WILLARD CITY CORPORATION
PUBLIC WORKS STANDARD DRAWINGS

SUBMITTED & RECOMMENDED

CHRIS BREINHOLT, P.E.
JONES & ASSOCIATES — DATE 6/23/22

APPROVAL

TRAVIS MOTE
WILLARD CITY MAYOR — DATE 5/24/2022

BRYCE WHEELWRIGHT
CITY PLANNER — DATE 6-23-22

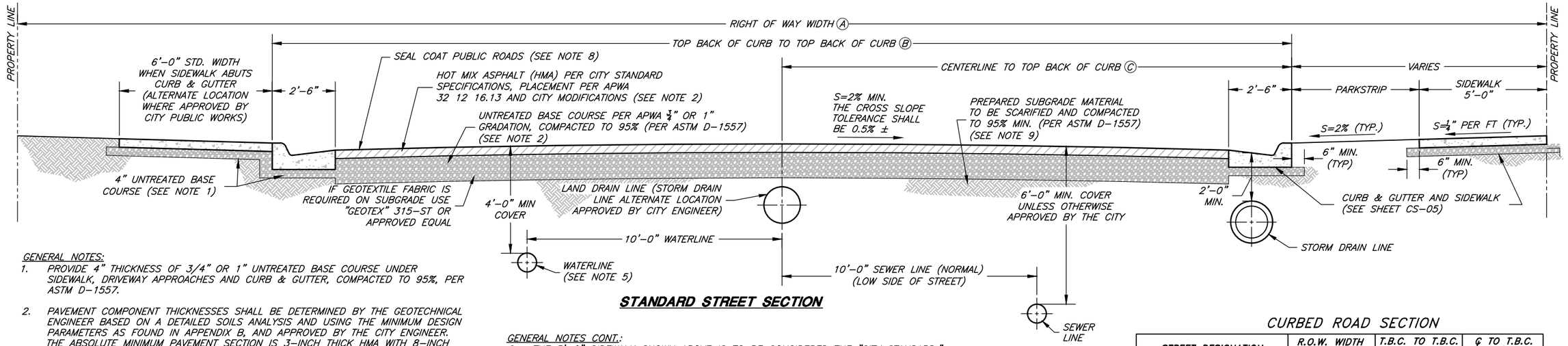
PAYDEN VINE
PUBLIC WORKS SUPERVISOR — DATE 6/15/22

SUSAN K OBRAY
ATTEST, CITY RECORDER — DATE 6-23-22

JONES & ASSOCIATES
CONSULTING ENGINEERS

ORIGINAL MAY 2022

Index of Drawings



STANDARD STREET SECTION

GENERAL NOTES:

1. PROVIDE 4" THICKNESS OF 3/4" OR 1" UNTREATED BASE COURSE UNDER SIDEWALK, DRIVEWAY APPROACHES AND CURB & GUTTER, COMPACTED TO 95%, PER ASTM D-1557.
2. PAVEMENT COMPONENT THICKNESSES SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER BASED ON A DETAILED SOILS ANALYSIS AND USING THE MINIMUM DESIGN PARAMETERS AS FOUND IN APPENDIX B, AND APPROVED BY THE CITY ENGINEER. THE ABSOLUTE MINIMUM PAVEMENT SECTION IS 3-INCH THICK HMA WITH 8-INCH UTBC. IF NO GEOTECHNICAL REPORT IS AVAILABLE (EMERGENCY SITUATION, ETC.), 4-INCH THICK HMA WITH 12-INCH THICK UTBC SHALL BE USED.
3. ALL ROAD CUTS SHALL BE PATCHED PER CS-04 AND CS-12
4. CURB & GUTTER AND SIDEWALKS SHALL BE CONSTRUCTED USING FIBER REINFORCED CONCRETE AND IN COMPLIANCE WITH WILLARD CITY TECHNICAL SPECIFICATIONS AND THESE DRAWINGS.
5. ALL CULINARY WATER MAINS AND SERVICES MUST MAINTAIN A MINIMUM SEPARATION FROM ALL SEWER MAINS AND LATERALS OF 10'-0" HORIZONTAL AND 18" VERTICAL IN ACCORDANCE WITH THE STATE OF UTAH DIVISION OF DRINKING WATER RULES SECTION R309-550-7

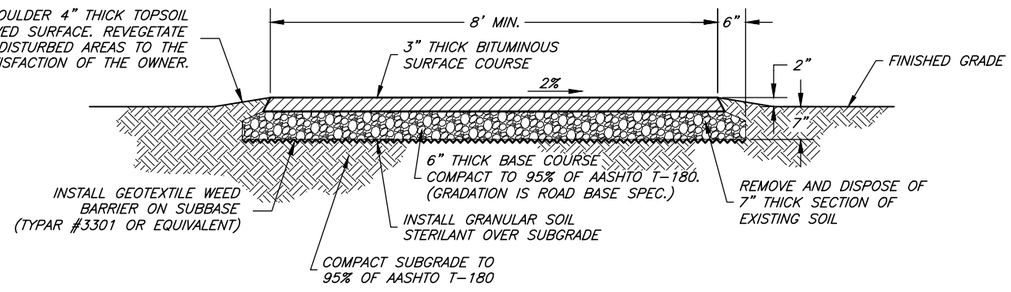
GENERAL NOTES CONT.:

6. THE 5'-0" SIDEWALK SHOWN ABOVE IS TO BE CONSIDERED THE "CITY STANDARD." OTHER LOCATIONS AND TYPES OF SIDEWALK AS REQUESTED BY THE DEVELOPER MUST BE APPROVED BY THE CITY. IF SIDEWALK IS LOCATED AGAINST THE TBC, IT MUST BE A MINIMUM OF 6 FEET IN WIDTH.
7. NATURAL GAS TYPICALLY LOCATED IN THE PARKSTRIP, POWER AND COMMUNICATION LINES TYPICALLY LOCATED BEHIND PROPERTY LINES OR IN LOT EASEMENTS.
8. "SEAL COAT" CONSISTS OF THE FOLLOWING:
   a. CHIP SEAL PER APWA 32 01 13.64 AND CITY MODIFICATIONS, AND
   b. FOG SEAL PER APWA 32 01 13.50 AND CITY MODIFICATIONS.
9. IMPORTED FILL UNDER ROADWAY SHALL BE GRANULAR BORROW, 2" MAX.

CURBED ROAD SECTION

STREET DESIGNATION	R.O.W. WIDTH (A)	T.B.C. TO T.B.C. (B)	℄ TO T.B.C. (C)
STANDARD RESIDENTIAL	60'	SEE SHEET 2A	SEE SHEET 2A
LOW IMPACT RESIDENTIAL	60'	SEE SHEET 2A	SEE SHEET 2A
MINOR RESIDENTIAL	50'	SEE SHEET 2A	SEE SHEET 2A
LOCAL	66'	SEE SHEET 2B	SEE SHEET 2B
COLLECTOR	66'	SEE SHEET 2B	SEE SHEET 2B
PUD	60'	SEE SHEET 2B	SEE SHEET 2B

NOTE:
THE ABOVE AND ALTERNATIVE ROAD SECTIONS REQUIRED SHALL BE AS DETERMINED BY THE CITY ENGINEER & PLANNING COMMISSION BASED UPON ZONING, GENERAL PLAN, SIZE OF DEVELOPMENT, ESTIMATED TRAFFIC VOLUME, & AMOUNT OF OPEN SPACE ASSOCIATED WITH DEVELOPMENTS, AS WELL AS THEIR PROXIMITY TO HIGH VOLUME ROADS OR COMMERCIAL ZONING.



8' ASPHALT TRAIL CROSS SECTION

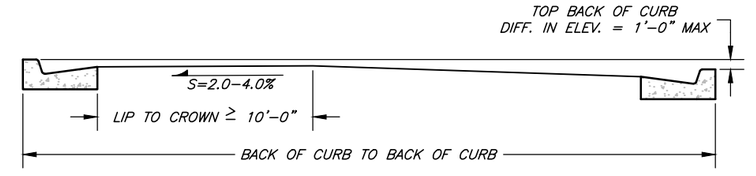
TRAIL NOTES:

A1. TRAILS SHOULD BE DESIGNED AND CONSTRUCTED AT GRADES LESS THAN 8% GRADE TO PROMOTE ACCESSIBLE USE.

B1. GRADE AVERAGES OF LESS THAN 6% WILL PROVIDE THE MOST USER FRIENDLY EXPERIENCE AND ARE PREFERRED.

C1. WHERE POSSIBLE A SLIGHT MEANDERING ALIGNMENT SHOULD BE USED.

D1. WHERE REQUIRED BENCHES SHOULD BE SPACED APPROXIMATELY EVERY ¼ MILE



CROWN LOCATION FOR VARIOUS CROSS SLOPES

CROWN NOTES:

A. MAXIMUM DIFFERENCE IN ELEVATION BETWEEN CURBS ON OPPOSITE SIDES OF THE STREET SHALL NOT EXCEED 1'-0" AS SHOWN IN DETAIL.

B. ON ARTERIAL STREETS AND CERTAIN STREETS APPROVED BY THE CITY COUNCIL, THE CITY ENGINEER WILL PROVIDE A PAVEMENT DESIGN. LOCATION OF SIDEWALK AND CURB & GUTTER MAY VARY PER DIRECTION OF THE CITY ENGINEER.

C. ALL OTHER PROPOSED STREET CROSS SECTIONS SHALL BE AS APPROVED BY THE CITY ENGINEER.

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.	

SCALE: N.T.S.

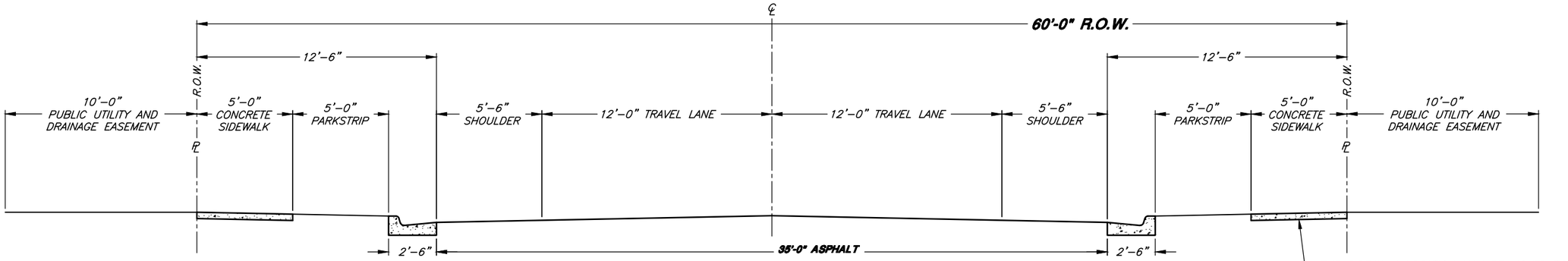
DESIGNED
DRAWN
CHECKED

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

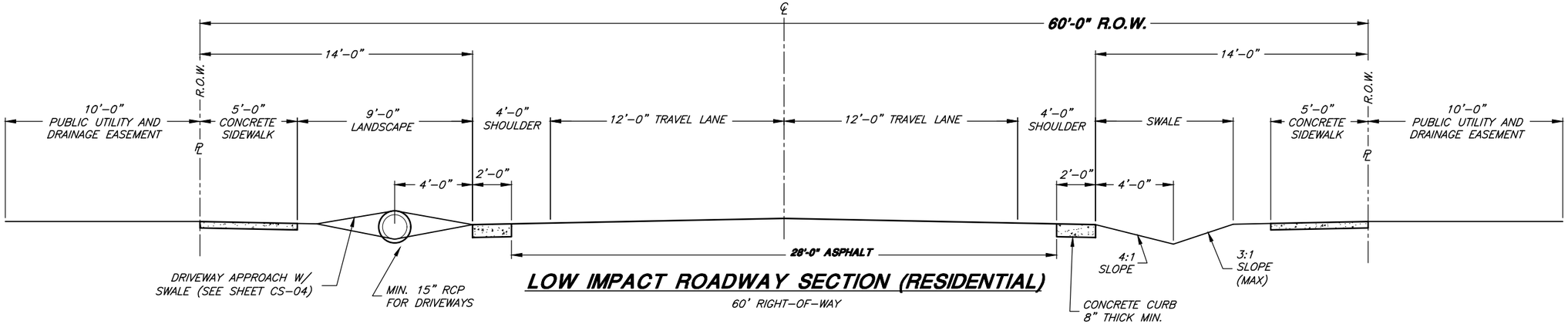
PUBLIC ROADS - TYPICAL STREET SECTION & TRAIL DETAILS

SHEET: CS-02
OF 31 SHEETS
0



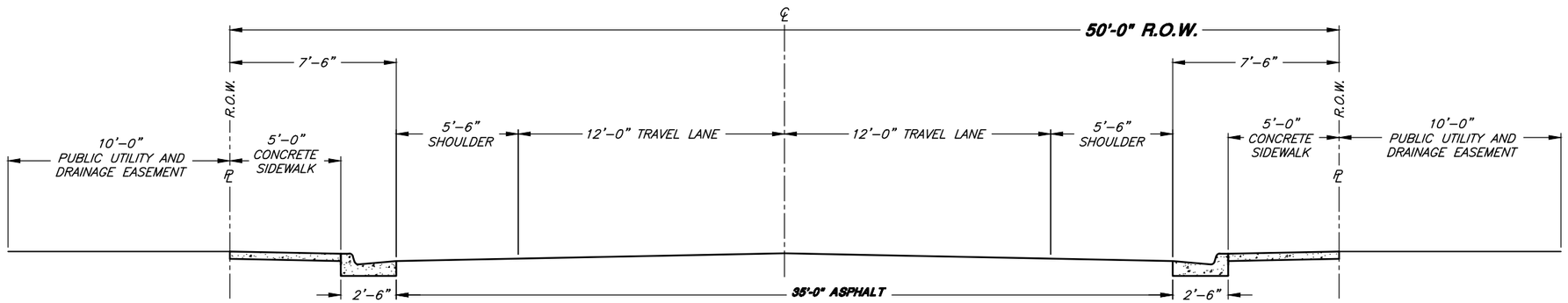
STANDARD RESIDENTIAL ROADWAY SECTION

THE 60'–0" ROADWAY SECTION SHOWN ABOVE IS TO BE CONSIDERED THE "CITY STANDARD". WHERE DESIGNATED BY THE CITY ON A CASE BY CASE BASIS IN AREAS OF PRE–EXISTING ROADWAY IMPROVEMENTS, ALTERNATE STREET CROSS SECTION DESIGNS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER AND THE CITY PUBLIC WORKS DEPARTMENT.



LOW IMPACT ROADWAY SECTION (RESIDENTIAL)

60' RIGHT–OF–WAY

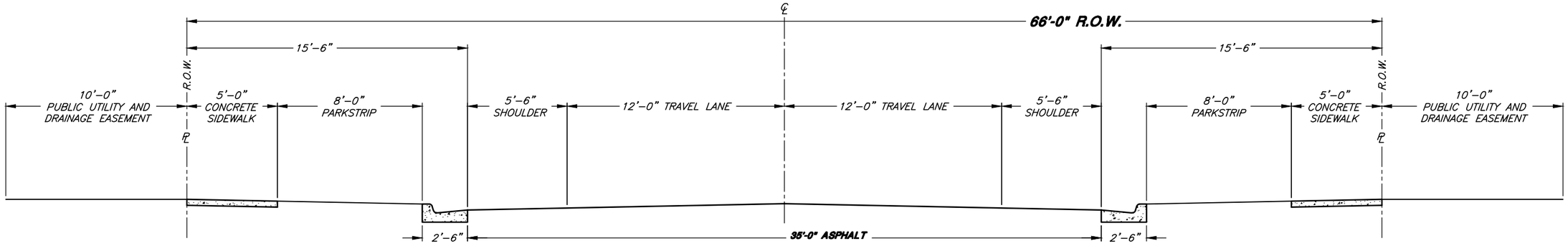


MINOR RESIDENTIAL ROADWAY SECTION

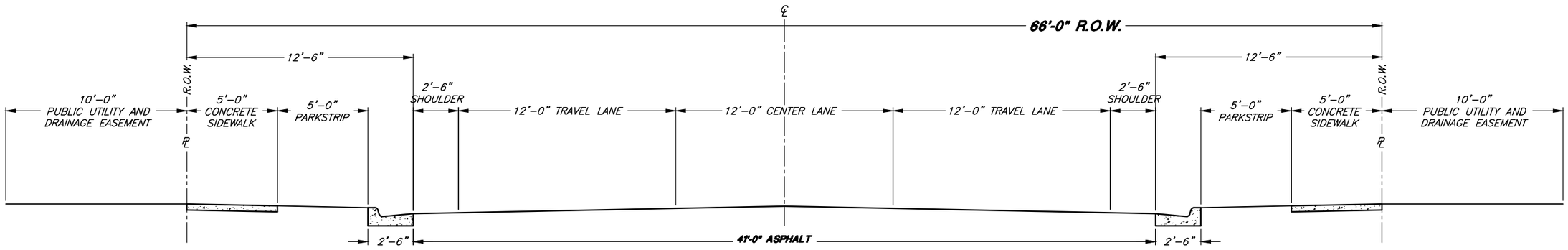
50' RIGHT–OF–WAY

PROJECT ENGINEER	REV.	DATE	APPR.	SCALE:	DESIGNED	JONES & ASSOCIATES	WILLARD CITY CORPORATION
MAY 2022				N.T.S.	DRAWN	CONSULTING ENGINEERS	PUBLIC WORKS STANDARDS
DATE					CHECKED	6080 Fashion Point Drive South Ogden, Utah 84403 (801) 476–9767 www.jonescivil.com	PUBLIC ROADS - STANDARD RESIDENTIAL ROAD SECTIONS

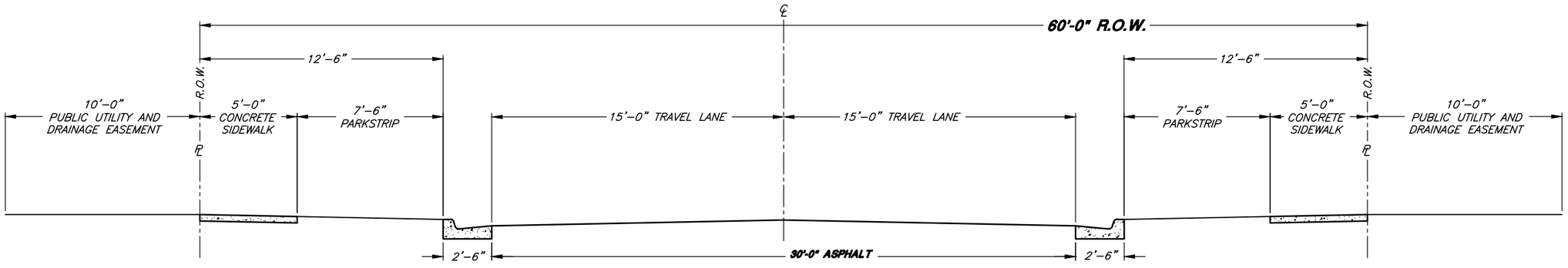
SHEET: CS-02A
OF 31 SHEETS
0



LOCAL - 66' RIGHT-OF-WAY



COLLECTOR - 66' RIGHT-OF-WAY



PUD - 60' RIGHT-OF-WAY

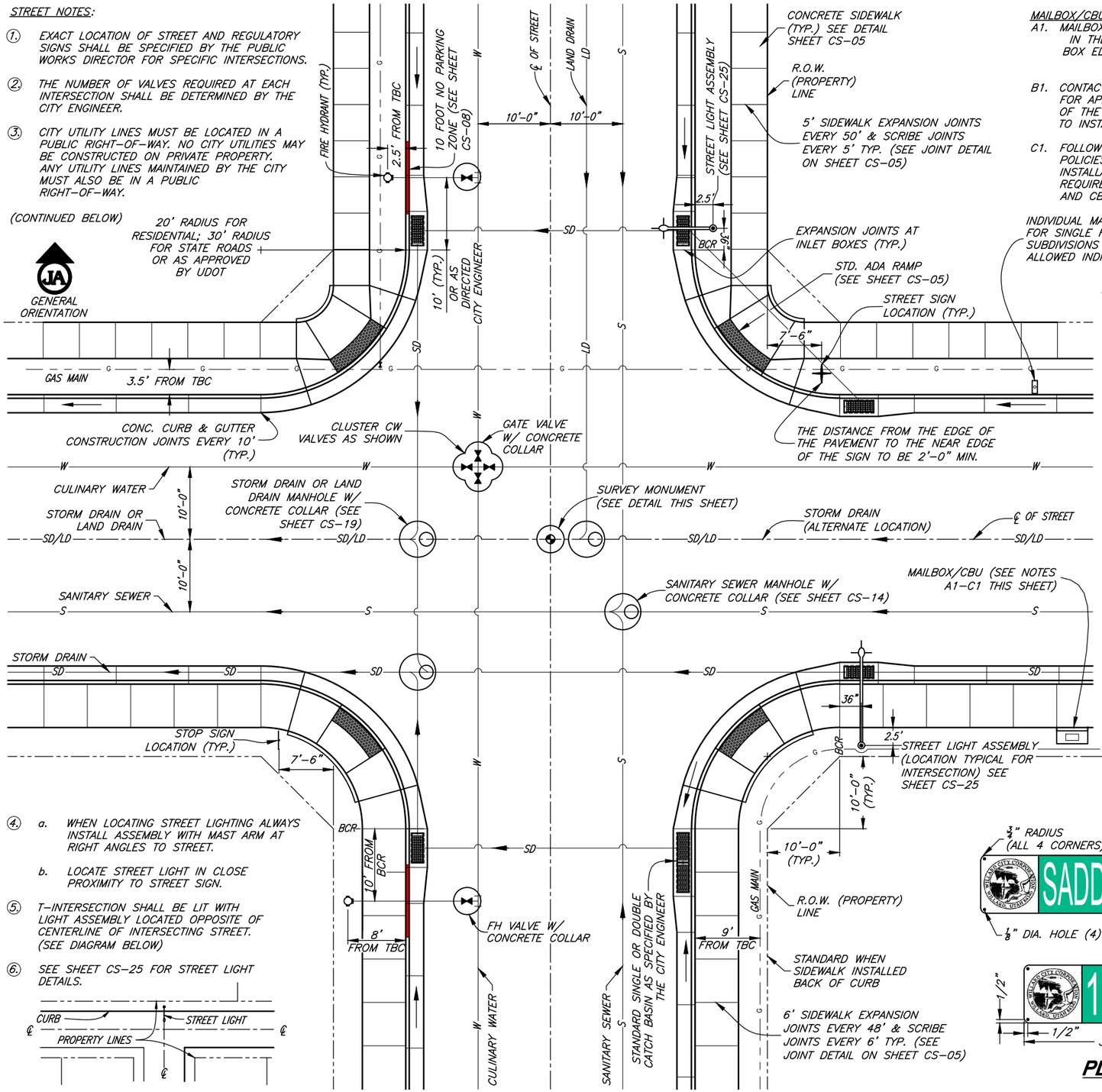
PROJECT ENGINEER	REV.	DATE	APPR.	SCALE:	DESIGNED	JA JONES & ASSOCIATES	WILLARD CITY CORPORATION
MAY 2022				N.T.S.	DRAWN	CONSULTING ENGINEERS	PUBLIC WORKS STANDARDS
DATE					CHECKED	6080 Fashion Point Drive South Ogden, Utah 84403 (801) 476-9767 www.jonescivil.com	PUBLIC ROADS - STANDARD LOCAL, COLLECTOR & PUD ROAD SECTIONS

SHEET: CS-02B OF 31 SHEETS 0

STREET NOTES:

1. EXACT LOCATION OF STREET AND REGULATORY SIGNS SHALL BE SPECIFIED BY THE PUBLIC WORKS DIRECTOR FOR SPECIFIC INTERSECTIONS.
2. THE NUMBER OF VALVES REQUIRED AT EACH INTERSECTION SHALL BE DETERMINED BY THE CITY ENGINEER.
3. CITY UTILITY LINES MUST BE LOCATED IN A PUBLIC RIGHT-OF-WAY. NO CITY UTILITIES MAY BE CONSTRUCTED ON PRIVATE PROPERTY. ANY UTILITY LINES MAINTAINED BY THE CITY MUST ALSO BE IN A PUBLIC RIGHT-OF-WAY.

(CONTINUED BELOW)



4. a. WHEN LOCATING STREET LIGHTING ALWAYS INSTALL ASSEMBLY WITH MAST ARM AT RIGHT ANGLES TO STREET.
   b. LOCATE STREET LIGHT IN CLOSE PROXIMITY TO STREET SIGN.
5. T-INTERSECTION SHALL BE LIT WITH LIGHT ASSEMBLY LOCATED OPPOSITE OF CENTERLINE OF INTERSECTING STREET. (SEE DIAGRAM BELOW)
6. SEE SHEET CS-25 FOR STREET LIGHT DETAILS.

MAILBOX/CBU NOTES:

A1. MAILBOXES SHALL NOT BE PLACED IN THE SIDEWALK. NO MAILBOX OR CBU BOX EDGES SHALL EXTEND PAST THE TBC.

B1. CONTACT THE LOCAL POSTMASTER FOR APPROVAL ON THE LOCATION OF THE MAILBOX OR CBU PRIOR TO INSTALLATION.

C1. FOLLOW USPS GUIDELINES & POLICIES FOR THE PLACEMENT, INSTALLATION, AND ACCESS REQUIREMENTS FOR ALL MAILBOX AND CBU UNITS.

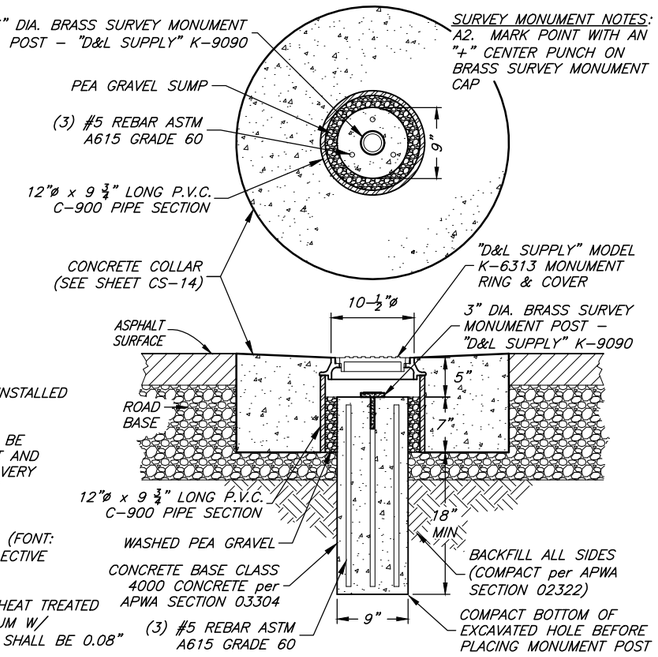
INDIVIDUAL MAILBOXES ALLOWED ONLY FOR SINGLE HOMES BEING BUILT IN SUBDIVISIONS THAT WERE PREVIOUSLY ALLOWED INDIVIDUAL BOXES

STREET SIGN NOTES:

A. ALL SIGNS TO BE FURNISHED & INSTALLED BY THE DEVELOPER.
B. STREET SIGN BACKGROUND SHALL BE REGULATORY GREEN, BOTH STREET AND TRAFFIC SIGNS SHALL BE AT THE VERY LEAST HIGH INTENSITY REFLECTIVE SHEETING (9FP-85 TYPE IIIA)
C. LEGEND SHALL BE WHITE LETTERS (FONT: HIGHWAY C), HIGH INTENSITY REFLECTIVE SHEETING (9FP-85 IIIA)
D. SIGN BLANK SHALL BE 6081-T6 HEAT TREATED HIGH TENSILE DEGREASED ALUMINUM W/ ALODINE 1200 FINISH-THICKNESS SHALL BE 0.08"
E. EACH SIGN SHALL CONSIST OF TWO PLATES RIVETED TOGETHER & MOUNTED AS SHOWN
F. SIGNS ON PRIVATE ROADS SHALL MEET ALL SPECIFICATIONS FOR STANDARD SIGNS. (PRIVATE SIGNS WILL NOT BE MAINTAINED BY THE CITY.)
G. ALL STREETS WITH NAMES MUST ALSO SHOW LOCATIONS COORDINATE DESIGNATION
H. CONTACT CITY PRIOR TO MAKING SIGNS TO VERIFY PROPER NAMES AND COORDINATES

SURVEY MONUMENT NOTES:

A2. MARK POINT WITH AN "+" CENTER PUNCH ON BRASS SURVEY MONUMENT CAP



SURVEY MONUMENT DETAIL

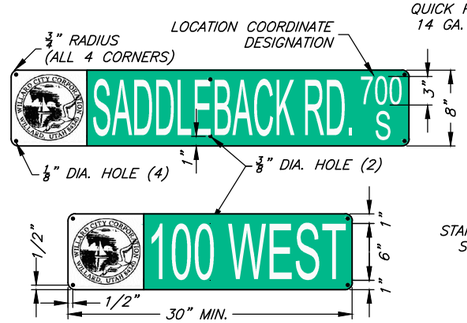
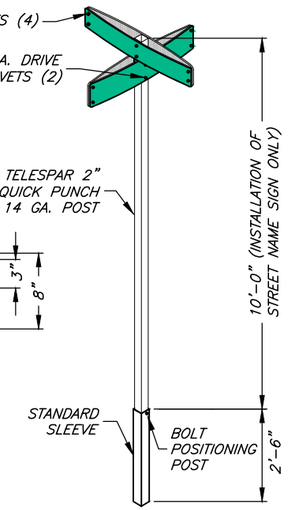


PLATE DETAIL



STREET SIGN & POST

STREET / TRAFFIC SIGN & POST

REV.	DATE	APPR.	
1	MAY '22	ZJB	UPDATED STREET SIGN POST DIMENSIONS

PROJECT ENGINEER
MAY 2022
DATE

SCALE: N.T.S.

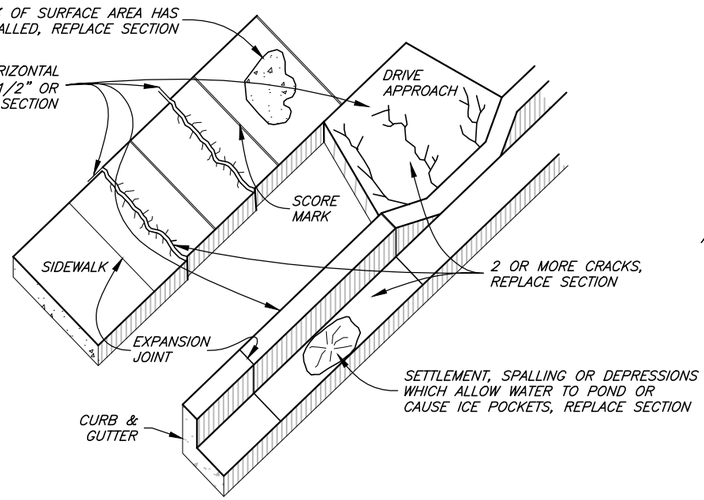
DESIGNED
DRAWN
CHECKED

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

PUBLIC ROADS - TYPICAL INTERSECTION & STREET DETAILS

SHEET: CS-03
OF 31 SHEETS
0



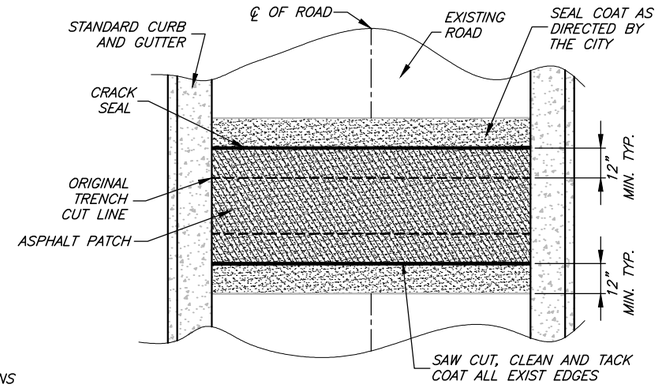
CONCRETE REPLACEMENT NOTES:

A. REPLACEMENT IS REQUIRED IF ANY COMPONENT HAS ONE OR MORE OF THE CONDITIONS SHOWN ABOVE.

B. ANY TIME CONCRETE IS CUT TO REPLACE A DEFECTIVE COMPONENT, THE CUT SHOULD EXTEND COMPLETELY THROUGH THE PIECE BEING REPLACED.

C. CURB & GUTTER MIN. 10'–0" SECTIONS.

DEFECTIVE CONCRETE REPLACEMENT CRITERIA

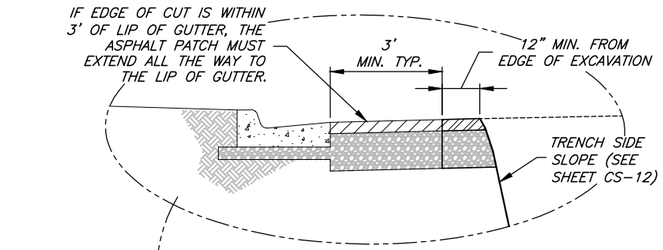


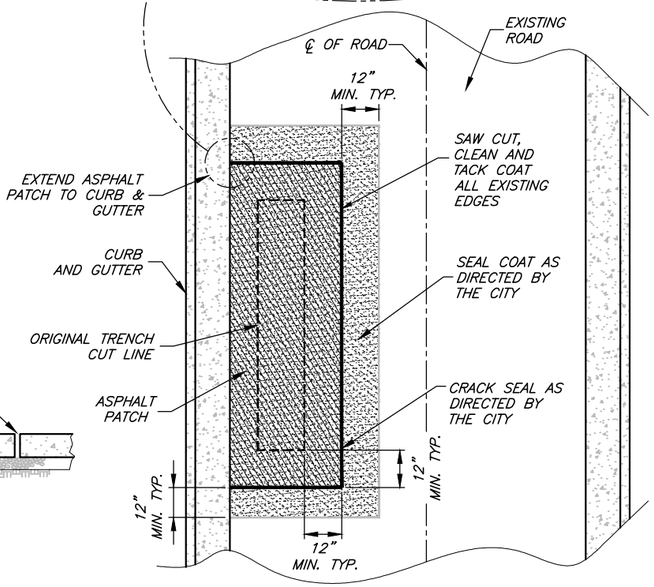
TYPICAL HORIZONTAL ASPHALT PATCH PLAN

ASPHALT PATCH NOTES:

A1. ON ANY ROAD PAVED OR OVERLAYED WITHIN THE LAST 10 YEARS, THE PATCH MUST BE COMPLETED PER APWA PLAN 255 (BITUMINOUS PAVEMENT T–PATCH).

A2. NO ANGLED ASPHALT PATCHING ALLOWED.



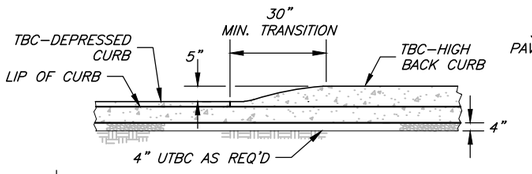


TYPICAL PARALLEL ASPHALT PATCH PLAN

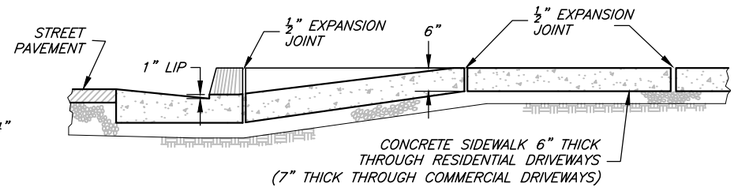
DRIVEWAY APPROACH NOTES:

1. IN NEW SUBDIVISIONS WHERE FUTURE DRIVEWAY LOCATIONS ARE UNKNOWN, THE DRIVEWAY APPROACH SHALL BE MADE BY SAW CUTTING THE BACK OF THE EXISTING CURB TO THE REQUIRED DRIVEWAY WIDTH. ALL SAW CUTTING SHALL BE ACCOMPLISHED BY A CITY APPROVED LICENSED CONTRACTOR.

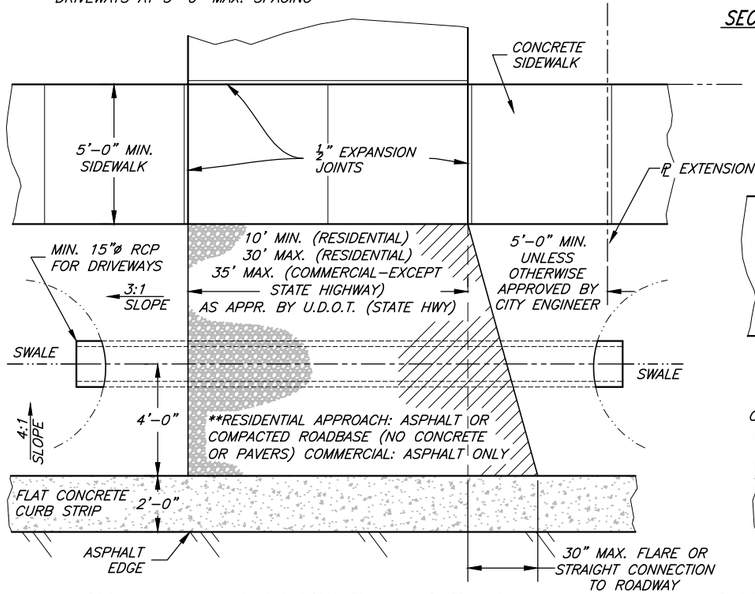
2. SCORE SIDEWALK ½" OF SIDEWALK THICKNESS AT EACH 5'–0" OR 6'–0" SECTION. EXPANSION JOINTS AT EACH 48'–0" (6'–0" SIDEWALK) OR 50'–0" (5'–0" SIDEWALK), PROVIDE ADDITIONAL CONTRACTION JOINTS ON OVERSIZED DRIVEWAYS AT 5'–0" MAX. SPACING



SECTION B–B

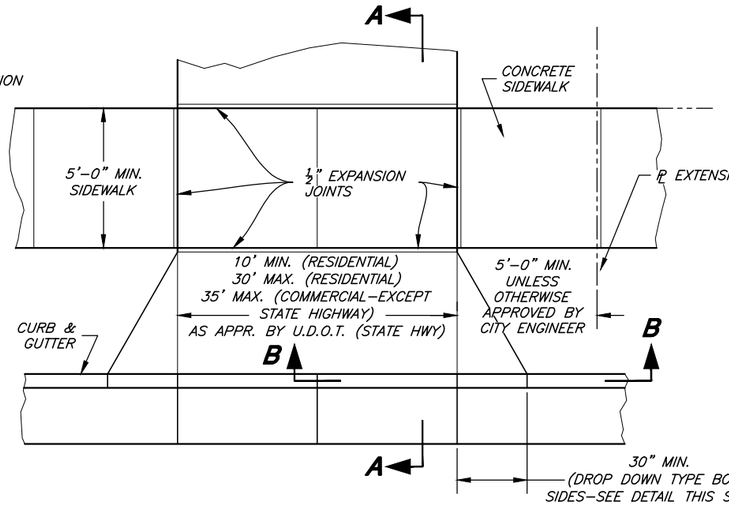


SECTION A–A



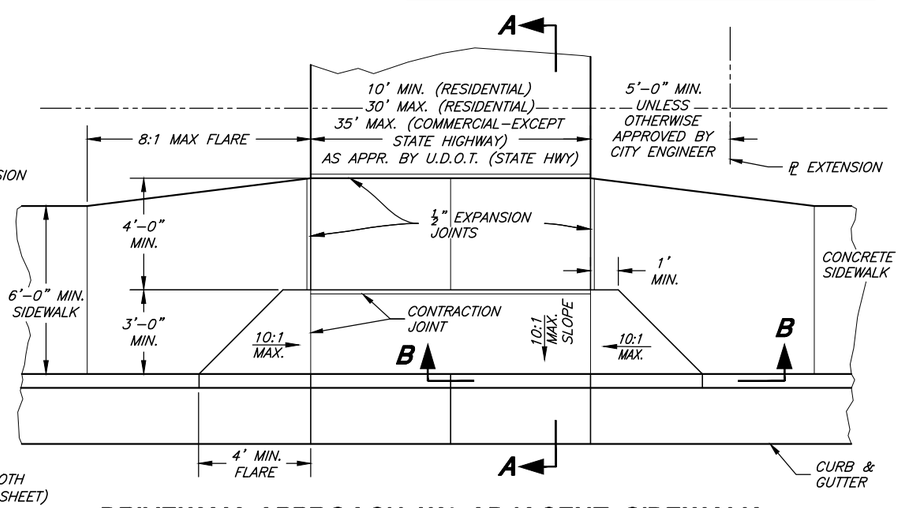
DRIVEWAY APPROACH W/ SWALE

LOW IMPACT ROADWAY SECTION



DRIVEWAY APPROACH W/ PARKSTRIP

DROP DOWN STYLE (CITY STANDARD)



DRIVEWAY APPROACH W/ ADJACENT SIDEWALK

PROJECT ENGINEER	REV.	DATE	APPR.	SCALE:	DESIGNED	DRAWN	CHECKED
MAY 2022 DATE				N.T.S.			

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476–9767
www.jonescivil.com

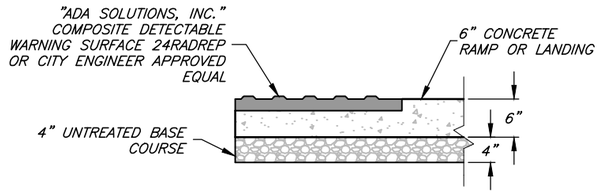
WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

PUBLIC ROADS - TYPICAL DRIVE APPROACH, ASPHALT PATCH & DEFECTIVE CONCRETE REPLACEMENT DETAILS

SHEET: CS-04
OF 31 SHEETS
0

DETECTABLE WARNING SURFACE NOTES:

1. LOCATE THE DETECTABLE WARNING SURFACE SO THE OUTSIDE CORNER NEAREST THE STREET IS WITHIN 1 INCH OF THE BACK OF CURB (TBC). PROVIDE 2–FOOT MINIMUM DEPTH.
2. PROVIDE DETECTABLE WARNING SURFACE FOR FULL WIDTH OF CURB CUT.
3. THE DETECTABLE WARNING SURFACE DOMES SHALL BE ORIENTED SUCH THAT THE ROWS ARE PARALLEL WITH THE DIRECTION OF PEDESTRIAN TRAVEL TO THE RAMP ON THE OPPOSITE SIDE OF THE STREET.
4. THE STANDARD COLOR FOR THE DETECTABLE WARNING SURFACE SHALL BE DARK GRAY OR PRE–APPROVED CONTRASTING COLOR. WHEN THE EXISTING SIDEWALK COLOR IS NOT STANDARD CONCRETE, THE COLOR OF THE DETECTABLE WARNING SURFACE SHALL BE DETERMINED BY THE CITY ENGINEER OR AUTHORIZED REPRESENTATIVE.
5. WHEN A DETECTABLE WARNING SURFACE DOME IS CUT, THE REMAINING PORTION OF THE DOME SHALL BE BEVELED TO A MAXIMUM SLOPE OF 1:2.



DETECTABLE WARNING SURFACE DETAIL

ADA RAMP NOTES:

A. WHERE DESIGNATED BY THE CITY, ALTERNATE UDOT OR APWA RAMP DESIGNS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER AND THE CITY PUBLIC WORKS DEPARTMENT. SUBMIT ENGINEERED CONSTRUCTION PLANS TO CITY ENGINEER FOR REVIEW AND ACCEPTANCE PRIOR TO CONSTRUCTION.

B. SITE CONDITIONS WILL VARY. CONFIGURATION OF RAMP, LANDING, AND TRANSITION MAY BE CHANGED, BUT THEY MUST MEET DIMENSIONS AND SLOPES AS SHOWN IN THE MOST RECENT EDITION OF THE U.D.O.T. STANDARDS & SPECIFICATIONS (SHEETS PA1 THROUGH PA5). THE USE OF FLARES, CURB WALLS, ETC. ARE AT THE DISCRETION OF THE ENGINEER.

C. LOCATE CURB CUT WITHIN CROSSWALK.

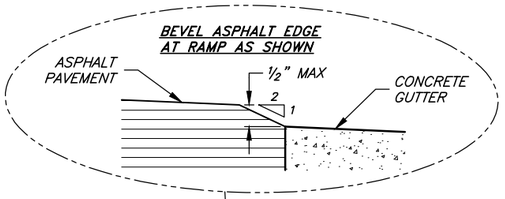
D. RAMP GRADE BREAK MUST BE PERPENDICULAR TO THE RUNNING SLOPE.

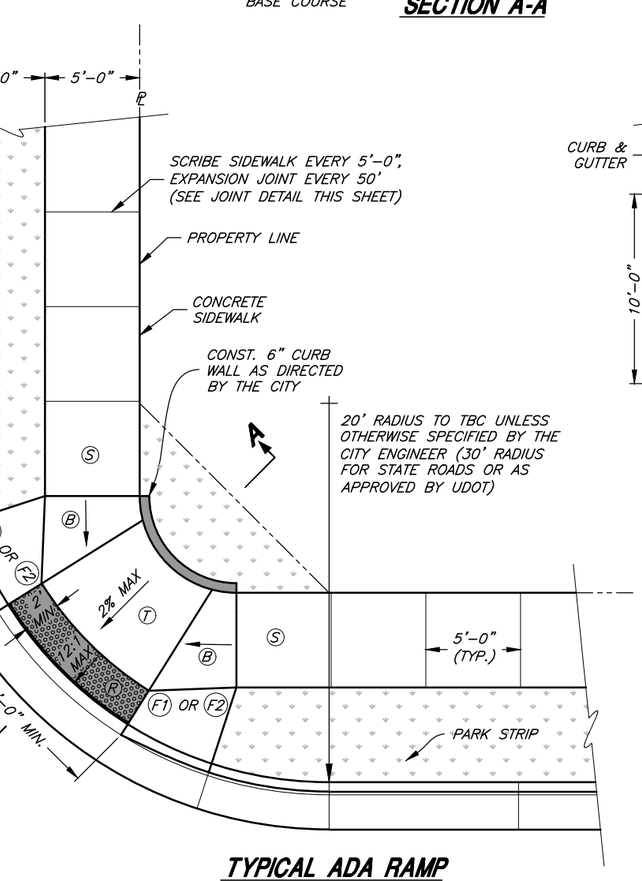
SLOPE TABLE			
	ITEM	MAX RUNNING SLOPE*	MAX. CROSS SLOPE*
Ⓣ	TURNING SPACE [2]	2% (1V:48H)	2% (1V:48H)
Ⓡ	RAMP	8.3% (1V:12H)	2% (1V:48H)
Ⓢ	SIDEWALK	5% (1:20) [1]	2% (1V:48H)
Ⓕ1	TRAVERSABLE SURFACE	10% (1V:10H)	--
Ⓕ2	NON–TRAVERSABLE SURFACE	25% (1V:4H)	--
Ⓑ	BLENDED TRANSITION	5% (1V:20H) 2% MIN.	2% (1V:48H)

* RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL. CROSS SLOPE IS PERPENDICULAR TO PEDESTRIAN TRAVEL.

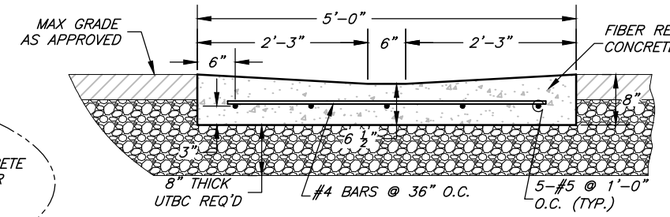
[1] 5% MAX OR NATURAL SLOPE OF LAND

[2] NOT TO EXCEED 2% IN ANY DIRECTION



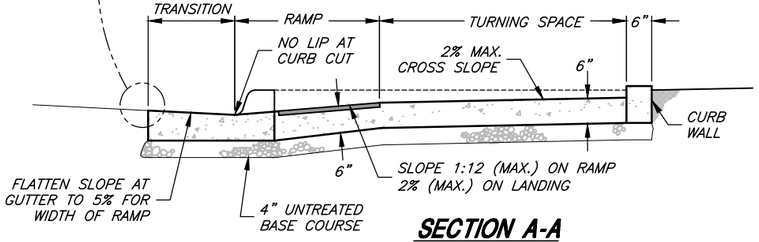


TYPICAL ADA RAMP

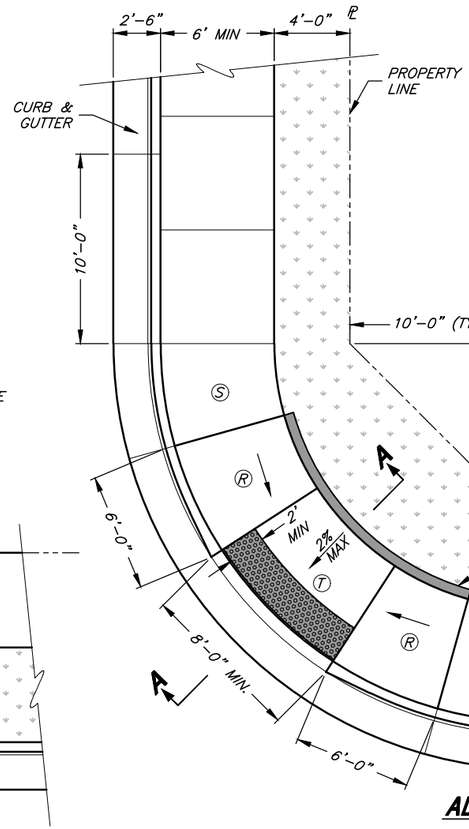


CROSS DRAIN SECTION

(FOR REPLACEMENTS ONLY – NO NEW CONSTRUCTION)

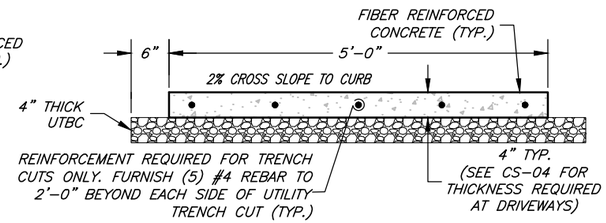


SECTION A-A



ADA RAMP-DETAIL "B"

(WITHOUT PARK STRIP)



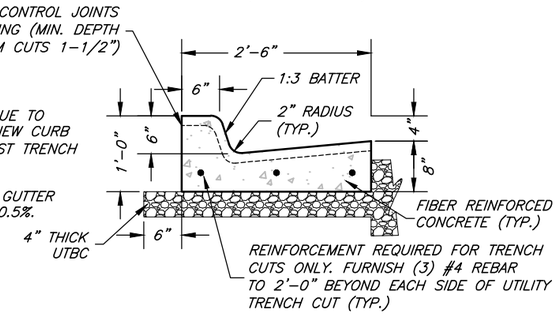
SIDEWALK SECTION

(CITY STANDARD)

CURB & GUTTER NOTES:

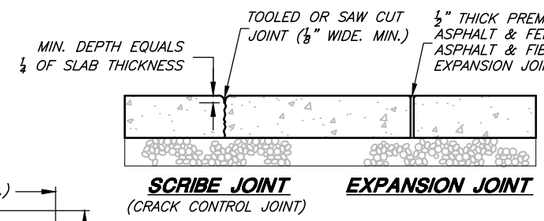
A1. WHEN REPLACING CURB DUE TO CONSTRUCTION ACTIVITY, NEW CURB MUST EXTEND 5' MIN. PAST TRENCH ON EACH SIDE.

B1. THE SLOPE FOR CURB & GUTTER MUST BE A MINIMUM OF 0.5%.



CURB & GUTTER SECTION

(CITY STANDARD)



SCRIBE JOINT (CRACK CONTROL JOINT) EXPANSION JOINT

JOINT DETAIL

GENERAL NOTES:

A2. INSTALLATION TOLERANCES ON CURB & GUTTER AND SIDEWALK PER APWA 32 16 13, 3.7.

B2. AS–BUILT SURVEY MAY BE REQUIRED TO VERIFY COMPLIANCE WITH TOLERANCES.

C2. GRINDING OF CONCRETE, TO MEET TOLERANCES, WILL NOT BE ALLOWED.

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.

SCALE: N.T.S.

DESIGNED
DRAWN
CHECKED

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476–9767
www.jonescivil.com

WILLARD CITY CORPORATION

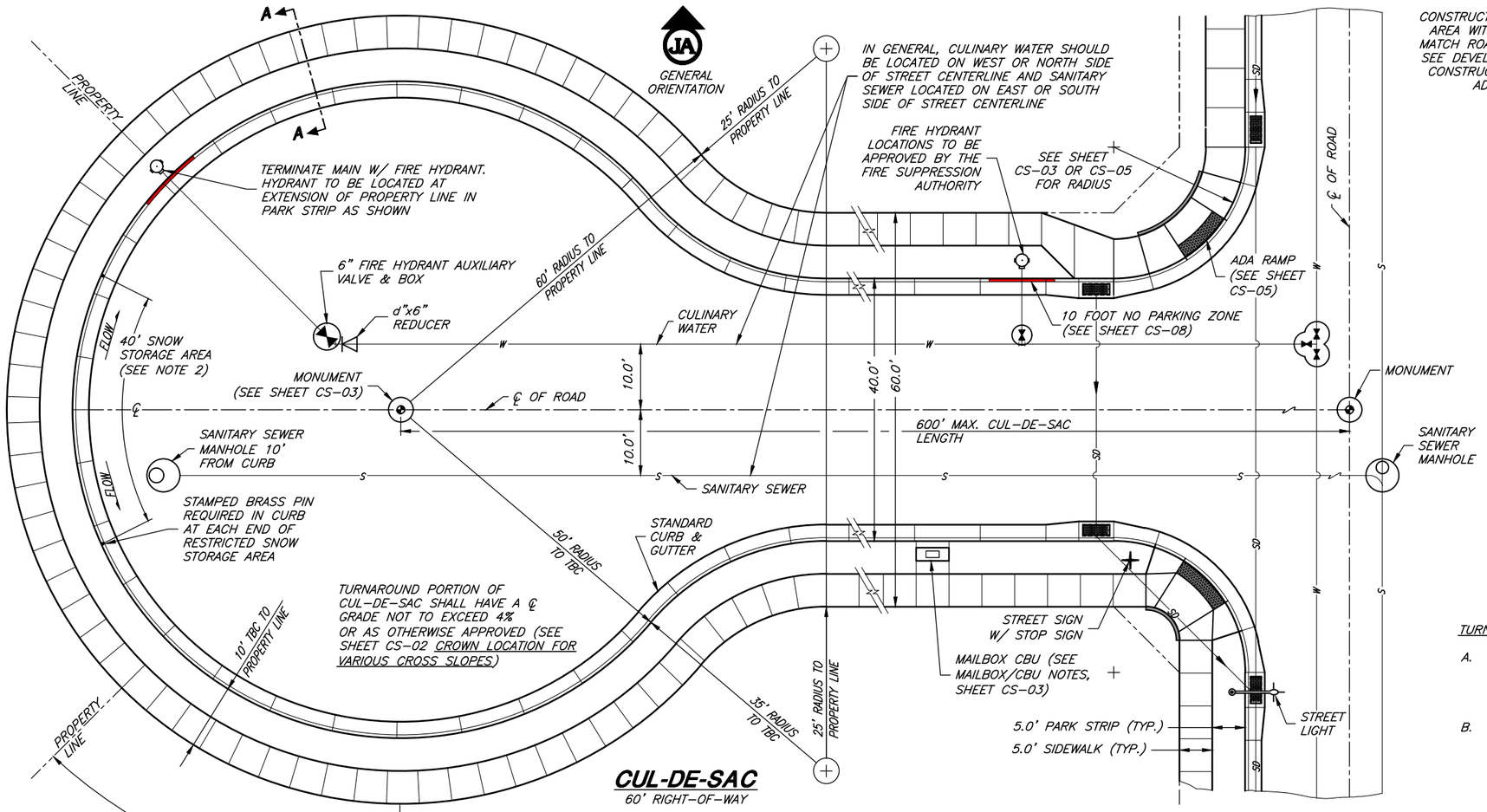
PUBLIC WORKS STANDARDS

PUBLIC ROADS - TYPICAL ADA RAMP, SIDEWALK, CURB & GUTTER, AND CONCRETE JOINT DETAILS

SHEET: CS-05

OF 31 SHEETS

0



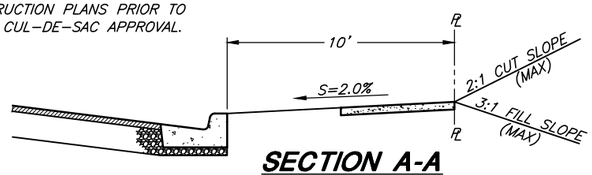
CUL-DE-SAC

60' RIGHT-OF-WAY

GENERAL NOTES:

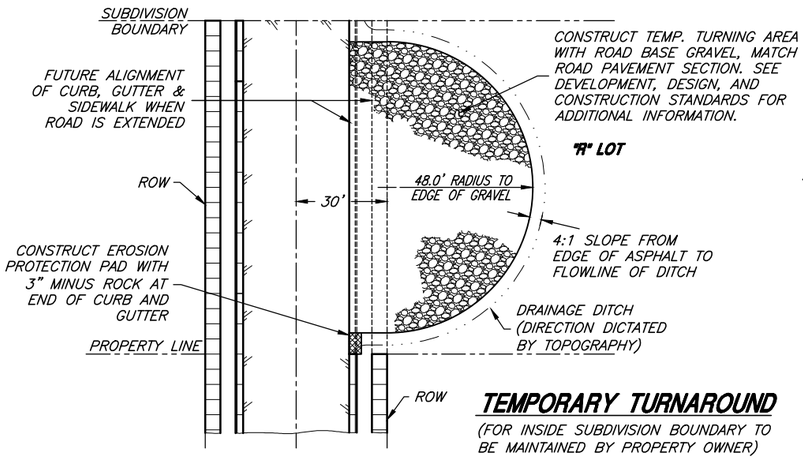
1. THE CIRCULAR CUL-DE-SAC LAYOUT ON THIS SHEET IS TO BE CONSIDERED AS THE CITY STANDARD DESIGN. OTHER ALTERNATE DESIGNS MAY BE CONSIDERED AS APPROVED BY THE CITY ENGINEER.

2. NO DRIVEWAYS, FIRE HYDRANTS, OR MAIL BOXES ARE PERMITTED WITHIN THE SNOW STORAGE AREA. THE SNOW STORAGE AREA SHALL BE SHOWN ON THE IMPROVEMENT/CONSTRUCTION PLANS PRIOR TO SUBDIVISION AND/OR CUL-DE-SAC APPROVAL.



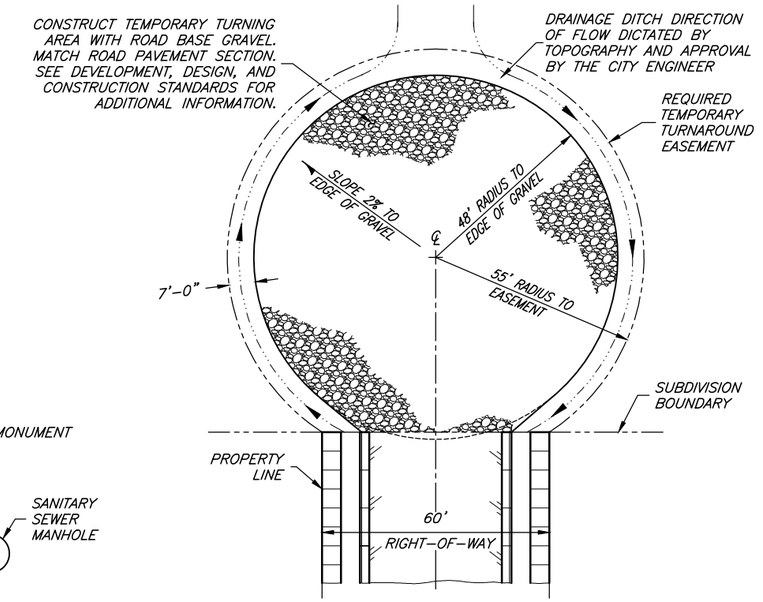
SECTION A-A

REQUIRED GRADING BETWEEN TBC AND PROPERTY LINE



TEMPORARY TURNAROUND

(FOR INSIDE SUBDIVISION BOUNDARY TO BE MAINTAINED BY PROPERTY OWNER)



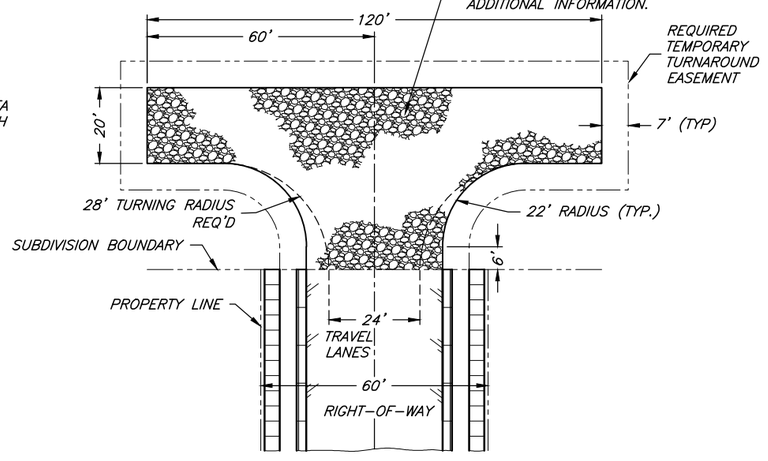
CITY STANDARD TEMPORARY TURNAROUND

(FOR OUTSIDE OF SUBDIVISION BOUNDARY AND TO BE MAINTAINED BY PROPERTY OR EASEMENT OWNER)

TURNAROUND NOTES:

A. THE DRAINAGE DITCH SHALL HAVE A 4 HORZ. TO 1 VERT. (4:1) SIDE SLOPE FROM THE EDGE OF GRAVEL TO THE FLOW LINE OF DITCH.

B. DRAINAGE DITCH MUST HAVE A MIN. GRADE OF 0.5%



ALTERNATE TEMPORARY TURNAROUND

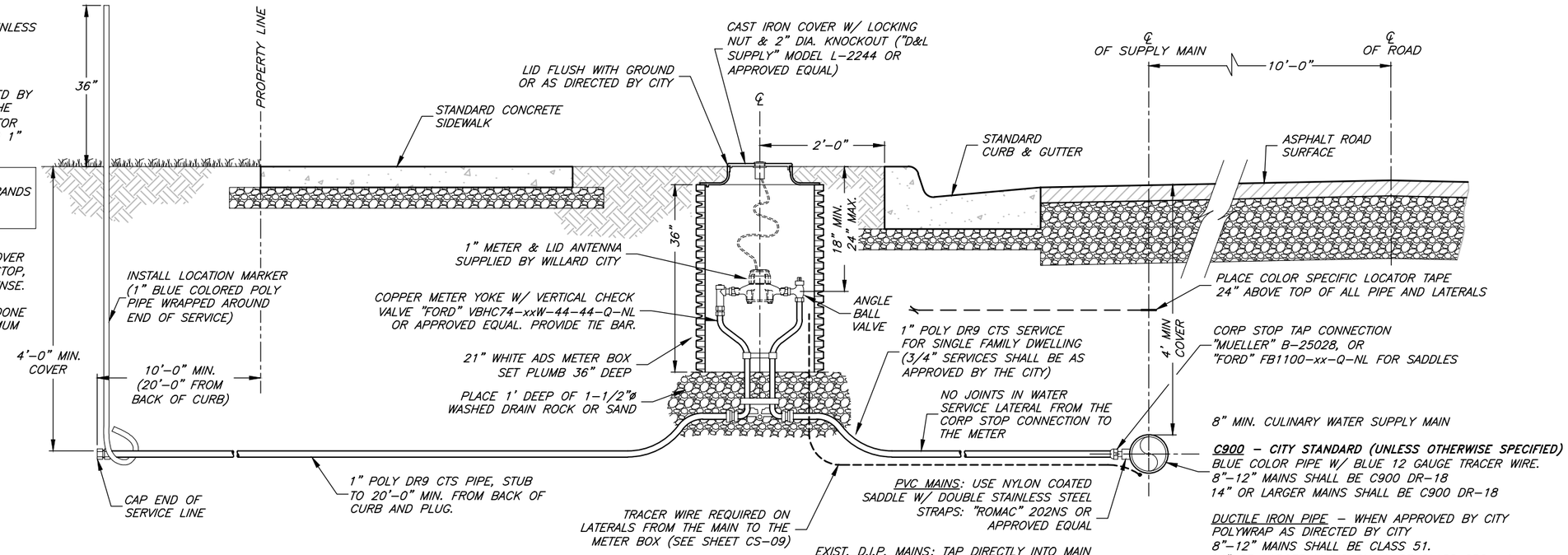
120' HAMMERHEAD DETAIL

PROJECT ENGINEER	REV.	DATE	APPR.	SCALE: N.T.S.	DESIGNED	JONES & ASSOCIATES CONSULTING ENGINEERS 6080 Fashion Point Drive South Ogden, Utah 84403 (801) 476-9767 www.jonescivil.com	WILLARD CITY CORPORATION
MAY 2022					DRAWN		PUBLIC WORKS STANDARDS
DATE					CHECKED		PUBLIC ROADS - CUL-DE-SAC & TEMP. TURNAROUND DETAILS

SHEET: CS-06 OF 31 SHEETS 0

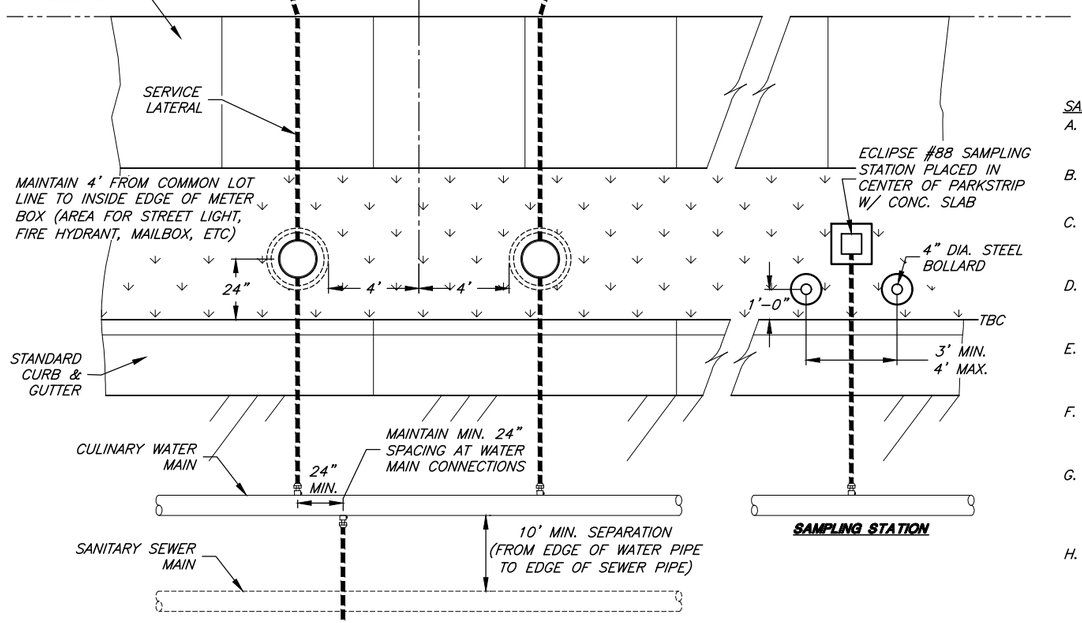
GENERAL NOTES:

1. ALL FITTINGS SHALL BE "MUELLER" COMPRESSION TYPE UNLESS OTHERWISE NOTED.
2. "BLUE" BOLTS AND NUTS ARE REQUIRED BY THE CITY.
3. ALL SUPPLIES, LABOR, MACHINERY, ETC. WILL BE SUPPLIED BY THE CONTRACTOR. WILLARD CITY WILL SUPPLY AND SET THE METER ONLY ON ¾" AND 1" CONNECTIONS. THE CONTRACTOR SHALL SUPPLY METERS FOR CONNECTIONS GREATER THAN 1" (SEE SHEET CS-10).
4. ALL SPECIFIED BRANDS OF MATERIALS SHOWN ON THESE DRAWINGS ARE "CITY STANDARDS." OTHER EQUIVALENT BRANDS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER AND THE CITY PUBLIC WORKS DEPARTMENT.
5. CULINARY WATER METERS SHALL NOT BE LOCATED WITHIN THE DRIVEWAY AREA. IF A DRIVEWAY IS PLACED OVER AN EXISTING METER, THE "ENTIRE" SERVICE LINE, CORP STOP, AND METER SHALL BE RELOCATED AT THE OWNER'S EXPENSE.
6. INSPECTION OF ALL WATER LINE INSTALLATIONS WILL BE DONE BY THE CITY WATER DEPARTMENT, WITH A 48 HOUR MINIMUM NOTICE REQUIRED PRIOR TO START OF WORK.



RESIDENTIAL WATER SERVICE AND METER

CITY STANDARD



STANDARD WATER METER LOCATION

SAMPLING STATION NOTES:

A. SAMPLING STATIONS SHALL BE 4' BURY, WITH A ¾" FIP INLET, AND A ¾" UNTHREADED NOZZLE.

B. ALL STATIONS SHALL BE ENCLOSED IN A LOCKABLE, NON-REMOVABLE, ALUMINUM-CAST HOUSING.

C. WHEN OPENED, THE STATION SHALL REQUIRE NO KEY FOR OPERATION, AND THE WATER WILL FLOW IN AN ALL BRASS WATERWAY.

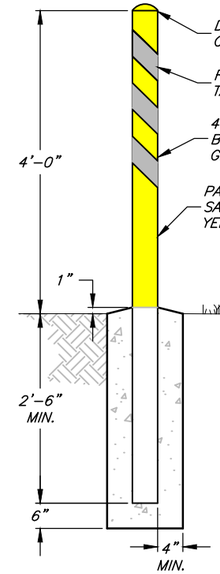
D. ALL WORKING PARTS WILL ALSO BE OF BRASS AND BE REMOVABLE FROM ABOVE GROUND WITH NO DIGGING. EXTERIOR PIPING SHALL BE BRASS PIPE.

E. A COPPER VENT TUBE WILL ENABLE EACH STATION TO BE PUMPED FREE OF STANDING WATER TO PREVENT FREEZING AND TO MINIMIZE BACTERIA GROWTH.

F. ECLIPSE NO. 88 SAMPLING STATION SHALL BE MANUFACTURED BY KUPFERLE FOUNDRY, ST. LOUIS, MO 63102

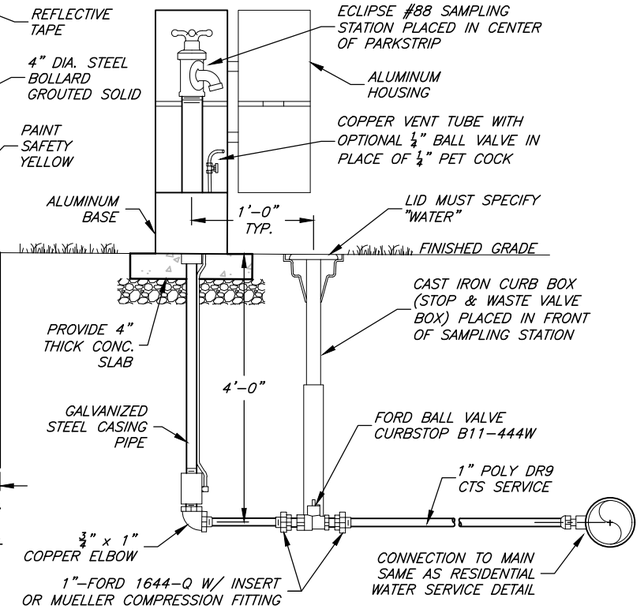
G. ALL DEVELOPERS ARE REQUIRED TO INSTALL A SAMPLING STATION FOR EVERY 80 LOTS OR ONE PER DEVELOPMENT FOR DEVELOPMENTS SMALLER THAN 80 LOTS. LOCATION AS DIRECTED BY THE CITY ENGINEER.

H. PROVIDE 2 STEEL BOLLARDS TO PROTECT SAMPLING STATION. PLACE IN FRONT OF SAMPLING STATION AS SHOWN IN THE DETAIL ON THIS SHEET.



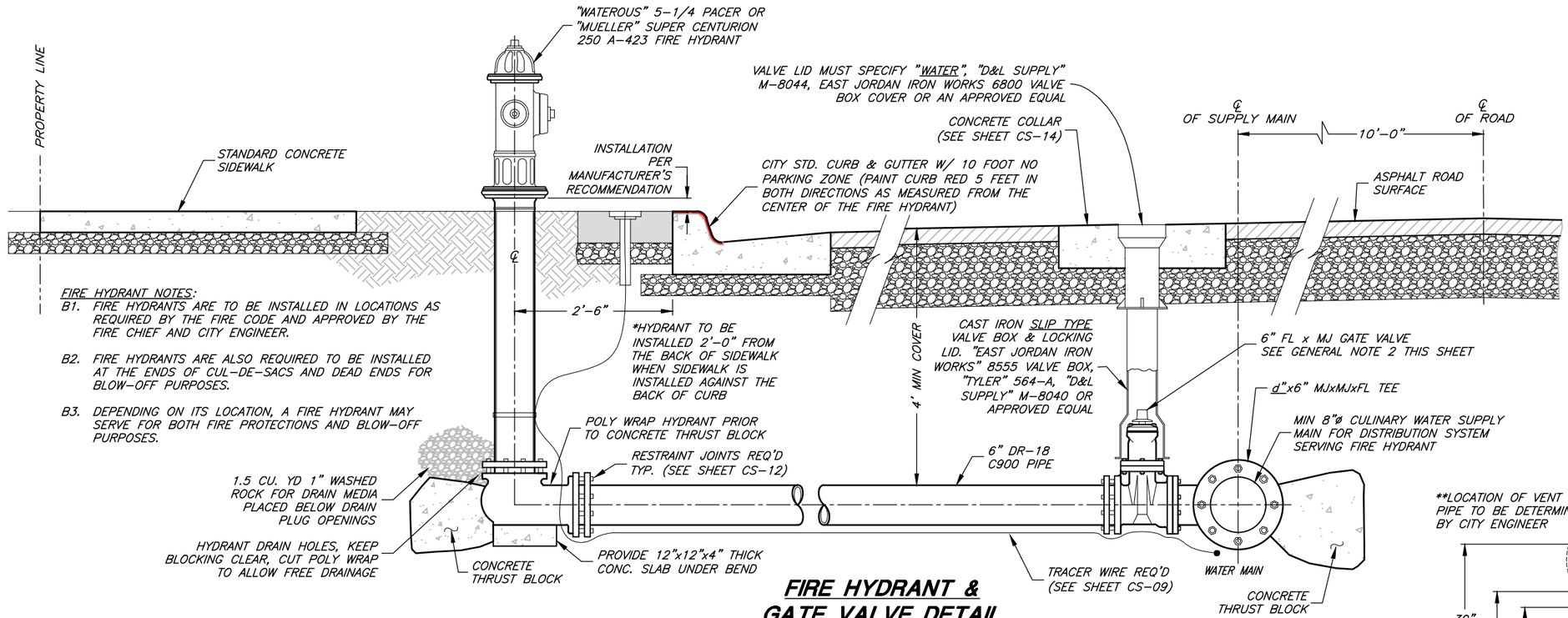
BOLLARD DETAIL

(SEE NOTE H)



SAMPLING STATION

PROJECT ENGINEER				SCALE:	DESIGNED	JONES & ASSOCIATES CONSULTING ENGINEERS	WILLARD CITY CORPORATION	SHEET:
MAY 2022				N.T.S.	DRAWN	6080 Fashion Point Drive	PUBLIC WORKS STANDARDS	CS-07
DATE	REV.	DATE	APPR.		CHECKED	South Ogden, Utah 84403 (801) 476-9767	CULINARY WATER - RESIDENTIAL WATER SERVICE, LATERAL LOCATION, AND SAMPLING STATION DETAILS	OF 31 SHEETS
						www.jonescivil.com		0



FIRE HYDRANT & GATE VALVE DETAIL

FIRE HYDRANT NOTES:

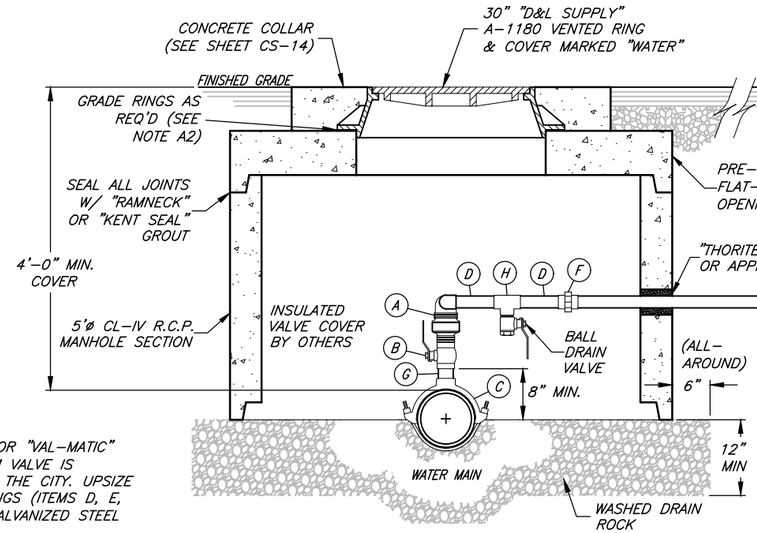
B1. FIRE HYDRANTS ARE TO BE INSTALLED IN LOCATIONS AS REQUIRED BY THE FIRE CODE AND APPROVED BY THE FIRE CHIEF AND CITY ENGINEER.

B2. FIRE HYDRANTS ARE ALSO REQUIRED TO BE INSTALLED AT THE ENDS OF CUL-DE-SACS AND DEAD ENDS FOR BLOW-OFF PURPOSES.

B3. DEPENDING ON ITS LOCATION, A FIRE HYDRANT MAY SERVE FOR BOTH FIRE PROTECTIONS AND BLOW-OFF PURPOSES.

GENERAL NOTES:

1. "BLUE" BOLTS AND NUTS ARE REQUIRED BY THE CITY.
2. ALL WATER MAIN AND HYDRANT GATE VALVES TO BE AWWA C509 RESILIENT WEDGE "MUELLER" A-2361, "CLOW" 2639, OR AMERICAN FLOW CONTROL SERIES 2500 VALVES (ANY CHIPS IN THE VALVE FACTORY COATING DUE TO SHIPPING/INSTALLATION MUST BE REPAIRED USING AN APPROVED EPOXY COATING)
3. ALL SPECIFIED BRANDS OF MATERIALS SHOWN ON THESE DRAWINGS ARE "CITY STANDARDS." OTHER EQUIVALENT BRANDS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER AND THE CITY PUBLIC WORKS DEPARTMENT.
4. PIPES, JOINTS, FITTINGS, VALVES, & FIRE HYDRANTS SHALL CONFORM TO ANSI / NSF 61.
5. FIRE HYDRANTS SHALL NOT BE LOCATED WITHIN 10 FEET OF A SANITARY SEWER OR WITHIN 10 FEET OF STORM DRAIN WHERE POSSIBLE.
6. ALL WATER SYSTEM MATERIALS SHALL BE NEW; USED MATERIAL ARE NOT ALLOWED.



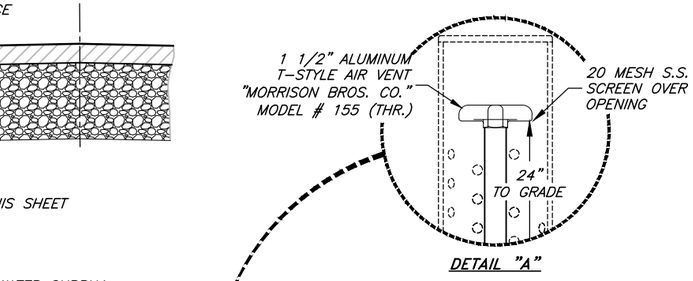
AIR/VACUUM RELIEF STATION

(BURIED WATER MAIN APPLICATION)

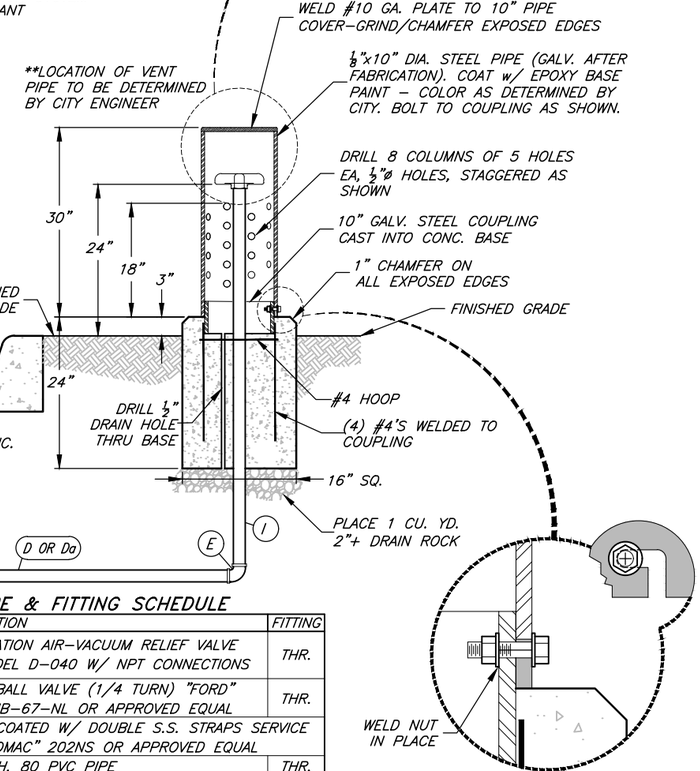
AIR/VACUUM RELIEF STATION NOTES:

A1. THE USE OF AN "APCO" 145C OR "VAL-MATIC" 202C COMBINATION AIR/VACUUM VALVE IS ACCEPTED WHEN APPROVED BY THE CITY. UPSIZE VENT PIPE, AIR VENT AND FITTINGS (ITEMS D, E, F, H AND I) TO 2" DIA. AND GALVANIZED STEEL WHEN USING ALTERNATE VALVES.

A2. NO MORE THAN 12" OF GRADE RINGS TO BE ALLOWED ON ANY MANHOLE



DETAIL "A"



DETAIL "B"

PIPE & FITTING SCHEDULE

NO.	DESCRIPTION	FITTING
A	2" COMBINATION AIR-VACUUM RELIEF VALVE "A.R.I." MODEL D-040 W/ NPT CONNECTIONS	THR.
B	2" BRASS BALL VALVE (1/4 TURN) "FORD" B11-xxx-HB-67-NL OR APPROVED EQUAL	THR.
C	2" NYLON COATED W/ DOUBLE S.S. STRAPS SERVICE SADDLE "ROMAC" 202NS OR APPROVED EQUAL	
D	1 1/2" SCH. 80 PVC PIPE	THR.
Da	1 1/2" POLY PIPE	THR.
E	1 1/2" GALV. STEEL 90° ELBOW	THR.
F	1 1/2" SCH. 80 PVC UNION	THR.
G	2" BRASS PIPE	THR.
H	1 1/2" SCH. 80 PVC TEE	THR.
I	1 1/2" GALV. STEEL PIPE	THR.

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.	

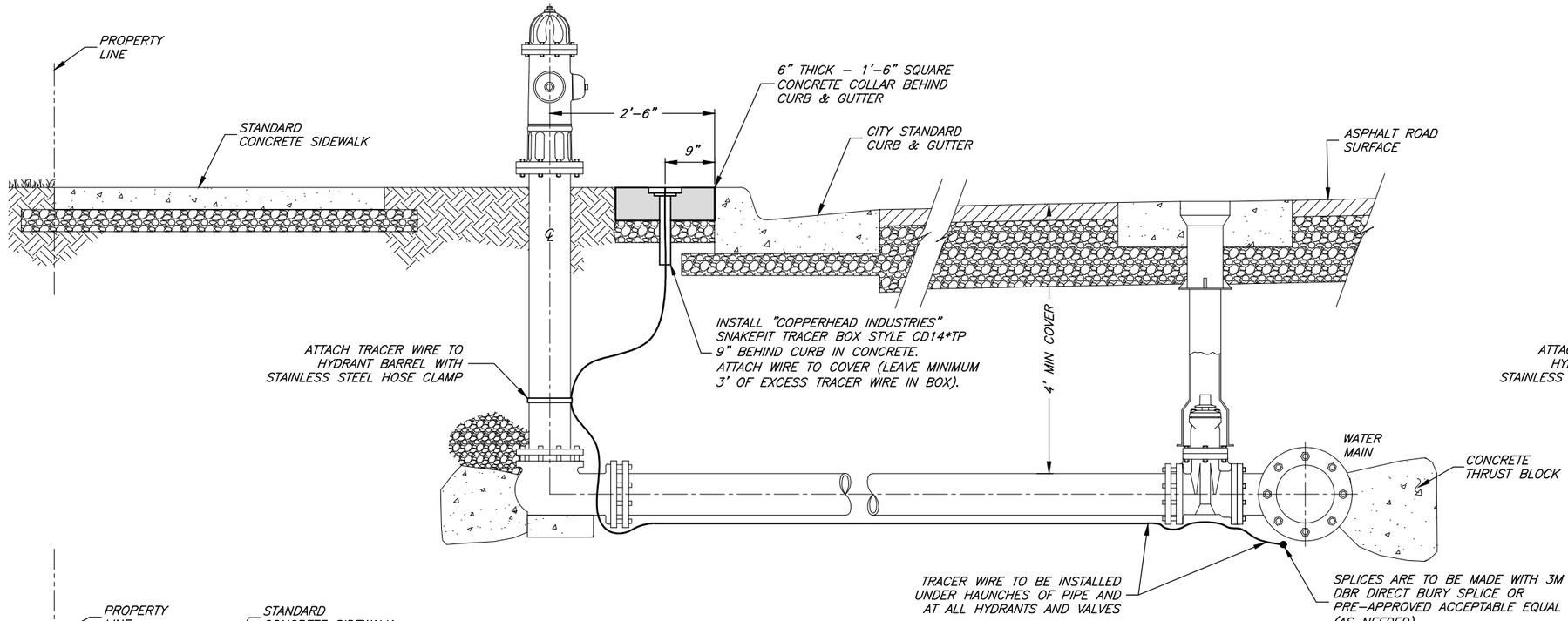
SCALE: N.T.S.

DESIGNED
DRAWN
CHECKED

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

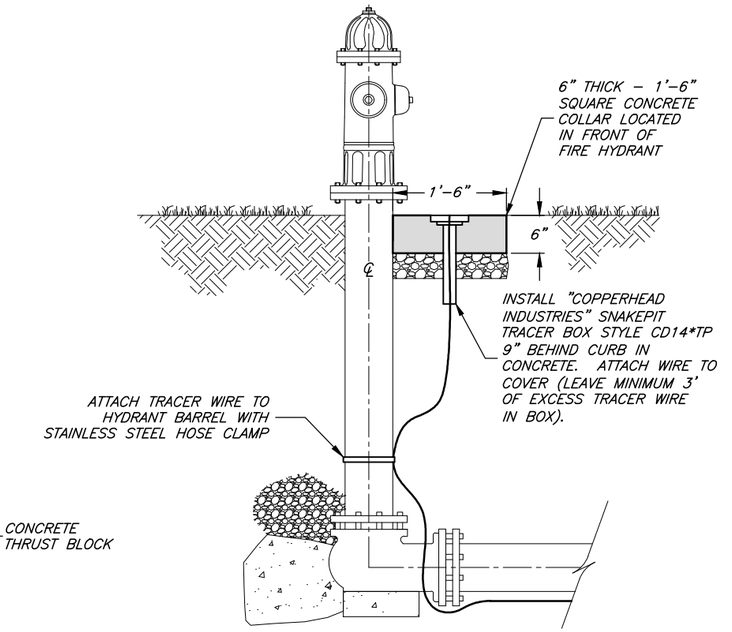
WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS
CULINARY WATER - AIR/VACUUM RELIEF STATION & FIRE HYDRANT DETAILS

SHEET: CS-08
OF 31 SHEETS
0



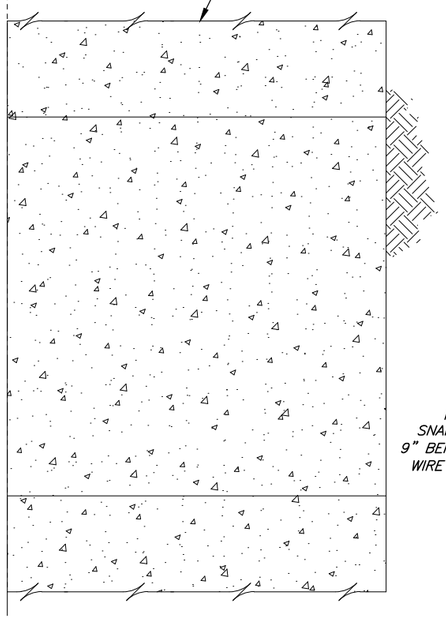
TRACER WIRE INSTALLATION

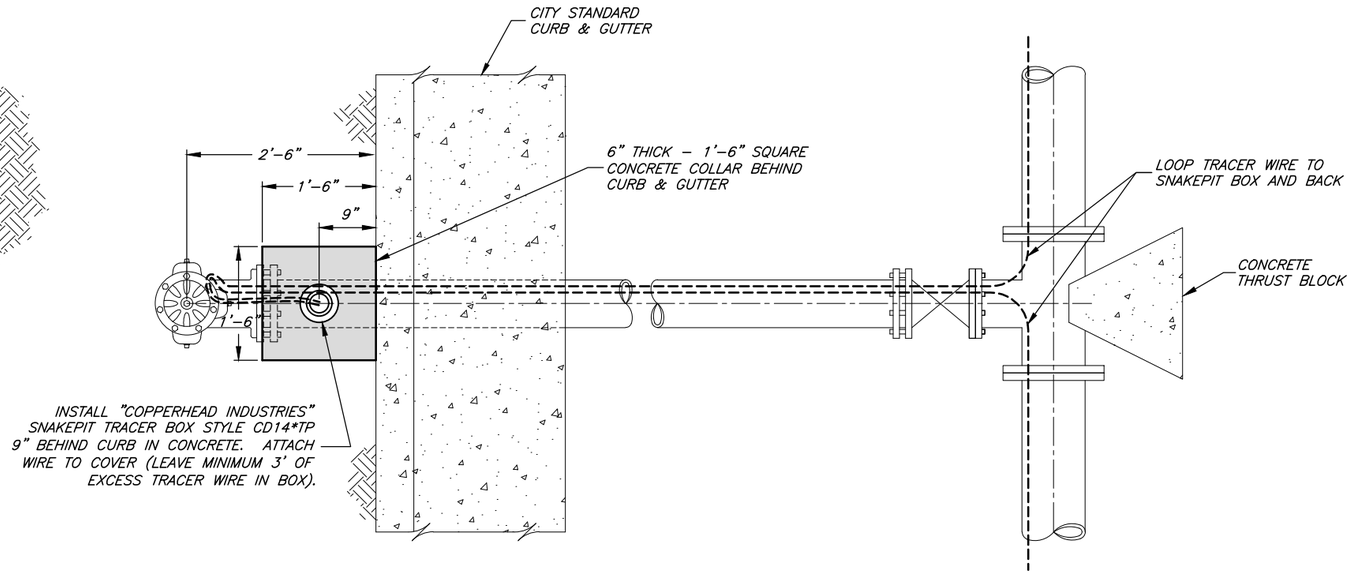
CITY STANDARD STREET SECTION (CURB & GUTTER)



ALTERNATE TRACER WIRE INSTALLATION

WHERE APPROVED BY THE CITY PUBLIC WORKS DEPARTMENT ON STREET SECTIONS WITH NO CURB & GUTTER





NOTES:

1. ALL WATERLINES SHALL HAVE A MINIMUM 12 GA. INSULATED TRACER WIRE INSTALLED UNDER THE HAUNCHES OF THE PIPE PRIOR TO BACKFILLING.
2. TRACER WIRES SHALL TERMINATE AT ALL FIRE HYDRANTS. AT SERVICE SADDLES AND TAPPING SLEEVES, THE TRACER WIRE SHALL NOT BE ALLOWED TO BE PLACED BETWEEN THE SADDLE AND THE PIPE. A GROUNDING ROD SHALL BE INSTALLED AT ALL TRACER SYSTEM TERMINAL POINTS.
3. TRACER WIRE SHALL BE COPPER WIRE WITH BLUE INSULATION RATED FOR DIRECT BURIAL. ALL WIRE CONNECTORS SHALL BE 3M DBR DIRECT BURY SPLICE OR PRE-APPROVED ACCEPTABLE EQUAL AND SHALL BE WATERTIGHT TO PROVIDE ELECTRICAL CONTINUITY.
4. ALL TRACER WIRE SHALL BE TESTED FOR CONTINUITY IN THE PRESENCE OF THE PUBLIC WORKS INSPECTOR PRIOR TO ASPHALT PLACEMENT. ANY TRACER WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR PRIOR TO ASPHALT PLACEMENT.

PROJECT ENGINEER

MAY 2022
DATE

REV.	DATE	APPR.

SCALE: N.T.S.

DESIGNED
DRAWN
CHECKED

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION

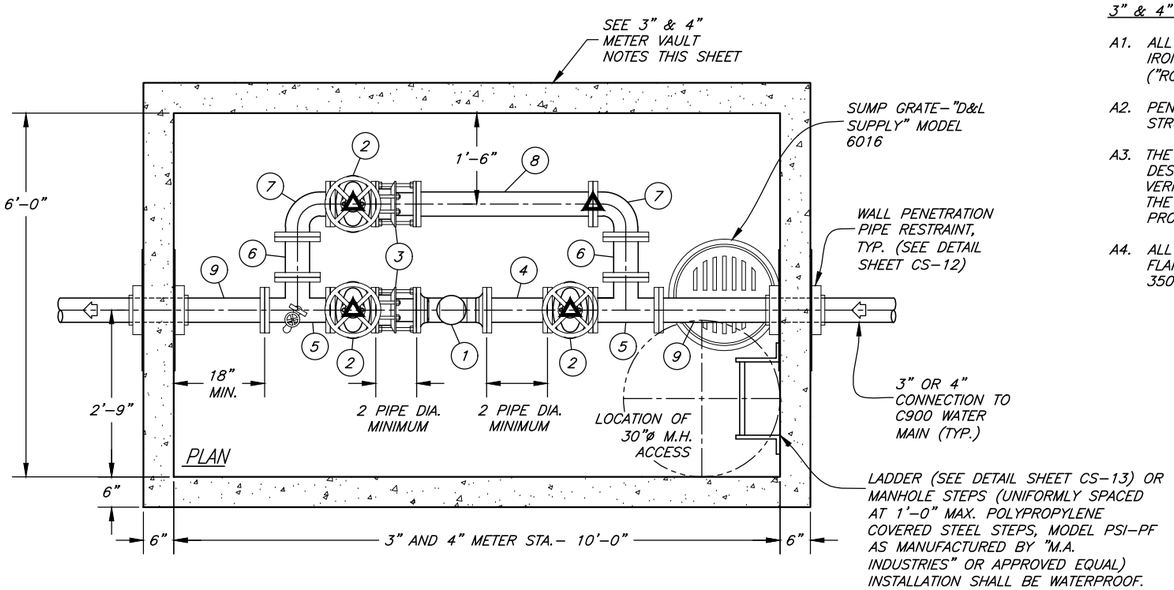
PUBLIC WORKS STANDARDS

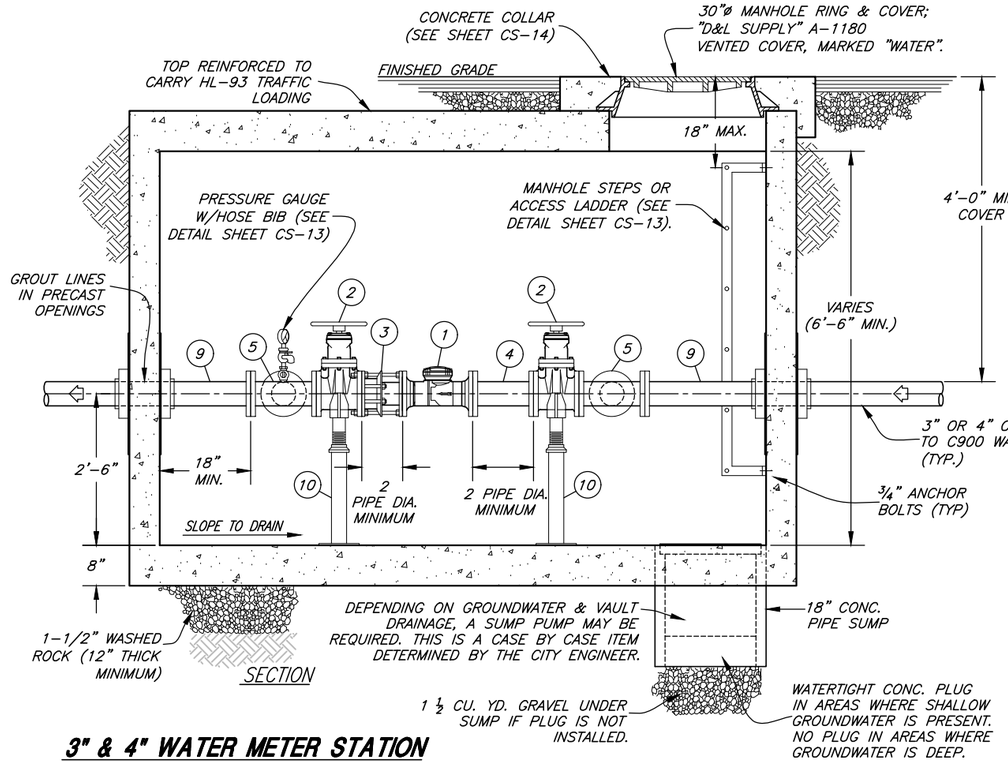
CULINARY WATER - TRACER WIRE INSTALLATION DETAILS

SHEET: CS-09

OF 31 SHEETS

0





3" & 4" WATER METER STATION

3" & 4" METER VAULT NOTES:

A1. ALL FITTINGS OUTSIDE OF THE VAULT ARE TO BE DUCTILE IRON MJ WITH THRUST RESTRAINT RETAINER GLANDS ("ROMAC", MJRG, OR APPROVED EQUAL)

A2. PENETRATION WALLS NEED TO BE ADEQUATELY DESIGNED STRUCTURALLY FOR ANTICIPATED THRUST.

A3. THE PRECAST VAULT MANUFACTURER IS RESPONSIBLE FOR DESIGN RELATED TO TRAFFIC LOADING AND THRUST. VERIFICATION OF PROPER DESIGN MUST BE PROVIDED TO THE CITY BY THE DEVELOPER, CONTRACTOR, OR PROPERTY OWNER AS THE CASE MAY BE.

A4. ALL FITTINGS SHALL BE AWWA C–110 WITH 125 LB. FLANGES. ALL PIPING SHALL BE DUCTILE IRON PIPE CLASS 350 P.S.I. MIN.

GENERAL NOTES:

C1. PROPERTY OWNER OR CONTRACTOR SHALL PAY FOR ALL COSTS OF INSTALLATION INCLUDING ALL MATERIALS, ALL EXCAVATION AND FILL, ASPHALT REPLACEMENT AND WATER MAIN CONNECTION.

C2. INSPECTION OF ALL WATER LINE INSTALLATIONS WILL BE DONE BY THE CITY WATER DEPARTMENT, WITH A 48 HOUR MINIMUM NOTICE REQUIRED PRIOR TO START OF WORK.

C3. IF APPLICABLE, A CITY EXCAVATION PERMIT MUST BE REQUESTED AND APPROVED PRIOR TO START OF WORK.

C4. "BLUE" BOLTS AND NUTS ARE REQUIRED BY THE CITY.

C5. CONTRACTOR TO SUPPLY ALL METERS 1 ½" OR LARGER.

1 1/2" & 2" METER NOTES:

B1. 1½" SERVICE LINE–13" METER
2" SERVICE LINE–17" METER

B2. NO MORE THAN 12" OF GRADE RINGS TO BE ALLOWED ON ANY MANHOLE

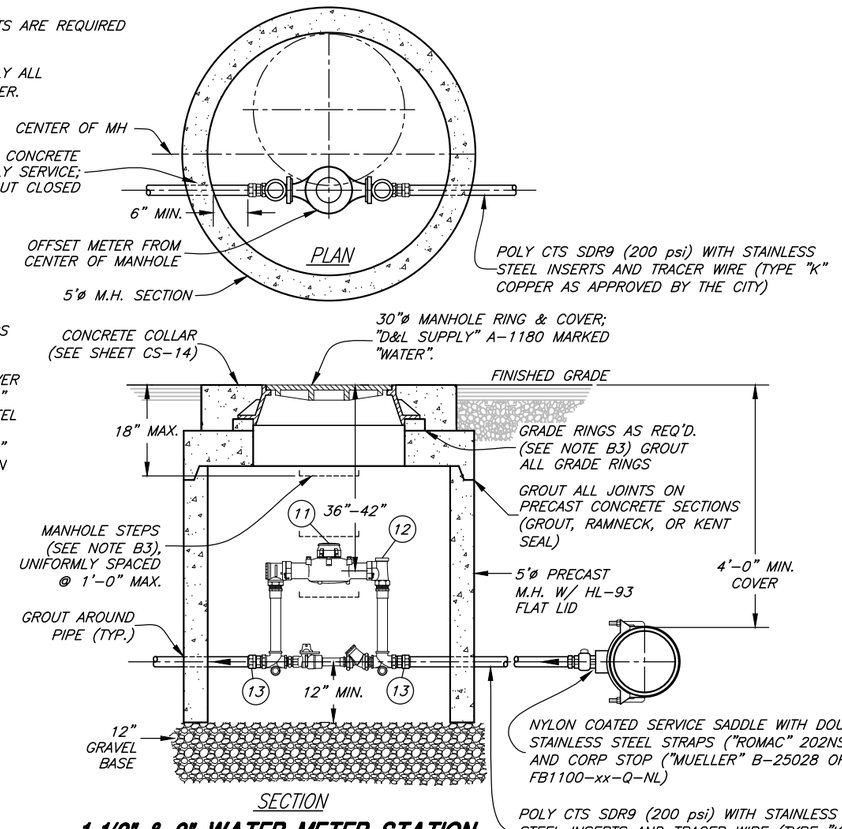
B3. MANHOLE STEPS (FOR MANHOLES OVER 6' DEEP.) UNIFORMLY SPACED (1'–0" MAX.) POLYPROPYLENE COVERED STEEL STEPS, MODEL PSI–PF AS MANUFACTURED BY "M.A. INDUSTRIES" OR APPROVED EQUAL – INSTALLATION OF STEPS SHALL BE WATERPROOF.

NOTE:
ALL SPECIFIED BRANDS OF MATERIALS SHOWN ON THESE DRAWINGS ARE "CITY STANDARDS." OTHER EQUIVALENT BRANDS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER AND THE CITY PUBLIC WORKS DEPARTMENT.

PIPE & FITTING SCHEDULE

NO.	DESCRIPTION (3" & 4" METER STA.)	JOINT TYPE	3" LINE	4" LINE
1	"MASTER METER" OCTAVE ULTRASONIC METER	FL	3"	4"
2	"MUELLER" RESILIENT WEDGE GATE VALVE W/ HANDWHEEL	FL	3" A–2362	4" A–2361
3	"ROMAC" DJ400 DISMANTLING JOINT	FL	3"	4"
4	SPOOL PIECE (2 PIPE DIA. MINIMUM)	FL	3"	4"
5	TEE	FL	3"	4"
6	SPOOL PIECE	FL	3"	4"
7	90° ELBOW	FL	3"	4"
8	SPOOL PIECE	FL	3"	4"
9	NIPPLE	FLxPE	3"	4"
10	"CLOW" F–1608 OR "ANVIL" #264 GALV. PIPE SUPPORT W/ COMPANION FLANGE & VARIABLE HEIGHT NIPPLE (4 EA REQ'D)		△ SYMBOL	

NO.	DESCRIPTION (1 1/2" & 2" METER STA.)	JOINT TYPE	1 1/2" LINE	2" LINE
11	"MASTER METER" INTERMEDIATE MULTI–JET METER W/3G INTEGRATED REGISTER	OVAL TYPE FL	1 1/2"	––
	"MASTER METER" OCTAVE ULTRASONIC METER		––	2"
12	METER YOKE (18" HEIGHT) "MUELLER" B2423–2	–	1 1/2"	2"
	OR "FORD" VBH76–xxB–11–66–NL OR	–	1 1/2"	––
	"FORD" VBH77–xxB–11–77–NL	–	––	2"
13	"MUELLER" 110 COMPRESSION CONNECTION COUPLING OR "FORD" C84–xx–Q–NL	–	1 1/2"	2"



1 1/2" & 2" WATER METER STATION

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.

SCALE: N.T.S.

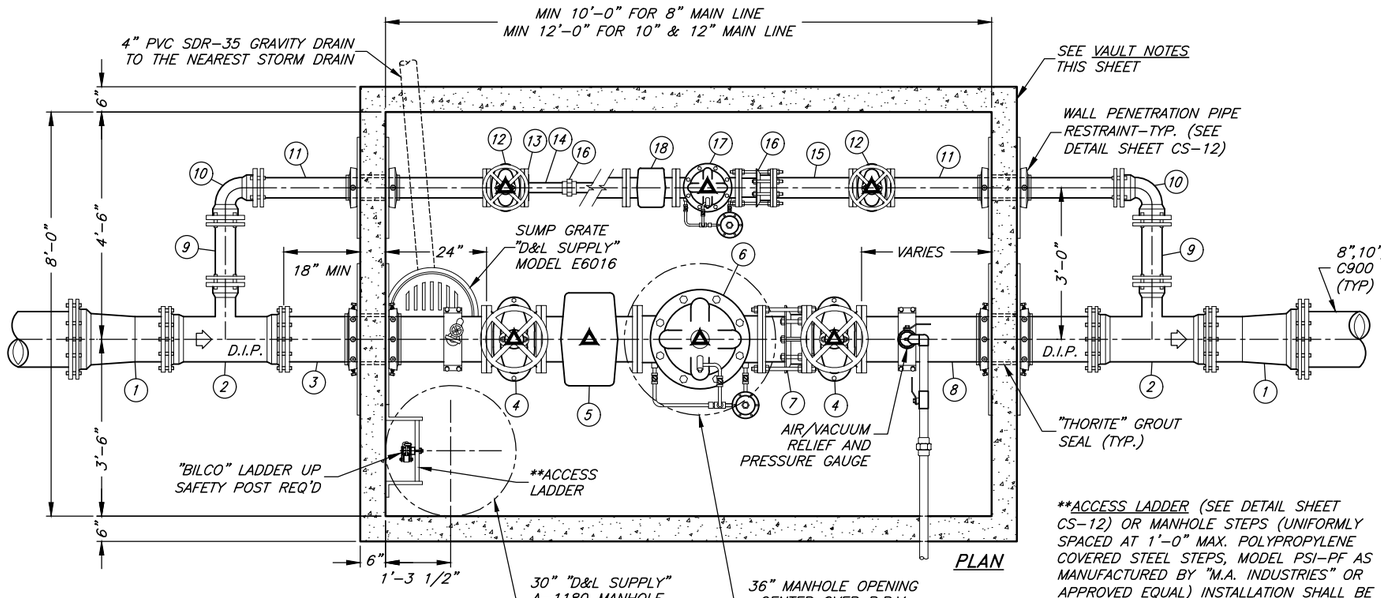
DESIGNED
DRAWN
CHECKED

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476–9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

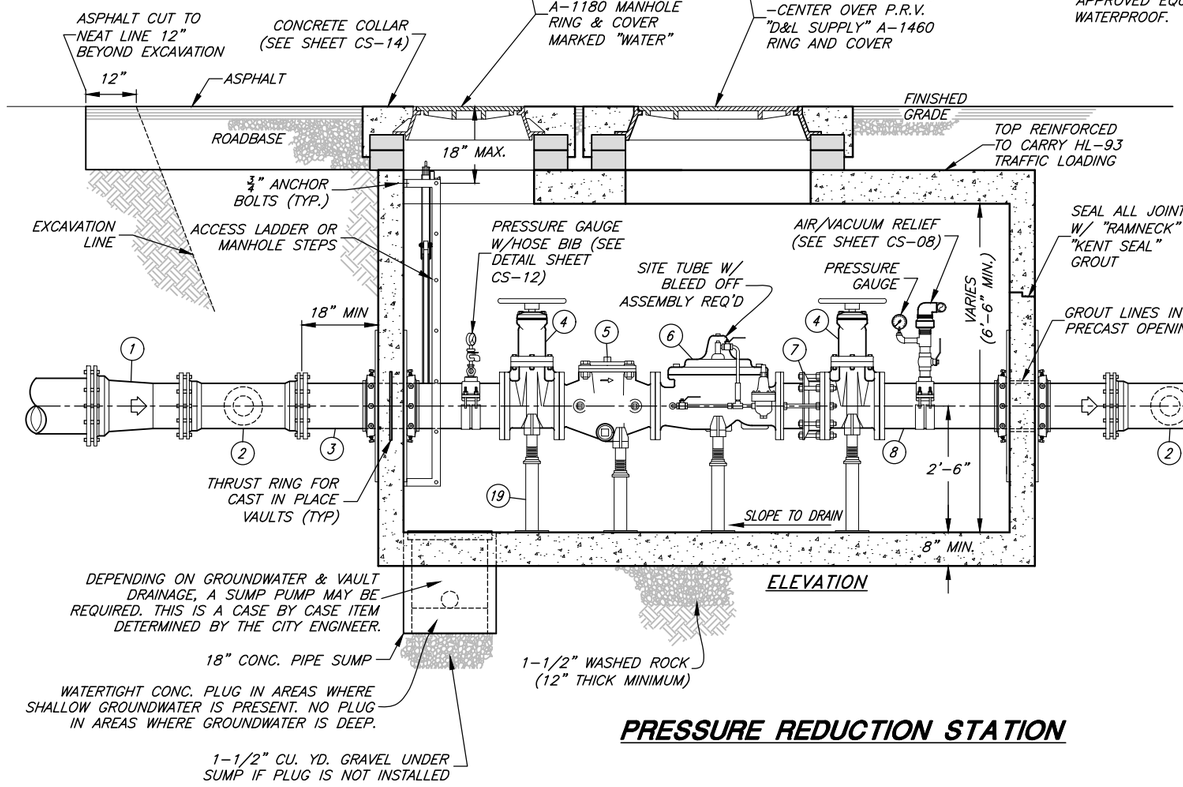
CULINARY WATER - STANDARD WATER METER STATIONS

SHEET: CS-10
OF 31 SHEETS
0

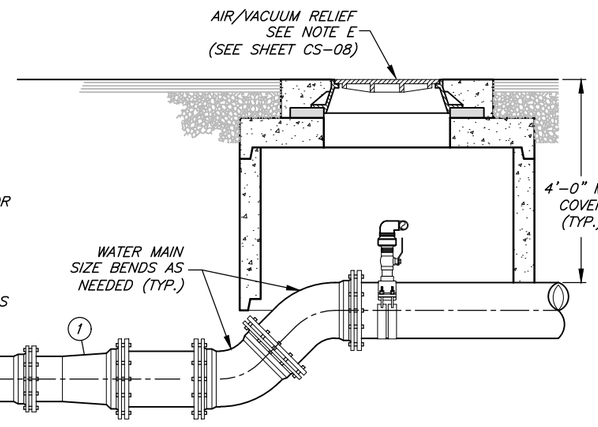


PIPE & FITTING SCHEDULE					
NO.	DESCRIPTION	JOINT TYPE	8" LINE	10" LINE	12" LINE
1	D.I. REDUCER (2)	MJ	8"x6"	10"x8"	12"x10"
2	D.I. REDUCING TEE (2)	MJ	6"X6"X4"	8"X8"X4"	10"X10"X4"
3	D.I. NIPPLE PIECE	FLxPE	6"	8"	10"
4	"MUELLER" A-2361 GATE VALVE W/ HANDWHEEL (2)	FL	6"	8"	10"
5	"CLA-VAL" X43H STRAINER	FL	6"	8"	10"
6	"CLA-VAL" 90-01 PRESSURE REDUCTION VALVE	FL	6"	8"	10"
7	"ROMAC" DJ400 DISMANTLING JOINT	FL	6"	8"	10"
8	D.I. NIPPLE PIECE	FLxPE	6"	8"	10"
9	D.I. PIPE SECTION	PE	4"	4"	4"
10	D.I. 90° ELBOW (2)	MJ	4"	4"	4"
11	D.I. NIPPLE PIECE	FLxPE	4"	4"	4"
12	"MUELLER" A-2361 GATE VALVE W/ HANDWHEEL (2)	FL	4"	4"	4"
13	BLIND FLANGE W/ THR. CONNECTION (4)	FLxTHR.	4"x2"	--	--
14	D.I. SPOOL PIECE	FL	--	4"	4"
	BRASS PIPE	THR.	2"	--	--
15	D.I. SPOOL PIECE	FL	--	4"	4"
	BRASS PIPE	THR.	2"	--	--
16	"ROMAC" DJ400 DISMANTLING JOINT	FL	--	4"	4"
	BRASS UNION	THR.	2"	--	--
17	"CLA-VAL" 90-01 PRESSURE REDUCTION VALVE	FL	2"	4"	4"
18	"CLA-VAL" X43H STRAINER	FL	2"	4"	4"
19	"CLOW" F-1608 OR "ANVIL" #264 GALV. PIPE SUPPORT W/ 3" COMPANION FLANGE & VARIABLE HEIGHT 3" NIPPLE (7 EA REQD.)				△ SYMBOL

**ACCESS LADDER (SEE DETAIL SHEET CS-12) OR MANHOLE STEPS (UNIFORMLY SPACED AT 1'-0" MAX. POLYPROPYLENE COVERED STEEL STEPS, MODEL PSI-PF AS MANUFACTURED BY "M.A. INDUSTRIES" OR APPROVED EQUAL) INSTALLATION SHALL BE WATERPROOF.



PRESSURE REDUCTION STATION



GENERAL NOTES:

A. "BLUE" BOLTS AND NUTS ARE REQUIRED BY THE CITY.

B. ALL FITTINGS OUTSIDE OF THE VAULT ARE TO BE DUCTILE IRON MJ WITH THRUST RESTRAINT RETAINER GLANDS ("ROMAC", MJRG, OR APPROVED EQUAL)

C. STRUCTURE, PIPING & VALVE SIZES FOR P.R.V. STATIONS ON LINE SIZES GREATER THAN 12" SHALL BE SPECIFIED BY THE CITY ENGINEER.

D. ALL SPECIFIED BRANDS OF MATERIALS SHOWN ON THESE DRAWINGS ARE "CITY STANDARDS." OTHER EQUIVALENT BRANDS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER AND THE CITY PUBLIC WORKS DEPARTMENT.

E. WHEN BENDS ARE USED TO ACHIEVE PROPER DEPTH & DIMENSIONS, AIR/VAC SHALL BE LOCATED PRIOR TO BENDS ON DOWNHILL SIDE OF PRV; OTHERWISE AIR/VAC SHALL BE LOCATED IN PRV VAULT.

F. ADD HIGH PRESSURE RELIEF VALVE IN PRVs WHERE DIRECTED BY CITY/ENGINEER.

PRV GENERAL SPECIFICATIONS:

A1. PRV TO BE CLA-VAL #90-01 YBCSKC
A2. 150 # FLANGED FOR 250 PSI WORKING PRESSURE, 300# FLANGED IF GREATER THAN 250 PSI
A3. DUCTILE IRON BODY GLOBE PATTERN
A4. EPOXY LINED AND COATED
A5. STAINLESS STEEL INTERNAL TRIM
A6. BRONZE PILOT CONTROLS
A7. STAINLESS STEEL TUBES & FITTINGS
A8. SPRING RANGES FOR PRESSURE REDUCING PILOT
A9. X101 VALVE POSITION INDICATOR
A10. CK2 ISOLATION BALL VALVES (STAINLESS)
A11. CV FLOW CONTROL (OPENING)

COATING NOTES:

B1. THE P.R.V. VALVE SHALL INCLUDE FACTORY INSTALLED INTERIOR EPOXY COATING.

B2. ALL NEW AND EXISTING PIPING, VALVES, FITTINGS, METERS, ETC, INSIDE THE VAULT SHALL BE EPOXY PAINTED.

B3. METAL SURFACES TO BE PAINTED SHALL BE PRIMED AND THEN PAINTED W/ TWO COATS OF EPOXY PAINT.

B4. COLORS AS DIRECTED BY THE CITY ENGINEER OR CITY UTILITY DEPARTMENT.

VAULT NOTES:

C1. PRE-PLUMBED PRV VAULTS ARE THE PREFERRED OPTION FOR INSTALLATION. THE USE AND LOCATION OF A PRE-PLUMBED PRV VAULT SHALL BE AS DIRECTED BY THE CITY ENGINEER FOLLOWING REVIEW OF CURRENT SITE CONDITIONS.

C2. WHERE APPLICABLE, PRESSURE RELIEF VALVE ASSEMBLY MAY BE REQUIRED. THIS IS A CASE BY CASE ITEM DETERMINED BY THE CITY WATER DEPARTMENT (PRV VAULT WILL NEED TO BE LENGTHENED TO ACCOMMODATE SUCH VALVE)

C3. PRECAST CONCRETE STRUCTURE CAN BE REPLACED WITH A CAST-IN-PLACE CONCRETE VAULT. SUBMIT ENGINEERED CONSTRUCTION PLANS WITH REBAR DETAILS TO CITY ENGINEER FOR REVIEW AND ACCEPTANCE PRIOR TO CONSTRUCTION.

C4. PENETRATION WALLS NEED TO BE ADEQUATELY DESIGNED STRUCTURALLY FOR ANTICIPATED THRUST.

C5. THE PRECAST VAULT MANUFACTURER IS RESPONSIBLE FOR DESIGN RELATED TO HL-93 TRAFFIC LOADING AND THRUST. VERIFICATION OF PROPER DESIGN MUST BE PROVIDED TO THE CITY BY THE DEVELOPER, CONTRACTOR, OR PROPERTY OWNER AS THE CASE MAY BE.

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.

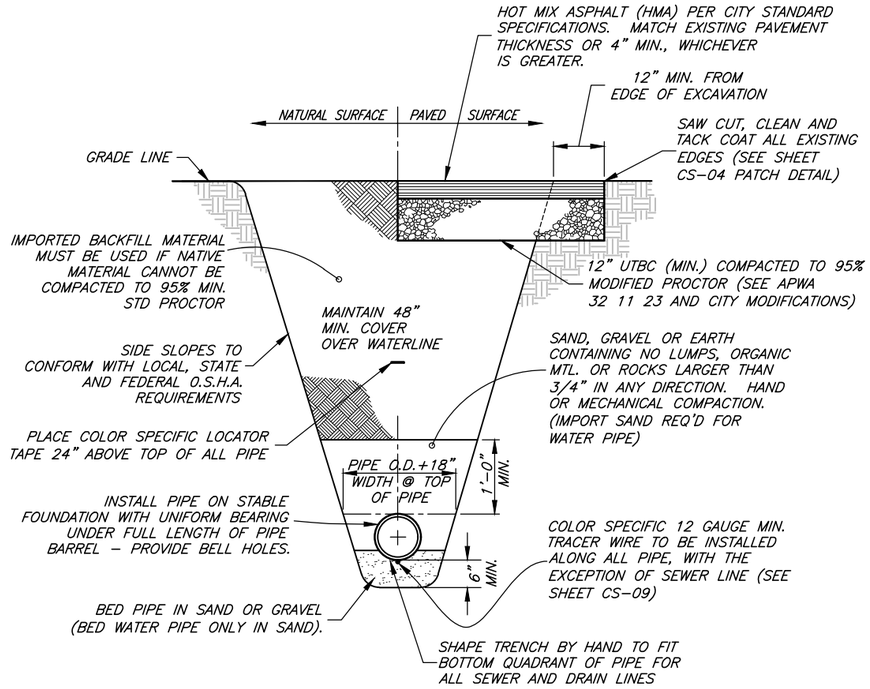
SCALE: N.T.S.

DESIGNED
DRAWN
CHECKED

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS
CULINARY WATER - PRESSURE REDUCTION STATION

SHEET: CS-11
OF 31 SHEETS
0



TYPICAL TRENCH SECTION

(WATER, IRRIGATION, SEWER, STORM DRAIN, AND LAND DRAIN)

TRENCH NOTES:

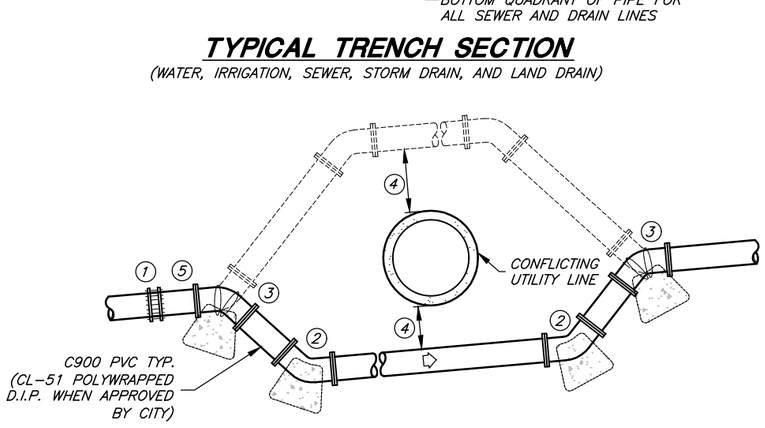
A. BACKFILL PER APWA 33 05 20 AND CITY MODIFICATIONS.

B. COMPACTION TEST REQUIRED AT SPRING–LINE FOR ALL P.V.C. OR H.D.P.E. PIPES.

C. PAVEMENT RESTORATION PER APWA 33 05 25 AND CITY MODIFICATIONS.

D. GRAVEL SURFACED AREAS, SUCH AS ROADS AND SHOULDERS, PARKING AREAS, AND UNPAVED DRIVEWAYS, SHALL BE REPAIRED WITH 8" THICK (MIN.) 1" UNTREATED BASE COURSE COMPACTED TO 95% MODIFIED PROCTOR.

E. WATER & SEWER LINES, INCLUDING SERVICE LINES, SHALL NOT BE INSTALLED IN THE SAME TRENCH.



TYPICAL WATERLINE LOOP

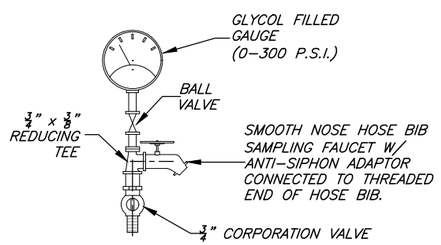
① TRANSITION COUPLING; "ROMAC" ALPHA, "ROMAC" MACRO, OR APPROVED EQUAL

② MJ 45° BEND W/RETAINER GLANDS

③ CONSTRUCT THRUST BLOCKS AT EACH 45° BEND W/(3) #6 REBAR SECURING BLOCK TO FITTING (EPOXY COATING)

④ MINIMUM OF 12" COVER BETWEEN THE WATERLINE AND CONFLICTING UTILITY LINE TO BE CROSSED, EXCEPT LOOPS INVOLVING SEWER MAINS WHERE A MINIMUM OF 18" VERTICAL COVER **ABOVE** THE SEWER MAIN IS REQUIRED. EXCEPTIONS MUST BE APPROVED BY THE UTAH DIVISION OF DRINKING WATER (DDW).

⑤ AN AIR/VACUUM RELIEF VALVE MAY BE REQUIRED ON A CASE BY CASE BASIS AS DIRECTED BY THE CITY PUBLIC WORKS DEPARTMENT.



PRESSURE GAUGE

W/SAMPLING FAUCET DETAIL

PIPE RESTRAINT

A1. FOR NOMINAL PIPE DIAMETERS 8" AND GREATER, ALL BENDS, CROSSES, TEES, REDUCERS, AND VALVES SHALL BE INSTALLED WITH RESTRAINING JOINTS ("MEGA–LUG", "ALPHA" OR APPROVED EQUAL).

A2. DESIGN SHALL ALSO BE REQUIRED TO ENSURE ADEQUATE RESTRAINT FOR PIPING JOINTS NEAR FITTINGS BASED ON PIPE DIAMETER AND PIPE PRESSURE.

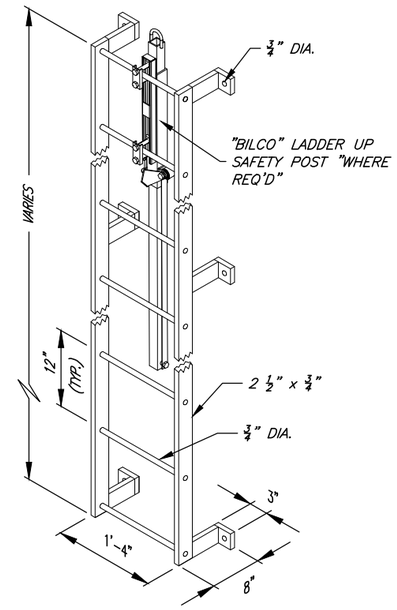
THRUST BLOCKING NOTES:

B1. CONCRETE SHALL NOT BE PLACED WITHIN 1–1/2" OF JOINTS AND BOLTS. COVER ALL METAL CONTACT AREAS WITH A POLY WRAP PRIOR TO CONCRETE PLACEMENT.

B2. IN THE ABSENCE OF A SOILS REPORT, ALL THRUST BLOCKS SHALL BE SIZED ON THE BASIS OF A MAXIMUM LATERAL BEARING VALUE FOR 2000 P.S.F. AND A THRUST RESULTING FROM 200% OF THE WATER LINE STATIC LINE TEST.

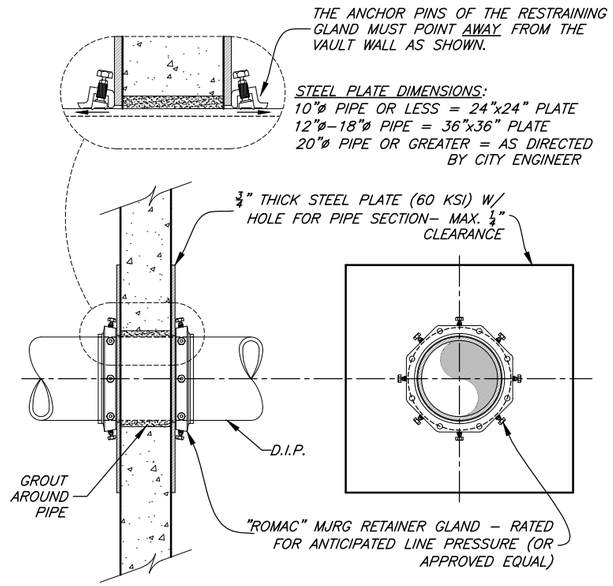
B3. THRUST BLOCKS ARE REQUIRED AT ALL BENDS OF 22–1/2° OR MORE. 11–1/4° BENDS SHALL HAVE RETAINER GLANDS.

B4. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.



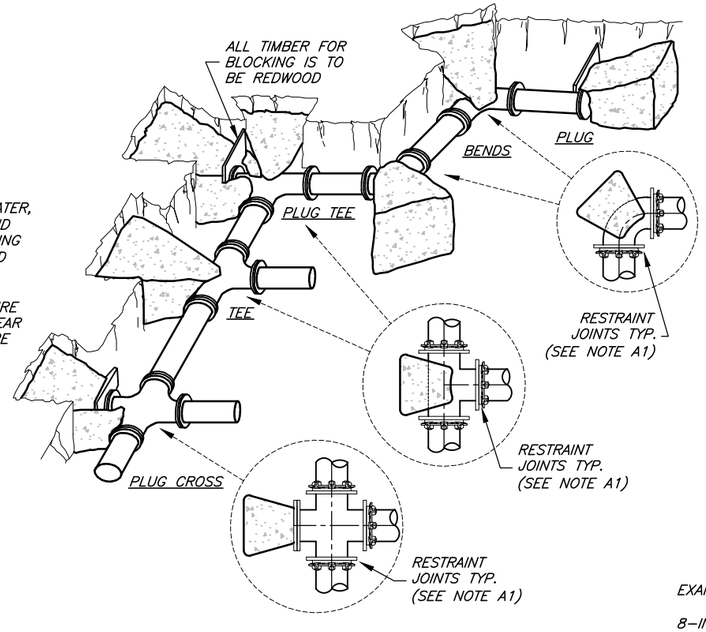
LADDER DETAIL

HOT DIP GALVANIZE AFTER FABRICATION



WALL PENETRATION DETAIL

FOR PRECAST VAULT (TYP)



TYPICAL RETAINER GLANDS & THRUST BLOCKING

THRUST PER PSI OF WATER PRESSURE AT VARIOUS FITTINGS				
PIPE SIZE (IN.)	DEAD END OR TEE (LB.)	90° ELBOW (LB.)	45° ELBOW (LB.)	22–1/2° ELBOW (LB.)
4	19	27	15	7
6	39	55	30	15
8	67	94	51	26
10	109	154	84	43
12	155	218	119	61
14	210	296	161	82
16	272	383	209	106
18	351	494	269	137
20	434	611	333	169
24	623	878	487	244
30	947	1,332	722	377
36	1,356	1,905	1,032	542

NOTES:

C1. IN USING THE ABOVE TABLE, USE THE MAXIMUM INTERNAL PRESSURE ANTICIPATED (I.E. HYDROSTATIC TEST PRESSURE, POSSIBLE SURGE PRESSURE DUE TO PUMP SHUT OFF, ETC.).

C2. SEE SOILS REPORT FOR BEARING STRENGTH OF SOIL. IN THE ABSENCE OF A SOILS REPORT, AN AVERAGE SOIL (SPADABLE MEDIUM CLAY) CAN BE ASSUMED TO HAVE A BEARING STRENGTH OF 2000 P.S.F.

EXAMPLE:

8–INCH 90° ELBOW, PRESSURE 200 LB./SQ. IN.
FROM TABLE: THRUST = 94 X 200 = 18,800 LB.
ASSUME BEARING STRENGTH = 2.000 LB./SQ. FT.

$\frac{18{,}8000}{2{,}000}$ = 9.4 SQ. FT. AREA OF BEARING REQUIRED FOR THRUST BLOCK

PROJECT ENGINEER

MAY 2022
DATE

REV.	DATE	APPR.

SCALE: N.T.S.

DESIGNED
DRAWN
CHECKED

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476–9767
www.jonescivil.com

WILLARD CITY CORPORATION

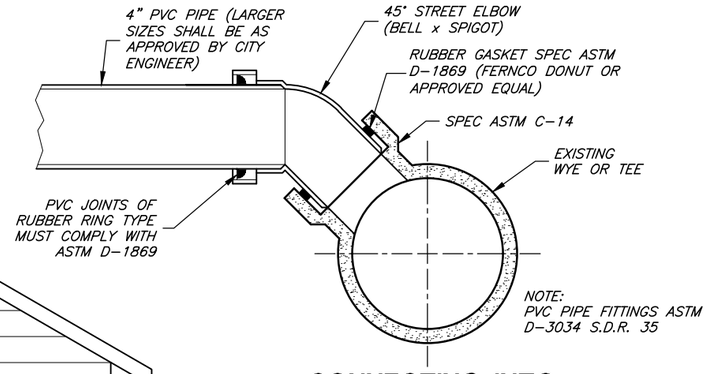
PUBLIC WORKS STANDARDS

CULINARY WATER - THRUST BLOCK, WATERLINE LOOP, PIPE TRENCH & MISC. VAULT DETAILS

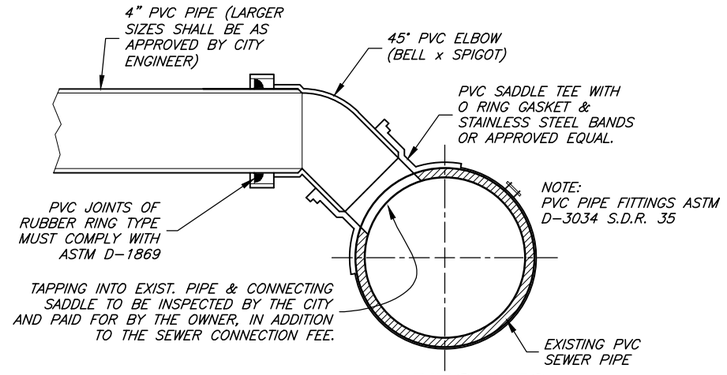
SHEET: CS-12

OF 31 SHEETS

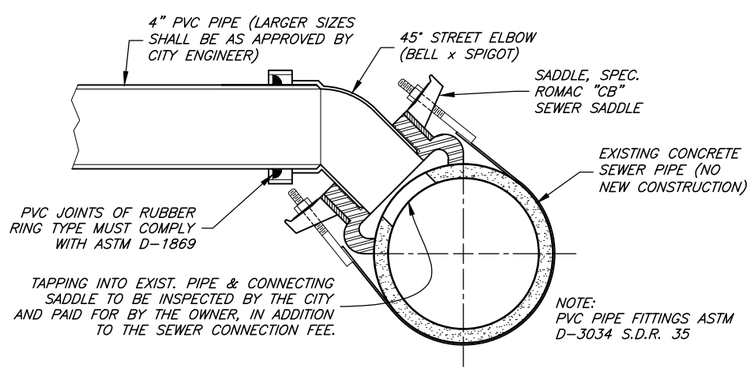
0



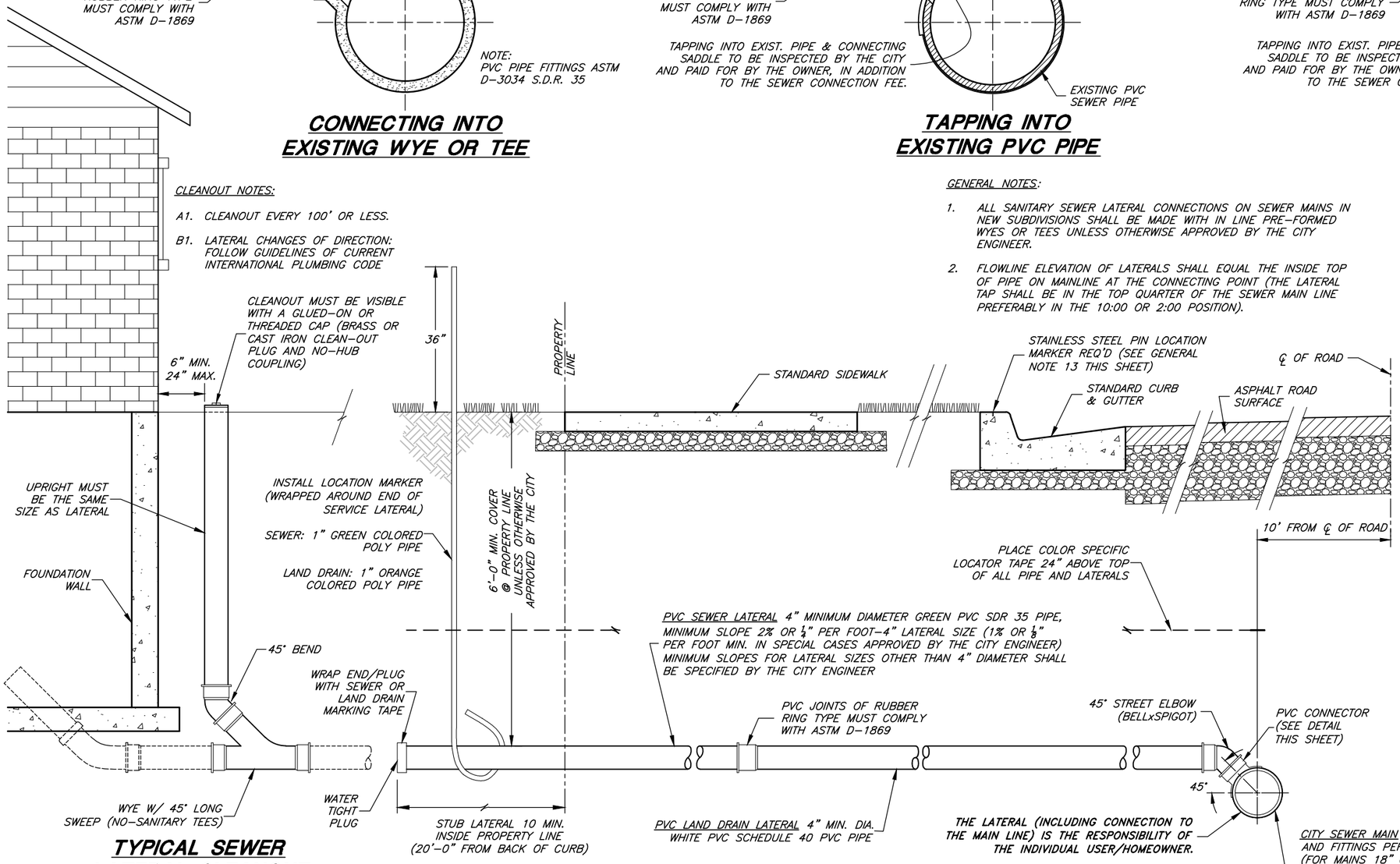
CONNECTING INTO EXISTING WYE OR TEE



TAPPING INTO EXISTING PVC PIPE



TAPPING INTO EXISTING CONCRETE PIPE



TYPICAL SEWER LATERAL CLEANOUT

TYPICAL SEWER / LAND DRAIN LATERALS CONNECTION

GENERAL NOTES:

1. ALL SANITARY SEWER LATERAL CONNECTIONS ON SEWER MAINS IN NEW SUBDIVISIONS SHALL BE MADE WITH IN LINE PRE-FORMED WYES OR TEES UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. FLOWLINE ELEVATION OF LATERALS SHALL EQUAL THE INSIDE TOP OF PIPE ON MAINLINE AT THE CONNECTING POINT (THE LATERAL TAP SHALL BE IN THE TOP QUARTER OF THE SEWER MAIN LINE PREFERABLY IN THE 10:00 OR 2:00 POSITION).

GENERAL NOTES CONT.:

3. SANITARY SEWER SERVICE LATERAL CONNECTIONS SHALL NOT BE ALLOWED IN SEWER MANHOLES.
4. SANITARY SEWER MAINS AND LATERALS SHALL BE "GREEN" IN COLOR. LAND DRAIN MAINS AND LATERALS SHALL BE SCHEDULE 40 "WHITE" IN COLOR. IRRIGATION PIPE'S SHALL BE "PURPLE" IN COLOR. PREVIOUS YEARS PIPE COLORS MAY VARY THROUGHOUT THE CITY. **CONTRACTOR TO VERIFY EXISTING PIPE PRIOR TO MAKING ANY CONNECTION.**
5. ALL CLEANOUTS SHALL BE MARKED AND FITTED WITH A BRASS PLUG OR METAL LID FOR LOCATION PURPOSES.
6. ALL CULINARY WATER MAINS AND SERVICES MUST MAINTAIN A MINIMUM SEPARATION ABOVE ALL SEWER MAINS AND LATERALS OF 18" VERTICAL AND 10'-0" HORIZONTAL IN ACCORDANCE WITH THE STATE OF UTAH DIVISION OF DRINKING WATER (DDW) RULES SECTION R309-550-7. EXCEPTIONS MUST BE APPROVED BY DDW.
7. ALL SANITARY SEWER LINES SHALL BE INSPECTED BY MEANS OF VIDEO CAMERA WHEN CONSTRUCTED.
8. DOWNSTREAM LAND DRAIN CONNECTION TO AN EXISTING STORM DRAIN SYSTEM IS REQUIRED.
9. THE LOCATION OF THE SEWER LATERAL MUST BE DOCUMENTED AND SUBMITTED TO THE CITY ON SCALED AS-BUILT DRAWINGS.
10. **LATERAL CONNECTION TO THE SEWER MAIN MUST BE DONE IN THE PRESENCE OF AND INSPECTED BY THE CITY PUBLIC WORKS DEPARTMENT AT THE TIME OF CONSTRUCTION. ANY CONNECTION NOT INSTALLED CORRECTLY SHALL BE REPLACED AT THE DEVELOPERS AND/OR CONTRACTORS EXPENSE.**
11. REQUESTS FOR INSPECTION ON WORK SHALL BE GIVEN 24 HOURS IN ADVANCE OF THE WORK STARTING.
12. IT SHALL BE THE RESPONSIBILITY OF THE PERSON RESPONSIBLE FOR CONSTRUCTION TO ENSURE THAT INSPECTIONS TAKE PLACE WHERE AND WHEN REQUIRED.
13. STAMPED STAINLESS STEEL OR BRASS PINS USED FOR LATERAL LOCATING ARE REQUIRED BY THE CITY. PINS SHALL BE INSTALLED BY THE CONTRACTOR DURING ALL NEW CONSTRUCTION OR RESTORED WHEN REPLACING DAMAGED CURB & GUTTER DUE TO ANY CONSTRUCTION RELATED ACTIVITY. PINS SHALL BE STAMPED "S" FOR SANITARY SEWER, AND "L" FOR LAND DRAIN.

PROJECT ENGINEER

MAY 2022
DATE

REV.	DATE	APPR.	

SCALE: N.T.S.

DESIGNED
DRAWN
CHECKED

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

SANITARY SEWER - LATERAL & CONNECTION DETAILS

SHEET: CS-13
OF 31 SHEETS
0

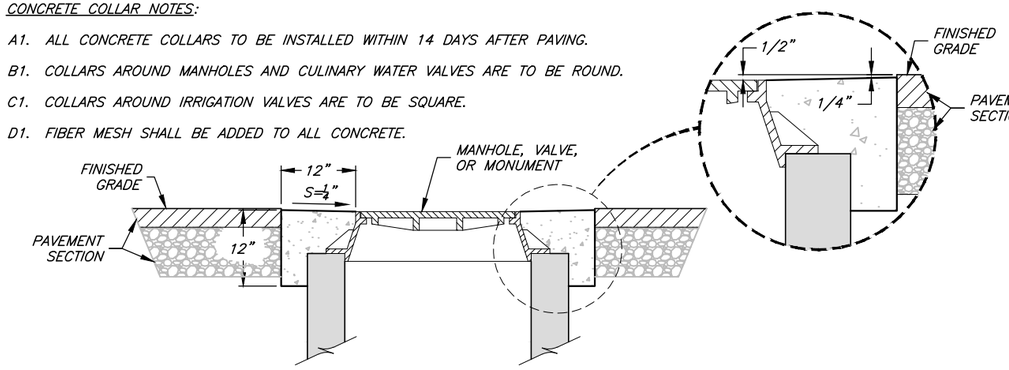
CONCRETE COLLAR NOTES:

A1. ALL CONCRETE COLLARS TO BE INSTALLED WITHIN 14 DAYS AFTER PAVING.

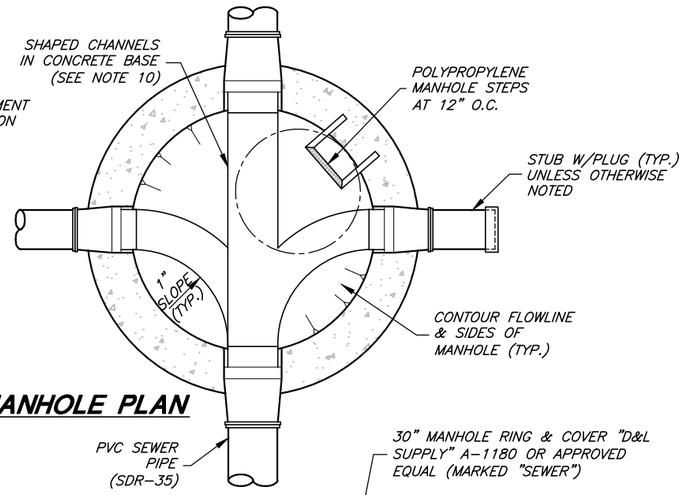
B1. COLLARS AROUND MANHOLES AND CULINARY WATER VALVES ARE TO BE ROUND.

C1. COLLARS AROUND IRRIGATION VALVES ARE TO BE SQUARE.

D1. FIBER MESH SHALL BE ADDED TO ALL CONCRETE.



CONCRETE COLLAR DETAIL



MANHOLE PLAN

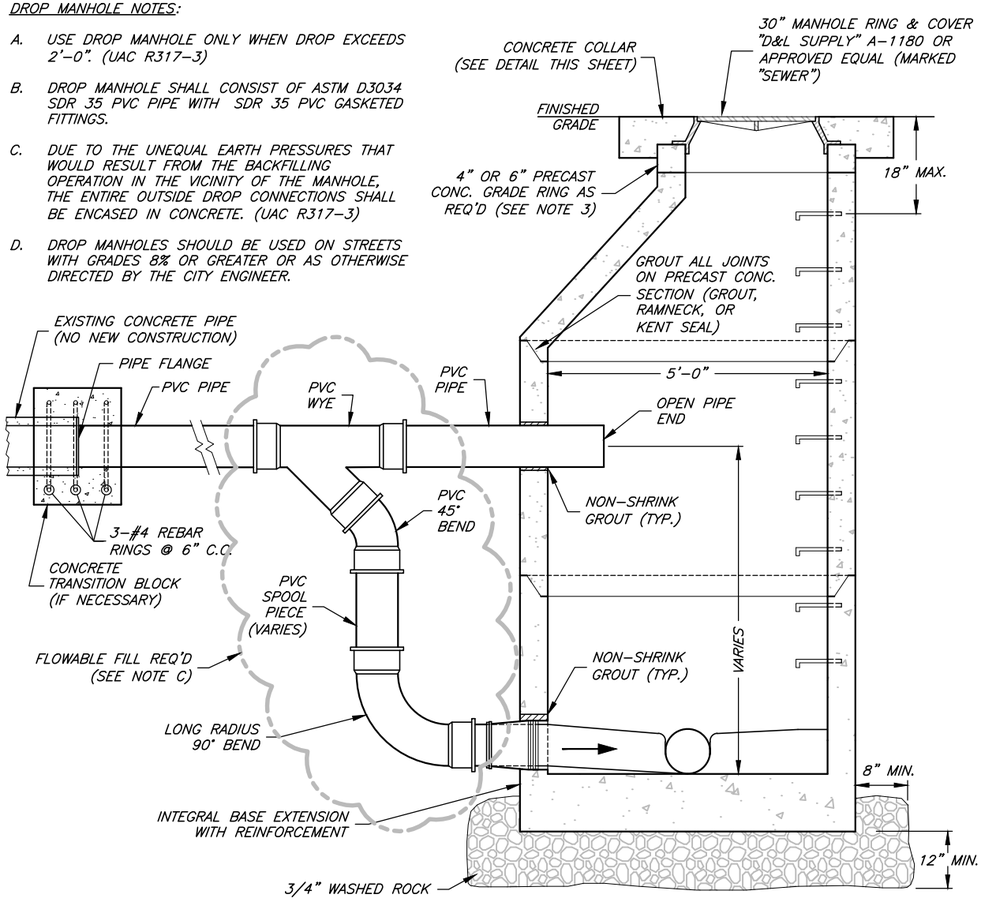
DROP MANHOLE NOTES:

A. USE DROP MANHOLE ONLY WHEN DROP EXCEEDS 2'-0". (UAC R317-3)

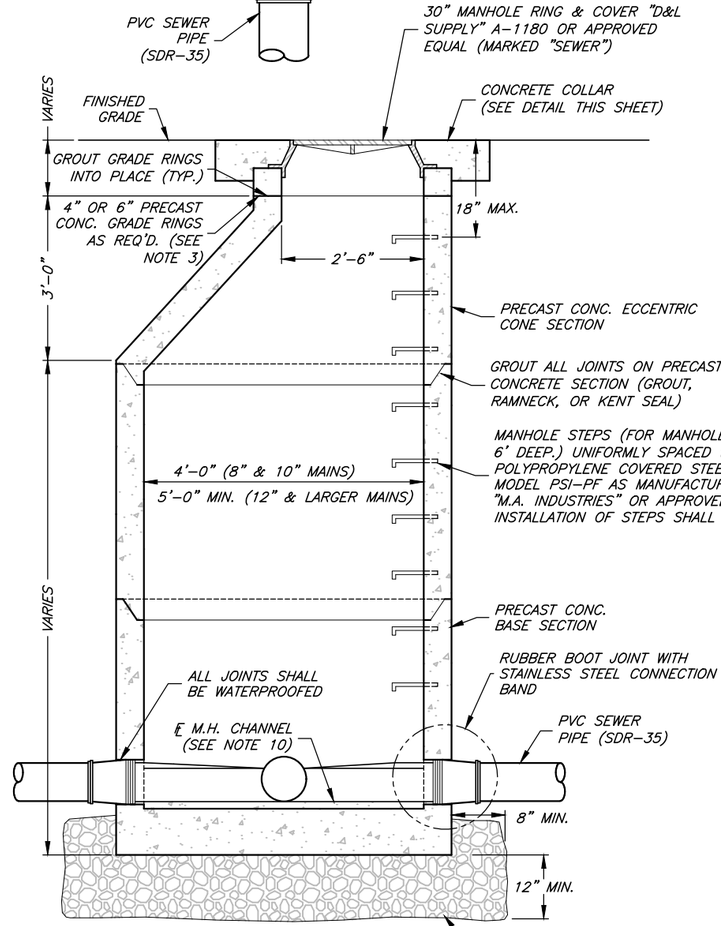
B. DROP MANHOLE SHALL CONSIST OF ASTM D3034 SDR 35 PVC PIPE WITH SDR 35 PVC GASKETED FITTINGS.

C. DUE TO THE UNEQUAL EARTH PRESSURES THAT WOULD RESULT FROM THE BACKFILLING OPERATION IN THE VICINITY OF THE MANHOLE, THE ENTIRE OUTSIDE DROP CONNECTIONS SHALL BE ENCASED IN CONCRETE. (UAC R317-3)

D. DROP MANHOLES SHOULD BE USED ON STREETS WITH GRADES 8% OR GREATER OR AS OTHERWISE DIRECTED BY THE CITY ENGINEER.



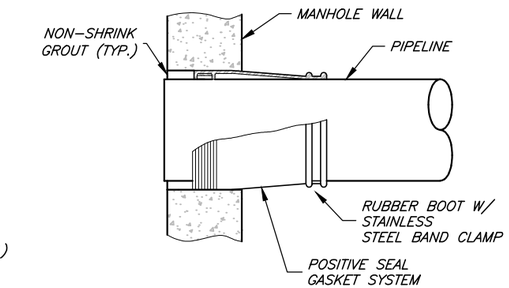
TYPICAL DROP MANHOLE SECTION



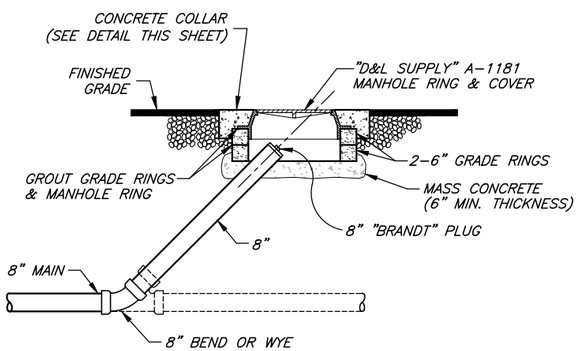
TYPICAL MANHOLE SECTION

GENERAL NOTES:

1. SECURE INVERTS IN ALL MANHOLES DURING CONSTRUCTION SO AS TO PREVENT GRAVEL AND OTHER DEBRIS FROM COLLECTING INSIDE.
2. A LARGER DIAMETER MANHOLE MAY BE REQUIRED BY THE DESIGN ENGINEER AFTER EVALUATION OF THE NUMBER, SIZE, AND ANGLE OF THE PIPES THAT CONNECT TO THE MANHOLE.
3. NO MORE THAN 12" OF GRADE RINGS TO BE ALLOWED ON ANY MANHOLE.
4. ALL TERMINATING SEWER MAINS SHALL END WITH A CITY STANDARD MANHOLE.
5. SERVICE LATERAL CONNECTIONS SHALL NOT BE ALLOWED IN SEWER MANHOLES.
6. ALL SANITARY SEWER LINES SHALL BE INSPECTED BY MEANS OF VIDEO CAMERA AND AIR TESTED WHEN CONSTRUCTED. SEE APWA 33 08 00 AND CITY MODIFICATIONS FOR MORE INFORMATION.
7. WHERE THE DIFFERENCE IN ELEVATION BETWEEN THE INCOMING SEWER AND MANHOLE INVERT IS LESS THAN 24 INCHES, THE INVERT SHOULD BE FILLETED.
8. FLAT MANHOLE RINGS & COVERS (SLAB CONSTRUCTION) ARE NOT ALLOWED ON ANY MANHOLE CONE SECTION.
9. CAST-IN-PLACE MANHOLE BASE SECTIONS SHALL ONLY BE USED WHEN CONNECTING TO AN EXISTING SEWER MAIN LINE. BASE, CONTOUR FLOWLINES AND SHAPED CHANNELS MUST BE INSPECTED BY THE CITY AT THE TIME OF CONSTRUCTION.
10. **THE REQUIRED SHAPED SEWER CHANNELS IN THE BASE OF THE MANHOLE MUST BE INSPECTED BY THE CITY TO ENSURE A SUITABLE FLOW PATTERN. ANY CHANNELS NOT FORMED OR FUNCTIONING CORRECTLY SHALL BE REPLACED OR REFORMED AT THE DEVELOPERS AND/OR CONTRACTORS EXPENSE.**



RUBBER BOOT DETAIL



DRAIN/SEWER MAINLINE CLEANOUT

TEMPORARY (USE ONLY UPON APPROVAL FROM THE CITY ENGINEER)

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.	

SCALE: N.T.S.

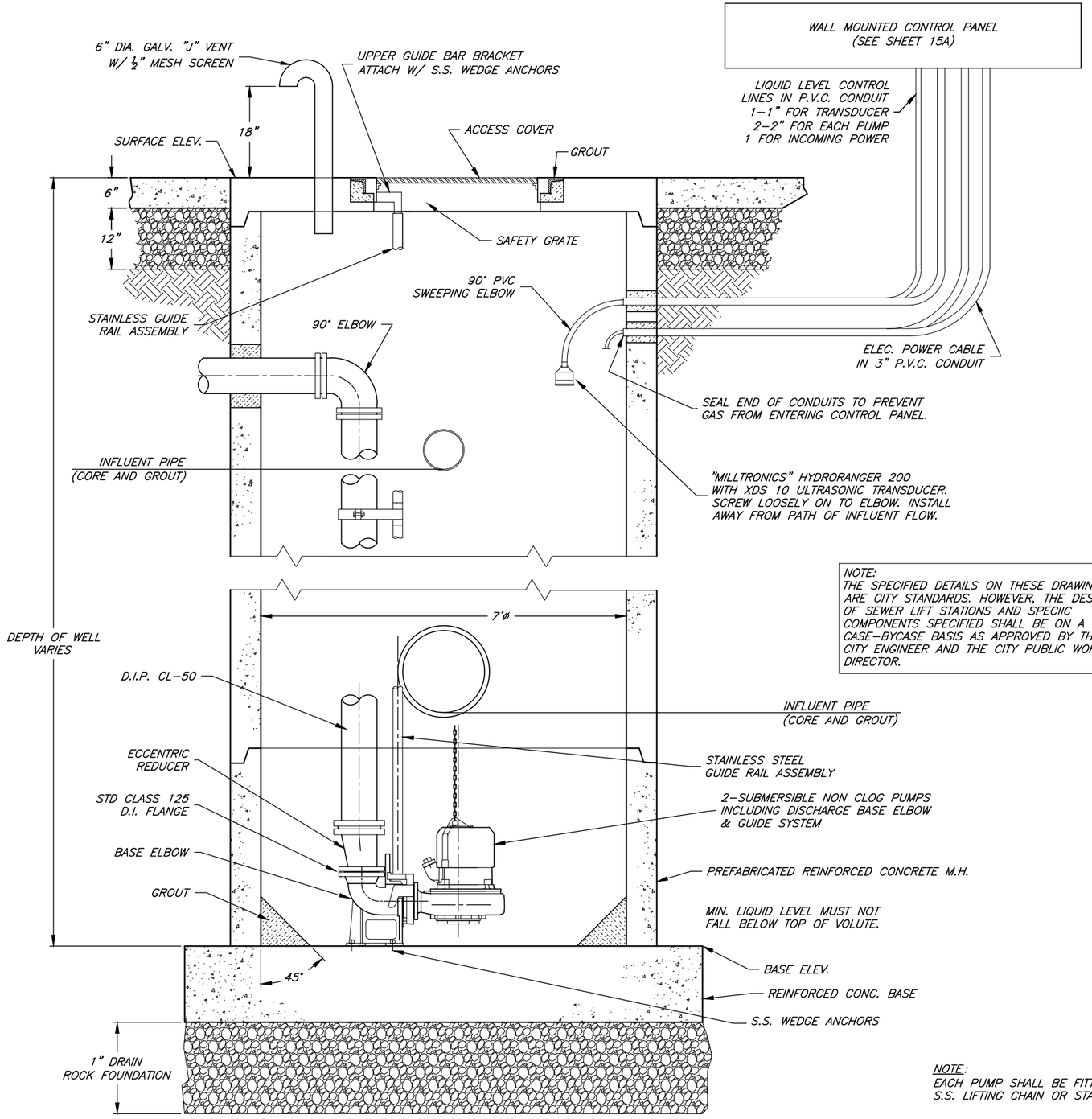
DESIGNED
DRAWN
CHECKED

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

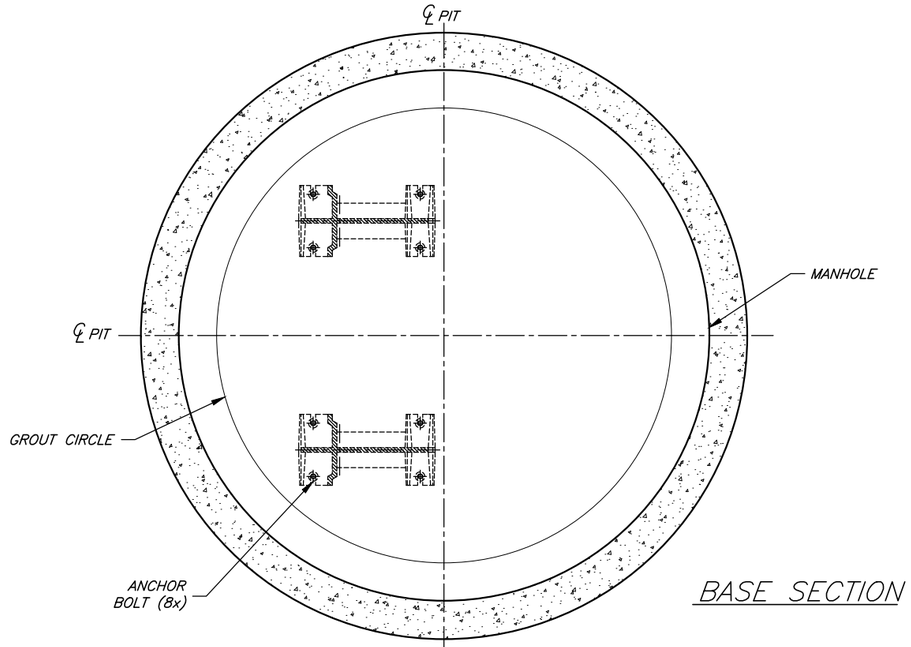
SANITARY SEWER - TYPICAL MANHOLES & DETAILS

SHEET: CS-14
OF 31 SHEETS
0

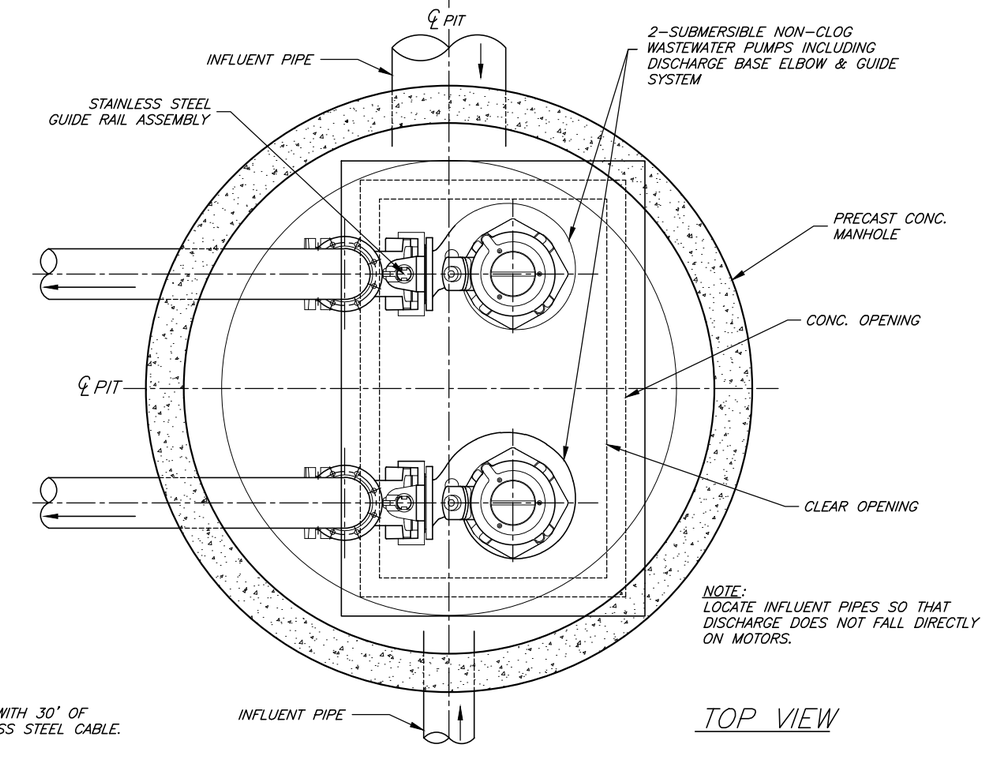


NOTE:
THE SPECIFIED DETAILS ON THESE DRAWINGS ARE CITY STANDARDS. HOWEVER, THE DESIGN OF SEWER LIFT STATIONS AND SPECIIC COMPONENTS SPECIFIED SHALL BE ON A CASE–BYCASE BASIS AS APPROVED BY THE CITY ENGINEER AND THE CITY PUBLIC WORKS DIRECTOR.

NOTE:
EACH PUMP SHALL BE FITTED WITH 30' OF S.S. LIFTING CHAIN OR STAINLESS STEEL CABLE.



BASE SECTION



NOTE:
LOCATE INFLUENT PIPES SO THAT DISCHARGE DOES NOT FALL DIRECTLY ON MOTORS.

TOP VIEW

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.

SCALE: N.T.S.

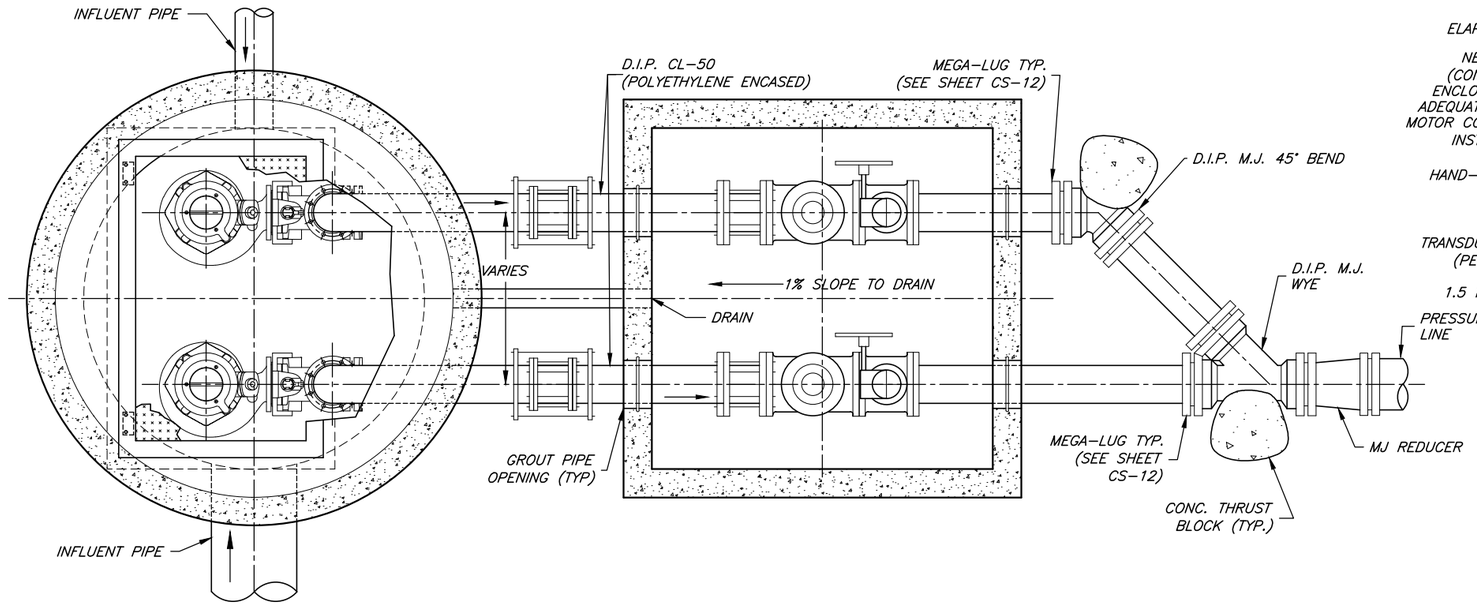
DESIGNED
DRAWN
CHECKED

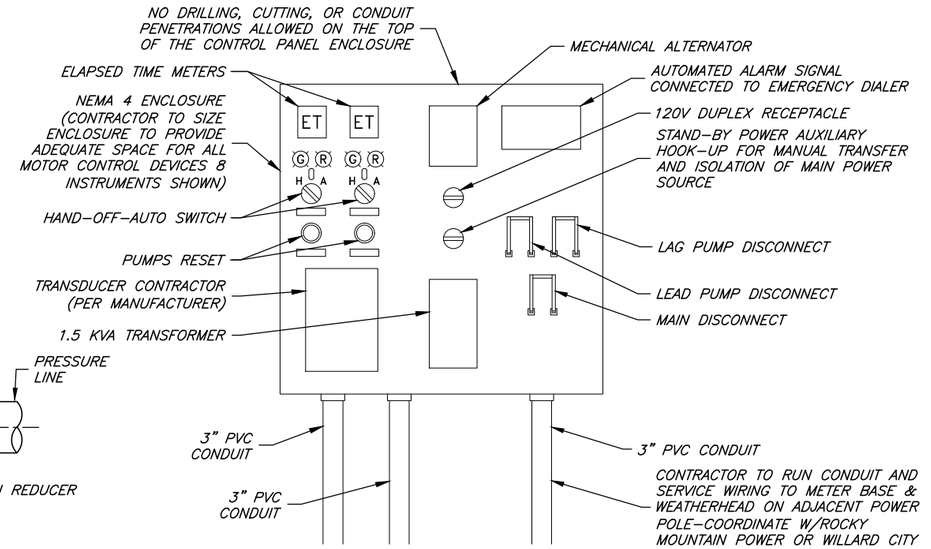
JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476–9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

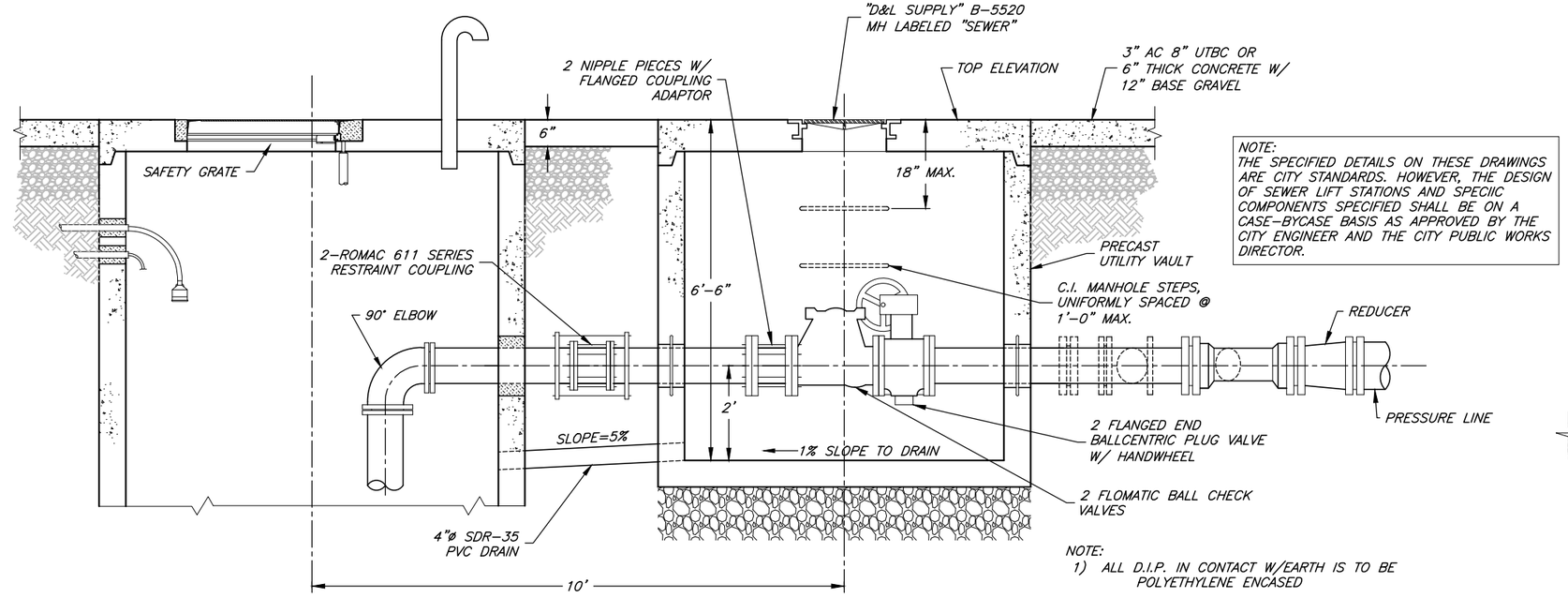
SANITARY SEWER - TYPICAL SEWER LIFT STATION

SHEET: CS-15
OF 31 SHEETS
0





PUMP CONTROL PANEL

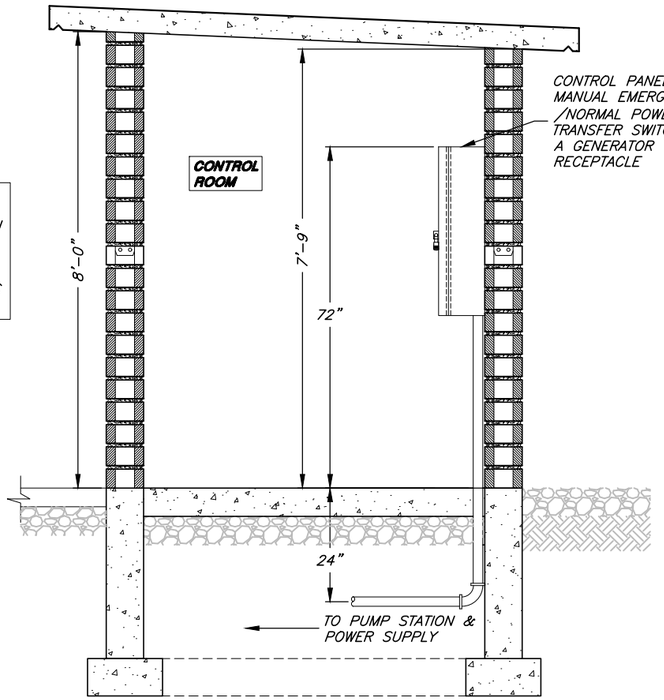


NOTE:
THE SPECIFIED DETAILS ON THESE DRAWINGS ARE CITY STANDARDS. HOWEVER, THE DESIGN OF SEWER LIFT STATIONS AND SPECIIC COMPONENTS SPECIFIED SHALL BE ON A CASE-BYCASE BASIS AS APPROVED BY THE CITY ENGINEER AND THE CITY PUBLIC WORKS DIRECTOR.

CHECK VALVE STATION

NOTE:
1) ALL D.I.P. IN CONTACT W/EARTH IS TO BE POLYETHYLENE ENCASED

2) 14 GAUGE TRACER WIRE REQUIRED ON PRESSURE LINE EVERY 400-500 FT W/ ACCESS BOX INSTALLED



PANEL WALL

CONTRACTOR SHALL PROVIDE ¾" BARE COPPER GROUNDING ROD & I/O BARE COPPER GROUNDING CONDUCTOR FOR CONTINUOUS GROUND.

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.	

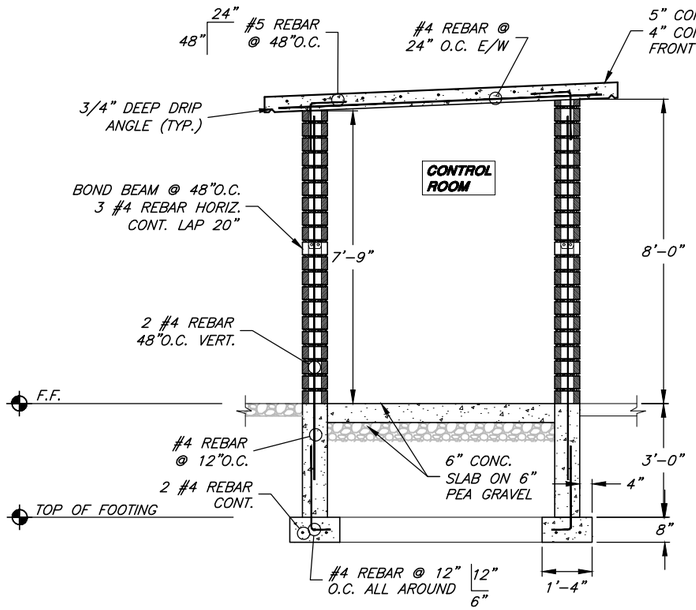
SCALE: N.T.S.

DESIGNED
DRAWN
CHECKED

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS
SANITARY SEWER - LIFT STATION CHECK VALVE & CONTROL PANEL

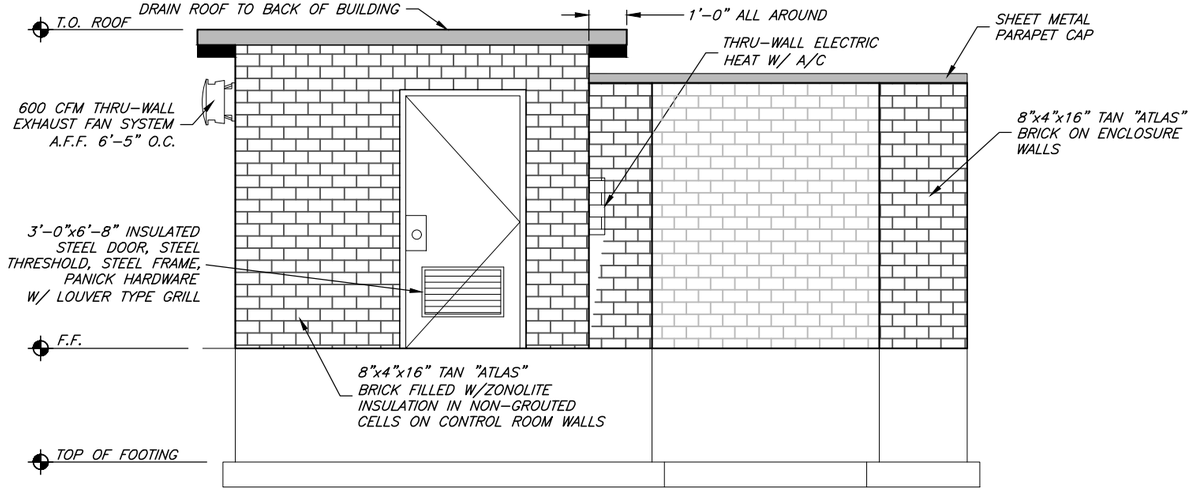
SHEET: CS-15A
OF 31 SHEETS
0



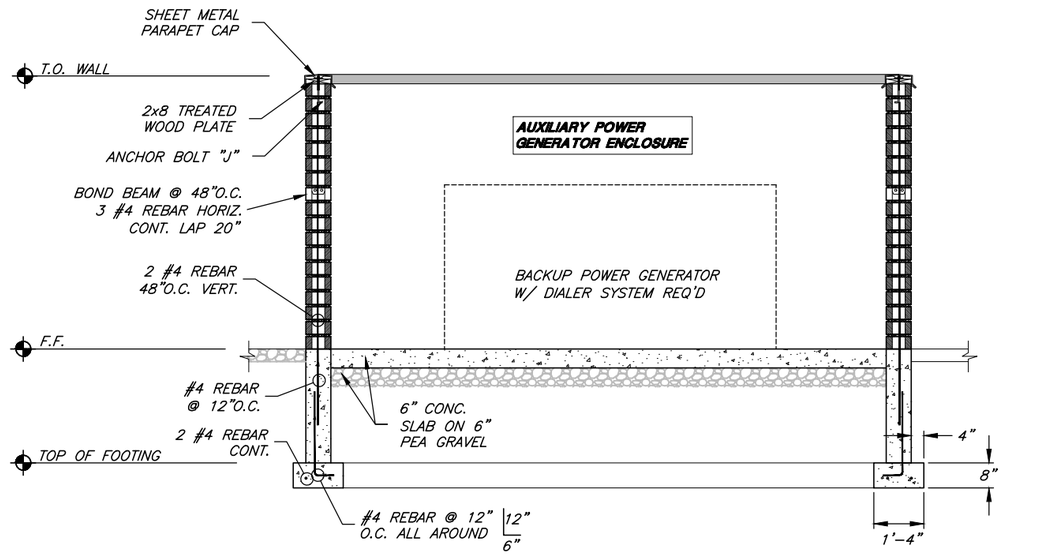
BUILDING SECTION 15/B

NOTES:

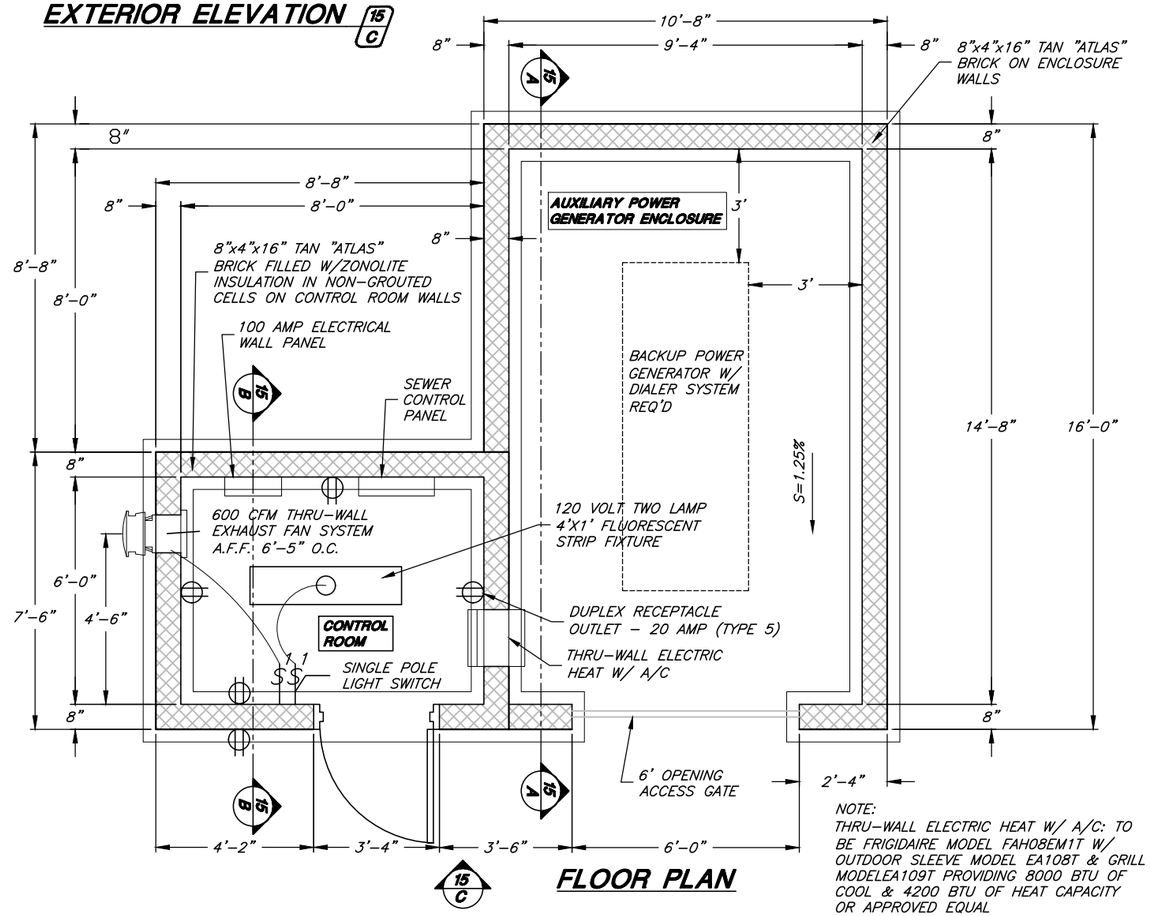
1. ALL ELECTRICAL WIRING TO BE ENCLOSED IN CONDUIT.
2. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH 2006 I.B.C. AND AND OTHER APPLICABLE CODES.
3. ALL CONCRETE SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI.
4. ALL REINFORCED BARS #4 OR GREATER SHALL BE GRADE 60.
5. ELECTRICAL SYSTEM BY OTHERS. GENERAL CONTRACTOR TO COORDINATE LOCATION OF ELECTRICAL APPURTENANCES WITH ELECTRICAL CONTRACTOR. TRENCHING, CONDUIT, AND BACKFILLING IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
6. ALL EXPOSED CONCRETE EXTERIOR SURFACES SHALL HAVE A HAND RUBBED CONCRETE FINISH.
7. FOOTINGS SHALL REST ON UNDISTURBED GROUND OR SHALL SIT ON IMPORTED GRANULAR BACKFILL COMPACTED TO 95% MAX. DRY DENSITY.
8. DOOR SHALL BE PAINTED W/ 1 PRIMER COAT AND 2 FINISH COATS OF ENAMEL PAINT. COLOR TO BE SPECIFIED BY THE CITY PUBLIC WORKS DEPARTMENT.



EXTERIOR ELEVATION 15/C



BUILDING SECTION 15/A

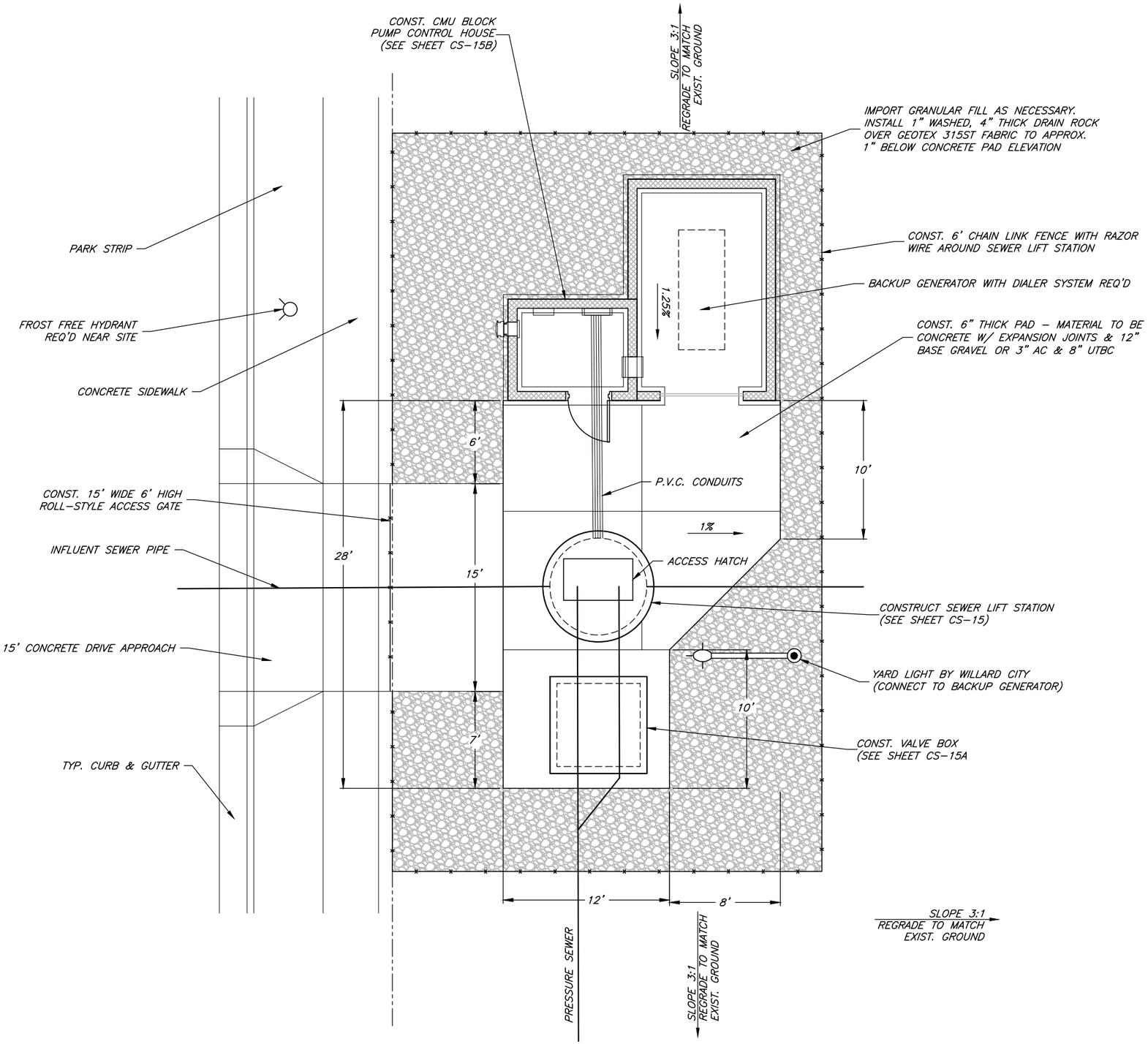


FLOOR PLAN

NOTE:
THRU-WALL ELECTRIC HEAT W/ A/C: TO BE FRIGIDAIRE MODEL FAH08EM1T W/ OUTDOOR SLEEVE MODEL EA108T & GRILL MODELEA109T PROVIDING 8000 BTU OF COOL & 4200 BTU OF HEAT CAPACITY OR APPROVED EQUAL

PROJECT ENGINEER	REV.	DATE	APPR.	SCALE: N.T.S.	DESIGNED	JA JONES & ASSOCIATES CONSULTING ENGINEERS 6080 Fashion Point Drive South Ogden, Utah 84403 (801) 476-9767 www.jonescivil.com	WILLARD CITY CORPORATION
MAY 2022					DRAWN		PUBLIC WORKS STANDARDS
DATE					CHECKED		SANITARY SEWER - LIFT STATION CONTROL BLDG.

SHEET: CS-15B
OF 31 SHEETS
0



PROJECT ENGINEER

MAY 2022
DATE

REV.	DATE	APPR.	

SCALE: N.T.S.

DESIGNED

DRAWN

CHECKED

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION

PUBLIC WORKS STANDARDS

SANITARY SEWER - LIFT STATION SITE PLAN

SHEET: CS-15C

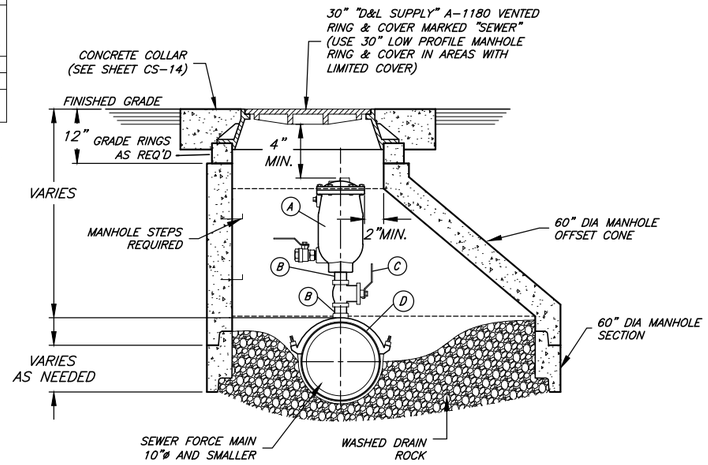
OF 31 SHEETS

0

PIPE & FITTING SCHEDULE

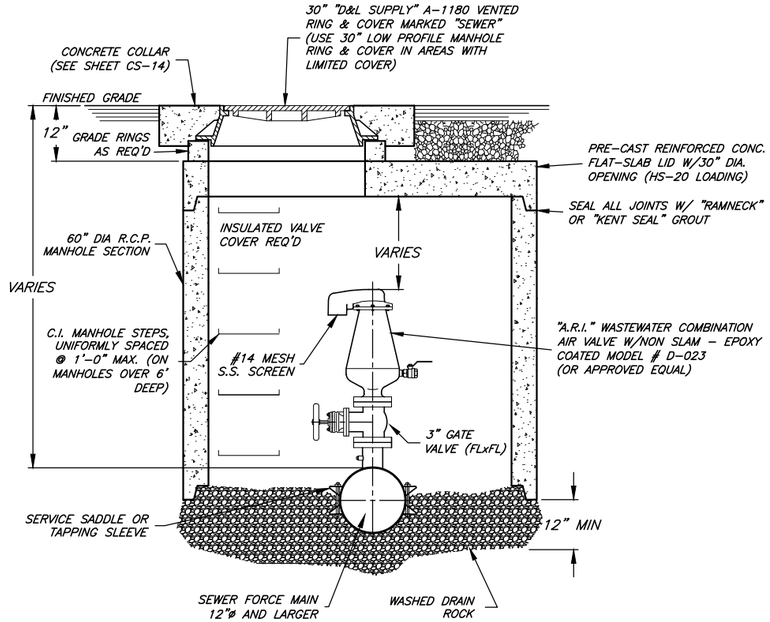
NO.	DESCRIPTION	FITTING
A	2" WASTEWATER AIR RELEASE VALVE "VAL MATIC" MODEL # 49A W/ OPTIONAL VACUUM CHECK ON THE OUTLET	THR.
B	2" BRASS PIPE	THR.
C	2" BALL VALVE (1/4 TURN 200 PSI MIN.)	THR.
D	2" NYLON COATED SERVICE SADDLE W/ STEEL STRAPS "ROMIC MODEL # 202NS	___

NOTES:
1. WHERE SEWAGE WATER QUALITY IS ADEQUATE AS DICTATED BY THE CITY ENGINEER, AN A.R.I. D040 OR APPROVED EQUAL VALVE MAY BE SPECIFIED.



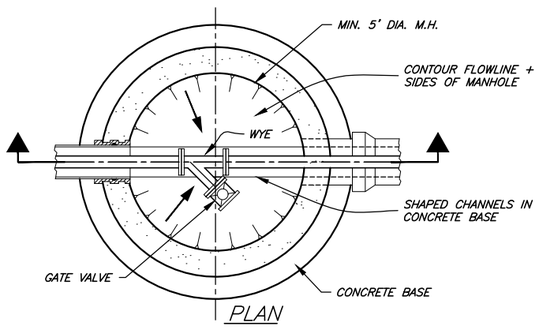
TYPICAL 2" WASTEWATER AIR RELEASE VALVE STATION

10"ø MAINS AND UNDER

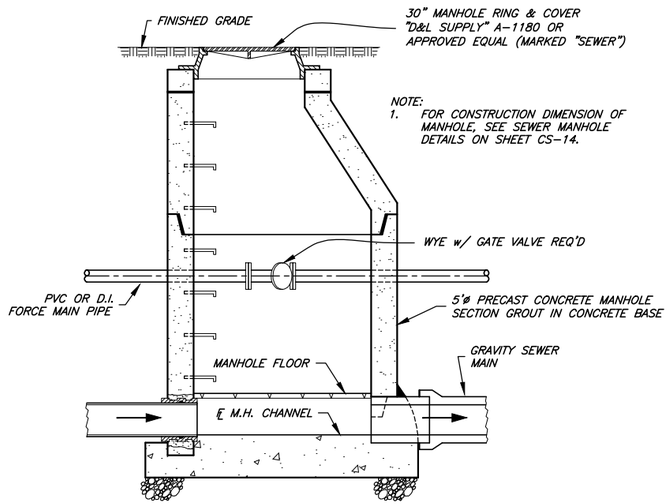


TYPICAL 3" WASTEWATER AIR/VACUUM RELIEF STATION

12"ø MAINS AND LARGER



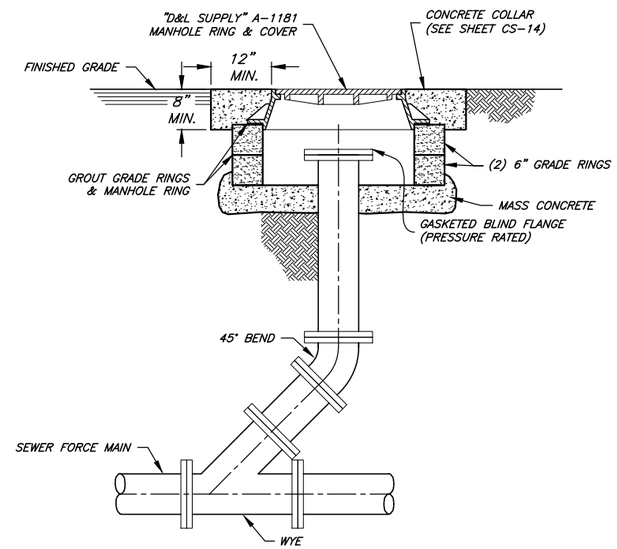
PLAN



FORCE MAIN CLEANOUT MANHOLE

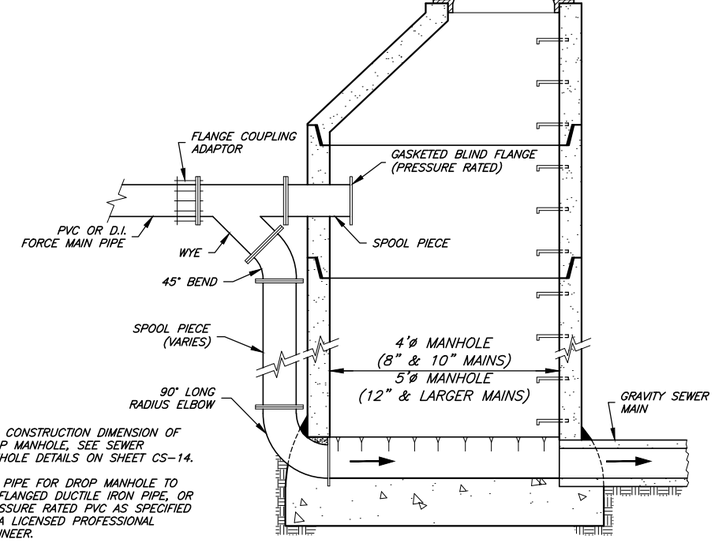
WHERE SPECIFIED BY THE WASTEWATER TREATMENT MANAGER

GENERAL NOTE:
ALL CLEANOUTS SHALL BE MARKED AND FITTED WITH A METAL LID FOR LOCATION PURPOSES.



STANDARD SEWER FORCE MAIN CLEANOUT

4"ø TO 12"ø MAINS



NOTES:
1. FOR CONSTRUCTION DIMENSION OF DROP MANHOLE, SEE SEWER MANHOLE DETAILS ON SHEET CS-14.
2. ALL PIPE FOR DROP MANHOLE TO BE FLANGED DUCTILE IRON PIPE, OR PRESSURE RATED PVC AS SPECIFIED BY A LICENSED PROFESSIONAL ENGINEER.
3. NO MORE THAN 12" OF GRADE RINGS TO BE ALLOWED ON ANY MANHOLE

FORCE MAIN CONNECTION MANHOLE

FORCE MAIN CONNECTION TO GRAVITY SEWER SYSTEM

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.

SCALE: N.T.S.

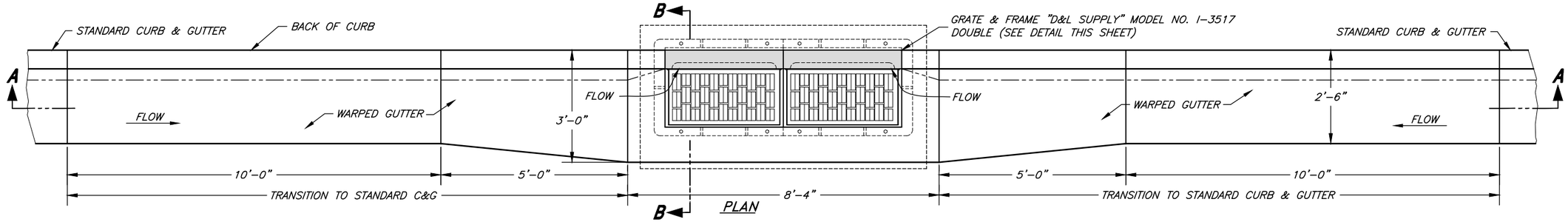
DESIGNED ____
DRAWN ____
CHECKED ____

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

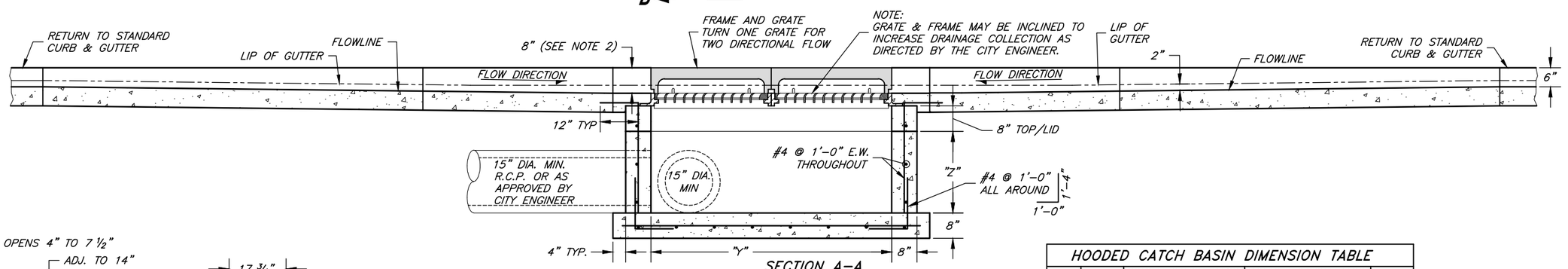
WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

SANITARY SEWER - FORCE MAIN DETAILS

SHEET: CS-16
OF 31 SHEETS
0



PLAN



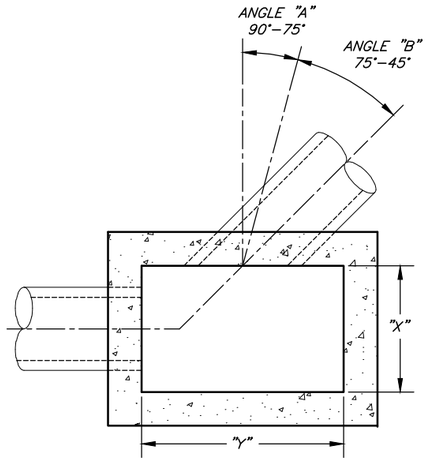
SECTION A-A

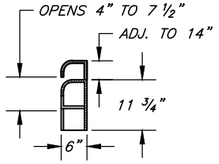
DOUBLE HOODED CATCH BASIN

GENERAL NOTES:

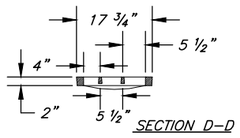
1. ALL CATCH BASIN BOX SIZES REFLECT DIMENSIONS FOR THE MINIMUM 15"ø PIPE SIZE. BOX DIMENSIONS MUST INCREASE PROPORTIONALLY TO ACCOMMODATE LARGER PIPE SIZES.
2. DEPTH MAY VARY FROM 6" TO 10" AS DIRECTED BY THE CITY ENGINEER.
3. CAST-IN-PLACE CONCRETE CATCH BASINS CAN BE REPLACED WITH PRECAST CONCRETE CATCH BASINS WITH HL-93 DECK LOADING AND COMPARABLE SIZE.
4. ALL BOXES SHALL BE FORMED ON THE INSIDE AND OUTSIDE OF THE BOX AND INSPECTED BY THE CITY PRIOR TO THE PLACING OF CONCRETE.
5. DOUBLE CATCH BASINS WILL BE REQUIRED IN LOCATIONS SPECIFIED BY THE CITY ENGINEER (TYPICALLY IN LOW SPOTS OR WHERE ADDITIONAL INLET CAPACITY IS NEEDED).
6. STORM DRAIN LINES SHALL BE 15 INCH MINIMUM DIAMETER REINFORCED CONCRETE PIPE (RCP), OF APPROPRIATE CLASS.
7. ALTERNATE STRUCTURE (E.G. COMBO BOXES) MAY BE USED WITH APPROVAL OF THE CITY ENGINEER. STRUCTURES SHALL FOLLOW APWA STANDARD PLANS AND BE A COMMON SIZE.

HOODED CATCH BASIN DIMENSION TABLE						
PIPE SIZE (IN.)	"X"	SINGLE CATCH BASIN "Y" (ANGLE A)	SINGLE CATCH BASIN "Y" (ANGLE B)	DOUBLE CATCH BASIN "Y" (ANGLE A)	DOUBLE CATCH BASIN "Y" (ANGLE B)	"Z" MIN.
15	2'-6"	3'-0"	3'-0"	6'-4"	6'-4"	2'-0"
18	2'-6"	3'-0"	4'-0"	6'-4"	6'-4"	2'-6"
21	4'-0"	4'-0"	4'-0"	6'-4"	6'-4"	3'-0"
24	4'-0"	4'-0"	5'-0"	6'-4"	6'-4"	3'-0"
30	4'-0"	4'-0"	6'-0"	6'-4"	6'-4"	3'-6"
36	4'-0"	5'-0"	6'-0"	6'-4"	6'-4"	4'-0"
42	6'-0"	6'-0"	7'-0"	6'-4"	8'-0"	5'-0"
48	6'-0"	6'-0"	8'-0"	6'-4"	8'-0"	5'-6"

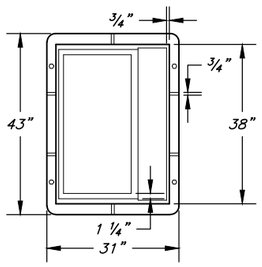




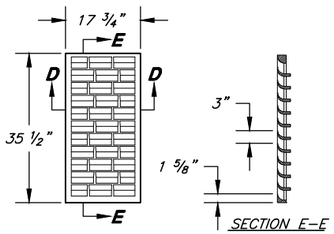
CURB HOOD (SIDE VIEW)



SECTION D-D

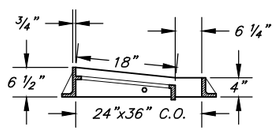


FRAME (TOP VIEW)

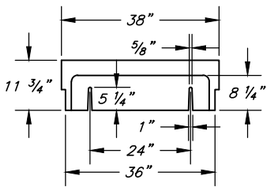


GRATE (TOP VIEW)

SECTION E-E



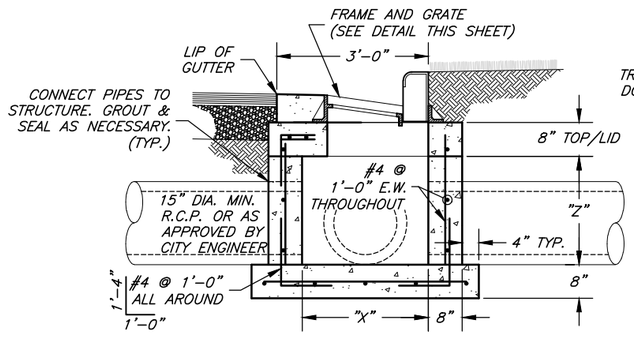
FRAME (SECTION VIEW)



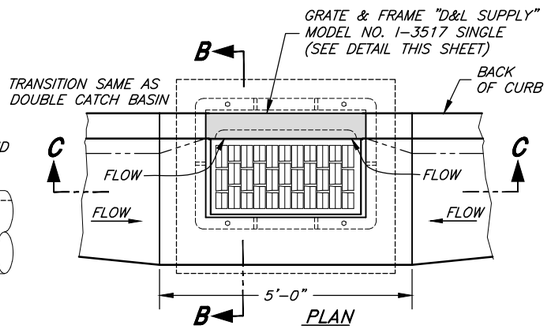
CURB HOOD (FRONT VIEW)

FRAME, REINFORCED CURB HOOD, AND TYPE "L" GRATE

"D&L SUPPLY" I-3517

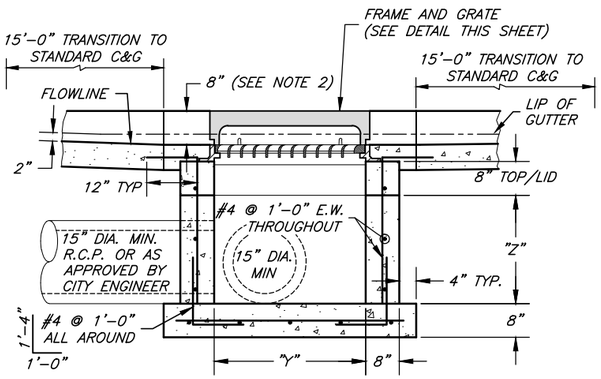


SECTION B-B



PLAN

SINGLE HOODED CATCH BASIN



SECTION C-C

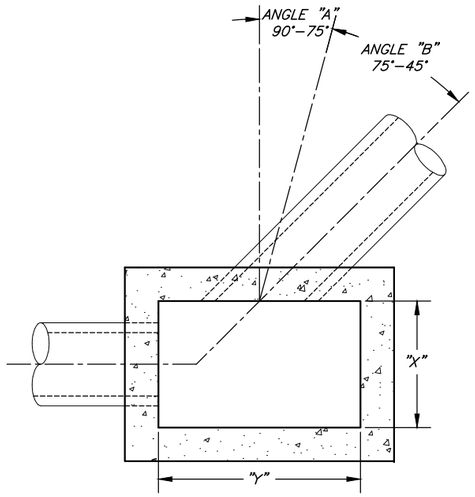
PROJECT ENGINEER	REV.	DATE	APPR.	SCALE: N.T.S.	DESIGNED / DRAWN / CHECKED
MAY 2022 DATE					

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

STORM DRAIN - SINGLE & DOUBLE CATCH BASIN DETAILS

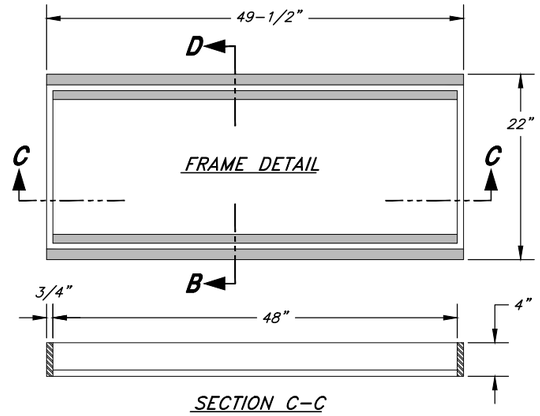
SHEET: CS-17 OF 31 SHEETS 0



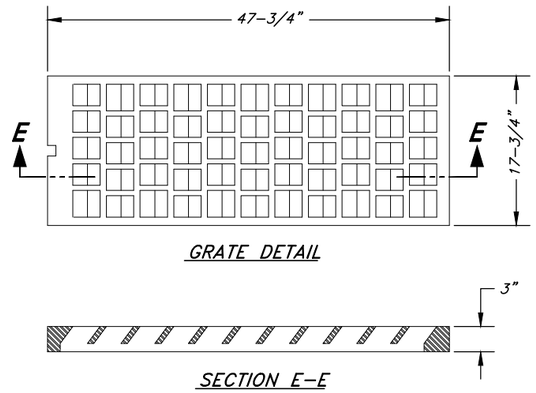
DRAINAGE DITCH INLET BOX DIMENSION TABLE				
PIPE SIZE (IN.)	"X"	INLET BOX "Y" (ANGLE A)	INLET BOX "Y" (ANGLE B)	"Z" MIN.
15	2'–6"	4'–0"	4'–0"	2'–0"
18	2'–6"	4'–0"	4'–0"	2'–6"
21	4'–0"	4'–0"	4'–0"	3'–0"
24	4'–0"	4'–0"	5'–0"	3'–0"
30	4'–0"	4'–0"	6'–0"	3'–6"
36	4'–0"	4'–0"	6'–0"	4'–0"
42	6'–0"	6'–0"	7'–0"	5'–0"
48	6'–0"	6'–0"	8'–0"	5'–6"

GENERAL NOTE:

STORM DRAIN LINES SHALL BE 15 INCH MINIMUM DIAMETER REINFORCED CONCRETE PIPE (RCP), OF APPROPRIATE CLASS.



SECTION C–C



GRATE DETAIL

SECTION E–E

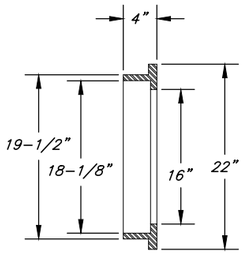
FRAME & GRATE DETAILS

FRAME AND GRATE NOTES:

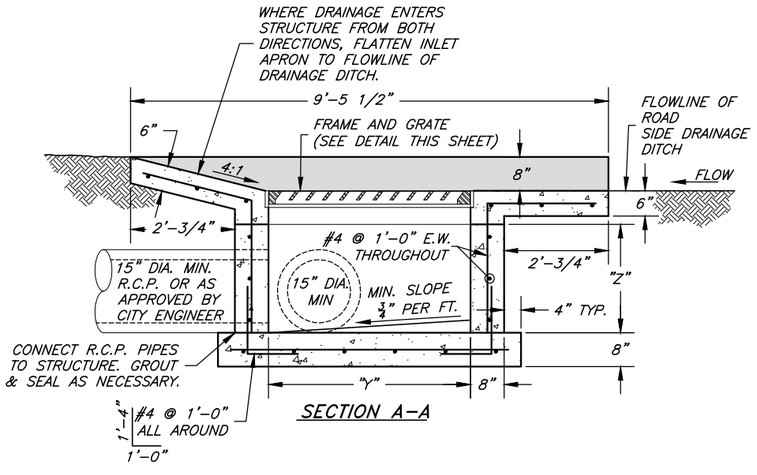
A1. GRATE AND FRAME SHALL BE AS MANUFACTURED BY "D&L SUPPLY" I–1803

B1. BICYCLE SAFE GRATE REQUIRED.

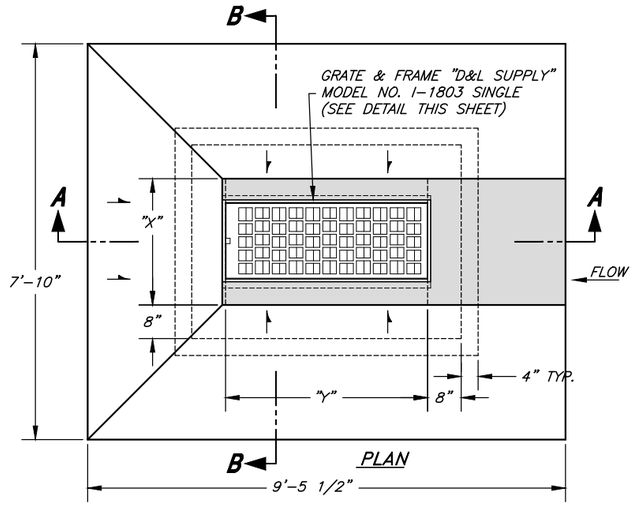
C1. "OR EQUAL" GRATES AND FRAMES WILL BE CONSIDERED AS APPROVED BY THE CITY ENGINEER.



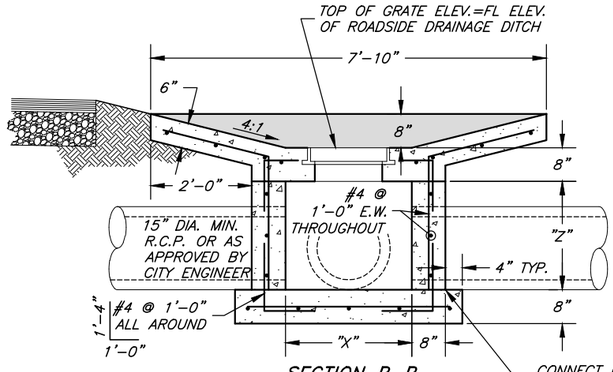
SECTION D–D



SECTION A–A



DRAINAGE DITCH / PARKING LOT INLET BOX



SECTION B–B

DRAINAGE BOX NOTES:

1. ALL BOX SIZES REFLECT DIMENSIONS FOR THE MINIMUM 15"ø PIPE SIZE. BOX DIMENSIONS MUST INCREASE PROPORTIONALLY TO ACCOMMODATE LARGER PIPE SIZES. (SEE TABLE THIS SHEET)

2. CAST–IN–PLACE CONCRETE STRUCTURES CAN BE REPLACED WITH PRECAST CONCRETE STRUCTURES WITH HL–93 DECK LOADING AND COMPARABLE SIZE.

3. ALL BOXES SHALL BE FORMED ON THE INSIDE AND OUTSIDE OF THE BOX AND INSPECTED BY THE CITY PRIOR TO THE PLACING OF CONCRETE.

PROJECT ENGINEER

DATE: MAY 2022

REV.	DATE	APPR.	

SCALE: N.T.S.

DESIGNED

DRAWN

CHECKED

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476–9767
www.jonescivil.com

WILLARD CITY CORPORATION

PUBLIC WORKS STANDARDS

STORM DRAIN - DRAINAGE DITCH INLET BOX & GENERAL GRATE AND FRAME DETAILS

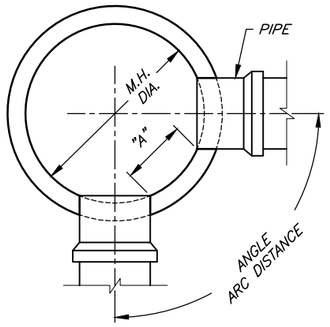
SHEET: CS-18

OF 31 SHEETS

0

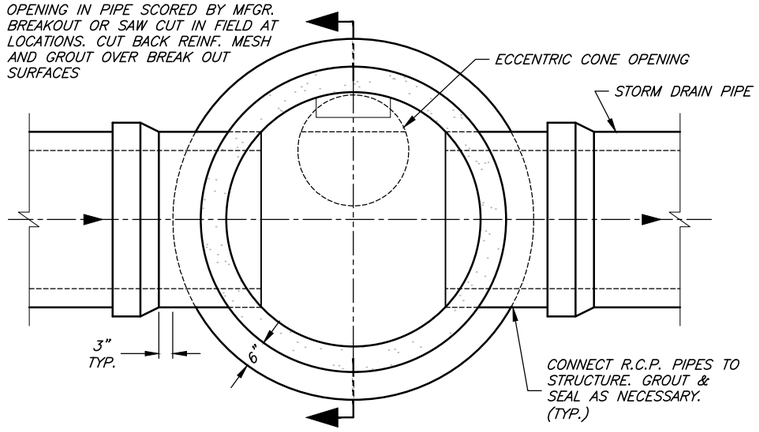
PIPE SIZES

M.H. SIZE	IN-LINE M.H. 180°	JUNCTION MANHOLE (ANGLE / ARC DISTANCE) 90°	85°	80°	75°	70°	65°	60°	55°	50°	45°
4'Ø M.H.	15"–24"	15"–18"	15"–18"	15"	15"	--	--	--	--	--	--
5'Ø M.H.	27"–30"	21"–24"	21"–24"	18"–21"	18"–21"	15"–18"	15"–18"	15"	--	--	--
6'Ø M.H.	36"–48"	27"–30"	27"–30"	24"–27"	24"	21"–24"	21"	18"	15"–18"	15"	--
7'Ø M.H.	54"	36"	36"	30"	27"–30"	27"	24"	21"–24"	21"	18"	15"
8'Ø M.H.	60"	42"	42"	36"	36"	30"	27"–30"	27"	24"	21"	18"

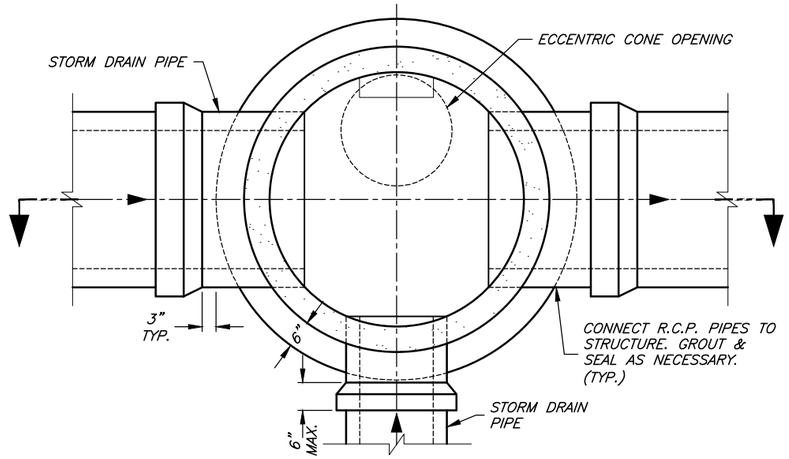


SIZING NOTES:

1. SUGGESTED "A" DISTANCE IS 6" OR GREATER FOR 48", 60" AND 72" DIAMETER MANHOLES
2. SUGGESTED "A" DISTANCE IS 8" OR GREATER FOR 84" AND 96" DIAMETER MANHOLES



TYPICAL LINE MANHOLE



TYPICAL JUNCTION MANHOLE

GENERAL NOTES:

A. STORM DRAIN MANHOLE DIAMETER TO BE DETERMINED BY THE DESIGN ENGINEER AFTER EVALUATION OF THE NUMBER, SIZE, AND PIPE ENTRY ANGLE OF THE PIPES THAT CONNECT TO THE MANHOLE.

B. NO MORE THAN 12" OF GRADE RINGS TO BE ALLOWED ON ANY MANHOLE

C. PLYWOOD COVERS SHALL BE USED AT MANHOLE FLOOR TO COVER FLOWLINE DURING CONSTRUCTION AND MAINTENANCE ACTIVITIES.

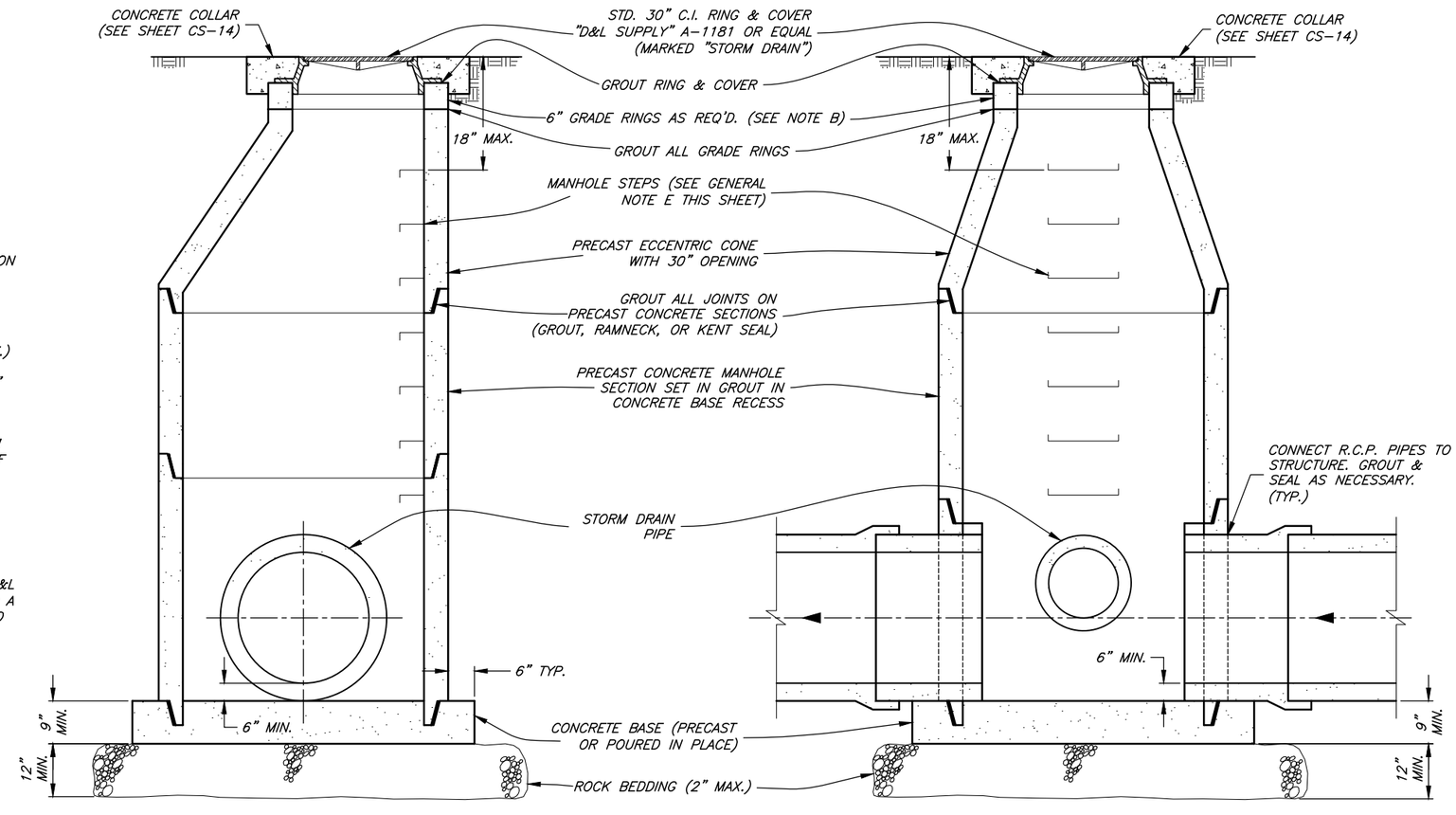
D. ALL INTERIOR JOINTS SHALL BE SMOOTH AND EVENLY GROUTED WITH NON-SHRINK GROUT MIX.

E. MANHOLE STEPS UNIFORMLY SPACED (1'-0" MAX.) POLYPROPYLENE COVERED STEEL STEPS, MODEL PSI-PF AS MANUFACTURED BY "M.A. INDUSTRIES" OR APPROVED EQUAL - INSTALLATION OF STEPS SHALL BE WATERPROOF.

F. STORM DRAIN LINES SHALL BE 15 INCH MINIMUM DIAMETER REINFORCED CONCRETE PIPE (RCP), OF APPROPRIATE CLASS.

G. FLAT MANHOLE RINGS & COVERS (SLAB CONSTRUCTION) ARE NOT ALLOWED ON ANY MANHOLE CONE SECTION.

H. THE USE OF STORM DRAIN UTILITY VAULTS (BOXES) WITH STD. 30" C.I. RING & COVER ("D&L SUPPLY" A-1181 MARKED "STORM DRAIN") AND A CONCRETE COLLAR IS ACCEPTED WHEN APPROVED BY THE CITY.



PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.	

SCALE: N.T.S.

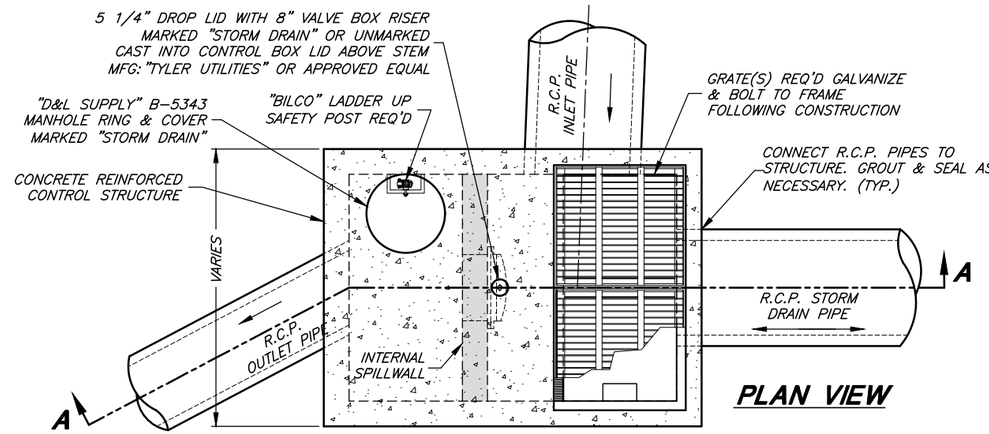
DESIGNED
DRAWN
CHECKED

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

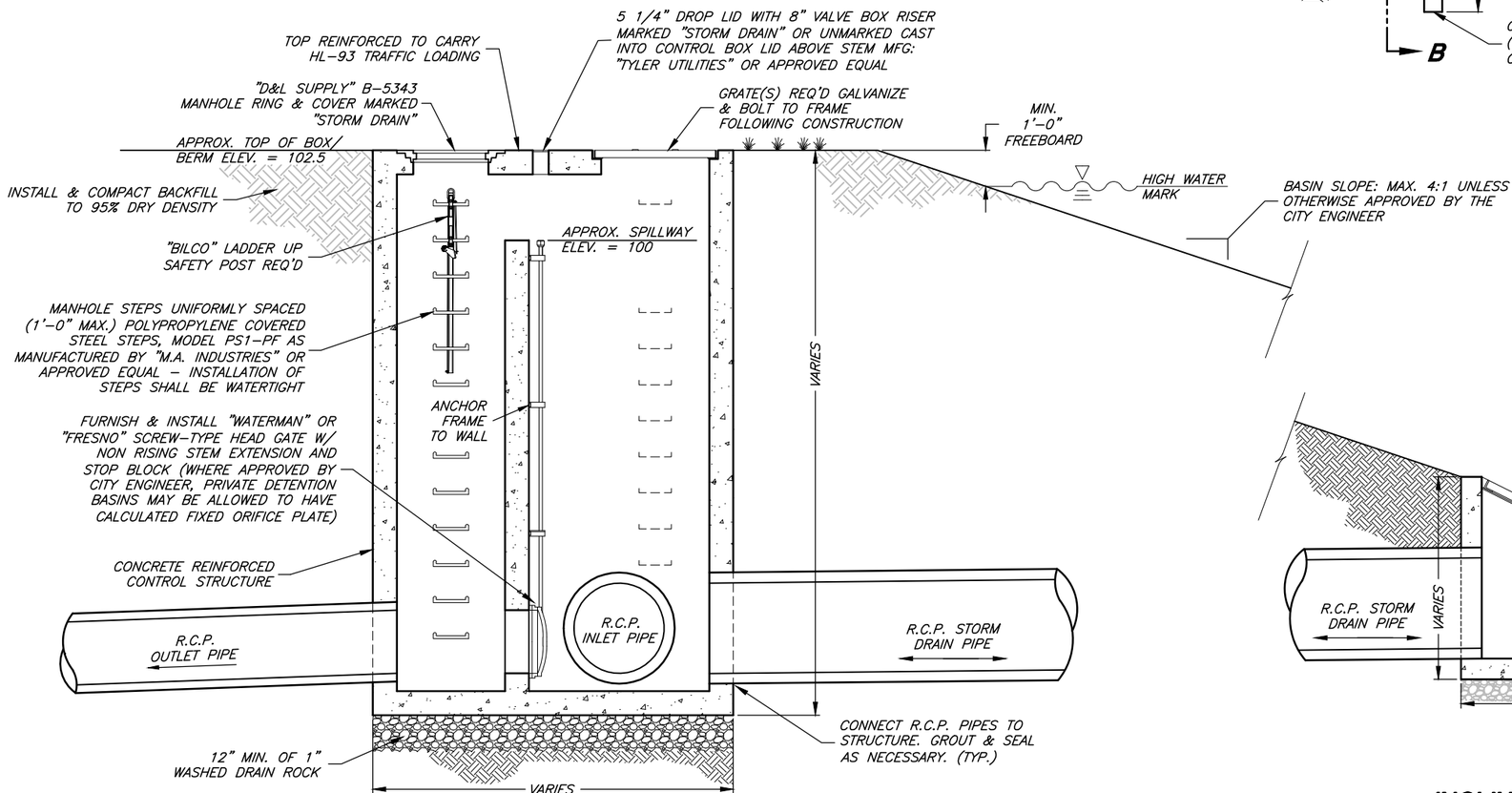
STORM DRAIN - MANHOLE DETAILS

SHEET: CS-19
OF 31 SHEETS
0

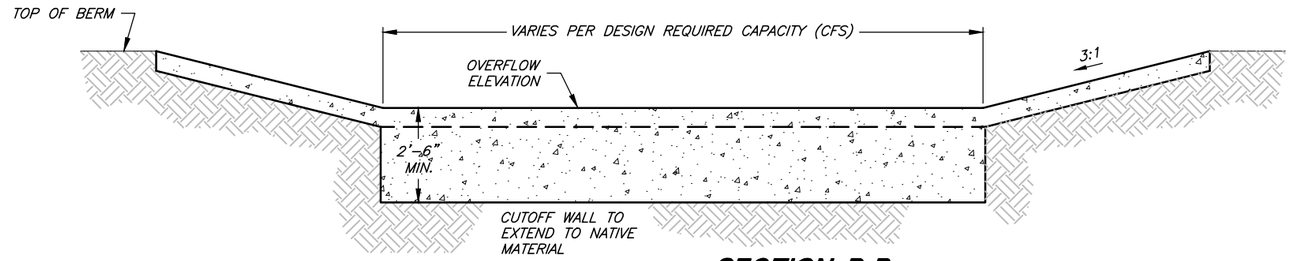


DETENTION INLET/OUTLET CONTROL STRUCTURE

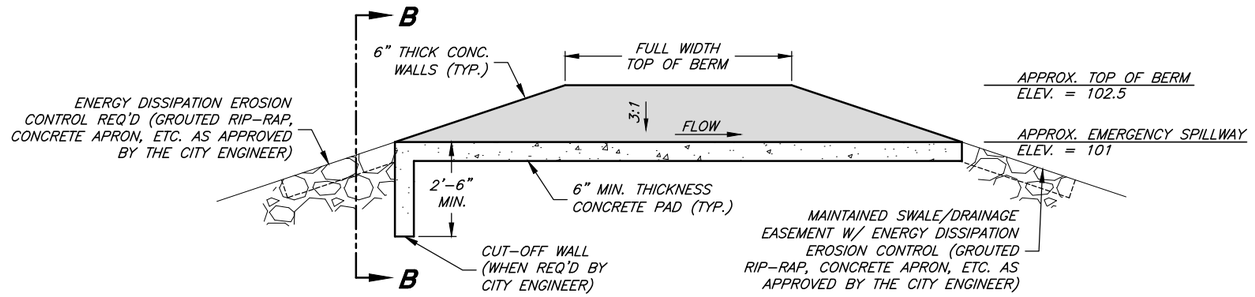
(PRECAST OR CAST-IN-PLACE)



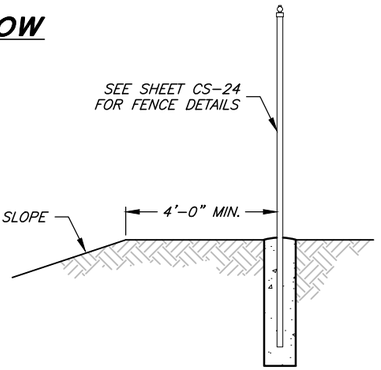
SECTION A-A



SECTION B-B

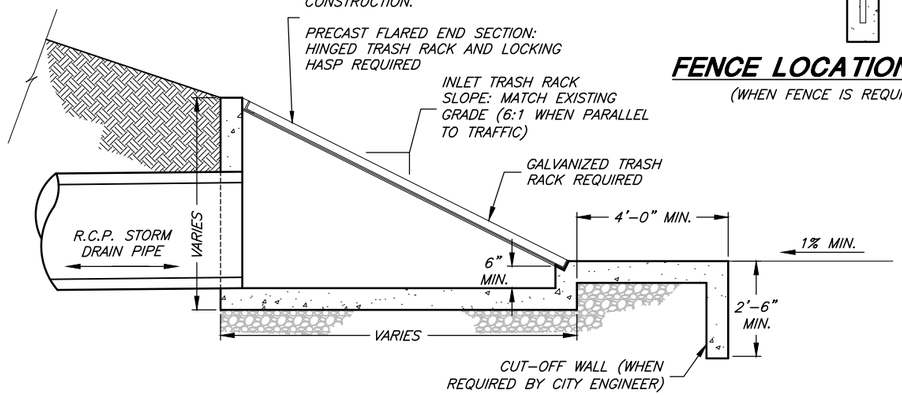


EMERGENCY OVERFLOW



FENCE LOCATION DETAIL

(WHEN FENCE IS REQUIRED BY CITY)



INCLINED GRATE STORM DRAIN INLET

GENERAL AND STRUCTURAL NOTES: SEE SHEET CS-21

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.	

SCALE: N.T.S.

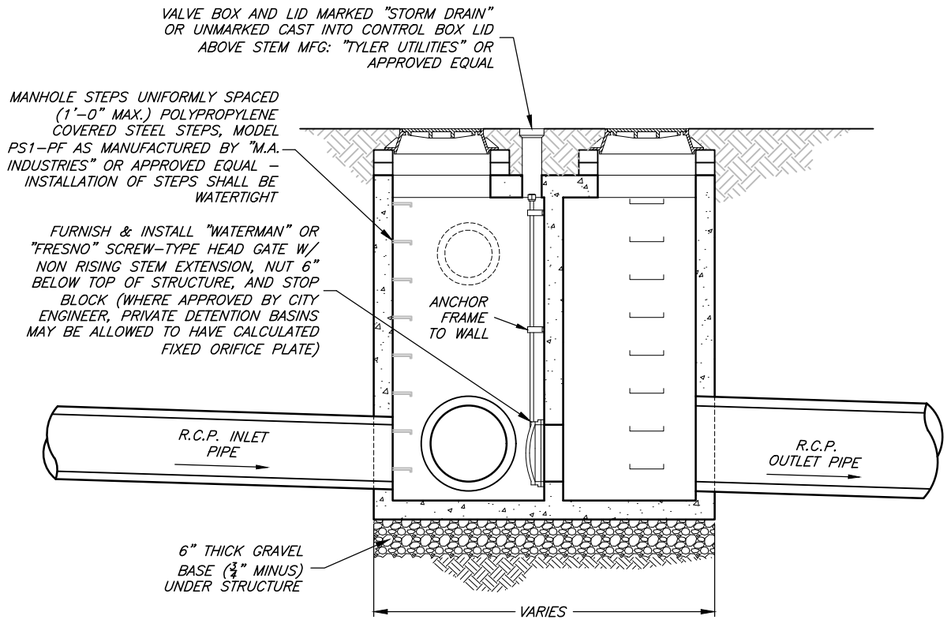
DESIGNED
DRAWN
CHECKED

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

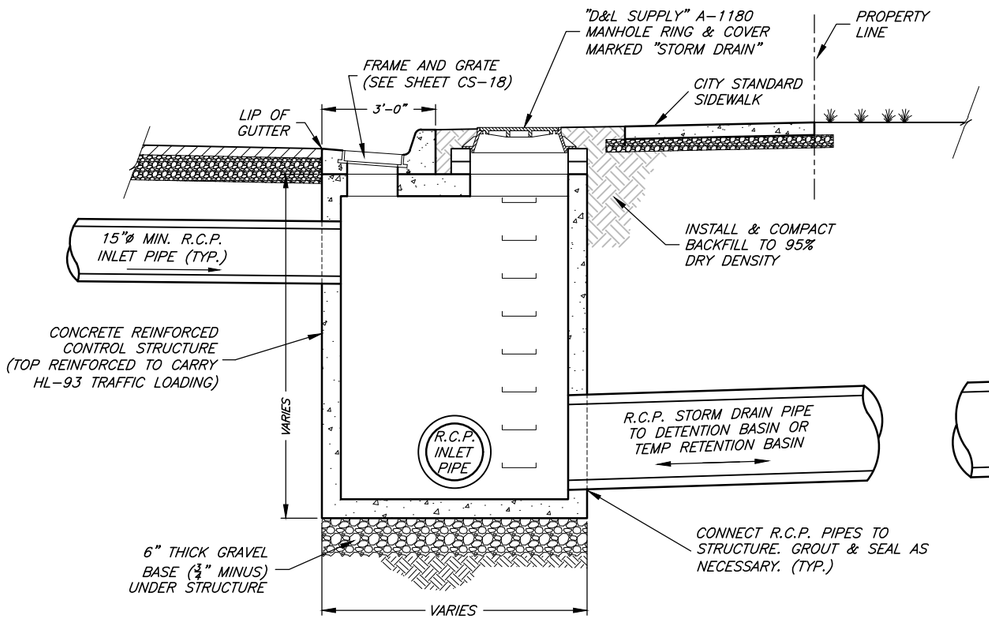
WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

STORM DRAIN - LARGE DETENTION BASIN DETAILS

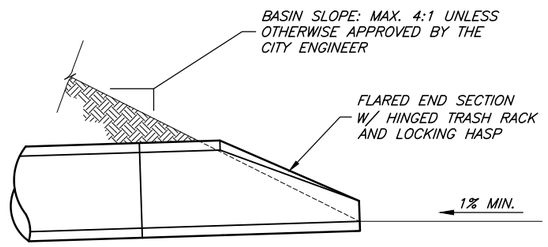
SHEET: CS-20
OF 31 SHEETS
0



SECTION B-B



SECTION A-A



EMERGENCY OVERFLOW AND FENCE LOCATION DETAIL : SEE SHEET CS-20

GENERAL NOTES:

1. ALL BASINS REGARDLESS OF LOCAL OR REGIONAL SHALL BE DESIGNED TO ACCOMMODATE A 100 YEAR STORM EVENT.
2. A DAM SAFETY (UTAH DIVISION OF WATER RIGHTS) HAZARD PERMIT MAY BE REQUIRED.
3. STRUCTURE DESIGN AND FLOW CALCULATIONS MUST BE APPROVED BY CITY ENGINEER PRIOR TO CONSTRUCTION.
4. STORM DRAIN LINES SHALL BE 15 INCH MINIMUM DIAMETER REINFORCED CONCRETE PIPE (RCP), OF APPROPRIATE CLASS.
5. THE SURFACE AREA OF THE BASIN SHALL BE SODDED AND SHALL BE PROVIDED WITH AN AUTOMATED SPRINKLER SYSTEM APPROVED BY THE CITY ENGINEER.
6. GRATES SHALL BE REMOVABLE FOR MAINTENANCE PURPOSES
7. GRATES SHALL BE HOT DIPPED GALVANIZED WITH BARS AT MAXIMUM 3 INCH SPACING.
8. LOW FLOWS MUST BE PIPED CONTINUOUSLY TO THE CONTROL STRUCTURE. NO OPEN FLOW IS PERMITTED THROUGH THE BASIN.
9. INCLINED GRATES ARE REQUIRED ON ALL PIPES/INLETS WHERE OPEN CHANNELS, DITCHES, OR PONDS DISCHARGE DIRECTLY INTO THE STORM DRAIN SYSTEM.
10. AN INTERNAL SPILLWAY MAY BE CONSTRUCTED INSIDE THE STRUCTURE DEPENDING ON SITE CONDITIONS AND ELEVATIONS.
11. BASIN STRUCTURES ARE DETERMINED BY THE SIZE OF THE DETENTION BASIN OR AS REQUIRED BY THE CITY ENGINEER. (SEE SHEET CS-20 OR CS-21)
    a. SMALL DETENTION BASIN: LESS THAN OR EQUAL TO 1 ACRE FOOT
    b. LARGE DETENTION BASIN: GREATER THAN 1 ACRE FOOT

STRUCTURAL NOTES:

A. PRECAST CONCRETE STRUCTURE CAN BE REPLACED WITH CAST-IN-PLACE CONCRETE VAULT. SUBMIT ENGINEERED CONSTRUCTION PLANS WITH REBAR DETAILS TO CITY ENGINEER FOR REVIEW AND ACCEPTANCE PRIOR TO CONSTRUCTION.

B. ADD REINFORCEMENT AROUND OPENINGS EQUAL TO REINFORCEMENT DISPLACED BY OPENING.

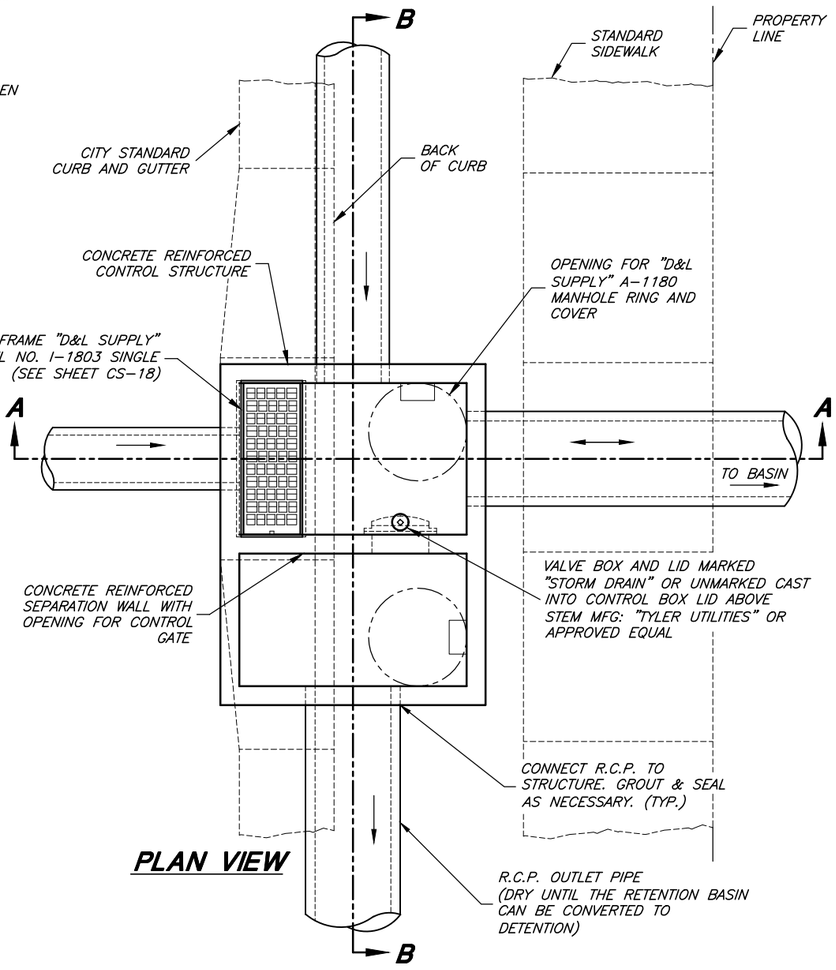
C. THE PRECAST VAULT MANUFACTURER IS RESPONSIBLE FOR DESIGN RELATED TO TRAFFIC LOADING AND THRUST. VERIFICATION OF PROPER DESIGN MUST BE PROVIDED TO THE CITY BY THE DEVELOPER, CONTRACTOR, OR PROPERTY OWNER AS THE CASE MAY BE.

D. REINFORCEMENT TO CONFORM WITH ASTM A 615 GRADE 60

E. CONCRETE SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF 5,000 PSI

F. USE AN AIR-ENTRAINING AGENT ON ALL CONCRETE EXPOSED TO THE WEATHER.

G. HL-93 LOADING



PLAN VIEW

INLET/OUTLET CONTROL STRUCTURE

(PRECAST OR CAST-IN-PLACE)

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.

SCALE: N.T.S.

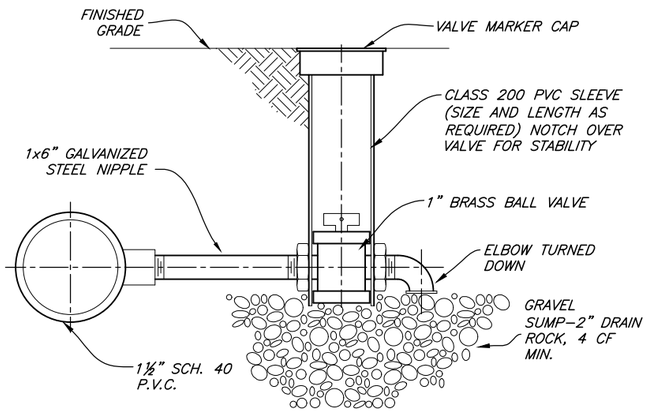
DESIGNED
DRAWN
CHECKED

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

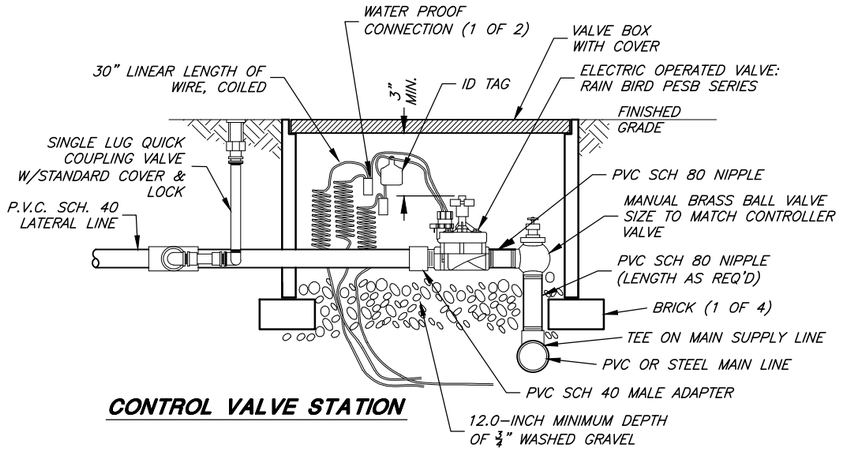
WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

STORM DRAIN - SMALL DETENTION BASIN DETAILS

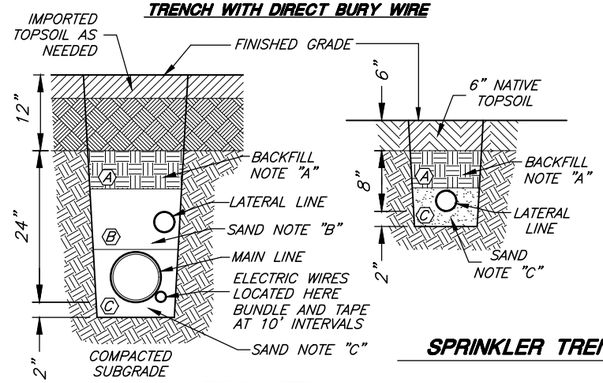
SHEET: CS-21
OF 31 SHEETS
0



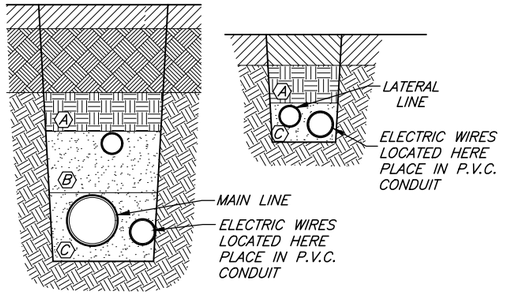
MANUAL DRAIN VALVE



CONTROL VALVE STATION



TRENCH WITH DIRECT BURY WIRE



TRENCH WITH ELECTRICAL CONDUIT

SPRINKLER TRENCH DETAILS

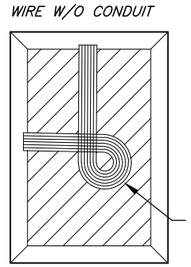
TRENCH NOTES:

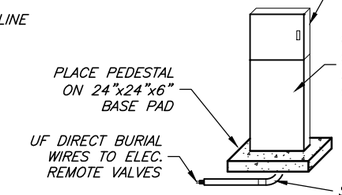
Ⓐ USE EXCAVATED TRENCH MATERIAL NOT TO EXCEED 2" DIA. ROCKS.

Ⓑ IN CASES WHERE LATERAL LINE IS INSTALLED IN MAINLINE TRENCH, USE SAND TO BACKFILL TRENCH SO THAT LATERAL LINE IS 14" BELOW FINISHED GRADE & COVERED W/ SAND.

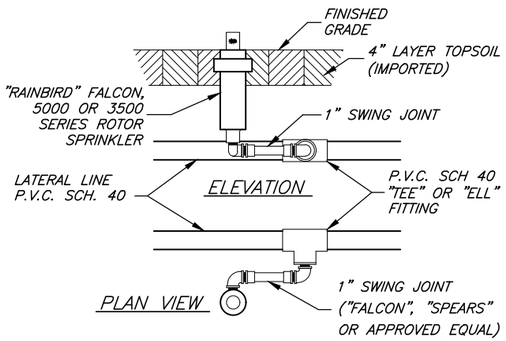
Ⓒ USE SAND TO PROVIDE A 2" BED AND COVER ALL P.V.C. PIPES AND ELECTRICAL WIRES. IN CASES WHEN NATIVE MATERIAL IS NOT ACCEPTABLE AS BACKFILL.

GEN. NOTE:
LOCATE ALL TRENCHES 12" AWAY FROM BUILDINGS, SIDEWALKS, OR ANY HARD SURFACE. SETTLE ALL TRENCHES W/ WATER PRIOR TO FINE GRADING AND RAKING OF TOPSOIL. MAIN LINES RUNNING IN SAME TRENCH SHOULD BE SIDE BY SIDE WITH A MINIMUM DISTANCE OF 6" APART.

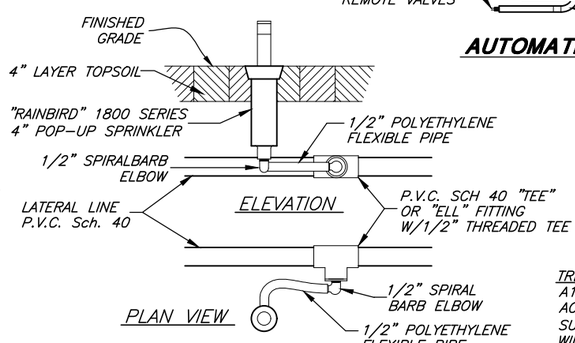




AUTOMATIC CLOCK DETAIL



ROTOR HEAD CONNECTION DETAIL



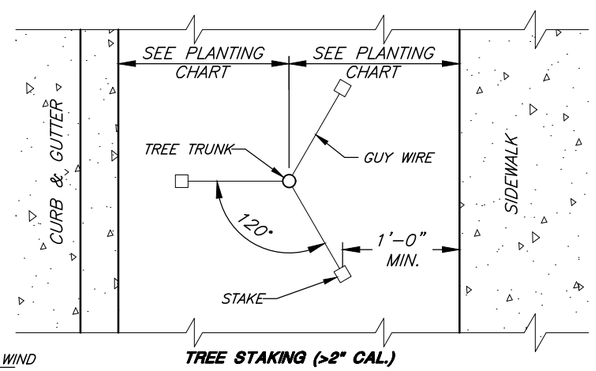
1800 SERIES HEAD CONNECTION DETAIL

SPRINKLER NOTES:

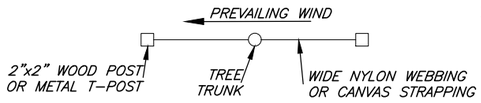
1. INSTALL ALL WIRING ACCORDING TO LOCAL CODES. ALL WIRES ABOVE FINISHED GRADE TO BE INSTALLED IN METAL CONDUITS.
2. SPACE SPRINKLER HEADS AT A MAXIMUM OF 95% OF COVERAGE DISTANCE.

TREE NOTES:
A1. ALL PLANTED TREES TO BE SPACED IN ACCORDANCE WITH THE SPECIES CHARACTERISTICS SUCH THAT THE TREES' CROWNS AT MATURITY WILL NOT OVERLAP WITH ANOTHER TREE NOR TOUCH OR OVERHANG A BUILDING.

B1. FOR ADDITIONAL HELP WITH TREE SELECTION VISIT WWW.TREEBROWSER.ORG FOR FURTHER INFORMATION ON NATIVE AND INTRODUCED TREES GROWING IN UTAH AND THE INTERMOUNTAIN WEST.



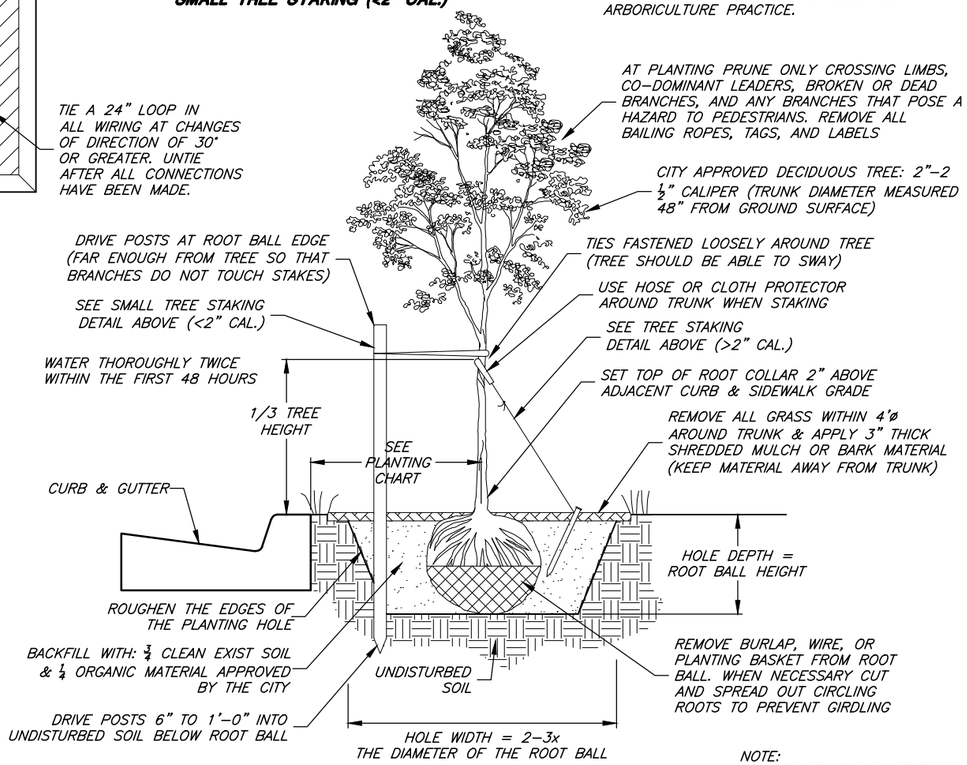
TREE STAKING (>2" CAL.)



SMALL TREE STAKING (<2" CAL.)

STAKING DETAILS

STAKING OPTIONAL UNLESS REQUIRED BY THE CITY INSPECTOR. STAKES OR GUYS ARE TO BE INSTALLED USING ACCEPTED ARBORICULTURE PRACTICE.



NOTE:
REMOVE STAKING ONCE TREE ROOTS ARE ESTABLISHED

TREES IN PARKSTRIP & PLANTING DETAIL

TREE PLANTING CHART

SIZE	MATURE HEIGHT	CURB/SIDEWALK	STREET CORNER/FH	POWER/UTILITY DISTANCE
LARGE	OVER 40 FT.	4 FT. MIN. DISTANCE	30 FEET FROM STREET	10 LATERAL FT. OF ANY OVERHEAD UTILITY WIRE &
MEDIUM	25 FT. TO 40 FT.	3 FT. MIN. DISTANCE	CORNER & 10 FEET	5 LATERAL FT. OF ANY UNDERGROUND UTILITY LINE
SMALL	LESS THAN 25 FT.	2 FT. MIN. DISTANCE	FROM ANY FIRE HYDRANT	--

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.	

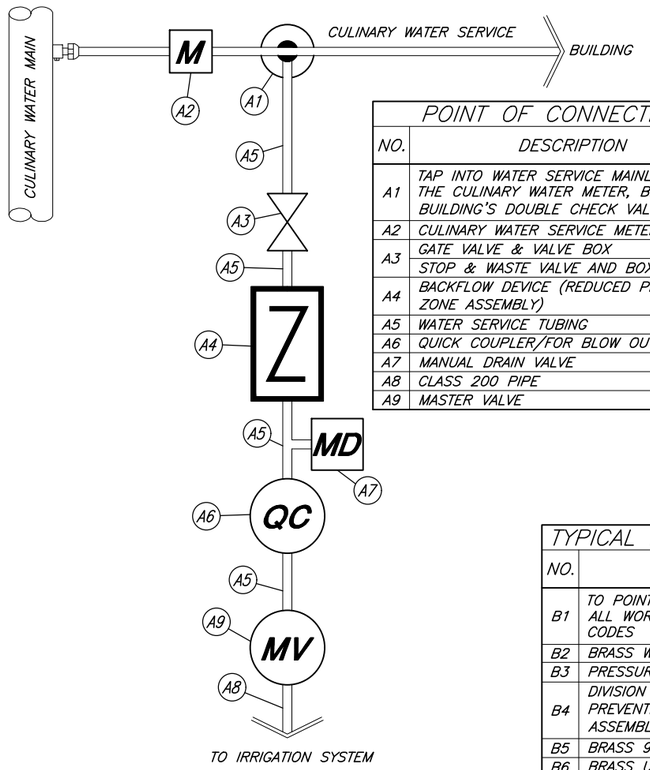
SCALE: N.T.S.

DESIGNED
DRAWN
CHECKED

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS
GENERAL - SPRINKLER & TREE PLANTING DETAILS

SHEET: CS-22
OF 31 SHEETS
0



TO IRRIGATION SYSTEM

TYPICAL POINT OF CONNECTION SCHEMATIC DIAGRAM

NOT TO SCALE

POINT OF CONNECTION	
NO.	DESCRIPTION
A1	TAP INTO WATER SERVICE MAINLINE, AFTER THE CULINARY WATER METER, BEFORE BUILDING'S DOUBLE CHECK VALVE
A2	CULINARY WATER SERVICE METER
A3	GATE VALVE & VALVE BOX
	STOP & WASTE VALVE AND BOX
A4	BACKFLOW DEVICE (REDUCED PRESSURE ZONE ASSEMBLY)
A5	WATER SERVICE TUBING
A6	QUICK COUPLER/FOR BLOW OUT
A7	MANUAL DRAIN VALVE
A8	CLASS 200 PIPE
A9	MASTER VALVE

TYPICAL PIPE & FITTING SCHEDULE	
NO.	DESCRIPTION
B1	TO POINT OF CONNECTION – ADAPT AS NECESSARY. ALL WORK SHALL CONFORM TO ALL APPLICABLE CODES
B2	BRASS WYE STRAINER W/ 60 MESH SCREEN
B3	PRESSURE REDUCING VALVE (AS REQUIRED)
B4	DIVISION OF DRINKING WATER APPROVED BACKFLOW PREVENTER UNIT (REDUCED PRESSURE ZONE ASSEMBLY)
B5	BRASS 90 DEGREE ELBOW (TYP.)
B6	BRASS UNION (TYP.)
B7	BRASS PIPE (TYP.)
B9	BRASS COUPLING
B10	PIPE ADAPTER AND MAINLINE PIPE
THE USE OF GALVANIZED STEEL PIPE & FITTINGS IS ACCEPTED WHEN APPROVED BY THE CITY PUBLIC WORKS DEPARTMENT.	

REDUCED PRESSURE ASSEMBLY (RP) NOTES:

C1. WHERE REQUIRED OR WHEN DIRECTED BY THE CITY, AN RP ASSEMBLY SHALL BE INSTALLED WHEN A SECONDARY SERVICE IS CONNECTED TO THE CULINARY WATER SYSTEM.

C2. THE RP ASSEMBLY SHALL BE INSTALLED IN A HORIZONTAL POSITION ONLY.

C3. RP ASSEMBLIES SHALL NOT BE INSTALLED IN A PIT.

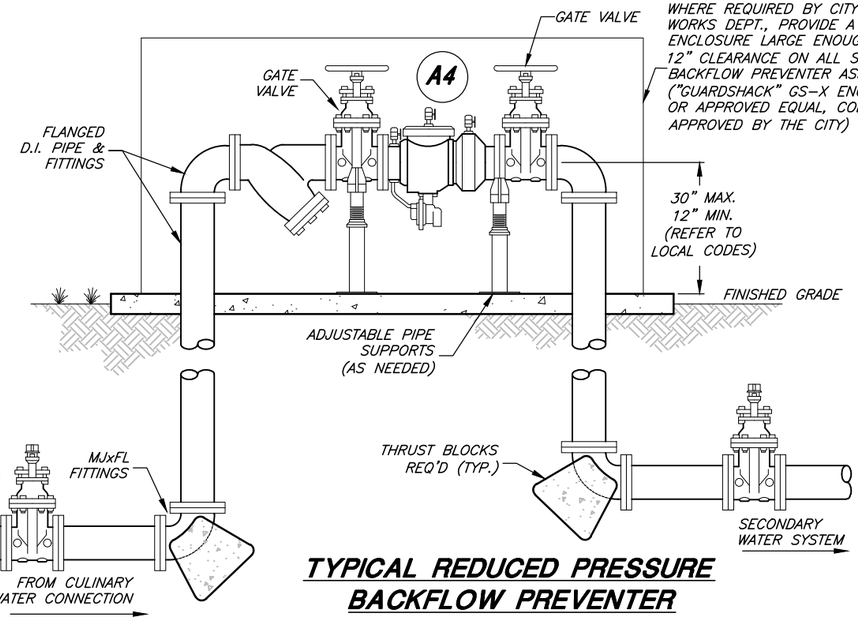
C4. THE BODY OF THE RP ASSEMBLY SHALL BE A MINIMUM OF 12 INCHES FROM ANY WALLS, CEILINGS, OR ENCUMBRANCES AND SHALL BE READILY ACCESSIBLE FOR TESTING, REPAIR AND/OR MAINTENANCE.

C5. THE BOTTOM OF THE RP ASSEMBLY SHALL BE A MINIMUM OF 12 INCHES ABOVE THE GROUND FLOOR.

C6. RP VALVE ASSEMBLY AND PIPES TO MATCH SECONDARY LATERAL/MAIN SIZE.

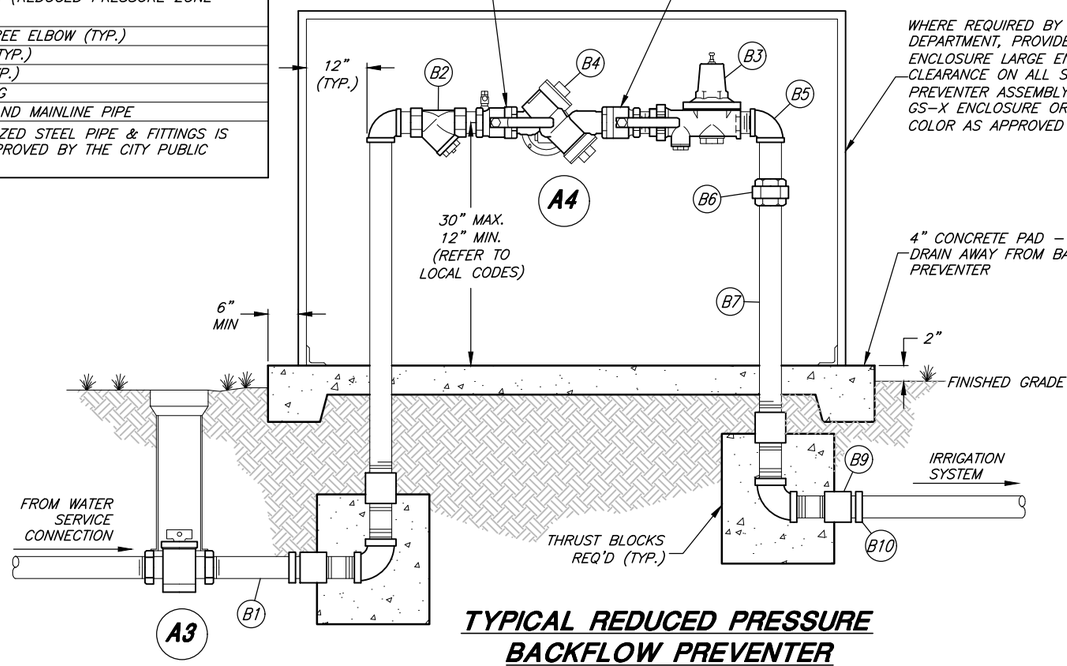
C7. THE BACKFLOW PREVENTER SHALL BE BRONZE FOR 6–INCH AND SMALLER VALVES, AND EPOXY COATED DUCTILE IRON FOR 8–INCH AND LARGER VALVES.

C8. BACKFLOW PREVENTION DEVICES SHALL BE SELECTED FROM A LIST OF APPROVED DEVICES SET FORTH BY THE UTAH DIVISION OF DRINKING WATER. REDUCED PRESSURE ASSEMBLIES (RP) AND CITY ENGINEER APPROVED DOUBLE CHECK VALVE ASSEMBLIES (DCA) WILL BE THE ONLY ACCEPTED STYLES OF BACKFLOW PREVENTION DEVICES.



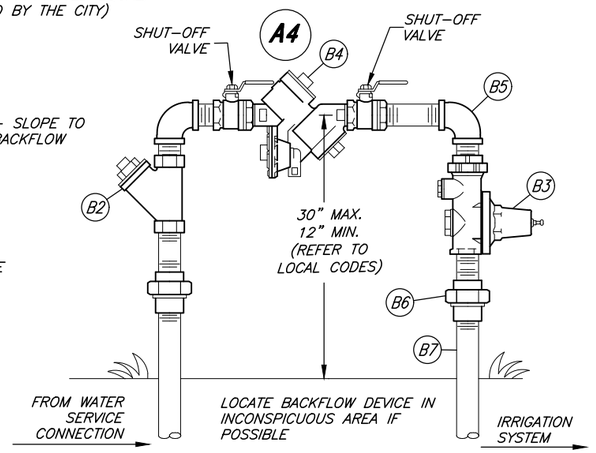
TYPICAL REDUCED PRESSURE BACKFLOW PREVENTER

4" AND LARGER DIAMETER



TYPICAL REDUCED PRESSURE BACKFLOW PREVENTER

LESS THAN 3" DIAMETER



ALTERNATE REDUCED PRESSURE BACKFLOW PREVENTER

OPTIONAL ALTERNATE FOR RESIDENTIAL CONNECTIONS AND COMMERCIAL DEVELOPMENTS LESS THAN ONE ACRE

GENERAL NOTES:

1. DESIGN, CONSTRUCTION, AND INSTALLATION SHALL BE DONE ACCORDING TO AND COMPLY WITH ALL CURRENT ADOPTED BUILDING AND PLUMBING CODES, AND TO MANUFACTURERS WRITTEN INSTRUCTIONS AND RECOMMENDATIONS.
2. ALL TESTING, MAINTENANCE, AND/OR REPAIR SHALL BE PERFORMED BY A STATE CERTIFIED BACKFLOW ASSEMBLY TECHNICIAN.
3. THE ASSEMBLY MUST BE THOROUGHLY DRAINED AND WINTERIZED EACH WINTER.
4. THE RP ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND VANDALISM WHERE APPLICABLE.
5. ABOVE GROUND FITTINGS TO BE EPOXY PAINTED BLUE ON THE CULINARY SIDE AND PURPLE ON THE SECONDARY SIDE.
6. PROVIDE BOLLARDS OR OTHER PROTECTION IF AND AS DIRECTED BY THE CITY.
7. RP ASSEMBLY DESIGN AND CONSTRUCTION DETAILS/DRAWINGS TO BE SUBMITTED TO THE CITY ENGINEER AND THE CITY PUBLIC WORKS DEPARTMENT FOR APPROVAL PRIOR TO INSTALLATION.
8. LOCATION OF BACKFLOW ASSEMBLY SHALL BE APPROVED BY THE CITY PUBLIC WORKS DEPARTMENT PRIOR TO INSTALLATION.
9. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED WITHIN 10 DAYS OF INITIAL USE BY A LICENSED BACKFLOW DEVICE TESTER.
10. ALL BACKFLOW PREVENTION ASSEMBLIES ARE TO BE TESTED ANNUALLY BY A CERTIFIED TESTER AND REPAIRS OR MAINTENANCE COMPLETED AS NEEDED. ANNUALLY SUBMIT TEST RESULTS TO THE CITY.

PROJECT ENGINEER

MAY 2022
DATE

REV.	DATE	APPR.	

SCALE: N.T.S.

DESIGNED
DRAWN
CHECKED

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476–9767
www.jonescivil.com

WILLARD CITY CORPORATION

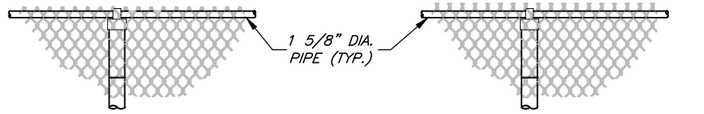
PUBLIC WORKS STANDARDS

GENERAL - REDUCED PRESSURE (RP) BACKFLOW PREVENTION ASSEMBLY

SHEET: CS-23

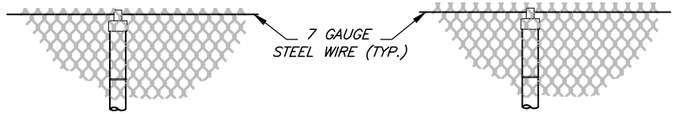
OF 31 SHEETS

0



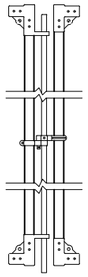
KNUCKLED SELVAGE
TYPE I

TWISTED & BARBED SELVAGE
TYPE II

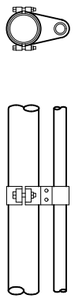


KNUCKLED SELVAGE W/ TENSION WIRE
TYPE III

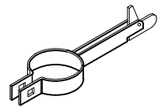
TWISTED & BARBED SELVAGE W/ TENSION WIRE
TYPE IV



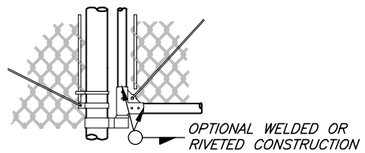
DROP ROD ASSEMBLY



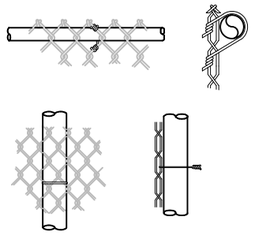
TOP GATE HINGE



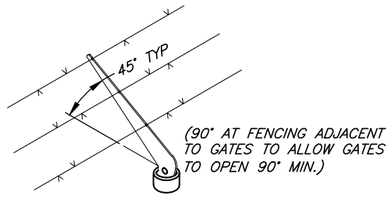
GATE KEEPER



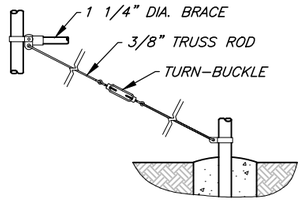
BOTTOM GATE HINGE AND GATE DETAIL



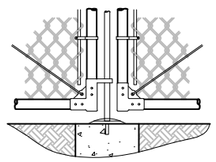
PIPE POST TIE



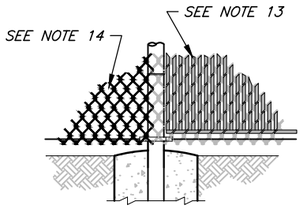
COMBINATION CAP AND BARBED WIRE SUPPORTING ARM



BRACE & TRUSS CONNECTIONS



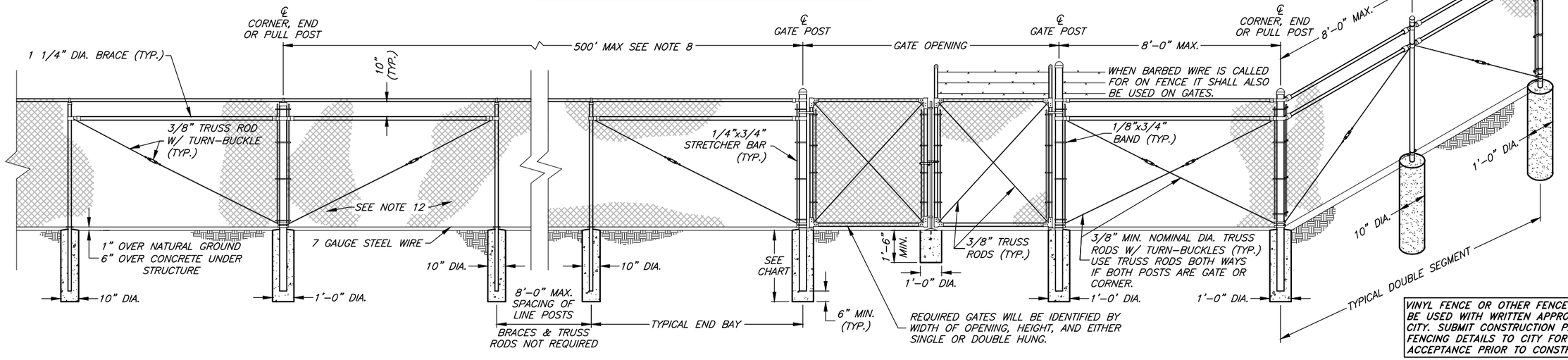
CENTER GATE STOP AND GATE DETAIL



SLATS & VINYL COATING DETAIL

HEIGHT	GATE OPENING	GATE POST	GATE FRAME
UNDER 6 FEET	SINGLE TO 6' OR DOUBLE TO 12'	2"	1"
	SINGLE OVER 6' TO 8' OR DOUBLE OVER 12' TO 16'	2 1/2"	1 1/2"
	SINGLE OVER 8' TO 12' OR DOUBLE 16' TO 24'	4"	
6 FEET AND OVER	SINGLE TO 6' OR DOUBLE TO 12'	3 1/2"	1 1/2"
	SINGLE OVER 6' TO 12' OR DOUBLE OVER 12' TO 24'	4"	
	SINGLE OVER 12' TO 18' OR DOUBLE OVER 24' TO 36'	6"	
	SINGLE OVER 18' OR DOUBLE OVER 36'	8"	

HEIGHT OF FABRIC	DEPTH OF POSTS	LENGTH OF END, CORNER OR PULL POST	LENGTH OF LINE POST	SIZE OF POSTS	
				END, CORNER, & PULL POSTS	LINE POST
				NOM. SIZE	NOM. SIZE
7'	3'	10'	9'-8"	2 1/2"	2"
6'	3'	9'	8'-8"	2 1/2"	2"
5'	3'	8'	7'-8"	2"	1 1/2"
4'	2'	6'	5'-8"	2"	1 1/2"
3'	2'	5'	4'-8"	2"	1 1/2"



GENERAL NOTES:

1. MATERIALS, CONSTRUCTION, AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH PROJECT STANDARD SPECIFICATIONS.
2. THE TYPE OF TOP SUPPORT IS SPECIFIED IN THE BIDDING SCHEDULE, TYPES I AND II TUBULAR RAIL, TYPES III AND IV TENSION WIRE.
3. BARB WIRE SHALL BE USED ONLY WHEN DESIGNATED ON THE PLANS OR IN THE SPECIFICATIONS.
4. TWISTED AND BARBED SELVAGE TOP AND BOTTOM SHALL BE USED ON FENCES 5-FEET HIGH OR GREATER.
5. KNUCKLED SELVAGE ON TOP AND TWISTED AND BARBED ON BOTTOM SHALL BE USED ON FENCES LESS THAN 5-FEET.
6. ALL STEEL PIPE MEMBERS SHALL CONFORM TO ASTM A53 HOT DIPPED ZINC COATED HIGH TENSILE STEEL PIPE.
7. POSTS SHALL BE SCHEDULE 40 PIPE.
8. LINE POSTS SHALL BE LOCATED AT EQUAL SPACING FOR EACH SEGMENT WITH A MAXIMUM SPACING AS FOLLOWS:
   a. TANGENT SECTIONS TO 500-FOOT RADIUS NOT MORE THAN 8-FEET.
   b. UNDER 500-FOOT RADIUS TO 200-FOOT RADIUS NOT MORE THAN 8-FEET.
   c. UNDER 200-FOOT RADIUS TO 100-FOOT RADIUS NOT MORE THAN 6-FEET.
   d. UNDER 100-FOOT RADIUS NOT MORE THAN 5-FEET.
9. TRUSS RODS AND BRACES SHALL NOT BE REQUIRED FOR FABRIC HEIGHT LESS THAN 5-FEET.
10. TENSION WIRE SHALL BE 7 GAUGE ZINC- OR ALUMINUM-COATED COIL SPRING STEEL TENSION WIRE.
11. ALL POSTS SHALL BE SET IN 3000 PSI CONCRETE AND SHALL BE TOPPED WITH BALL TYPE OR OTHER APPROVED ORNAMENT.
12. ALL FABRIC SHALL BE 2" GALVANIZED 9 GAUGE MESH.
13. VERTICAL SEMI-PRIVACY VINYL SLATS WITH BOTTOM-LOCKING SLAT, WHEN REQUIRED BY THE CITY. COLOR AS APPROVED BY THE CITY.
14. VINYL COATED CHAINLINK FENCING WHEN REQUIRED BY THE CITY. COLOR AS APPROVED BY THE CITY.
15. ALL FENCING SHALL CONFORM TO LOCATION AND HEIGHT LIMITATIONS AS STATED IN THE WILLARD CITY FENCING ORDINANCE.

VINYL FENCE OR OTHER FENCE STYLES MAY BE USED WITH WRITTEN APPROVAL BY THE CITY. SUBMIT CONSTRUCTION PLANS AND FENCING DETAILS TO CITY FOR REVIEW AND ACCEPTANCE PRIOR TO CONSTRUCTION.

PROJECT ENGINEER
MAY 2022
DATE

REV.	DATE	APPR.	
1	MAY '22	ZJB	UPDATED POST TABLE - DEPTH OF POSTS

SCALE: N.T.S.

DESIGNED
DRAWN
CHECKED

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

GENERAL - CHAIN LINK FENCE DETAILS

SHEET: **CS-24** OF 31 SHEETS
0

STREET LIGHT STYLES AND LOCATIONS

SL-1 STREET LIGHT:

- FIXTURE STYLE: LED LAMP POST (FULLY DARK-SKY COMPLIANT)
- POLE HEIGHT: 14 FEET
- SPACING: MAXIMUM 400 FEET, ON ALTERNATING SIDES OF THE STREET (OR AS OTHERWISE APPROVED/DIRECTED BY THE CITY)
- LOCATION: CUL-DE-SACS, MID-BLOCK, AND RESIDENTIAL/MINOR INTERSECTIONS

OPTIONAL SL-2 STREET LIGHT:

- FIXTURE STYLE: LED COBRA HEAD WITH MAST ARM
- POLE HEIGHT: 25 FEET
- LOCATION: MAJOR INTERSECTIONS AND PARKING LOTS (OR AS OTHERWISE DIRECTED BY THE CITY)

STREET LIGHT GENERAL NOTES

LIGHT FIXTURES AND POLES:

1. THE SL-1 AND SL-2 STREET LIGHT (LIGHT POLE AND LED FIXTURE) TO BE FURNISHED AND INSTALLED BY ROCKY MOUNTAIN POWER (RMP), AND PAID FOR BY THE DEVELOPER/CONTRACTOR.

DEVELOPER/CONTRACTOR GENERAL NOTES:

2. THE COST OF ALL NEW DEVELOPMENT STREET LIGHTS IS THE RESPONSIBILITY OF THE DEVELOPER.
3. DEVELOPER/CONTRACTOR SHALL CONSULT WITH THE POWER COMPANY (RMP) ON THE PULL BOX LOCATION, PEDESTAL LOCATION, CONDUIT LOCATION, FOOTING INSTALLATION, AND DIGGING PRIOR TO ANY CONSTRUCTION.

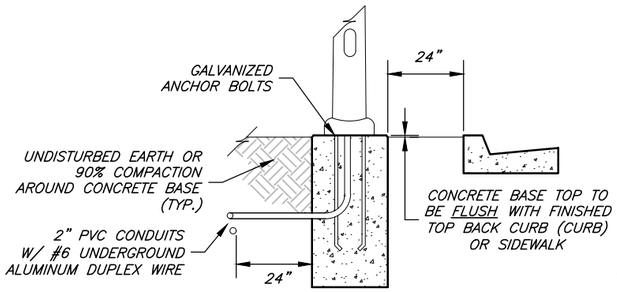
   ALL SPECIFICATIONS AND MODEL #S FOR WIRE, CONDUIT, FUSE KITS, SPLICE KITS, JUNCTION BOXES, AND CONNECTIONS MUST BE APPROVED BY RMP PRIOR TO INSTALLATION
4. DEVELOPER/CONTRACTOR TO FURNISH AND INSTALL CONCRETE FOOTING PER ROCKY MOUNTAIN POWER STANDARD REFERENCE #FP171 AND #FP253. ANCHOR BOLTS MUST NOT CONFLICT WITH THE STREET LIGHT POLE BASE. (IF THE CONCRETE FOOTING IS INSTALLED INCORRECTLY, ROCKY MOUNTAIN POWER (RMP) SHALL REPLACE THE FOOTING AT THE DEVELOPER'S/CONTRACTOR'S EXPENSE)
5. THE DEVELOPER/CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL POWER INFRASTRUCTURE FOR THE DEVELOPMENT, INCLUDING COORDINATION WITH THE POWER COMPANY FOR CONNECTION AND SERVICE TO THE PROPOSED STREET LIGHTS
6. ALL PROPOSED STREET LIGHT TYPES AND LOCATIONS MUST BE SHOWN ON THE APPROVED IMPROVEMENT PLANS
7. EACH LIGHT POLE ASSEMBLY SHALL HAVE A PULL BOX (MODEL/MANUFACTURER AS DESIGNATED BY RMP) WITH A COVER MARKED "STREET LIGHTING". THE PULL BOX MUST BE FLUSH TO GRADE AND LOCATED WITHIN A MAXIMUM OF 4' FROM THE BASE OF THE POLE
8. INGROUND BOXES LOCATED WITHIN 20' OF APPROACHES OR INTERSECTIONS SHALL BE TRAFFIC RATED. WHERE APPROVED BY THE CITY ENGINEER, ANY BOX INSTALLATION IN CONCRETE WILL REQUIRE THE GROUND BOX TO BE DESIGNED AND LISTED FOR USE IN CONCRETE. SUBMIT BOX SPECIFICATIONS TO CITY ENGINEER FOR APPROVAL PRIOR TO INSTALLATION. ALL BOXES SHALL HAVE THE WORDS "STREET LIGHTING" ON THE COVER.
9. ALL STREET LIGHTS SHOULD BE LOCATED ON LOT LINES WHEN NOT LOCATION AT AN INTERSECTION
10. ALL STREET LIGHTS SHOULD BE LOCATED 2 FEET BEHIND THE BACK OF CURB OR BACK OF SIDEWALK. ON ROAD SECTIONS WITHOUT CURB & GUTTER LOCATE STREET LIGHT AS DIRECTED BY CITY ENGINEER

ATTENTION

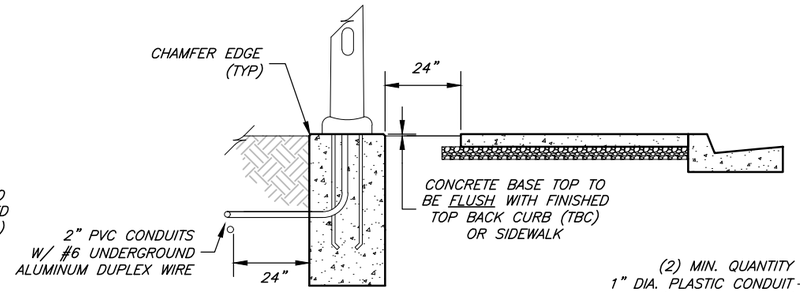
DEVELOPER/CONTRACTOR SHALL NOTIFY THE ROCKY MOUNTAIN POWER OFFICE PRIOR TO LIGHTING INSTALLATION TO ARRANGE FOR POWER TO BE PROVIDED ON SITE, AS WELL AS APPROVAL OF LIGHTING UNIT LOCATIONS AND APPROVAL OF ACTUAL COMPONENT SELECTION.

REFER TO THE ROCKY MOUNTAIN POWER DISTRIBUTION CONSTRUCTION STANDARD MANUAL FOR IDENTIFICATION OF ALL STANDARD REFERENCE NUMBERS LISTED ON THIS SHEET.

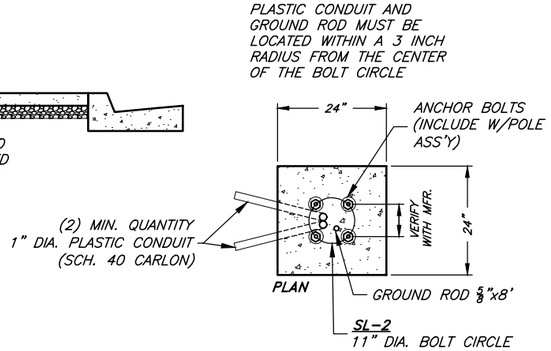
ALL FINAL WORK AND MATERIAL TO BE APPROVED BY THE CITY AND THE CITY ENGINEER.

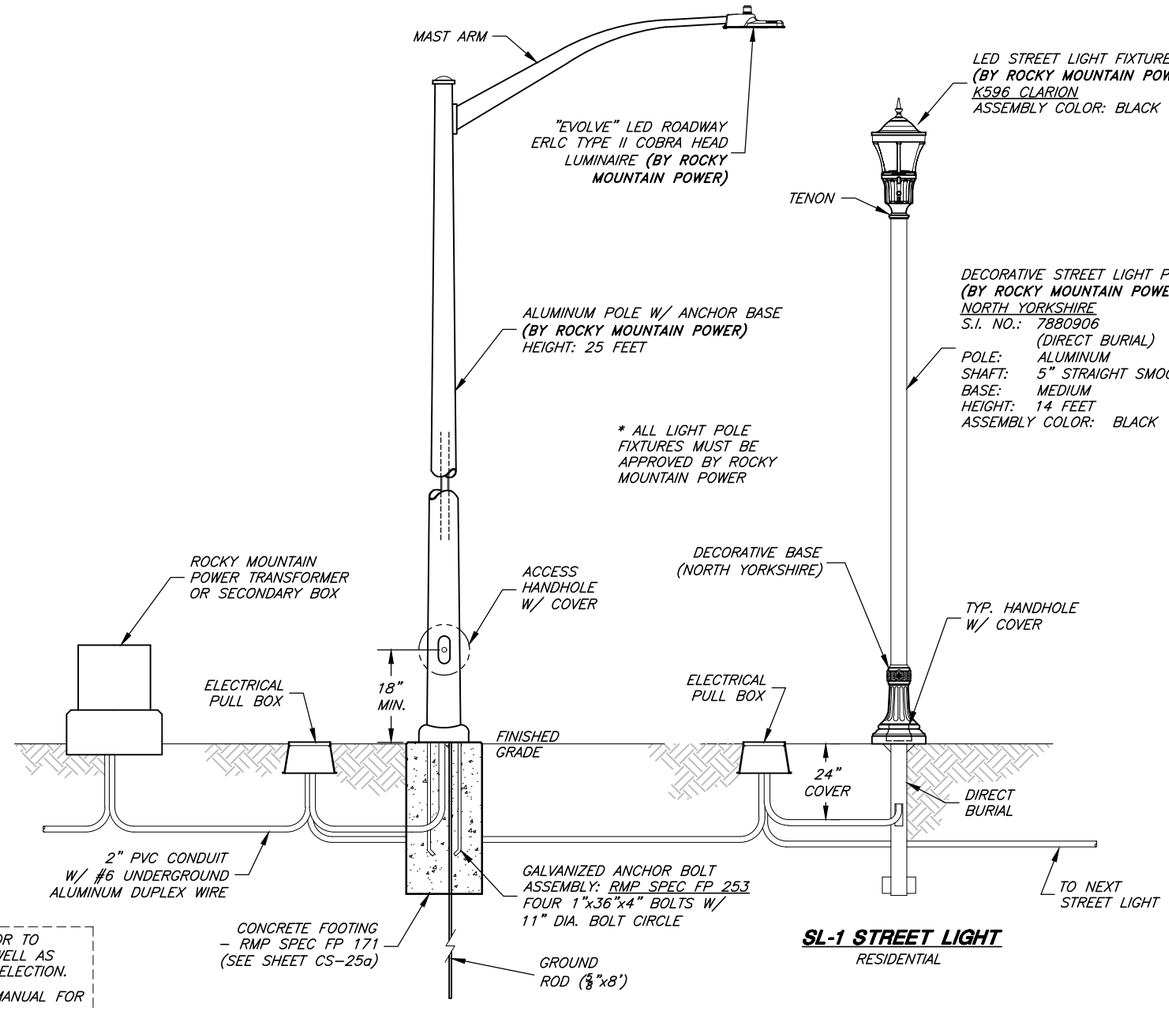


POLE SPACING FROM TBC



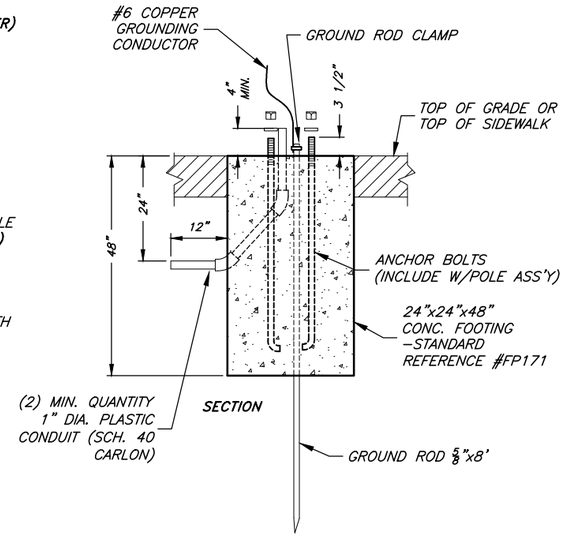
POLE SPACING FROM SIDEWALK





OPTIONAL SL-2 STREET LIGHT
COMMERCIAL/INDUSTRIAL

SL-1 STREET LIGHT
RESIDENTIAL



TYPICAL CONCRETE FOOTING
RMP STANDARD REFERENCE #FP171

THE FOOTING SPECIFIED ON THIS STANDARD IS DESIGNED FOR USE WITH THE STD. 11 GA. (OR 10 GA.) METAL STREET LIGHT POLES FOR MOUNTING HEIGHTS UP TO 35 FEET. IT SHOULD NOT BE APPLIED IN LOCATIONS WHICH REQUIRE A POLE OF HIGHER STRENGTH (SUCH AS A DEAD-END POLE, COMBINATION STREET LIGHT/TRAFFIC SIGNAL POLE, OR ETC.)

FOOTING NOTES:

A. FOOTINGS WILL GENERALLY BE INSTALLED BY A CONTRACTOR. FOOTINGS SHOULD BE LOCATED AS SHOWN ON THIS SHEET.
B. THE MANUFACTURER SHALL FURNISH (4) ANCHOR BOLTS, (1) GROUND ROD & PLASTIC CONDUITS FOR EACH FOOTING AS REQ'D.
C. NUMBER AND ORIENTATION OF THE PLASTIC CONDUITS ARE INFLUENCED BY THE UNDERGROUND CIRCUIT ROUTE AND SHOULD BE DETERMINED IN EACH LOCATION FOR THE MOST PRACTICAL SOLUTION.
D. ANCHOR BOLTS SHALL BE FURNISHED WITH 6" MIN. THREAD LENGTH AND SHALL BE HOT DIP GALVANIZED.

REV.	DATE	APPR.	
1	MAY '22	ZJB	UPDATED PLANS WITH SPECIFIC RMP POLES AND LED FIXTURES

PROJECT ENGINEER
MAY 2022
DATE

SCALE: N.T.S.

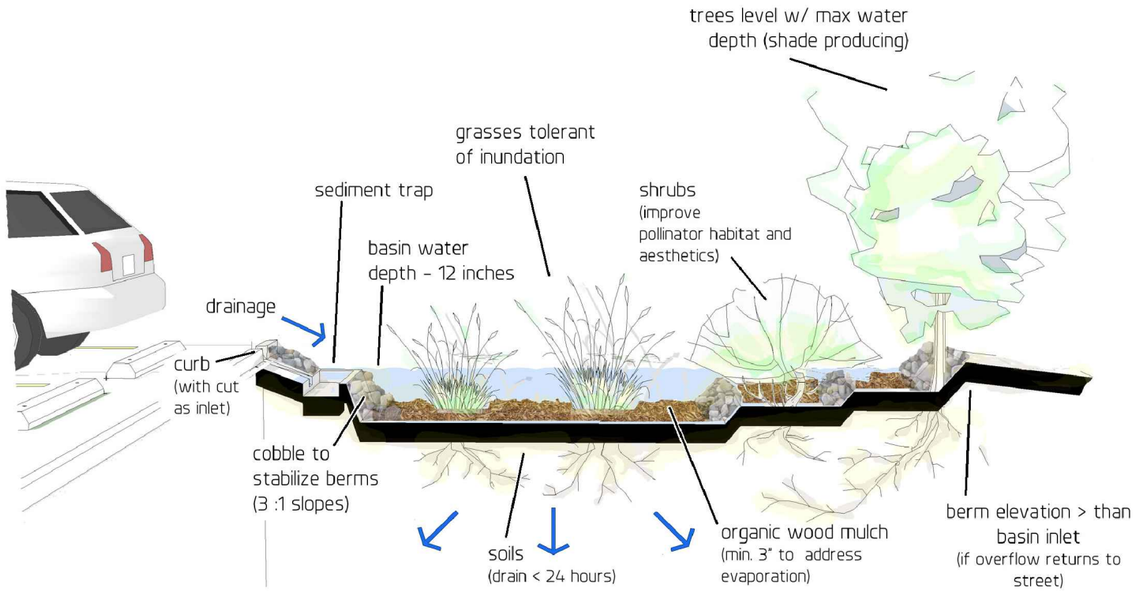
DESIGNED
DRAWN
CHECKED

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com

WILLARD CITY CORPORATION
PUBLIC WORKS STANDARDS

GENERAL - STREET LIGHTING STANDARDS

SHEET: CS-25
OF 31 SHEETS
0



Basic Basin Design Considerations

diagram by
Paul Navrot
for SUH

RAIN GARDEN

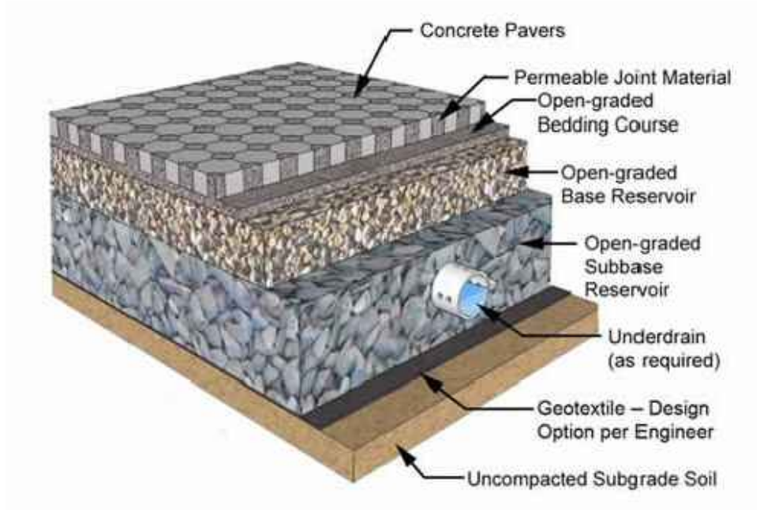
**** http://www.lid-stormwater.net/site_map.htm ****

RAIN BARREL

**** http://www.goodideasinc.com/products/rain-barrels/rain-wizard-50/ ****

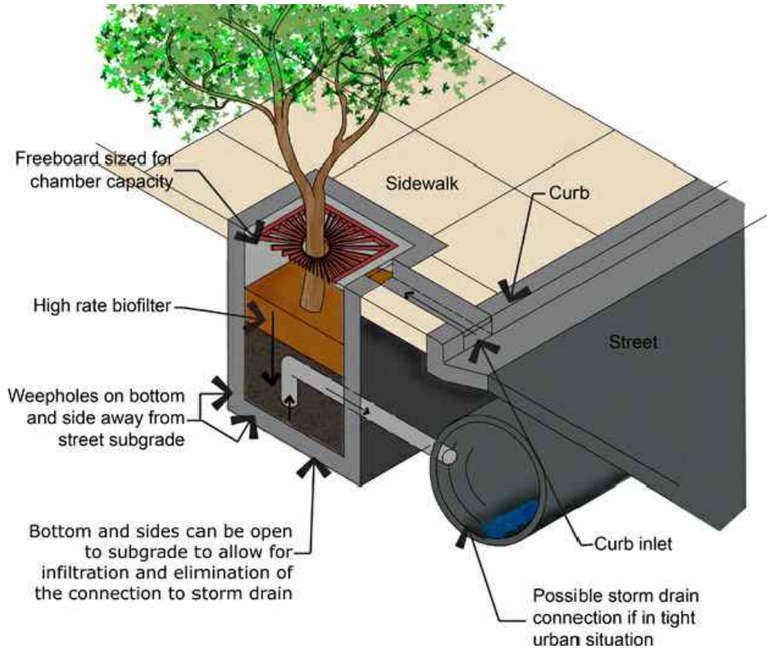
DISCLAIMER:
ALL LID EXAMPLES SHOWN ON THIS SHEET ARE FOR REFERENCE PURPOSES ONLY. ANY SPECIFIC WEBSITES, COMMERCIAL PRODUCTS, PROCESS OR SERVICE BY TRADE NAME, TRADEMARK, MANUFACTURER, OR OTHERWISE, DOES NOT CONSTITUTE OR IMPLY ITS ENDORSEMENT, RECOMMENDATION, OR FAVORING BY WILLARD CITY. THE PURPOSE OF PROVIDING SPECIFIC PRODUCT INFORMATION IS TO ENSURE THAT THE CONTRACTOR AND/OR DEVELOPER HAS ALL THE APPROPRIATE INFORMATION AND REFERENCES TO ASSESS THE USEFULNESS OF THE PRODUCT.

THE LID EXAMPLES LISTED ON THIS SHEET ARE POSSIBLE RECOMMENDATIONS FOR USE WITHIN THE CITY. OTHER LID REQUIREMENTS OR TYPES WILL BE CONSIDERED ON A CASE BY CASE BASIS.



PERMEABLE PAVER

From Smith, D. 2006. *Permeable Interlocking Concrete Pavement–selection design, construction and maintenance. Third Edition.* Interlocking Concrete Pavement Institute. Herndon, VA



TREE BOX FILTER

From www.wbdg.org

PROJECT ENGINEER				SCALE:		WILLARD CITY CORPORATION	SHEET:
MAY 2022				N.T.S.	DESIGNED	PUBLIC WORKS STANDARDS	CS-26
DATE	REV.	DATE	APPR.		DRAWN	GENERAL - LID (LOW IMPACT DEVELOPMENT) EXAMPLES	OF 31 SHEETS
					CHECKED		0

JA JONES & ASSOCIATES CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403 (801) 476-9767
www.jonescivil.com