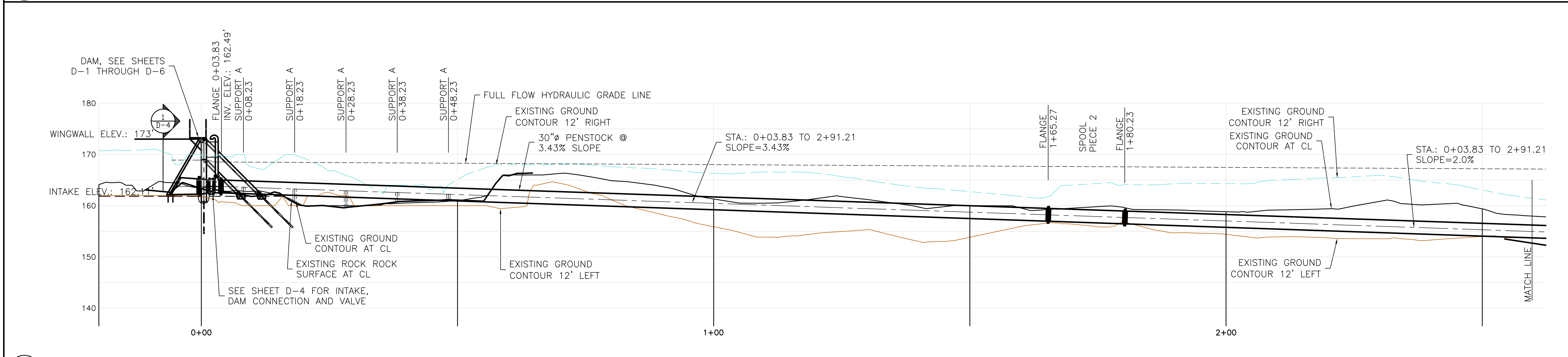
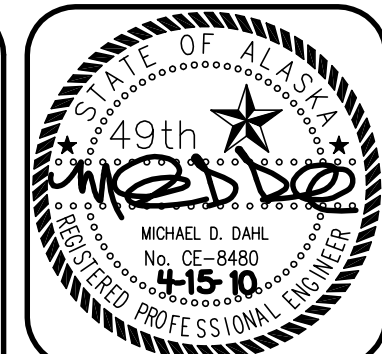


1 PENSTOCK PLAN
SCALE: 1 INCH = 10 FEET



2 PENSTOCK PROFILE
SCALE: 1 INCH = 10 FEET



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Drawing
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EDA AWARD # 07-01-06108
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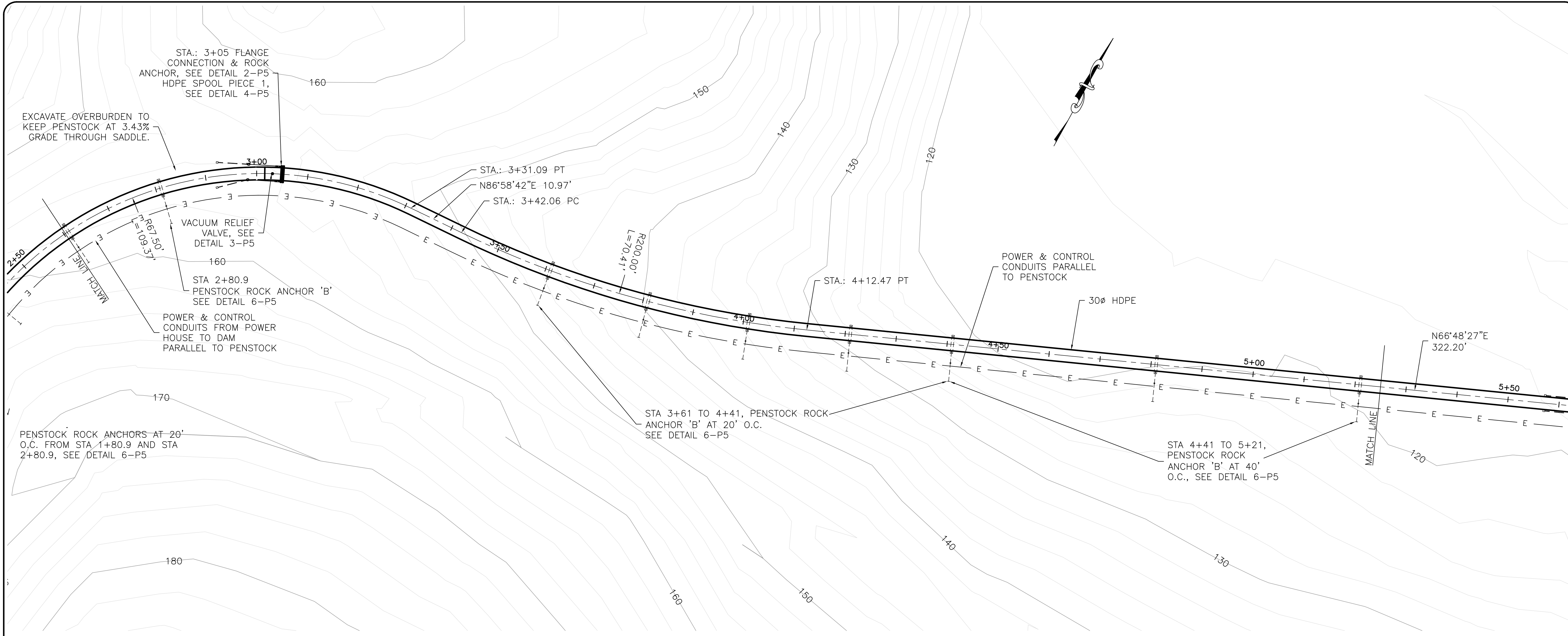
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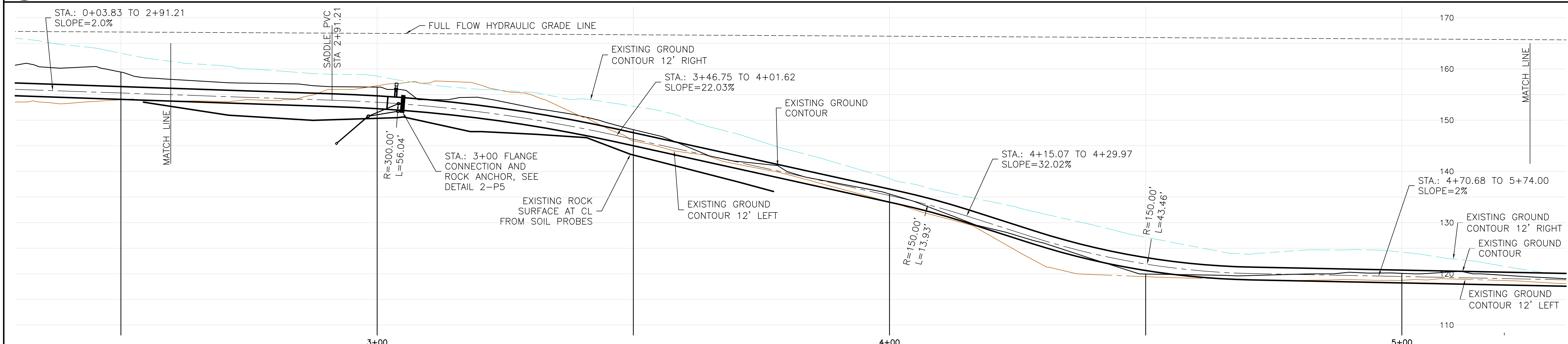
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1 PENSTOCK PLAN
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2 PENSTOCK PROFILE
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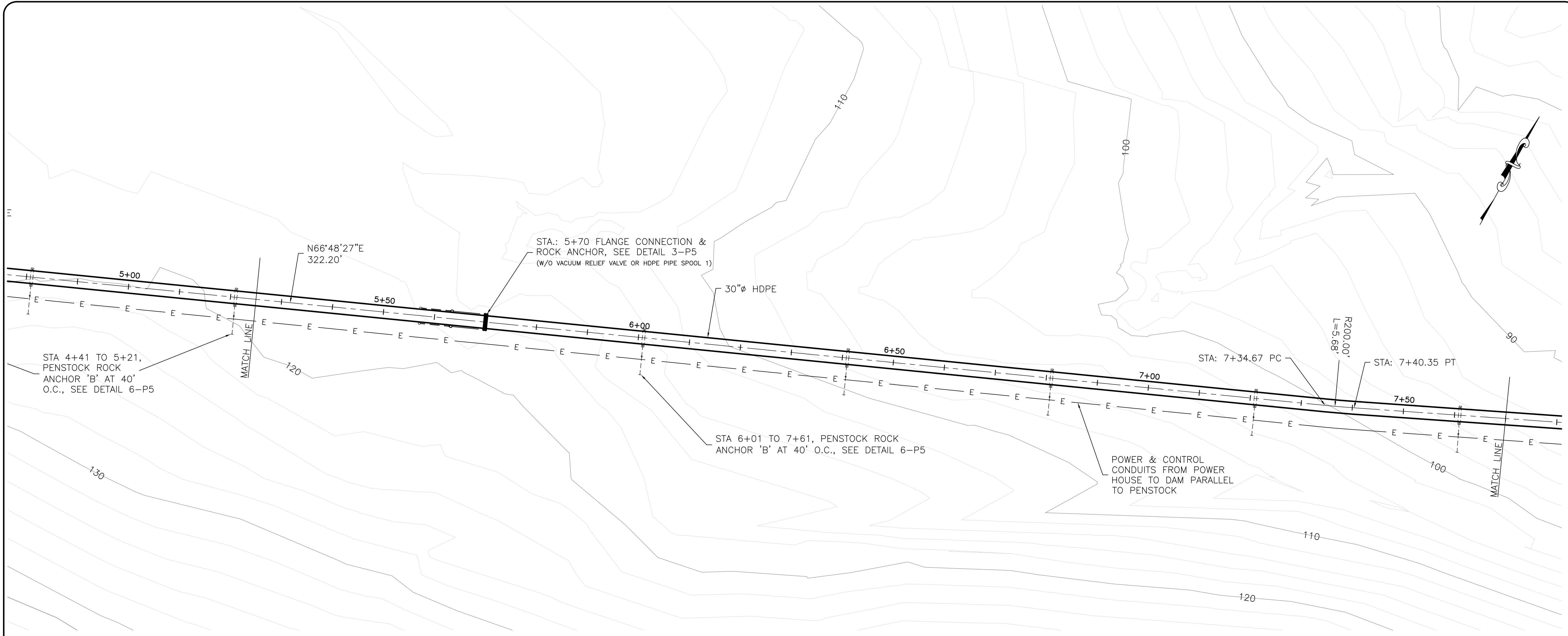
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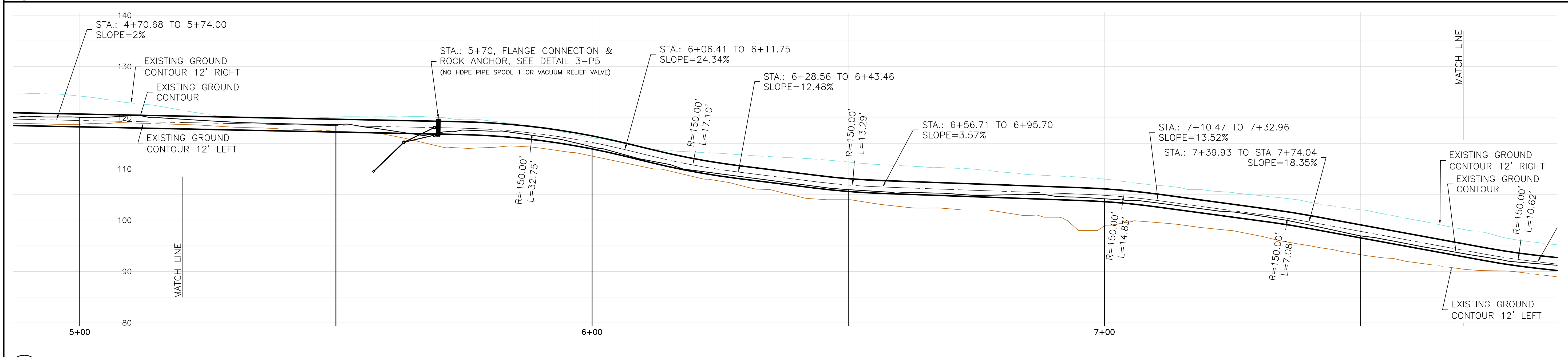
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2 PENSTOCK PROFILE
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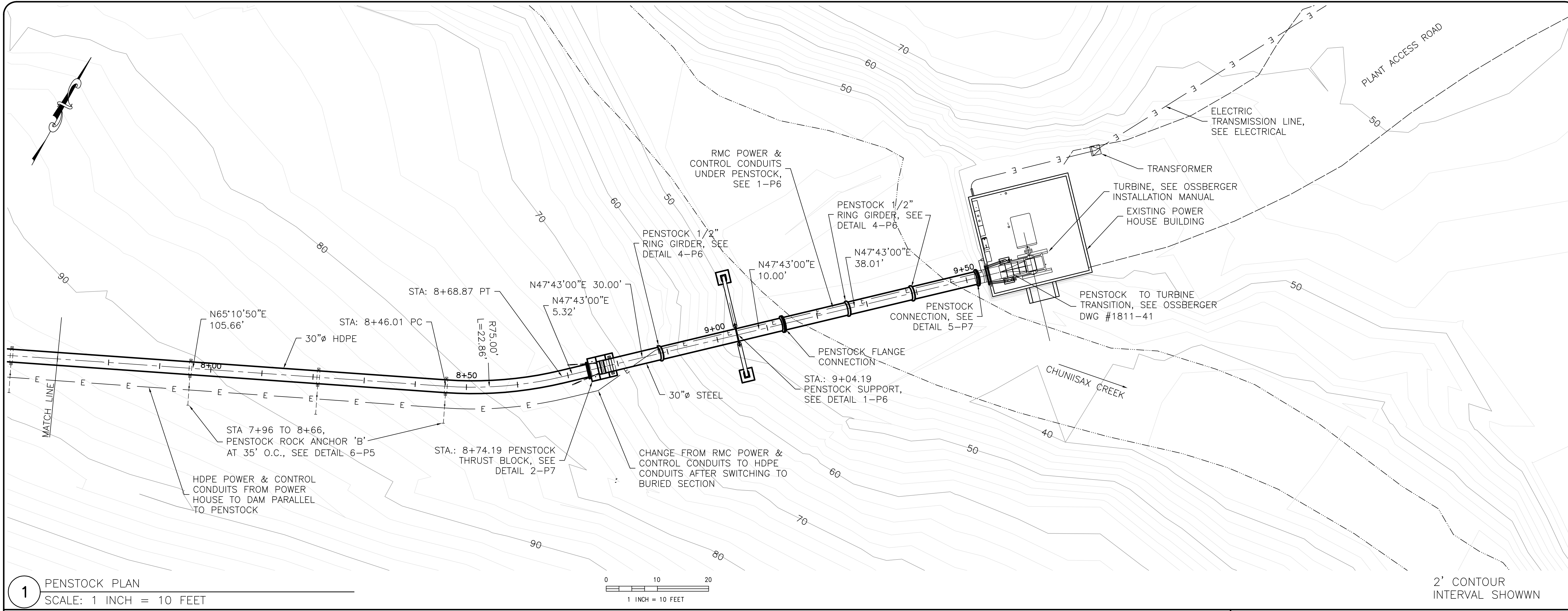
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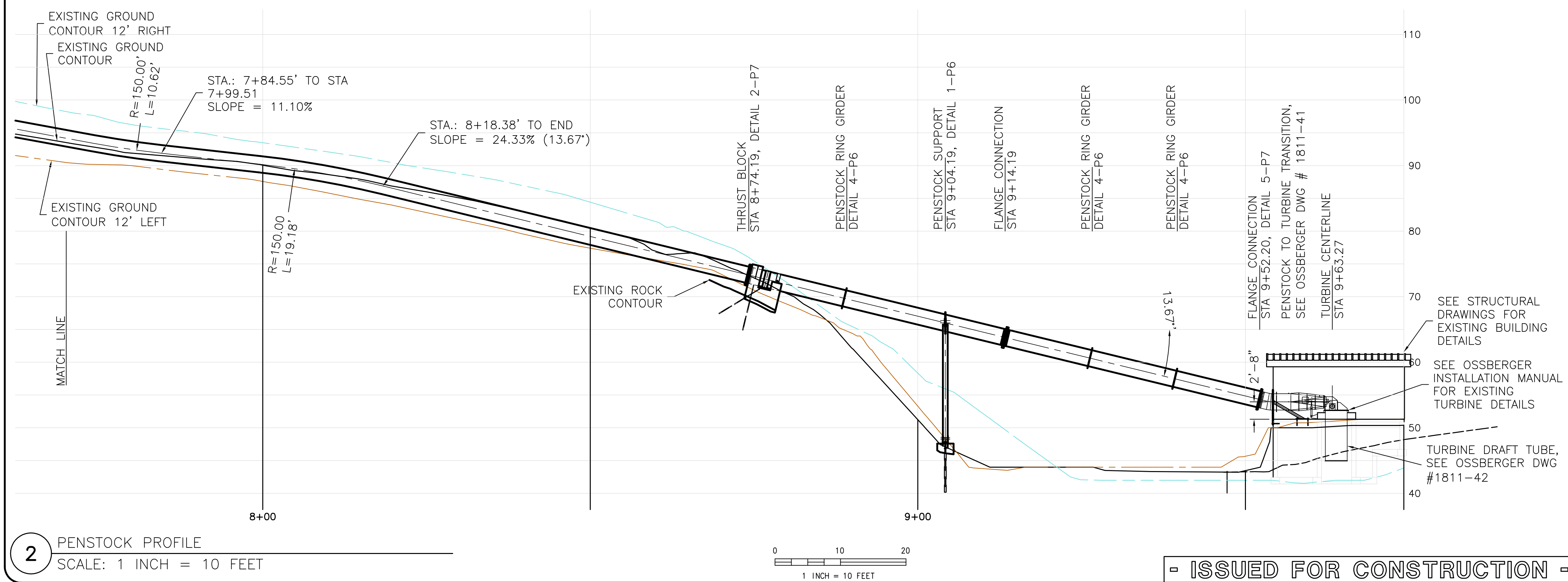
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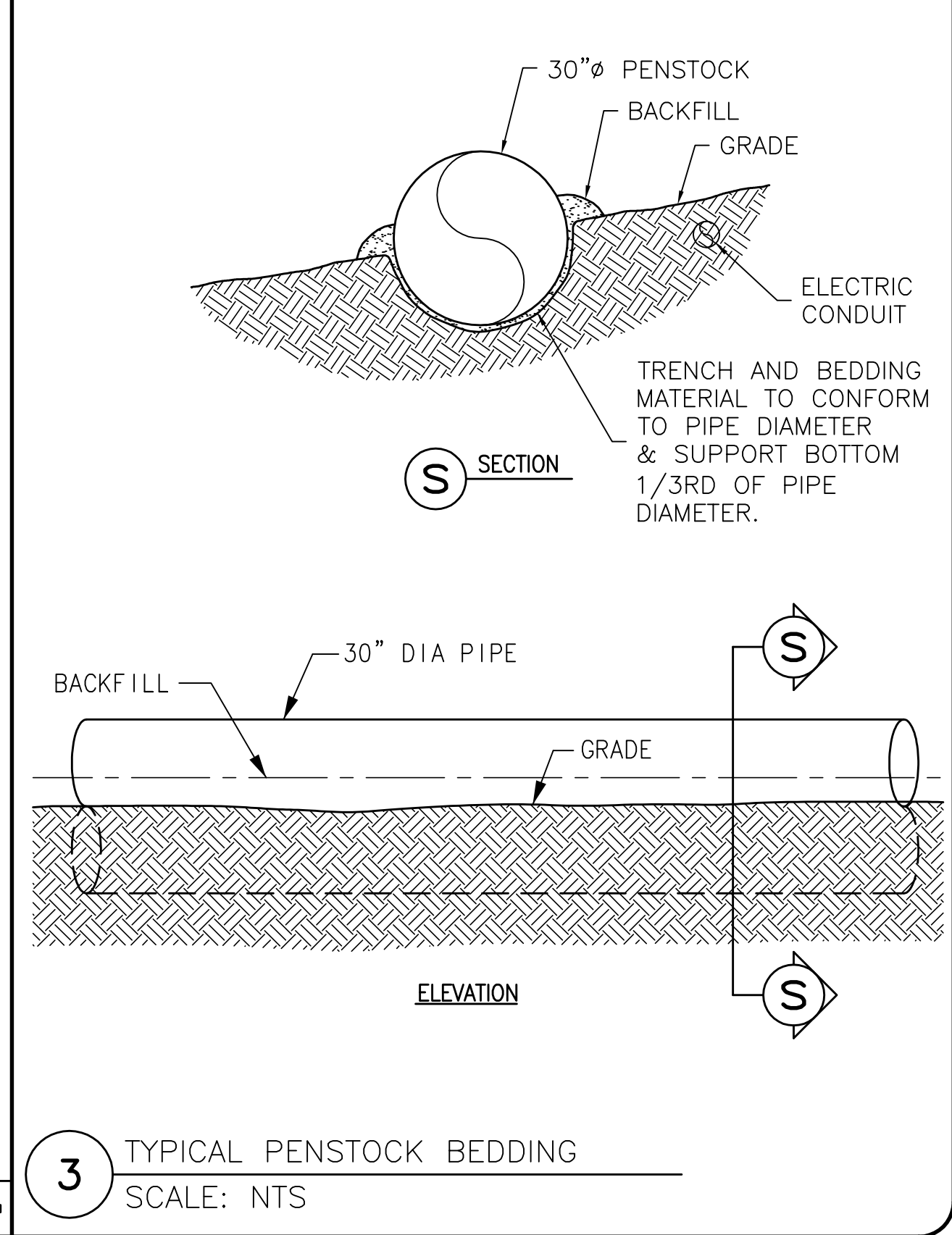
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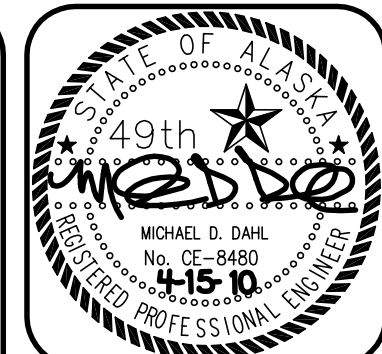


2 PENSTOCK PROFILE
SCALE: 1 INCH = 10 FEET



3 TYPICAL PENSTOCK BEDDING
SCALE: NTS

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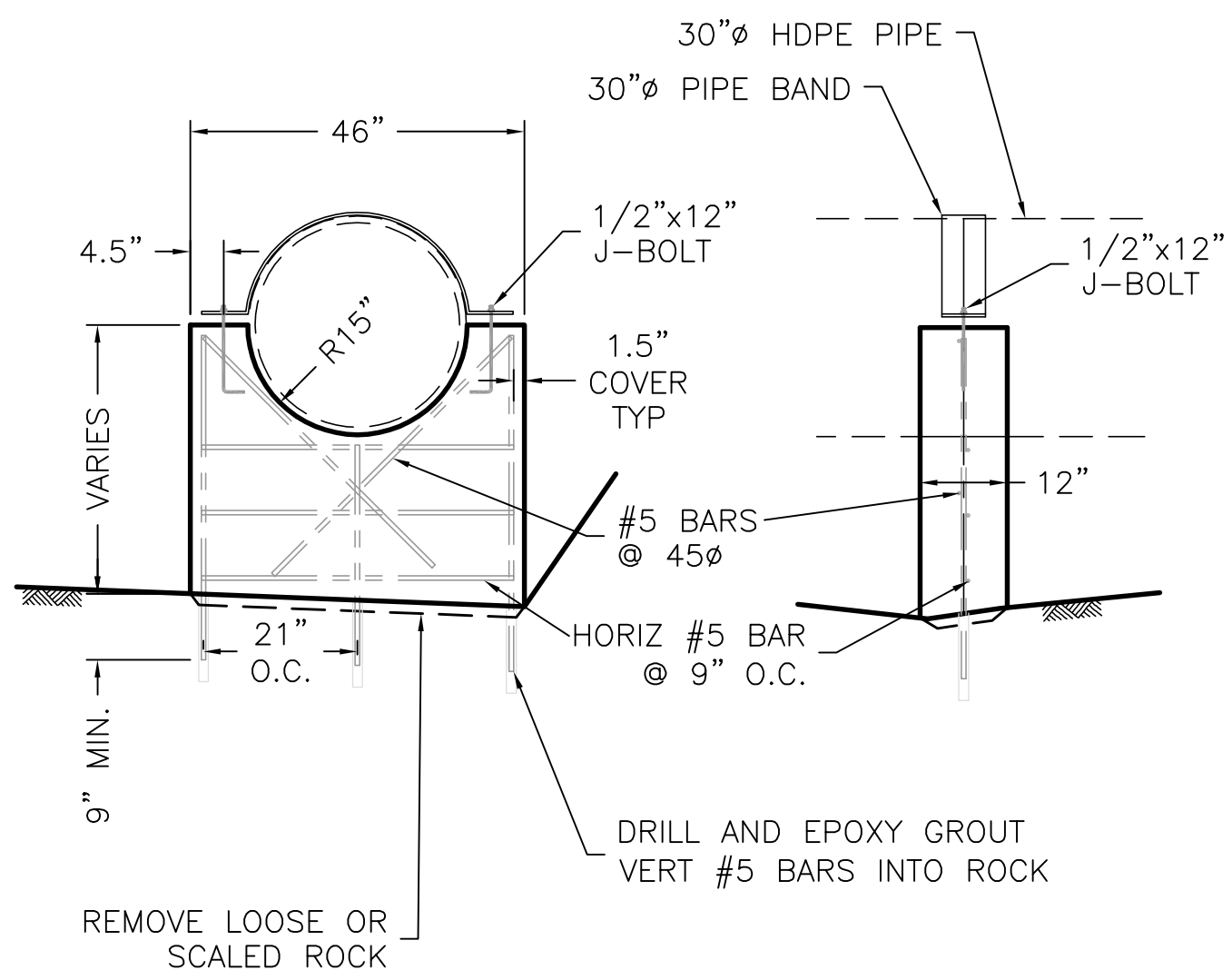
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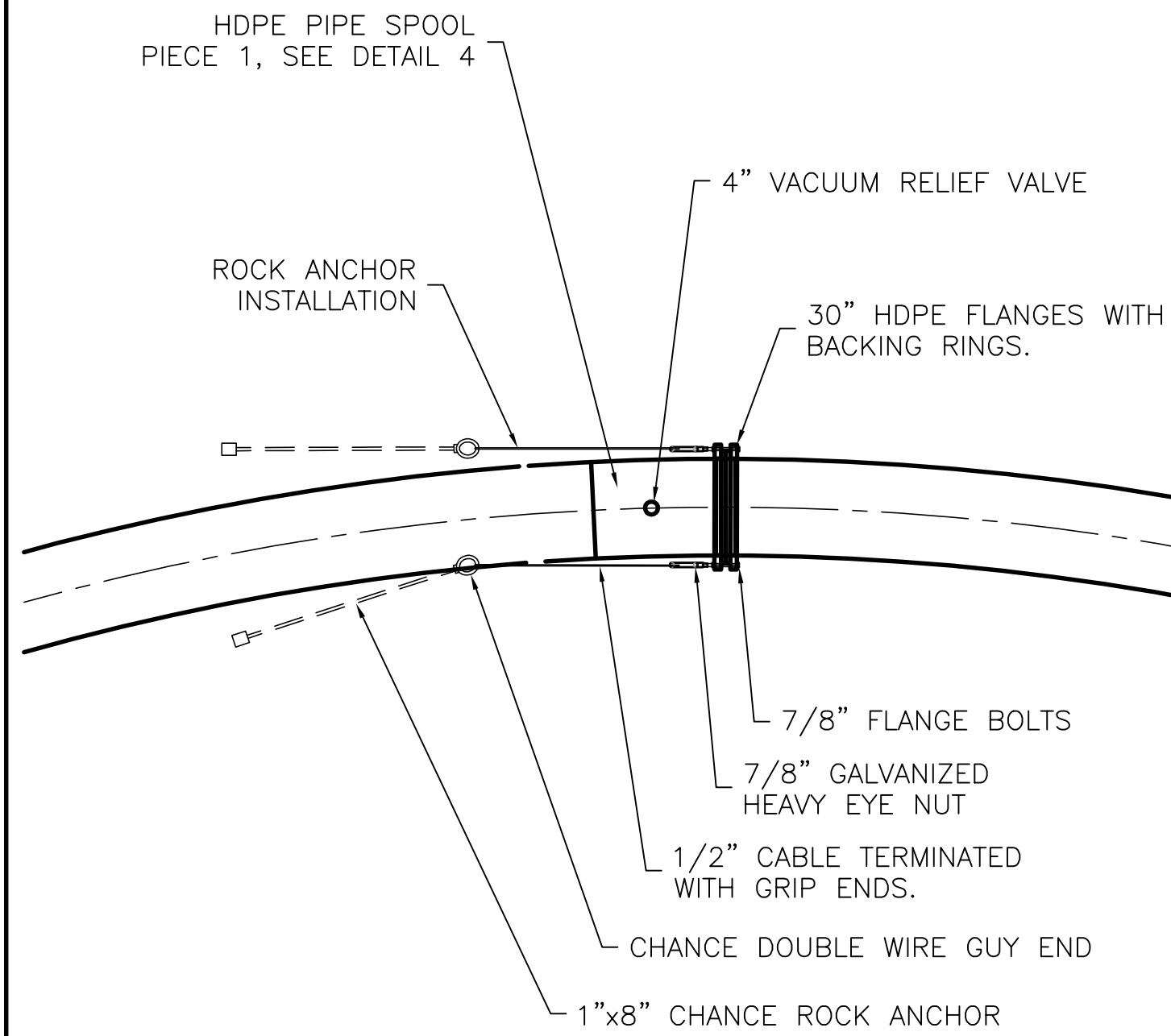
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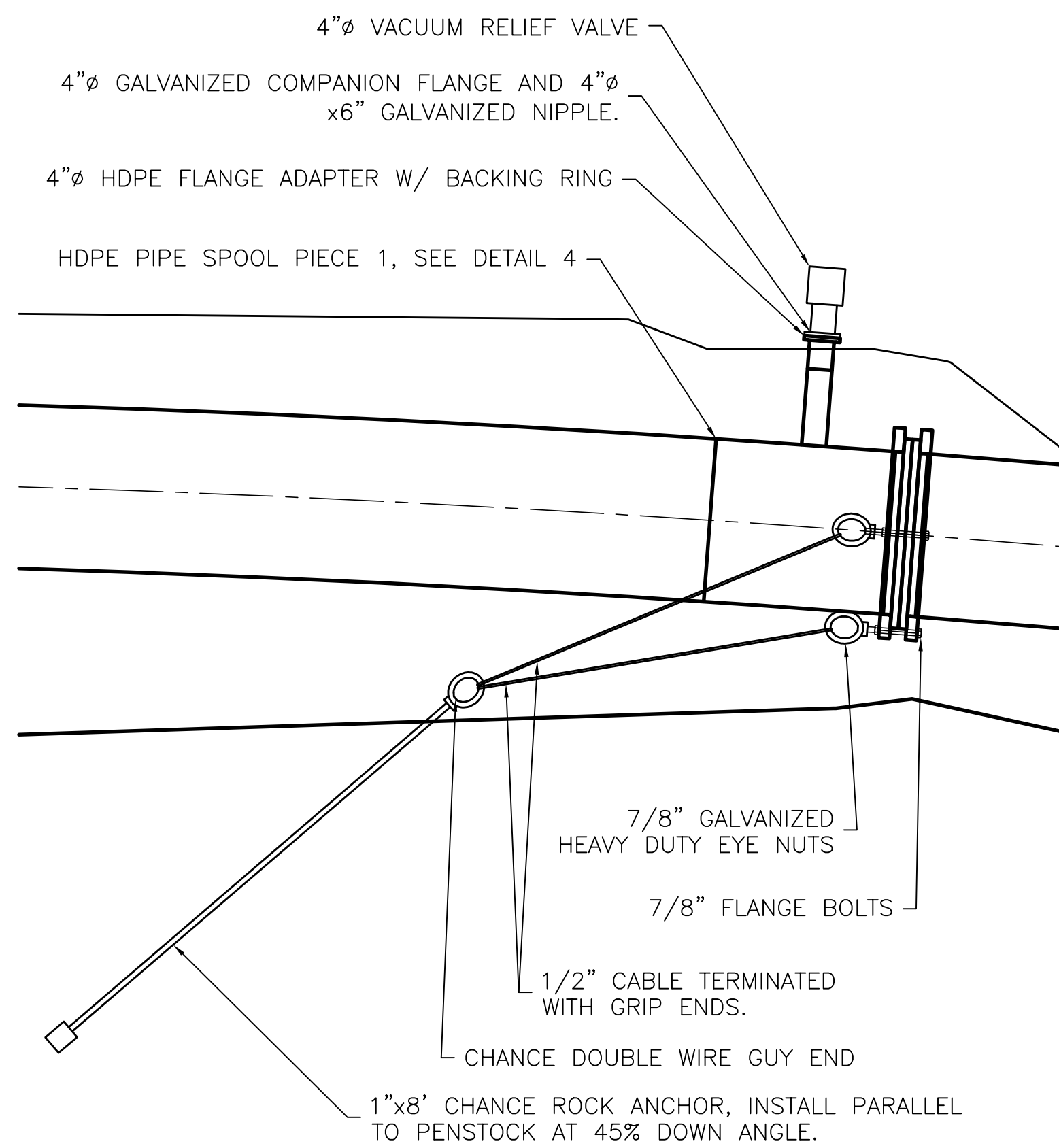
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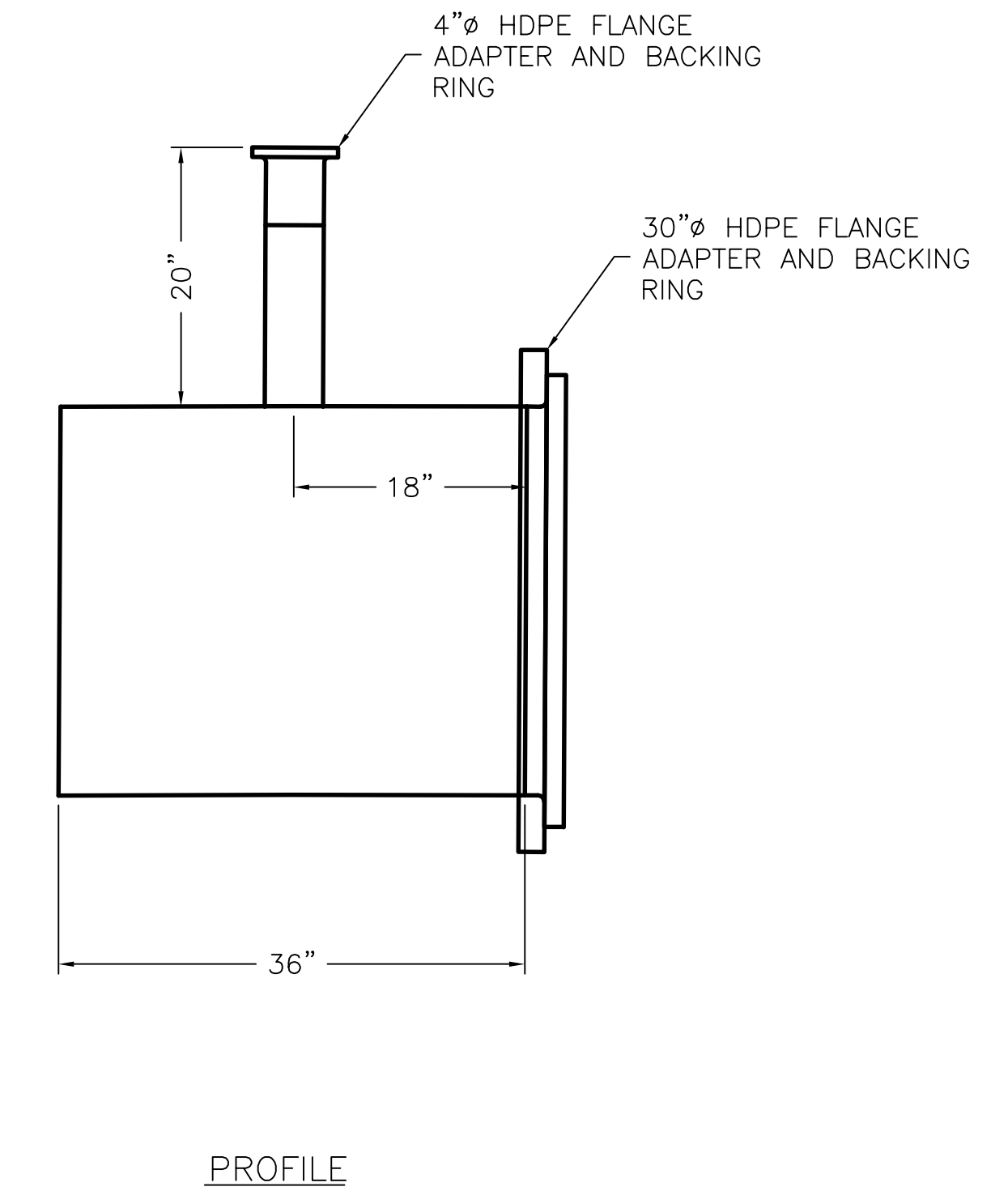
1 CONCRETE PENSTOCK SUPPORT 'A'
SCALE: 1/2 INCH = 1 FOOT



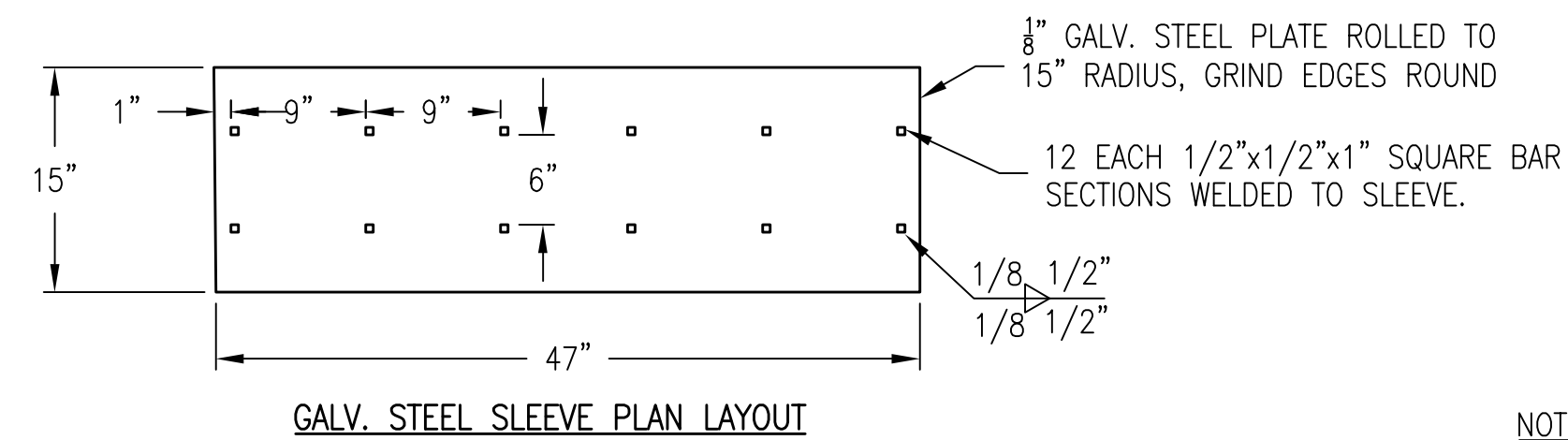
2 PENSTOCK ANCHOR - PLAN
SCALE: 1" = 4 FEET



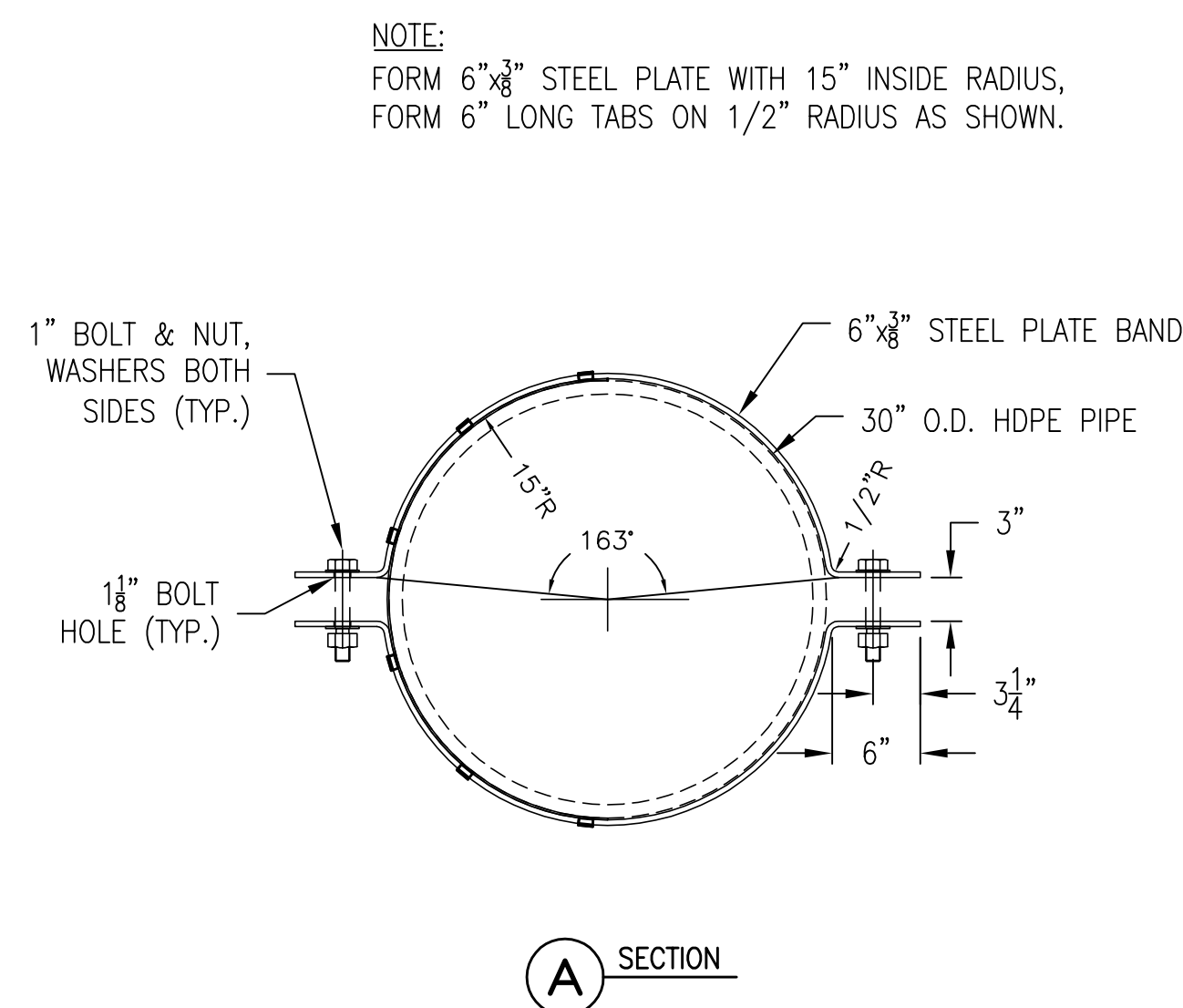
3 PENSTOCK ANCHOR - PROFILE
SCALE: 1" = 2 FEET



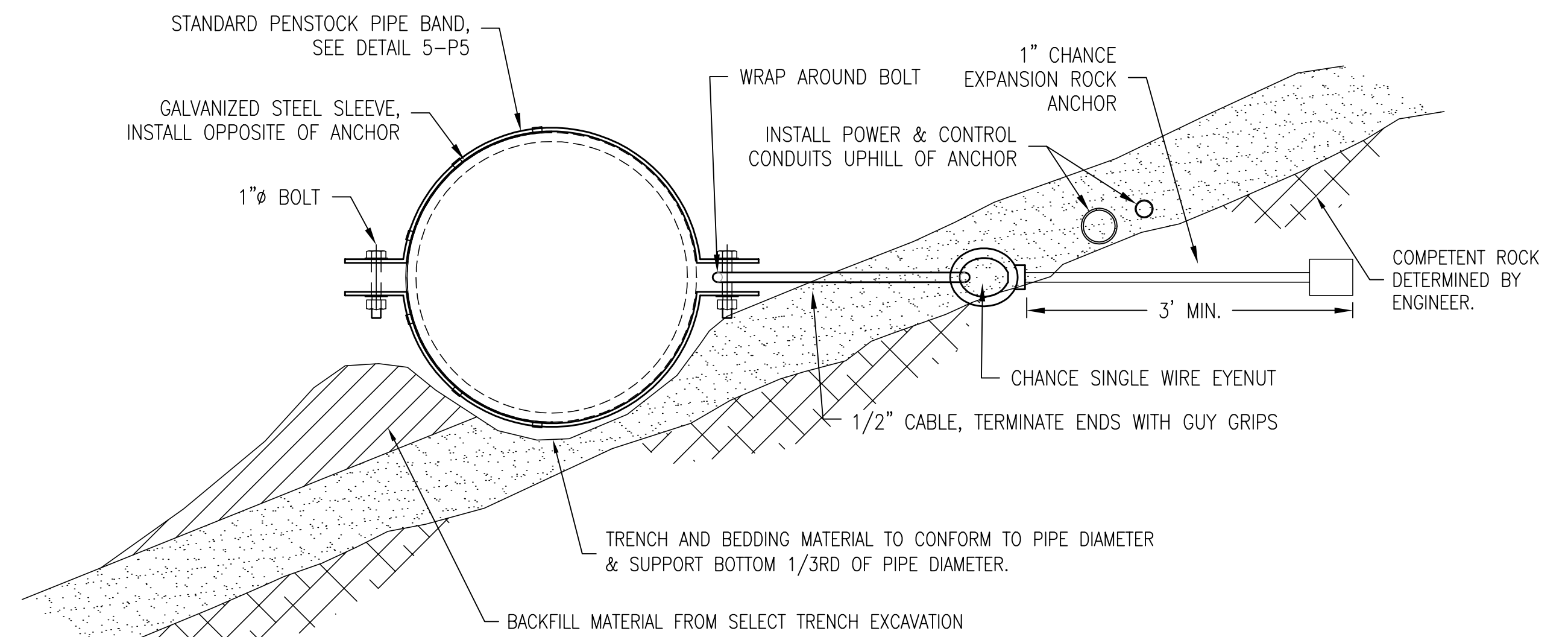
4 HDPE SPOOL PIECE 1
SCALE: 1" = 1 FOOT



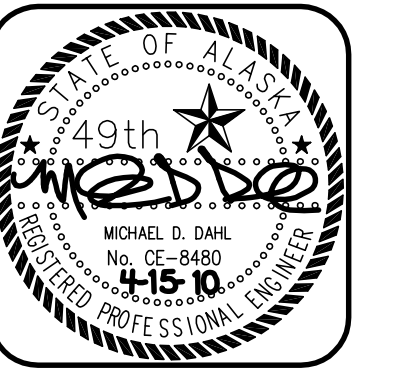
5 STANDARD PENSTOCK PIPE BAND
SCALE: 1 INCH = 1 FOOT



6 PENSTOCK SIDE HILL ANCHOR
SCALE: 1 INCH = 1 FOOT



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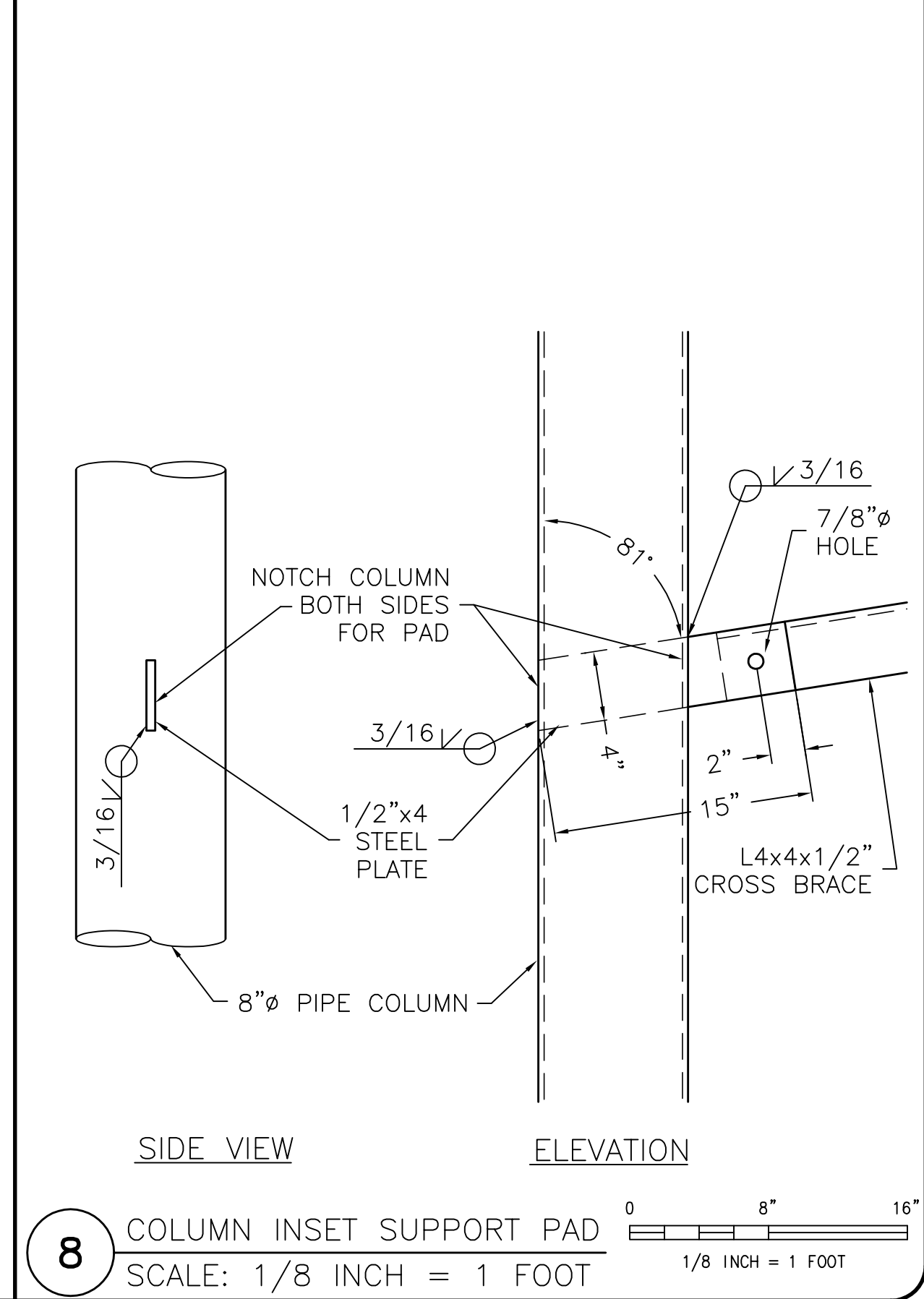
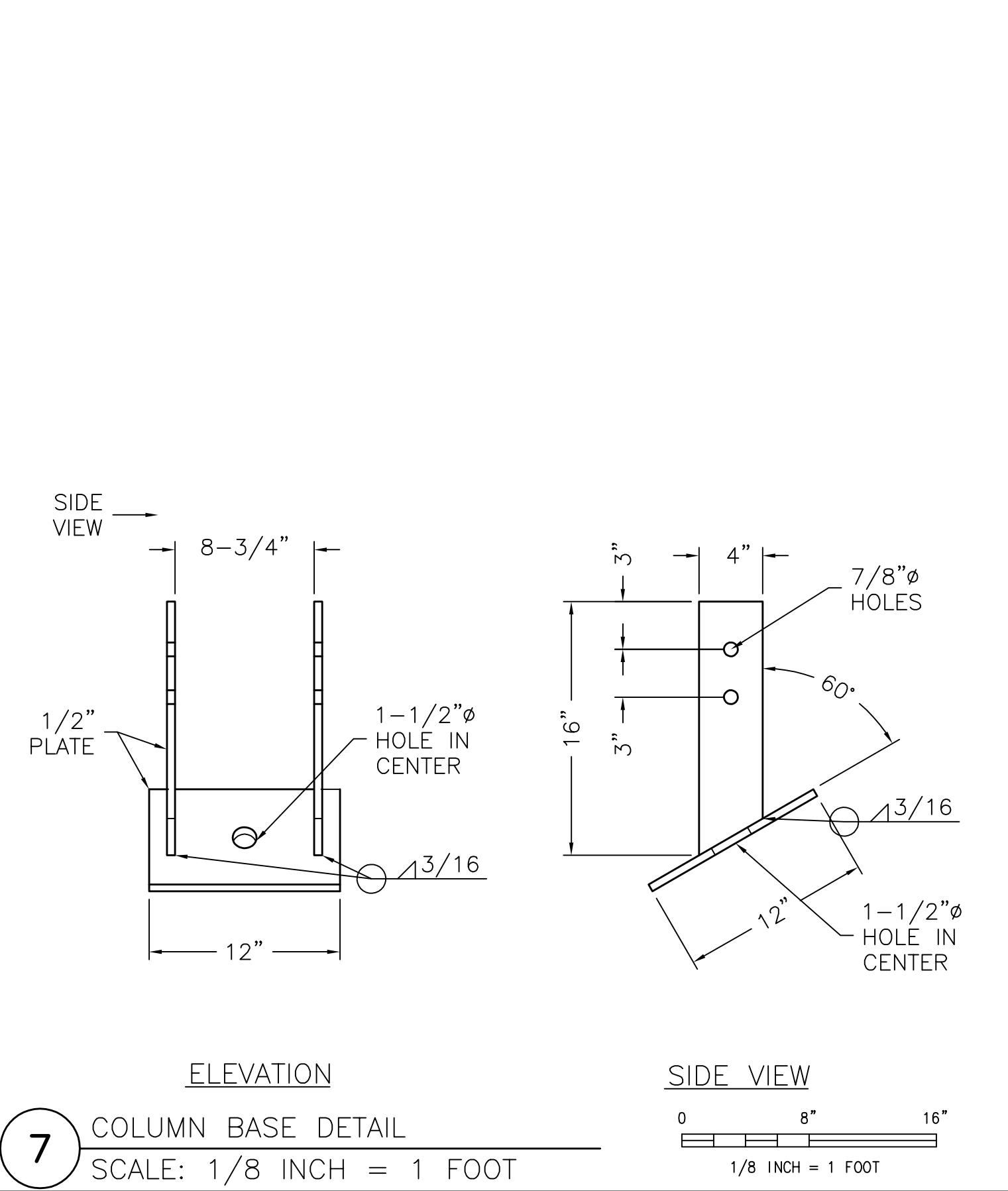
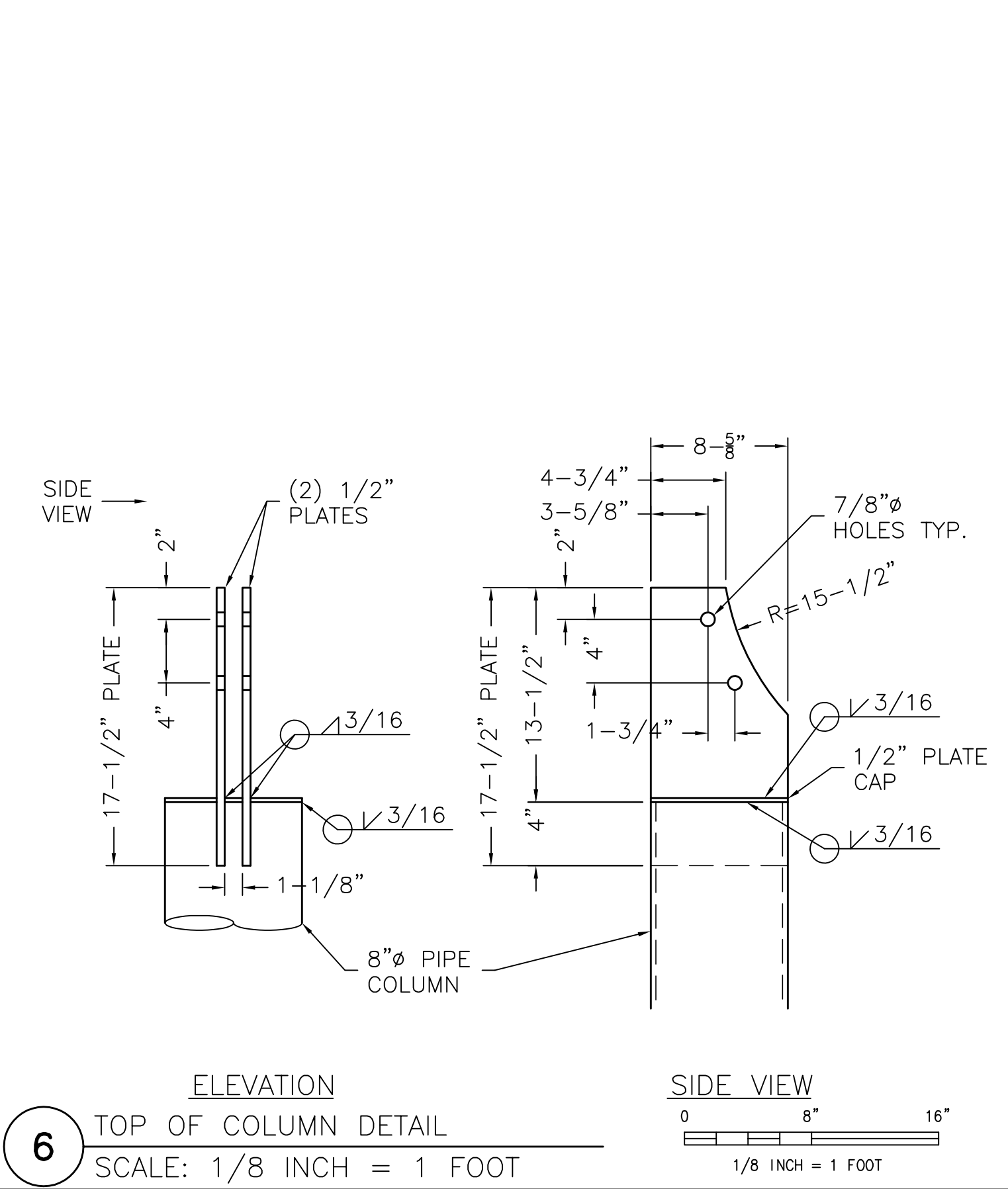
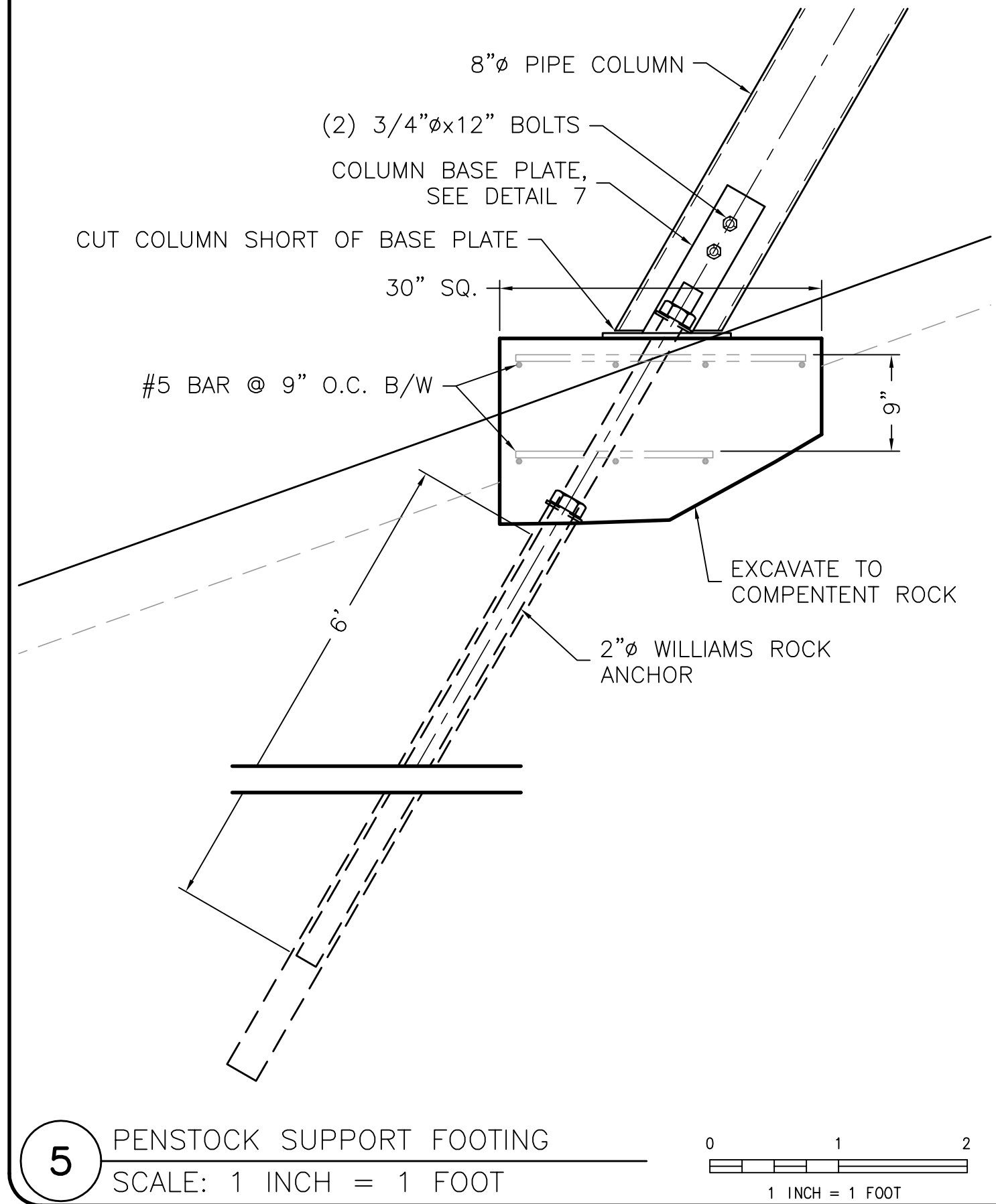
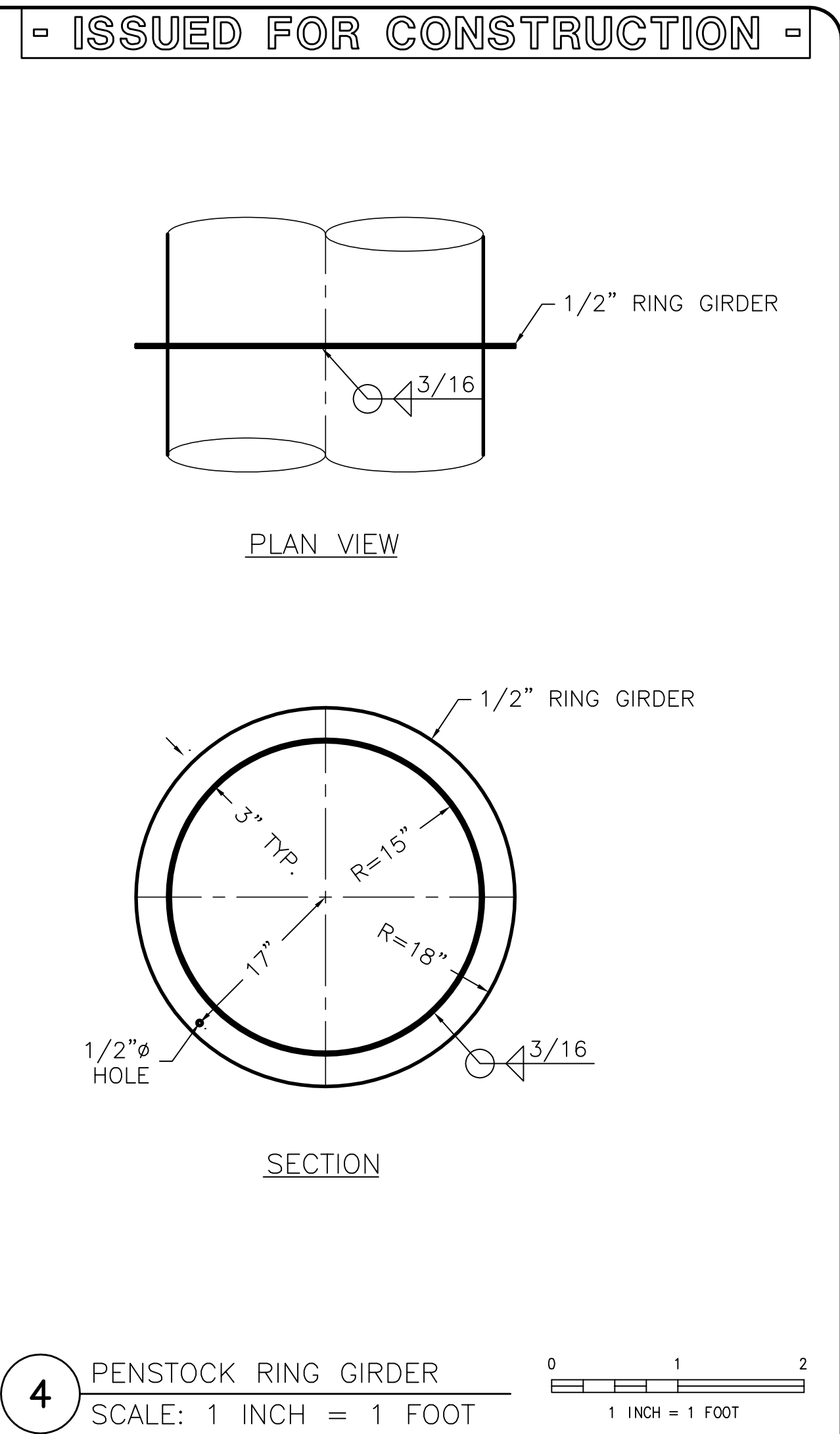
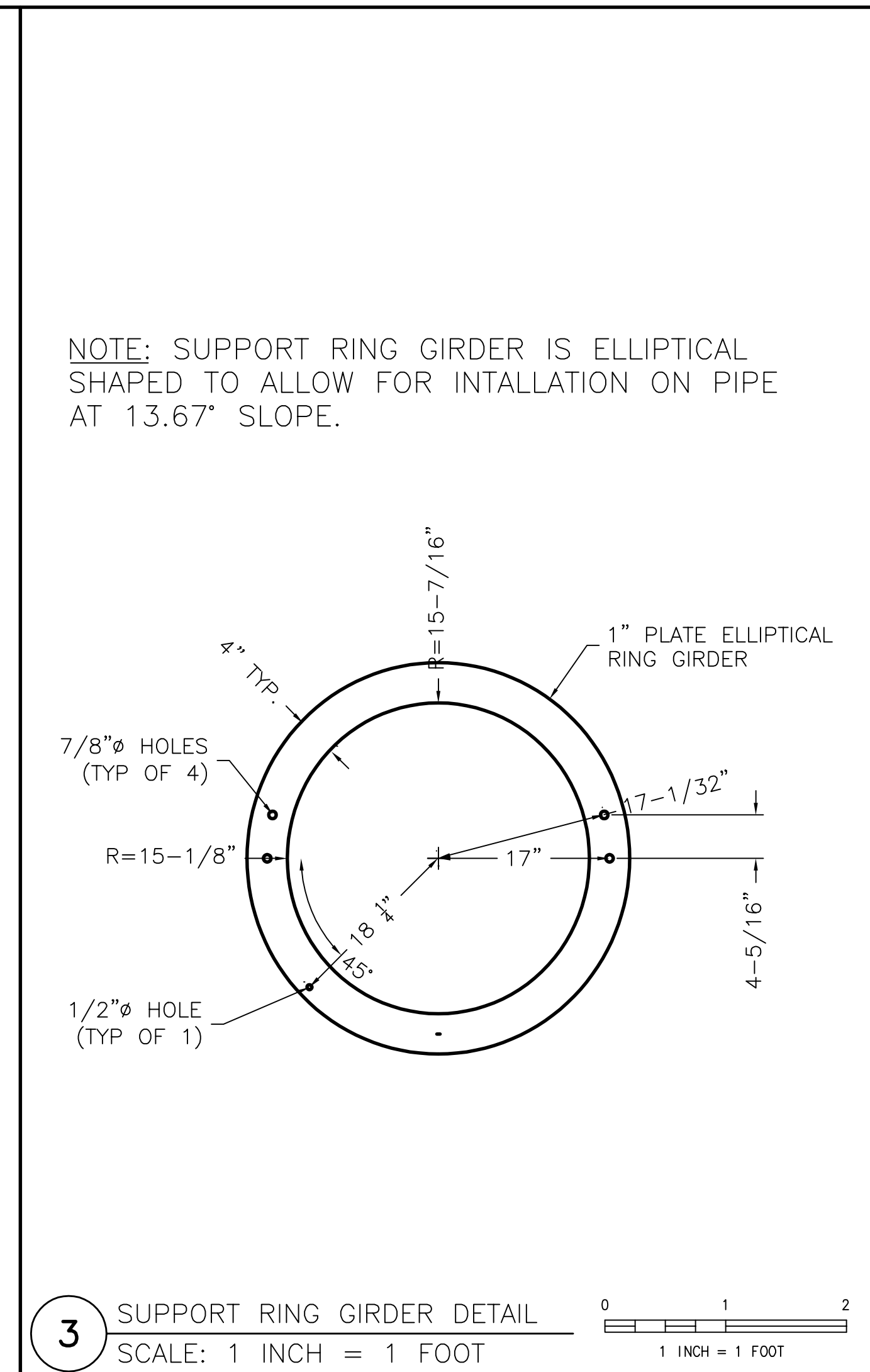
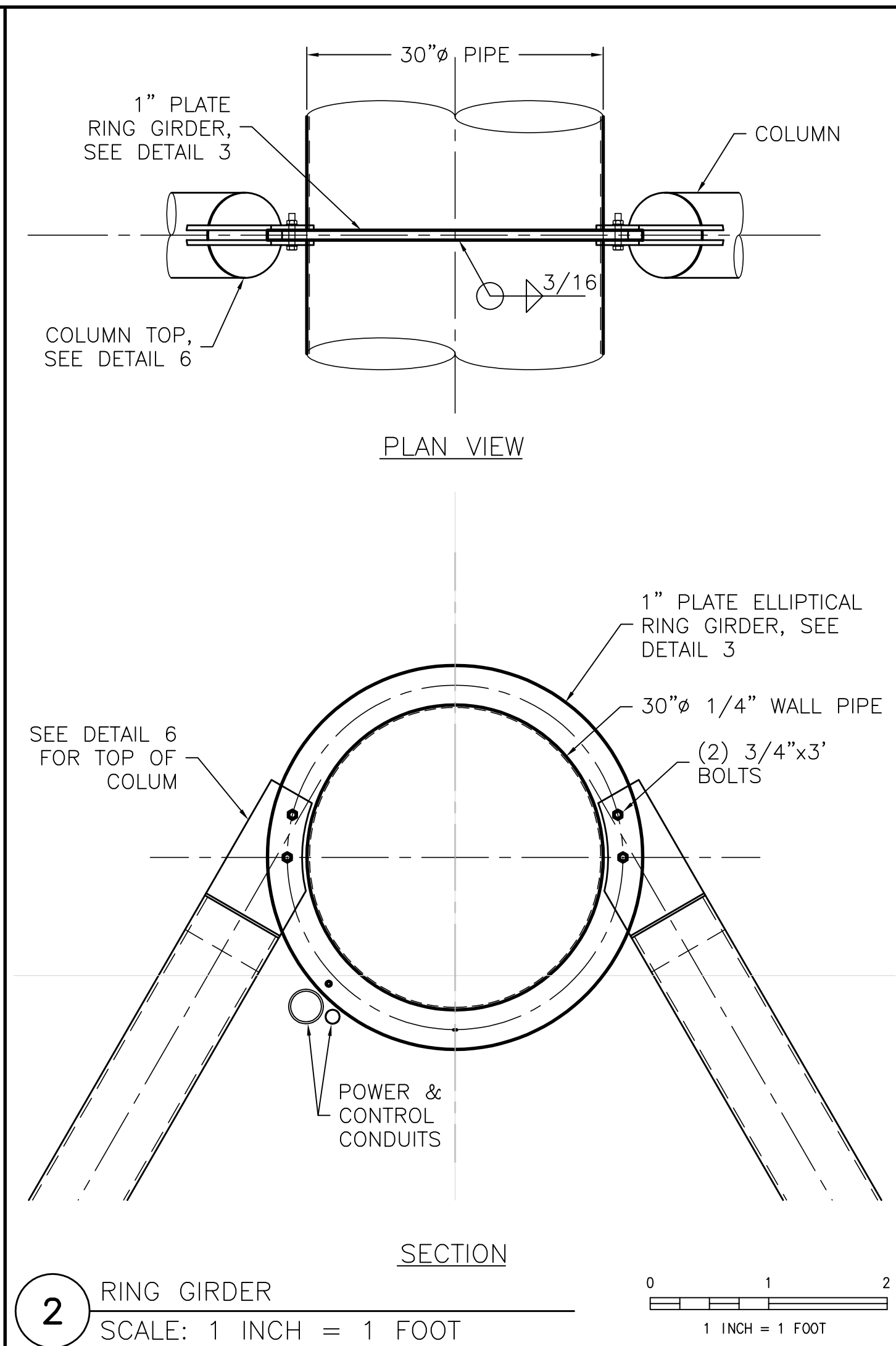
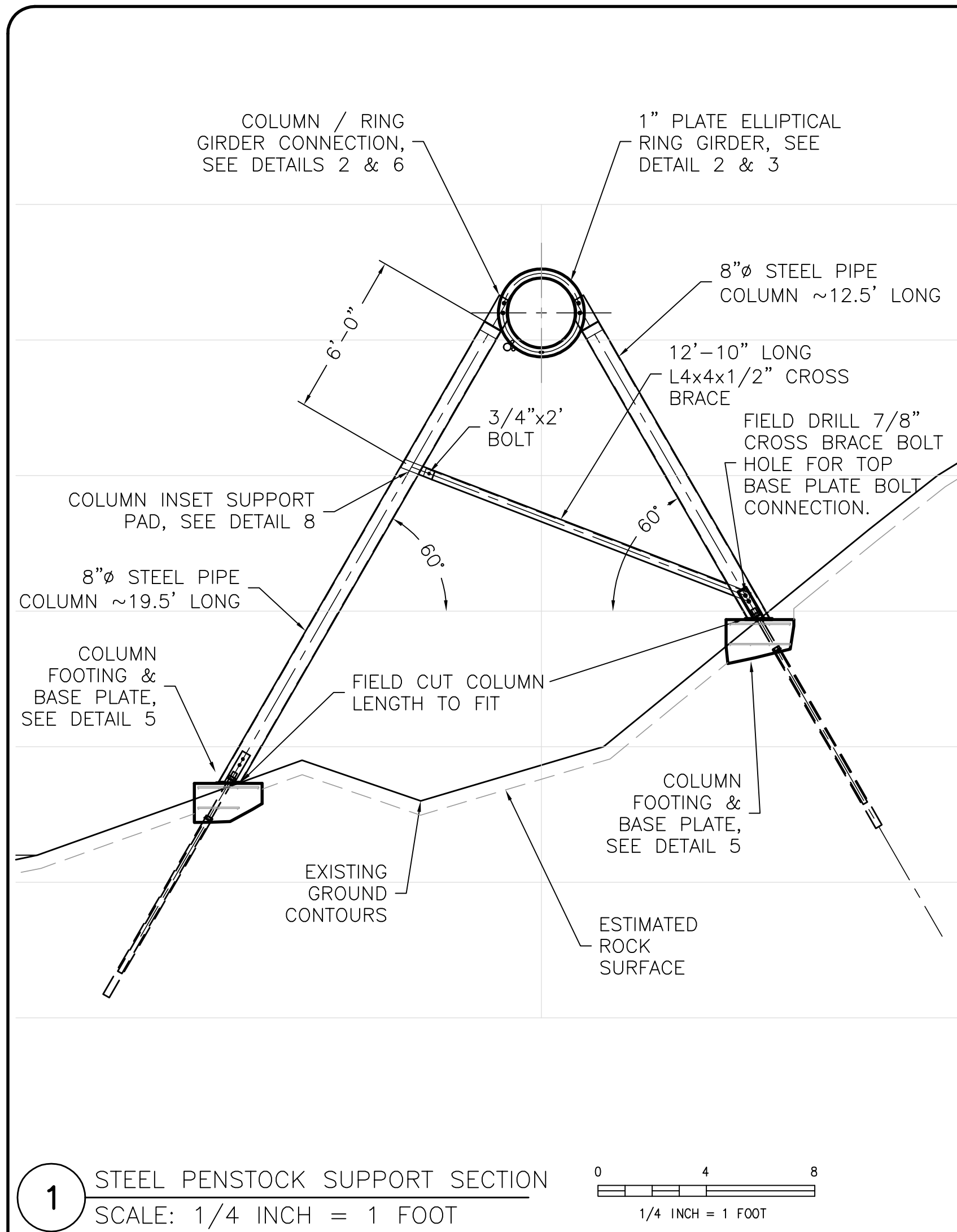
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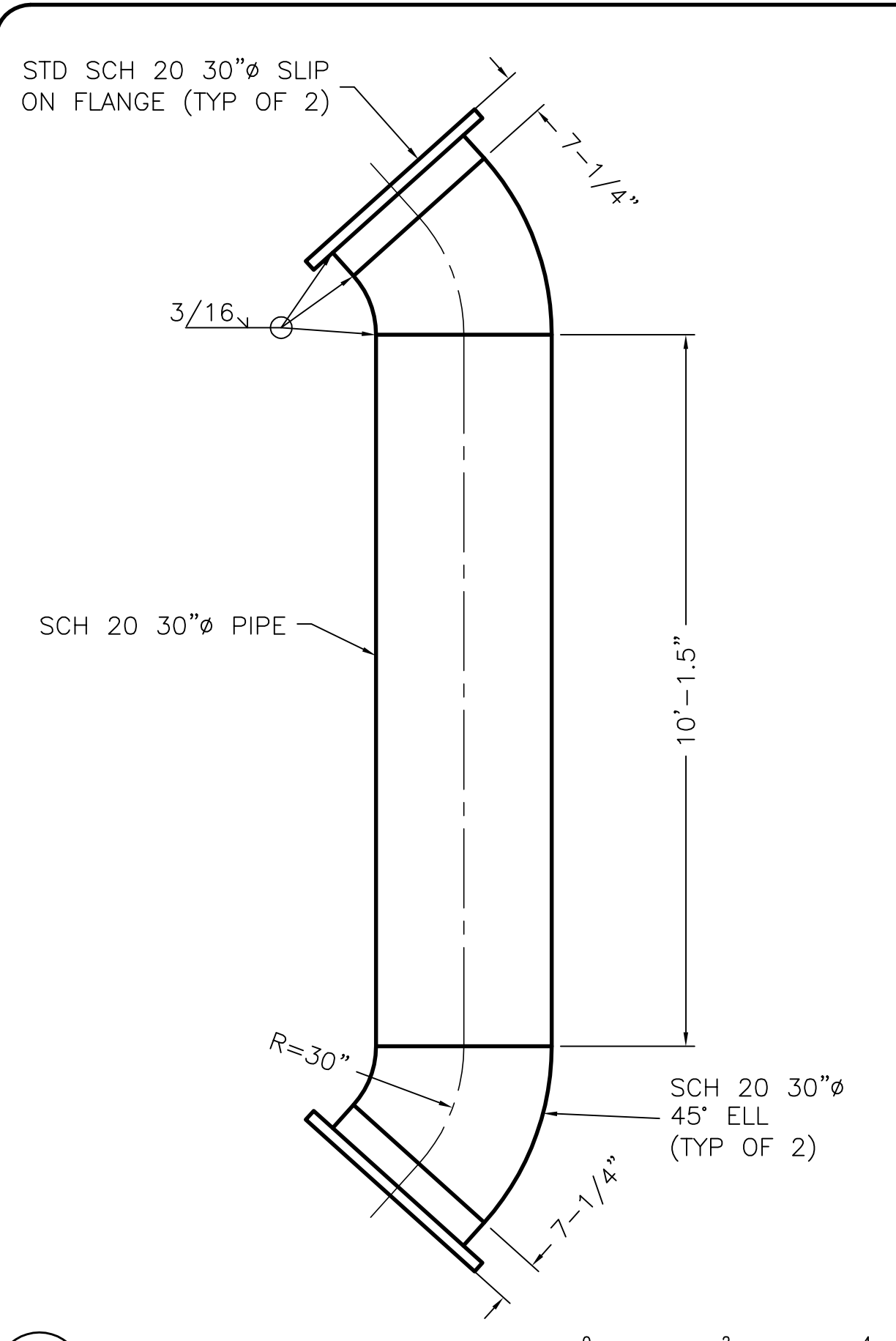
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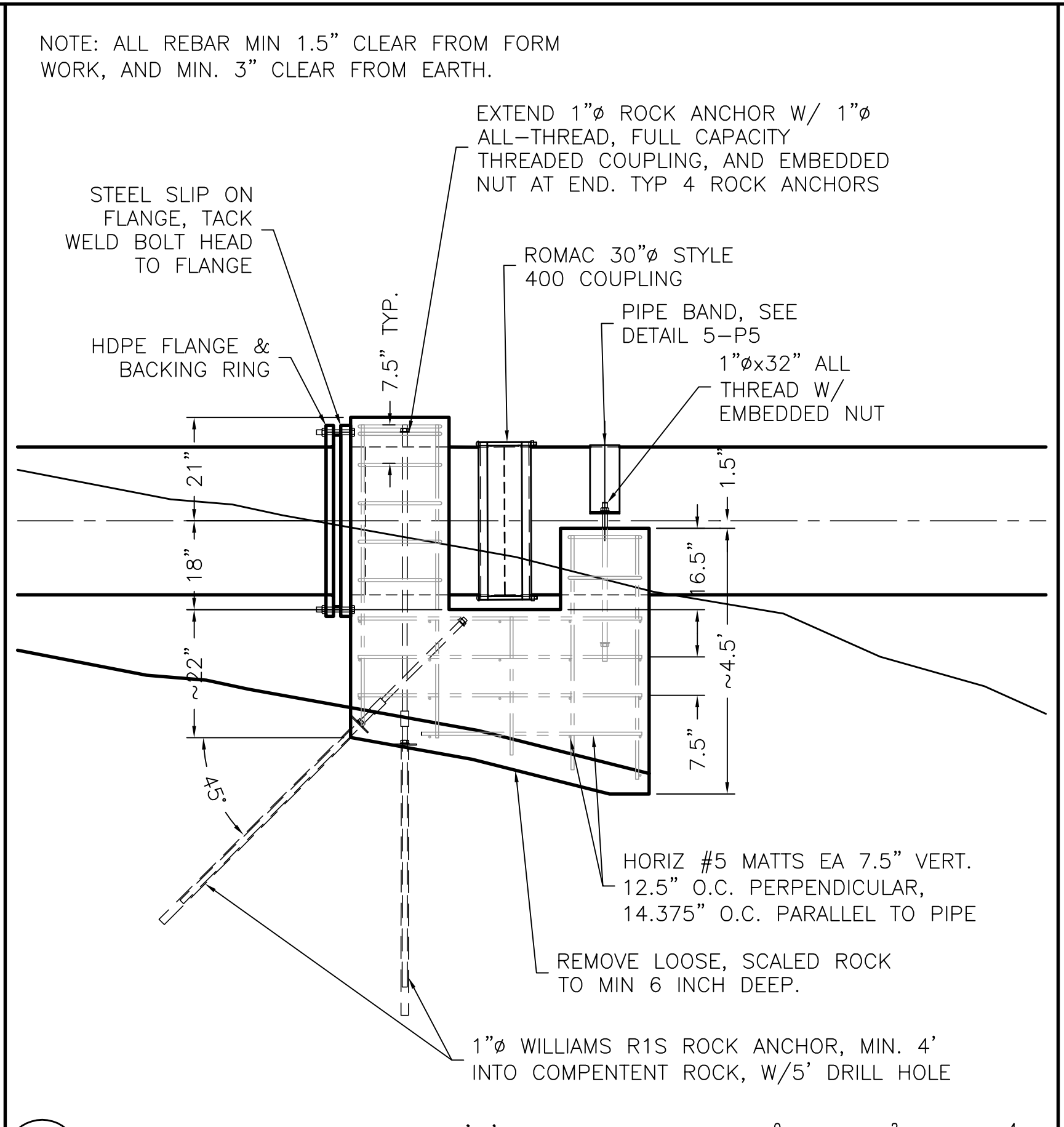
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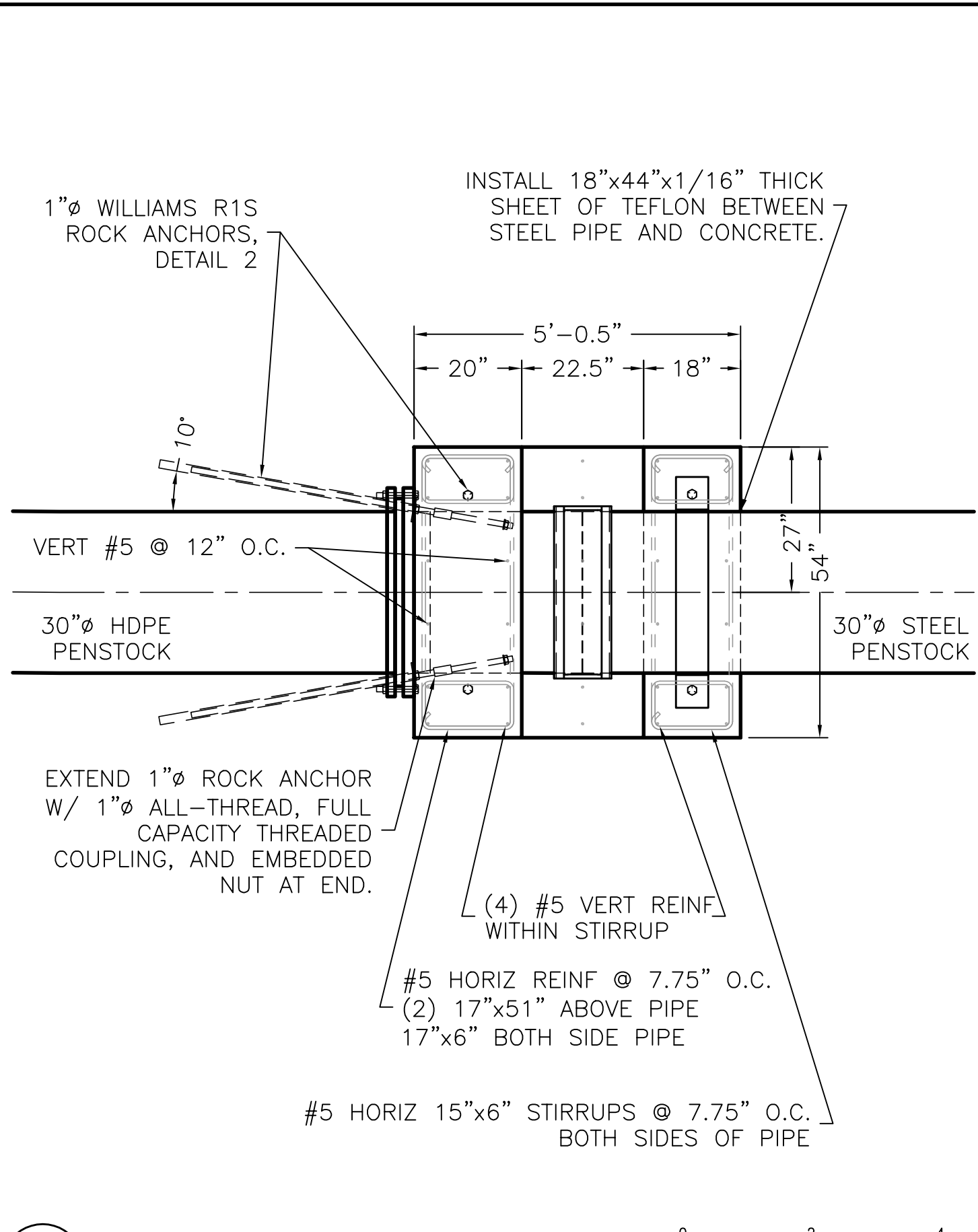
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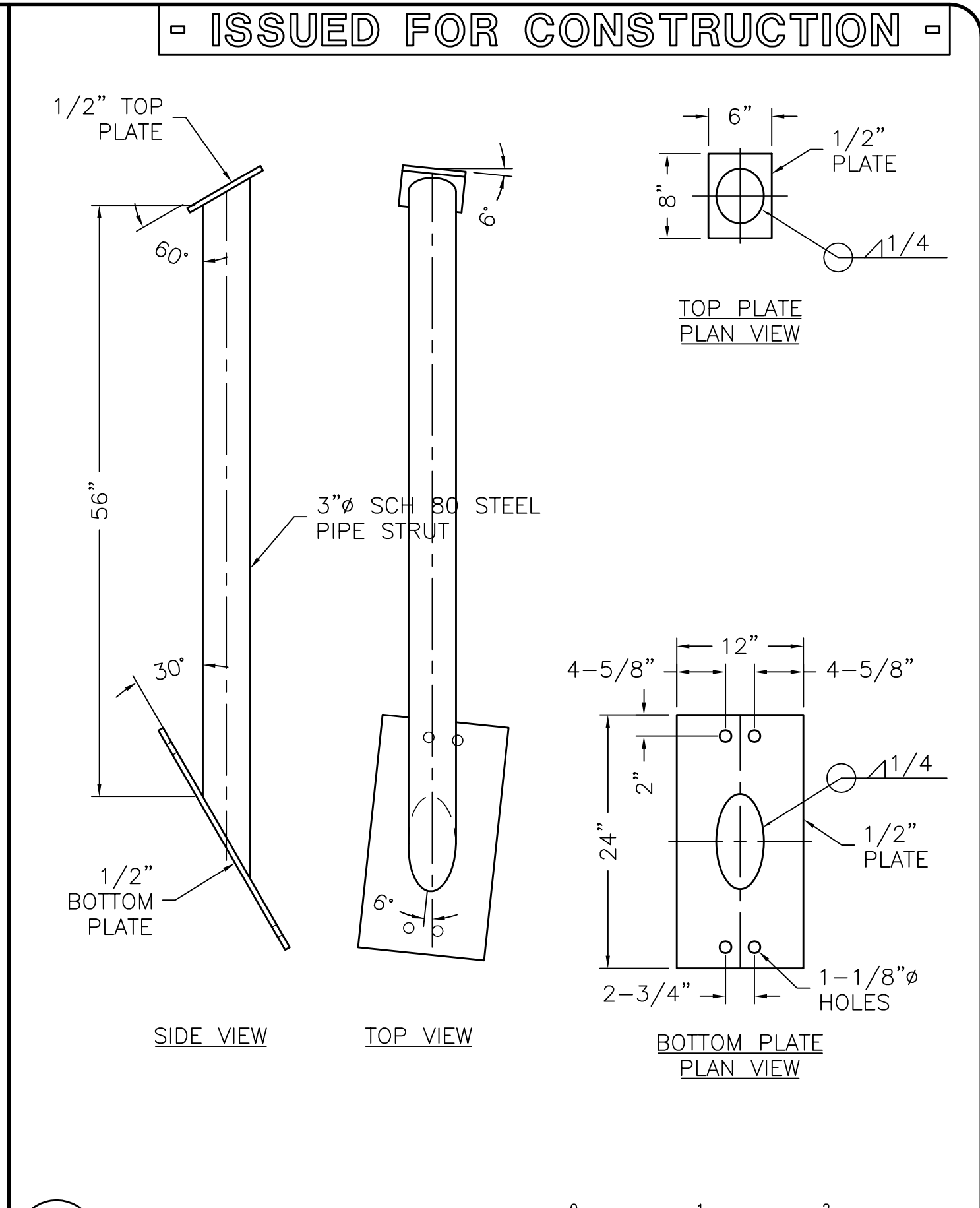
1 PENSTOCK SPOOL PIECE 2
SCALE: 1/2 INCH = 1 FOOT



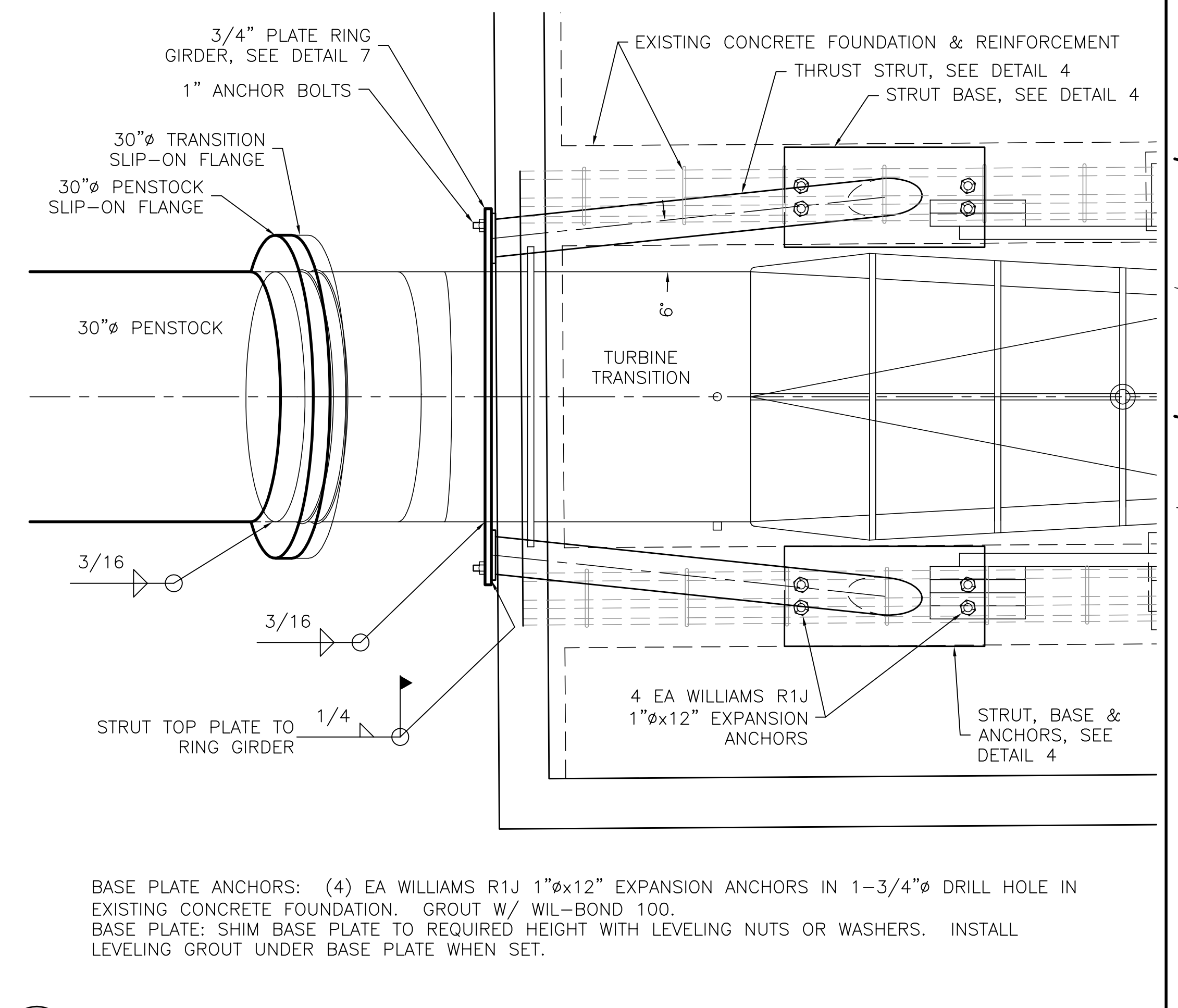
2 PENSTOCK THRUST BLOCK 'B' - ELEVATION
SCALE: 1" = 2 FEET



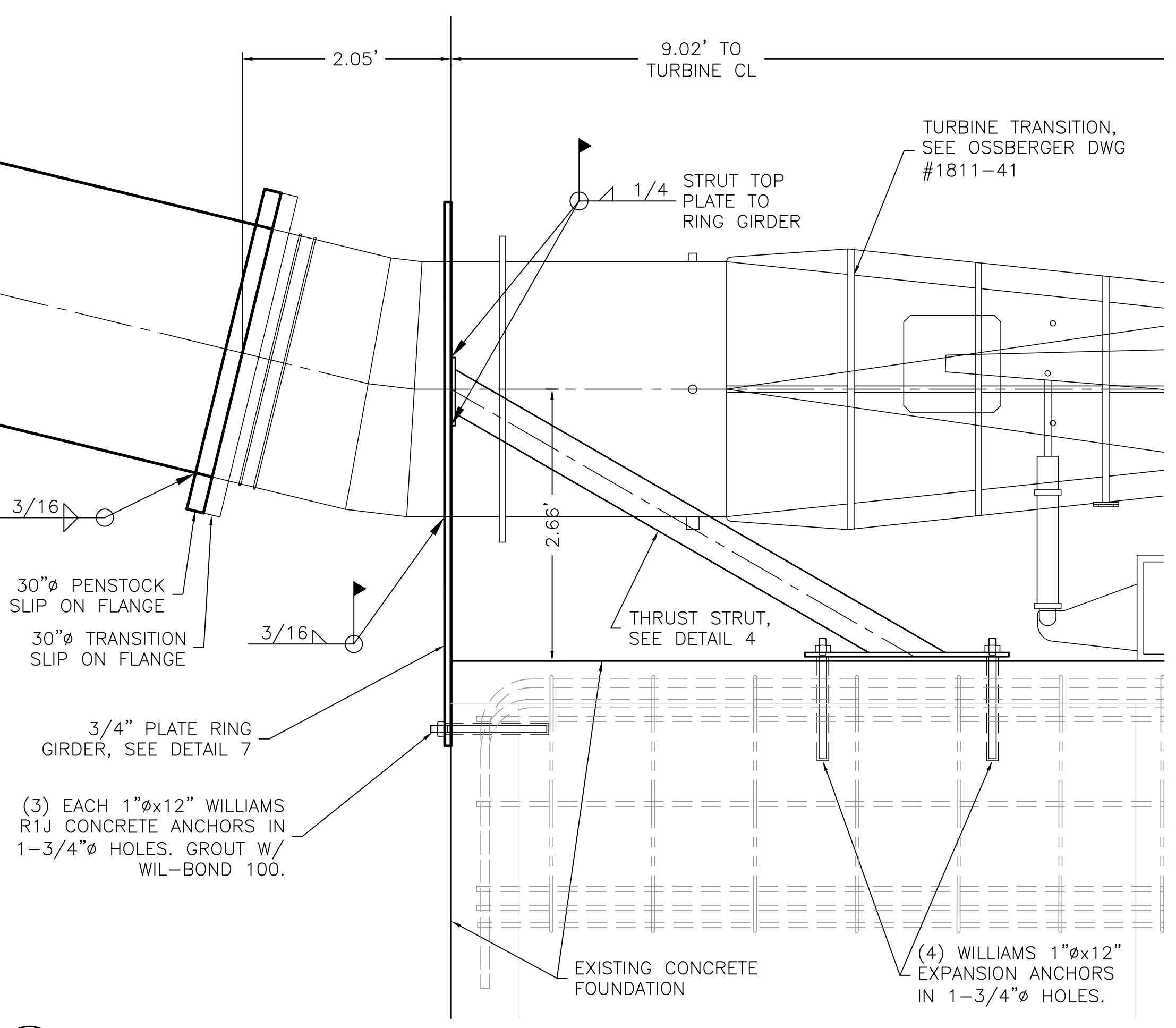
3 PENSTOCK THRUST BLOCK - PLAN
SCALE: 1" = 2 FEET



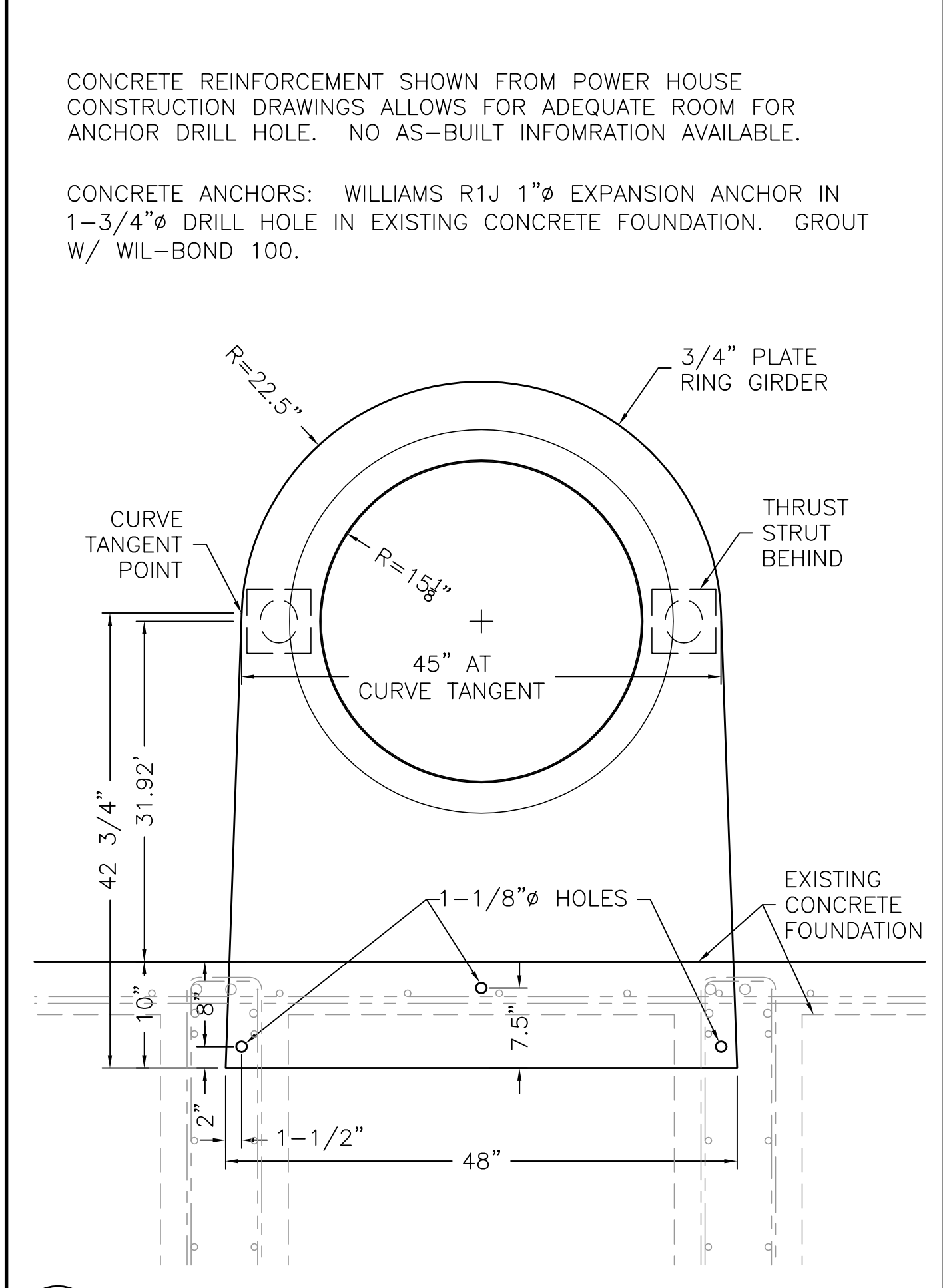
4 THRUST STRUCT DETAIL
SCALE: 1 INCH = 1 FOOT



5 PENSTOCK / TURBINE CONNECTION - PLAN
SCALE: 1 INCH = 1 FOOT

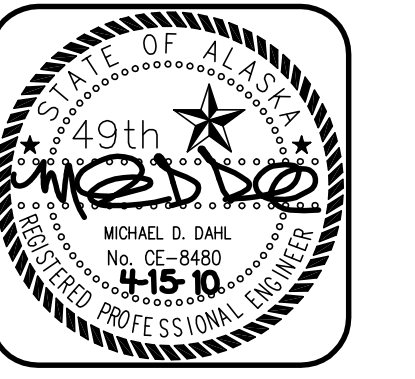


6 PENSTOCK / TURBINE CONNECTION - ELEVATION
SCALE: 1 INCH = 1 FOOT



7 RING GIRDER DETAIL
SCALE: 1 INCH = 1 FOOT

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PENSTOCK DETAILS
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GENERAL PROJECT NOTES:

1. CONSTRUCT IN ACCORDANCE WITH THE MOST RECENTLY ADOPTED EDITIONS OF THE IPC, IBC, IMC, NESC, ADA, LOCAL UTILITIES, STATE AND MUNICIPAL CODES AND GOOD PRACTICE. OBSERVE O.S.H.A. REQUIREMENTS DURING CONSTRUCTION.
2. PROVIDE ALL LABOR BY WORKERS SKILLED AND REGULARLY EMPLOYED AT THE APPROPRIATE TRADE.
3. PROVIDE TEMPORARY BRACING FOR FORMS AND EQUIPMENT UNTIL CONCRETE OR SUPPORTS ARE SET. PLACE IN ACCORDANCE WITH DRAWINGS AND MANUFACTURERS INSTRUCTIONS.
4. RESTORE TO PRECONTRACT CONDITION ANY PUBLIC OR PRIVATE LAND DISTURBED BY CONTRACT ACTIVITY. THIS SHALL INCLUDE ANY RESEEDING OR REVEGETATION OF EXISTING HORTICULTURE.
5. WHERE EQUIPMENT OR MATERIALS ARE NOTED ON THESE DRAWINGS AS A MANUFACTURER AND MODEL NUMBER, OTHER MANUFACTURERS PRODUCTS THAT ARE EQUAL OR BETTER MAY BE SUBSTITUTED UPON APPROVAL BY THE ENGINEER.
6. CONTRACTOR SHALL VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL CONSTRUCTION IN THE FIELD, AND RECORD ANY CHANGES. SUPPLY ONE SET OF RED LINED RECORD DRAWINGS TO THE ENGINEER AFTER PROJECT CONSTRUCTION COMPLETED FOR PREPARATION OF PROJECT AS-BUILT DRAWINGS.
7. WHERE SUBMITTALS ARE REQUIRED, SUBMIT 3 COPIES TO ENGINEER FOR REVIEW AND APPROVAL.
8. SET POWERHOUSE PIPE CONNECTION ACCURATELY, IN ALIGNMENT AND WHERE SHOWN, PLUMB, LEVEL, FREE OF RACK AND TWIST, AND SET PARALLEL OR PERPENDICULAR AS REQUIRED TO LINE AND PLANE OF SURFACE. ELEVATION TOLERANCE = 1/16" AT POWERHOUSE PIPE CONNECTION.
9. ALIGNMENT FOR ELECTRICAL CONDUIT FROM POWERHOUSE TO DAM SHOWN ON PLAN AND PROFILE SHEETS. 1/2" DIAMETER HOLES PROVIDED IN RING GIRDER SUPPORTS FOR CONDUIT HANGERS. SPAN BETWEEN RING GIRDERS IS 13'+.

MATERIALS:

1. EXPANSION JOINT SHALL BE ROMAC STYLE 400 STEEL COUPLING MODEL NUMBER 400-30.00-1 WITH ROMACOTE FUSINO BONDED EPOXY COATING WITH STAINLESS STEEL NUTS, BOLTS AND WASHERS.
2. AIR VENT - VACUUM RELIEF VALVE SHALL BE 4 INCH DIAMETER WATERMAN MODEL CR-101.

EARTHWORK:

ELEVATION OF ROCK SURFACE SHOWN ON DRAWINGS WAS OBTAINED DURING GEOTECH INVESTIGATION; BOREHOLES INTO ROCK WERE NOT MADE FOR THE DESIGN OF THIS PROJECT. CUT AND FILL SLOPES SHOWN ARE ASSUMED APPROPRIATE FOR THE SITE CONDITIONS AND MATERIALS AVAILABLE FOR CONSTRUCTION. CONTRACTOR SHALL VERIFY SOIL AND ROCK CONDITIONS TO DETERMINE ADEQUACY OF CUT AND FILL SLOPES SHOWN ON THE PLANS AND FOR PURPOSES OF DAM CONSTRUCTION AND PERFORMANCE. NOTIFY THE ENGINEER IF SIGNIFICANT CHANGES TO THE CUT OR FILL ARE REQUIRED DUE TO SOFT OR LOOSE MATERIAL ENCOUNTERED IN THE EXCAVATIONS.

VERTICAL ROCK FACES ARE ACCEPTABLE WHERE GEOLOGY CAN SUPPORT AND OVERBURDEN AT THE TOP OF THE CUT IS STABILIZED. STEEPER FILL SLOPES UP TO 1:1 WILL BE ALLOWED IF SUITABLE ROCK, OR OTHER MEANS, IS AVAILABLE FOR FILL STABILIZATION AND EROSION CONTROL.

CLEAR AND REMOVE ORGANIC OVERBURDEN FROM THE PENSTOCK THRUST BLOCK PRIOR TO PROCEEDING WITH ROCK EXCAVATION AND ROCK ANCHOR INSTALLATION.

EXCAVATE LOOSE ROCK FOR CONCRETE THRUST BLOCK AND PIPE SUPPORT BASES TO COMPETENT ROCK. ENGINEER TO VERIFY ROCK QUALITY PRIOR TO CONCRETE CONSTRUCTION. CONSTRUCT CONCRETE FOOTING AS SHOWN ON THE DRAWINGS IN ACCORDANCE WITH "CONCRETE" SECTION OF THIS SPECIFICATION.

STOCKPILE ADEQUATE TOPSOIL AND ORGANIC MATERIAL FOR USE IN REVEGETATION OF DISTURBED AREAS AFTER COMPLETION OF EXCAVATION IF REQUIRED.

DISPOSE OF EXCESS EXCAVATION MATERIAL ALONG THE PENSTOCK ALIGNMENT TO COVER PIPE, OR IN AREA APPROVED BY THE OWNER OUTSIDE THE FOOTPRINT OF THE PROPOSED PROJECT.

DEVELOP A PLAN TO LIMIT EROSION AND TRANSPORT OF MATERIAL, INCLUDING WIND BLOWN DEBRIS, INCLUDING BUT NOT LIMITED TO, EROSION FENCING AND BARRIERS AND FILTRATION OR IMPOUND AND SETTLEMENT FACILITIES AS NEEDED. FOLLOW USF&W REQUIREMENTS IN USACOE PERMIT FOR THIS PROJECT.

IN THE EVENT ANY CONTAMINATED SOILS ARE DISCOVERED DURING EXCAVATION, THE CONTRACTOR SHALL DISPOSE OF IN ACCORDANCE WITH STATE OF ALASKA REGULATIONS AND BACK FILL WITH NEW BACKFILL MATERIAL SPECIFIED ABOVE.

PENSTOCK CONSTRUCTION:

DURING LOADING, TRANSPORTATION AND UNLOADING OF PIPE, EVERY PRECAUTION SHALL BE TAKEN TO PREVENT INJURY TO THE PIPE. NO PIPE SHALL BE DROPPED FROM TRUCKS, OR ALLOWED TO ROLL DOWN SLIDES WITHOUT PROPER RETAINING ROPES. DURING TRANSPORT EACH PIPE SHALL REST ON SUITABLE PADS, STRIP, SKIDS OR BLOCKS SECURELY WEDGE OR TIED IN PLACE. INTERNAL PIPE BRACING SHALL BE INSTALLED WHERE RECOMMENDED BY PIPE MANUFACTURER. ANY DAMAGED PIPE SHALL BE REPLACED.

FUSION OF HDPE PIPE AND FITTINGS: SECTIONS OF POLYETHYLENE PIPE SHALL BE JOINED INTO CONTINUOUS LENGTHS ON THE JOBSITE ABOVE GROUND. JOING SHALL BE DONE BY THE THERMAL BUTT FUSION METHOD AND SHALL BE PERFORMED IN ACCORDANCE WITH PROCEDURES ESTABLISHED BY THE PIPE MANUFACTURER. BUTT FUSION EQUIPMENT USED IN THE JOINING PROCEDURES SHOULD BE CAPABLE OF MEETING ALL CONDITIONS RECOMMENDED BY THE PIPE MANUFACTURER. FUSION PRESSURES, TEMPERATURES AND CYCLE TIMES SHALL BE ACCORDING TO PIPE MANUFACTURERS RECOMMENDATIONS.

PERSONNEL CONDUCTING BUTT FUSION JOINING SHALL BE TRAINED AND CERTIFIED IN BUTT FUSION OF HDPE PIPE.

WELDING OF STEEL PIPE AND FITTING SHALL BE DONE IN ACCORDANCE WITH SPECIFICAITON SECTION "STRUCTURAL STEEL."

INSPECT PIPE FOR DEFECTS BEFORE INSTALLATION AND FUSION OR WELDING. DEFECTIVE, DAMAGED OR UNSOUND PIPE WILL BE REJECTED.

CUT PIPE TRUE AND SQUARE IN A NEAT AND WORKMANLIKE MANNER WITHOUT DAMAGE TO THE PIPE. MARK PIPE OR USE TEMPLATE IF REQUIRED TO MAKE TRUE AND SQUARE CUT ALIGNMENT.

INTALL PENSTOCK IN ALIGNMENT AND GRADE SHOWN ON THE DRAWINGS. ALIGNMENT AND GRADE MAY BE ALTERED TO MEET SITE CONDITIONS AND MAINTAIN MINIMUM PENSTOCK GRADE OF 2 PERCENT. NO NEGATIVE PENSTOCK GRADE OR GRADE LESS THAN 2 PECTENT ALLOWED.

THE FULL LENGTH OF EACH SECTION OF PIPE SHALL REST SOLIDLY UPON THE PIPE BED WITH RECESSES EXCAVATED TO ACCOMMODATE COUPLINGS AND ANCHORS. PIPE SHALL NOT BE LAID IN WATER OR WHEN TRENCH/BEDDING CONDITIONS ARE UNSUITABLE FOR THE WORK.

WHEN WORK IS NOT IN PROGRESS, OPEN ENDS OF PIPE, FITTING AND VALVES SHALL BE SECURELY CLOSED SO THAT NO EARTH, TRENCH WATER, OR OTHER SUBSTANCES WILL ENTER THE PIPES OR FITTINGS. PIPE ENDS LEFT FOR FUTURE CONNECTIONS SHALL BE VALVED, PLUGGED, OR CAPPED.

CORRECT AND REPAIR ANY SETTLEMENT OF FILL OR BACKFILL PRIOR TO INSTALLATION OF PENSTOCK.

HDPE FLANGE ASSEMBLIES SHALL BE CONNECTED AND ALL BOLTS DRAWN UP EVENLY AND IN-LINE USING PROCEDURES RECOMMENDED BY THE PIPE MANUFACTURER.

HDPE PIPE AND FITTINGS:

HDPE PIPE SHALL BE MANUFACTURED FROM A PE 4710 RESIN LISTED WITH THE PLASTIC PIPE INSTITUE (PPI) AS TR-4. THE RESIN MATERIAL WILL MEET THE SPECIFICATIONS OF ASTM D3350 WITH A CELL CALSSIFICAITON OF 445574C/E. PIPE SHALL BE FORMULATED WITH CARBON BLACK AND/OR ULTRAVIOLET STABILIZER FOR MAXIMUM PROTECTION AGAINST UV RAYS. PIPE SHALL HAVE A MANUFACTURING STANDARD OF ASTM F714. PIPE SHALL CONTAIN NO RECYCLED COMPOUNDS EXCEPT THAT GENERATED IN THE MANUFACTURER'S OWN PLANT FROM RESIN OF THE SAME SPECIFICATION FROM THE SAME RAW MATERIAL.

PIPE SHALL BE DR32.5 (64 PSI WATER RATING).

PIPE SHALL BE MARKED ACCORDING TO ASTM F-714 AND AT A MINIMUM SHALL BE MARKED AT 5 FOOT INTERVALS WITH PIPE MANUFACTURER, NOMINAL PIPE SIZE, MATERIAL DESIGNATION, MANUFACTURERING STANDARD REFERENCE, DIMENSION RATIO OR PRESSURE RATING, AND PRODUCTION CODE FROM WHICH DATE AND PLACE OF MANUFACTURER CAN BE DETERMINED.

BUTT FUSION FITTINGS SHALL BE THE SAME RESIN MATERIAL AND SPICIFICATION AS HDPE PIPE. BUTT FUSION FITTING SHALL MEET THE MANUFACTURING SPECIFICATIONS OF ASTM D3261. MOLDED AND FABRICATED FITTINGS SHALL HAVE THE SAME PRESSURE RATING AS THE PIPE. FABRICATED FITTINGS ARE TO BE MANUFACTURED USING A DATA LOGGER. TEMPERATURE, FUSION PRESSURE AND A GRAPHIC REPRESENTATION OF THE FUSION CYCLE SHALL BE PART OF THE QUALITY CONTROL RECORDS.

FITTINGS SHALL BE MARKED BY PRINTING OR OTHER INDELIBLE MARKING ACCORDING TO ASTM D 3261 WITH NAME OF PIPE MANUFACTURER, NOMINAL PIPE SIZE, MATERIAL DESIGNATION, MANUFACTURING STANDARD REFERENCE, DIMENSION RATIO OR PRESSURE RATING, AND PRODUCTION CODE FROM WHICH DATE AND PLACE OF MANUFACTURER CAN BE DETERMINED.

MECHANICAL CONNECTION OF HDPE PIPE SHALL BE BY MEANS OF A SUITABLE FLANGE ASSEMBLY. FLANGE ASSEMBLY SHALL CONSIST OF A MOLDED POLYETHYLENE STUB END MADE OF THE SAME RESIN AS THE PIPE RESIN MATERIAL AS THE PIPE MATERIAL AND A BACKUP FLANGE OF STAINLESS STEEL MADE TO CLASS 150, ANSI B16.5 DIMENSION STANDARDS, RUBBER GASKET, AND CONNECTED WITH GALVANIZED STEEL BOLTS OF CORRECT SIZE AND STRENGTH FOR THE FLANGE.

STRUCTURAL STEEL:

SEE "STRUCTURAL STEEL" SPECIFICATION SECTION ON SHEET D-6.

STEEL PENSTOCK PIPE SECTION SHALL BE 30 INCH DIAMETER ATSM A53 GRADE B WITH A WALL THICKNESS OF 1/4-INCH.

ALL PIPE, STEEL SHAPES AND FABRICATED ASSEMBLIES SHALL BE COATED IN ACCORDANCE WITH "STEEL COATINGS" SPECIFICATION SECTION.

SUBMIT SHOP DRAWINGS OF FABRICATED RING GIRDER, PENSTOCK SUPPORT COLUMNS AND BASES, PENSTOCK TRANSITION RING GIRDER AND STRUTS AND OTHER STEEL SHOP FABRICATED ASSEMBLIES TO ENGINEER FOR APPROVAL.

INSTALL ANCHORING DEVICES AND FASTENERS AS SHOWN AND AS NECESSARY FOR SECURING METAL FABRICATIONS TO THE POWERHOUSE AS SPECIFIED.

STEEL COATINGS:

PENSTOCK 30-INCH DIAMETER PIPE SHALL BE COATED INTERNALLY AND EXTERNALLY WITH POLYURETHANED COATING IN ACCORDANCE WITH AWWA C222. COATING THICKNESS SHALL BE A MINIMUM OF 25 MILS.

ALL OTHER STEEL PIPE, SHAPES AND FABRICATED ASSEMBLIES SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123, G90.

PREPARE ALL WELDED MATERIALS TO BE COATED BY BLASTING OR GRINDING TO A SP-10 FINISH, AND CLEAN TO REMOVE ALL DUST, WATER AND OILS PRIOR TO INSTALLATION OF HOT DIP GALVANIZING COATING.

REPAIR PENSTOCK EXTERIOR POLYURETHANE COATED DAMAGED SURFACES, FIELD WELDED JOINTS AND CUT MEMBERS WITH COLD APPLIED TAPE CONFORMING TO AWWA C209. THE COLD TAPE SHALL CONSIST OF TWO WRAPS OF 35 MIL TAPE FOR A TOTAL THICKNESS OF 70 MILS.

REPAIR DAMAGED GALVANIZED SURFACES, ALL FIELD WELDED JOINTS AND CUT MEMBERS WITH GALVILITE COLD GALVANIZING COMPOUND. WIRE BRUSH SURFACE TO BE COATED TO REMOVE ALL LOOSE MATERIAL, SCALE AND WASH CLEAN. APPLY 3 COATS OF MINIMUM 1.5 MILS DRY FILM THICKNESS PER COAT.

CONCRETE:

SEE "CONCRETE" SPECIFICATION SECTION ON SHEET D-6.

CONCRETE REINFORCING:

SEE "CONCRETE REINFORCING" SPECIFICATION SECTION ON SHEET D-6.

CONCRETE ANCHORS:

CONCRETE ANCHORS SHALL BE WILLIAMS R1J SPIN-LOCK CONCRETE ANCHORS WITH 60 KSI YIELD STRENGTH OR APPROVED EQUAL.

INSTALL IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. GROUT ANNULUS WITH WIL-BOND EPOXY GROUT, OR EQUAL, AFTER BOLT INSTALLATION.

GROUT:

GROUT SHALL BE PREMIXED, NONMETALLIC, NONCORROSIVE, NONSTAINING GROUT CONTAINING SELECTED SILICA SANDS, PORTLAND CEMENT, SHRINKAGE-COMPENSATING AGENTS, PLASTICIZING AND WATER-REDUCING AGENTS, COMPLYING WITH ASTM C1107, WITH FLUID CONSISTENCY AND A 30 MINUTE WORKING TIME.

ROCK ANCHORS:

PENSTOCK THRUST BLOCK AND PENSTOCK COLUMN BASE ROCK ANCHORS SHALL BE WILLIAMS R1S HOLLOW CORE SPIN LOCK DEFORMED BARS OF THE DIAMETER AND LENGTH INDICATED, OR APPROVED EQUAL UNLESS OTHERWISE INDICATED.

PENSTOCK ROCK ANCHORS SHALL BE CHANCE 1-INCH DIAMETER EXPANDING ROCK ANCHORS, CAATALOG NUMBER R196L, OR APPROVED EQUAL UNLESS OTHERWISE INDICATED.

ALL ROCK ANCHORS AND BOLTS SHALL BE INSTALLED IN COMPETENT ROCK IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. ENGINEER SHALL DETERMINE SUITABILITY OF BEDROCK.

WILLIAMS ROCK ANCHOR TESTING: TEST ONE OF EACH PAIR, AND ALL SINGLE, ROCK ANCHORS TO THE REQUIRED TENSION INDICATED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. FAILED ANCHORS SHALL BE REPLACED. WILLIAMS ROCK ANCHORS INSTALLED FOR THE PENSTOCK SUPPORT BASE AND THRUST BLOCK SHALL BE FULLY GROUTED IN PLACE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

CHANCE PENSTOCK ROCK ANCHOR TESTING: TEST FIRST TWO CHANCE ROCK PENSTOCK ANCHORS TO THE REQUIRED TENSION INDICATED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. IF INITIAL TESTS MEET REQUIRED TENSION, TEST EVERY FIFTH ANCHOR. FAILED ANCHORS SHALL BE REPLACED, AND ALL REMAINING ANCHORS TESTED.

SOIL ANCHORS:

ALL SOIL ANCHORS SHALL BE CHANCE PISA HELIX ASSEMBLIES, STANDARD STRENGTH SERIES, WITH 8-INCH AND 10-INCH TWIN HELIX, PART NUMBER P012904 AND P12905, WITH 1-INCH TORQUE ROD EXTENSION AND COUPLING AND EYENUT OR APPROVED EQUAL UNLESS OTHERWISE INDICATED.

ALL SCREW ANCHORS SHALL BE INSTALLED ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

TESTING: FIRST TWO SCREW ANCHOR INSTALLATIONS IN EACH SOIL TYPE SHALL BE TESTED TO THE REQUIRED TENSION INDICATED ON THE DESIGN DRAWINGS. IF INITIAL INSTALLATIONS PASS, TEST EVERY FOURTH SUBSEQUENT ANCHOR. IF EITHER INITIAL INSTALLATION OR SUBSEQUENT TEST FAILS, REPOSITION ANCHOR AND RETEST ALL SUBSEQUENT ANCHORS.

CABLE AND ENDS:

ANCHOR CABLES SHALL BE 1/2" GALVANIZED UTILITY GRADE STEEL CABLE WITH ULTIMATE TENSILE STRESS OF 25,000 POUNDS.

CABLE TERMINATIONS SHALL BE 1/2" "BIG-GRIP DEAD-END" AS MANUFACTURED BY PERFORMED LINE PRODUCTS, WITH HEAVY DUTY WIRE ROPE THIMBLES.

BOLTS AND NUTS:

BOLTS SHALL CONFORM TO ASTM A490 WITH HEAVY HEX NUTS AND WASHERS. ALL NUTS, WASHERS AND BOLTS SHALL BE HOT DIPPED GALVANIZED.

STAINLESS STEEL BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A598 WHERE STAINLESS STEEL CALLED FOR.

PROTECTION:

INSULATE ALUMINUM SURFACES THAT WILL COME IN CONTACT WITH CONCRETE OR METAL BY GIVING A COAT OF HEAVY-BODIED ALKALI RESISTING BITUMINOUS PAINT OR OTHER APPROVED PAINT IN THE SHOP.

CLEANING AND DISINFECTION:

REMOVE ALL EXCESS MATERIALS AND DEBRIS FROM AREA.

CLEAN INTERIOR OF PENSTOCK OF ALL TRASH, DEBRIS, SHAVINGS AND WELDING RESIDUE.

REVEGETATE DISTURBED ORGANIC AREAS IN ACCORDANCE WITH EARTHWORK SPECIFICATION.

HYDROSTATIC TESTING:

BACKFILL PENSTOCK WHERE REQUIRED TO CENTERLINE OF PIPE LEAVING JOINTS EXPOSED.

PRIOR TO HYDROSTATIC TEST ALL JOINT RESTRAINTS SHALL BE COMPLETELY INSTALLED AND INSPECTED.

IF PENSTOCK IS TESTED IN SECTIONS, AND AT TEMPORARY CAPS AT CONNECTION TO POWER HOUSE, CONTRACTOR SHALL PROVIDE AND INSTALL ALL REQUIRED TEMPORARY THRUST RESTRAINTS REQUIRED TO SAFELY CONDUCT THE TEST.

FILL PENSTOCK WITH WATER AND BLEED ALL AIR FROM SYSTEM. ALLOW WATER TO STABILIZE FOR 12 HOURS. VISUALLY INSPECT ALINGMENT FOR VISIBLE LEAKS.

PERFORM PRESSURE AND LEAKAGE TEST FOR TWO (2) HOURS AT 64 PSI. 1.25 TIMES THE OPERATING PRESSURE.

LEAKAGE SHALL NOT EXCEED THE FOLLOWING REQUIREMENTS.

1. STEEL PIPE: NO LEAKS.
2. HDPE PIPE: NO LEAKS. PRESSURE DROP IN ACCORDANCE WITH PIPE MANUFACTURERS RECOMMENDATIONS.



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NO.	DATE	REVISIONS

PENSTOCK SPECIFICATIONS
 Project
CHUNISAX CREEK HYDROELECTRIC PROJECT
 EDA AWARD # 07-01-06108
 Atka, Alaska

DATE:	4/15/10
DESIGNED:	MDD
DRAWN:	MD
CHECKED:	EA
SCALE:	AS NOTED
FILE:	MAINDAM

Sheet
P-8
 OF 8

- ISSUED FOR CONSTRUCTION -