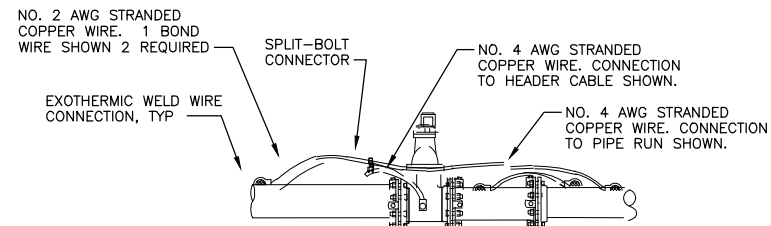


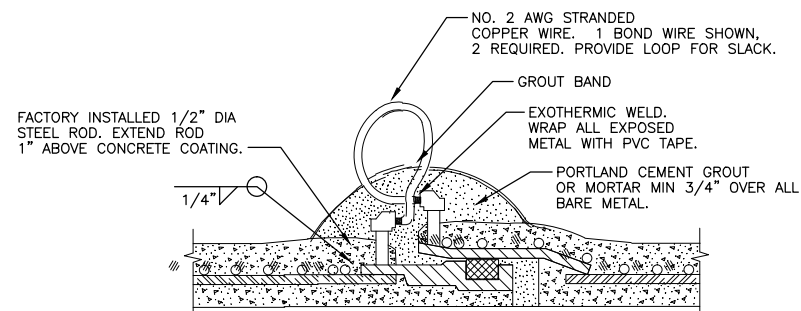
NOTE:
MECHANICAL JOINT STYLE SHOWN, OTHER JOINTS SIMILAR.

**JOINT BOND
UNCOATED & DIELECTRIC COATED PIPE**



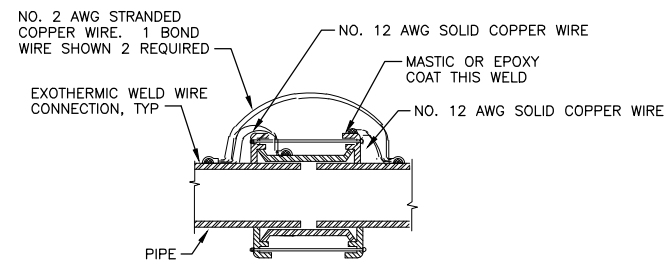
NOTES:
1. MECHANICAL JOINT STYLE SHOWN, OTHER JOINTS SIMILAR.
2. CONNECT FITTINGS AND VALVES TO HEADER CABLE OR PIPE RUN WITH (1) NO. 4 AWG STRANDED WIRE.
3. DO NOT BURN SEALS OR SEALING SURFACE.

**JOINT BOND
FITTINGS & VALVES**



NOTE:
CONCRETE CYLINDER PIPE, PUSH-ON JOINT SHOWN.

**JOINT BOND
MORTAR COATED STEEL PIPE (MCSP) & CONCRETE CYLINDER PIPE (CCP)**

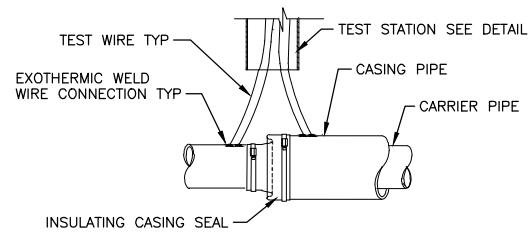


**JOINT BOND
FLEXIBLE SLEEVE COUPLING FOR DI PIPE**

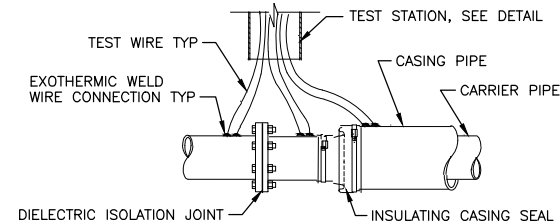
GENERAL NOTE:
ALL WIRE INSULATION IS USE-TYPE OR HMWPE-TYPE.

JOINT BONDS (1)
SCALE: NTS

January 2021



CASING TEST STATION (TS/C)



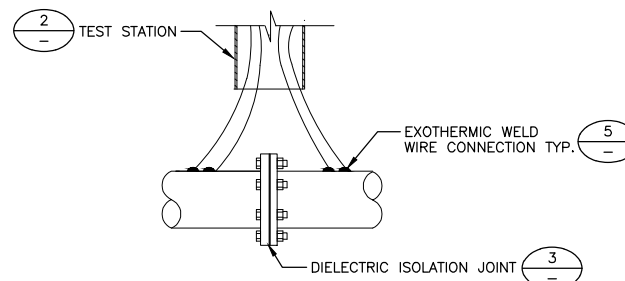
NOTE:
1. ISOLATION FLANGE JOINT SHOWN, OTHERS SIMILAR.

COMBINATION TEST STATION (TS/C)

ITEM	WIRE COLOR	WIRE
NEW WATER MAIN	WHITE	8 AWG, STRANDED COPPER WIRE, USE-TYPE INSULATION
EXISTING WATER MAIN	BLACK	8 AWG, STRANDED COPPER WIRE, USE-TYPE INSULATION
CASING PIPE	ORANGE	8 AWG, STRANDED COPPER WIRE, USE-TYPE INSULATION
GALVANIC ANODES	BLUE	12 AWG, SOLID COPPER WIRE, TW OR THHN INSULATION
ZINC REFERENCE CELL	YELLOW	12 AWG, SOLID COPPER WIRE, TW OR THHN INSULATION
CP MONITORING COUPONS	PURPLE	12 AWG, STRANDED COPPER WIRE, TW OR THHN INSULATION

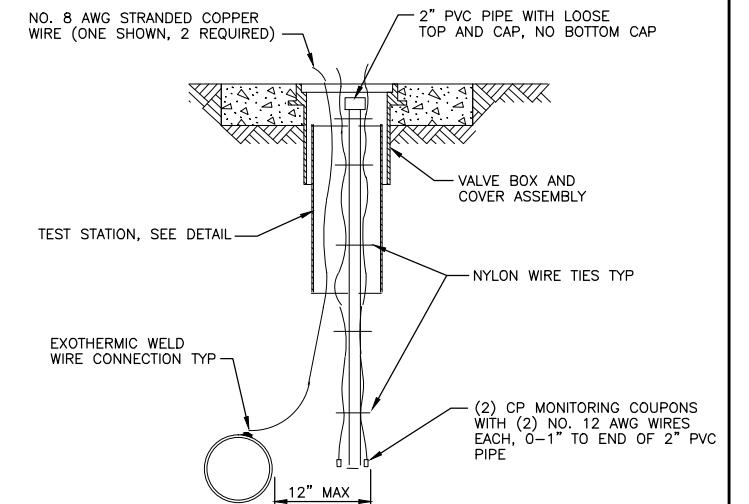
NOTES:
1. WIRE SHALL HAVE ENOUGH SLACK TO EXTEND A MIN OF 2 FT ABOVE FINISHED GRADE AFTER FINAL PAVING.
2. FOR AN ISOLATION JOINT RUN OF NEW WATER PIPE, WIRE ON THE UP STATION SIDE OF THE ISOLATION JOINT SHALL BE WHITE AND WIRE ON THE DOWN STATION SIDE OF THE ISOLATION JOINT SHALL BE BLACK.
3. COLOR CODE WIRES BY INSULATION COLOR, OR BY COLORED TAPE OR PAINT ON LAST 4 FT OF WIRE.

CORROSION CONTROL TEST WIRE IDENTIFICATION TABLE



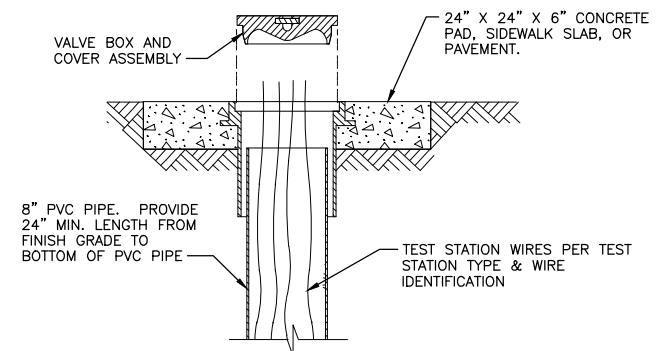
NOTE:
1. ISOLATION FLANGE JOINT SHOWN, OTHER SIMILAR.

ISOLATION JOINT TEST STATION (TS/IJ)



NOTES:
1. BED COUPON IN SAME BACKFILL AS PIPE. COMPACT BACKFILL TO 1 FT. MIN. ABOVE COUPON.
2. DO NOT BACKFILL INSIDE 2" OR 8" PVC PIPE.

MONITORING TEST STATION (TS-M)



TEST STATION INSTALLATION

TEST STATIONS (2)
SCALE: NTS

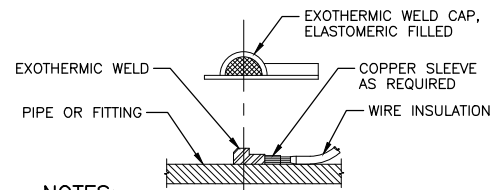
DESIGNED	ACE	APPROVED	
DRAWN	ACE	SCALE	AS SHOWN
DATE		DATE	AUG 2012
REVISIONS		FILE	X

0 1" IF THIS BAR IS NOT ONE INCH, THEN ADJUST SCALES ACCORDINGLY

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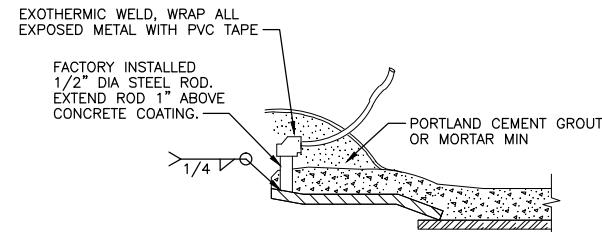
CATHODIC PROTECTION
STANDARD DETAIL - EL - 2



NOTES:

1. APPLY WELD CAP DIRECTLY TO PIPE, NOT TO PIPE WRAP. USE PRIMER AS REQUIRED BY THE MANUFACTURER.
2. COMPLETELY ENCLOSE WIRE WITHIN WELD CAP.
3. REPAIR ANY DAMAGED COATING NOT COVERED BY WELD CAP.

EXOTHERMIC WELD DI & STEEL PIPE



EXOTHERMIC WELD MCSP & CCP PIPE

FOR PIPING RUNS GREATER THAN OR EQUAL TO 100 FEET

PIPE DIAMETER	NUMBER OF ANODES
LESS THAN OR EQUAL TO 16"	1 PER 100 FT (2 MIN)
18" TO 30"	2 PER 100 FT
GREATER THAN OR EQUAL TO 32"	4 PER 100 FT

NOTES:

1. RUNS OF PIPE SHALL HAVE AN ANODE INSTALLED AT EACH END.
2. ANODES TO BE SPACED A MIN OF 5 FT APART.
3. ANODES ALONG A RUN OF PIPE SHALL BE EVENLY DISTRIBUTED AND LOCATED ADJACENT TO A PIPE JOINT.

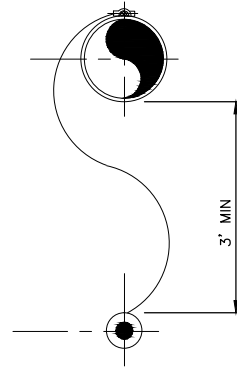
FOR PIPING RUNS LESS THAN 100 FEET INSTALL ANODE AT EACH END OF RUN

PIPE DIAMETER	NUMBER OF ANODES
LESS THAN OR EQUAL TO 16"	2 (1 AT EACH END)
GREATER THAN OR EQUAL TO 18"	4 (2 AT EACH END)

ANODE SCHEDULE

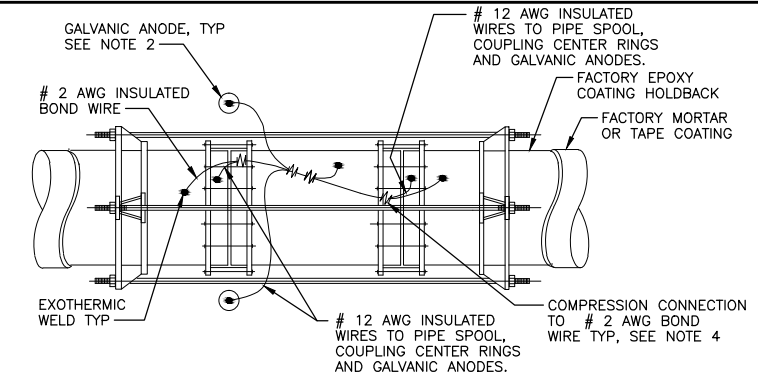
NOTES:

1. LOCATE ANODES A MAX OF 3 FEET HORIZONTALLY FROM CENTERLINE OF PIPE.
2. PLACE GALVANIC ANODE IN CLEAN NATIVE BACKFILL AND COMPACT TO 12" ABOVE ANODE.
3. ANODES MAY BE PLACED UPRIGHT OR HORIZONTALLY, HORIZONTAL ORIENTATION SHOWN.
4. ANODE WIRE SHALL BE EXOTHERMIC WELDED DIRECTLY TO PIPE OR INCORPORATED INTO THE JOINT BOND WITH A SPLIT-BOLT CONNECTION.



GALVANIC ANODE 1
SCALE: NTS

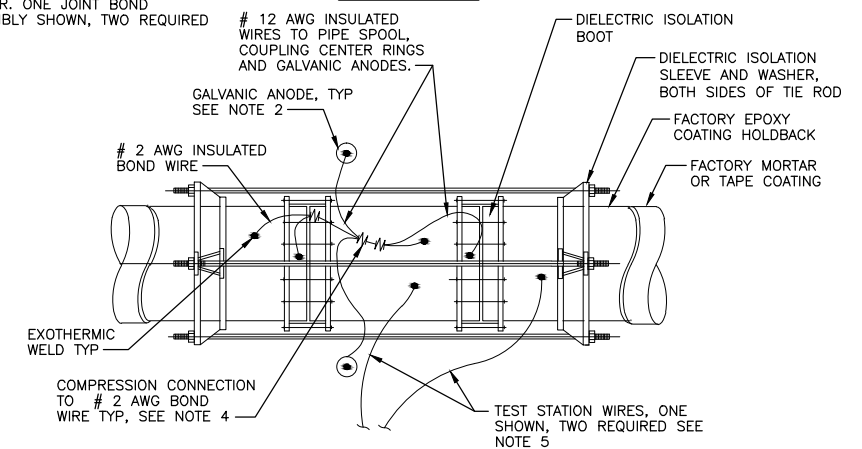
GALVANIC ANODE INSTALLATION



NOTES:

DOUBLE FLEX COUPLING SHOWN, SINGLE FLEX COUPLING SIMILAR. ONE JOINT BOND ASSEMBLY SHOWN, TWO REQUIRED

JOINT BOND



NOTES:

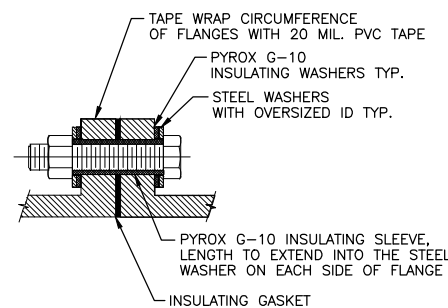
DOUBLE FLEX COUPLING SHOWN, SINGLE FLEX COUPLING SIMILAR. ONE JOINT BOND ASSEMBLY SHOWN, TWO REQUIRED

ISOLATION JOINT

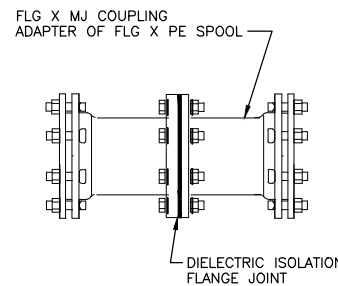
NOTES:

1. FACTORY EPOXY COAT PIPE, HOLD BACK AREA, LUGS, SPOOL AND FLEXIBLE COUPLINGS.
2. TWO ANODES SHOWN, PROVIDE FOUR ANODES TOTAL, TWO EACH JOINT BOND ASSEMBLY.
3. WAX TAPE COAT THE ENTIRETY OF THE JOINT INCLUDING THE HOLD BACK AREA, THE SPOOL, THE COUPLINGS, THE HARNESS LUGS AND TIES. WAX TAPE SYSTEM SHALL INCLUDE PETROLATUM PRIMER, PETROLATUM PROFILING MASTIC, PETROLATUM TAPE, AND STRETCH FILM OVERWRAP. PROVIDE PROFILING MASTIC TO COAT COUPLINGS AND FILL POCKETS IN HARNESS RINGS AND LUGS.
4. WRAP ELECTRICAL COMPRESSION CONNECTIONS WITH TWO LAYERS OF SELF FUSING BUTYL RUBBER ELECTRICAL INSULATING TAPE AND TWO LAYERS OF VINYL ELECTRICAL TAPE.
5. TEST STATIONS, REFERENCE ELECTRODES AND COUPONS NOT SHOWN.

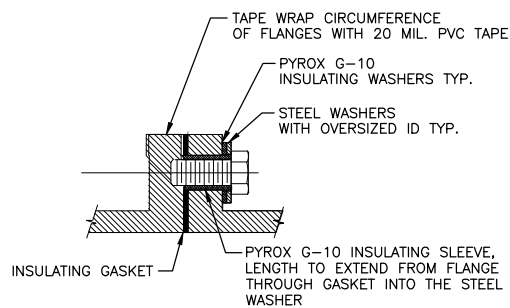
RESTRAINED FLEX COUPLING CORROSION PROTECTION 3
SCALE: NTS



DIELECTRIC ISOLATION FLANGE JOINT DETAIL



DIELECTRIC ISOLATION FLANGE JOINT ASSEMBLY



DIELECTRIC ISOLATION FLANGE JOINT TAP SCREW DETAIL

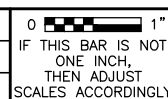
NOTES:

1. CENTER FLEXIBLE COUPLING OVER INSULATING BOOTS.
2. EXOTHERMIC WELD TO COUPLING PRIOR TO ASSEMBLY. DO NOT BURN BOOTS.
3. BOND THE COUPLING TO A PROTECTED SIDE OF THE JOINT WHERE SPECIFIED.

DIELECTRIC ISOLATION FLEXIBLE COUPLING 2
SCALE: NTS

January 2021

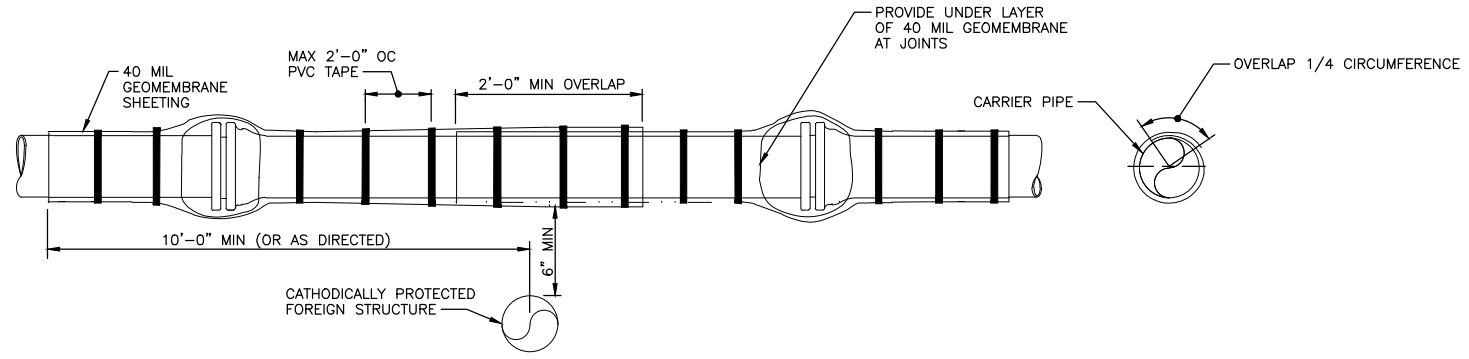
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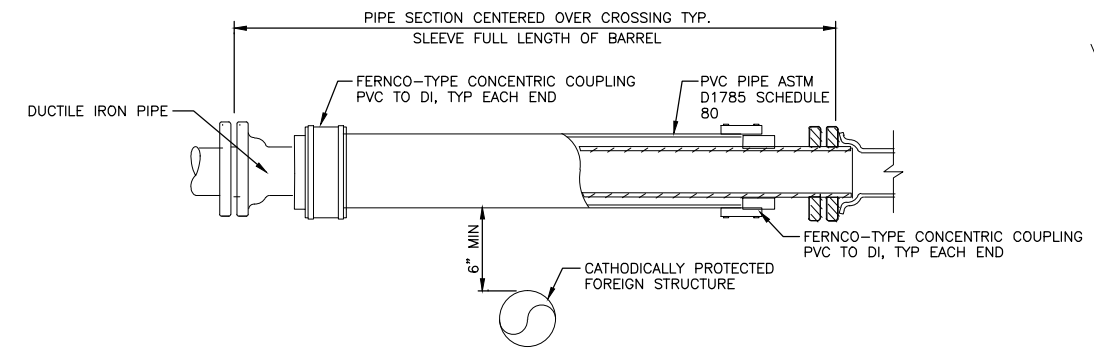
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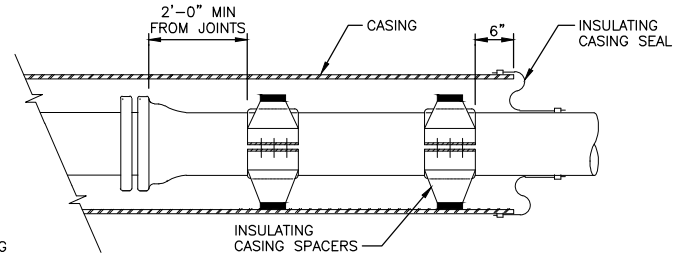
CATHODIC PROTECTION
STANDARD DETAILS - SHEET 2



SLEEVE WRAPPED

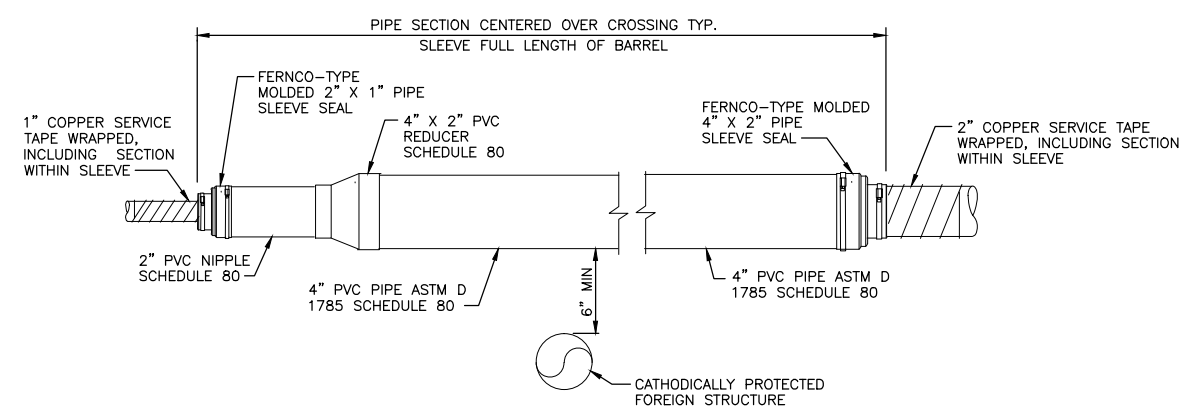


SLEEVE SLIP-ON FOR DI PIPE



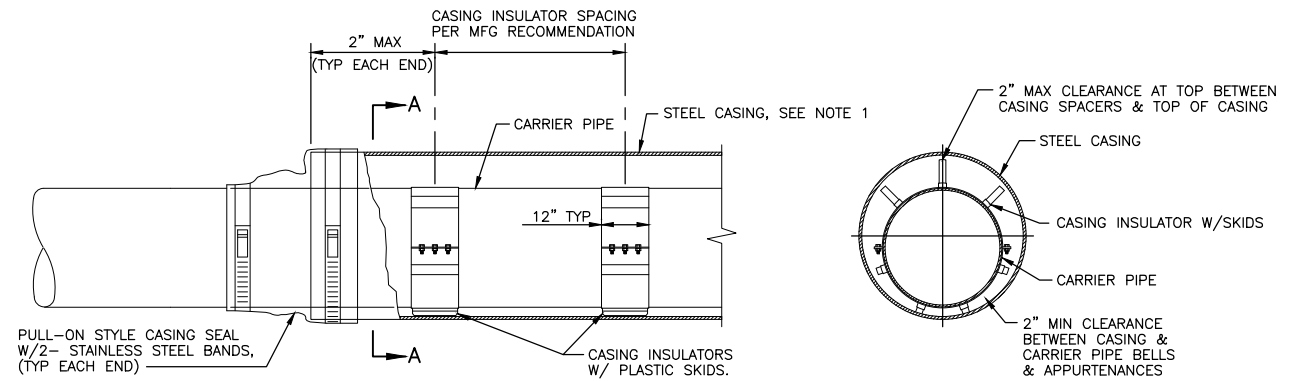
- NOTES:**
1. PROVIDE A SPACER WITHIN 6" OF EACH CASING END. PROVIDE INTERMEDIATE SPACERS AS REQUIRED, NOT TO EXCEED THE MAXIMUM DISTANCE SPECIFIED BY THE MANUFACTURER.
 2. INSTALL CASING SEAL PER MANUFACTURER REQUIREMENTS TO PREVENT TENSIONING SEAL DURING BACKFILL.

CASING SPACERS & END SEALS



**SLEEVE SLIP-ON FOR COPPER SERVICE
1" OR 2" COPPER SHOWN**

SLEEVED AND CASED PIPE DETAILS 1
SCALE: NTS



- NOTES:**
1. SEE SPECIFICATIONS FOR CASING AND CASING COATING REQUIREMENTS.
 2. SEE SPECIFICATIONS AND DRAWINGS FOR CASING CATHODIC PROTECTION REQUIREMENTS.
 3. SEE DETAIL 2, SHEET 1, FOR CASING TEST STATION REQUIREMENTS.

STEEL CASING DETAIL 2
SCALE: NTS

- GENERAL NOTES:**
1. PROVIDE A SLEEVE WHEN CROSSING OVER OR UNDER POTENTIAL STRAY CURRENT SOURCES.
 2. WHEN SLEEVING A PIPE JOINT PROVIDE 2 CASING SPACERS, 1 EACH SIDE OF JOINT.
 3. COPPER SHALL BE WRAPPED WITH 20 MIL PVC TAPE, 50% OVERLAP, 40 MIL TOTAL, INSIDE & OUTSIDE PVC SLEEVE.
 4. OVERLAP GEOMEMBRANE SHEETING A MINIMUM OF 1/4 THE OF PIPE CIRCUMFERENCE. ENSURE OVERLAP RUNS ALONG CROWN OF PIPE.
 5. SLEEVES AND CASINGS SHALL BE DRY & MOISTURE FREE BEFORE SEALING.

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DATE	NO.	REVISIONS	BY							