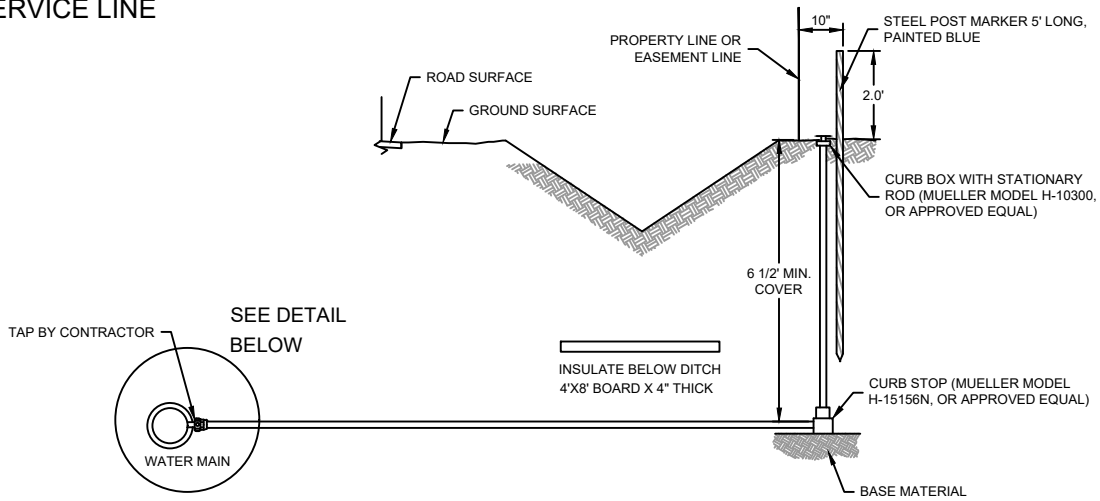
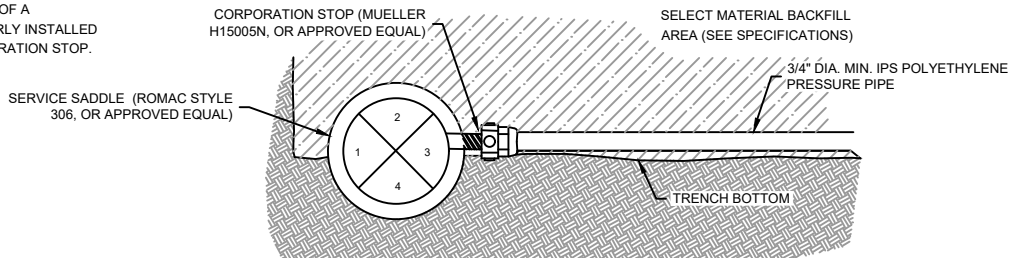


# RESIDENTIAL SERVICE LINE



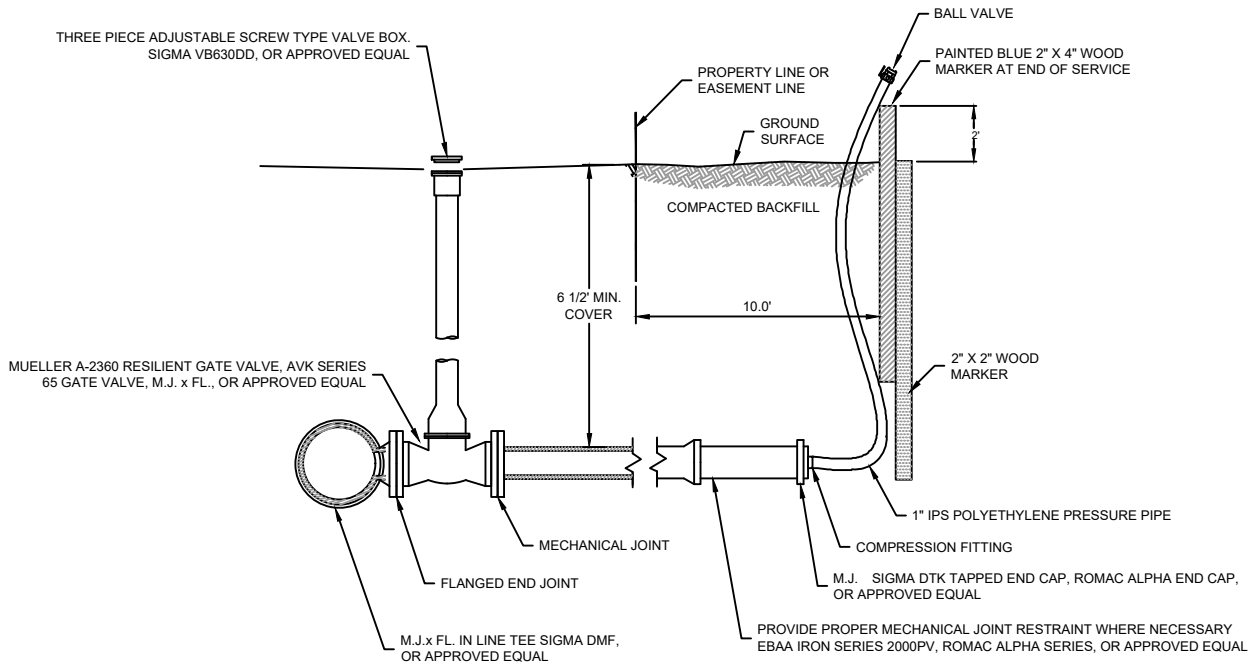
DETAIL OF A PROPERLY INSTALLED CORPORATION STOP.



**GENERAL NOTES:**

1. WATER SERVICE LINES SHALL HAVE A MINIMUM 6 1/2 FOOT COVER MEASURED FROM THE EXISTING GROUND SURFACE.
2. WATER SERVICE LINES SHALL BE INSTALLED WHERE SHOWN ON THE DRAWINGS OR AS SPECIFIED.
3. BEDDING SHALL BE 1" DIA. MAXIMUM WITHIN 6" OF SERVICE PIPE.

# COMMERCIAL SERVICE LINE



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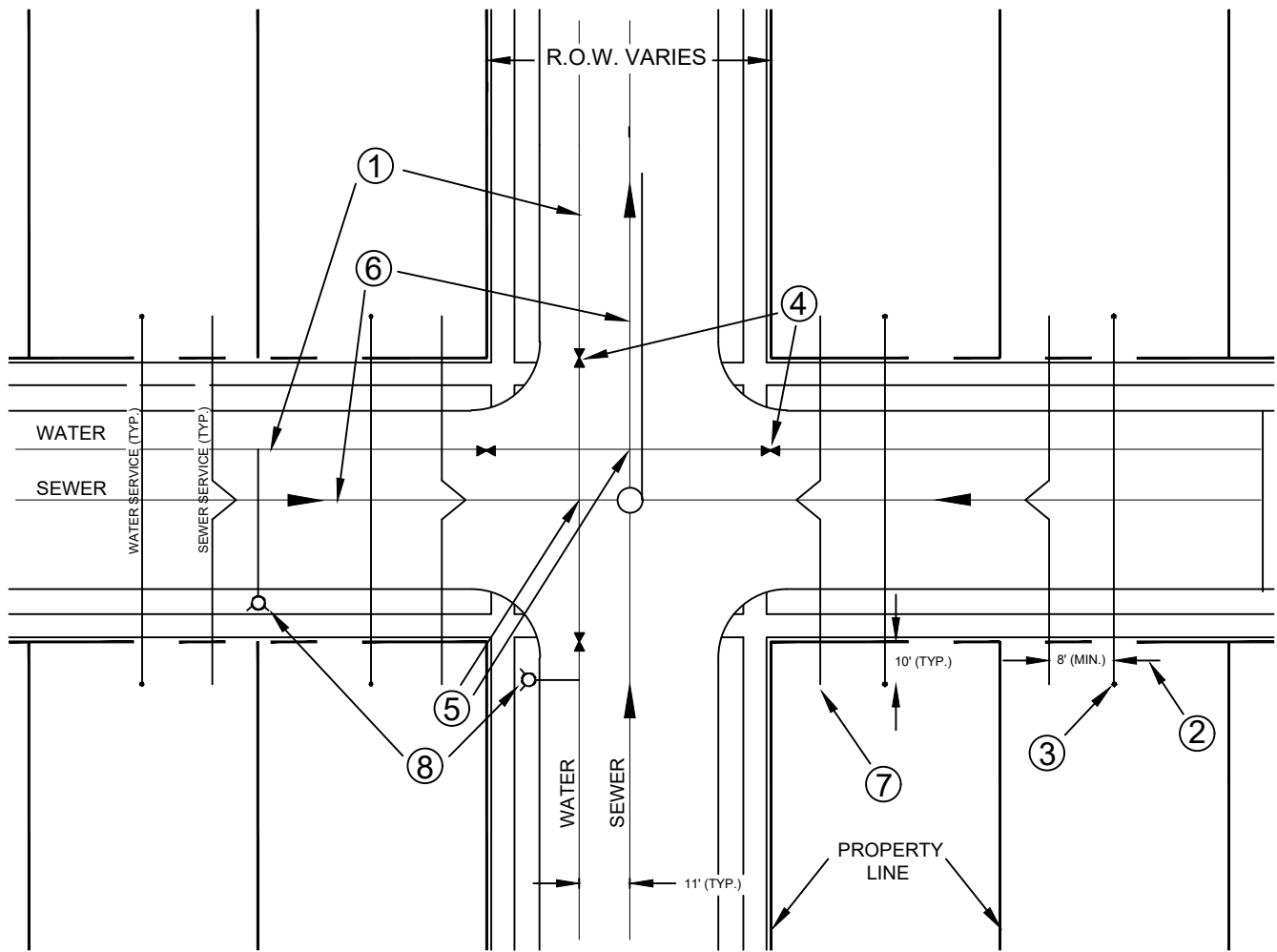
DRAWN BY: C.JF  
DSGN. BY: BJH  
APPR. BY: BJH  
DATE: 09/2018

FOUR CORNERS WATER AND SEWER DISTRICT  
STANDARD DETAILS  
BOZEMAN MT

PROJECT NO.  
4716.004.01

RESIDENTIAL AND COMMERCIAL  
WATER SERVICE LINE DETAIL

FIGURE NUMBER  
02660-1



1. WATER MAINS AND SEWER MAINS MUST HAVE A MINIMUM HORIZONTAL SEPARATION OF 10' (OUTSIDE OF PIPE TO OUTSIDE OF PIPE).
2. WATER SERVICES AND SEWER SERVICES HAVE A MINIMUM HORIZONTAL SEPARATION OF 8' (OUTSIDE OF PIPE TO OUTSIDE OF PIPE).
3. WATER SERVICE STUBS SHALL BE LOCATED AT CENTER OF LOT AND EXTEND 10' INSIDE OF LOT LINE (SEE STANDARD DRAWING NUMBER 02660-1).
4. WATER MAIN VALVES SHALL BE LOCATED AT PROPERTY LINES.
5. WATER & SEWER MAIN CROSSINGS SHALL HAVE A MINIMUM VERTICAL SEPARATION OF 18", UNLESS OTHER PROVISIONS ARE TAKEN.
6. SEWER MAINS SHALL BE GENERALLY LOCATED ON THE STREET CENTERLINE.
7. SEWER SERVICE STUBS SHALL BE LOCATED 10' FROM DOWNSTREAM PROPERTY LINE AND EXTEND 10' INSIDE OF LOT LINE (SEE STANDARD DRAWING FIGURE NUMBER 02730-3).
8. HYDRANT TEE SHALL BE LOCATED A MINIMUM OF 5' FROM VALVES ON WATER MAIN. HYDRANT TEE SHALL BE LOCATED ALONG EXTENDED FOR MID-BLOCK LOCATIONS (SEE STANDARD DRAWING FIGURE 02660-4)



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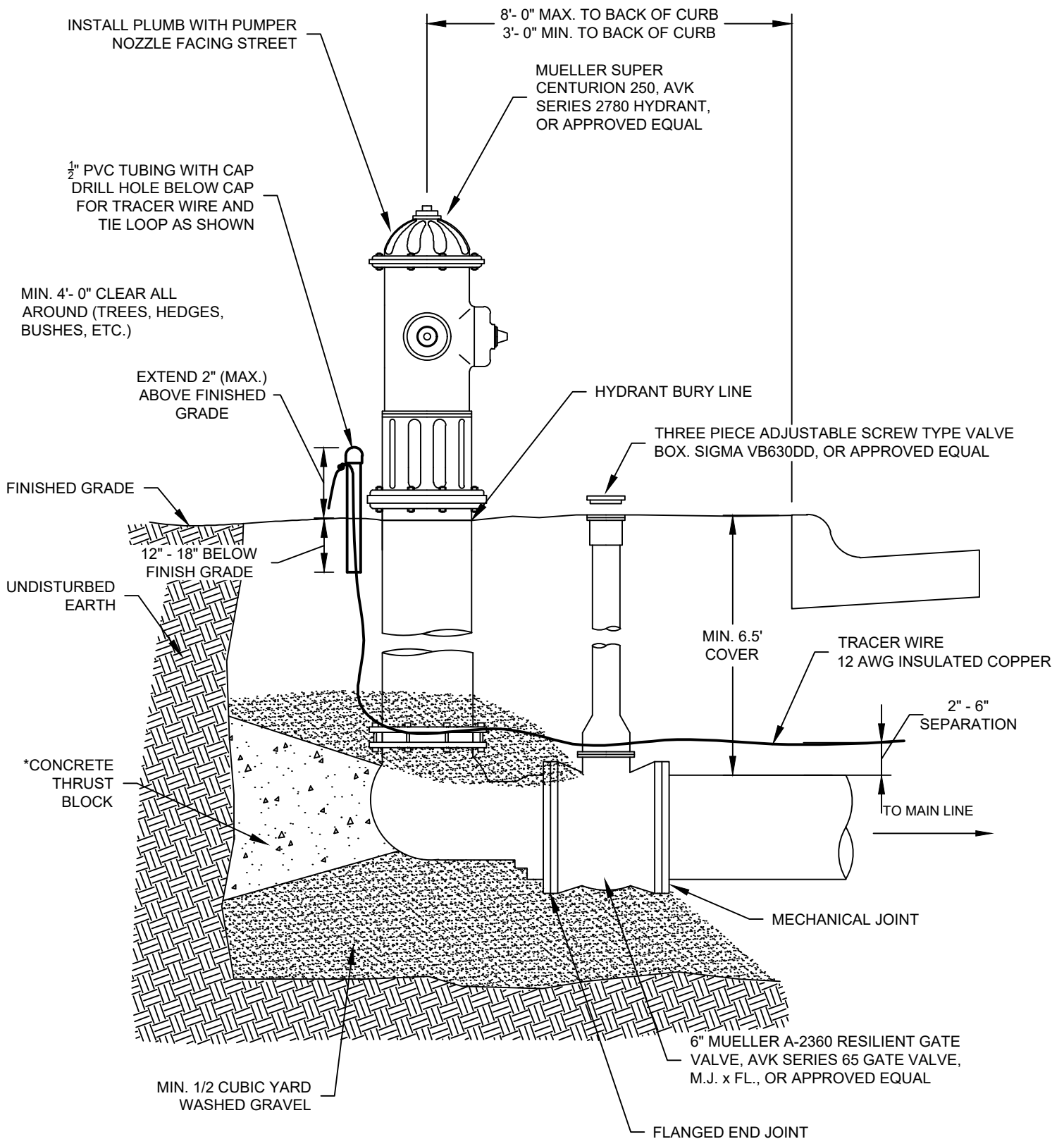
DRAWN BY: MMG  
DSGN. BY: BJH  
APPR. BY: BJH  
DATE: 12-13-18

FOUR CORNERS WATER AND SEWER DISTRICT STANDARD  
BOZEMAN MONTANA DETAILS

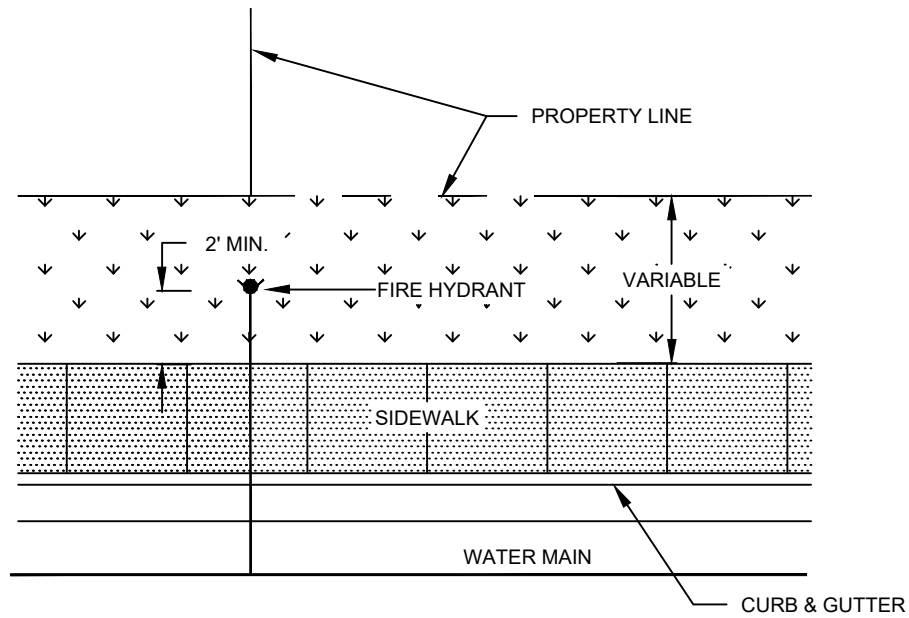
PROJECT NO.  
4716.004.01

WATER AND SEWER MAIN AND SERVICES LOCATIONS

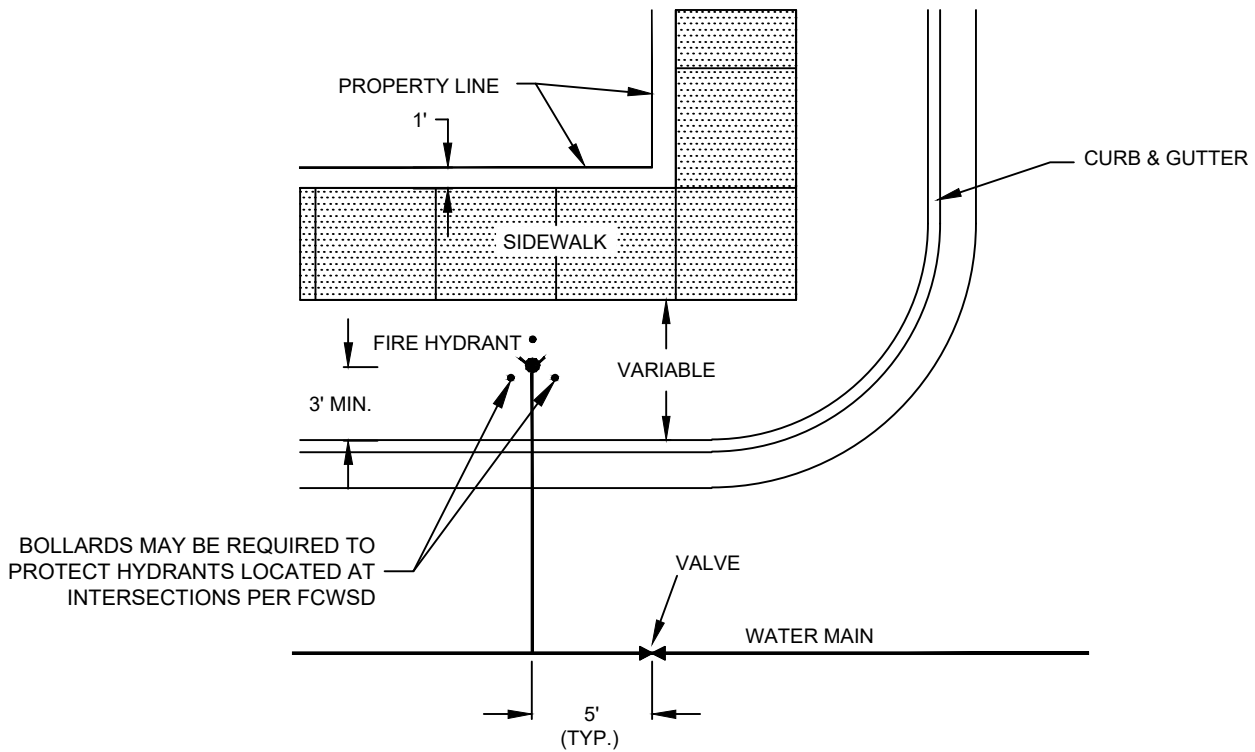
FIGURE NUMBER  
**02660-2**



\*MEGA-LUG OR APPROVED EQUAL JOINT RESTRAINTS MAY BE USED IN LIEU OF CONCRETE THRUST BLOCK



CURB WALK DETAIL



BOULEVARD WALK DETAIL



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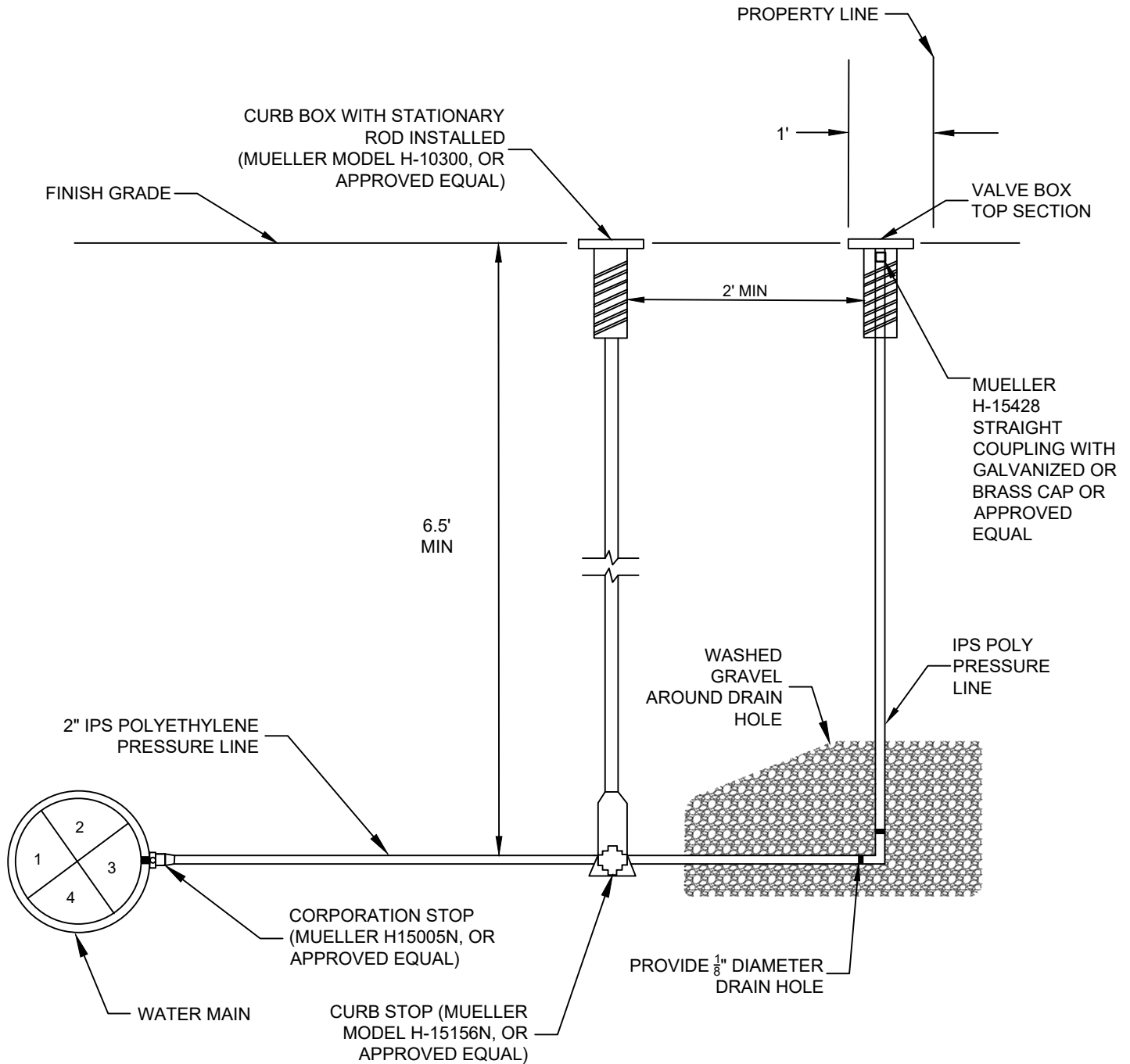
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DATE: 12-13-18

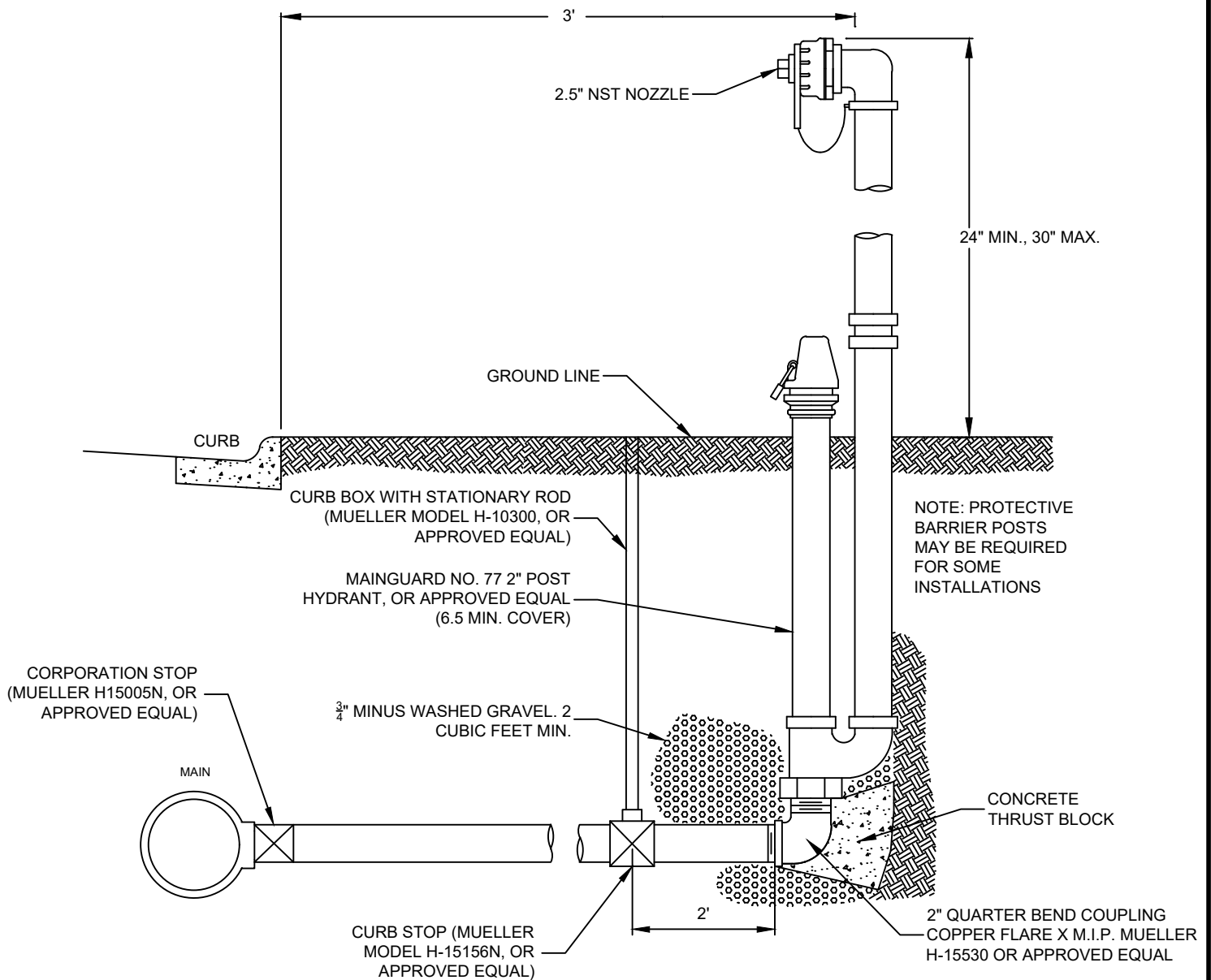
FOUR CORNERS WATER AND SEWER DISTRICT  
BOZEMAN MONTANA  
STANDARD DETAILS

PROJECT NO.  
4716.004.01

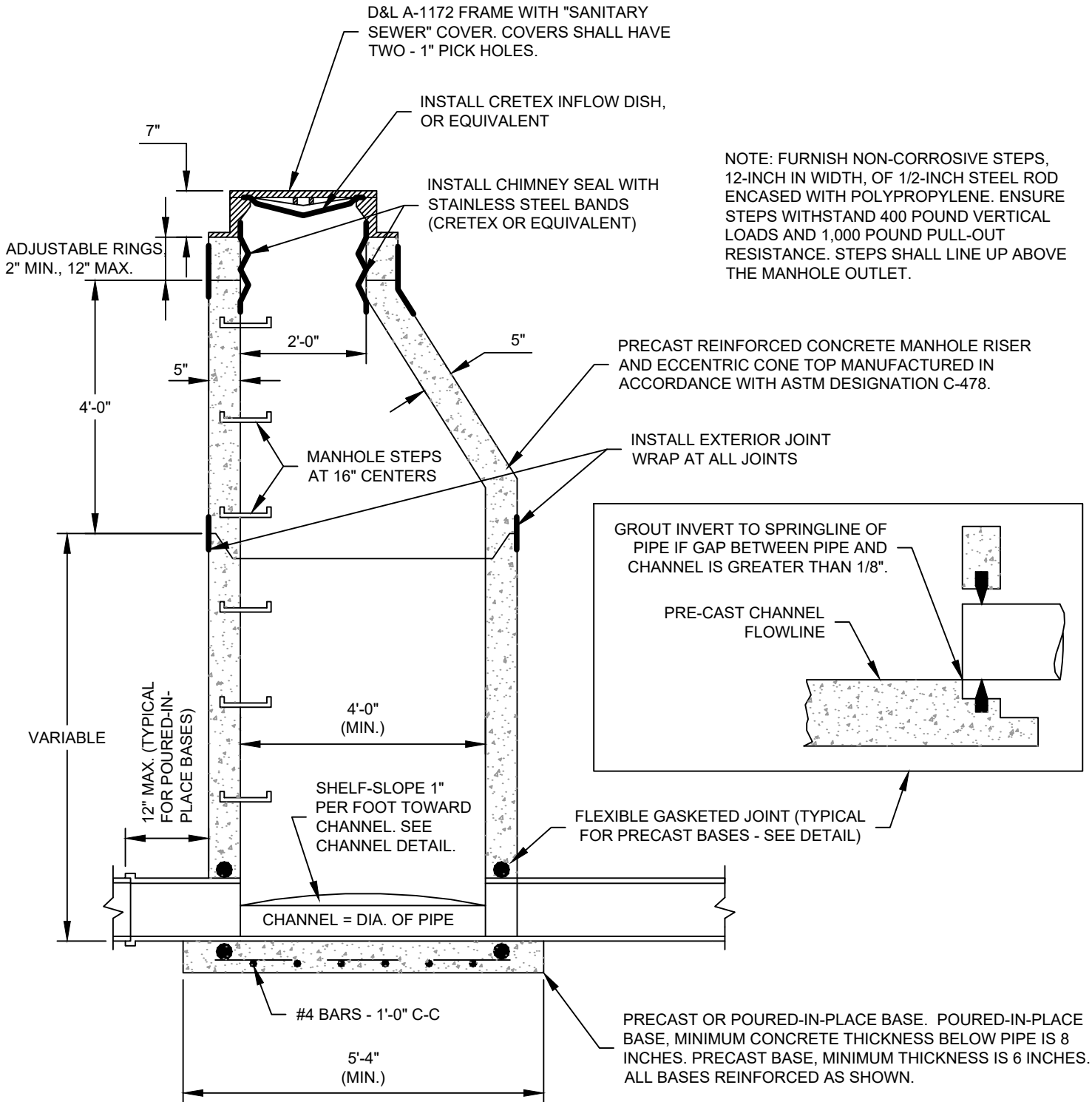
FIRE HYDRANT LOCATION DETAIL

FIGURE NUMBER  
02660-4






BLOW-OFF HYDRANTS SHALL BE NON-FREEZING, SELF DRAINING TYPE WITH A 6.5' BURY. THESE HYDRANTS WILL BE FURNISHED WITH A 2" FIP INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN TO THE LEFT. ALL OF THE WORKING PARTS SHALL BE OF BRONZE-TO-BRONZE DESIGN, AND BE SERVICEABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET SHALL ALSO BE BRONZE AND BE 2 1/2" NST. HYDRANTS SHALL BE LOCKABLE AND SHALL BE MAINGUARD #77 AS MANUFACTURED BY KUPFERLE FOUNDRY CO., ST. LOUIS, MO, OR APPROVED EQUAL.

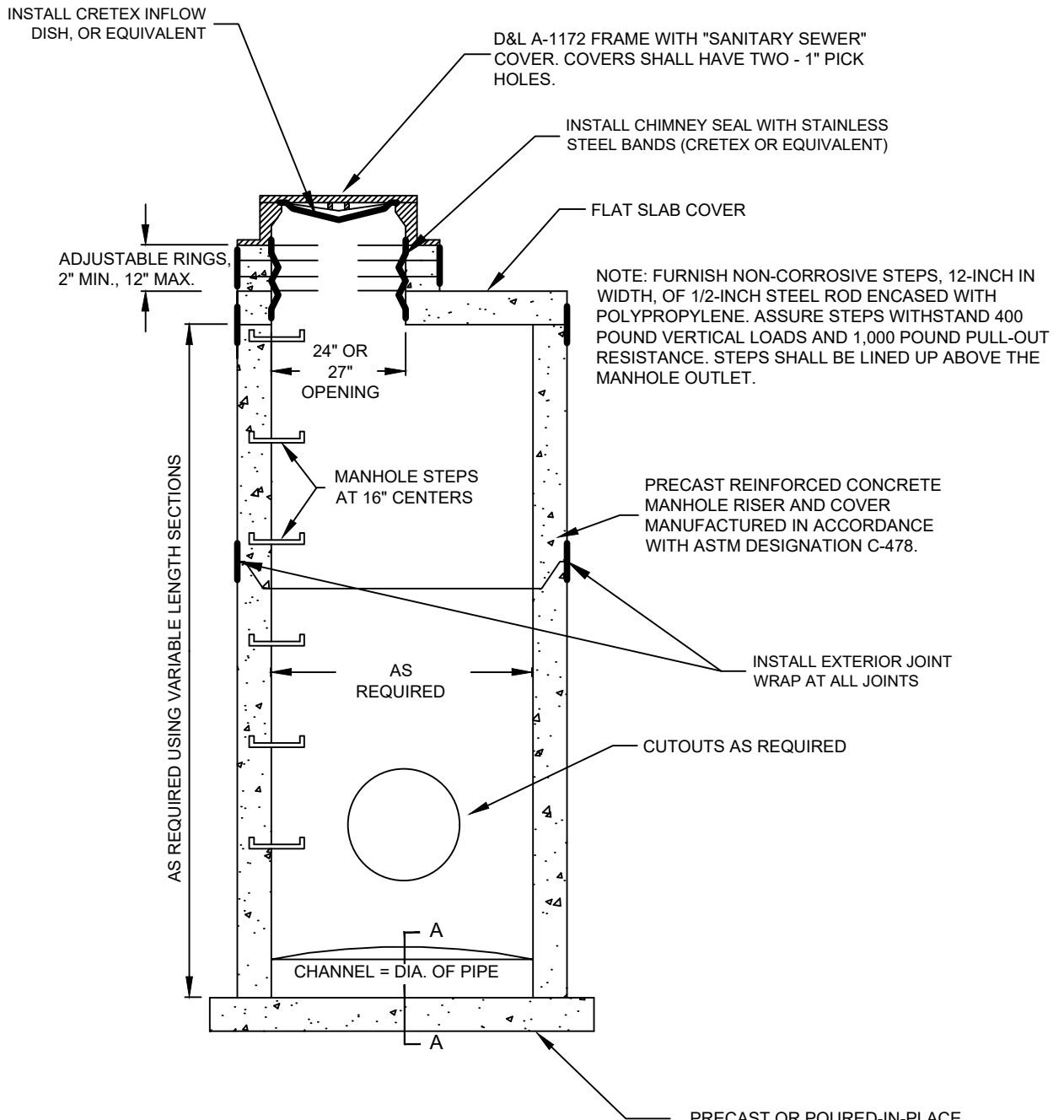


**NOTES:**

1. ALL JOINTS BETWEEN MANHOLE SECTIONS, MANHOLE RING & TOP SECTION, AND AROUND SEWER PIPE INTO MANHOLE SHALL BE WATERTIGHT. JOINTS SHALL BE SEALED USING WATERTIGHT JOINT WRAP PLACED ON THE EXTERNAL OF THE STRUCTURE. JOINTING MATERIAL SHALL BE "RAM-NEK" OR APPROVED EQUAL FOR ALL JOINTS EXCEPT BETWEEN SEWER PIPE AND MANHOLE WALL.
2. MANHOLES LOCATED IN AREAS WITH POTENTIAL TO BE SUBJECTED TO SURFACE WATER SHALL HAVE SOLID GASKETED COVERS AND CHIMNEY SEALS.
3. MANHOLES INSTALLED IN GROUNDWATER AREAS SHALL HAVE WATERTIGHT JOINT WRAP PLACED ON THE EXTERNAL OF THE STRUCTURE AND AN EXTERNAL WATERPROOF COATING INSTALLED.

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			<p>BOZEMAN</p>	<p>MT</p>

N:\4716\004\01\ACAD\FCWSD Design Standards\02730-1 Eccentric Manhole.dwg Plotted by lee hageman on Jun/24/2019



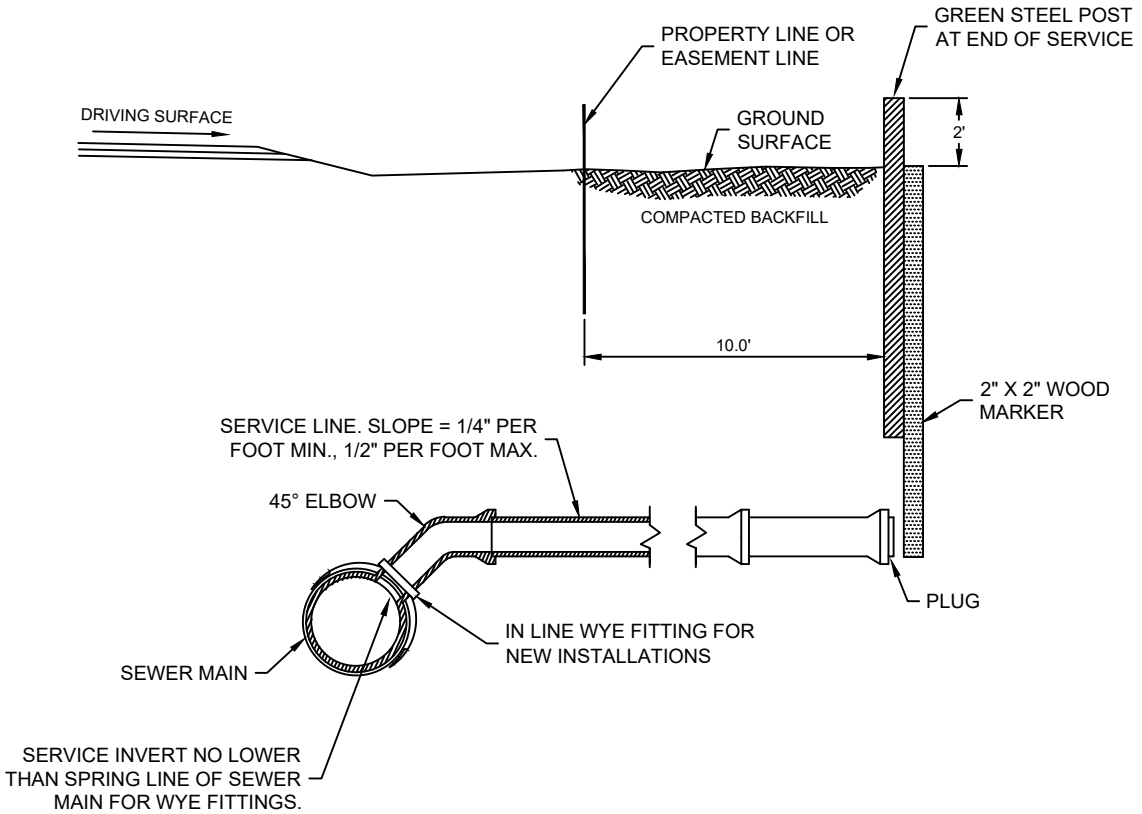
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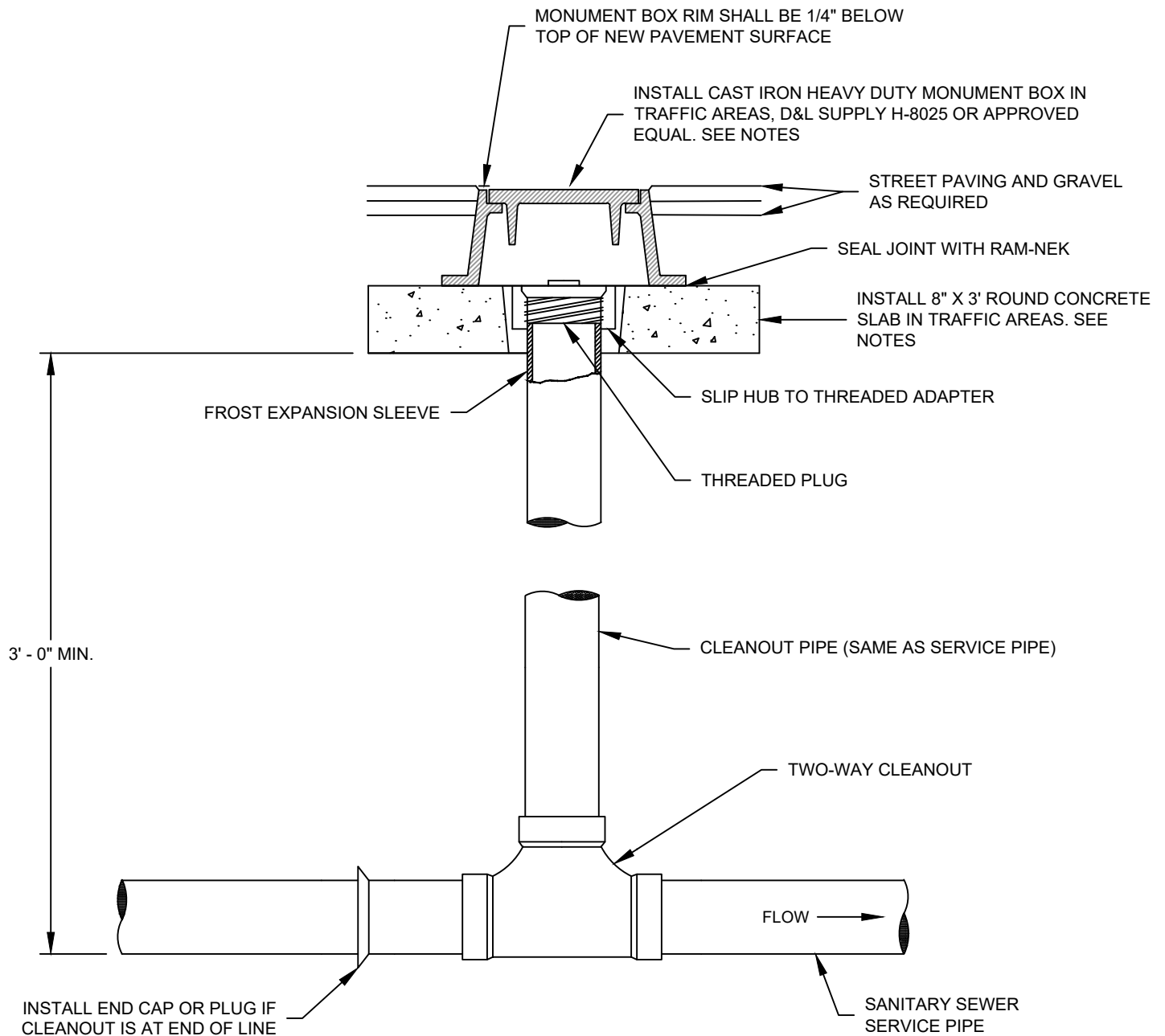
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PRECAST OR POURED-IN-PLACE BASE. POURED-IN-PLACE BASE, MINIMUM CONCRETE THICKNESS BELOW PIPE IS 8 INCHES. PRECAST BASE, MINIMUM THICKNESS IS 6 INCHES.



# COMMERCIAL SERVICE LINE





**NOTES:**

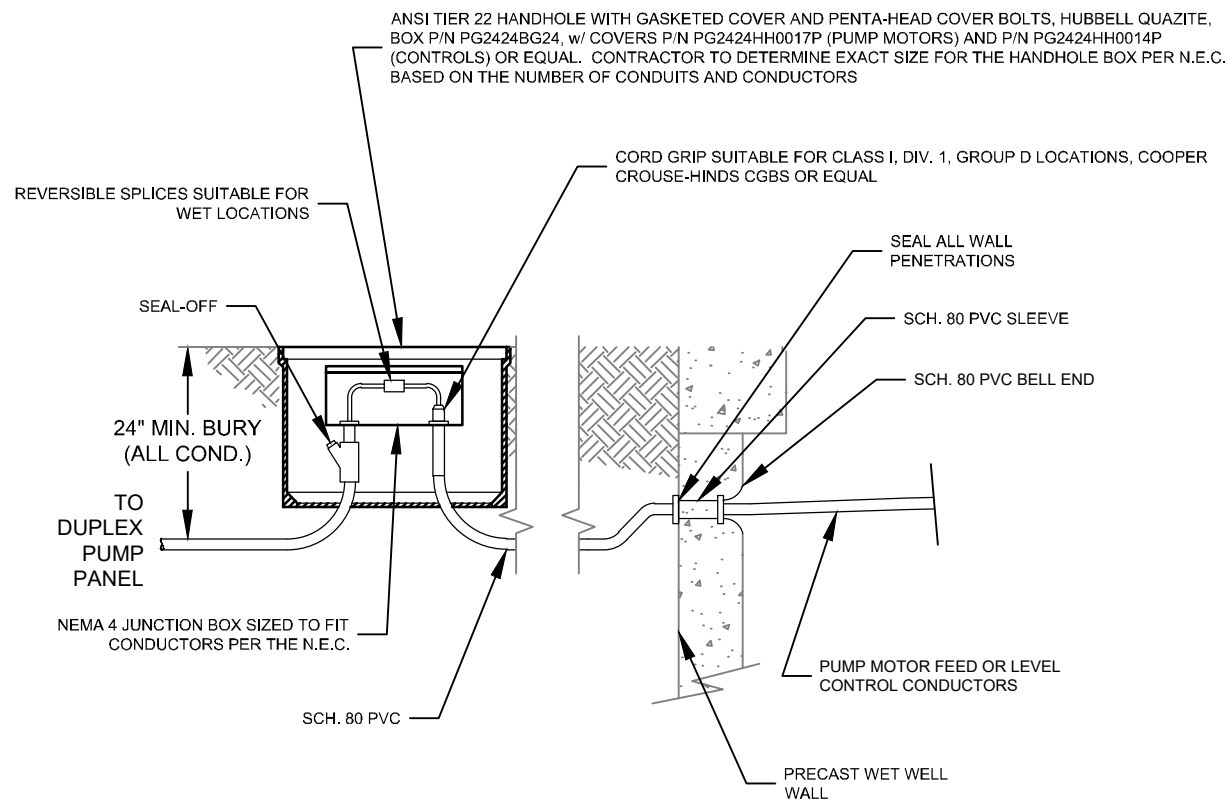
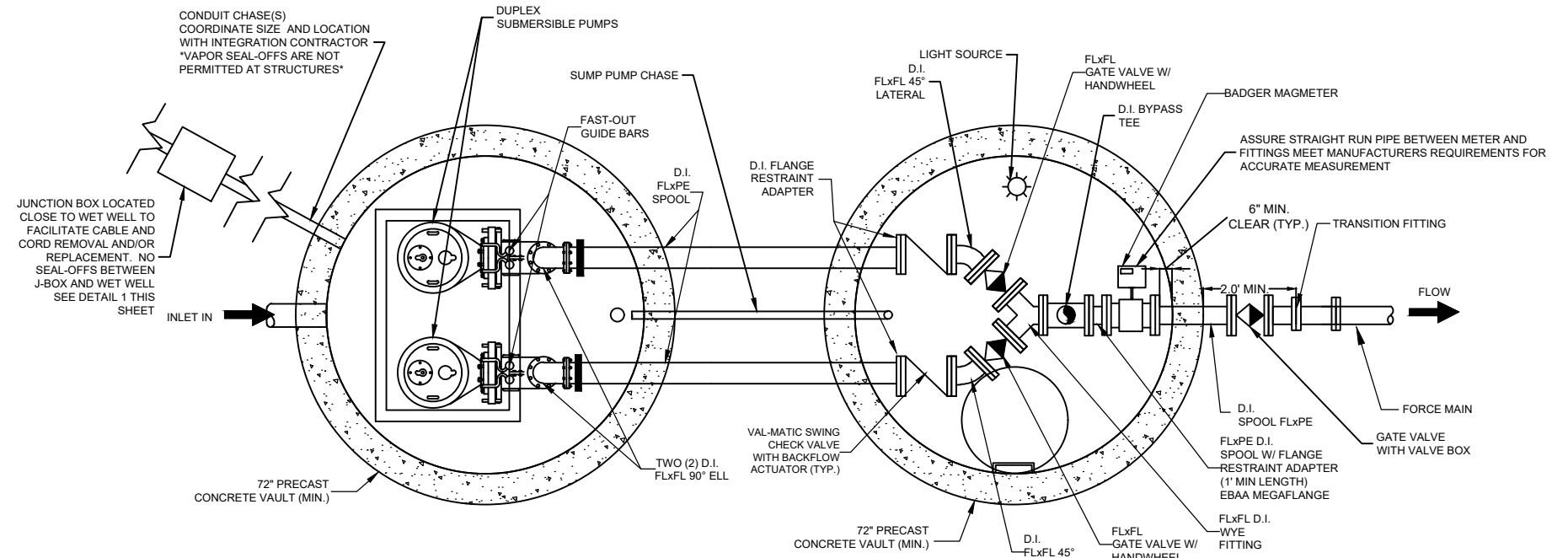
1. A SEWER CLEANOUT MUST BE PLACED WITHIN 3 FEET OF ANY BUILDING, AT ANY 45-DEGREE OR GREATER BEND, AT PIPE SIZE TRANSITION POINTS, AND PLACED AT A MAXIMUM 100-FOOT INTERVAL FOR LONG STRAIGHT RUNS IN COMPLIANCE WITH THE UNIFORM PLUMBING CODE.
2. INSTALL IRRIGATION-TYPE VALVE BOX IN LIEU OF HEAVY DUTY MONUMENT BOX AND CONCRETE SLAB IN NON-TRAFFIC AREAS.
3. DRAWING NOT TO SCALE.

**GENERAL NOTES:**

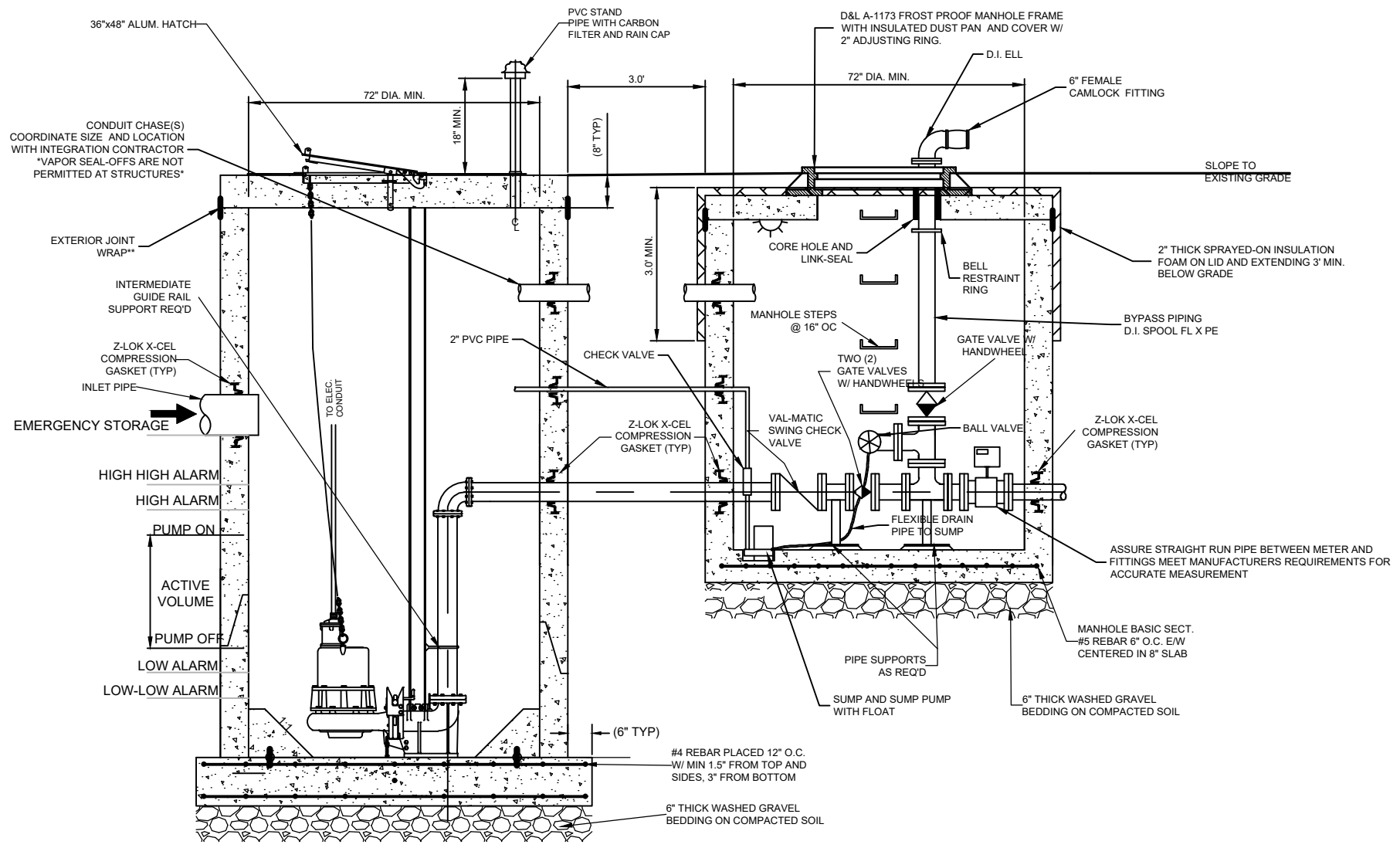
- A.) LIFT STATION AND COMPONENTS SHALL MEET OR EXCEED DESIGN CRITERIA OF CURRENT FCWSD STANDARDS, MONTANA DEPT. OF ENVIRONMENTAL QUALITY, AND MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS (MPWSS) AS APPLICABLE.
- B.) EQUIPMENT FOR CONFINED SPACE ENTRY SHALL BE IN ACCORDANCE WITH OSHA AND OTHER REGULATORY AGENCY REQUIREMENTS.
- C.) FCWSD-APPROVED BACK-UP GENERATOR MUST BE PROVIDED.
- D.) VALVE VAULTS MUST BE EQUIPPED WITH 110V AC POWER TO RUN LIGHT, TIMER, SUMP PUMP, AND MAG FLOWMETER.
- E.) PLAIN END DUCTILE IRON PIPE SHALL BE CONNECTED TO ADJACENT FLANGES BY E-Z FLANGE ADAPTERS.
- F.) LIFT STATION MUST HAVE A SEPARATE EMERGENCY LEVEL TRANSDUCER OR FLOAT SWITCH IN ADDITION TO A PRIMARY LEVEL TRANSDUCUCER.
- G.) ALL FITTINGS, JOINTS, AND APPURTENANCES MUST MAINTAIN A MINIMUM OF 6" CLEAR SPACING FROM THE NEAREST CONCRETE SURFACE.
- H.) ALL CONCRETE AND GROUTING SHALL CONFORM TO CURRENT MPWSS.
- I.) FIBERGLASS WET WELLS MAY BE SUBSTITUTED PER FCWSD DESIGN STANDARDS.
- J.) ALL CONDUIT PENETRATIONS ARE Z-LOK X-CEL COMPRESSION GASKETS.
- K.) SPRAYED INSULATION IS CLOSED-CELL FOAM BY CORBOND CORPORATION, OR APPROVED EQUAL.
- L.) FLOAT-OPERATED PUMP PLACED WITHIN SUMP IN VALVE VAULT FLOOR TO EVACUATE LIQUIDS IN THE VAULT THROUGH THE 2" PVC DRAIN PIPE MOUNTED ABOVE ANNULAR SPACE BETWEEN DRAIN PIPE AND PUMP DISCHARGE PIPE. PIPE SHALL BE SEALED TO PREVENT GASES FROM WETWELL FROM ENTERING VALVE VAULT. PUMP SHALL HAVE INTEGRAL FLOAT. A CHECK VALVE SHALL BE INSTALLED ON THE SUMP PUMP DISCHARGE LINE.
- M.) CONCRETE WET WELL STRUCTURES MUST HAVE AN INTERIOR COATING FOR HYDROGEN SULFIDE (H<sub>2</sub>S) RESISTANCE. H<sub>2</sub>S COATING SHALL BE CONTINUOUS TNEPEC PERMASHIELD FR SERIES 436, OR APPROVED EQUAL. COATING SHALL BE PROVIDED WITH MINIMUM DRY FILM THICKNESS AS RECOMMENDED BY THE MANUFACTURER FOR THIS APPLICATION.

\* SEAL-OFFS ARE NOT PERMITTED FOR CABLES AT CONDUIT CHASES. PROVIDE AN AIR GAP AT THE JUNCTION BOX IF NECESSARY TO COMPLY WITH ELECTRICAL CODE.

\*\* CONCRETE STRUCTURES PLACED BELOW GRADE SHALL HAVE ALL JOINTS SEALED WITH WATERTIGHT EXTERIOR JOINT WRAP AND A WATERPROOF EXTERIOR COATING TO PREVENT INFILTRATION OF GROUNDWATER



**JUNCTION BOX DETAIL**  
SCALE: NTS



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		<p>SAMPLE LIFT STATION 1</p>	<p>FIGURE NUMBER <b>02730-5</b></p>	

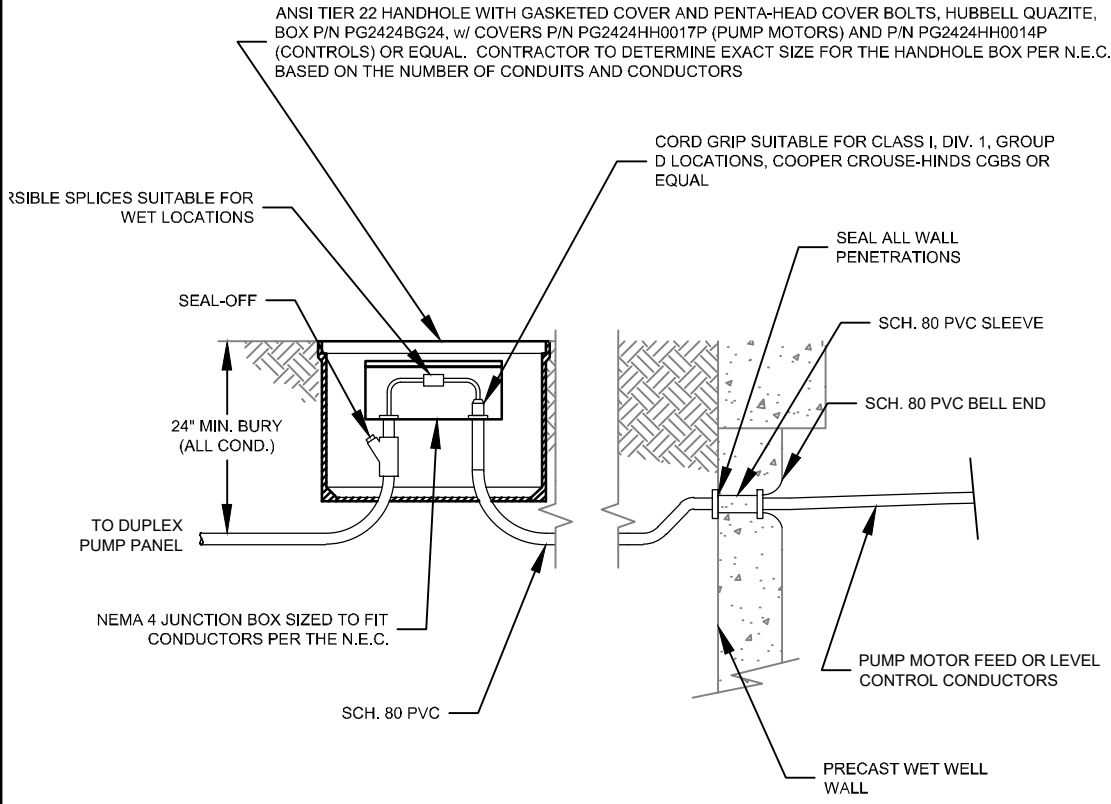
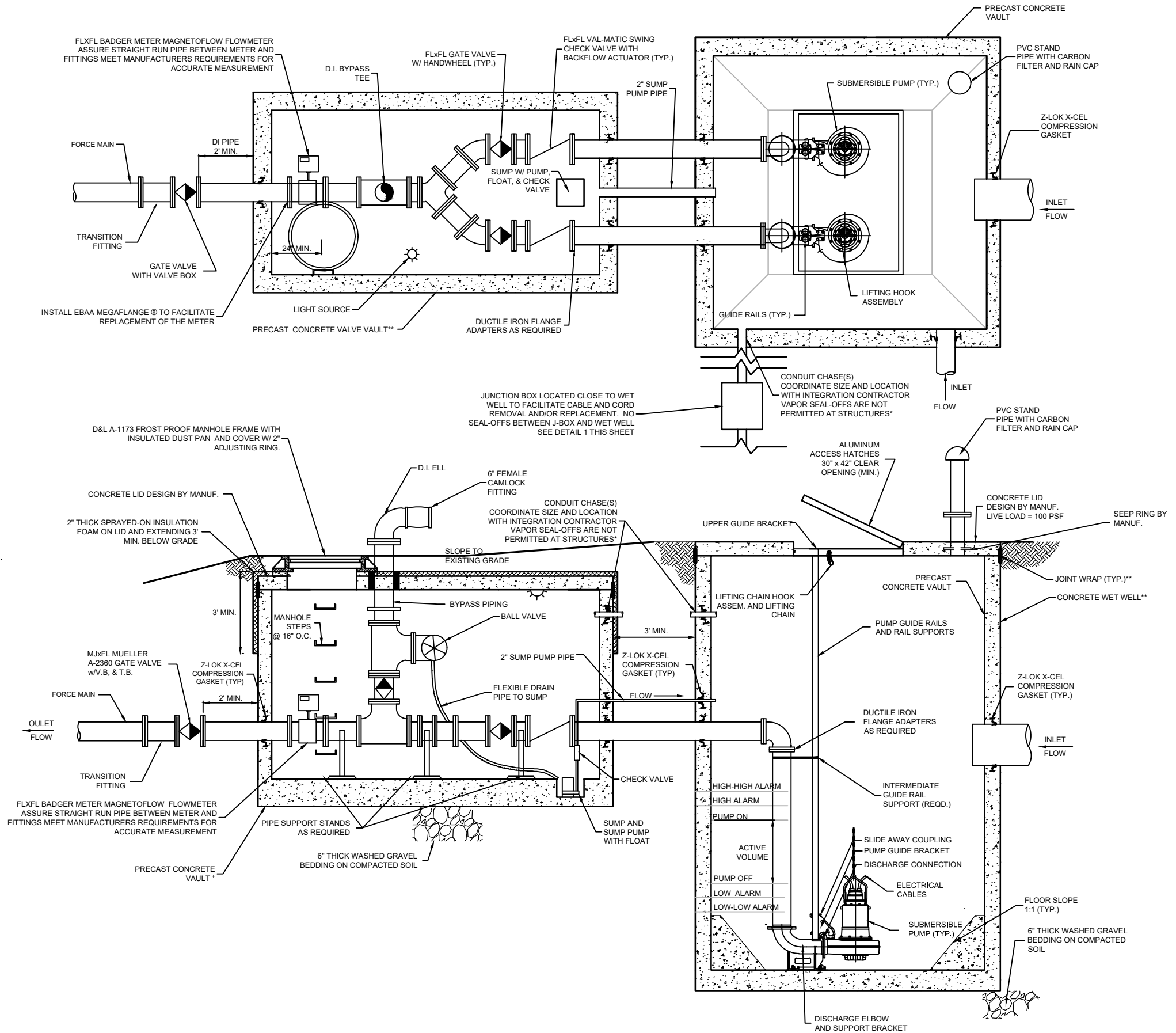
N:\4716\004\01\ACAD\FCWSD Design Standards\02730-5 SAMPLE LIFT STATION 1.dwg Plotted by lee hageman on Jun/24/2019

**GENERAL NOTES:**

- A.) LIFT STATION AND COMPONENTS SHALL MEET OR EXCEED DESIGN CRITERIA OF CURRENT FCWSD STANDARDS, MONTANA DEPT. OF ENVIRONMENTAL QUALITY, AND MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS (MPWSS) AS APPLICABLE.
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**JUNCTION BOX DETAIL**  
SCALE: NTS

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			<p>BOZEMAN</p>	<p>MONTANA</p>	<p>FIGURE NUMBER 02730-6</p>