

WEIR/CONDUIT INVENTORY - GYPSUM STACK AND GYPSUM STACK STILLING POND

Pipe	Drawing No.	Rev. Date	Action	Pipe Description	Survey Point	Easting (X)	Northing (Y)	Approximate Elevation (Z)	Influent/Effluent
1	10W215-01	7/23/1991	No further action - active outfall to 008		0201	527225.87	1600784.38	621	Influent
2	10W325-2	6/9/2006	Active slurry pipe. Should be staked per points provided	per James Catlett - utilized as a culvert	0202	527027.43	1600674.47	615	Effluent
3	10E7416-2	7/19/2001	Should be found and staked per points provided - to be grouted	Not found in field	0301	528423.74	1602023.40	628	Influent
4	10E7416-2	7/19/2001	Should be found and staked per points provided - to be grouted	Outlet observed on the dike in the field	0302	528626.35	1602043.26	628	Effluent
5	observed in field	N/A	"Active spillway conduit" from Pond 3. Buried section should be staked and inlet structure should be located so not to damage- extension work plan	36" dia. HDPE, above ground for 50-70 feet up the hill.	0401	528407.16	1602193.95	628	Influent
6	10W7420	11/5/1984	Per Mr. Catlett, pipe was removed		0402	528620.64	1602190.24	628	Effluent
7	10W7420	11/5/1984	Per Mr. Catlett, pipe was removed		0501	527149.85	1602059.32	669	Rim - Digitized Inlet
8	10E7416-1	9/8/1995	Active, located on internal starter dike, surveyed during dike repair	24" metal pipe	4100	526982.95	1601881.11	633	PVC1
9	10E7416-1	9/8/1995	Active, located on internal starter dike, surveyed during dike repair	24" metal pipe	4101	527021.91	1601923.91	656	PVC1
10	10E7416-1	9/8/1995	Shown in plans, no elevation found, should be staked per points provided, should be grouted	Not found in field	4102	527029.66	1601934.31	656	PVC1
11	10E7416-2	7/19/2001	Decant Pipe that failed. Grouted on 1/14/09, Planned drill locations requires stake at Point 1101		1872	527053.43	1601329.64	654	Influent
12	10E7416-2	7/19/2001	Active spillway conduit 6" underground, will abandon per Stantec recommendations - Plans to replace with HDPE	24" CMP- above ground, outlet on mid slope, changes to HDPE underground.	1873	527018.69	1601310.40	639	CL of Pipe
13	observed in field	N/A	Green pipe supporting black sluice pipes. See photo HPIM0285		1874	526902.16	1601245.96	612	Effluent
14	10E7416-2	7/19/2001	Northern half has been removed, pipe is buried -18" - Mr. Catlett planned to abandon this inactive buried conduit from Pond 3	18" dia. white PVC pipe.	1101	527042.80	1601255.66	654	Point on Bench
15	10E7416-2	7/19/2001	Old decant spillway - To be grouted - Surveyed by AJ - Should be staked	24" CMP- outlet exposed in ditch	1102	527267.95	1601304.07	615	Influent
16	10E7416-2	7/19/2001	No further action - functioning pipe from perimeter ditch to stilling pond		1103	527239.44	1601255.51	615	Brand
17	10E7416-2	7/19/2001	No further action - culvert pipe		1104	526919.44	1601255.37	613	Effluent
18	10E7416-2	7/19/2001	No further action - culvert pipe		1859	527167.09	1601026.81	651	Invert
19	10E7416-2	7/19/2001	Active sluice lines located for H. Aparicio		1857	527155.67	1601039.39	661	CL of Pipe
20	observed in field	N/A	Surface Inlet Collection Pipe. See photo HPIM0372	18" Plastic Pipe - outlet exposed in ditch	1855	527102.36	1601175.92	648	Brand
21	observed in field	N/A	Surface Inlet Collection Pipe. See photo HPIM0289	18" Plastic Pipe - outlet exposed in ditch	1867	527032.19	1601173.15	645	Effluent
22	observed in field	N/A	Surface Inlet Collection Pipe. See photo HPIM0636	18" Plastic Pipe - outlet exposed in ditch	1401	527189.87	1602147.22	669	Digitized Inlet
					4102	527029.66	1601934.31	656	Intersection
					7156	526906.15	1601846.38	616	Effluent
					1501	527063.10	1601678.93	661	Digitized Influent
					1870	527001.95	1601678.93	633	Surveyed Point
					1869	526975.13	1601656.98	620	Surveyed Point
					1901	526962.56	1601909.50	626	Influent
					1902	526962.58	1601853.45	619	Effluent
					2001	527058.88	1601617.06	640	Influent
					2002	526964.07	1601617.01	623	Effluent
					2101	527058.85	1600967.07	640	Influent
					2102	526964.25	1600967.02	623	Effluent
					2201	526936.31	1602032.86	640	Influent
					2202	526897.21	1601905.64	623	Effluent

NOTES:

- The inventory information presented is based on available Tennessee Valley Authority (TVA) project drawings and TVA field survey information collected January 9 through January 19, 2009 at the Forced Oxidation Wet Gypsum Stacking Phase 1 and 2 project.
- This inventory constitutes the first part in a three-part engineering effort to close out existing and/or abandoned buried decant spillway riser structures and associated conduits shown to penetrate the impoundment dikes. The second part of the abandonment procedure will include a records review by the TVA By-Products Division and the preparation of abandonment procedures by Stantec. The third part will consist of the implementation of an abandonment plan for the inventory of pipes which pose a threat to the integrity of the Pond.
- Topographic mapping was developed from a composite of a LiDAR survey performed by Tuck Mapping Solutions, Inc. on January 9, 2009 (post-event) and surveys performed by TVA on October 30, 2006 and January 14, 2009.
- Reference drawings for the planned/design location of conduits are provided in the table.

LEGEND

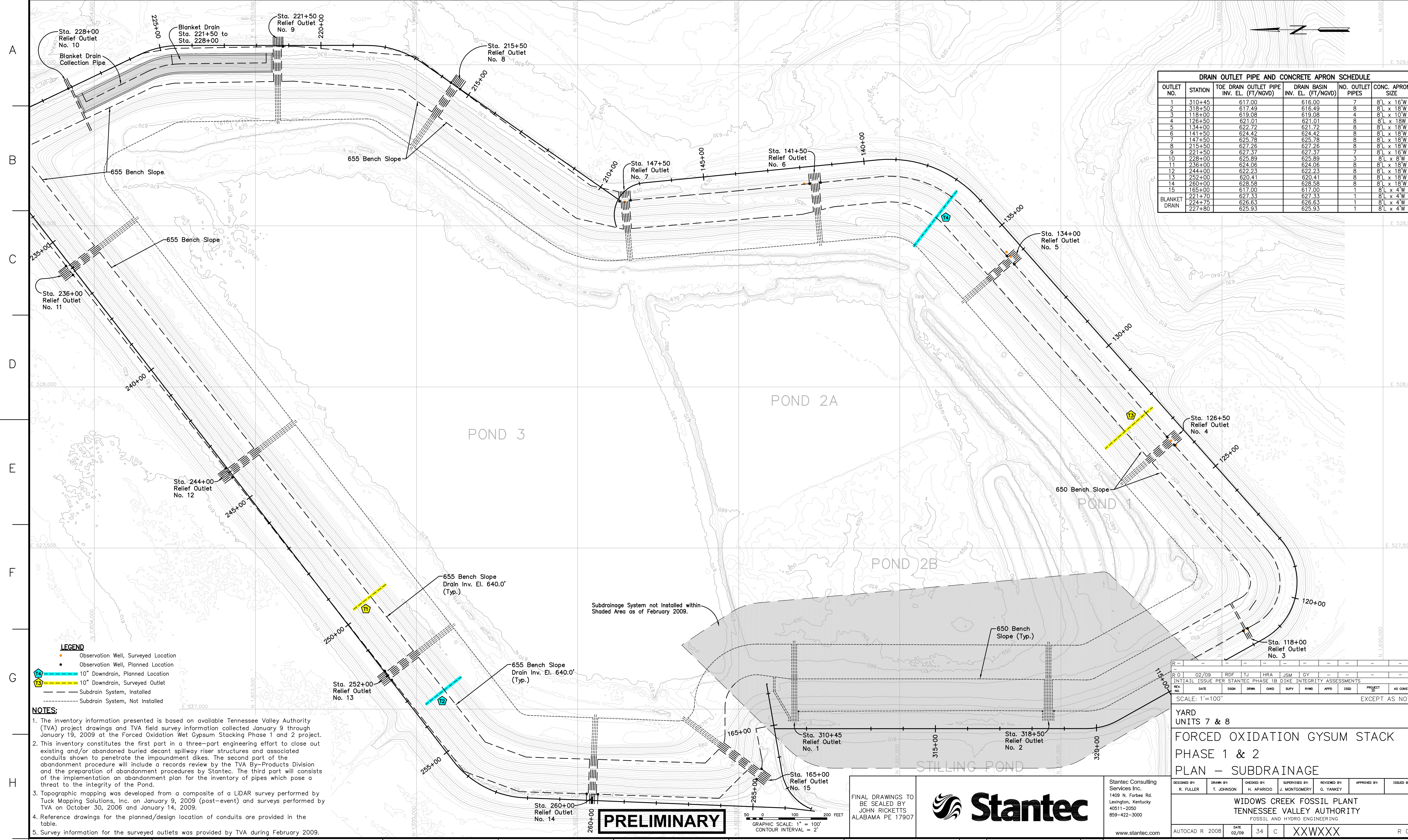
- 3 Planned Only
- 5 Surveyed - Active
- 12 Surveyed - To Be Abandoned
- 11 Closure Completed

PRELIMINARY

R -	-	-	-	-	-	-	-	-	-	-	-
R 0	03/09	RDF	TJ	HRA	JSM	GY	-	-	-	-	-
INTIAL	ISSUE	AS PER	STANTEC	PHASE 1B	DIKE	INTEGRITY	ASSESSMENTS				DISCIPLINE
REV.	NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVID	APPD	ISSD	PROJECT	AS CONST
										1746818 ENVIRONMENTAL DRAWINGS WGS PIPE INVENTORY 08118C-WF-101-P1.DWG	
SCALE: 1"=100'											
EXCEPT AS NOTED											
YARD UNITS 7 & 8											
FORCED OXIDATION GYPSUM STACK											
PHASE 1 & 2											
PLAN - WIER/CONDUIT INVENTORY											
DESIGNED BY:	R. FULLER	DRAWN BY:	T. JOHNSON	CHECKED BY:	H. APARICIO	SUPERVISED BY:	J. MONTGOMERY	REVIEWED BY:	G. YANKEE	APPROVED BY:	
WIDOWS CREEK FOSSIL PLANT											
TENNESSEE VALLEY AUTHORITY											
FOSSIL AND HYDRO ENGINEERING											
AUTOCAD R 2008	DATE	03/09	34	C	XXWXXX	R 0					



Stantec Consulting Services Inc.
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Lexington, Kentucky 40511-2050
859-422-3000
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DRAIN OUTLET PIPE AND CONCRETE APRON SCHEDULE						
OUTLET NO.	STATION	TOE DRAIN OUTLET PIPE INV. EL. (FT/NGVD)	DRAIN BASIN INV. EL. (FT/NGVD)	NO. OUTLET PIPES	CONC. APRON SIZE	
1	310+45	617.00	616.00	7	8'L x 16'W	
2	318+50	617.49	616.49	8	8'L x 18'W	
3	118+00	619.08	619.08	4	8'L x 10'W	
4	126+50	621.01	621.01	8	8'L x 18'W	
5	134+00	622.72	621.72	8	8'L x 18'W	
6	141+50	624.42	624.42	8	8'L x 18'W	
7	147+50	625.75	625.75	9	8'L x 18'W	
8	215+50	627.26	627.26	8	8'L x 18'W	
9	221+50	627.37	627.37	7	8'L x 16'W	
10	228+00	625.89	625.89	3	8'L x 8'W	
11	236+00	624.06	624.06	8	8'L x 18'W	
12	244+00	622.23	622.23	8	8'L x 18'W	
13	252+00	620.41	620.41	8	8'L x 18'W	
14	260+00	628.58	628.58	8	8'L x 18'W	
15	165+00	617.00	617.00	1	8'L x 4'W	
BLANKET DRAIN	221+70	627.33	627.33	1	8'L x 4'W	
	224+75	626.63	626.63	1	8'L x 4'W	
	227+80	625.93	625.93	1	8'L x 4'W	

- LEGEND**
- Observation Well, Surveyed Location
 - Observation Well, Planned Location
 - 10" Downdrain, Planned Location
 - 10" Downdrain, Surveyed Outlet
 - Subdrain System, Installed
 - Subdrain System, Not Installed

- NOTES:**
- The inventory information presented is based on available Tennessee Valley Authority (TVA) project drawings and TVA field survey information collected January 9 through January 19, 2009 at the Forced Oxidation Wet Gypsum Stacking Phase 1 and 2 project.
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 - Reference drawings for the planned/design location of conduits are provided in the table.
 - Survey information for the surveyed outlets was provided by TVA during February 2009.

PRELIMINARY

GRAPHIC SCALE: 1" = 100'
CONTOUR INTERVAL = 2'

FINAL DRAWINGS TO BE SEALED BY JOHN RICKETTS ALABAMA PE 17907



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REV. NO.	DATE	ISSN	DRWN	CHKD	SUPV	RVMD	APPD	ISSD	PROJECT	AS CONST.	REV. BY	DISCIPLINE
R-0	02/09		RDF	TJ	HRA	JSM	GY					
INITIAL ISSUE PER STANTEC PHASE 1B DIKE INTEGRITY ASSESSMENTS											DISCIPLINE	
SCALE: 1"=100'											EXCEPT AS NOTED	

YARD UNITS 7 & 8
FORCED OXIDATION GYSUM STACK PHASE 1 & 2
PLAN - SUBDRAINAGE

DESIGNED BY: R. FULLER	DRAWN BY: T. JOHNSON	CHECKED BY: H. APARICIO	SUPERVISED BY: J. MONTGOMERY	REVIEWED BY: G. YANKEY	APPROVED BY:	ISSUED BY:
WIDOWS CREEK FOSSIL PLANT TENNESSEE VALLEY AUTHORITY FOSSIL AND HYDRO ENGINEERING						
AUTOCAD R 2008	DATE 02/09	34	C	XXWXXX	R 0	

685' BENCH SCHEDULE OF SURFACE WATER RUNOFF COLLECTION PIPES AND INLETS

INLET NO.	STATION
601	607+47.5
602	615+32.5
603	623+22.5 *
604	613+15.0 *
605	639+02.5
606	648+87.5
607	654+72.5
608	662+57.5
609	670+42.5
610	678+27.5
611	686+12.5

*HIGH POINT BETWEEN INLET NOS. 603 AND 604 TO BE CENTERED ON ACCESS RAMP TO 720 BENCH. ADJUST INLET LOCATIONS AS REQUIRED TO MATCH AS-CONSTRUCTED RAMP LOCATION AND MAINTAIN MAX. 800' SPACING BETWEEN ADJACENT INLETS.

650' BENCH SCHEDULE OF SURFACE WATER RUNOFF COLLECTION PIPES AND INLETS

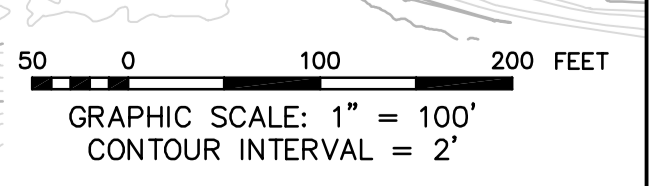
INLET NO.	STATION
501	502+25.0
502	508+75.0
503	540+24.6
504	546+42.0
505	554+39.6
506	562+47.5
507	568+75.1
508	576+32.5
509	583+77.9
510	591+79.8

LEGEND

	500 Series, 655 Bench Surveyed Outlets
	500 Series, 655 Bench Planned Location
	600 Series, 685 Bench Planned Location

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PRELIMINARY



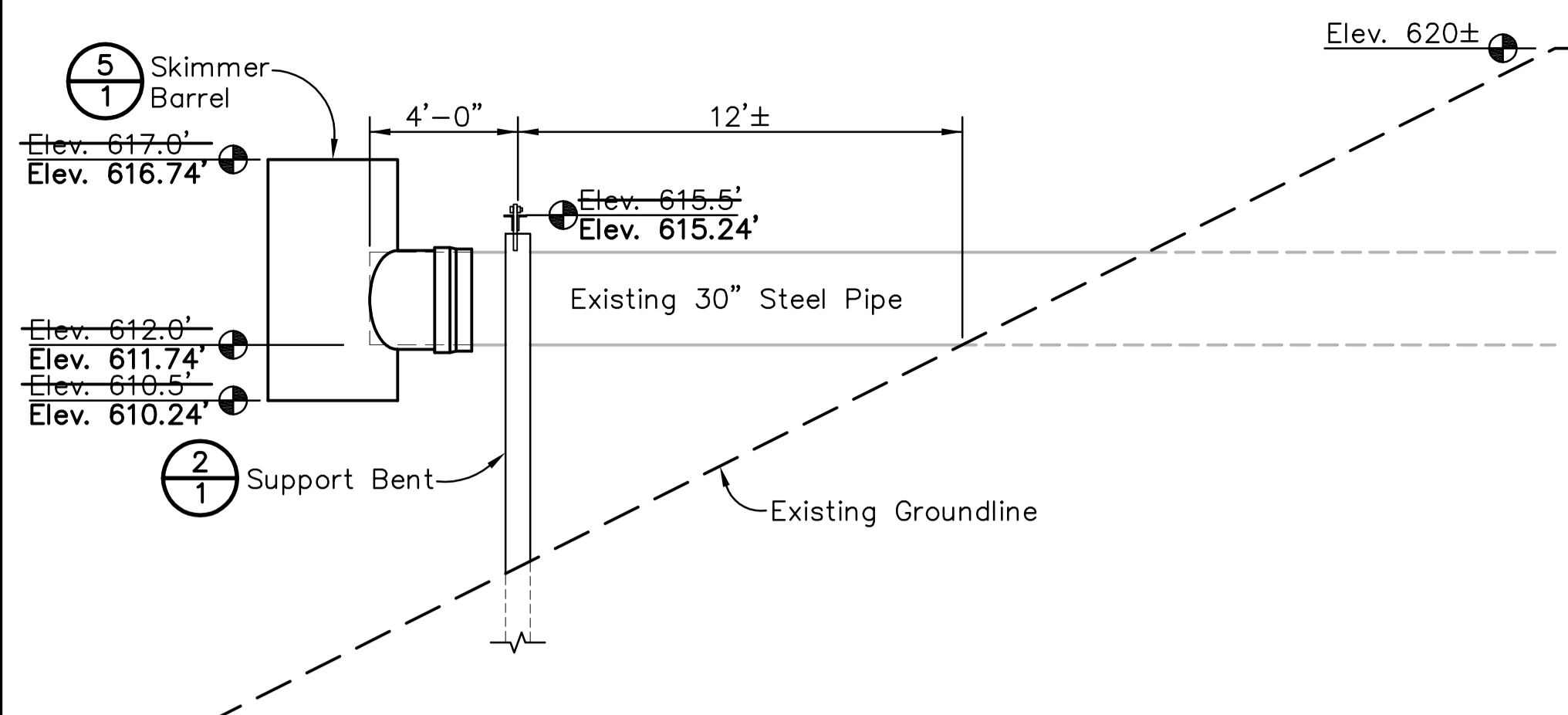
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REV. NO.	DATE	ISSN	DRWN	CHKD	SUPV	RVID	APPD	ISSD	PROJECT	AS CONST	REV. BY	DISCIPLINE
0	02/09		R. FULLER	T. JOHNSON	H. APARICIO	J. MONTGOMERY	G. YANKEY		WIDOWS CREEK FOSSIL PLANT			ENVIRONMENTAL

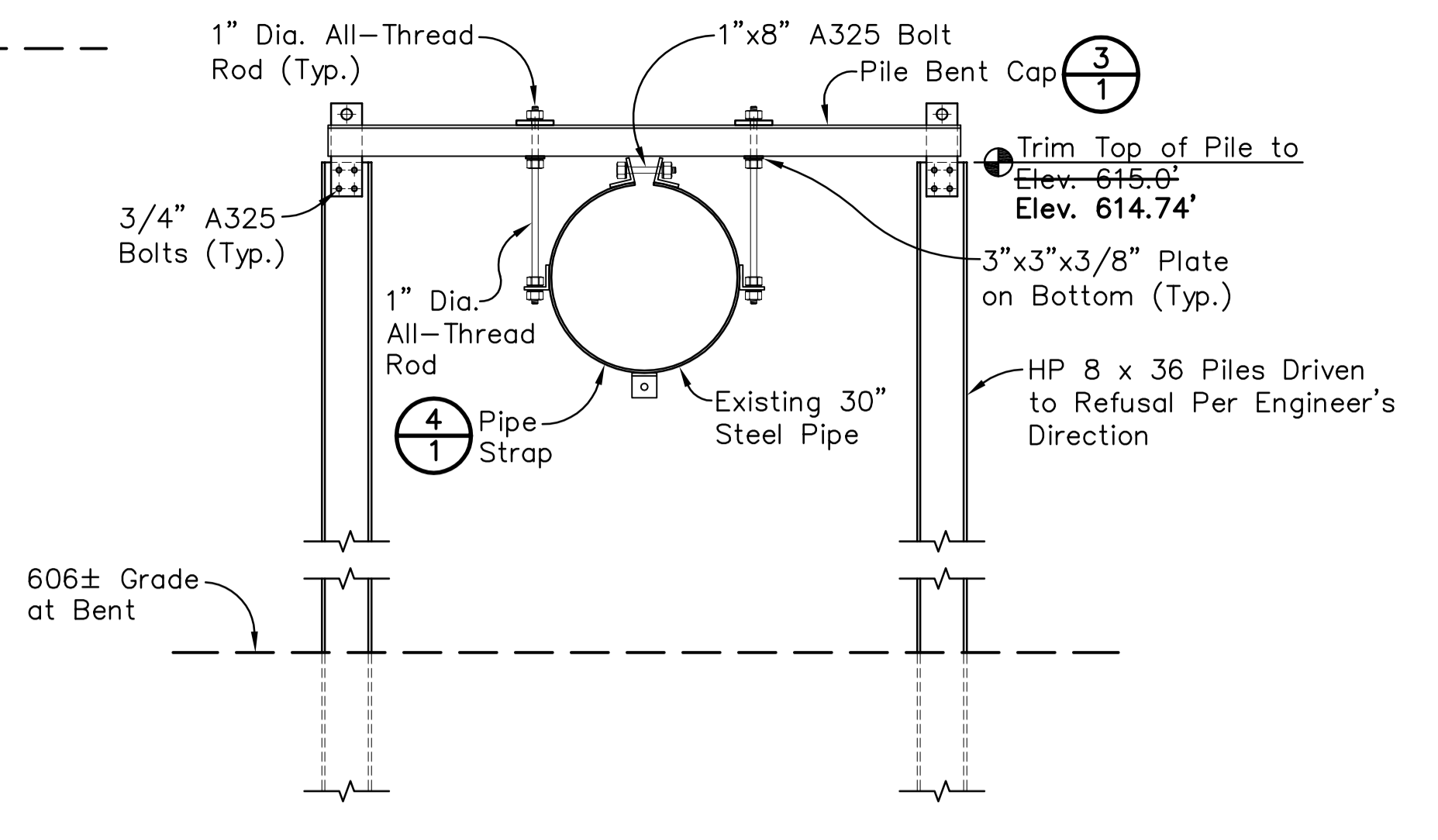
SCALE: 1"=100'

YARD UNITS 7 & 8											
FORCED OXIDATION GYPSUM STACK											
PHASE 1 & 2											
PLAN - SURFACE INLETS											
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:					
R. FULLER	T. JOHNSON	H. APARICIO	J. MONTGOMERY	G. YANKEY			WIDOWS CREEK FOSSIL PLANT				
							TENNESSEE VALLEY AUTHORITY				
							FOSSIL AND HYDRO ENGINEERING				
AUTOCAD R 2008	DATE 02/09	34	C	XXWXXX	R 0						

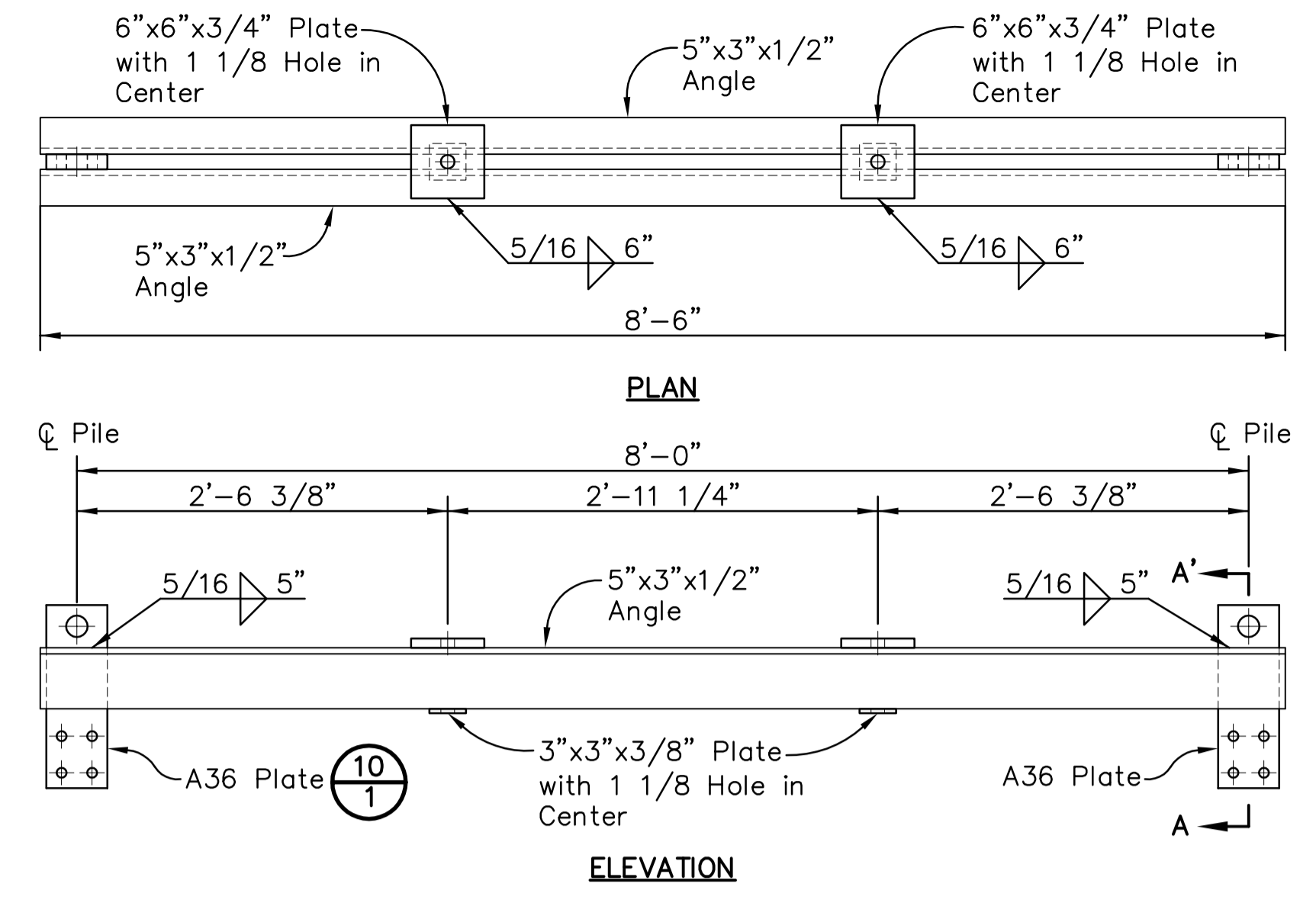
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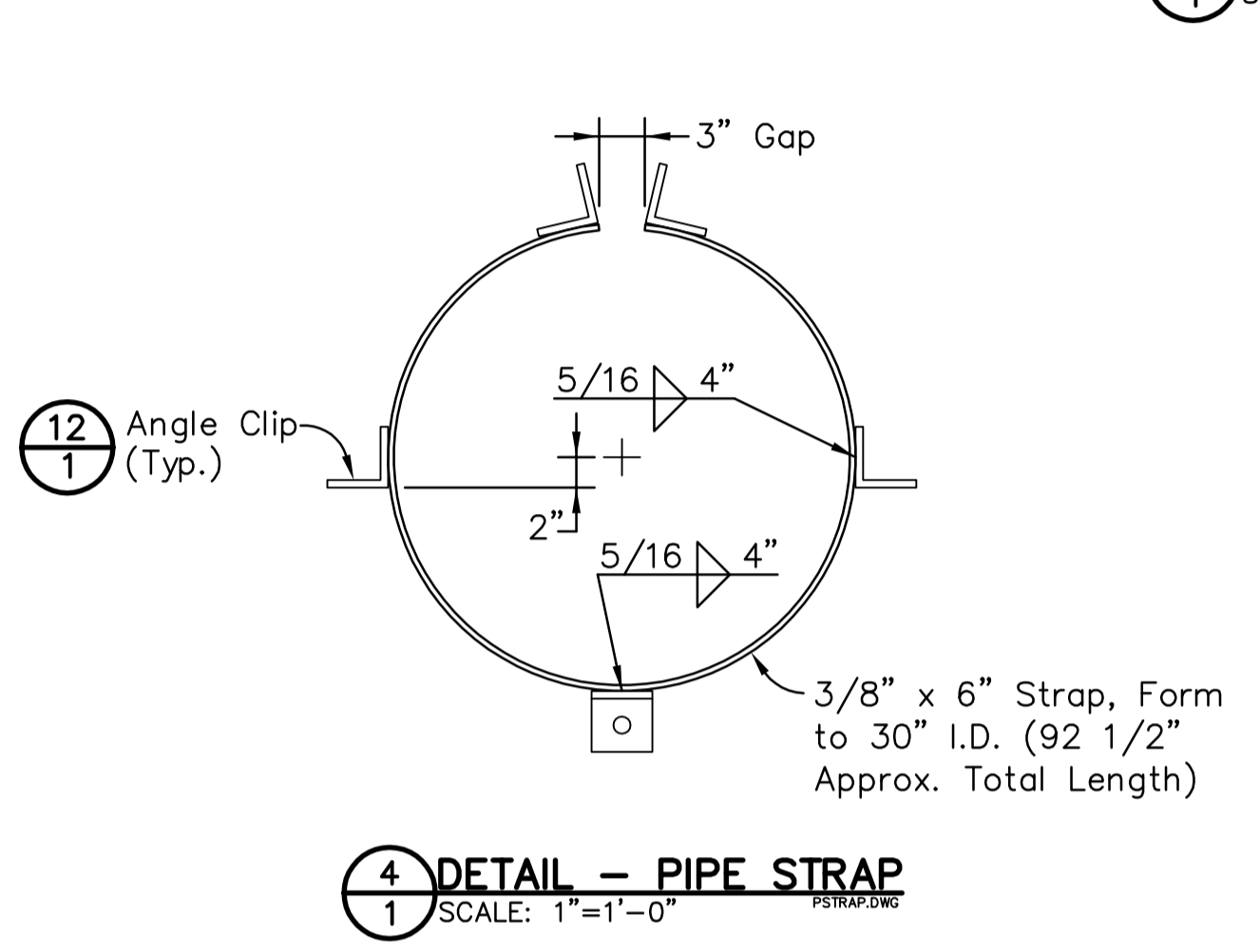
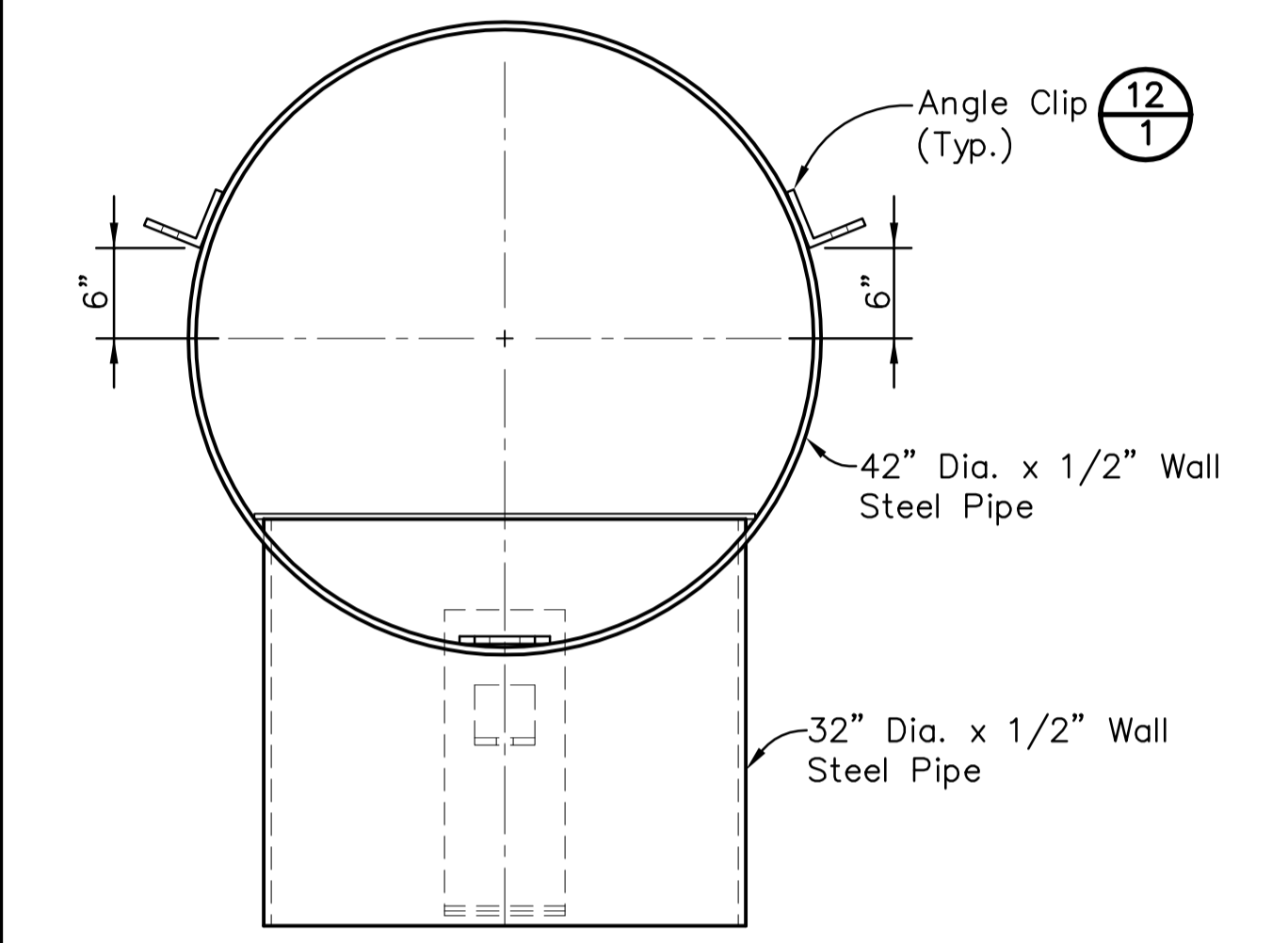
1 DETAIL - GENERAL ARRANGEMENT
 SCALE: 1/4"=1'-0"



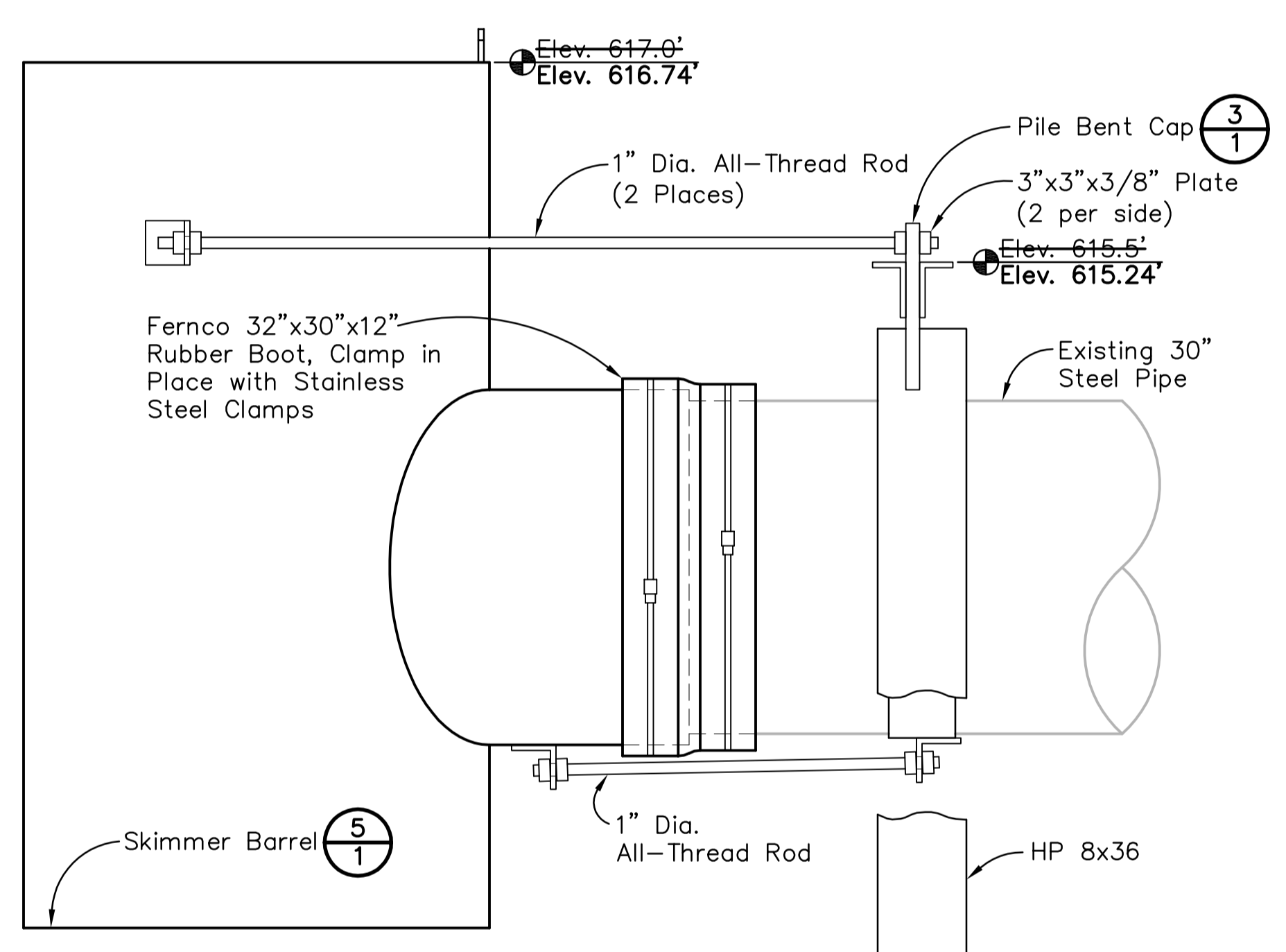
2 ELEVATION - SUPPORT BENT
 SCALE: 1/2"=1'-0"



3 DETAIL - PILE BENT CAP
 SCALE: 1"=1'-0"

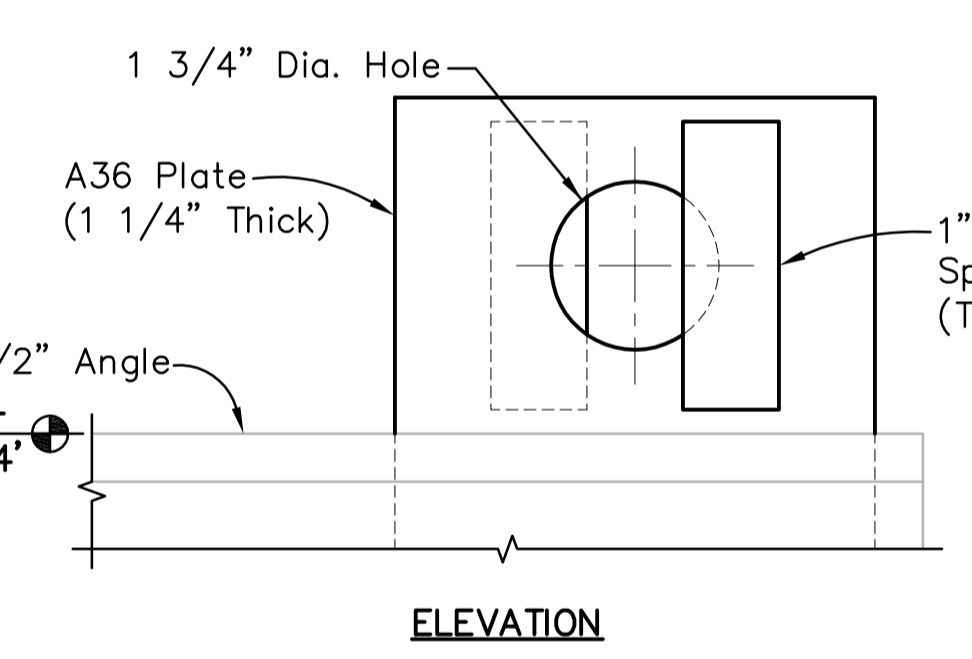
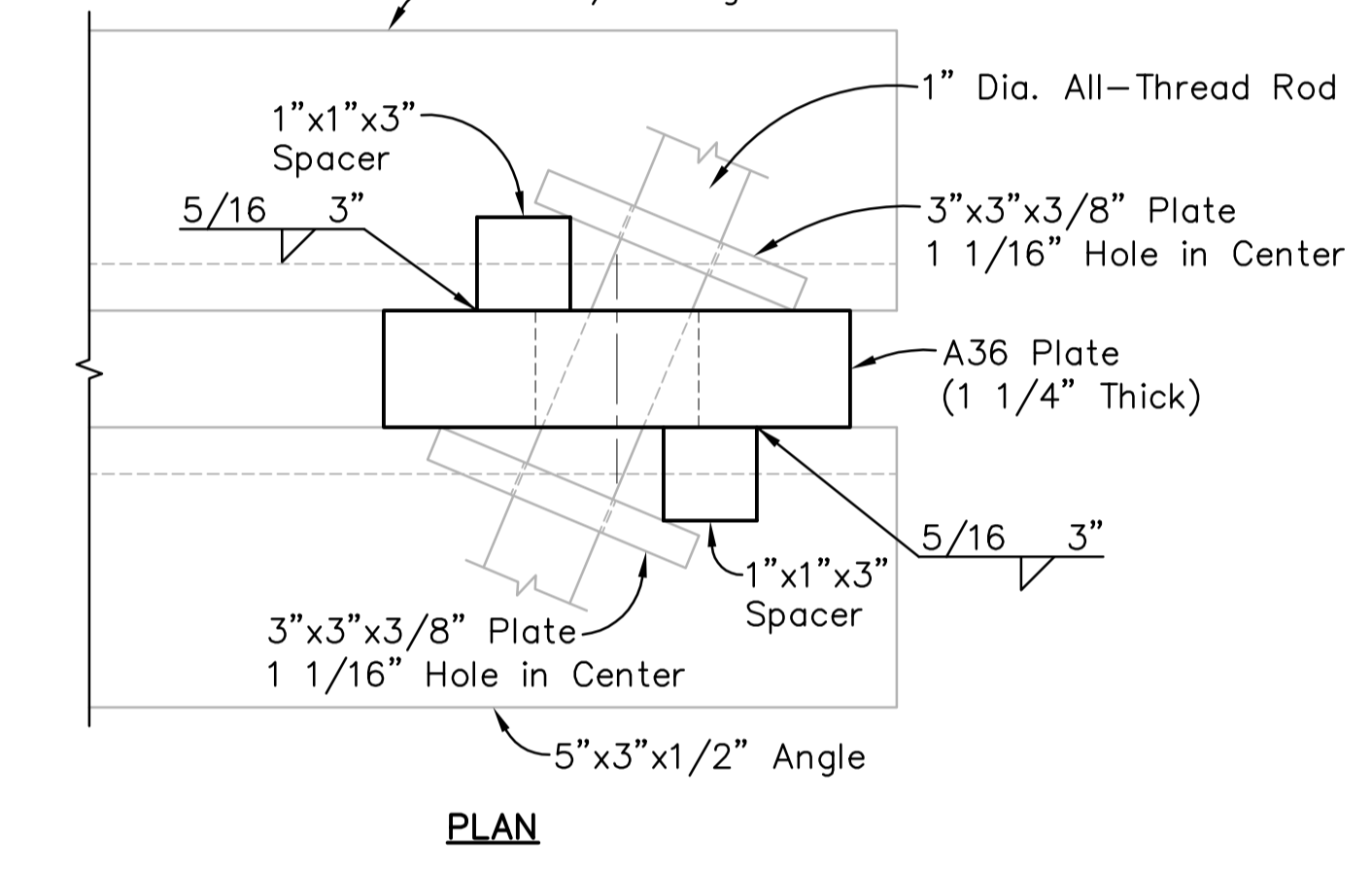


4 DETAIL - PIPE STRAP
 SCALE: 1"=1'-0"



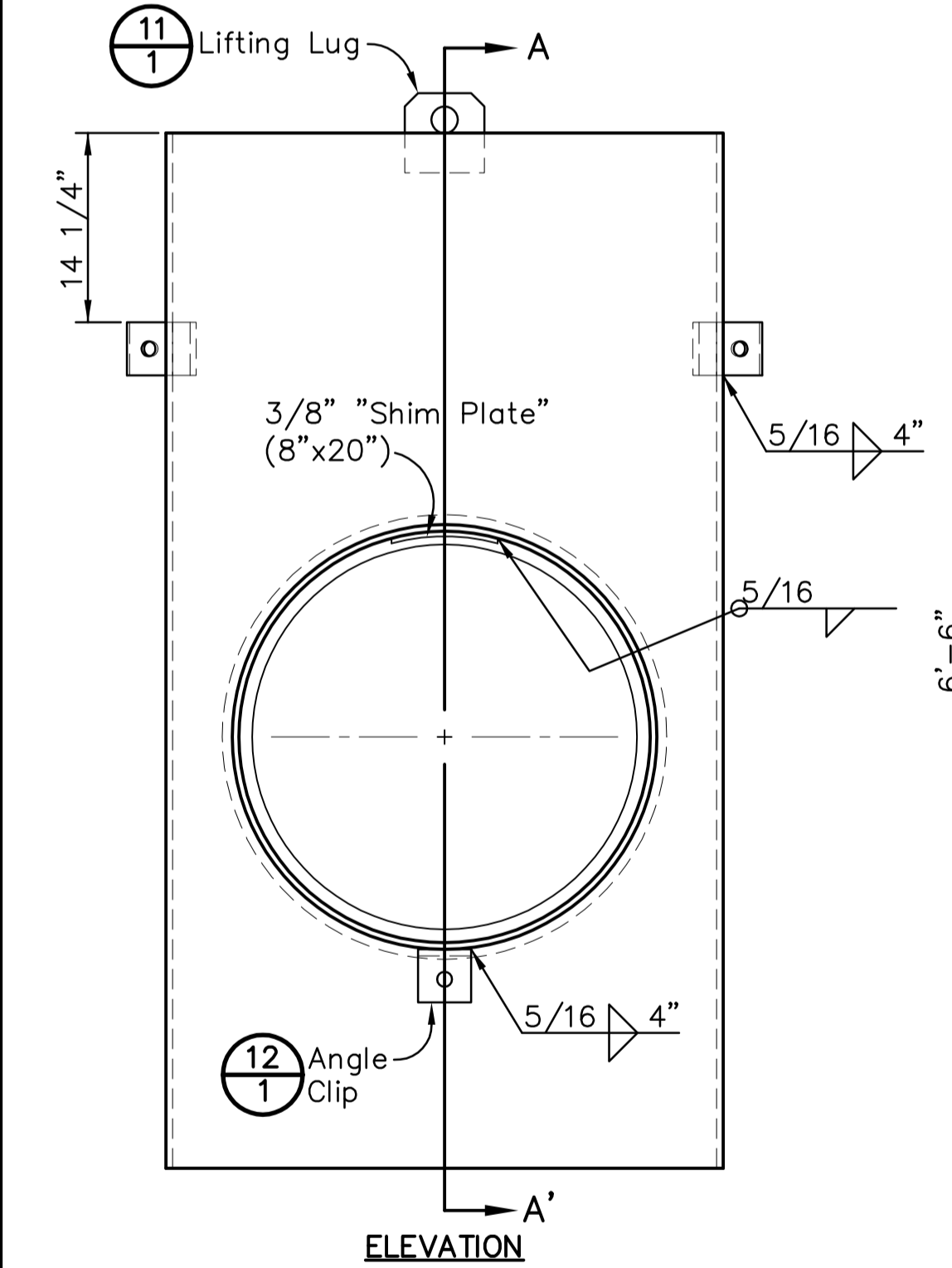
NOTE:
 Tighten Outer Nuts on each All-Thread Rod, then Tighten Inner Nuts to Lock in Place.

6 DETAIL - SKIMMER INSTALLATION LAYOUT
 SCALE: 1"=1'-0"

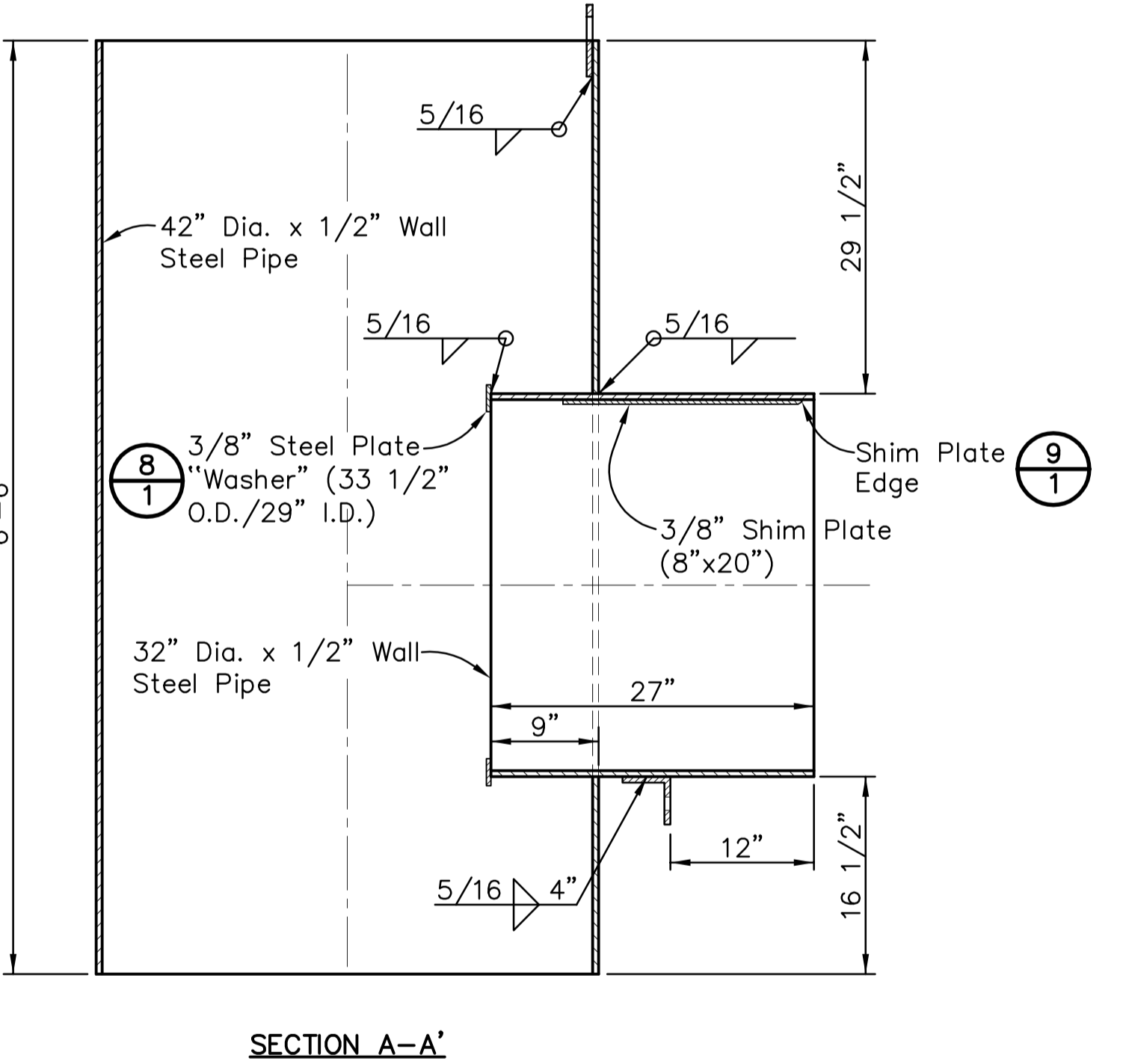


NOTE:
 The two Pile Top Plates shall be built as mirror images of each other. They shall be installed in the Pile Bent Cap oriented to accept the All-Thread Rod from Skimmer properly.

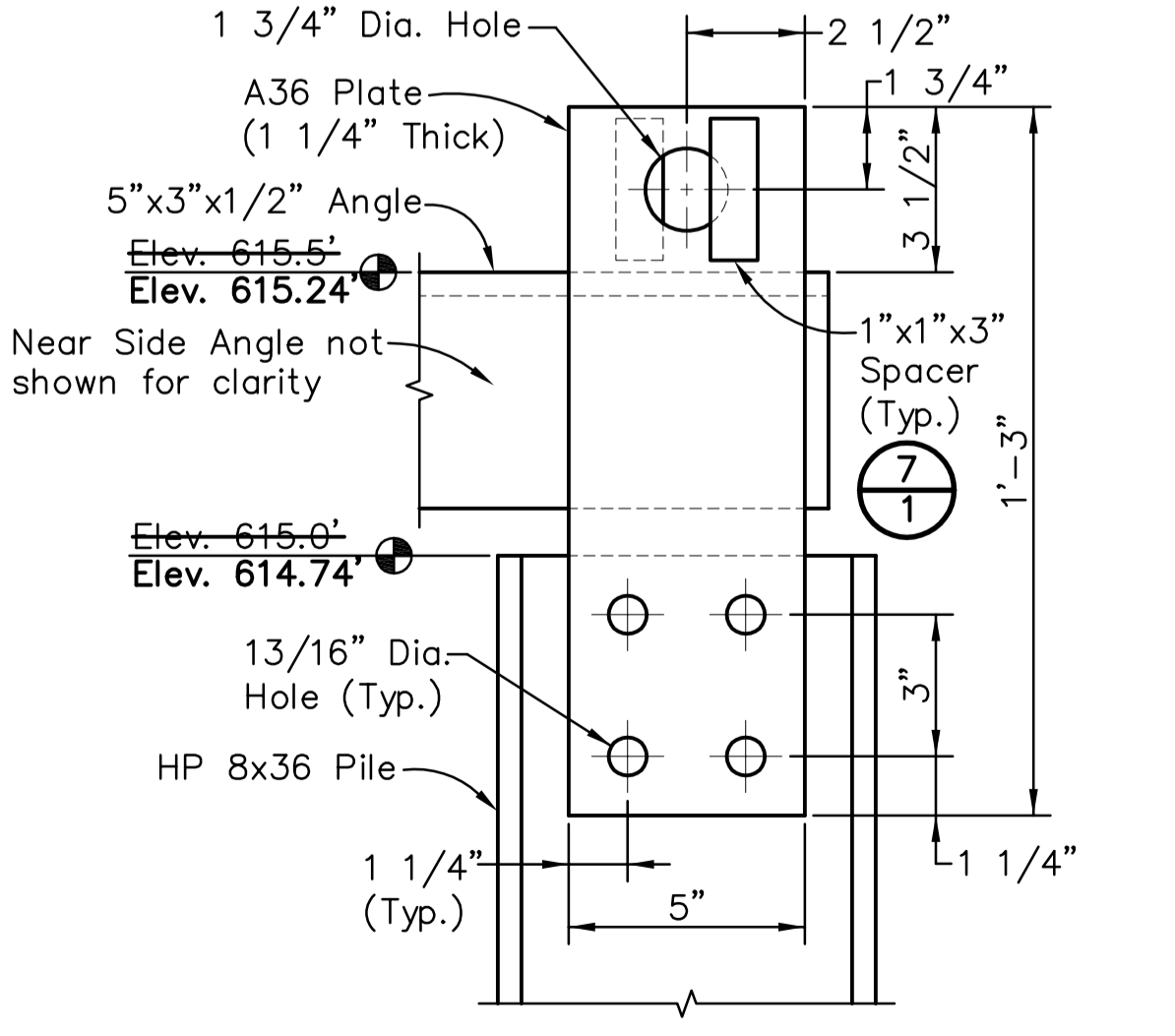
7 DETAIL - PILE TOP PLATE SPACER
 SCALE: 6"=1'-0"



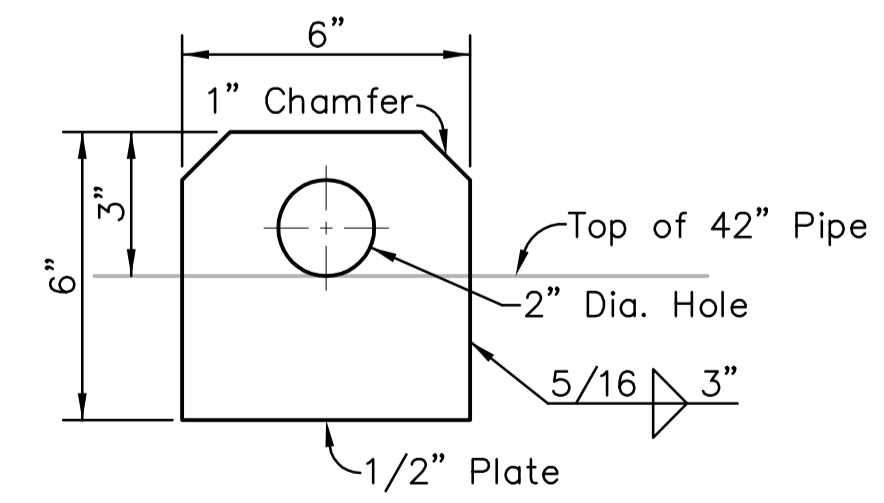
5 DETAIL - SKIMMER BARREL
 SCALE: 1"=1'-0"



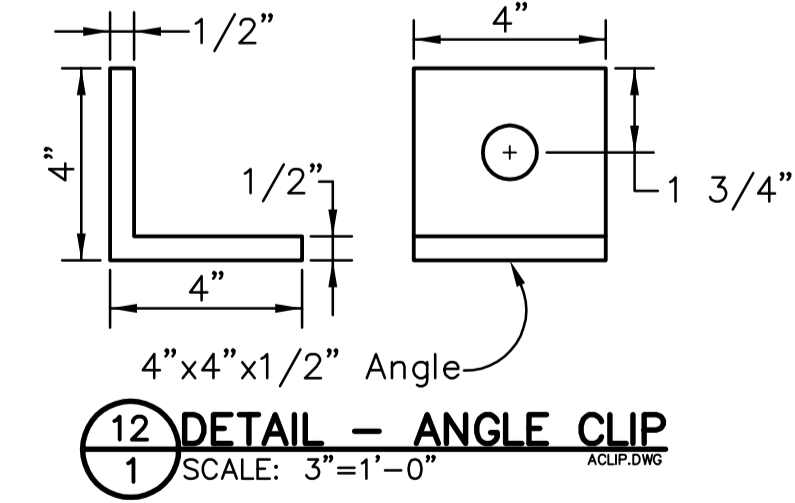
9 DETAIL - SHIM PLATE EDGE
 SCALE: 6"=1'-0"



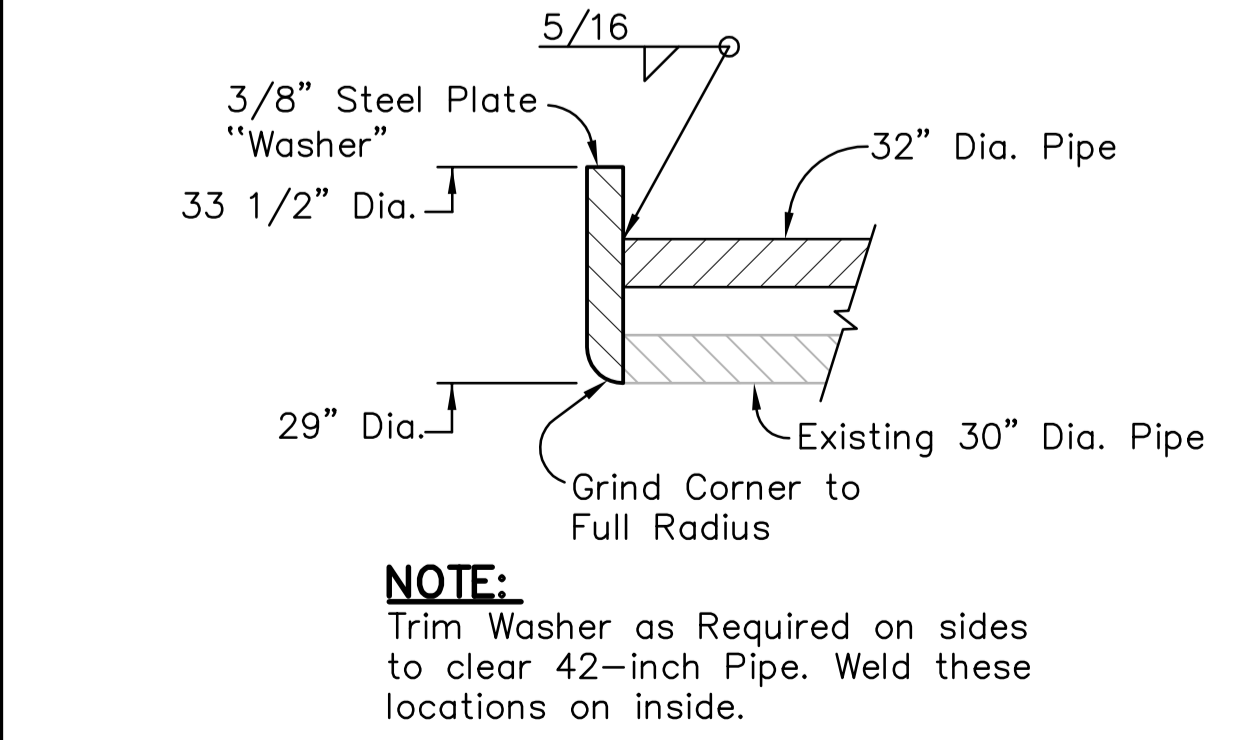
10 DETAIL - PILE TOP PLATE LAYOUT
 SCALE: 3"=1'-0"



11 DETAIL - LIFTING LUG
 SCALE: 3"=1'-0"



12 DETAIL - ANGLE CLIP
 SCALE: 3"=1'-0"



8 DETAIL - 3/8" STEEL PLATE WASHER
 SCALE: 6"=1'-0"

GENERAL NOTES

- Material Specifications:**
- All steel pieces shall be A36 material or higher grade.
 - All welding shall be performed with E70XX electrodes.
 - All welding shall be performed by welders certified for the type of weld utilized.
 - All steel shall be shop cleaned to SSPC-SP 3 or SSPC-SP 6 conditions prior to coating.
 - All steel elements shall be coated with a two stage finish consisting of a zinc rich primer and a coal tar epoxy top coat. The finish color shall be a medium gray or other color as directed by the Owner. Galvanizing may be accepted on some elements as an alternative.
 - All welding shall be shop performed unless otherwise approved in writing by the Owner.
 - The flexible boot coupling shall be an elastomeric polyvinyl chloride (PVC) LDCX 32-in x 30-in coupling as manufactured by Fernco or equivalent product as approved by the Owner.
- Installation Procedure:**
- Drive HP 8x36 piles on either side of existing 30-inch pipe. Piles are to be located approximately 4 feet back from the end of the pipe. The piles shall be oriented such that the pile web planes are at right angles to the axis of the 30-inch pipe.
 - Drive both piles to refusal on a firm underlying layer. The Owner's designated engineering representative shall determine what is acceptable for pile refusal. A penetration of at least 20 feet below grade (30 feet total length) should be provided for.
 - After refusal is obtained, the piles shall be cut-off at a surveyed top elevation of 615.0 feet. Drill / cut 13/16 inch holes to match the pattern in the pre-fabricated pile top plates.
 - Install bent cap assembly by bolting pile top plates to the piles.
 - Install pipe strap around existing 30-inch pipe in the same plane as the pile webs and bent cap. Align strap such that the side angle clips are at the same level and tighten the bolt at the top to clamp the pipe solidly onto the pipe.
 - Install 1-inch dia. all-thread rods through the angle clips on the pipe strap and up through the 6x6 plates on the bent cap assembly. Include 3x3x3/8 plate below bent cap angles and an additional nut below the bent cap and above the angle clips.
 - Tighten the outer (over top / under bottom) nuts to snug condition such that the rods support and slightly raise the pipe.
 - Tighten the inner nuts at each location to lock each connection.
 - Demolish the wooden skimmer structure and dispose of the debris as directed by the Owner (off-site unless otherwise directed).
 - Dredge / dip sludge from area around the pipe end to an elevation of, or below, 606 feet.
 - Slide elastomeric boot coupler over 30-inch pipe, ensuring that it is oriented with the larger (32-inch) end outward toward the end of the existing pipe. Loosely install stainless steel pipe clamps around boot.
 - Lift new skimmer assembly into place and slide 32-inch pipe "tee" over end of existing 30-inch pipe.
 - Install 3 segments of all thread rod as shown in the installation drawings. Include nuts inside and outside at each location. Include a 3x3x3/8 plate on both sides of the pile top plates.
 - Align new skimmer assembly in a vertical configuration and tighten outer nuts on all three all-thread rods. When all three rods are tensioned in place, tighten inside nuts to lock joints in place.
 - Slide larger end of flexible coupling over 32-inch pipe. Tighten hose clamps around flexible coupling.

Final Details:

- With assembly in place and aligned properly, torque each pair of nuts to lock joint in place.
- Clean any locations where finish was damaged during installation with a power grinder.
- Touchup damaged finish areas and any unfinished locations (pile tops) with zinc rich primer and coal tar epoxy finish coat. This finish shall match the shop applied finish texture and color.
- Any damage to embankment slope, crest and roadway, shall be repaired and reseeded. Road shall be repaired with crushed stone.

For Supporting Design Calculations see FPGWCFESCDD0000020090001		R 0 08/09 DAB TJ RDF JKR - - - - -		R 1 08/09 DAB TJ RDF JKR - - - - -		DISCIPLINE INTERFACE	
RECORD DRAWING		SCALE: NONE		EXCEPT AS NOTED			
YARD UNITS 7 & 8		FORCED OXIDATION GYPSUM STACK STILLING POND		SKIMMER REPLACEMENT DETAILS			
DESIGNED BY: D. BACK	DRAWN BY: T. JOHNSON	CHECKED BY: R. FULLER	SUPERVISED BY: J. RICKETTS	REVIEWED BY:	APPROVED BY:	ISSUED BY:	
Stantec Consulting Services Inc. 1409 N. Forbes Rd. Lexington, Kentucky 40511-2050 Tel. 859.422.3000 Fax 859.422.3100 www.stantec.com		WIDOWS CREEK FOSSIL PLANT TENNESSEE VALLEY AUTHORITY FOSSIL AND HYDRO ENGINEERING		AUTOCAD R 2008 DATE 02/09 34 C 10W504-01		R 1	

RECORD DRAWING