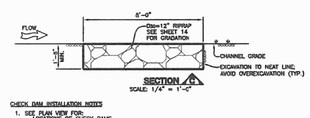
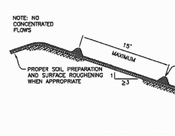
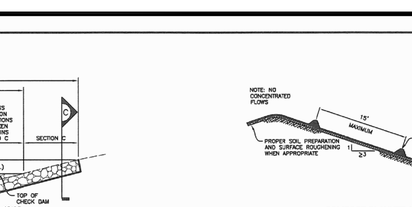
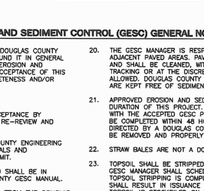


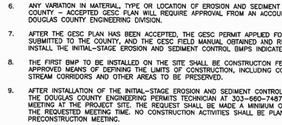


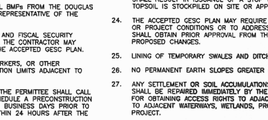












GRADING, EROSION, AND SEDIMENT CONTROL (GESC) GENERAL NOTES

1. THE DOUGLAS COUNTY ENGINEER'S SIGNATURE AFFIXED TO THIS DOCUMENT INDICATES THE DOUGLAS COUNTY PUBLIC WORKS DEPARTMENT, ENGINEERING DIVISION, HAS REVIEWED THE DOCUMENT AND FOUND IT IN GENERAL COMPLIANCE WITH THE DOUGLAS COUNTY SUBDIVISION REGULATIONS AND/OR THE GRADING, EROSION AND SEDIMENT CONTROL (GESC) CRITERIA MANUAL. THE DOUGLAS COUNTY ENGINEER, THROUGH ACCEPTANCE OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY (OTHER THAN AS STATED ABOVE) FOR THE COMPLETENESS AND/OR ACCURACY OF THESE DOCUMENTS.
2. THE ADEQUACY OF THIS GESC PLAN LIES WITH THE ORIGINAL DESIGN ENGINEER.
3. THE GESC PLAN SHALL BE CONSIDERED VALID FOR TWO (2) YEARS FROM THE DATE OF ACCEPTANCE BY DOUGLAS COUNTY, AFTER WHICH TIME THE PLAN SHALL BE VOID AND WILL BE SUBJECT TO RE-REVIEW AND RE-ACCEPTANCE BY DOUGLAS COUNTY.
4. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE DOUGLAS COUNTY ENGINEERING DIVISION. DOUGLAS COUNTY RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO THE GESC MANUAL, GESC PLAN OR GESC PERMIT.
5. THE PLACEMENT OF EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs) SHALL BE IN ACCORDANCE WITH THE DOUGLAS COUNTY – ACCEPTED GESC PLAN AND THE DOUGLAS COUNTY GESC MANUAL.
6. ANY VARIATION IN MATERIAL, TYPE OR LOCATION OF EROSION AND SEDIMENT CONTROL BMPs FROM THE DOUGLAS COUNTY – ACCEPTED GESC PLAN WILL REQUIRE APPROVAL FROM AN ACCOUNTABLE REPRESENTATIVE OF THE DOUGLAS COUNTY ENGINEERING DIVISION.
7. AFTER THE GESC PLAN HAS BEEN ACCEPTED, THE GESC PERMIT APPLIED FOR, FEES AND FISCAL SECURITY SUBMITTED TO THE COUNTY, AND THE GESC FIELD MANUAL OBTAINED AND REVIEWED, THE CONTRACTOR MAY INSTALL THE INITIAL-STAGE EROSION AND SEDIMENT CONTROL BMPS INDICATED ON THE ACCEPTED GESC PLAN.
8. THE FIRST BMP TO BE INSTALLED ON THE SITE SHALL BE CONSTRUCTION FENCE, MARKERS, OR OTHER APPROVED MEANS OF DEFINING THE LIMITS OF CONSTRUCTION, INCLUDING CONSTRUCTION LIMITS ADJACENT TO STREAM CORRIDORS AND OTHER AREAS TO BE PRESERVED.
9. AFTER INSTALLATION OF THE INITIAL-STAGE EROSION AND SEDIMENT CONTROL BMPs, THE PERMITTEE SHALL CALL THE DOUGLAS COUNTY ENGINEERING PERMITS TECHNICIAN AT 303-660-7487 TO SCHEDULE A PRECONSTRUCTION MEETING AT THE PROJECT SITE. THE REQUEST SHALL BE MADE A MINIMUM OF THREE BUSINESS DAYS PRIOR TO THE REQUESTED MEETING TIME. NO CONSTRUCTION ACTIVITIES SHALL BE PLANNED WITHIN 24 HOURS AFTER THE PRECONSTRUCTION MEETING.
10. THE OWNER OR OWNER'S REPRESENTATIVE, THE GESC MANAGER, THE GENERAL CONTRACTOR, AND THE GRADING SUBCONTRACTOR, IF DIFFERENT FROM THE GENERAL CONTRACTOR, MUST ATTEND THE PRECONSTRUCTION MEETING. IF ANY OF THE REQUIRED PARTICIPANTS FAIL TO ATTEND THE PRECONSTRUCTION MEETING, OR IF THE GESC FIELD MANUAL IS NOT ON SITE, OR IF THE INSTALLATION OF THE INITIAL BMPs ARE NOT APPROVED BY THE DOUGLAS COUNTY GESC INSPECTOR, THE APPLICANT WILL HAVE TO PAY A REINSPECTION FEE, ADDRESS ANY PROBLEMS WITH BMP INSTALLATION, AND CALL TO RESCHEDULE THE MEETING, WITH A CORRESPONDING DELAY IN THE START OF CONSTRUCTION. DOUGLAS COUNTY STRONGLY ENCOURAGES THE APPLICANT TO HAVE THE ENGINEER OF RECORD AT THE PRECONSTRUCTION MEETING. FAILURE OF THE ENGINEER OF RECORD TO ATTEND MAY RESULT IN A DELAY OF THE START OF CONSTRUCTION.
11. CONSTRUCTION SHALL NOT BEGIN UNTIL THE DOUGLAS COUNTY GESC INSPECTOR APPROVES THE INSTALLATION OF THE INITIAL BMPs AND THE APPROVED GESC PERMIT IS PICKED UP FROM THE COUNTY AND IS IN-HAND ON THE SITE. THE COMPLETED PERMIT WILL BE AVAILABLE WITHIN 24-HOURS AFTER THE INSTALLATION OF THE INITIAL BMPs ARE APPROVED.
12. THE GESC MANAGER SHALL STRICTLY ADHERE TO THE DOUGLAS COUNTY-APPROVED LIMITS OF CONSTRUCTION AT ALL TIMES. THE DOUGLAS COUNTY ENGINEERING DIVISION MUST APPROVE ANY CHANGES TO THE LIMITS OF CONSTRUCTION AND, AT THE DISCRETION OF THE ENGINEERING DIVISION, ADDITIONAL EROSION/SEDIMENT CONTROLS MAY BE REQUIRED IN ANY ADDITIONAL AREAS OF CONSTRUCTION.
13. THE MAXIMUM AREA OF CONSTRUCTION SHALL BE LIMITED TO 40 ACRES (70 ACRES IF APPROVED FOR SOIL MITIGATION OPERATIONS) TO REDUCE THE AMOUNT OF LAND DISTURBED AT ANY ONE TIME. LARGER SITES SHALL BE DIVIDED INTO PHASES THAT ARE EACH 40 (OR 70) ACRES OR LESS IN SIZE. THESE PROJECTS SHALL CONDUCT GRADING ACTIVITIES IN ACCORDANCE WITH THE ACCEPTED GESC PLAN. BMP INSTALLATION AND APPROVAL BY DOUGLAS COUNTY AT THE START AND COMPLETION OF EACH PHASE SHALL BE CONDUCTED IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE GESC MANUAL AND/OR GESC FIELD MANUAL.
14. PRIOR TO ACTUAL CONSTRUCTION, THE PERMITTEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES. FOR INFORMATION, CONTACT THE DENVER INTER-UTILITY GROUP AT 1-800-922-1987 OR FAX AT (303)534-6700.
15. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATIONS.
16. THE GESC PERMIT SHALL BE VALID FOR A PERIOD OF ONE (1) YEAR.
17. A COPY OF THE GESC PERMIT, ACCEPTED GESC PLANS AND THE GESC FIELD MANUAL SHALL BE ON SITE AT ALL TIMES.
18. THE GESC MANAGER SHALL BE RESPONSIBLE FOR ENSURING THAT THE SITE REMAINS IN COMPLIANCE WITH THE GESC PERMIT AND SHALL BE THE PERMITTEE'S CONTACT PERSON WITH THE COUNTY FOR ALL MATTERS PERTAINING TO THE GESC PERMIT. THE GESC MANAGER SHALL BE PRESENT AT THE SITE THE MAJORITY OF THE TIME AND SHALL BE AVAILABLE THROUGH A 24-HOUR CONTACT NUMBER. IN THE EVENT THAT THE CONTRACTOR'S GESC MANAGER IS NOT ON SITE AND CANNOT BE REACHED DURING A VIOLATION, THE ALTERNATE GESC MANAGER SHALL BE CONTACTED. IF NEITHER THE GESC MANAGER NOR ALTERNATE GESC MANAGER CAN BE CONTACTED DURING ANY VIOLATION, A STOP WORK ORDER SHALL BE ISSUED.
19. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE THROUGH THE DOUGLAS COUNTY-APPROVED ACCESS POINT. A VEHICLE TRACKING CONTROL PAD IS REQUIRED AT ALL ACCESS POINTS ON THE SITE. ADDITIONAL STABILIZED CONSTRUCTION ENTRANCES MAY BE ADDED WITH AUTHORIZATION FROM THE DOUGLAS COUNTY ENGINEERING DIVISION.
20. THE GESC MANAGER IS RESPONSIBLE FOR CLEANUP OF SEDIMENT OR CONSTRUCTION DEBRIS TRACKED ONTO ADJACENT PAVED AREAS. PAVED AREAS INCLUDING STREETS ARE TO BE KEPT CLEAN THROUGHOUT BUILD-OUT AND SHALL BE CLEANED, WITH A STREET SWEEPER OR SIMILAR DEVICE, AT FIRST NOTICE OF ACCIDENTAL TRACKING OR AT THE DISCRETION OF THE DOUGLAS COUNTY GESC INSPECTOR. STREET WASHING IS NOT ALLOWED. DOUGLAS COUNTY RESERVES THE RIGHT TO REQUIRE ADDITIONAL MEASURES TO ENSURE AREA STREETS ARE KEPT FREE OF SEDIMENT AND/OR CONSTRUCTION DEBRIS.
21. APPROVED EROSION AND SEDIMENT CONTROL BMPs SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THIS PROJECT. AT A MINIMUM, THE GESC MANAGER SHALL INSPECT ALL BMPs IN ACCORDANCE WITH THE ACCEPTED GESC PLAN AND GESC MANUAL. ALL NECESSARY MAINTENANCE AND REPAIR ACTIVITIES SHALL BE COMPLETED WITHIN 48 HOURS FOR LEVEL III VIOLATIONS, AND IMMEDIATELY FOR LEVEL II VIOLATIONS, OR AS DIRECTED BY A DOUGLAS COUNTY GESC INSPECTOR. ACCUMULATED SEDIMENT AND CONSTRUCTION DEBRIS SHALL BE REMOVED AND PROPERLY DISPOSED.
22. STRAW BALES ARE NOT A DOUGLAS COUNTY GESC-ACCEPTED SEDIMENT CONTROL BMP.
23. TOPSOIL SHALL BE STRIPPED AND STOCKPILED IN THE LOCATION SHOWN ON THE ACCEPTED GESC PLAN. THE GESC MANAGER SHALL SCHEDULE AN INSPECTION WITH THE DOUGLAS COUNTY GESC INSPECTOR AS SOON AS TOPSOIL STRIPPING IS COMPLETED. FAILURE TO SCHEDULE SUCH INSPECTION OR FAILURE TO STOCKPILE TOPSOIL SHALL RESULT IN ISSUANCE OF A STOP WORK ORDER. THE STOP WORK ORDER SHALL REMAIN IN PLACE UNTIL TOPSOIL IS STOCKPILED ON SITE OR APPROPRIATE SOIL AMENDMENTS ARE STOCKPILED ON SITE.
24. THE ACCEPTED GESC PLAN MAY REQUIRE CHANGES OR ALTERATIONS AFTER APPROVAL TO MEET CHANGING SITE OR PROJECT CONDITIONS OR TO ADDRESS INEFFICIENCIES IN DESIGN OR INSTALLATION. THE GESC MANAGER SHALL OBTAIN PRIOR APPROVAL FROM THE DESIGN ENGINEER AND DOUGLAS COUNTY ENGINEERING FOR ANY PROPOSED CHANGES.
25. LINING OF TEMPORARY SWALES AND DITCHES SHALL BE IN ACCORDANCE WITH THE GESC CRITERIA MANUAL.
26. NO PERMANENT EARTH SLOPES GREATER THAN 3:1 SHALL BE ALLOWED.
27. ANY SETTLEMENT OR SOIL ACCUMULATIONS BEYOND THE LIMITS OF CONSTRUCTION DUE TO GRADING OR EROSION SHALL BE REPAIRED IMMEDIATELY BY THE GESC MANAGER. THE GESC MANAGER SHALL BE HELD RESPONSIBLE FOR OBTAINING ACCESS RIGHTS TO ADJACENT PROPERTY, IF NEEDED, AND REMEDIATING ANY ADVERSE IMPACTS TO ADJACENT WATERWAYS, WETLANDS, PROPERTIES, ETC. RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
28. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
29. SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE SEEDED AND MULCHED WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION. NO STOCKPILES SHALL BE PLACED WITHIN ONE HUNDRED (100) FEET OF A DRAINAGE WAY UNLESS APPROVED BY THE DOUGLAS COUNTY ENGINEERING DIVISION.
30. ALL CHEMICAL OR HAZARDOUS MATERIAL SPILLS WHICH MAY ENTER WATERS OF THE STATE OF COLORADO, WHICH INCLUDE BUT ARE NOT LIMITED TO, SURFACE WATER, GROUND WATER AND DRY GULLIES OR STORM SEWER LEADING TO SURFACE WATER, SHALL BE IMMEDIATELY REPORTED TO THE CDPHE PER CRS 25-8-601, AND DOUGLAS COUNTY. RELEASES OF PETROLEUM PRODUCTS AND CERTAIN HAZARDOUS SUBSTANCES LISTED UNDER THE FEDERAL CLEAN WATER ACT (40 CFR PART 116) MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER AS WELL AS THE CDPHE. CONTACT INFORMATION FOR CDHPE, DOUGLAS COUNTY AND THE NATIONAL RESPONSE CENTER CAN BE FOUND IN APPENDIX A. SPILLS THAT POSE AN IMMEDIATE RISK TO HUMAN LIFE SHALL BE REPORTED TO 911. FAILURE TO REPORT AND CLEAN UP ANY SPILL SHALL RESULT IN ISSUANCE OF A STOP WORK ORDER.
31. ALL WORK ON SITE SHALL STAY A MINIMUM OF ONE HUNDRED (100) FEET AWAY FROM ANY DRAINAGE WAY, WETLAND, ETC. UNLESS OTHERWISE NOTED ON AN ACCEPTED DOUGLAS COUNTY GESC PLAN.
32. ALL PROJECTS SHALL BALANCE EARTHWORK QUANTITIES ON SITE. IN THE EVENT A VARIANCE IS GRANTED BY THE COUNTY ENGINEER TO ALLOW IMPORT OR EXPORT OF MATERIAL, THE PERMITEE SHALL HAVE A GESC PERMIT IN HAND FOR THE IMPORT OR EXPORT SITE PRIOR TO ANY TRANSPORTING OF EARTHEN MATERIAL. THE GESC MANAGER SHALL NOTIFY THE DOUGLAS COUNTY GESC INSPECTOR OF THE LOCATION AND PERMIT NUMBERS OF BOTH THE EXPORTING AND IMPORTING SITES PRIOR TO ANY IMPORT/ EXPORT OPERATIONS.
33. THE USE OF REBAR, STEEL STAKES OR STEEL FENCE POSTS FOR STAKING OR SUPPORT OF ANY EROSION OR SEDIMENT CONTROL BMP IS PROHIBITED (EXCEPT STEEL TEE-POSTS FOR USE IN SUPPORTING CONSTRUCTION FENCE).
34. THE CLEANING OF CONCRETE DELIVERY TRUCK CHUTES IS RESTRICTED TO APPROVED CONCRETE WASH OUT LOCATIONS ON THE JOB SITE. THE DISCHARGE OF WATER CONTAINING WASTE CONCRETE TO THE STORM SEWER SYSTEM IS PROHIBITED. ALL CONCRETE WASTE SHALL BE PROPERLY CLEANED UP AND DISPOSED AT AN APPROPRIATE LOCATION.
35. ALL DEWATERING ON SITE SHALL BE COORDINATED WITH A DOUGLAS COUNTY GESC INSPECTOR AND BE FREE OF SEDIMENT IN ACCORDANCE WITH THE GESC CRITERIA MANUAL.
36. ALL PERMANENT INSTALLATIONS OF PIPES FOR STORM SEWERS, SLOPE DRAINS, AND CULVERTS, TOGETHER WITH RIPRAP APRONS OR OTHER INLET AND OUTLET PROTECTION, REQUIRE INSPECTION BY DOUGLAS COUNTY ENGINEERING (SEPARATE FROM GESC INSPECTIONS).
37. ALL DISTURBED AREAS SHALL BE DRILL SEEDED AND CRIMP MULCHED IN ACCORDANCE WITH THE GESC CRITERIA MANUAL WITHIN THIRTY DAYS OF INITIAL EXPOSURE OR WITHIN SEVEN DAYS OF SUBSTANTIAL COMPLETION (AS DEFINED BY DOUGLAS COUNTY) OF AN AREA, WHICHEVER IS LESS. THIS MAY REQUIRE MULTIPLE MOBILIZATIONS FOR SEEDING AND MULCHING.
38. HYDRAULIC SEEDING AND HYDRAULIC MULCHING ARE NOT AN ACCEPTABLE METHOD OF SEEDING OR MULCHING IN DOUGLAS COUNTY.
39. NO CURB AND GUTTER PERMITS SHALL BE ISSUED UNTIL ALL DISTURBED AREAS ARE DRILL SEEDED AND CRIMP MULCHED.
40. NO PAVING PERMITS SHALL BE ISSUED UNTIL ALL INTERIM INLET PROTECTION IS INSTALLED AND APPROVED BY THE GESC INSPECTOR.
41. A FINAL GESC INSPECTION SHALL BE CONDUCTED A MINIMUM OF TWO WEEKS PRIOR TO THE ANTICIPATED REQUEST FOR CERTIFICATE OR TEMPORARY CERTIFICATE OF OCCUPANCY OR INITIAL ACCEPTANCE.

BMP LEGEND

DETAIL NO.	SHEET NO.		BMP LEGEND
1	1	CD	CHECK DAM
2	1	CB	COMPOST BLANKET
3	1	CFB	COMPOST FILTER BERM
4	1	CWA	CONCRETE WASHOUT AREA
5	1	CF	CONSTRUCTION FENCE
6	1	CM	CONSTRUCTION MARKERS
7	1	DW	DEWATERING
8	1	DD	DIVERSION DITCH
9	2	ECB	EROSION CONTROL BLANKET
10	2	IP	INLET PROTECTION
11	2	RCD	REINFORCED CHECK DAM
12	2	RRB	REINFORCED ROCK BERM
13	2	RRC	RRB FOR CULVERT PROTECTION
14	2	SB	SEDIMENT BASIN
15	3	SCL	SEDIMENT CONTROL LOG
16	3	ST	SEDIMENT TRAP
17	3	SM	SEEDING AND MULCHING
18	3	SF	SILT FENCE
19	3	SSA	STABILIZED STAGING AREA
20	3	SR	SURFACE ROUGHENING
21	3	TSD	TEMPORARY SLOPE DRAIN
22	3	TSC	TEMPORARY STREAM CROSSING
23	3	TER	TERRACING
24	3	VTC	VEHICLE TRACKING CONTROL
25	3	WW	VTC WITH WHEEL WASH
	1		ROCK AND RIPRAP GRADATIONS
		LOC	LIMITS OF CONSTRUCTION

CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATIONS OF CHECK DAMS.
   - CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   - LENGTH, "L", CREST LENGTH, "CL", AND DEPTH, "D".
2. CHECK DAMS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.
3. RIPRAP UTILIZED FOR CHECK DAMS SHALL HAVE A D_{50} MEDIAN STONE SIZE OF 12".
4. RIPRAP PAD SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'-8".
5. THE ENDS OF THE CHECK DAM SHALL BE A MINIMUM OF 1'-6" HIGHER THAN THE CENTER OF THE CHECK DAM.

CHECK DAM MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT CHECK DAMS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF CHECK DAM IS WITHIN ½ OF THE HEIGHT OF THE CREST.
3. CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE COUNTY.
4. WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACK FILL. ANY DISTURBED AREA SHALL BE SEEDED AND MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

CD CHECK DAM 1

COMPOST BLANKET AND COMPOST FILTER BERM
SCALE: 1" = 10'-0"

COMPOST BLANKET NOTES:

1. SEE PLAN VIEW FOR AREA OF COMPOST BLANKET.
2. MAY BE USED IN PLACE OF STRAW MULCH OR EROSION CONTROL BLANKET IN AREAS WHERE ACCESS IS DIFFICULT DUE TO LANDSCAPING OR OTHER OBJECTS OR IN AREAS WHERE A SMOOTH TURF GRASS FINISH IS DESIRED.
3. SHALL ONLY BE UTILIZED IN AREAS WHERE SHEET FLOW CONDITIONS PREVAIL; SHALL BE PROHIBITED IN AREAS OF POSSIBLE CONCENTRATED FLOW.
4. SOIL PREPARATION SHALL BE COMPLETE PER THE SPECIFICATIONS OUTLINED IN THESE CRITERIA PRIOR TO APPLICATION.
5. WHEN TURF GRASS FINISH IS NOT DESIRED, SURFACE ROUGHENING ON SLOPES SHALL TAKE PLACE PRIOR TO APPLICATION.
6. SHALL BE EVENLY APPLIED AT A DEPTH OF 2 INCH.
7. MAYBE APPLIED UTILIZING PNEUMATIC BLOWER, OR BY HAND.
8. SEEDING SHALL BE DRILLED PRIOR TO THE APPLICATION OF COMPOST OR SEED MAY BE COMBINED AND BLOWN WITH THE PNEUMATIC BLOWER.
9. COMPOST FILTER BERM SHALL BE UTILIZED ON SLOPES WITH A MAXIMUM SPACING OF 15 FEET PER THE REQUIREMENTS FOUND IN THE COMPOST FILTER BERM SECTION.
10. THE GESC MANAGER SHALL INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.
11. COMPOST USED IN THE APPLICATION OF THE COMPOST BLANKET SHALL BE A CLASS I COMPOST AS DEFINED BY THE FOLLOWING PHYSICAL, CHEMICAL, AND BIOLOGICAL PARAMETERS:

PARAMETERS	CLASS I COMPOST FOR COMPOST BLANKET
MINIMUM STABILITY INDICATOR	STABLE TO VERY STABLE
SOLUBLE SALTS	MAXIMUM 5mmhos/cm
PH	6.0 – 8.0
AG INDEX	> 10
MATURITY INDICATOR EXPRESSED AS PERCENTAGE OF GERMINATION/VIGOR	80+/80+
MATURITY INDICATOR EXPRESSED AS AMMONIA N/ NITRATE N RATIO	< 4
MATURITY INDICATOR EXPRESSED AS CARBON TO NITROGEN RATIO	20:1
TESTED FOR CLOPYRALID	YES/NEGATIVE RESULT
MOISTURE CONTENT	30–60 %
ORGANIC MATTER CONTENT	25–45 % OF DRY WEIGHT
PARTICLE SIZE DISTRIBUTION	3" (75mm) 100% PASSING 1" (25mm) 95% TO 100% PASSING 3/4" (19mm) 85% TO 90% PASSING 3/8" (9.5mm) 50% TO 60% PASSING #4 20 TO 35% PASSING
PRIMARY, SECONDARY NUTRIENTS; TRACE ELEMENT	MUST BE REPORTED
TESTING AND TEST REPORT SUBMITTAL REQUIREMENTS	STA + CLOPYRALID
ORGANIC MATTER PER CUBIC YARD	MUST REPORT
CHEMICAL CONTAMINANTS	MEET OR EXCEED US EPA CLASS A STANDARD, 40 CFR 503.1 TABLES 1 & 3 LEVELS
MINIMUM MANUFACTURING/PRODUCTION REQUIREMENT	FULLY PERMITTED UNDER COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION
RISK FACTOR RELATING TO PLANT GERMINATION AND HEALTH	LOW

NOTE: CLOPYRALID IS THE COMMON NAME OF A HERBICIDE THAT KILLS BROAD-LEAVED WEEDS SUCH AS DANDELIONS, CLOVER AND THISTLE.

CB COMPOST BLANKET 2

COMPOST FILTER BERM NOTES:

1. SEE PLAN VEW FOR LENGTH OF COMPOST FILTER BERM.
2. SHALL BE APPLIED TO ALL SLOPES RECEIVING A COMPOST BLANKET AT 15' INCREMENTS.
3. FILTER BERMS SHALL RUN PARALLEL TO THE CONTOUR.
4. FILTER BERMS SHALL BE A MINIMUM OF 1' H x 2' W.
5. FILTER BERMS SHALL BE APPLIED UTILIZING PNEUMATIC BLOWER, OR BY HAND.
6. SHALL ONLY BE UTILIZED IN AREAS WHERE SHEET FLOW CONDITIONS PREVAIL; SHALL BE PROHIBITED IN AREAS OF POSSIBLE CONCENTRATED FLOW.
7. SOIL PREPARATION SHALL BE COMPLETE PER THE SPECIFICATIONS OUTLINED IN THESE CRITERIA PRIOR TO APPLICATION.
8. WHEN TURF GRASS FINISH IS NOT DESIRED, SURFACE ROUGHENING ON SLOPES SHALL TAKE PLACE PRIOR TO APPLICATION.
9. SEEDING SHALL BE DRILLED BEFORE THE APPLICATION OF COMPOST OR SEED MAY BE COMBINED AND BLOWN WITH THE PNEUMATIC BLOWER.
10. THE GESC MANAGER SHALL INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.
11. COMPOST USED IN THE APPLICATION OF THE COMPOST BLANKET SHALL BE A CLASS I COMPOST AS DEFINED BY THE FOLLOWING PHYSICAL, CHEMICAL, AND BIOLOGICAL PARAMETERS:

PARAMETERS	CLASS I COMPOST FOR COMPOST FILTER BERM
MINIMUM STABILITY INDICATOR	STABLE TO VERY STABLE
SOLUBLE SALTS	MAXIMUM 5mmhos/cm
PH	6.0 – 8.0
AG INDEX	> 10
MATURITY INDICATOR EXPRESSED AS PERCENTAGE OF GERMINATION/VIGOR	80+/80+
MATURITY INDICATOR EXPRESSED AS AMMONIA N/ NITRATE N RATIO	< 4
MATURITY INDICATOR EXPRESSED AS CARBON TO NITROGEN RATIO	20:1
TESTED FOR CLOPYRALID	YES/NEGATIVE RESULT
MOISTURE CONTENT	30–60 %
ORGANIC MATTER CONTENT	25–45 % OF DRY WEIGHT
PARTICLE SIZE DISTRIBUTION	3" (75mm) 100% PASSING 1" (25mm) 95% TO 100% PASSING 3/4" (19mm) 85% TO 90% PASSING 3/8" (9.5mm) 50% TO 60% PASSING #4 20 TO 35% PASSING
PRIMARY, SECONDARY NUTRIENTS; TRACE ELEMENT	MUST BE REPORTED
TESTING AND TEST REPORT SUBMITTAL REQUIREMENTS	STA + CLOPYRALID
ORGANIC MATTER PER CUBIC YARD	MUST REPORT
CHEMICAL CONTAMINANTS	MEET OR EXCEED US EPA CLASS A STANDARD, 40 CFR 503.1 TABLES 1 & 3 LEVELS
MINIMUM MANUFACTURING/PRODUCTION REQUIREMENT	FULLY PERMITTED UNDER COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION
RISK FACTOR RELATING TO PLANT GERMINATION AND HEALTH	LOW

NOTE: IF A BIOSOLID COMPOST IS TO BE UTILIZED IT SHALL BE PRODUCED BY A FACILITY IN POSSESSION OF A VALID NOTICE OF AUTHORIZATION (NOA) FOR THE UNRESTRICTED USE AND DISTRIBUTION BY THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT. THE NOA SHALL BE PROVIDED UPON REQUEST TO DOUGLAS COUNTY.

NOTE: A LAB TEST DETAILING THE CHEMICAL, PHYSICAL, AND BIOLOGICAL PARAMETERS SHALL BE PROVIDED UPON REQUEST BY DOUGLAS COUNTY.

CFB COMPOST FILTER BERM 3

CONCRETE WASHOUT AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATIONS OF CONCRETE WASHOUT AREA.
2. THE CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
3. VEHICLE TRACKING CONTROL (DETAIL 24) IS REQUIRED AT THE ACCESS POINT.
4. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT AREA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
5. EXCAVATED MATERIAL SHALL BE UTILIZED IN PERIMETER BERM CONSTRUCTION.

CONCRETE WASHOUT AREA MAINTENANCE NOTES

1. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
2. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AN APPROVED WASTE SITE.
3. WHEN THE CONCRETE WASHOUT AREA IS REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.
4. INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.

CWA CONCRETE WASHOUT AREA 4

CONSTRUCTION FENCE INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - TYPE OF CONSTRUCTION LIMIT INDICATOR (FENCE OR MARKERS).
   - LOCATION AND LENGTH OF FENCE OR LINE OF MARKERS.
2. CONSTRUCTION FENCE OR MARKERS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO OTHER BMPS AND ANY LAND-DISTURBING ACTIVITIES.
3. STEEL TEE POSTS SHALL BE UTILIZED FOR SUPPORT OF CONSTRUCTION FENCE. MAXIMUM SPACING FOR TEE POSTS SHALL BE 15'.

CONSTRUCTION FENCE MAINTENANCE NOTES

1. ANY DAMAGED FENCE OR MARKERS SHALL BE REPAIRED ON A DAILY BASIS.
2. FENCE OR MARKERS SHALL BE REMOVED AT THE END OF CONSTRUCTION. IF ANY DISTURBED AREA EXISTS AFTER FENCE REMOVAL, IT SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

CF CONSTRUCTION FENCE 5

CM CONSTRUCTION MARKERS 6

DEWATERING INSTALLATION NOTES

1. THE GESC MANAGER SHALL OBTAIN A CONSTRUCTION DISCHARGE (DEWATERING) PERMIT FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT PRIOR TO ANY DEWATERING OPERATIONS. ALL DEWATERING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE DISCHARGE PERMIT AND SHALL BE COORDINATED WITH THE DOUGLAS COUNTY GESC INSPECTOR.
2. THE GESC MANAGER SHALL PROVIDE, OPERATE, AND MAINTAIN DEWATERING SYSTEMS OF SUFFICIENT SIZE AND CAPACITY TO PERMIT EXCAVATION AND SUBSEQUENT CONSTRUCTION IN DRY CONDITIONS AND TO LOWER AND MAINTAIN THE GROUNDWATER LEVEL A MINIMUM OF 2-FEET BELOW THE LOWEST POINT OF EXCAVATION AND CONTINUOUSLY MAINTAIN EXCAVATIONS FREE OF WATER UNTIL BACKFILLED TO FINAL GRADE.
3. DEWATERING OPERATIONS SHALL USE ONE OR MORE OF THE DEWATERING SUMPS SHOWN ABOVE OR OTHER MEANS APPROVED BY THE COUNTY TO REDUCE THE PUMPING OF SEDIMENT, AND SHALL PROVIDE A TEMPORARY BASIN FOR SETTLING PUMPED DISCHARGES PRIOR TO RELEASE OFF SITE OR TO A RECEIVING WATER. SEDIMENT BASIN PER DETAIL 14 MAY BE USED IN LIEU OF SUMP DISCHARGE SETTLING BASIN SHOWN ABOVE.
4. A 4' SQUARE RIPRAP PAD SHALL BE PLACED AT DISCHARGE POINT.
5. THE DISCHARGE END OF THE LINE SHALL BE STAKED IN PLACES TO PREVENT MOVEMENT OF RIPRAP PAD.

DEWATERING MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT DEWATERING SYSTEMS AND PERFORM ANY NECESSARY REPAIRS OR MAINTENANCE ON A HOURLY BASIS.
2. TEMPORARY SETTLING BASINS SHALL BE REMOVED WHEN NO LONGER NEEDED FOR DEWATERING OPERATIONS. ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

DW DEWATERING 7

DIVERSION DITCH INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION OF DIVERSION DITCH.
   - TYPE OF DITCH (UNLINED, ECB LINED, PLASTIC LINED OR RIPRAP LINED).
   - LENGTH OF EACH TYPE OF DITCH.
   - DEPTH, "D", AND WIDTH, "W" DIMENSIONS.
   - FOR ECB LINED DITCH, EROSION CONTROL BLANKET TYPE (SEE DETAIL 9).
   - FOR RIPRAP LINED DITCH, SIZE OF RIPRAP, "D50".
2. SEE DRAINAGE PLANS FOR DETAILS OF ANY PERMANENT CONVEYANCE FACILITIES OR DIVERSION DITCHES EXCEEDING A 2-YEAR FLOW RATE OF 10 CFS.
3. DIVERSION DITCHES INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
4. FOR ECB LINED DITCHES, INSTALLATION OF EROSION CONTROL BLANKET SHALL CONFORM TO THE REQUIREMENTS OF DETAIL 9.
5. IN LOCATIONS WHERE CONSTRUCTION TRAFFIC MUST CROSS A DIVERSION DITCH, THE PERMITTEES SHALL INSTALL A TEMPORARY CULVERT WITH A MINIMUM DIAMETER OF 12-INCHES.

DIVERSION DITCH MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT DIVERSION DITCHES WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. DIVERSION DITCHES ARE TO REMAIN IN PLACE UNTIL THE END OF CONSTRUCTION, OR, IF APPROVED BY THE COUNTY, LEFT IN PLACE.
3. IF DIVERSION DITCHES ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

DD DIVERSION DITCH 8

TABLE 1. RIPRAP GRADATIONS

D50 MEDIAN STONE SIZE (INCHES)	% OF MATERIAL SMALLER THAN TYPICAL STONE	TYPICAL STONE EQUIVALENT DIAMETER (INCHES)	TYPICAL STONE WEIGHT (POUNDS)
6	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	85 35 10 0.4
9	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	160 85 35 1.3
12	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	440 275 85 3
18	100 50 – 70 35 – 50 2 – 10	30 24 18 6	1280 650 275 10
24	100 50 – 70 35 – 50 2 – 10	42 33 24 9	3500 1700 650 35

TABLE 2. RIPRAP BEDDING

SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	CLASS A
3"	100
1 1/2"	20 – 90
NO. 4	0 – 20
NO. 200	0 – 3
MATCHES SPECIFICATIONS FOR CDOT CLASS A FILTER MATERIAL AND UDFCD TYPE 1 BEDDING. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

TABLE 3. 1 1/2" CRUSHED ROCK

SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1 1/2"	90 – 100
1"	20 – 55
3/4"	0 – 15
3/8"	0 – 5
MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK AND RIPRAP GRADATIONS

Sheet Revisions

NOTE: SCALES SHOWN ARE FOR 24"x36" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.

DOUGLAS COUNTY
DEPARTMENT OF PUBLIC WORKS
Engineering Division

GESC GRADING, EROSION, AND SEDIMENT CONTROL

GESC PLAN STANDARD NOTES AND DETAILS

SHEET 1 OF 3

H:\Drawings\Roxborough\001.335.00 – Ravenna WS Impr Design\Sheets\GESC\GESC.dwg, GESC 4, 12/10/2019 10:18 AM

By	Date	Description
ACP	11/22/2019	AS-BUILT

REVISIONS

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE
GESC PLAN STANDARD NOTES AND DETAILS - SHEET 1 OF 3

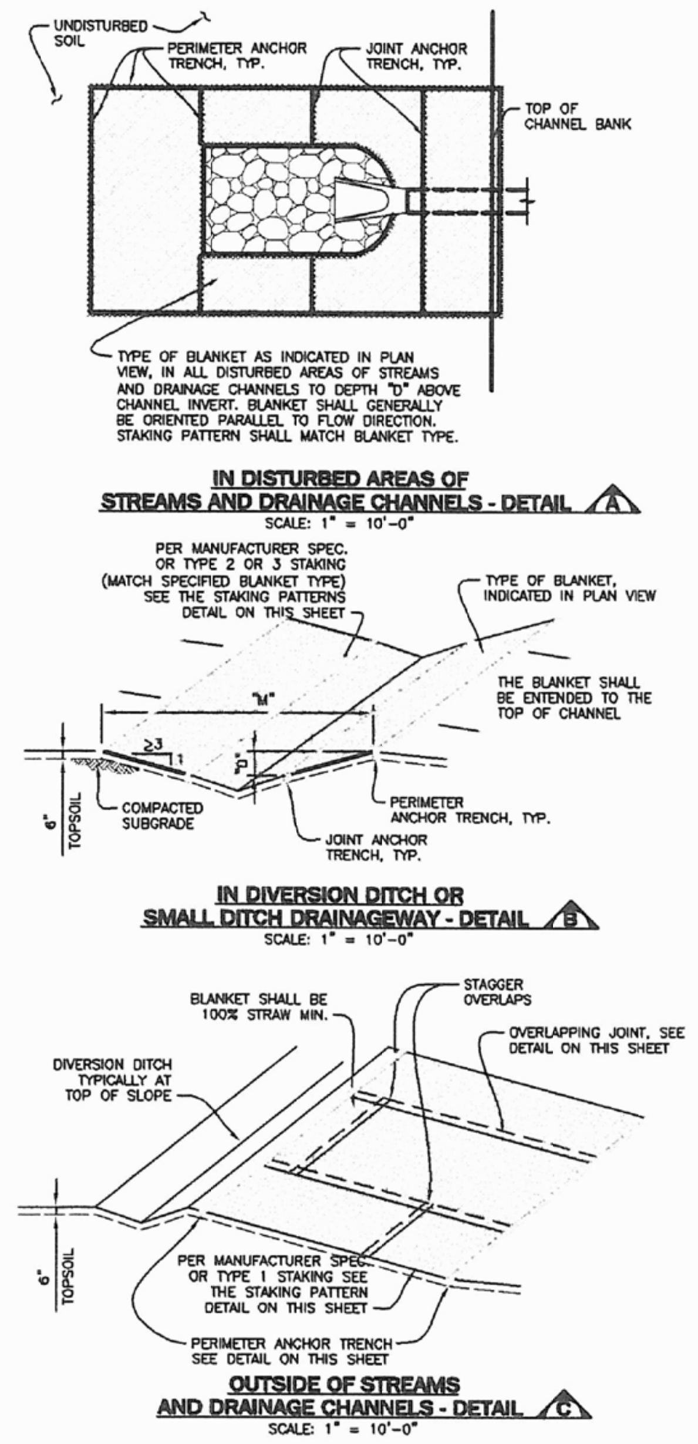
DRAWING

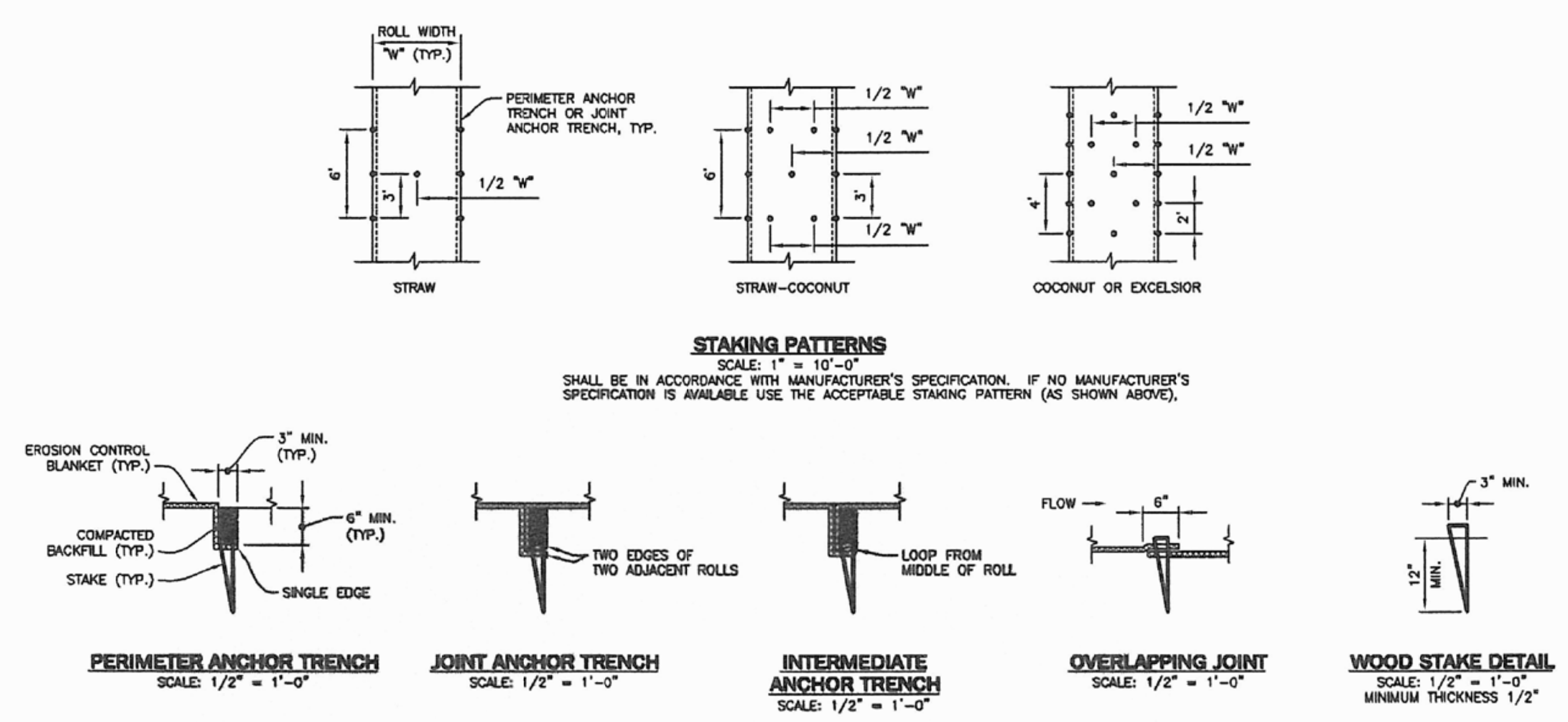
TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO.: 001.335.01
RWSD
DRAWING NO.: GESC4

AS-BUILTS

EROSION CONTROL BLANKET (ECB) — DETAIL 9





IN DISTURBED AREAS OF STREAMS AND DRAINAGE CHANNELS - DETAIL A — SCALE: 1" = 10'-0"

IN DIVERSION DITCH OR SMALL DITCH DRAINAGEWAY - DETAIL B — SCALE: 1" = 10'-0"

OUTSIDE OF STREAMS AND DRAINAGE CHANNELS - DETAIL C — SCALE: 1" = 10'-0"

PERIMETER ANCHOR TRENCH — SCALE: 1/2" = 1'-0"

JOINT ANCHOR TRENCH — SCALE: 1/2" = 1'-0"

INTERMEDIATE ANCHOR TRENCH — SCALE: 1/2" = 1'-0"

OVERLAPPING JOINT — SCALE: 1/2" = 1'-0"

WOOD STAKE DETAIL — SCALE: 1/2" = 1'-0", MINIMUM THICKNESS 1/2"

EROSION CONTROL BLANKET INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION OF PERIMETER OF EROSION CONTROL BLANKET.
   - TYPE OF BLANKET (STRAW, STRAW-COCONUT, COCONUT, OR EXCELSIOR).
   - AREA "A" IN SQUARE YARDS OF EACH TYPE OF BLANKET.
2. ALL EROSION CONTROL BLANKETS AND NETTING SHALL BE MADE OF 100% NATURAL AND BIODEGRADABLE MATERIAL; NO PLASTIC OR OTHER SYNTHETIC MATERIAL, EVEN IF PHOTO DEGRADABLE, SHALL BE ALLOWED.
3. IN AREAS WHERE EROSION CONTROL BLANKET IS SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING BELOW THE BLANKET IN ACCORDANCE WITH THE REQUIREMENTS OF DETAIL 17, SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO BLANKET INSTALLATION AND THE BLANKET SHALL BE IN FULL CONTACT WITH SUBGRADE, NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.
4. PERIMETER ANCHOR TRENCH SHALL BE USED AT OUTSIDE PERIMETER OF ALL BLANKET AREAS.
5. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF BLANKETS TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL BLANKETS EXCEPT STRAW, WHICH MAY USE AN OVERLAPPING JOINT.
6. INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE-HALF THE ROLL LENGTH FOR COCONUT AND EXCELSIOR BLANKETS.
7. THE OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF BLANKETS TOGETHER FOR BLANKETS ON SLOPES.
8. MATERIAL SPECIFICATIONS OF EROSION CONTROL BLANKET SHALL CONFORM TO TABLE 7.1.

EROSION CONTROL BLANKET INSTALLATION NOTES - CONTINUED

9. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING EROSION CONTROL BLANKET SHALL BE RESEEDED AND MULCHED IN ACCORDANCE WITH DETAIL 17.
10. SEE DRAINAGE DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION MEASURES THAT MAY EXCEED THE DESIGN CONDITIONS ASSOCIATED WITH THE DETAILS ABOVE.

TABLE 7.1 - EROSION CONTROL BLANKET TYPE

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	NETTING MIN.
STRAW*	-	100%	-	DOUBLE/NATURAL
STRAW-COCONUT	30% MIN.	70% MAX.	-	DOUBLE/NATURAL
COCONUT	100%	-	-	DOUBLE/NATURAL
EXCELSIOR	-	-	100%	DOUBLE/NATURAL

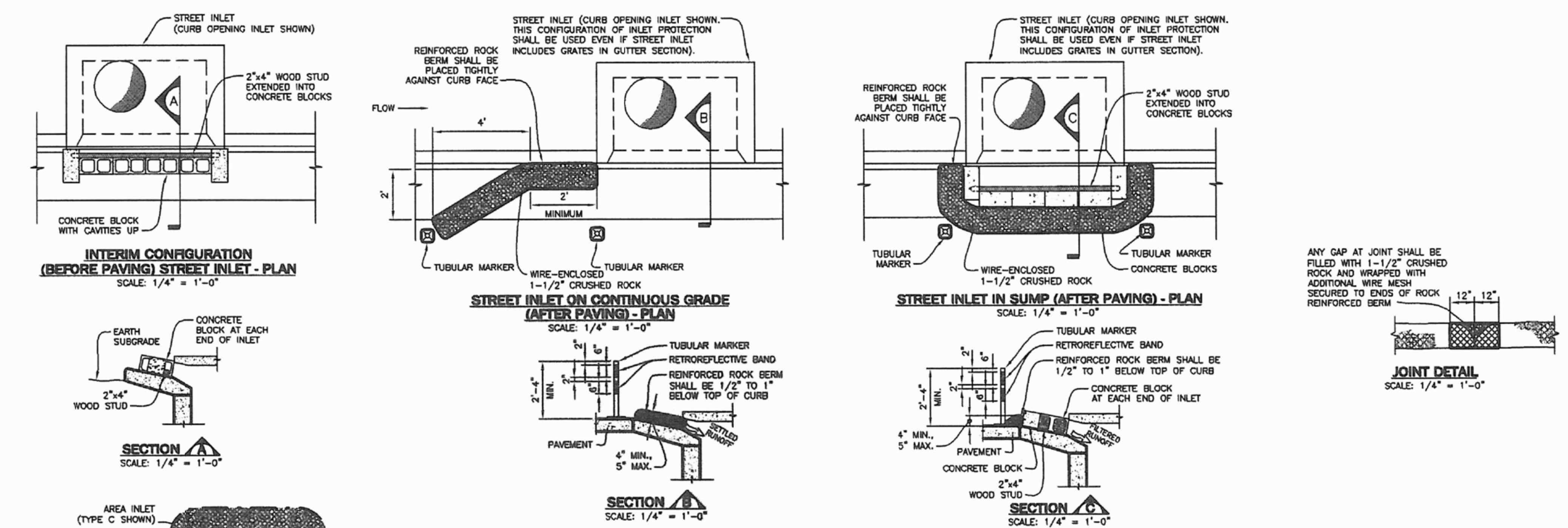
* FOR OUTSIDE OF STREAMS AND DRAINAGE CHANNELS

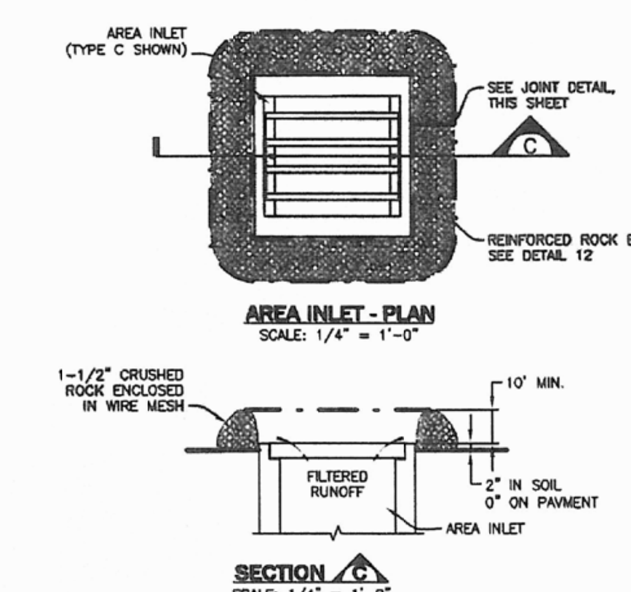
EROSION CONTROL BLANKET MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT EROSION CONTROL BLANKETS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
2. EROSION CONTROL BLANKET IS TO BE LEFT IN PLACE UNLESS REQUESTED TO BE REMOVED BY THE COUNTY.
3. ANY EROSION CONTROL BLANKET PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE RE-INSTALLED. ANY SUBGRADE AREAS BELOW THE BLANKET THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE EROSION CONTROL BLANKET REINSTALLED.

ECB EROSION CONTROL BLANKET (9)

INLET PROTECTION (IP) — DETAIL 10





INTERIM CONFIGURATION (BEFORE PAVING) STREET INLET - PLAN — SCALE: 1/4" = 1'-0"

STREET INLET ON CONTINUOUS GRADE (AFTER PAVING) - PLAN — SCALE: 1/4" = 1'-0"

STREET INLET IN SUMP (AFTER PAVING) - PLAN — SCALE: 1/4" = 1'-0"

JOINT DETAIL — SCALE: 1/4" = 1'-0"

SECTION A — SCALE: 1/4" = 1'-0"

SECTION B — SCALE: 1/4" = 1'-0"

SECTION C — SCALE: 1/4" = 1'-0"

AREA INLET - PLAN — SCALE: 1/4" = 1'-0"

INLET PROTECTION INSTALLATION NOTES

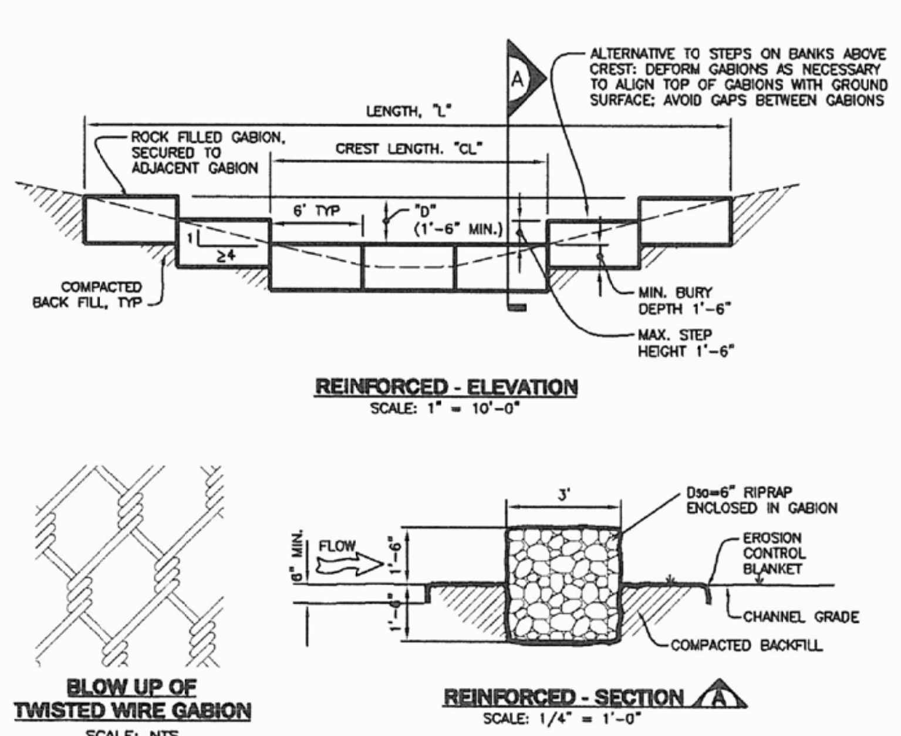
1. INTERIM CONFIGURATION OF INLET PROTECTION IN STREETS SHALL BE INSTALLED WITHIN 48-HOURS OF POURING INLET. INLET PROTECTION (AFTER PAVEMENT) SHALL BE INSTALLED WITHIN 48 HOURS AFTER PAVING IS PLACED.
2. INLET PROTECTION AT AREA INLETS SHALL BE INSTALLED WITHIN 48-HOURS OF POURING INLET.
3. CRUSHED ROCK SHALL BE FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON SHEET 1 (1-1/2" MINUS). RECYCLED CONCRETE MEETING THIS GRADATION MAY BE USED.
4. WIRE MESH SHALL BE FABRICATED OF 10 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE"). ROLL WIDTH SHALL BE 48-INCHES.
5. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6-INCH CENTERS ALONG ALL JOINTS AND AT 2-INCH CENTERS ON ENDS OF BERM.
6. REINFORCED ROCK BERM SHALL BE CONSTRUCTED IN ONE PIECE OR SHALL BE CONSTRUCTED USING JOINT DETAIL.
7. TUBULAR MARKERS SHALL MEET REQUIREMENTS OF MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS AMENDED.
8. THE TOP OF REINFORCED ROCK BERM SHALL BE 1/2"-1" BELOW TOP OF CURB.

INLET PROTECTION MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT INLET PROTECTION WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY. MORE FREQUENT INSPECTIONS AND REPAIRS SHALL BE REQUIRED DURING WINTER CONDITIONS DUE TO FREEZE/THAW PROBLEMS.
2. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF ROCK BERM IS WITHIN 2-1/2 INCHES OF THE CREST.
3. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED, UNLESS THE COUNTY APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.
4. WHEN INLET PROTECTION AT AREA INLETS ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

IP INLET PROTECTION (10)

REINFORCED CHECK DAM (RCD) — DETAIL 11



REINFORCED - ELEVATION — SCALE: 1" = 10'-0"

BLOW UP OF TWISTED WIRE GABION — SCALE: NTS

REINFORCED - SECTION A — SCALE: 1/4" = 1'-0"

REINFORCED CHECK DAM INSTALLATION NOTES

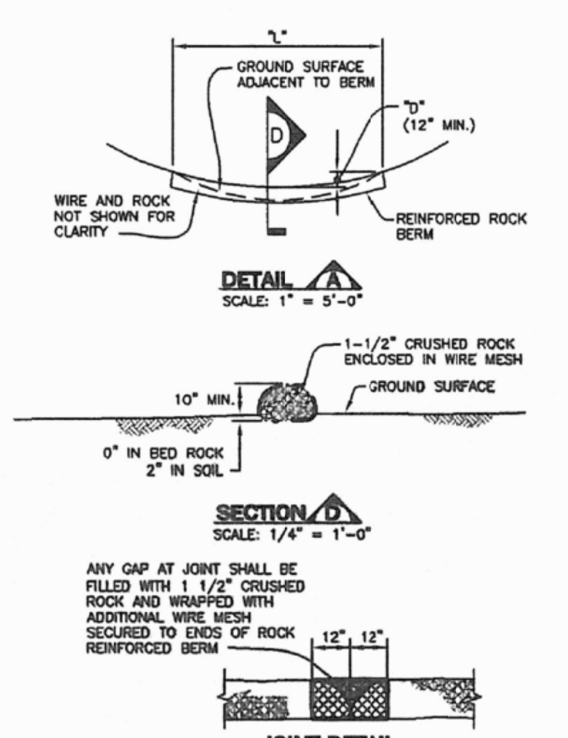
1. SEE PLAN VIEW FOR:
   - LOCATIONS OF CHECK DAMS.
   - CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   - LENGTH, "L", CREST LENGTH, "CL", AND DEPTH, "D".
2. CHECK DAMS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.
3. REINFORCED CHECK DAMS, GABIONS SHALL HAVE GALVANIZED TWISTED WIRE NETTING WITH A MAXIMUM OPENING DIMENSION OF 4-1/2" AND A MINIMUM WIRE THICKNESS OF 0.10". WIRE "HOG RINGS" AT 4" SPACING OR OTHER APPROVED MEANS SHALL BE USED AT ALL GABION SEAMS AND TO SECURE THE GABION TO THE ADJACENT GABION.
4. RIPRAP UTILIZED FOR CHECK DAMS SHALL HAVE A D_{50} MEDIAN STONE SIZE OF 6".
5. THE CHECK DAM SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'-6".
6. EROSION BLANKET SHALL BE PLACED IN THE REINFORCED CHECK DAM TRENCH EXTENDING A MINIMUM OF 1'-6" ON BOTH THE UPSTREAM AND DOWNSTREAM SIDES OF THE REINFORCED CHECK DAM.

REINFORCED CHECK DAM MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT CHECK DAMS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF CHECK DAM IS WITHIN ½ OF THE HEIGHT OF THE CREST.
3. CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE COUNTY.
4. WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACK FILL. ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

RCD REINFORCED CHECK DAM (11)

REINFORCED ROCK BERM (RRB) — DETAIL 12



DETAIL — SCALE: 1" = 5'-0"

SECTION D — SCALE: 1/4" = 1'-0"

JOINT DETAIL — SCALE: 1/4" = 1'-0"

REINFORCED ROCK BERM INSTALLATION NOTES

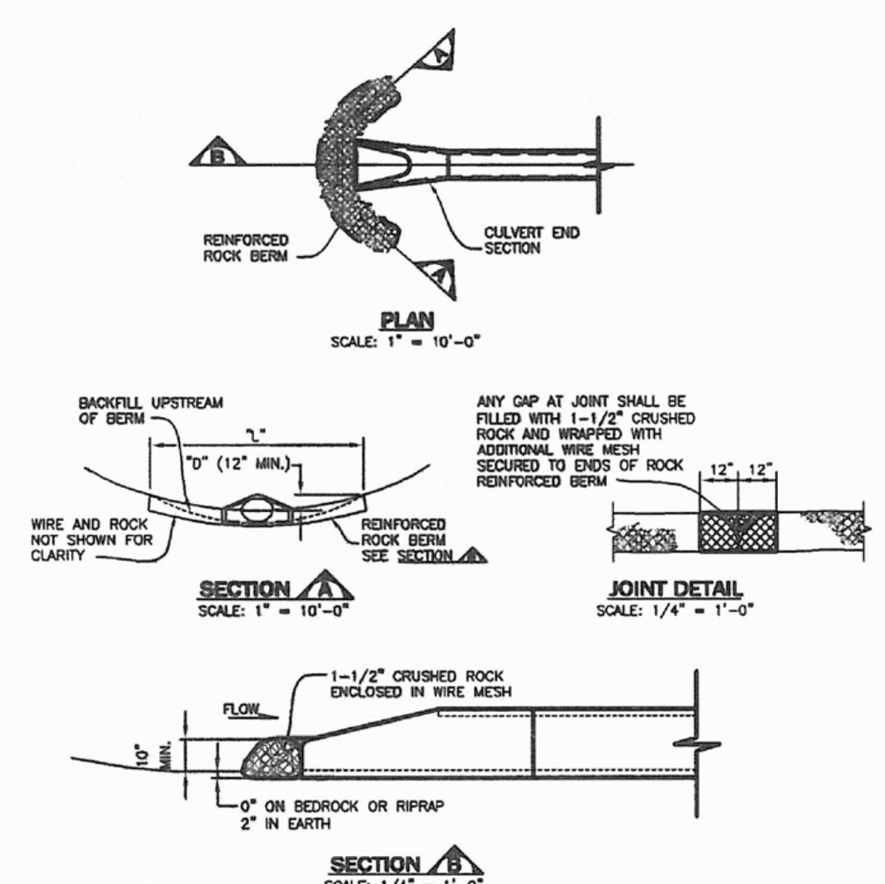
1. SEE PLAN VIEW FOR:
   - LOCATIONS OF REINFORCED ROCK BERMS.
   - LENGTH, "L", AND DEPTH, "D" DIMENSIONS.
2. REINFORCED ROCK BERM SECTION APPLIES TO CULVERT INLET FILTER AND INLET PROTECTION.
3. CRUSHED ROCK SHALL BE FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON SHEET 1 (1-1/2" MINUS). RECYCLED CONCRETE MEETING THIS GRADATION MAY BE USED.
4. WIRE MESH SHALL BE FABRICATED OF 10 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE"). ROLL WIDTH SHALL BE 48-INCHES.
5. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6-INCH CENTERS ALONG ALL JOINTS AND AT 2-INCH CENTERS ON ENDS OF BERM.
6. FOR CONCENTRATED FLOW AREAS THE ENDS OF THE REINFORCED ROCK BERM SHALL BE 12" HIGHER THAN THE CENTER OF THE BERM.

REINFORCED ROCK BERM MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT REINFORCED ROCK BERM WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF REINFORCED ROCK BERM SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF FILTER IS WITHIN 5 INCHES OF THE CREST.
3. REINFORCED ROCK BERMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED.
4. WHEN REINFORCED ROCK BERMS ARE REMOVED, ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

RRB REINFORCED ROCK BERM (12)

RRB FOR CULVERT PROTECTION (RRC) — DETAIL 13



PLAN — SCALE: 1" = 10'-0"

SECTION A — SCALE: 1" = 10'-0"

JOINT DETAIL — SCALE: 1/4" = 1'-0"

SECTION B — SCALE: 1/4" = 1'-0"

INSTALLATION NOTES

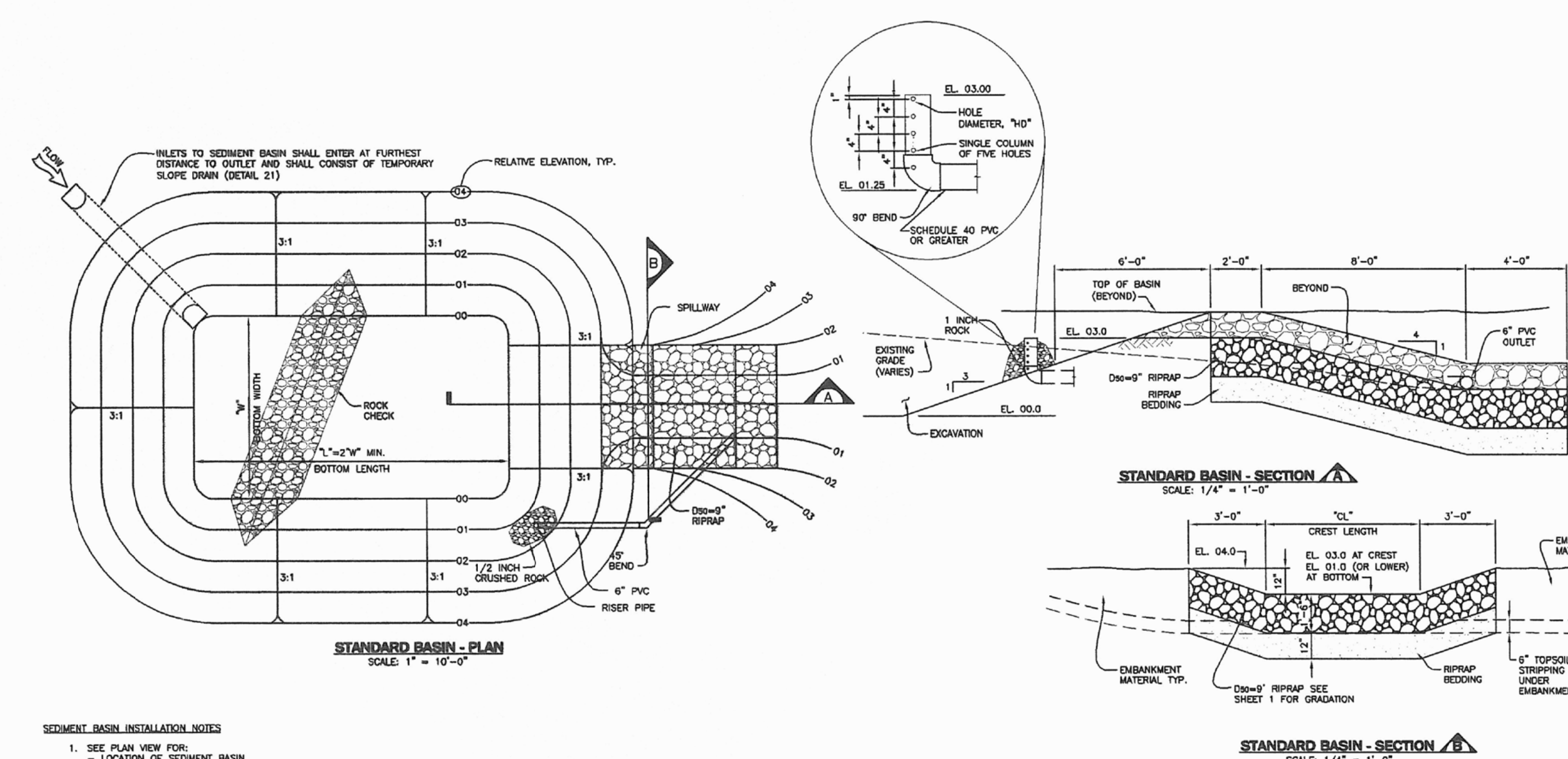
1. SEE PLAN VIEW FOR:
   - LOCATIONS OF CULVERT INLET FILTERS.
   - LENGTH, "L", AND DEPTH, "D".
2. CRUSHED ROCK SHALL BE FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON SHEET 1 (1-1/2" MINUS). RECYCLED CONCRETE MEETING THIS GRADATION MAY BE USED.
3. WIRE MESH SHALL BE FABRICATED OF 10 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE").
4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6-INCH CENTERS ALONG ALL JOINTS AND AT 2-INCH CENTERS ON ENDS OF BERM.
5. THE ENDS OF THE REINFORCED ROCK BERM SHALL BE 12" HIGHER THAN THE CENTER OF THE BERM.

MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT CULVERT INLET FILTER WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF CULVERT INLET FILTER SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF FILTER IS ½ THE HEIGHT OF THE REINFORCED ROCK BERM.
3. RRB FOR CULVERT PROTECTION ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE COUNTY.
4. WHEN CULVERT INLET FILTERS ARE REMOVED, ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

RRC RRB FOR CULVERT PROTECTION (13)

SEDIMENT BASIN (SB) — DETAIL 14



STANDARD BASIN - PLAN — SCALE: 1" = 10'-0"

STANDARD BASIN - SECTION A — SCALE: 1/4" = 1'-0"

STANDARD BASIN - SECTION B — SCALE: 1/4" = 1'-0"

SEDIMENT BASIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION OF SEDIMENT BASIN.
   - TYPE OF BASIN (STANDARD BASIN OR NON-STANDARD BASIN).
   - FOR STANDARD BASIN, CREST LENGTH, "CL", BOTTOM WIDTH, "W", AND HOLE DIAMETER, "HD".
   - FOR NON-STANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT, "H", NUMBER OF COLUMNS, "N", HOLE DIAMETER, "HD", AND PIPE DIAMETER "D".
2. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.
3. SEDIMENT BASINS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY OTHER LAND-DISTURBING ACTIVITY.
4. EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS OR CONCRETE GREATER THAN 3 INCHES AND SHALL HAVE A MINIMUM OF 15 PERCENT BY WEIGHT PASSING THE NO. 200 SIEVE.
5. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY WITHIN 2 PERCENTAGE POINTS OF OPTIMUM DENSITY IN ACCORDANCE WITH ASTM D698.
6. PIPE SCH 40 OR GREATER SHALL BE USED.
7. THE DETAILS SHOWN ON THIS SHEET PERTAIN TO STANDARD SEDIMENT BASIN(S) IDENTIFIED ON THE GESC PLAN VIEW DRAWINGS USED FOR DRAINAGE AREAS LESS THAN 15 ACRES. SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY, OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS LARGER THAN 15 ACRES.

SEDIMENT BASIN MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT SEDIMENT BASIN WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. SEDIMENT ACCUMULATED IN SEDIMENT BASIN SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS WITHIN 2.0 FEET OF THE CREST OF THE SPILLWAY.
3. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE COUNTY.
4. IF SEDIMENT BASINS ARE REMOVED, THE DISTURBED AREA SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

SB SEDIMENT BASIN (14)

Sheet Revisions

NOTE: SCALES SHOWN ARE FOR 24"x36" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.

DOUGLAS COUNTY
DEPARTMENT OF PUBLIC WORKS
Engineering Division

GESC GRADING, EROSION, AND SEDIMENT CONTROL

GESC PLAN STANDARD NOTES AND DETAILS

SHEET 2 OF 3

By	Date	Description
ACP	11/22/2019	AS-BUILT

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE
GESC PLAN STANDARD NOTES AND DETAILS - SHEET 2 OF 3

TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. GESC5

AS-BUILTS

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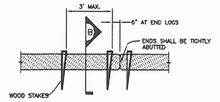

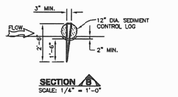

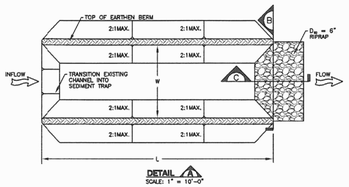

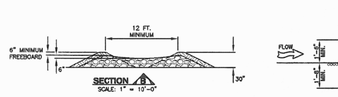

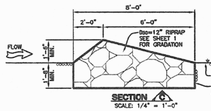

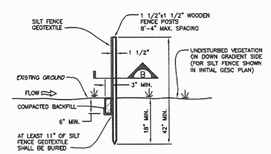

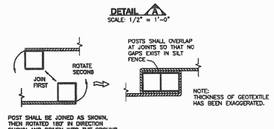

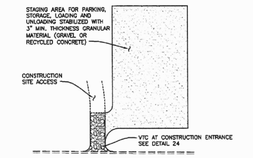

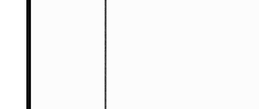

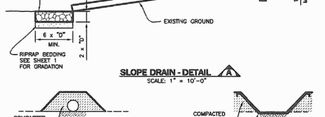

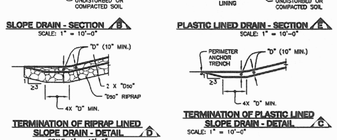

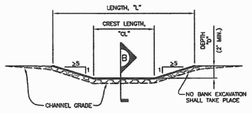

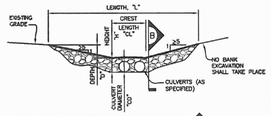

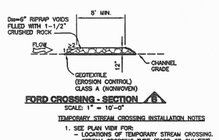

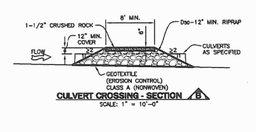

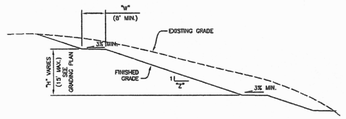

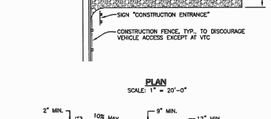

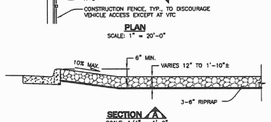

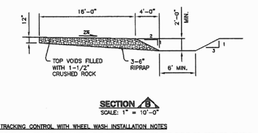

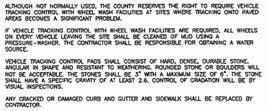

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION AND LENGTH OF SEDIMENT CONTROL LOG.
2. SEDIMENT CONTROL LOGS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR, OR COCONUT FIBER.
4. NOT FOR USE IN CONCENTRATED FLOW AREAS.
5. THE SEDIMENT CONTROL LOG SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 2".

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT SEDIMENT CONTROL LOGS DAILY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOGS SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN ½ THE HEIGHT OF THE CREST OF LOG.
3. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION. IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

(SCL) SEDIMENT CONTROL LOG (15)

SEDIMENT TRAP INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.
2. SEDIMENT TRAPS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
3. SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION. THE BERM SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.
4. RIPRAP OUTLET SHALL BE CONSTRUCTED WITH D_{50}=12" RIPRAP WITH A MINIMUM OVERFLOW OF 6".
5. THE TOP OF THE EARTHEN BERM SHALL BE A MINIMUM OF 6" HIGHER THAN THE TOP OF THE RIPRAP OUTLET STRUCTURE.
6. THE ENDS OF THE RIPRAP OUTLET STRUCTURE SHALL BE MINIMUM OF 6" HIGHER THAN THE CENTER OF THE OUTLET STRUCTURE.

SEDIMENT TRAP MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT SEDIMENT TRAPS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF RIPRAP SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN ½ THE HEIGHT OF THE RIPRAP OUTLET STRUCTURE.
3. SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVERAGE IS APPROVED BY THE COUNTY.
4. WHEN SEDIMENT TRAPS ARE REMOVED THE DISTURBED AREA SHALL BE DRILLED SEEDED AND CRIMP MULCHED OR STABILIZED IN A MANNER APPROVED BY THE COUNTY.

(ST) SEDIMENT TRAP (16)

SEEDING AND MULCHING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - AREA OF SEEDING AND MULCHING.
   - TYPE OF SEED MIX (PERMANENT, TEMPORARY, OR LOW-GROWTH).
2. ALL BRANDS FURNISHED SHALL BE FREE FROM SUCH NOXIOUS SEEDS AS RUSSIAN OR CANADIAN THISTLE, COARSE FESCUE, EUROPEAN BINDWEED, JOHNSON GRASS, KNAP WEED AND LEAFY SPURGE.
3. THE SEEDER SHALL FURNISH TO THE CONTRACTOR A SIGNED STATEMENT CERTIFYING THAT THE SEED FURNISHED IS FROM A LOT THAT HAS BEEN TESTED BY A RECOGNIZED LABORATORY. SEED WHICH HAS BECOME WET, MOLDY, OR OTHERWISE DAMAGED IN TRANSIT OR IN STORAGE WILL NOT BE ACCEPTABLE. SEED TICKETS SHALL BE PROVIDED TO DOUGLAS COUNTY UPON REQUEST.
4. DRILL SEEDING MIX SHALL CONFORM TO THE TABLE ON THE RIGHT:
5. IF THE SEED AVAILABLE ON THE MARKET DOES NOT MEET THE MINIMUM PURITY AND GERMINATION PERCENTAGES SPECIFIED, THE SUBCONTRACTOR MUST COMPENSATE FOR A LESSER PERCENTAGE OF PURITY OR GERMINATION BY FURNISHING SUFFICIENT ADDITIONAL SEED TO EQUAL THE SPECIFIED PRODUCT. THE TAGS FROM THE SEED MIXES MUST BE SUPPLIED TO CONTRACTOR AND FORWARDED TO THE DOUGLAS COUNTY GESC INSPECTOR.
6. THE FORMULA USED FOR DETERMINING THE QUANTITY OF PURE LIVE SEED (PLS) SHALL BE (POUNDS OF SEED) X (PURITY) X (GERMINATION) = POUNDS OF PURE LIVE SEED (PLS).
7. PERMANENT SEED MIX SHALL BE USED UNLESS OTHERWISE APPROVED BY THE COUNTY.
8. ALL AREAS TO BE SEEDED AND MULCHED SHALL HAVE NATIVE TOPSOIL OR APPROVED SOIL AMENDMENTS SPREAD TO A DEPTH OF AT LEAST 6 INCHES (LOOSE DEPTH). HAUL ROADS AND OTHER COMPACTED AREAS SHALL BE LOOSENED TO A DEPTH OF 6 INCHES PRIOR TO SPREADING TOPSOIL.
9. SOIL IS TO BE THOROUGHLY LOOSENED (TILLED) TO A DEPTH OF AT LEAST 6 INCHES PRIOR TO SEEDING. THE TOP 6 INCHES OF THE SEED BED SHALL BE FREE OF ROCKS GREATER THAN 4 INCHES AND SOIL CLODS GREATER THAN 2 INCHES. SEEDING OVER ANY COMPACTED AREAS THAT HAVEN'T BEEN THOROUGHLY LOOSENED SHALL BE REJECTED.
10. SEED IS TO BE APPLIED USING A MECHANICAL DRILL TO A DEPTH OF 1/4 INCH. ROW SPACING SHALL BE NO MORE THAN 6 INCHES. MATERIAL USED FOR MULCH SHALL CONSIST OF LONG-STEMMED STRAW. AT LEAST 50 PERCENT OF THE MULCH, BY WEIGHT, SHALL BE 10 INCHES OR MORE IN LENGTH. MULCH SHALL BE APPLIED AND MECHANICALLY ANCHORED TO A DEPTH OF AT LEAST 2 INCHES. MULCH SHALL BE APPLIED AT A RATE OF 4000 LB. OF STRAW PER ACRE.
11. IF THE PERMITTEE DEMONSTRATES TO THE COUNTY THAT IT IS NOT POSSIBLE TO DRILL SEED, SEED IS TO BE UNIFORMLY BROADCAST AT TWO TIMES THE DRILLED RATE, THEN LIGHTLY HARROWED TO PROVIDE A SEED DEPTH OF APPROXIMATELY 1/4 INCH, THEN ROLLED TO COMPACT, THEN MULCHED AS SPECIFIED ABOVE.
12. SEEDING AND MULCHING SHALL BE COMPLETED WITHIN 30 DAYS OF INITIAL EXPOSURE OR 7 DAYS AFTER GRADING IS SUBSTANTIALLY COMPLETE IN A GIVEN AREA (AS DEFINED BY THE COUNTY). THIS MAY REQUIRE MULTIPLE MOBILIZATIONS FOR SEEDING AND MULCHING.
13. MULCH SHALL BE APPLIED WITHIN 24-HOURS OF SEEDING.
14. TACKIFIER SHOULD BE UTILIZED TO HELP WITH STRAW DISPLACEMENT.

SEEDING AND MULCHING MAINTENANCE NOTES

1. SEEDED AND MULCHED AREAS SHALL BE INSPECTED FOR REQUIRED COVERAGE MONTHLY FOR A PERIOD OF TWO YEARS FOLLOWING INITIAL SEEDING. REPAIRS AND RE-SEEDING AND MULCHING SHALL BE UNDERTAKEN AFTER THE FIRST GROWING SEASON FOR ANY AREAS FAILING TO MEET THE REQUIRED COVERAGE.
2. REQUIRED COVERAGE FOR STANDARD, OPEN SPACE AND LOW GROWTH SEED MIXES SHALL BE DEFINED AS FOLLOWS:
   1. THREE (3) PLANTS PER SQUARE FOOT WITH A MINIMUM HEIGHT OF 3 INCHES. THE 3 PLANTS PER SQUARE FOOT SHALL BE OF THE VARIETY AND SPECIES FOUND IN THE DOUGLAS COUNTY-APPROVED MIX.
   2. NO BARE AREAS LARGER THAN 4 SQUARE FEET (TWO-FEET BY TWO-FEET OR EQUIVALENT).
   3. FREE OF ERODED AREAS.
   4. FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH SECTION 6.4 OF THE GESC CRITERIA MANUAL.
3. REQUIRED COVERAGE FOR TURF GRASS AREAS SHALL BE DEFINED AS FOLLOWS:
   1. AT LEAST 80% VEGETATIVE COVER OF GRASS SPECIES PLANTED.
   2. NO BARE AREAS LARGER THAN 4 SQUARE FEET (TWO-FEET BY TWO-FEET OR EQUIVALENT).
   3. FREE OF ERODED AREAS.
   4. FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH SECTION 6.4 OF THE GESC CRITERIA MANUAL.
4. RILL AND GULLY EROSION SHALL BE FILLED WITH TOPSOIL PRIOR TO RESEEDING. THE RESEEDING METHOD SHALL BE APPROVED BY THE COUNTY.

DOUGLAS COUNTY PERMANENT DRILL SEEDING MIX

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
BIG BLUESTEM	KAW	PNWS	10	1.1
YELLOW INDIANGRASS	CHEYENNE	PNWS	10	1
SWITCHGRASS	BLACKWELL	PNWS	10	0.4
SIDEOATS GRAMA	VAUGHN	PNWB	10	0.9
WESTERN WHEATGRASS	ARRIBA	PNCS	10	1.6
BLUE GRAMA	HACHITA	PNWB	10	0.3
THICKSPIKE WHEATGRASS	CRITANA	PNCS	10	1
PRAIRIE SANDREED	GOSHEN	PNWS	10	0.7
GREEN NEEDLEGRASS	LODORM	PNCB	10	1
SLENDER WHEATGRASS	PRYOR	PNCB	5	0.6
STREAMBANK WHEATGRASS	SODAR	PNCS	5	0.6
			TOTAL	9.2

DOUGLAS COUNTY TEMPORARY DRILL SEEDING MIX

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
SMOOTH BROMEGRASS	LINCOLN	PICS	30	3.9
INTERMEDIATE WHEATGRASS	OAHE	PICS	30	4.5
PUBESCENT WHEATGRASS	LUNA	PICS	30	4.2
ANNUAL RYEGRASS	N/A	AICB	10	0.8
			TOTAL	13.4

DOUGLAS COUNTY LOW-GROWTH DRILL SEEDING MIX

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
BUFFALOGRASS	TEXOKA	PNWS	20	3.2
BLUE GRAMA	HACHITA	PNWB	20	0.6
WESTERN WHEATGRASS	ARRIBA	PNCS	20	3.2
SIDEOATS GRAMA	VAUGHN	PNWB	20	1.8
THICKSPIKE WHEATGRASS	CRITANA	PNCS	10	1
STREAMBANK WHEATGRASS	SODAR	PNCS	10	1.2
			TOTAL	11.0

NOTES:
P=PERENNIAL
A=ANNUAL
N=NATIVE
I=INTRODUCED
W=WARM SEASON
C=COOL SEASON
S=SOD FORMER
B=BUNCHGRASS

(SM) SEEDING AND MULCHING (17)

SILT FENCE INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION AND LENGTH OF FENCE.
2. ANCHOR TRENCH SHALL BE EXCAVATED WITH TRENCHER, OR WITH SILT FENCE INSTALLATION MACHINE; NO ROAD GRADERS, BACKHOES, ETC. SHALL BE USED. TRENCH SHALL BE COMPACTED BY HAND, WITH "JUMPING JACK", OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
3. SILT FENCE GEOTEXTILE SHALL MEET THE FOLLOWING REQUIREMENTS:
   - 6-TO 12-GALLONS PER MINUTE PER SQUARE FOOT FLOW CAPACITY.
   - 90 LB. TENSILE STRENGTH PER ASTM D4622.
   - UV DESIGN AT 500 HRS MIN. 70% STRENGTH RETAINED PER ASTM D 4355.
4. SILT FENCE INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT SILT FENCE DAILY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF SILT FENCE SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT REACHES A DEPTH OF 6-INCHES.
3. SILT FENCE SHALL BE REMOVED WHEN THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE COUNTY. IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

(SF) SILT FENCE (18)

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR GENERAL LOCATION OF STAGING AREA. CONTRACTOR MAY MODIFY LOCATION AND SIZE OF STABILIZED STAGING AREA WITH COUNTY APPROVAL.
2. STABILIZED STAGING AREA SHALL BE LARGE ENOUGH TO FULLY CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
3. IF REQUIRED BY THE COUNTY, SITE ACCESS ROADS SHALL BE STABILIZED IN THE SAME MANNER AS THE STAGING AREA.
4. STAGING AREA SHALL BE STABILIZED PRIOR TO ANY OTHER OPERATIONS ON THE SITE.
5. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM OF 3" OF GRANULAR MATERIAL (GRAVEL OR RECYCLED CONCRETE).

STABILIZED STAGING AREA MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT THE STABILIZED STAGING AREA WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. GESC MANAGER SHALL PROVIDE ADDITIONAL THICKNESS OF GRANULAR MATERIAL IF ANY RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.
3. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
4. ANY ACCUMULATED DIRT OR MUD SHALL BE REMOVED FROM THE SURFACE OF THE STABILIZED STAGING AREA.
5. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE COUNTY, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.

(SSA) STABILIZED STAGING AREA (19)

SURFACE ROUGHENING INSTALLATION NOTES

1. SURFACE ROUGHENING SHALL BE PROVIDED ON ALL FINISHED GRADES (SLOPES AND "FLAT" AREAS) WITHIN 2 DAYS OF COMPLETION OF FINISHED GRADE (FOR AREAS NOT RECEIVING TOPSOIL) OR WITHIN 2 DAYS OF TOPSOIL PLACEMENT.
2. AREAS WHERE BUILDING FOUNDATIONS, PAVEMENT, OR SOD IS TO BE PLACED WITHIN 7-DAYS OF FINISHED GRADING DO NOT NEED TO BE SURFACE ROUGHENED.
3. DISTURBED SURFACES SHALL BE ROUGHENED USING RIPPING OR TILLING EQUIPMENT ON THE CONTOUR OR TRACKING UP AND DOWN A SLOPE USING EQUIPMENT TREADS.

SURFACE ROUGHENING MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT THE SURFACE ROUGHENING WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. VEHICLES AND EQUIPMENT SHALL GENERALLY BE CONFINED TO ACCESS DRIVES AND SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.
3. IN NON-TURF GRASS FINISHED AREAS, SEEDING AND MULCHING SHALL TAKE PLACE DIRECTLY OVER SURFACE ROUGHENED AREAS WITHOUT FIRST SMOOTHING OUT THE SURFACE.
4. IN AREAS NOT SEEDED AND MULCHED AFTER SURFACE ROUGHENING, SURFACES SHALL BE RE-ROUGHENED AS NECESSARY TO MAINTAIN GROOVE DEPTH AND SMOOTH OVER ANY RILL EROSION.

(SR) SURFACE ROUGHENING (20)

SLOPE DRAIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION AND LENGTH OF SLOPE DRAIN.
   - PIPE DIAMETER, "D", AND RIPRAP SIZE, "D_{50}".
2. SLOPE DRAIN DIMENSIONS SHALL BE CONSIDERED MINIMUM DIMENSIONS; CONTRACTOR MAY ELECT TO INSTALL LARGER FACILITIES. ANY DAMAGE TO SLOPE OR SLOPE DRAIN DURING RUNOFF EVENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
3. SLOPE DRAINS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.
4. FOR TEMPORARY SLOPE DRAINS, PIPE MAY BE INSTALLED ON TOP OF SLOPE; HOWEVER, 12" MIN. COVER AT TOP OF SLOPE SHALL BE PROVIDED.
5. A RIPRAP PAD SHALL BE PLACED AT THE OUTFALL OF THE SLOPE DRAIN.

SLOPE DRAIN MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT SLOPE DRAINS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
2. TEMPORARY SLOPE DRAINS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED, BUT SHALL BE REMOVED PRIOR TO THE END OF CONSTRUCTION. WHEN SLOPE DRAINS ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

(TSD) TEMPORARY SLOPE DRAIN (21)

TEMPORARY STREAM CROSSING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATIONS OF TEMPORARY STREAM CROSSING.
   - STREAM CROSSING TYPE (FORD OR CULVERT).
   - FOR FORD CROSSING: LENGTH, "L", CREST LENGTH, "CL", AND DEPTH, "D".
   - FOR CULVERT CROSSING : LENGTH, "L", CREST LENGTH, "CL", CROSSING HEIGHT, "H", DEPTH, "D", CULVERT DIAMETER, "CD", AND NUMBER, TYPE AND CLASS OR GAUGE OF CULVERTS.
2. TEMPORARY STREAM CROSSING DIMENSIONS, D50, AND NUMBER OF CULVERTS INDICATED (FOR CULVERT CROSSING) SHALL BE CONSIDERED MINIMUM DIMENSIONS; ENGINEER MAY ELECT TO INSTALL LARGER FACILITIES. ANY DAMAGE TO STREAM CROSSING OR EXISTING STREAM CHANNEL DURING BASEFLOW OR FLOOD EVENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
3. SEE SHEET 1 FOR RIPRAP AND 1-1/2" CRUSHED ROCK GRADATIONS.
4. FOR A TEMPORARY STREAM CROSSING THAT WILL CARRY LOADS, THE TEMPORARY STREAM CROSSING MUST BE DESIGNED BY THE DESIGN ENGINEER.

TEMPORARY STREAM CROSSING MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT STREAM CROSSINGS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF STREAM CROSSINGS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF CROSSING IS WITHIN 6-INCHES OF THE CREST (FORD CROSSING) OR GREATER THAN AN AVERAGE DEPTH OF 12-INCHES (CULVERT CROSSING).
3. STREAM CROSSINGS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED, BUT SHALL BE REMOVED PRIOR TO THE END OF CONSTRUCTION.
4. WHEN STREAM CROSSINGS ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

(TSC) TEMPORARY STREAM CROSSING (22)

TERRACING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - WIDTH, "W", AND SLOPE, "Z".
2. TERRACING IS NOT REQUIRED FOR SLOPES OF 4 TO 1 OR FLATTER.
3. EARTH (VEGETATED) SLOPES STEEPER THAN 3 TO 1 ARE NOT ALLOWED ON THE SITE.

TERRACING MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT THE SURFACE ROUGHENING WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. ANY RILL EROSION OCCURRING ON SLOPES SHALL BE REPAIRED AND RESEEDED AND MULCHED IN ACCORDANCE WITH DETAIL 17.

(TER) TERRACING (23)

VEHICLE TRACKING CONTROL INSTALLATION NOTES

1. VEHICLE TRACKING CONTROL PADS SHALL BE INSTALLED AT EVERY ACCESS POINT TO SITE.
2. VEHICLE TRACKING CONTROL PADS SHALL CONSIST OF HARD, DENSE, DURABLE STONE, ANGULAR IN SHAPE AND RESISTANT TO WEATHERING. ROUNDED STONE OR BOULDERS WILL NOT BE ACCEPTABLE. THE STONES SHALL BE 3" WITH A MAXIMUM SIZE OF 6". THE STONE SHALL HAVE A SPECIFIC GRAVITY OF AT LEAST 2.6. CONTROL OF GRADATION WILL BE BY VISUAL INSPECTIONS.
3. ANY CRACKED OR DAMAGED CURB AND GUTTER AND SIDEWALK SHALL BE REPLACED BY PERMITTEE.
4. A DOUGLAS COUNTY TEMPORARY CONSTRUCTION ACCESS PERMIT IS REQUIRED FOR EACH ACCESS PERMIT.
5. A STOP SIGN INSTALLED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS AMENDED, SHALL BE INSTALLED FOR EXITING TRAFFIC AT THE VTC.

VEHICLE TRACKING CONTROL MAINTENANCE NOTES

1. GESC MANAGER SHALL INSPECT VEHICLE TRACKING CONTROL DAILY. GRAVEL SURFACE SHALL BE CLEAN AND LOOSE ENOUGH TO RUT SLIGHTLY UNDER WHEEL LOADS AND CAUSE LOOSE GRAVEL TO DISLODGE MUD FROM TIRES. WHEN GRAVEL BECOMES COMPACTED OR FILLED WITH SEDIMENT SO THAT THE EFFECTIVENESS OF THE PAD IS DIMINISHED, CONTRACTOR SHALL RIP, TURN OVER, OR OTHERWISE LOOSEN GRAVEL, PLACE ADDITIONAL NEW GRAVEL, OR REPLACE WITH NEW GRAVEL AS NECESSARY TO RESTORE EFFECTIVENESS.
2. VEHICLE TRACKING CONTROL SHALL BE REMOVED AT THE END OF CONSTRUCTION, THE GRAVEL MATERIAL REMOVED OR, IF APPROVED BY THE COUNTY, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.

(VTC) VEHICLE TRACKING CONTROL (24)

VEHICLE TRACKING CONTROL WITH WHEEL WASH INSTALLATION NOTES

1. ALTHOUGH NOT NORMALLY USED, THE COUNTY RESERVES THE RIGHT TO REQUIRE VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITIES AT SITES WHERE TRACKING ONTO PAVED AREAS BECOMES A SIGNIFICANT PROBLEM.
2. IF VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITIES ARE REQUIRED, ALL WHEELS ON EVERY VEHICLE LEAVING THE SITE SHALL BE CLEANED OF MUD USING A PRESSURE-WASHER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A WATER SOURCE.
3. VEHICLE TRACKING CONTROL PADS SHALL CONSIST OF HARD, DENSE, DURABLE STONE, ANGULAR IN SHAPE AND RESISTANT TO WEATHERING. ROUNDED STONE OR BOULDERS WILL NOT BE ACCEPTABLE. THE STONES SHALL BE 3" WITH A MAXIMUM SIZE OF 6". THE STONE SHALL HAVE A SPECIFIC GRAVITY OF AT LEAST 2.6. CONTROL OF GRADATION WILL BE BY VISUAL INSPECTIONS.
4. ANY CRACKED OR DAMAGED CURB AND GUTTER AND SIDEWALK SHALL BE REPLACED BY CONTRACTOR.
5. A STOP SIGN INSTALLED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS AMENDED, SHALL BE INSTALLED FOR EXITING TRAFFIC AT THE VTC.

VEHICLE TRACKING CONTROL WITH WHEEL WASH MAINTENANCE NOTES

1. GESC MANAGER SHALL INSPECT VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITIES DAILY. ACCUMULATED SEDIMENTS SHALL BE REMOVED FROM PAD SURFACE.
2. ACCUMULATED SEDIMENT IN THE WASHWATER/SEDIMENT TRAP SHALL BE REMOVED WHEN THE SEDIMENT DEPTH REACHES AN AVERAGE OF 12-INCHES.
3. VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITY SHALL BE REMOVED AT THE END OF CONSTRUCTION, THE RIPRAP MATERIAL REMOVED OR, IF APPROVED BY THE COUNTY, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.

(WW) VTC WITH WHEEL WASH (25)

Sheet Revisions

NOTE: SCALES SHOWN ARE FOR 24"x36" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.

DOUGLAS COUNTY
DEPARTMENT OF PUBLIC WORKS
Engineering Division

GESC GRADING, EROSION, AND SEDIMENT CONTROL

GESC PLAN
STANDARD NOTES
AND DETAILS

SHEET
3 OF 3

By	Date	Description
ACP	11/22/2019	AS-BUILT

REVISIONS

DESIGNED: JDB
CHECKED: MKM
DRAWN: SDH

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

GESC PLAN STANDARD NOTES AND DETAILS - SHEET 3 OF 3

DRAWING

TST
TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE NOVEMBER 2019
JOB NO. 001.335.01
RWSD
DRAWING NO. GESC6

AS-BUILTS

H:\Drawings\Roxborough\001.335.00 – Ravenna WS Impr Design\Sheets\GESC\GESC.dwg, GESC 6, 12/10/2019 10:18 AM

LOW TENSION AND SIGNAL

- WALL MOUNTED COMBINATION DATA PORT GENERAL NETWORK / PLANT NETWORK
- WALL MOUNTED DATA PORT
- UTILITY COLUMN MOUNTED DATA PORT
- FLOOR MOUNTED DATA PORT
- F (S) CEILING MOUNTED SPEAKER F–FLUSH MTD. S–SURFACE MTD.
- (S) WALL MOUNTED SPEAKER
- SPEAKER HORN
- PUSH BUTTON
- (B) BELL
- [B] BUZZER
- [CR] CARD READER
- WIRELESS ACCESS POINT

LIGHTING

- A–B–2 / (1) / b CEILING MOUNTED FIXTURE TYPE:1 PANEL:A–B SWITCH–b CIRCUIT–2
- WALL MOUNTED FIXTURE
- SURFACE MTD. FLUORESCENT FIXTURE
- WALL MTD. FLUORESCENT FIXTURE
- RECESSED FLUORESCENT FIXTURE
- INDICATOR LIGHT OR LIGHT FIXTURE
- EXIT LIGHT: WALL OR SURFACE MOUNT, ARROW AS (ARROW AS INDICATED ON DRAWINGS)
- EMERGENCY LIGHT
- WALL MOUNTED FLOODLIGHTS
- POLE MOUNTED FLOODLIGHTS
- (PE) PHOTOCELL
- (TC) TIME CLOCK CONTROLLED CEILING MTD. RECESSED EMERG. BATTERY PACK

CONDUIT AND WIRING

- SURFACE MOUNTED PANEL
- FLUSH MOUNTED PANEL
- CONDUIT (RUN IN WALLS, CEILING, OR ABOVE GRADE)
- CONDUIT (RUN IN SLAB, UNDERGROUND OR BEHIND OBSTRUCTION)
- CONDUIT (CAPPED)
- UP / DN CONDUIT (TURNS AS INDICATED)
- FLEX CONDUIT (NOT ALWAYS SHOWN)
- GROUND CONDUCTOR
- UGE — UNDERGROUND CONCRETE ENCASED DUCTBANK
- UGER — UNDERGROUND CONCRETE ENCASED REINFORCED DUCTBANK
- (XX) DETAIL CROSS REFERENCE

SINGLE LINE & SCHEMATIC

- POTHEAD OR CABLE/BUS–JUNCTION
- CAPACITOR
- POWER TRANSFORMER
- POWER CIRCUIT BREAKER
- LOW VOLTAGE CIRCUIT BREAKER
- LOAD BREAK SWITCH
- FUSED DISCONNECT SWITCH
- FUSED DISCONNECT (AIR)
- FUSE
- GROUND ROD
- GROUND TEST WELL
- FUSE LINK
- BUSDUCT
- POTENTIAL TRANSFORMER
- CURRENT TRANSFORMER
- ZERO SEQUENCE CURRENT TRANSFORMER
- BUSHING TYPE CURRENT CURRENT TRANSFORMER
- DISCONNECT DRAW–OUT TYPE TEST BLOCK
- WITHDRAW
- GROUND CONNECTION
- BOLTED CONNECTION
- E THERMAL OVERLOAD. IF 'E' IS SHOWN – SOLID STATE OVERLOAD
- INCOMING LINE
- OUTGOING LINE
- (K) KEY INTERLOCK
- KVA / VOLTS / Z% TRANSFORMER CONNECTION
- ARRESTOR
- ∅ PHASE
- EMERGENCY STOP
- NORMALLY CLOSED PUSHBUTTON
- NORMALLY OPEN PUSHBUTTON
- TEMPERATURE SWITCH
- NO ON TIME DELAY SWITCH
- NC ON TIME DELAY SWITCH
- CONTACTOR: NORMALLY CLOSED
- CONTACTOR: NORMALLY OPEN
- HEATER
- FLOAT SWITCH
- PRESSURE SWITCH (CLOSING ON RISING PRESSURE)
- PRESSURE SWITCH (OPENING ON RISING PRESSURE)
- ANALOG SIGNAL
- DIGITAL SIGNAL

MOTORS AND CONTROL

- [MCC] MOTOR CONTROL CENTER
- COMBINATION STARTER
- FUSED DISCONNECT SWITCH
- UNFUSED DISCONNECT SWITCH
- [$S] MANUAL MOTOR STARTER P–c/w PILOT LIGHT K–KEY OPERATED
- (T) THERMOSTAT
- (M) EXHAUST FAN
- (RTD) RESISTANCE TEMPERATURE DETECTOR
- (HP) MOTOR
- (Y) GENERATOR

OUTLETS AND DEVICES

- A–B–1 WALL MTD. DUPLEX RECEPTACLE (CCT. A–B–1)
- DOUBLE DUPLEX RECEPTACLE
- SPECIAL PURPOSE RECEPTACLE
- SPLIT FED RECEPTACLE
- SPECIAL RECEPTACLE E – EMERGENCY G – GROUND H – HOUSEKEEPING S – SAFETY IP– ISOLATED POWER IG– ISOLATED GROUND
- UTILITY COLUMN MTD. RECEPTACLE
- FLOOR MOUNTED RECEPTACLE
- 20A 20 AMPS
- S_Y^X SWITCH (X: SWITCH LABEL; Y: 3–3 WAY, 4–4 WAY, Y: T TIMED SWITCH)
- S^X SINGLE POLE SWITCH (X: SWITCH LABEL)
- WALL MOUNTED JUNCTION BOX
- WALL MOUNTED SINGLE FACED CLOCK
- WALL MOUNTED CLOCK OUTLET
- SECURITY CAMERA

FIRE ALARM DEVICES

- PRODUCTS OF COMBUSTION DETECTOR ZONE 3, DEVICE 6, F–FLUSH & S–SURFACE MTD. OUTLET BOX
- HEAT DETECTOR (15° RATE OF RISE)
- HEAT DETECTOR (FIXED TEMPERATURE)
- [F] FIRE ALARM BREAKGLASS STATION
- [F] FIRE ALARM HORN
- (F) FIRE ALARM ROTATING BEACON
- FIRE ALARM DUCT DETECTOR
- FIRE ALARM DOOR RELEASE – FLOOR MTD.
- VOICE COMM. TELEPHONE (FIREMEN'S)
- (F) VOICE COMM. SPEAKER (FIREMEN'S)

ABBREVIATIONS:

#	NUMBER
A	AMPS (AMPERES)
ABBR	ABBREVIATION
AC	ALTERNATING CURRENT
A/C	AIR CONDITIONING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPS INTERRUPTING CURRENT
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BFC	BELOW FINISHED CEILING
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
C	CONDUIT
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CO	CONDUIT ONLY
COMM	COMMUNICATION
CR	CONTROL RELAY
CS	CONTROL STATION
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DCS	DISTRIBUTED CONTROL SYSTEM
DISC	DISCONNECT
DS	DOOR SWITCH
DWG	DRAWING
E	EXISTING
E–STOP	EMERGENCY STOP
EF	EXHAUST FAN
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING CONDUIT
F	FUSE
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FATC	FIRE ALARM TERMINATION CABINET
FBO	FURNISHED BY OWNER
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE METAL CONDUIT
FLMC	FLEXIBLE LIQUIDTIGHT METALLIC CONDUIT
FO	FIBER OPTIC
FREQ	FREQUENCY
FVR	FULL VOLTAGE REVERSING
FVNR	FULL VOLTAGE NON–REVERSING
G	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GRC	GALVANIZED RIGID CONDUIT
HH	HAND HOLE
HMI	HUMAN TO MACHINE INTERFACE
IDF	INTERMEDIATE DISTRIBUTION FRAME
IDS	INTRUSION DETECTION SYSTEM
IG	ISOLATED GROUND
LAN	LOGICAL AREA NETWORK
LC	LIGHTING CONTACTOR
LTG	LIGHTING
MAU	MAKEUP AIR UNIT
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MDF	MAIN DISTRIBUTION FRAME
MDP	MAIN DISTRIBUTION PANEL
MH	MAN HOLE
MM	MULTIMODE
MOV	MOTOR OPERATED VALVE
MUX	MULTIPLEXER
MSH	MOTOR SPACE HEATER
MTS	MOTOR TEMPERATURE SWITCH
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRIC MANUFACTURES ASSOCIATION
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
O/L	OVERLOAD
OS	OCCUPANCY SENSOR
PB	PULL BOX
PH, ø	PHASE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PR	PAIR
PRI	PRIMARY
PSS	PANIC SHUTDOWN SYSTEM
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
REC	RECEPTACLE
RGS	RIGID GALVANIZED STEEL CONDUIT
RMS	ROOT MEAN SQUARE
RM	ROOM
RTU	REMOTE TERMINAL UNIT
SDBC	SOFT DRAWN BARE COPPER
SEC	SECONDARY
SPD	SURGE PROTECTION DEVICE
SS	SOFT START
ST	SHUNT TRIP
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SHD	SHIELD
T, XFMR	TRANSFORMER
TD	TIME DELAY RELAY
TC	TRAY CABLE OR TIME CLOCK
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITER LABORATORY
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT
VA	VOLTAMPERES
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS
WP	WEATHERPROOF AND IN–USE COVER
WT	WATERTIGHT

SPECIAL AREA DESIGNATIONS

THE DESIGNATIONS BELOW ARE LOCATED ON THE ELECTRICAL DRAWINGS TO DEFINE INSTALLATION REQUIREMENTS FOR THAT AREA. DESIGNATIONS ARE LOCATED WITHIN THE ROOM. ALL INDOOR AREAS NOT INDICATED BELOW ARE CLASSIFIED TYPE 1 AND MINIMUM NEMA TYPE 1 ENCLOSURES.

- NEMA TYPE 4XA — CORROSIVE STORAGE AND CHEMICAL FEED AREAS. CONDUIT SYSTEMS SHALL BE PVC–COATED RIGID STEEL CONDUIT AND ACCESSORIES. ENCLOSURES AND BOXES SHALL BE TYPE 4X PLASTIC.
- NEMA TYPE 4X — INDOOR WET LOCATIONS; VAULTS, HOSEDOWN, BASEMENTS, ETC. CONDUIT SYSTEMS SHALL RIGID STEEL CONDUIT AND ACCESSORIES, ENCLOSURES AND BOXES SHALL BE TYPE 4X 316 STAINLESS STEEL.
- NEMA TYPE 12 — INDOOR, DRY, DIRTY AREAS, DUSTY. ENCLOSURES AND EQUIPMENT SHALL BE MINIMUM TYPE 12 GASKETED.
- NEMA TYPE 7A — CLASS 1, DIVISION 1, GROUP C AND D AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
- NEMA TYPE 7B — CLASS 1, DIVISION 2, GROUP C AND D AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.

GENERAL NOTES:

1. INFORMATION SHOWN ON THE DRAWINGS IS DIAGRAMTIC. DATA PRESENTED ON THE DRAWINGS IS AS ACCURATE AS PLANNING CAN DETERMINE, BUT ACCURACY IS NOT GUARANTEED AND FIELD VERIFICATION OF ALL DIMENSIONS, LOCATIONS, LEVELS, ETC., TO BEST SUIT FIELD CONDITIONS IS REQUIRED. REVIEW ALL ARCHITECTURAL, CIVIL, STRUCTURAL AND MECHANICAL DRAWINGS AND ALL SPECIFICATIONS AND ADJUST ALL WORK TO CONFORM TO ALL CONDITIONS SHOWN THEREIN.
2. WHERE WIRE AND CABLE ROUTING IS NOT SHOWN, AND DESTINATION ONLY IS INDICATED, DETERMINE EXACT ROUTING AND LENGTHS REQUIRED BY FIELD VERIFICATION.

REVISIONS	Description	Date	By
	ISSUED FOR BID	8/2/18	RL
	ISSUED FOR CONSTRUCTION	9/21/2018	RL
	AS-BUILT	7/9/2019	RL

DESIGNED: RL
CHECKED: TMR
DRAWN: RL

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE (1 INCH / 1 INCH)

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

ELECTRICAL GENERAL LEGEND AND ABBREVIATIONS

DRAWING

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

COLORADO REGISTERED BRIAN N. TORRES 53413 9/21/18 PROFESSIONAL ENGINEER

DATE: JUNE 2018
JOB NO.: 001.335.01
RWSD
DRAWING NO.: E1

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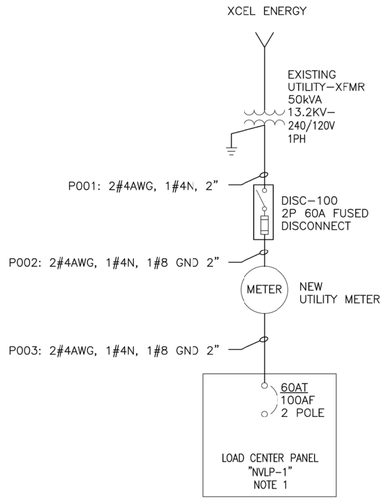
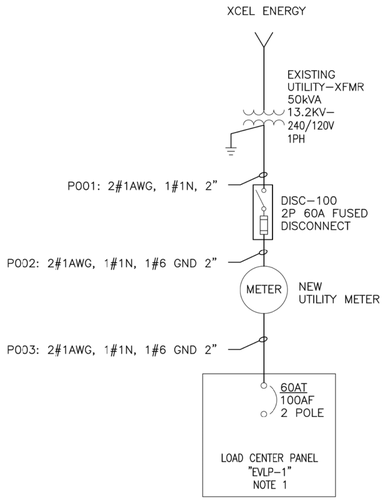


NORTH VAULT ONE LINE DIAGRAM



EAST VAULT ONE LINE DIAGRAM

NOTES:

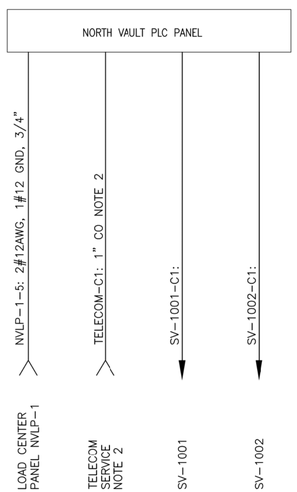
1. CONTRACTOR SHALL PROVIDE AND INSTALL MAIN BONDING JUMPER AT THE LOAD CENTER PANEL. LOAD CENTER PANEL SHALL BE SERVICE ENTRANCE RATED.
2. PROVIDE A 1" CONDUIT ONLY FROM THE NORTH VAULT PLC PANEL TO THE TELECOM POINT OF SERVICE. COORDINATE SERVICE ENTRANCE REQUIREMENTS WITH THE SERVING TELECOM UTILITY.

PANEL: NVLP-1

CCT	SIDE "A" LOAD	LOAD VA	BKR SIZE	A	B	BKR SIZE	LOAD VA	SIDE "B" LOAD	CCT
1	VAULT RECEPTACLES	360	20	X		20		Spare	2
3	VAULT LIGHTING	100	20		X	20		Spare	4
5	N. VAULT PLC Panel PLC-1000	600	20	X				Space	6
7	Space				X			Space	8
9	Space			X				Space	10
11	Space				X			Space	12
TOTAL PHASE "A" LOAD		960					100	TOTAL PHASE "B" LOAD	
CONNECTION: From Utility Meter							LOCATION: Above Grade at Vault		
BUS SIZE: 100A							VOLTAGE: 240/120VAC		
FEEDER: Refer to Drawings							PHASE: 1P/3W		
MAIN BREAKER: 60A							MOUNTING: Surface		

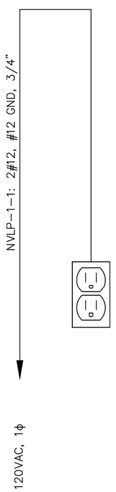
PANEL: EVLP-1

CCT	SIDE "A" LOAD	LOAD VA	BKR SIZE	A	B	BKR SIZE	LOAD VA	SIDE "B" LOAD	CCT
1	VAULT RECEPTACLES	360	20	X		20		Spare	2
3	VAULT LIGHTING	100	20		X	20		Spare	4
5	Space			X				Space	6
7	Space				X			Space	8
9	Space			X				Space	10
11	Space				X			Space	12
TOTAL PHASE "A" LOAD		360					100	TOTAL PHASE "B" LOAD	
CONNECTION: From Utility Meter							LOCATION: Above Grade at Vault		
BUS SIZE: 100A							VOLTAGE: 240/120VAC		
FEEDER: Refer to Drawings							PHASE: 1P/3W		
MAIN BREAKER: 60A							MOUNTING: Surface		



NORTH VAULT PLC PANEL PLC–1000

CONTROL VALVE SV–1001
(TYPICAL: SV–1002)



VAULT RECEPTACLE

REVISIONS			
	Description	Date	By
	ISSUED FOR BID	8/2/18	RL
	ISSUED FOR CONSTRUCTION	9/21/2018	RL
	DOUGLAS COUNTY COMMENTS	1/8/19	RL
	AS-BUILT	7/9/2019	RL

DESIGNED: RL
CHECKED: TMR
DRAWN: RL

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE (1 INCH / 1 INCH)

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

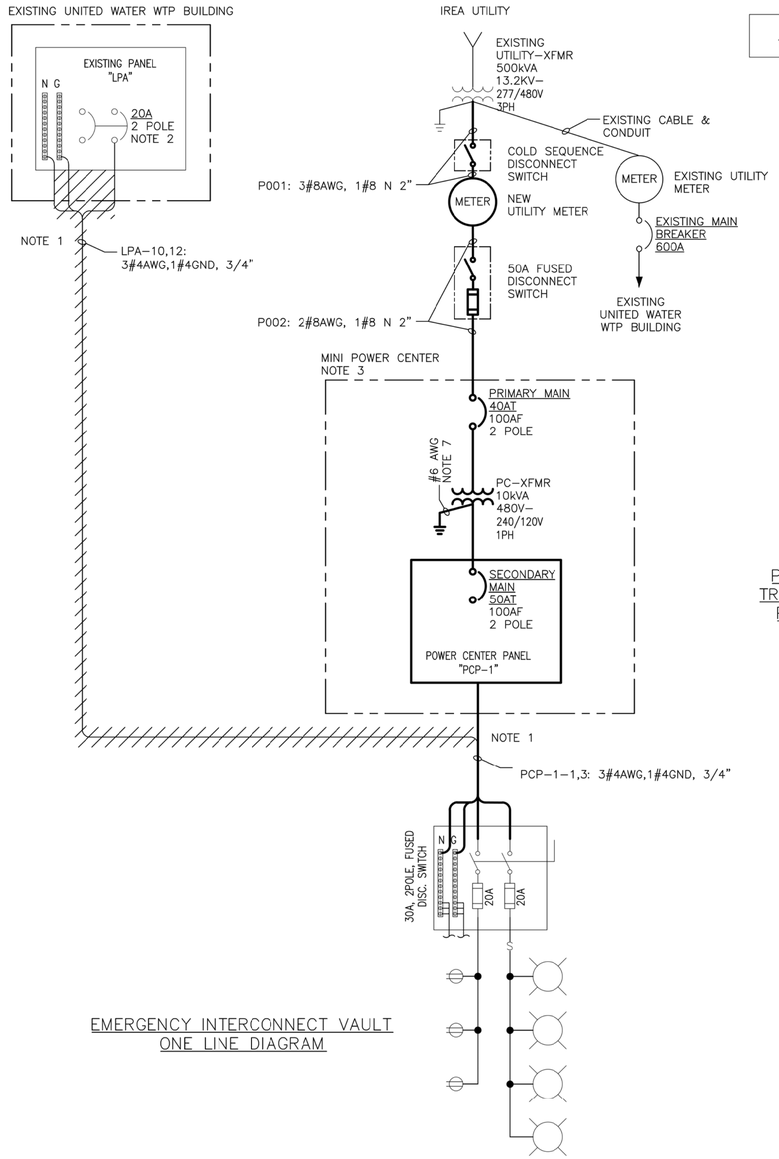
DRAWING: NORTH AND EAST VAULT ONE LINE DIAGRAMS

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

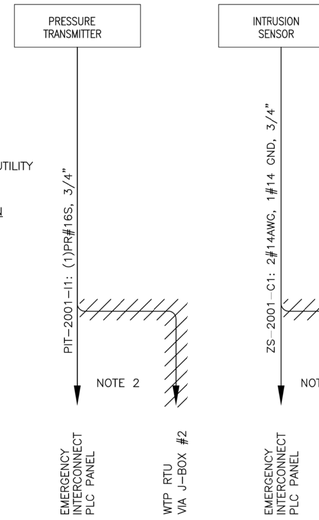
COLORADO REGISTERED BRYAN M. LORENTZ 53413 9/21/18 PROFESSIONAL ENGINEER

DATE: JUNE 2018
JOB NO.: 001.335.01
RWSD
DRAWING NO.: E2

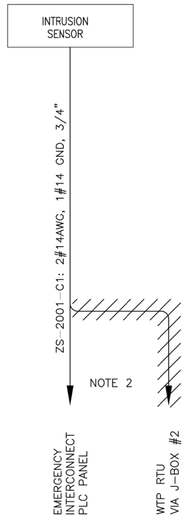
W:\T4104\T4104-15\10 DRAWINGS\03_WIP\E2_NORTH AND EAST VAULT SINGLE LINE DIAGRAM_RL_REVB.dwg, E2, 8/1/2019 7:58 AM



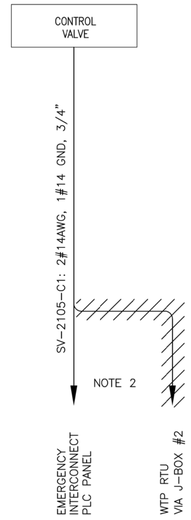
EMERGENCY INTERCONNECT VAULT ONE LINE DIAGRAM



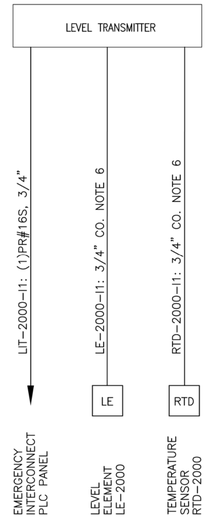
PRESSURE TRANSMITTER PIT–2001



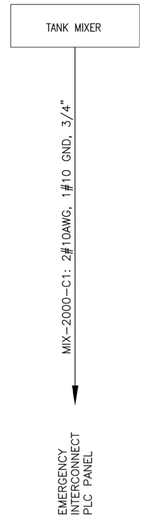
VAULT INTRUSION ALARM SENSOR ZS–2001
(TYPICAL ZS–2002)



CONTROL VALVE SV–2105
(TYPICAL SV–2106)



TANK LEVEL TRANSMITTER LIT–2000



TANK MIXER MIX–2000

NOTES:

1. CONTRACTOR SHALL INTERCEPT AND EXTEND EXISTING CABLE AND CONDUIT ROUTED TO PANEL "LPA" LOCATED IN THE EXISTING WTP BUILDING TO POWER CENTER PANEL "PCP–1".
2. CONTRACTOR SHALL INTERCEPT AND EXTEND EXISTING CABLE AND CONDUIT ROUTED TO WTP RTU LOCATED IN THE EXISTING WTP BUILDING TO THE EMERGENCY INTERCONNECT PLC PANEL "PLC–2000".
3. CONTRACTOR SHALL PROVIDE AND INSTALL MAIN BONDING JUMPER AT PCP–1. POWER CENTER PCP–1 SHALL BE SERVICE ENTRANCE RATED.
4. PROVIDE A 1" CONDUIT ONLY FROM THE EMERGENCY INTERCONNECT PLC PANEL TO THE TELECOM POINT OF SERVICE. COORDINATE SERVICE ENTRANCE REQUIREMENTS WITH THE SERVING TELECOM UTILITY.
5. CONTRACTOR SHALL COORDINATE EXISTING INSTRUMENTATION OUTAGE TIME AND DURATION WITH OWNER PRIOR TO CONSTRUCTION.
6. CONTRACTOR SHALL COORDINATE MANUFACTURER SUPPLIED CABLE WITH INSTRUMENT SUPPLIER. CONTRACTOR SHALL COORDINATE CABLE LENGTH WITH FIELD CONDITIONS.
7. CONTRACTOR SHALL PROVIDE AND INSTALL TWO GROUND RODS FOR GROUND CONNECTION AS SHOWN.

FLOAT SWITCH FS–2001
(TYPICAL FS–2002)

TANK RECEPTACLE

EMERGENCY INTERCONNECT PLC PANEL PLC–2000

PANEL: PCP-1

CCT	SIDE "A" LOAD	LOAD VA	BKR SIZE	A	B	BKR SIZE	LOAD VA	SIDE "B" LOAD	CCT
1	VAULT RECEPTACLES	360	20	X		20	360	TANK RECEPTACLE	2
3	VAULT LIGHTING	100	20		X	20		Spare	4
5	EM INTER, PLC Panel PLC-2000	600	20	X				Space	6
7	EM INTER, PLC Panel PLC-2000	1000	20		X			Space	8
9	Spare		20	X				Space	10
11	Spare		20		X			Space	12
TOTAL PHASE "A" LOAD		1320					1100	TOTAL PHASE "B" LOAD	
CONNECTION: From Utility Meter							LOCATION: Above Grade at Vault		
BUS SIZE: 100A							VOLTAGE: 240/120VAC		
FEEDER: Refer to Drawings							PHASE: 1P/3W		
MAIN BREAKER: 50A							MOUNTING: Surface		

REVISIONS			
Description	Date	By	
ISSUED FOR BID	8/2/18	RL	
ISSUED FOR CONSTRUCTION	9/21/2018	RL	
DOUGLAS COUNTY COMMENTS / 2	1/8/19	RL	
DOUGLAS COUNTY COMMENTS / 3	3/25/19	RL	
IREA COMMENTS	4/11/19	RL	
AS-BUILT	7/9/2019	RL	

DESIGNED: RL
CHECKED: TMR
DRAWN: RL

1 INCH — BARS PLOT 1 INCH x 1 INCH AT FULL SCALE — 1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING: EMERGENCY INTERCONNECT VAULT ONE LINE DIAGRAMS

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

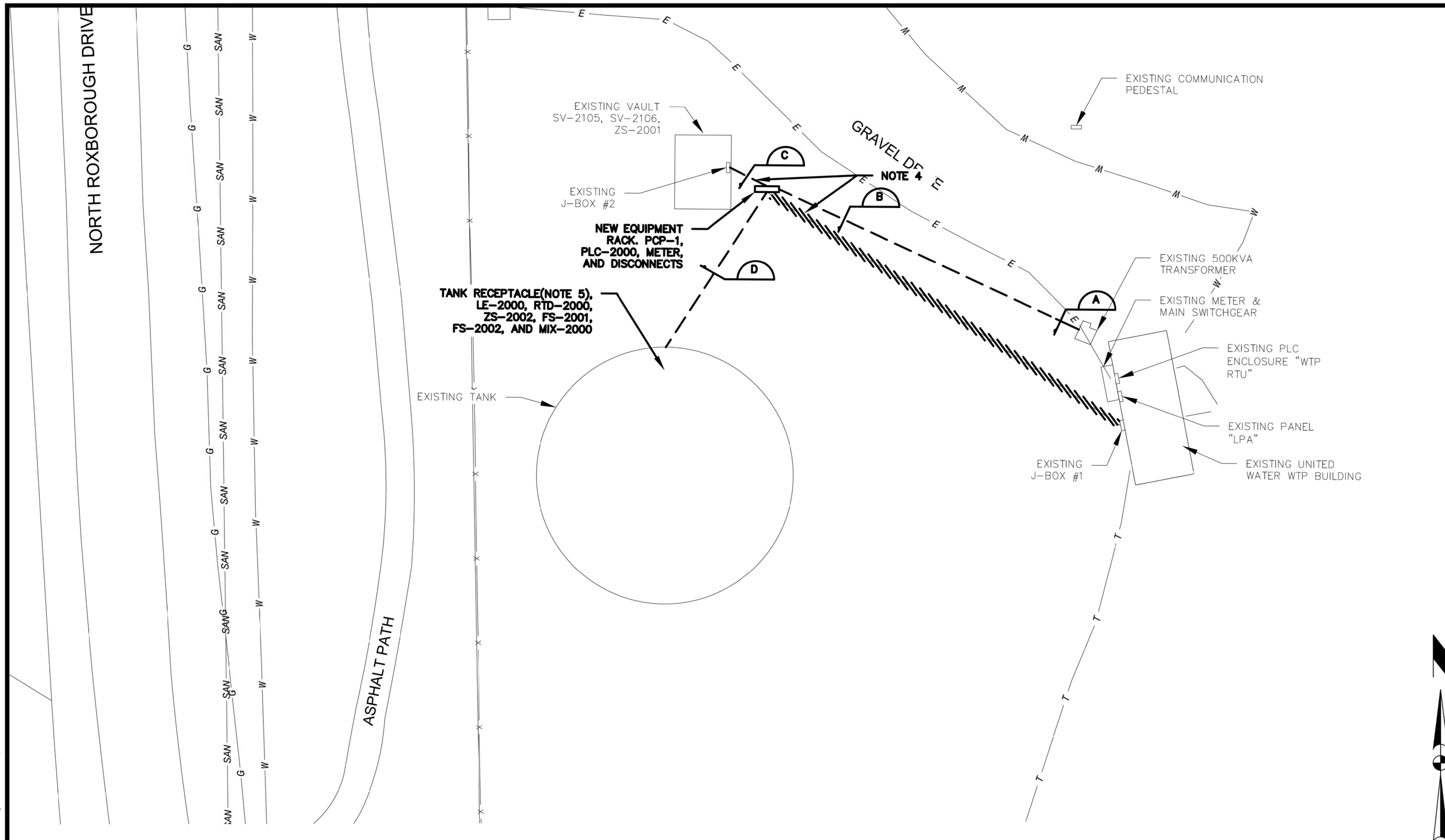
COLORADO REGISTERED STEVEN M. LORENZ 53413 9/21/18 PROFESSIONAL ENGINEER

DATE: JUNE 2018
JOB NO.: 001.335.01
RWSD
DRAWING NO.: E3

W:\T4104\T4104-15\10 DRAWINGS\03_WIP\E3_EMERGENCY INTERCONNECT VAULT SINGLE LINE DIAGRAM_RL_REVD.dwg, E3, 8/1/2019 7:58 AM

NOTES:

1. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL OBTAIN PUBLIC AND PRIVATE UTILITY LOCATES TO VERIFY UTILITY LOCATIONS. POTHOLE ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL ROUTE CONDUITS TO BEST SUIT FIELD CONDITIONS. CONTRACTOR SHALL PROVIDE HAND HOLES AND JUNCTION BOXES AS REQUIRED FOR A COMPLETE INSTALLATION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR RETURNING LANDSCAPING AFFECTED BY WORK BACK TO ORIGINAL CONDITION.
4. CONTRACTOR SHALL INTERCEPT EXISTING CONDUCTORS ROUTED TO THE EXISTING WTP BUILDING AND EXTEND CONDUCTORS AND PROVIDE NEW CONDUIT AS REQUIRED TO THE NEW EQUIPMENT RACK.
5. PROVIDE A LOCKABLE IN USE WEATHER PROOF RECEPTACLE MOUNTED TO THE SIDE OF THE TANK HATCH.

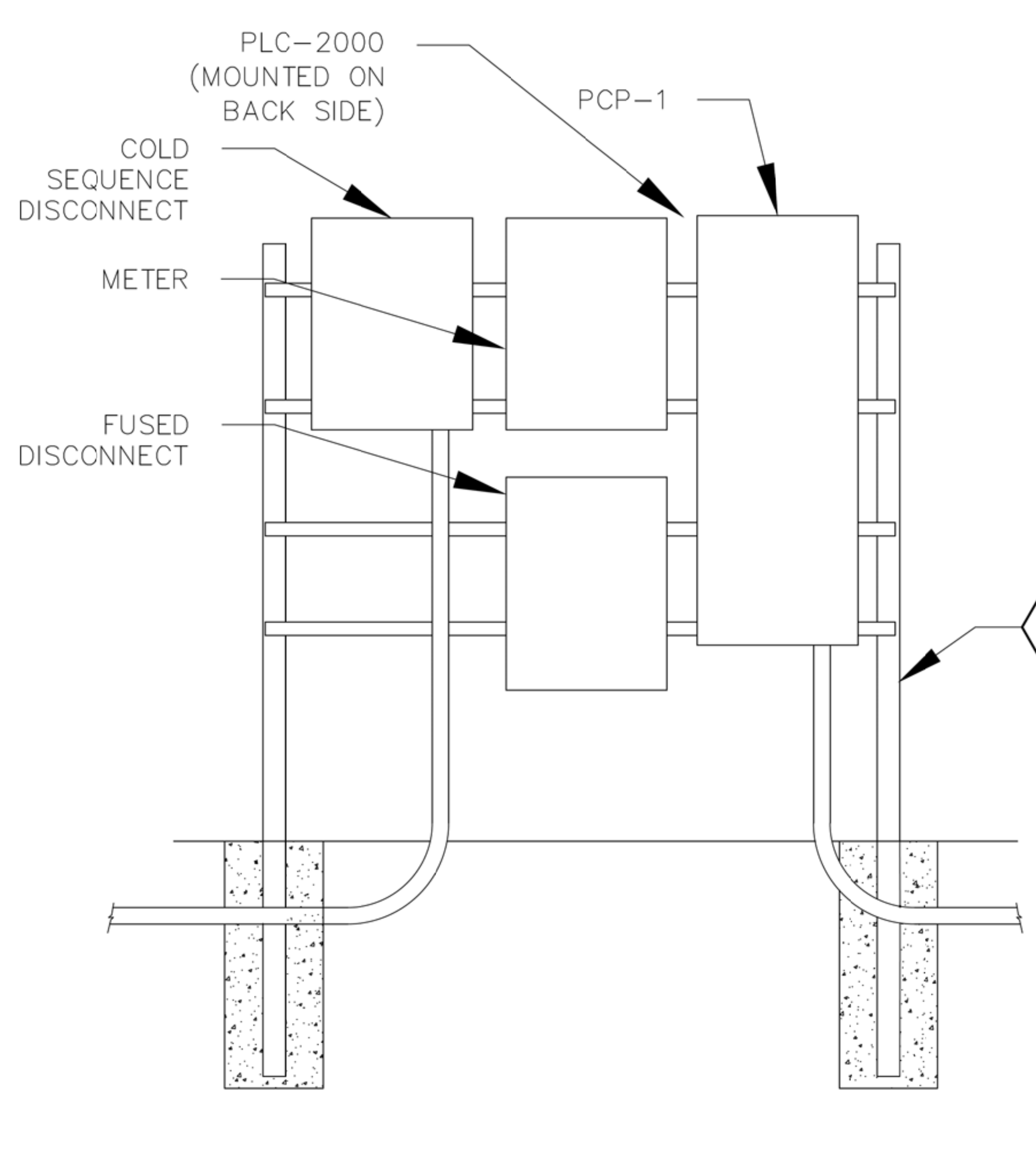


EXISTING TANK & VAULT SITE PLAN

SCALE: 1" = 20'

20 0 10 20 40

1 INCH = 20 FEET

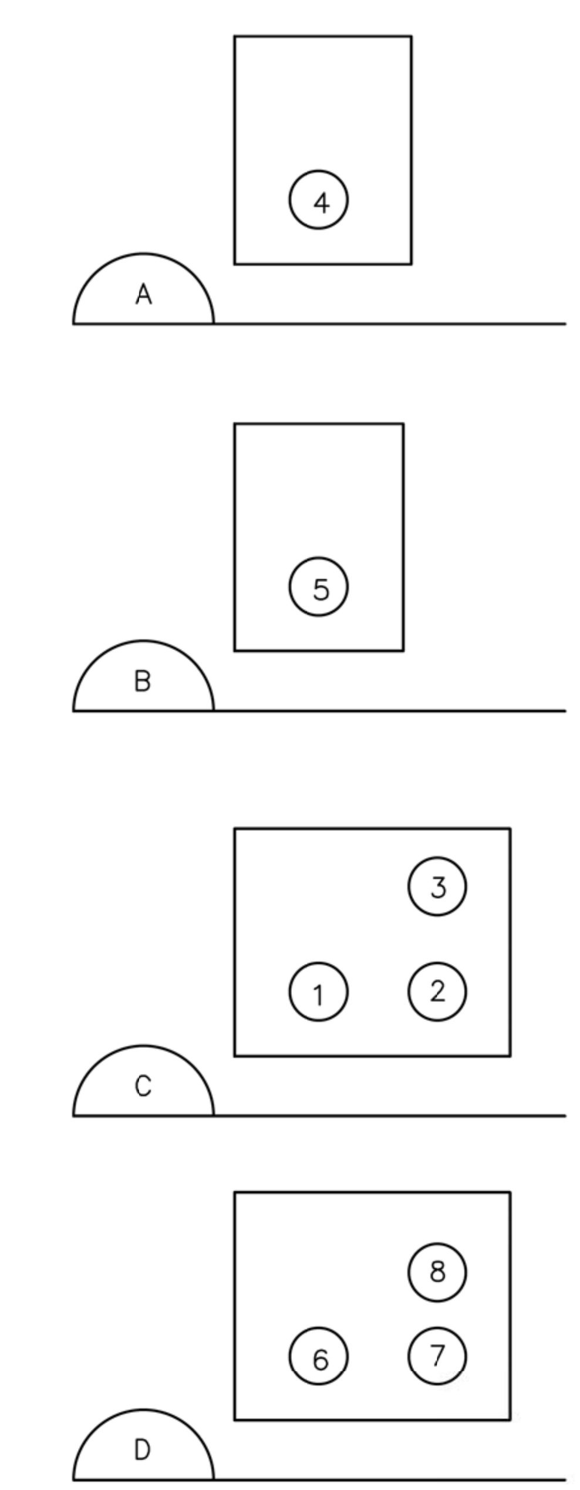


EQUIPMENT RACK DETAIL

SCALE: NTS

DIRECT BURIED CONDUIT SCHEDULE

	NO.	CONDUIT ID	CIRCUIT ID	FROM	TO	SIZE	TYPE
NOTE 4	1	P003	PCP-1-1,3	POWER CENTER PANEL "PCP-1"	EXISTING DISCONNECT SWITCH	2"	PVC
NOTE 4	2	I001	PIT-2001-I1	EMERGENCY INTERCONNECT "PLC-2000"	PRESSURE TRANSMITTER "PIT-2001"	1"	PVC
NOTE 4	3	C001	ZS-2001-C1, SV-2105-C1, SV-2106-C1, SPARE 2#14	EMERGENCY INTERCONNECT "PLC-2000"	INTRUSION SWITCH "ZS-2001", SOLENOID "SV-2105", AND SOLENOID "SV-2106"	1"	PVC
	4	P001	P001	EXISTING UTILITY TRANSFORMER	UTILITY METER	2"	PVC
	5	P002	P002	UTILITY METER	POWER CENTER PANEL "PCP-1"	2"	PVC
	6	C002	MIX-2000-C1, PCP-1-2	POWER CENTER PANEL "PCP-1"	TANK MIXER "MIX-2000", TANK RECEPTACLE	1"	PVC
	7	I002	LE-2000-I1, RTD-2000-I1	LEVEL TRANSMITTER "LIT-2000"	LEVEL ELEMENT "LE-2000" AND TEMPERATURE SENSOR "RTD-2000"	1"	PVC
NOTE 4	8	C004	FS-2001-C1 AND FS-2002-C1	EMERGENCY INTERCONNECT "PLC-2000"	TANK FLOAT SWITCHES "FS-2001" AND "FS-2002"	1"	PVC



COLORADO REGISTERED PROFESSIONAL ENGINEER RYAN M. LORENZ 53413 9/21/18

By	Date	Description
RL	8/2/18	ISSUED FOR BID
RL	9/21/2018	ISSUED FOR CONSTRUCTION
RL	7/9/2019	AS-BUILT

REVISIONS

DESIGNED: RL

CHECKED: TMR

DRAWN: RL

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE

1 INCH

1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT

RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

EMERGENCY INTERCONNECT TANK & VAULT SITE ELECTRICAL PLAN

DRAWING

MAGNA

96 INVERNESS DRIVE EAST UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

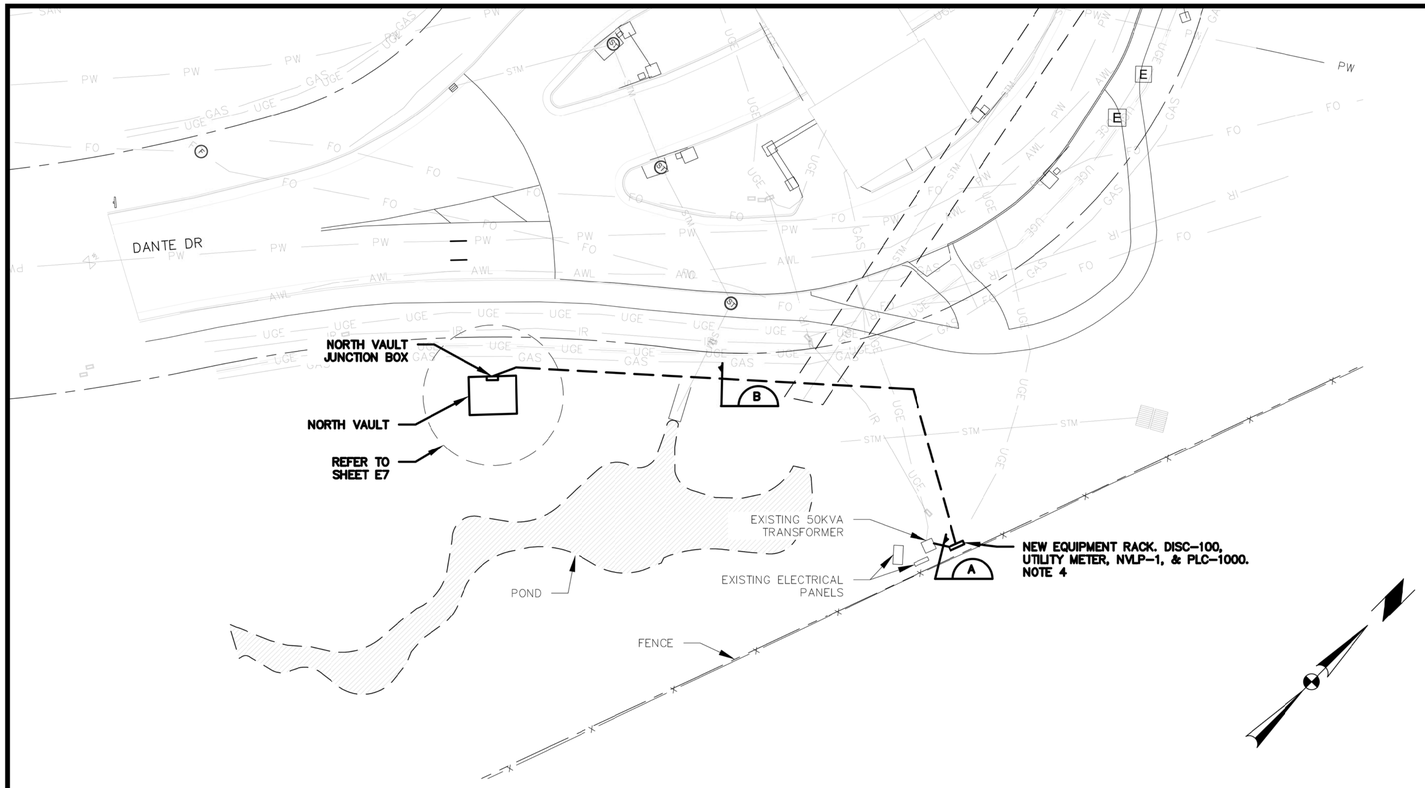
DATE JUNE 2018

JOB NO. 001.335.01

RWSD

DRAWING NO. E4

W:\T4104\T4104-15\10 DRAWINGS\03_WIP\E4_EMERGENCY INTERCONNECT TANK & VAULT SITE PLAN_RL_REVA.dwg, E4, 8/1/2019 7:58 AM



NORTH VAULT SITE PLAN
SCALE: 1" = 20'

20 0 10 20 40
1 INCH = 20 FEET

NOTES:

1. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL OBTAIN PUBLIC AND PRIVATE UTILITY LOCATES TO VERIFY UTILITY LOCATIONS. POTHOLE ALL UTILITY CROSSINGS PRIOR TC CONSTRUCTION.
2. CONTRACTOR SHALL ROUTE CONDUITS TO BEST SUIT FIELD CONDITIONS. CONTRACTOR SHALL PROVIDE HAND HOLES AND JUNCTION BOXES AS REQUIRED FOR A COMPLETE INSTALLATION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR RETURNING EXISTING LANDSCAPING AFFECTED BY WORK BACK TO ORIGINAL CONDITION.
4. CONTRACTOR SHALL PAINT NEW ELECTRICAL EQUIPMENT AND ENCLOSURES TO MATCH EXISTING. COORDINATE EXACT COLOR WITH RAVENNA MAINTENANCE PERSONNEL.
5. CONTRACTOR SHALL INTERCEPT EXISTING CONDUCTORS ROUTED TO THE EXISTING WTP BUILDING AND EXTEND CONDUCTORS AND PROVIDE NEW CONDUIT AS REQUIRED TO THE NEW EQUIPMENT RACK.
6. DIRECT BURRED CONDUIT ROUTING IS DIAGRAMTIC. CONTRACTOR SHALL ROUTE CONDUITS TO BEST SUITE FIELD CONDITIONS AND ROUTE CONDUITS WITHIN ANY EXISTING UTILITY EASEMENTS.

NOTE 6

DIRECT BURIED CONDUIT SCHEDULE

NO.	CONDUIT ID	CIRCUIT ID	FROM	TO	SIZE	TYPE
1	P001	UTILITY SERVICE	EXISTING UTILITY TRANSFORMER	DISCONNECT SWITCH "DISC-100"	2"	PVC
2	P002	NVLP-1-1,3	LOAD CENTER PANEL "NVLP-1"	VAULT LIGHTING & RECEPTACLES	1"	PVC
3	C001	SV-1001-C1 & SV-1002-C1	NORTH VAULT PLC PANEL "PLC-1000"	NORTH VAULT JUNCTION BOX	1"	PVC

REVISIONS	Description	Date	By
	ISSUED FOR BID	8/2/18	RL
	ISSUED FOR CONSTRUCTION	9/21/2018	RL
	AS-BUILT	7/9/2019	RL

DESIGNED: RL
CHECKED: TMR
DRAWN: RL

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

NORTH VAULT ELECTRICAL SITE PLAN

DRAWING

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

DATE: JUNE 2018
JOB NO.: 001.335.01
RWSD
DRAWING NO.: E5

COLORADO REGISTERED PROFESSIONAL ENGINEER
BRIAN M. LOBATO
53413
9/21/18

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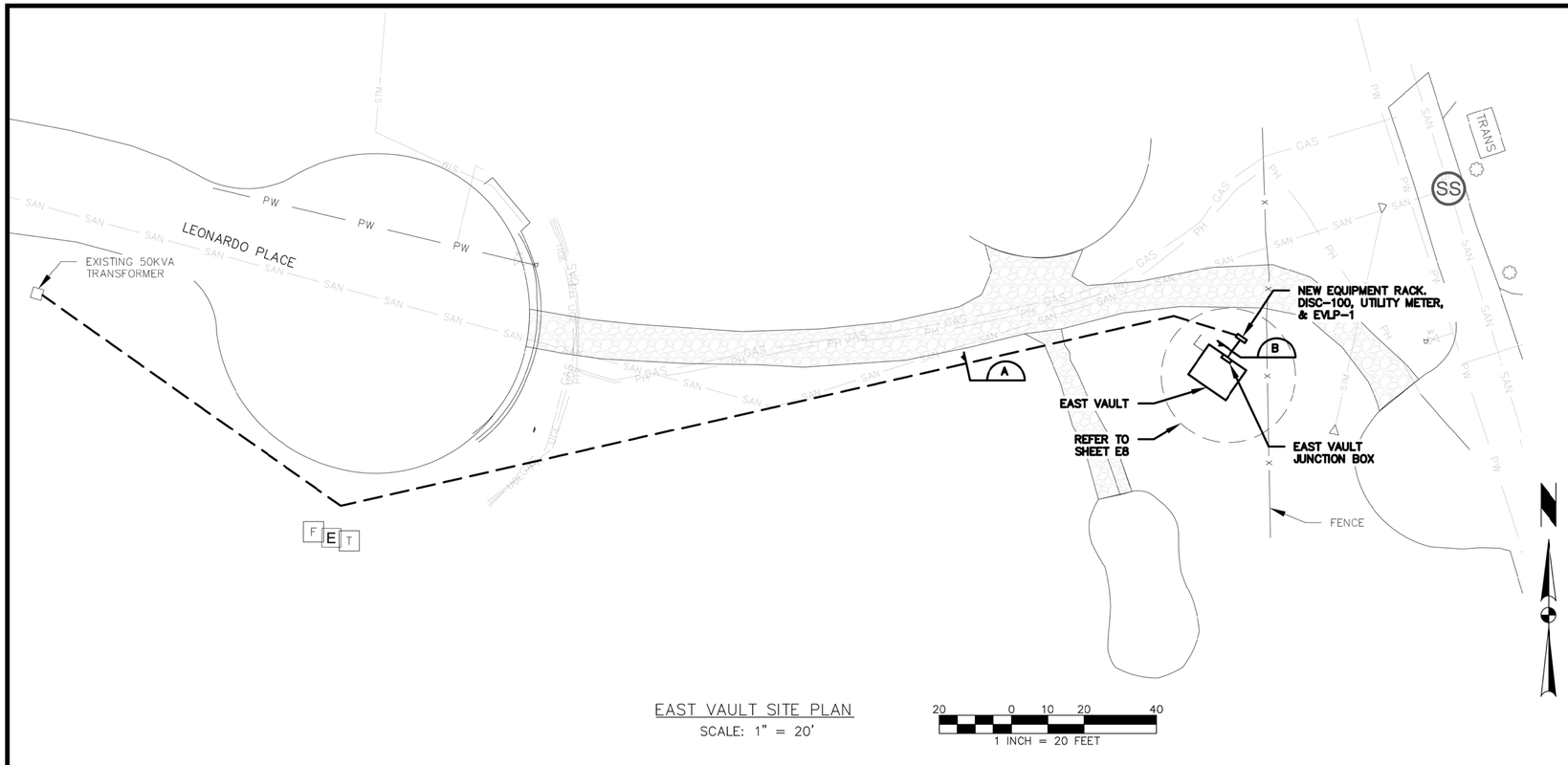


EAST VAULT SITE PLAN

SCALE: 1" = 20'

20 0 10 20 40

1 INCH = 20 FEET

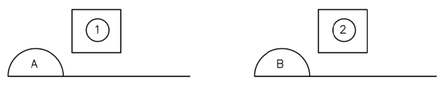
NOTES:

1. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL OBTAIN PUBLIC AND PRIVATE UTILITY LOCATES TO VERIFY UTILITY LOCATIONS. POTHOLE ALL UTILITY CROSSINGS PRIOR TC CONSTRUCTION.
2. CONTRACTOR SHALL ROUTE CONDUITS TO BEST SUIT FIELD CONDITIONS. CONTRACTOR SHALL PROVIDE HAND HOLES AND JUNCTION BOXES AS REQUIRED FOR A COMPLETE INSTALLATION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR RETURNING EXISTING LANDSCAPING AFFECTED BY WORK BACK TO ORIGINAL CONDITION.
4. DIRECT BURRED CONDUIT ROUTING IS DIAGRAMTIC. CONTRACTOR SHALL ROUTE CONDUITS TO BEST SUITE FIELD CONDITIONS AND ROUTE CONDUITS WITHIN ANY EXISTING UTILITY EASEMENTS.

NOTE 4

DIRECT BURIED CONDUIT SCHEDULE

NO.	CONDUIT ID	CIRCUIT ID	FROM	TO	SIZE	TYPE
1	P001	UTILITY SERVICE	EXISTING UTILITY TRANSFORMER	DISCONNECT SWITCH "DISC-100"	2"	PVC
2	P004	EVLP-1-1,3	LOAD CENTER PANEL "EVLP-1"	VAULT LIGHTING & RECEPTACLES	1"	PVC



REVISIONS	Description	Date	By
	ISSUED FOR BID	8/2/18	RL
	ISSUED FOR CONSTRUCTION	9/21/2018	RL
	AS-BUILT	7/9/2019	RL

DESIGNED: RL

CHECKED: TMR

DRAWN: RL

1 INCH

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE

1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING

EAST VAULT ELECTRICAL SITE PLAN

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

DATE JUNE 2018

JOB NO. 001.335.01

RWSD

DRAWING NO. E6

COLORADO REGISTERED RYAN M. LORENZ 53413 PROFESSIONAL ENGINEER 9/21/18

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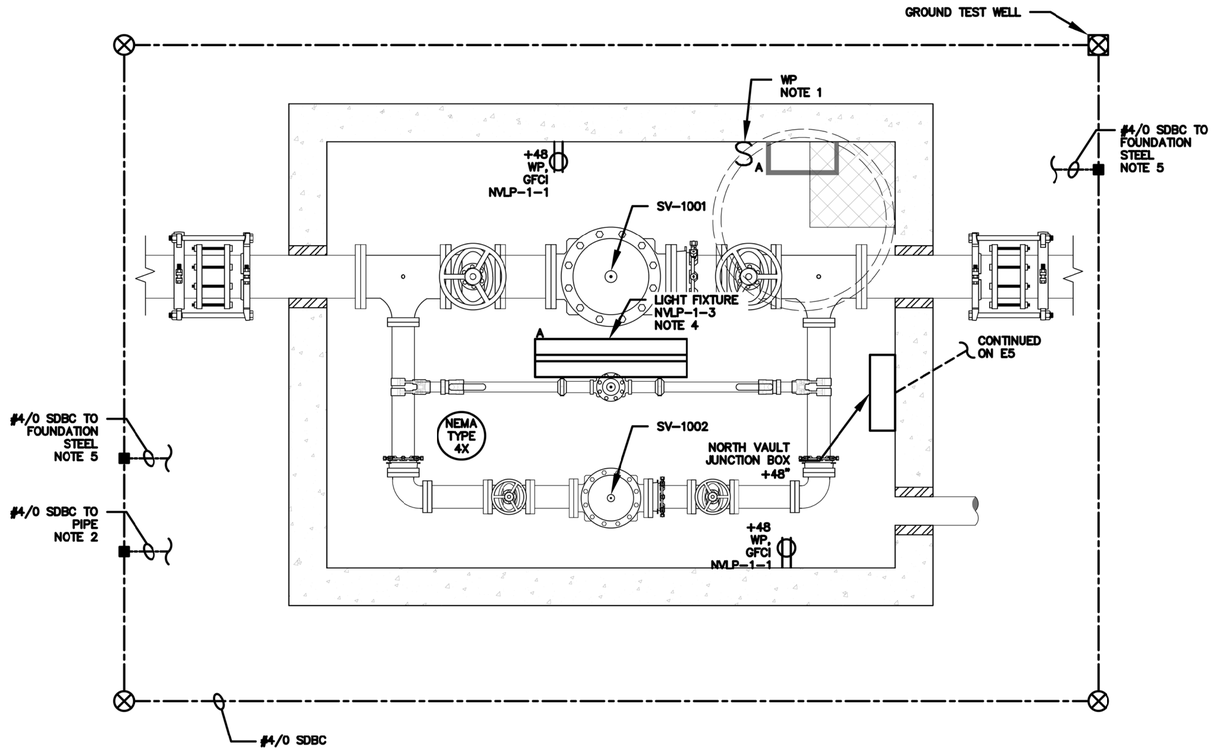
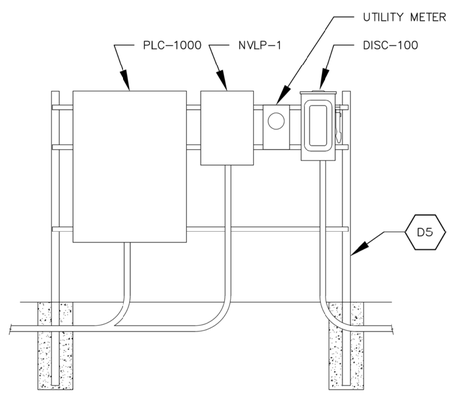


NORTH VAULT PLAN
SCALE: 3/4" = 1'-0"



NORTH VAULT EQUIPMENT RACK DETAIL
SCALE: NTS

NOTES:

1. CONTRACTOR SHALL MOUNT SWITCH WITHIN ARMS REACH OF HATCH OPENING.
2. CONTRACTOR SHALL GROUND PIPE ON THE ISOLATED SIDE OF ANY CATHODIC PROTECTION.
3. CONTRACTOR SHALL PROVIDE A 20"H X 16"W X 6"D MINIMUM JUNCTION BOX TO SUIT INCOMING CABLES AND PROVIDE ALLEN-BRADLEY 1492-J6 TERMINAL BLOCKS OR EQUIVALENT REQUIRED FOR INTERCONNECTIONS. TERMINAL BLOCKS SHALL BE ARRANGED IN JUNCTION BOX TO PROVIDE ADEQUATE VOLTAGE SEGREGATION OF CONTROL SIGNALS. JUNCTION BOXES SHALL BE NEMA TYPE 4X 316 STAINLESS STEEL ENCLOSURES.
4. SURFACE MOUNT LIGHT FIXTURE, LINEAR LED LOW BAY FIXTURE, 29W, 120V LED LITHONIA LIGHTING MSL 4000LM L/LV MVOLT GZ10 35K 80CRI OR EQUIVALENT.
5. PRECAST VAULT SHALL HAVE PROVISIONS FOR TWO GROUND CONNECTIONS TO FOUNDATION STEEL AS SHOWN.

REVISIONS			
Description	Date	By	
ISSUED FOR BID	8/2/18	RL	
ISSUED FOR CONSTRUCTION	9/21/2018	RL	
DOUGLAS COUNTY COMMENTS /1	1/9/19	RL	
AS-BUILT	7/9/2019	RL	

DESIGNED: RL
CHECKED: TMR
DRAWN: RL

1 INCH
BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

NORTH VAULT ELECTRICAL PLAN

DRAWING

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

DATE: JUNE 2018
JOB NO.: 001.335.01
RWSD
DRAWING NO.: E7

COLORADO REGISTERED
BRIAN M. LOBDELL
53413
9/21/18
PROFESSIONAL ENGINEER

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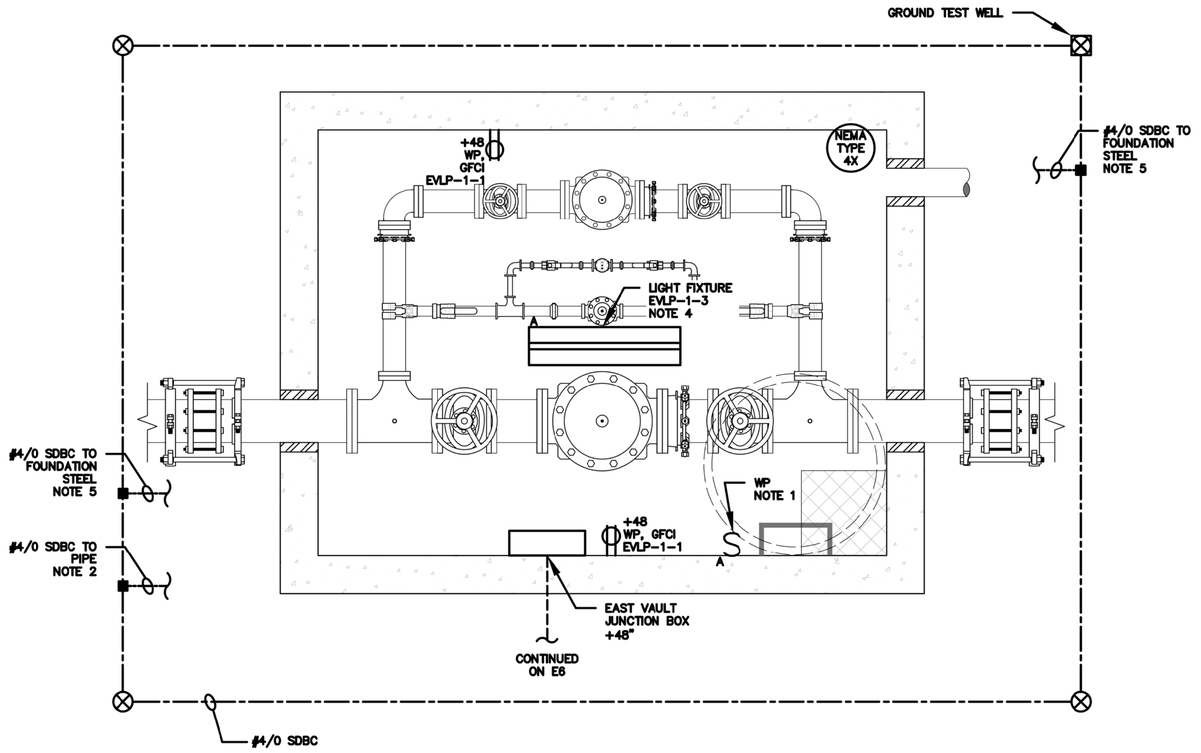
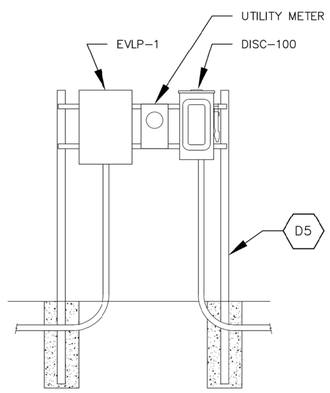


EAST VAULT PLAN
SCALE: 3/4" = 1'-0"

NOTES:

1. CONTRACTOR SHALL MOUNT SWITCH WITHIN ARMS REACH OF HATCH OPENING.
2. CONTRACTOR SHALL GROUND PIPE ON THE ISOLATED SIDE OF ANY CATHODIC PROTECTION.
3. CONTRACTOR SHALL PROVIDE A 20"H X 16"W X 6"D MINIMUM JUNCTION BOX TO SUIT INCOMING CABLES AND PROVIDE ALLEN-BRADLEY 1492-J6 TERMINAL BLOCKS OR EQUIVALENT REQUIRED FOR INTERCONNECTIONS. TERMINAL BLOCKS SHALL BE ARRANGED IN JUNCTION BOX TO PROVIDE ADEQUATE VOLTAGE SEGREGATION OF CONTROL SIGNALS. JUNCTION BOXES SHALL BE NEMA TYPE 4X 316 STAINLESS STEEL ENCLOSURES.
4. SURFACE MOUNT LIGHT FIXTURE, LINEAR LED LOW BAY FIXTURE, 29W, 120V LED LITHONIA LIGHTING MSL 4000LM L/LV MVOLT GZ10 35K 80CRI OR EQUIVALENT.
5. PRECAST VAULT SHALL HAVE PROVISIONS FOR TWO GROUND CONNECTIONS TO FOUNDATION STEEL AS SHOWN.



EAST VAULT EQUIPMENT RACK DETAIL
SCALE: NTS

REVISIONS	Description	Date	By
	ISSUED FOR BID	8/2/18	RL
	ISSUED FOR CONSTRUCTION	9/21/2018	RL
1	DOUGLAS COUNTY COMMENTS	1/9/19	RL
	AS-BUILT	7/9/2019	RL

DESIGNED: RL
CHECKED: TMR
DRAWN: RL

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING: EAST VAULT ELECTRICAL PLAN

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

DATE: JUNE 2018
JOB NO.: 001.335.01
RWSD
DRAWING NO.: E8

COLORADO REGISTERED BRIAN M. LORENZ 53413 9/21/18 PROFESSIONAL ENGINEER

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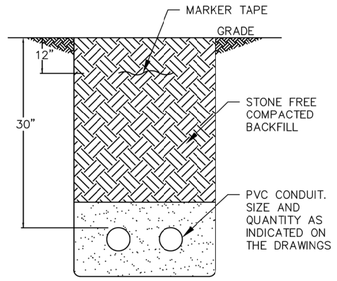
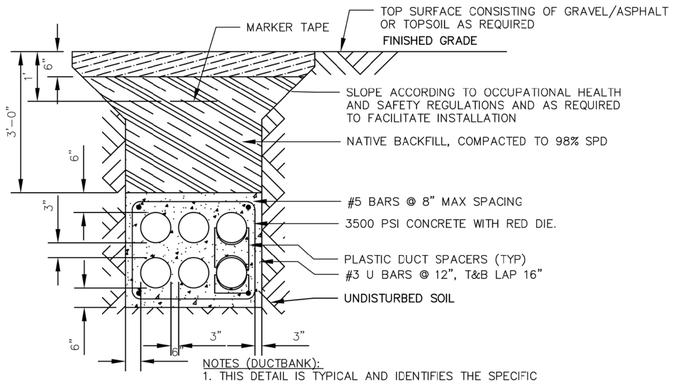


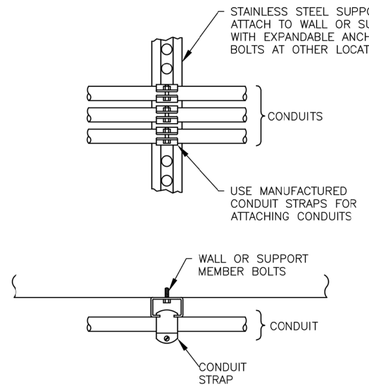
NOTES:
1. DUCTS SHALL BE SPACED A MINIMUM OF 3" APART. SAND TO BE PLACED SO THAT 6" SURROUNDS ALL DUCTS.

D1 *DIRECT BURIAL DETAIL*
SCALE: NTS



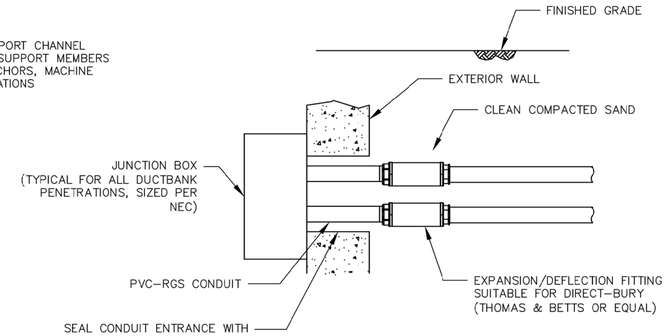
NOTES (DUCTBANK):
1. THIS DETAIL IS TYPICAL AND IDENTIFIES THE SPECIFIC CONSTRUCTION OF ALL CONCRETE DUCTBANKS.
2. REFER TO OTHER DRAWINGS (PLANS AND SCHEDULES) FOR SIZE AND QUANTITY OF DUCTS.
3. AS BEST AS PRACTICAL, SLOPE DUCTBANKS TO MANHOLES TO PROMOTE DRAINAGE.
4. INSTALL REINFORCING ONLY WHERE SPECIFIED OR INDICATED ON DRAWINGS.

D2 *CONCRETE DUCTBANK DETAIL*
SCALE: NTS



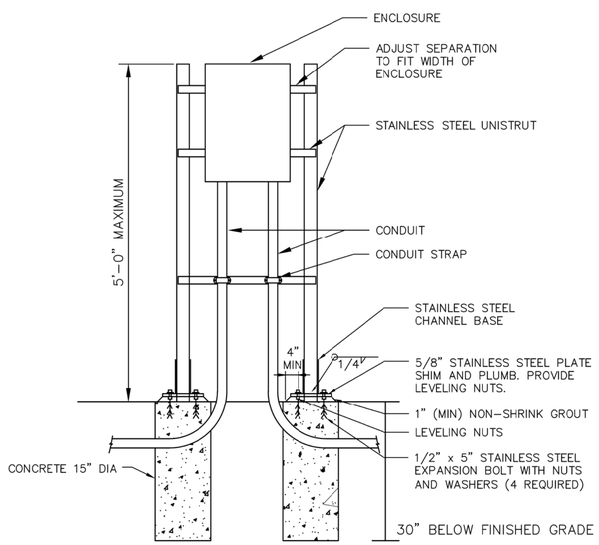
NOTES:
1. CONDUITS SHALL BE MOUNTED TO BEST SUITE FIELD CONDITIONS.
2. USED IN AREAS WHERE TWO OR MORE CONDUITS RUN PARALLEL.

D3 *CONDUIT MOUNTING DETAIL*
SCALE: NTS

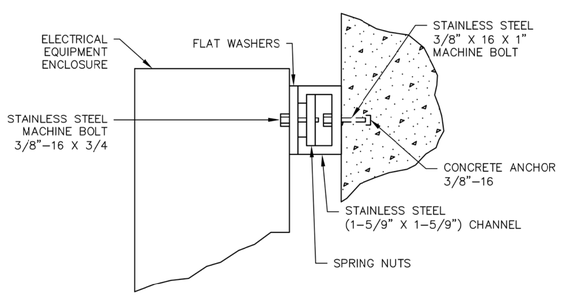


NOTES (ENTRANCE DETAIL):
1. CAULK ALL CONCRETE SURFACES IN OPENING AND AROUND EACH CONDUIT WITH A HYDROSTATIC WATER STOP (ADEKA P-201 OR EQUAL) AT ℄ WALL PRIOR TO GROUTING.

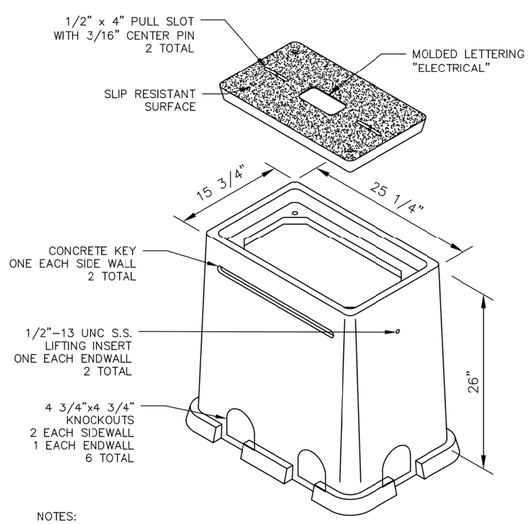
D4 *UNDERGROUND CONDUIT ENTRANCE DETAIL*
SCALE: NTS



D5 *ELECTRICAL EQUIPMENT RACK DETAIL*
SCALE: NTS



D6 *ENCLOSURE MOUNING DETAIL*
SCALE: NTS



NOTES:
1. POLYMER CONCRETE FRAME AND NON-SKID COVER FOR STRENGTH. FLARED AT BASE TO PROVIDE ADDITIONAL WORK SPACE.

D7 *ELECTRICAL HANDHOLE*
SCALE: NTS

REVISIONS

By	Date	Description
RL	8/2/18	ISSUED FOR BID
RL	9/21/2018	ISSUED FOR CONSTRUCTION
RL	7/9/2019	AS-BUILT

DESIGNED: RL
CHECKED: TMR
DRAWN: RL

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

ELECTRICAL GENERAL DETAILS

DRAWING

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

DATE: JUNE 2018
JOB NO. 001.335.01
RWSD
DRAWING NO. E9

COLORADO REGISTERED BRYAN M. LORENZ 53413 9/21/18 PROFESSIONAL ENGINEER

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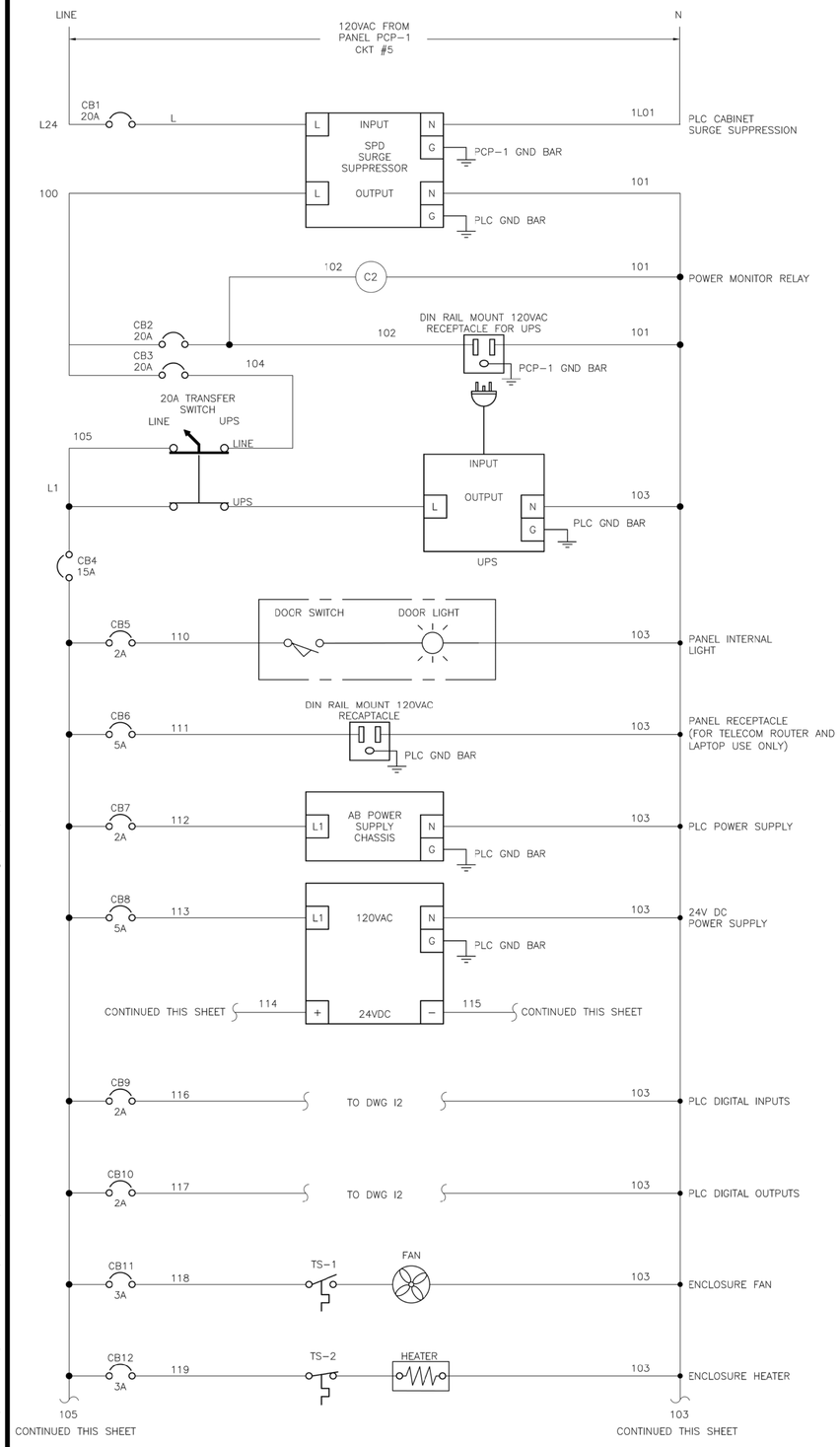

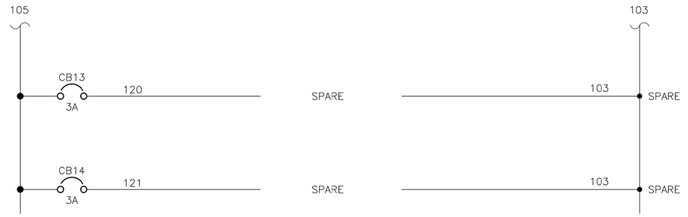

NOTES:

1. SCHEMATICS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR SHALL DESIGN SCHEMATICS TO MATCH INTENT OF INSTALLED INSTRUMENTS AND DEVICES.

REVISIONS	Description	Date	By
	ISSUED FOR BID	8/2/18	RL
	ISSUED FOR CONSTRUCTION	9/21/2018	RL
	AS-BUILT	7/9/2019	RL

DESIGNED: *RL*

CHECKED: *TMR*

DRAWN: *RL*

1 INCH

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE

1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING

EMERGENCY INTERCONNECT PLC POWER DISTRIBUTION

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

DATE: JUNE 2018

JOB NO.: 001.335.01

RWSD

DRAWING NO.: I1

COLORADO REGISTERED CHRISTIAN M. LORENZ 53413 PROFESSIONAL ENGINEER 9/21/18

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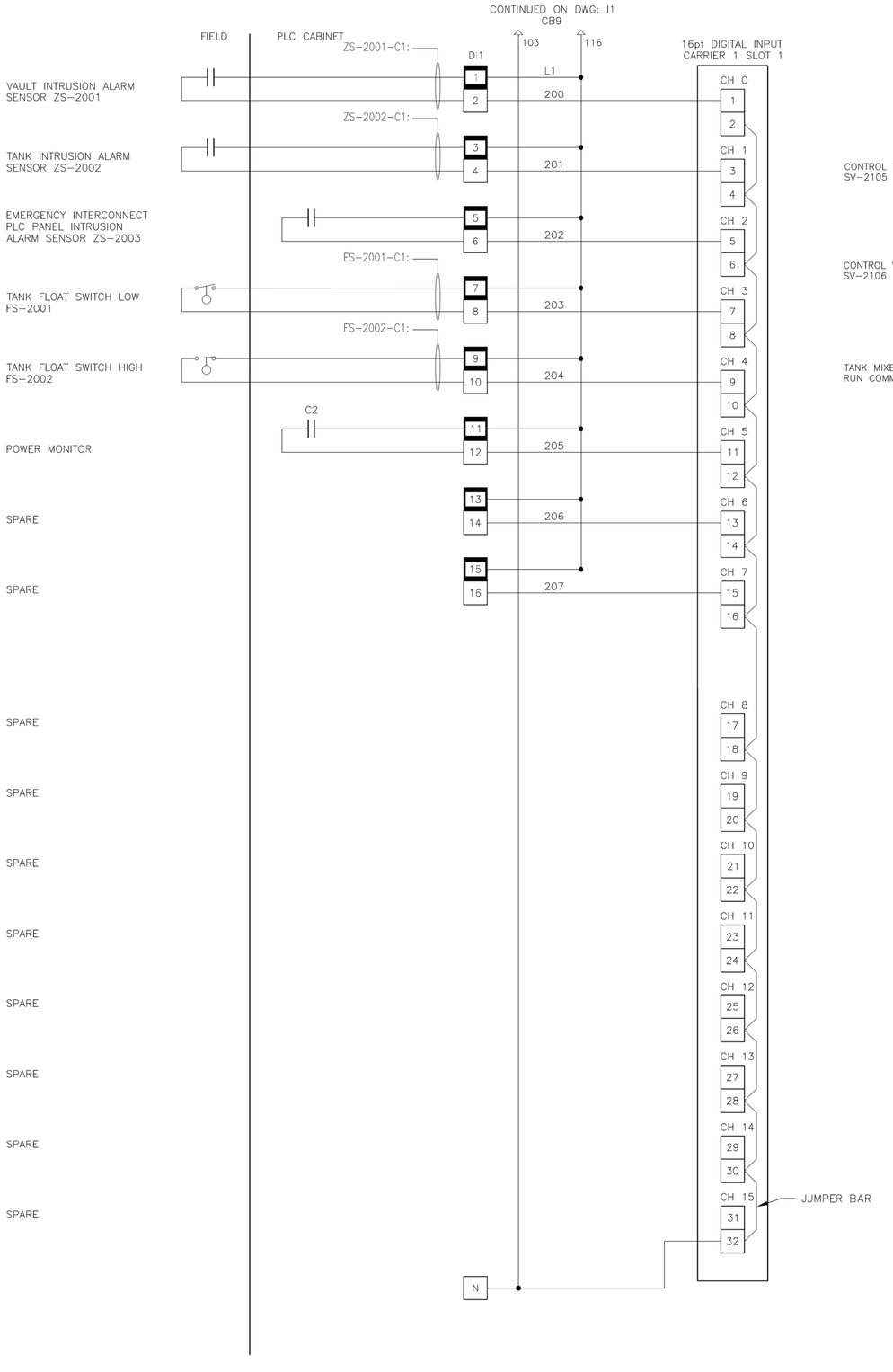
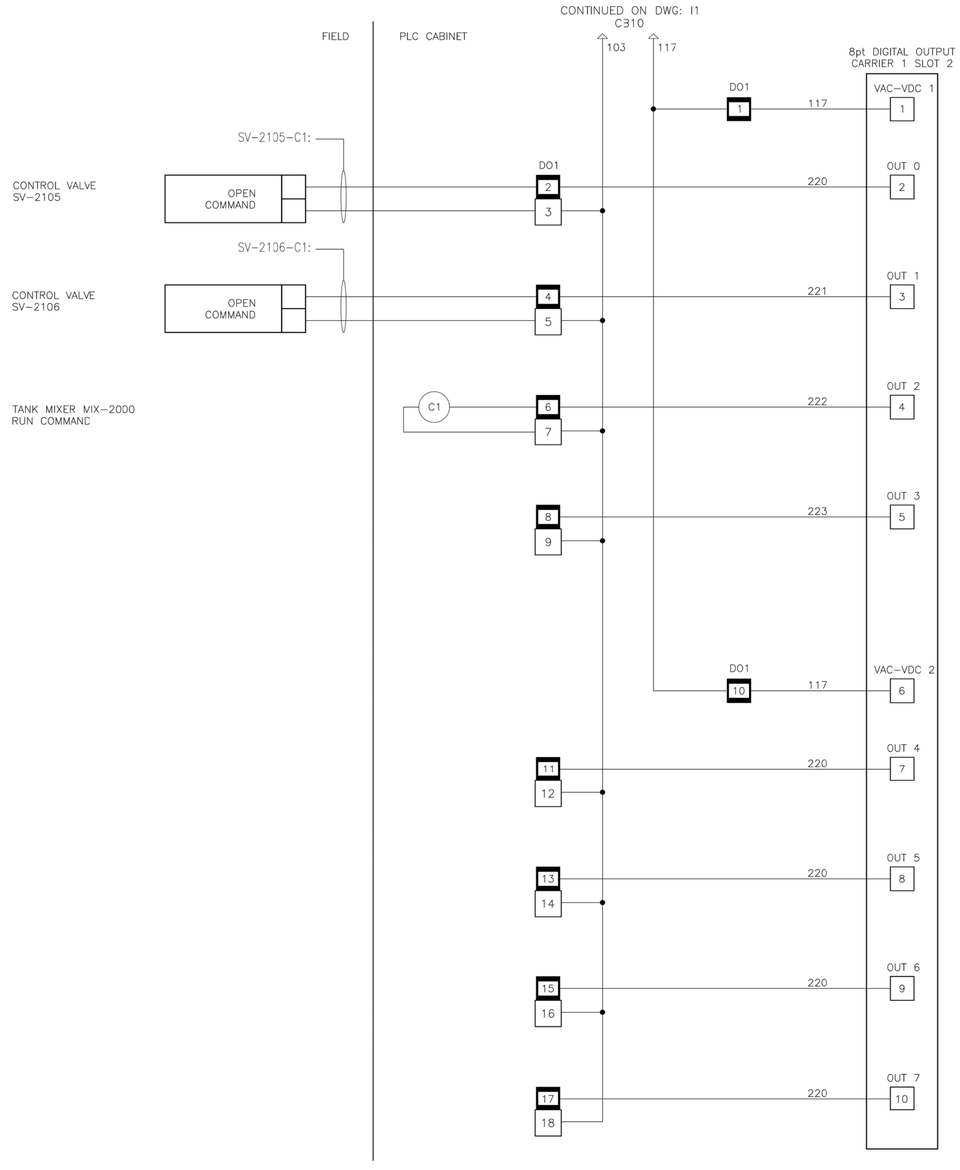
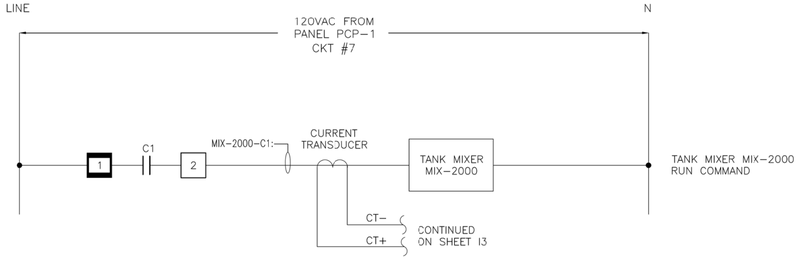






LEGEND:

- [X] FUSED TERMINAL BLOCK
- [X] TERMINAL BLOCK

NOTES:

1. SCHEMATICS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR SHALL DESIGN SCHEMATICS TO MATCH INTENT OF INSTALLED INSTRUMENTS AND DEVICES.

REVISIONS	Description	Date	By
	ISSUED FOR BID	8/2/18	RL
	ISSUED FOR CONSTRUCTION	9/21/2018	RL
	AS-BUILT	7/9/2019	RL

DESIGNED: RL
CHECKED: TMR
DRAWN: RL

1 INCH
BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

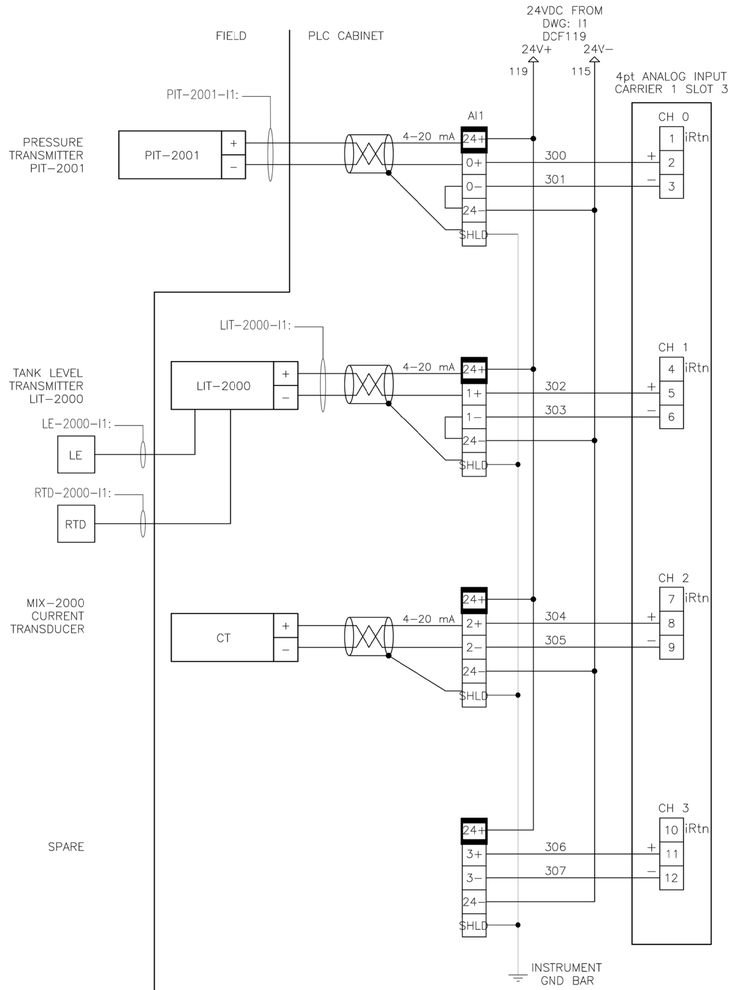
DRAWING
EMERGENCY INTERCONNECT PLC DIGITAL INPUTS AND OUTPUTS

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

COLORADO REGISTERED RYAN M. LOBERG 53413 9/21/18 PROFESSIONAL ENGINEER

DATE: JUNE 2018
JOB NO.: 001.335.01
RWSD
DRAWING NO.: 12

W:\T4104\T4104-15\10 DRAWINGS\03_WIP\12_EMERGENCY INTECONNECT PLC DIGITAL INPUTS & OUTPUTS_RL_REVA.dwg, I2, 8/1/2019 7:58 AM



LEGEND:

[X] FUSED TERMINAL BLOCK

X TERMINAL BLOCK

NOTES:

1. SHIELD WIRES TO BE CONNECTED TO GROUND AT PANEL. DEVICE SIDE SHALL BE ISOLATED.
2. SCHEMATICS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR SHALL DESIGN SCHEMATICS TO MATCH INTENT OF INSTALLED INSTRUMENTS AND DEVICES.

REVISIONS	Description	Date	By
	ISSUED FOR BID	8/2/18	RL
	ISSUED FOR CONSTRUCTION	9/21/2018	RL
	AS-BUILT	7/9/2019	RL

DESIGNED: RL

CHECKED: TMR

DRAWN: RL

1 INCH
1 INCH
BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
EMERGENCY INTERCONNECT PLC ANALOG INPUTS

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

DATE JUNE 2018

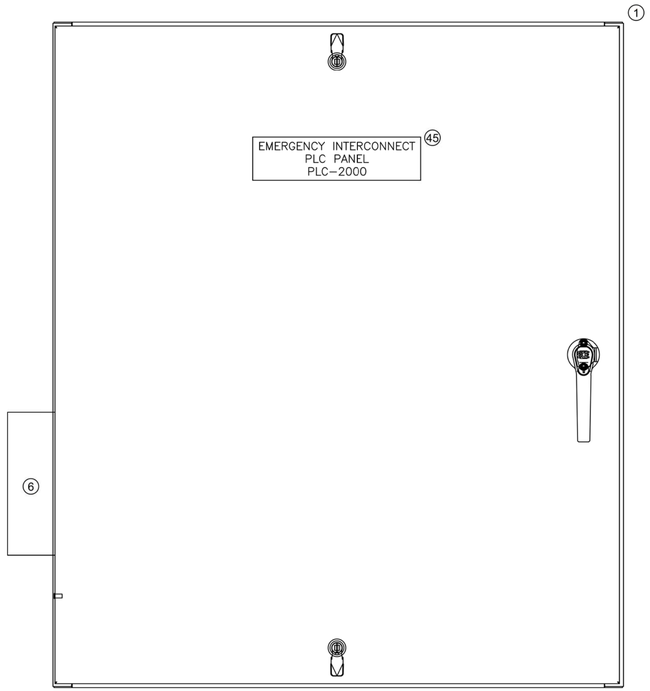
JOB NO. 001.335.01

RWSD

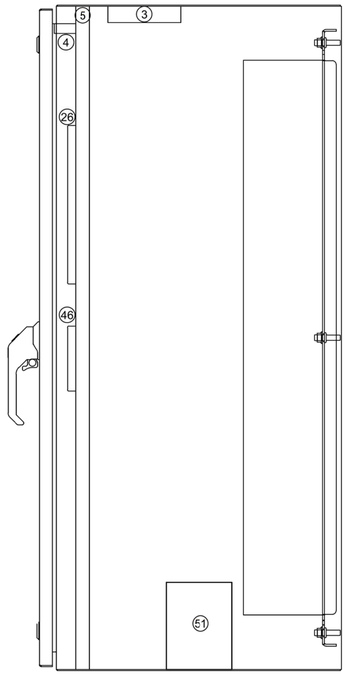
DRAWING NO. 13

COLORADO REGISTERED BRYAN M. LORENZ 53413 9/21/18 PROFESSIONAL ENGINEER

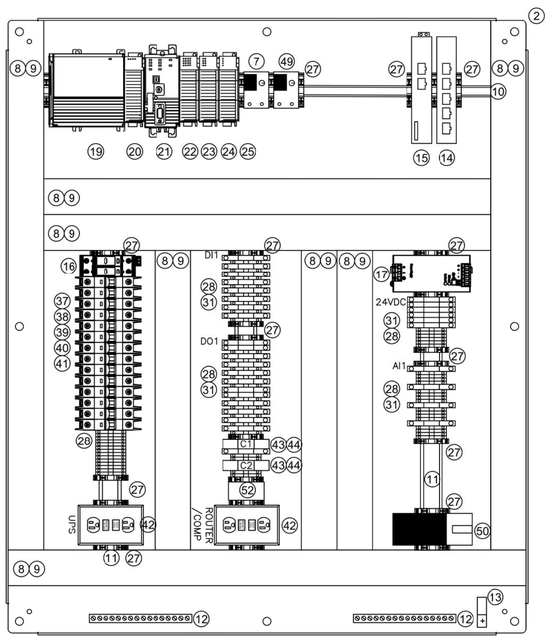
W:\T4104\T4104-15\10 DRAWINGS\03_WIP\13_EMERGENCY INTECONNECT PLC ANALOG INPUTS_RL_REVA.dwg, 13, 8/1/2019 7:59 AM



FRONT
VIEW



RIGHT SIDE VIEW



BACK
PANEL
FRONT
VIEW

	MATERIAL LIST				
	ITEM	QTY	MANUFACTURER	PART NUMBER	DESCRIPTION
	1	1	SAGINAW ENCLOSURE	SCE-42EL3618LPPL	42"X36"X18" ENCLOSURE
	2	1	SAGINAW ENCLOSURE	SCE-42P36	42"X36" ENCLOSURE BACK PANEL
	3	1	SAGINAW ENCLOSURE	SCE-LF24	24" ENCLOSURE LIGHT FIXTURE
	4	1	SAGINAW ENCLOSURE	SCE-LSA	ENCLOSURE DOOR SWITCH & ASSEMBLY
	5	1	SAGINAW ENCLOSURE	SCE-DF42EL36LP	DEAD FRONT PANEL ASSEMBLY
	6	1	KOOLTRONICS	KNP40F	NEMA 3R FILTER FAN
	7	1	KOOLTRONICS	KSSTF	THERMOSTAT NORMALLY OPEN
	8	AS REQ	PANDUIT	F2X5LG6	WIRE DUCT 2"X5" LT GRY
	9	AS REQ	PANDUIT	C2LG6	WIRE DUCT COVER 2" LT GRY
	10	AS REQ	ALLEN BRADLEY	199-DR2	DIN RAIL
	11	AS REQ	ALLEN BRADLEY	1492-DR6	HIGH RISE DIN RAIL
	12	2	ELECTRIC MOTION	EM 4250-12SSO	GROUND BAR
	13	1	BURNDY	KA31U	SINGLE BARREL GROUND LUG
	14	1	PHOENIX CONTACT	2891001	5 PORT ETHERNET SWITCH
	15	1	PHOENIX CONTACT	2700634	MGUARD INTELLIGENT FIREWALL ROUTER
	16	1	PHOENIX CONTACT	2856812	SURGE ARRESTER
	17	1	PULS	QS10.DNET	24VDC 196W POWER SUPPLY
NOT SHOWN	18	3	AUTOMATION DIRECT	C5E-STPBK-S7	SHIELDED ETHERNET CABLE 7FT
	19	1	ALLEN BRADLEY	1768-PA3	COMPACT LOGIX POWER SUPPLY
	20	1	ALLEN BRADLEY	1768-ENBT	COMPACT LOGIX COMM MODULE
	21	1	ALLEN BRADLEY	1768-L43	COMPACT LOGIX PROCESSOR
	22	1	ALLEN BRADLEY	1769-IA16	COMPACT LOGIX DIGITAL INPUT-16PTS
	23	1	ALLEN BRADLEY	1769-OW8	COMPACT LOGIX DIGITAL OUTPUT-8PTS
	24	1	ALLEN BRADLEY	1769-IF4I	COMPACT LOGIX ANALOG INPUT-4PTS
	25	1	ALLEN BRADLEY	1769-ECR	COMPACT LOGIX END CAP
	26	1	ALLEN BRADLEY	2711P-T9W21D8S	9" PANELVIEW PLUS
	27	AS REQ	PHOENIX CONTACT	0800886	END CLAMP
	28	AS REQ	PHOENIX CONTACT	3031212	TERMINAL BLOCK
NOT SHOWN	29	AS REQ	PHOENIX CONTACT	3030417	TERMINAL BLOCK END PLATE
NOT SHOWN	30	AS REQ	PHOENIX CONTACT	3030226	TERMINAL BLOCK CENTER JUMPER
	31	AS REQ	PHOENIX CONTACT	3036385	FUSE BLOCK
NOT SHOWN	32	AS REQ	PHOENIX CONTACT	3206212	FUSE BLOCK END PLATE
NOT SHOWN	33	AS REQ	PHOENIX CONTACT	3030323	FUSE BLOCK CENTER JUMPER
NOT SHOWN	34	AS REQ	BUSSMANN	MDA-1/4-R	1/4A FUSE 1/4"-1-1/4"
NOT SHOWN	35	AS REQ	BUSSMANN	MDA-1/2-R	1/2A FUSE 1/4"-1-1/4"
NOT SHOWN	36	AS REQ	BUSSMANN	MDA-1-R	1A FUSE 1/4"-1-1/4"
	37	3	ALLEN BRADLEY	1489-A1D200	1 POLE 20A CIRCUIT BREAKER
	38	1	ALLEN BRADLEY	1489-A1D150	1 POLE 15A CIRCUIT BREAKER
	39	2	ALLEN BRADLEY	1489-A1D050	1 POLE 5A CIRCUIT BREAKER
	40	4	ALLEN BRADLEY	1489-A1D030	1 POLE 3A CIRCUIT BREAKER
	41	4	ALLEN BRADLEY	1489-A1D020	1 POLE 2A CIRCUIT BREAKER
	42	2	PHOENIX CONTACT	5600462	DIN RAIL MOUNT GFCI RECEPTACLE
	43	2	ALLEN BRADLEY	700-HK36A1	16A SPDT RELAY
	44	2	ALLEN BRADLEY	700-HN121	SPDT RELAY SOCKET
	45	1	–	PHENOLIC TAG	EMERGENCY INTERCONNECT PLC PANEL PLC-2000
	46	1	ENDRESS + HAUSER	SEE SPECIFICATION 1690C	ULTRA SONIC MEASUREMENT TRANSMITTER/DISPLAY UNIT
	47	AS REQ	BUSSMANN	MDA-2-R	2A FUSE 1/4"-1-1/4"
	48	AS REQ	BUSSMANN	MDA-3-R	3A FUSE 1/4"-1-1/4"
	49	1	KOOLTRONICS	KSSTCF	THERMOSTAT NORMALLY CLOSED
	50	1	RITTAL	3105.320	ENCLOSURE HEATER
	51	1	APC	BE600M1	600VA UPS
	52	1	–	SEE SPECIFICATION 1690C	20A RATED 4-20mA CURRENT TRANSDUCER

NOTES

1. ALL ENCLOSURE PENETRATIONS SHALL MAINTAIN ENCLOSURE NEMA RATING.

REVISIONS			
Description	Date	By	
ISSUED FOR BID	8/2/18	RL	
ISSUED FOR CONSTRUCTION	9/21/2018	RL	
AS-BUILT	7/9/2019	RL	

DESIGNED: RL

CHECKED: TMR

DRAWN: RL

1 INCH
1 INCH
BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
EMERGENCY INTERCONNECT PLC PANEL LAYOUT

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

COLORADO REGISTERED
OSCAR M. LORENZO
53413
9/21/18
PROFESSIONAL ENGINEER

DATE JUNE 2018

JOB NO. 001.335.01

RWSD

DRAWING NO. 14

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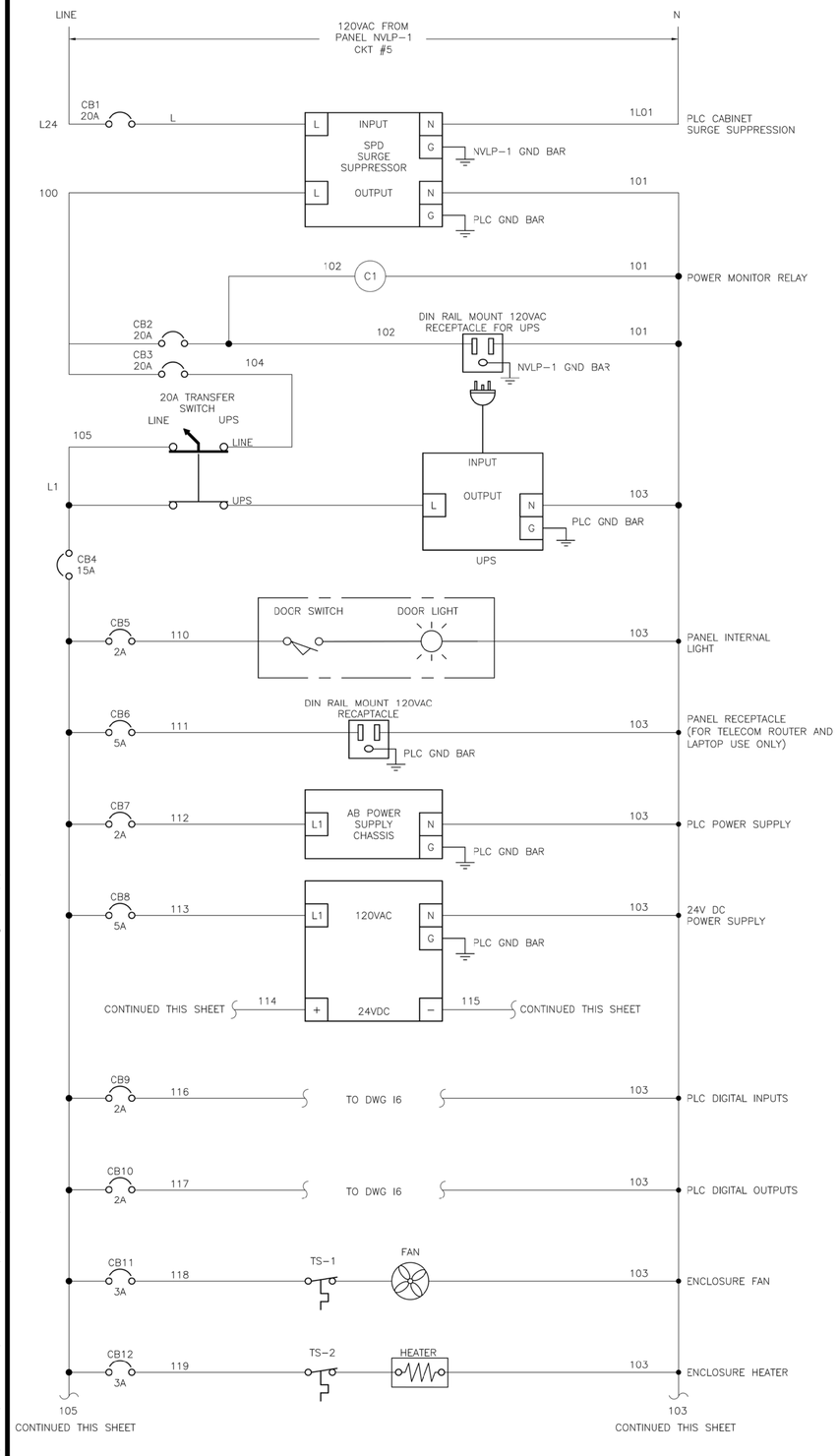

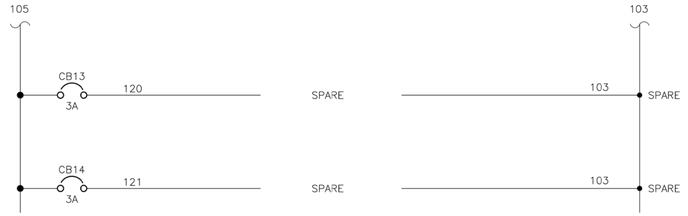

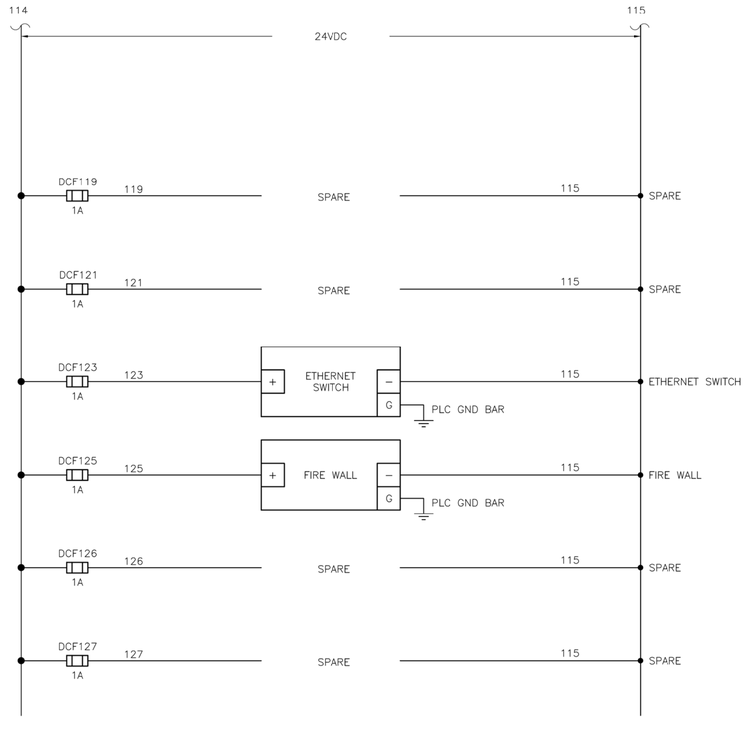

NOTES:

1. SCHEMATICS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR SHALL DESIGN SCHEMATICS TO MATCH INTENT OF INSTALLED INSTRUMENTS AND DEVICES.

REVISIONS	Description	Date	By
	ISSUED FOR BID	8/2/18	RL
	ISSUED FOR CONSTRUCTION	9/21/2018	RL
	AS-BUILT	7/9/2019	RL

DESIGNED: *RL*

CHECKED: *TMR*

DRAWN: *RL*

1 INCH

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE

1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

NORTH VAULT PLC POWER DISTRIBUTION

DRAWING

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

DATE: JUNE 2018

JOB NO.: 001.335.01

RWSD

DRAWING NO.: 15

COLORADO REGISTERED OSCAR M. LORENZO 53413 9/21/18 PROFESSIONAL ENGINEER

W:\T4104\T4104-15\10 DRAWINGS\03_WIP\15_NORTH VAULT PLC POWER DIST_RL_REVA.dwg, 15, 8/1/2019 7:59 AM

LEGEND:

☒ FUSED TERMINAL BLOCK

X TERMINAL BLOCK

NOTES:

1. SCHEMATICS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR SHALL DESIGN SCHEMATICS TO MATCH INTENT OF INSTALLED INSTRUMENTS AND DEVICES.

By	Date	REVISIONS Description
RL	8/2/18	ISSUED FOR BID
RL	9/21/2018	ISSUED FOR CONSTRUCTION
RL	7/9/2019	AS-BUILT

DESIGNED: RL

CHECKED: TMR

DRAWN: RL

BARS PLOT 1 INCH x 1 INCH AT FULL SCALE
1 INCH
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

NORTH VAULT PLC DIGITAL INPUTS AND OUTPUTS

DRAWING

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

RYAN M. LORENZ
53413
9/21/18

DATE JUNE 2018

JOB NO. 001.335.01

RWSD

DRAWING NO.
I6

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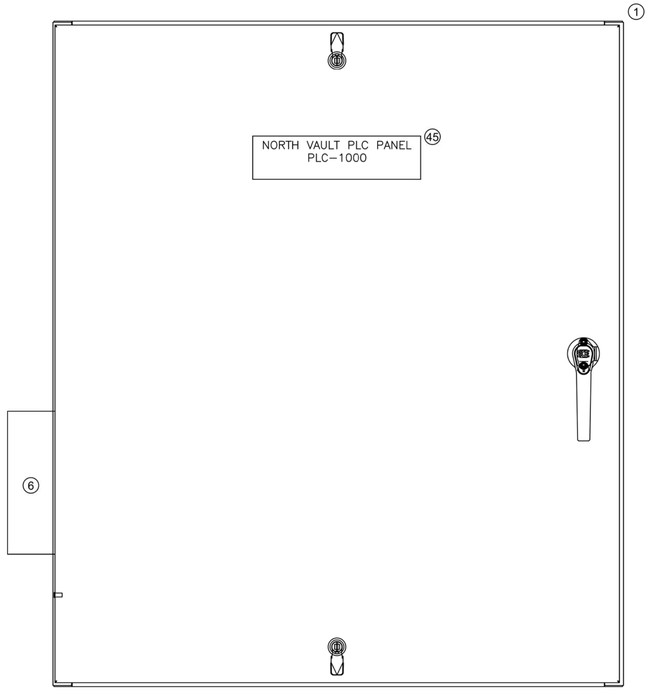
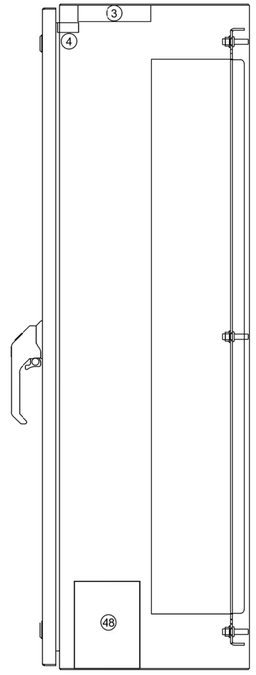


FRONT
VIEW

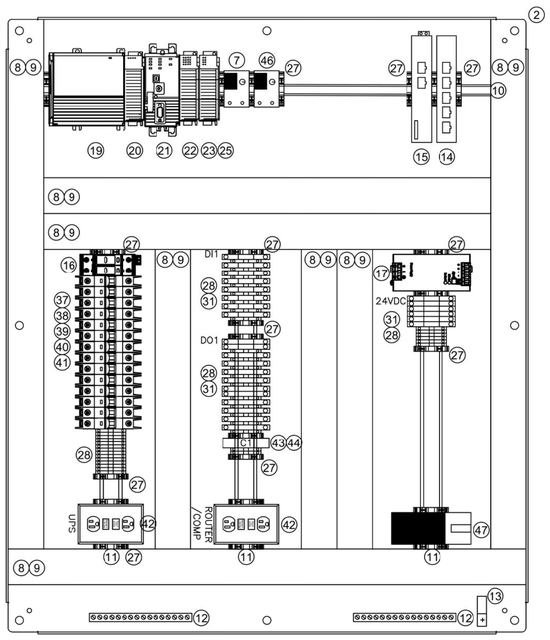


RIGHT SIDE VIEW

	MATERIAL LIST				
	ITEM	QTY	MANUFACTURER	PART NUMBER	DESCRIPTION
	1	1	SAGINAW ENCLOSURE	SCE–42EL3612LPPL	42"X36"X12" ENCLOSURE
	2	1	SAGINAW ENCLOSURE	SCE–42P36	42"X36" ENCLOSURE BACK PANEL
	3	1	SAGINAW ENCLOSURE	SCE–LF24	24" ENCLOSURE LIGHT FIXTURE
	4	1	SAGINAW ENCLOSURE	SCE–LSA	ENCLOSURE DOOR SWITCH & ASSEMBLY
	5	–	–	–	–
	6	1	KOOLTRONICS	KNP40F	NEMA 3R FILTER FAN
	7	1	KOOLTRONICS	KSSTF	THERMOSTAT NORMALLY OPEN
	8	AS REQ	PANDUIT	F2X5LG6	WIRE DUCT 2"X5" LT GRY
	9	AS REQ	PANDUIT	C2LG6	WIRE DUCT COVER 2" LT GRY
	10	AS REQ	ALLEN BRADLEY	199–DR2	DIN RAIL
	11	AS REQ	ALLEN BRADLEY	1492–DR6	HIGH RISE DIN RAIL
	12	2	ELECTRIC MOTION	EM 4250–12SSO	GROUND BAR
	13	1	BURNDY	KA31U	SINGLE BARREL GROUND LUG
	14	1	PHOENIX CONTACT	2891001	5 PORT ETHERNET SWITCH
	15	1	PHOENIX CONTACT	2700634	MGUARD INTELLIGENT FIREWALL ROUTER
	16	1	PHOENIX CONTACT	2856812	SURGE ARRESTER
	17	1	PULS	QS10.DNET	24VDC 196W POWER SUPPLY
NOT SHOWN	18	3	AUTOMATION DIRECT	C5E–STPBK–S7	SHIELDED ETHERNET CABLE 7FT
	19	1	ALLEN BRADLEY	1768–PA3	COMPACT LOGIX POWER SUPPLY
	20	1	ALLEN BRADLEY	1768–ENBT	COMPACT LOGIX COMM MODULE
	21	1	ALLEN BRADLEY	1768–L43	COMPACT LOGIX PROCESSOR
	22	1	ALLEN BRADLEY	1769–IA16	COMPACT LOGIX DIGITAL INPUT–16PTS
	23	1	ALLEN BRADLEY	1769–OW8	COMPACT LOGIX DIGITAL OUTPUT–8PTS
	24	–	–	–	–
	25	1	ALLEN BRADLEY	1769–ECR	COMPACT LOGIX END CAP
	26	–	–	–	–
	27	AS REQ	PHOENIX CONTACT	0800886	END CLAMP
	28	AS REQ	PHOENIX CONTACT	3031212	TERMINAL BLOCK
NOT SHOWN	29	AS REQ	PHOENIX CONTACT	3030417	TERMINAL BLOCK END PLATE
NOT SHOWN	30	AS REQ	PHOENIX CONTACT	3030226	TERMINAL BLOCK CENTER JUMPER
	31	AS REQ	PHOENIX CONTACT	3036385	FUSE BLOCK
NOT SHOWN	32	AS REQ	PHOENIX CONTACT	3206212	FUSE BLOCK END PLATE
NOT SHOWN	33	AS REQ	PHOENIX CONTACT	3030323	FUSE BLOCK CENTER JUMPER
NOT SHOWN	34	AS REQ	BUSSMANN	MDA–1/4–R	1/4A FUSE 1/4"–1–1/4"
NOT SHOWN	35	AS REQ	BUSSMANN	MDA–1/2–R	1/2A FUSE 1/4"–1–1/4"
NOT SHOWN	36	AS REQ	BUSSMANN	MDA–1–R	1A FUSE 1/4"–1–1/4"
	37	3	ALLEN BRADLEY	1489–A1D200	1 POLE 20A CIRCUIT BREAKER
	38	1	ALLEN BRADLEY	1489–A1D150	1 POLE 15A CIRCUIT BREAKER
	39	2	ALLEN BRADLEY	1489–A1D050	1 POLE 5A CIRCUIT BREAKER
	40	4	ALLEN BRADLEY	1489–A1D030	1 POLE 3A CIRCUIT BREAKER
	41	4	ALLEN BRADLEY	1489–A1D020	1 POLE 2A CIRCUIT BREAKER
	42	2	PHOENIX CONTACT	5600462	DIN RAIL MOUNT GFCI RECEPTACLE
	43	1	ALLEN BRADLEY	700–HK36A1	16A SPDT RELAY
	44	1	ALLEN BRADLEY	700–HN121	SPDT RELAY SOCKET
	45	1	–	PHENOLIC TAG	NORTH VAULT PLC PANEL PLC–1000
	46	1	KOOLTRONICS	KSSTCF	THERMOSTAT NORMALLY CLOSED
	47	1	RITTAL	3105.320	ENCLOSURE HEATER
	48	1	APC	BE600M1	600VA UPS

NOTES

1. ALL ENCLOSURE PENETRATIONS SHALL MAINTAIN ENCLOSURE NEMA RATING.



BACK
PANEL
FRONT
VIEW

REVISIONS

By	Date	Description
RL	8/2/18	ISSUED FOR BID
RL	9/21/2018	ISSUED FOR CONSTRUCTION
RL	7/9/2019	AS-BUILT

DESIGNED: RL

CHECKED: TMR

DRAWN: RL

1 INCH
BARS PLOT
1 INCH x 1 INCH
AT FULL SCALE
1 INCH

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING
NORTH VAULT PLC PANEL LAYOUT

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

DATE JUNE 2018

JOB NO. 001.335.01

RWSD

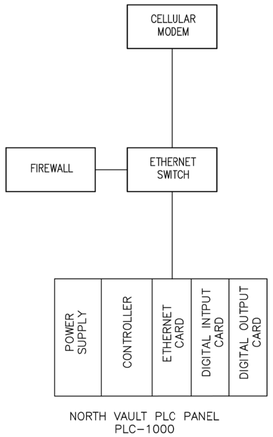
DRAWING NO. 17

COLORADO REGISTERED
BRYAN M. LORENZ
53413
9/21/18
PROFESSIONAL ENGINEER

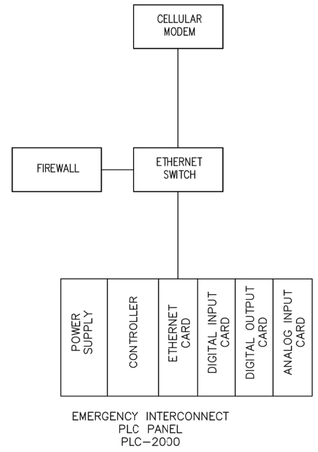
W:\T4104\T4104-15\10 DRAWINGS\03_WIP\17_NORTH VAULT PLC PANEL LAYOUT_RL_REVA.dwg, 17, 8/1/2019 7:59 AM

NOTES

1.



NORTH VAULT COMMUNICATION DIAGRAM



EMERGENCY INTERCONNECT COMMUNICATION DIAGRAM

REVISIONS	Description	Date	By
	ISSUED FOR BID	8/2/18	RL
	ISSUED FOR CONSTRUCTION	9/21/2018	RL
	AS-BUILT	7/9/2019	RL

DESIGNED: RL

CHECKED: TMR

DRAWN: RL

1 INCH x 1 INCH AT FULL SCALE

ROXBOROUGH WATER AND SANITATION DISTRICT
RAVENNA PHASE II WATER CONNECTION INFRASTRUCTURE

DRAWING: COMMUNICATION DIAGRAM

MAGNA
96 INVERNESS DRIVE EAST
UNIT R
ENGLEWOOD, CO 80112
(303) 799-1273

COLORADO REGISTERED PROFESSIONAL ENGINEER
RYAN M. LORENZ
53413
9/21/18

DATE: JUNE 2018

JOB NO.: 001.335.01

RWSD

DRAWING NO.: 18

W:\T4104\T4104-15\10 DRAWINGS\03_MIP\18_COMMUNICATION DIAGRAM_PL_REVA.dwg, 18, 8/1/2019 7:59 AM