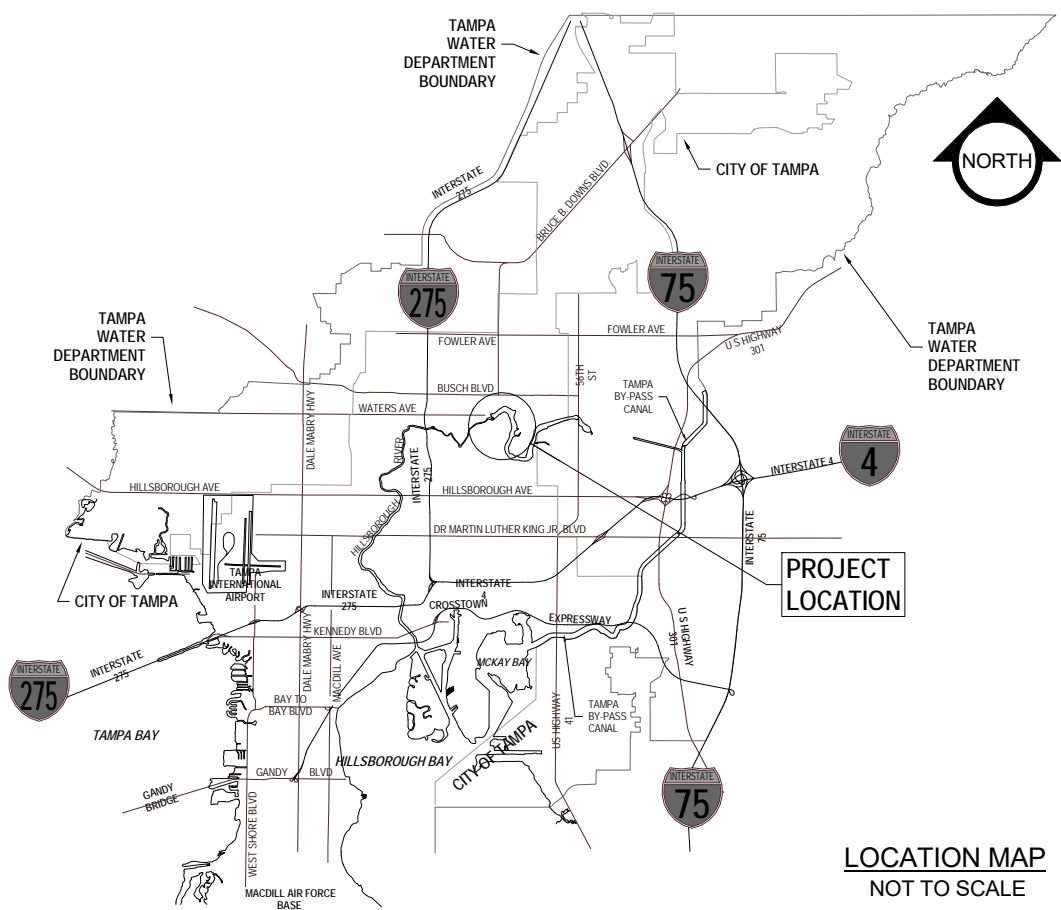


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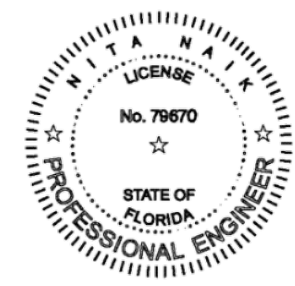
INDEX	
SHEET NO.	TITLE
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2	GENERAL NOTES, LEGEND, ABBREVIATIONS AND KEY MAP
3	OVERALL EXISTING SITE PLAN
4	SLUDGE THICKENER 1 AND 2 PIPELINE DEMOLITION PLAN
5	SLUDGE THICKENER 3 PIPELINE DEMOLITION PLAN
6	SLUDGE THICKENER 4 PIPELINE DEMOLITION PLAN
7	SLUDGE THICKENER 1 AND 2 PROPOSED PIPING PLAN
8	SLUDGE THICKENER 1 AND 2 PROPOSED PIPING PROFILE
9	SLUDGE THICKENER 3 PROPOSED PIPING PLAN
10	SLUDGE THICKENER 3 PROPOSED PIPING PROFILE
11	SLUDGE THICKENER 4 PROPOSED PIPING PLAN
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13	ISOMETRIC VIEW 1
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15	SEQUENCE OF CONSTRUCTION
16	DETAILS
17	DETAILS
18	DETAILS
19	DETAILS
20	MANHOLE DETAILS
21	MANHOLE DETAILS
22	SUE INFORMATION



PLANS FOR :  
**DLTWTF SLUDGE PIPING REPLACEMENT PROJECT**  
 TAMPA WATER DEPARTMENT  
 WORK ORDER NO. :  
**WTR-18-0009**



100% SUBMITTAL



PERMITS			
<input checked="" type="checkbox"/> CITY	<input type="checkbox"/> COUNTY	<input type="checkbox"/> STATE	<input type="checkbox"/> DEP
CONTRACTOR:			

**NITA NAIK**  
 P.E. #79670  
 ARCADIS U.S., INC.  
 3109 WEST DR. MARTIN LUTHER KING JR  
 BLVD, SUITE 350, TAMPA, FLA. 33607  
 C.A. NO. 7917

NO.	DATE	DESCRIPTION	BY

DESIGNED <u>NMN</u>	<b>DLTWTF SLUDGE PIPING REPLACEMENT</b>
DRAWN <u>AJS</u>	
CHECKED <u>FJB</u>	
DATE <u>10/30/18</u>	
<b>COVER SHEET</b>	











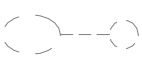


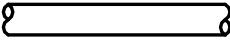




<b>100% PLANS</b>	
WORK ORDER NO. WTR-18-0009	
RECORD DRAWING NO.	
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**GENERAL NOTES:**

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT TECHNICAL SPECIFICATIONS, CONSTRUCTION DETAILS AND THE TAMPA WATER DEPARTMENT TECHNICAL MANUAL (LATEST EDITION). IN THE EVENT OF A DISCREPANCY, THE MOST STRINGENT CRITERIA SHALL APPLY.
2. SURVEY IS PERFORMED IN FLORIDA STATE PLANE COORDINATE SYSTEM, NAD 1983 AND ELEVATIONS ARE REFERENCED TO NAVD 88. CLOSED LOOP BENCHRUN USING FOLLOWING BENCHMARKS WERE USED:
  - a. BRASS DISK IN THE CONCRETE SIDEWALK, STAMPED "CITY OF TAMPA BENCHMARK SUNCOAST LAND SURVEYING DATE:4/30/2009 DATUM: NAVD 88 ELEVATION 47.53 FT".
  - b. BRASS DISK IN THE CONCRETE SIDEWALK, STAMPED "CITY OF TAMPA BENCHMARK SUNCOAST LAND SURVEYING DATE:4/30/2009 DATUM: NAVD 88 ELEVATION 45.40 FT".
3. CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITIES WITH THE DAVID L. TIPPIN WATER TREATMENT FACILITY PERSONNEL PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
4. LOCATIONS, ELEVATIONS AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES ARE SHOWN ACCORDING THE BEST INFORMATION AVAILABLE AT THE TIME OF THE PREPARATION OF THESE DRAWINGS.
5. EXISTING DIMENSIONS AND ELEVATIONS ARE BASED ON BEST AVAILABLE INFORMATION. UTILITIES AND STRUCTURS WHICH ARE NOT SHOWN TO BE REMOVED AND REPLACED OR RELOCATED, SHALL BE PROTECTED IN PLACE.
6. THE CONTRACTOR SHALL INSTALL THE REPLACEMENT SLUDGE PIPING TO THE ELEVATION AND SLOPES SHOWN ON THE DRAWINGS. A VERTICAL SEPARATION BETWEEN REPLACEMENT PIPING AND CROSSING WATER MAINS SHALL BE MORE THAN 12 INCHES AND 6 FEET HORIZONTAL (OUTSIDE OF THE WATER MAIN TO OUTSIDE OF PIPING). THE CONTRACTOR SHALL OBTAIN THE ELEVATIONS OF ALL UTILITIES CROSSING THE REPLACEMENT PIPING AND WHERE THE REQUIRED SEPARATIONS CANNOT BE ACHIEVED, SHALL NOTIFY THE ENGINEER.
7. ALL HARDWARE, UNLESS OTHERWISE NOTED SHALL BE 316 STAINLESS STEEL.
8. ALL BURIED JOINTS SHALL BE MECHANICAL JOINT.
9. RESTRAIN ALL PIPE JOINTS AND FITTINGS. CONCRETE THRUST BLOCK SHALL NOT BE USED TO PROVIDE THRUST RESTRAINT.
10. ALL PIPE, FITTINGS, BENDS AND VALVES SHALL BE INSTALLED USING CLASS C BEDDING, UNLESS OTHERWISE SHOWN OR DIRECTED.
11. DEMOLISHED MATERIAL SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF BY THE CONTRACTOR.
12. ALL NEW SLUDGE PIPE SHALL BE AWWA C900 PVC DR 18. ALL NEW FITTINGS SHALL BE DUCTILE IRON LINED WITH AMINE CURED NOVALAC EPOXY, PERMOX-CTF™ AS MANUFACTURED BY THE PERMITE CORP.
13. REFER TO SPECIFICATIONS FOR LINING SLUDGE PIPING UNDERNEATH THICKENERS WITH COMPOSITE TUBE LINER BY CURED-IN-PLACE PIPE (CIPP) LINER.
14. HYDROSTATIC AND PRESSURE TEST OF ALL NEW PIPING AND LINER IN ACCORDANCE WITH THE SPECIFICATIONS.

**LEGEND:**

	BOLLARD		SINGLE SUPPORT SIGN
	CLEANOUT		PAVEMENT CENTERLINE
	ELEC. MANHOLE		PAVEMENT CURB
	FAUCET		WATER
	LIGHT POLE		SIDEWALK
	STANDPIPE		PROPOSED SLUDGE PIPE
	VALVE BOX		EXISTING PIPES
			ELECTRICAL CONDUIT
			DEMOLITION

**ABBREVIATIONS**

- CIPP - CURED IN PLACE PIPE
- DIP - DUCTILE IRON PIPE
- PVC - POLYVINYL CHLORIDE
- TS - THICKENED SLUDGE



KEY MAP



NITA NAIK  
P.E. #79670  
ARCADIS U.S., INC.  
3109 WEST DR. MARTIN LUTHER KING JR  
BLVD, SUITE 350, TAMPA, FLA. 33607  
C.A. NO. 7917

NO.	DATE	DESCRIPTION	BY

DESIGNED	NMN
DRAWN	AJS
CHECKED	FJB
DATE	10/30/18

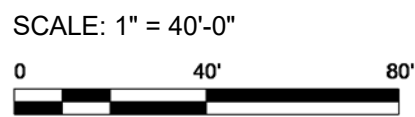
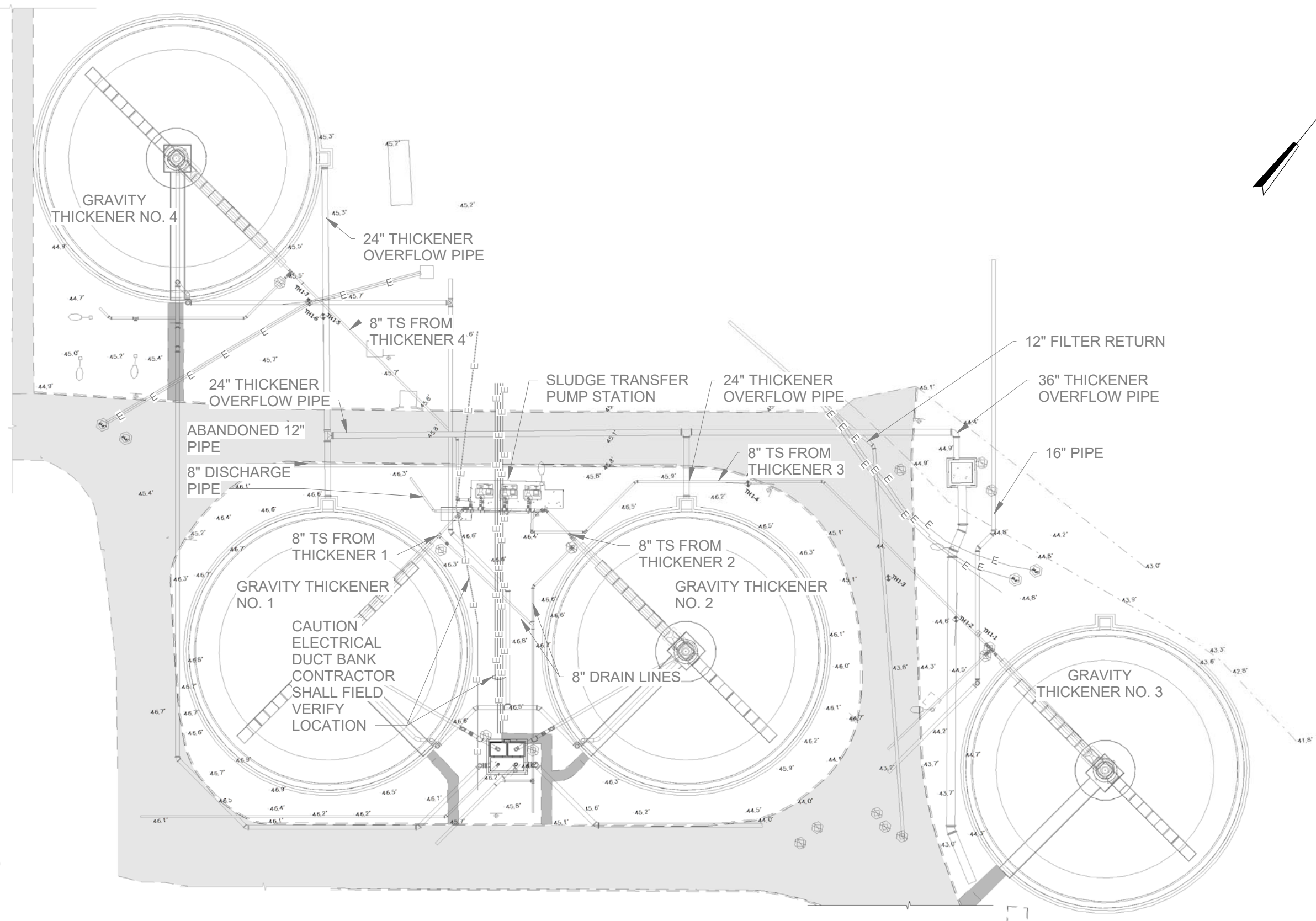
DLTWTF SLUDGE PIPING REPLACEMENT
GENERAL NOTES - LEGEND, ABBREVIATIONS AND KEY MAP



100% PLANS	
WORK ORDER NO. WTR-18-0009	
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3109 WEST DR. MARTIN LUTHER KING JR  
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C.A. NO. 7917

NO.	DATE	DESCRIPTION	BY

DESIGNED NMN  
DRAWN AJS  
CHECKED FJB  
DATE 10/30/18

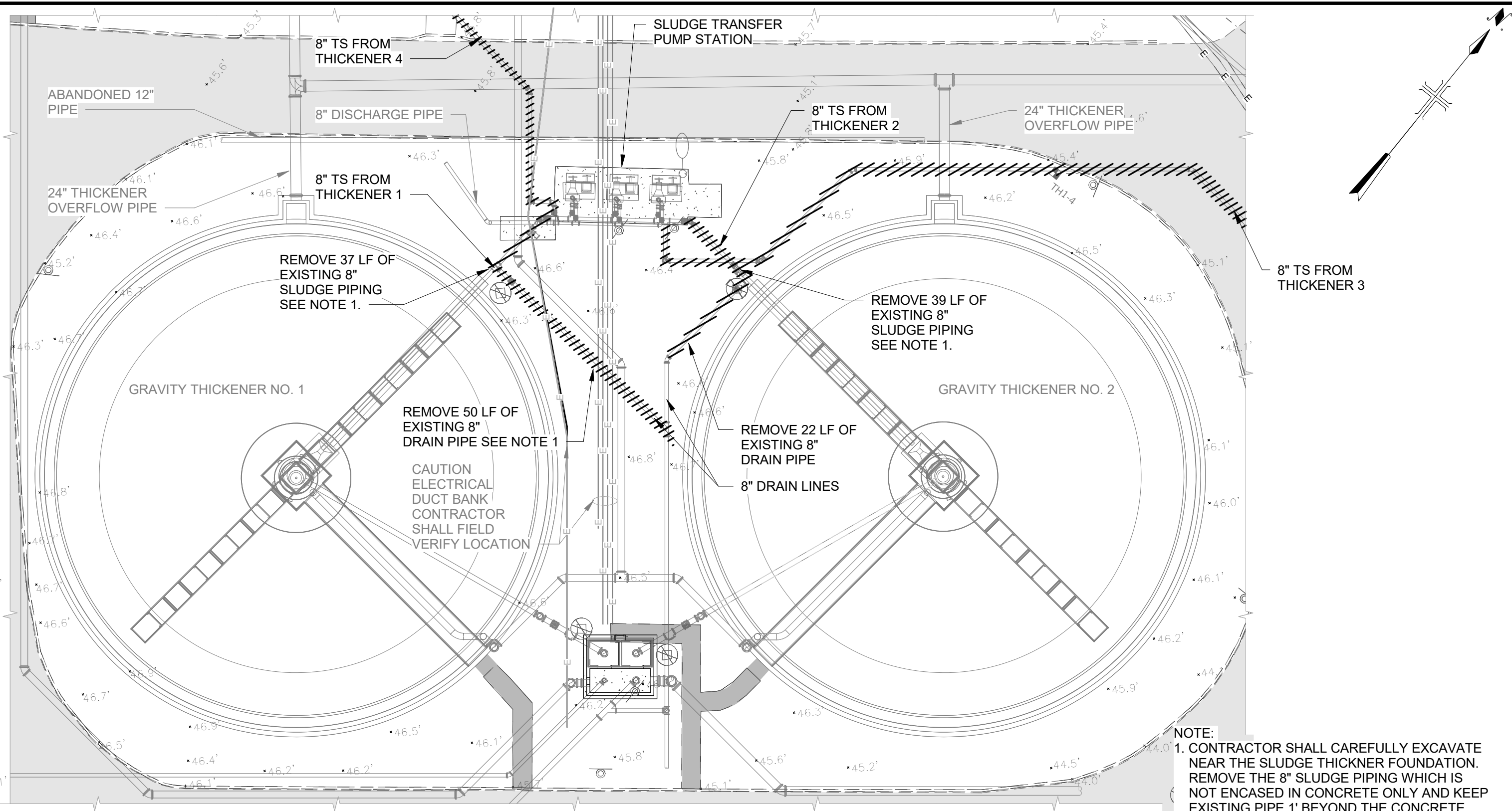
DLTWTF SLUDGE PIPING REPLACEMENT  
OVERALL EXISTING SITE PLAN



100% PLANS  
WORK ORDER NO. WTR-18-0009  
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6/27/2019 10:58:58 AM



**NOTE:**  
 1. CONTRACTOR SHALL CAREFULLY EXCAVATE NEAR THE SLUDGE THICKNER FOUNDATION. REMOVE THE 8" SLUDGE PIPING WHICH IS NOT ENCASED IN CONCRETE ONLY AND KEEP EXISTING PIPE 1' BEYOND THE CONCRETE ENCASEMENT. REMOVE THE 8" SLUDGE PIPING TILL THE ABOVE GRADE FITTING AT THE SLUDGE TRANSFER PUMP STATION.



SCALE : 1" = 20'-0"



NITA NAIK  
 P.E. #79670  
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 3109 WEST DR. MARTIN LUTHER KING JR  
 BLVD, SUITE 350, TAMPA, FLA. 33607  
 C.A. NO. 7917

NO.	DATE	DESCRIPTION	BY

DESIGNED NMN  
 DRAWN AJS  
 CHECKED FJB  
 DATE 10/30/18

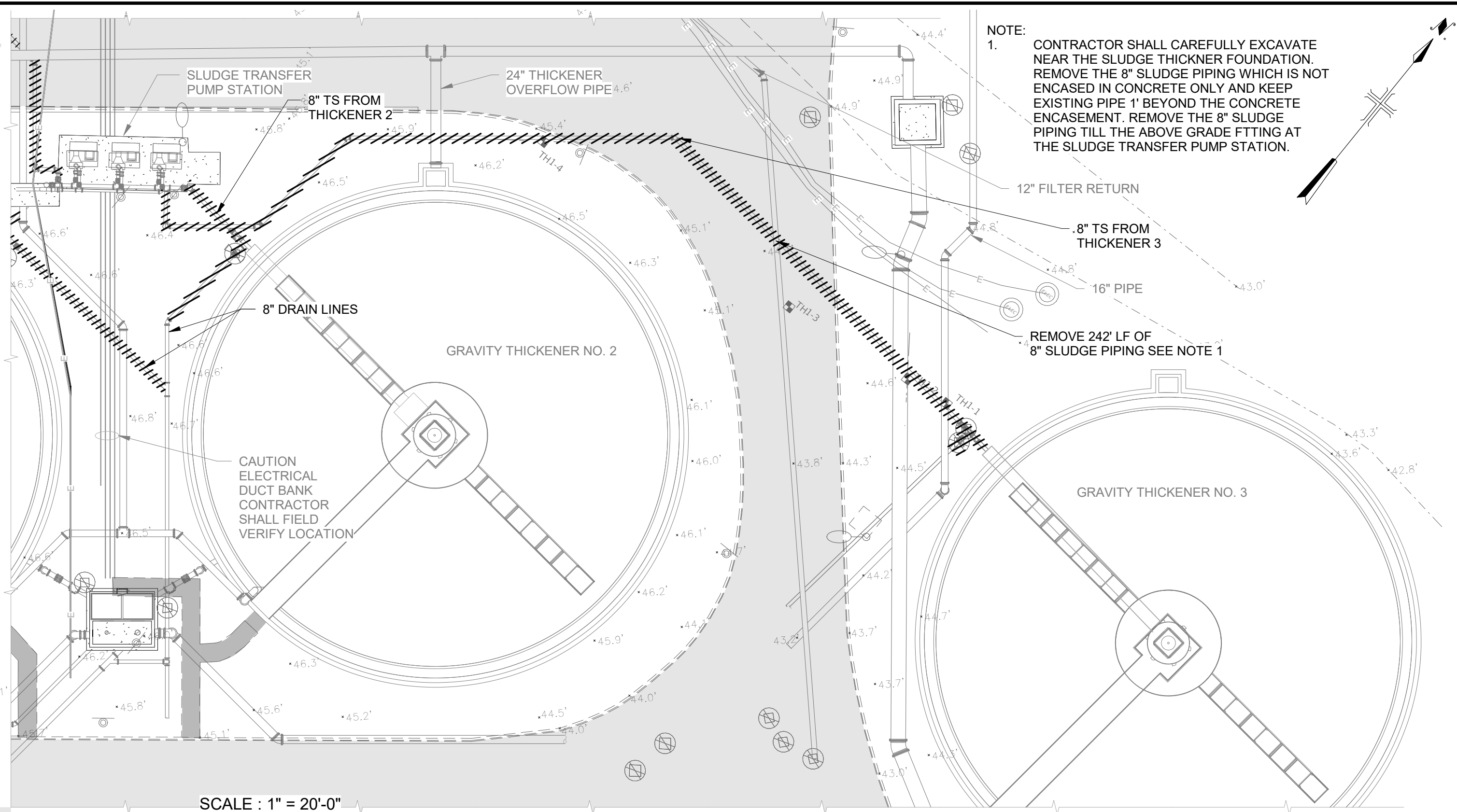
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 SLUDGE THICKENER 1 AND 2 PIPELINE  
 DEMOLITION PLAN



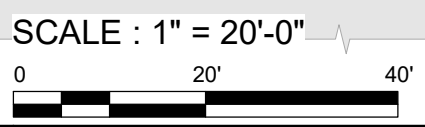
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6/27/2019 11:01:04 AM



**NOTE:**  
 1. CONTRACTOR SHALL CAREFULLY EXCAVATE NEAR THE SLUDGE THICKNER FOUNDATION. REMOVE THE 8" SLUDGE PIPING WHICH IS NOT ENCASED IN CONCRETE ONLY AND KEEP EXISTING PIPE 1' BEYOND THE CONCRETE ENCASEMENT. REMOVE THE 8" SLUDGE PIPING TILL THE ABOVE GRADE FITTING AT THE SLUDGE TRANSFER PUMP STATION.



**NITA NAIK**  
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 3109 WEST DR. MARTIN LUTHER KING JR  
 BLVD, SUITE 350, TAMPA, FLA. 33607  
 C.A. NO. 7917

NO.	DATE	DESCRIPTION	BY

DESIGNED NMN  
 DRAWN AJS  
 CHECKED FJB  
 DATE 10/30/18

**DLTWWF SLUDGE PIPING REPLACEMENT**  
**SLUDGE THICKENER 3 PIPELINE DEMOLITION PLAN**

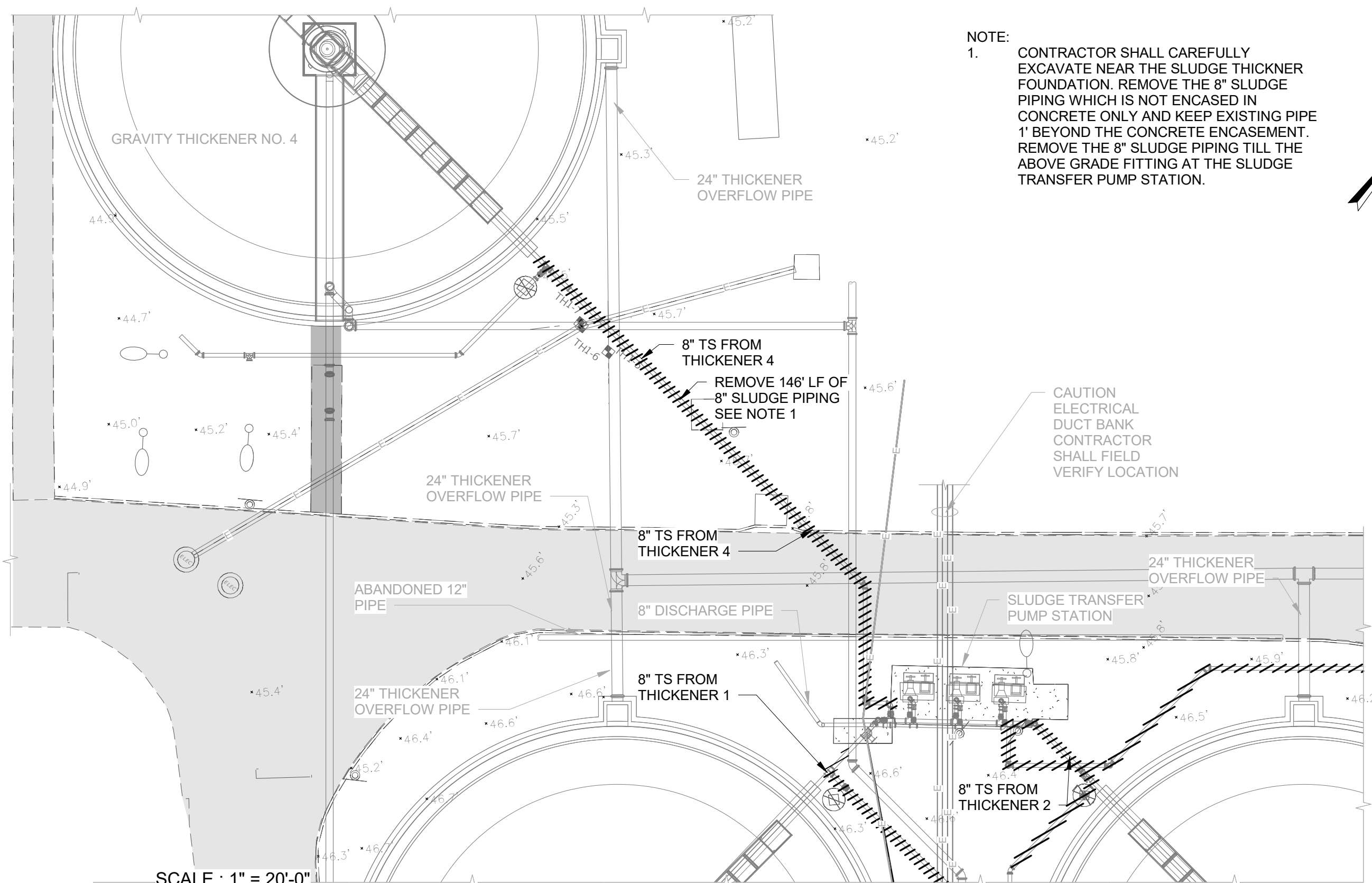


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 WORK ORDER NO. WTR-18-0009  
 RECORD DRAWING NO.  
 ATLAS PAGE D-14 SHEET 5 OF 22

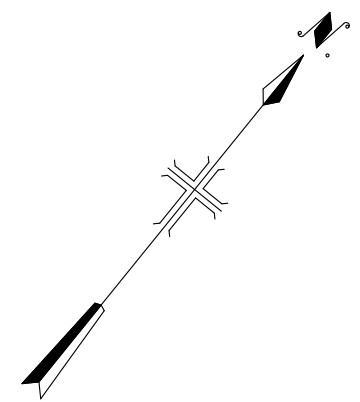


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6/27/2019 11:04:29 AM



NOTE:  
 1. CONTRACTOR SHALL CAREFULLY EXCAVATE NEAR THE SLUDGE THICKNER FOUNDATION. REMOVE THE 8" SLUDGE PIPING WHICH IS NOT ENCASED IN CONCRETE ONLY AND KEEP EXISTING PIPE 1' BEYOND THE CONCRETE ENCASEMENT. REMOVE THE 8" SLUDGE PIPING TILL THE ABOVE GRADE FITTING AT THE SLUDGE TRANSFER PUMP STATION.



SCALE : 1" = 20'-0"  
 0 20' 40'



NITA NAIK  
 P.E. #79670  
 ARCADIS U.S., INC.  
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 BLVD, SUITE 350, TAMPA, FLA. 33607  
 C.A. NO. 7917

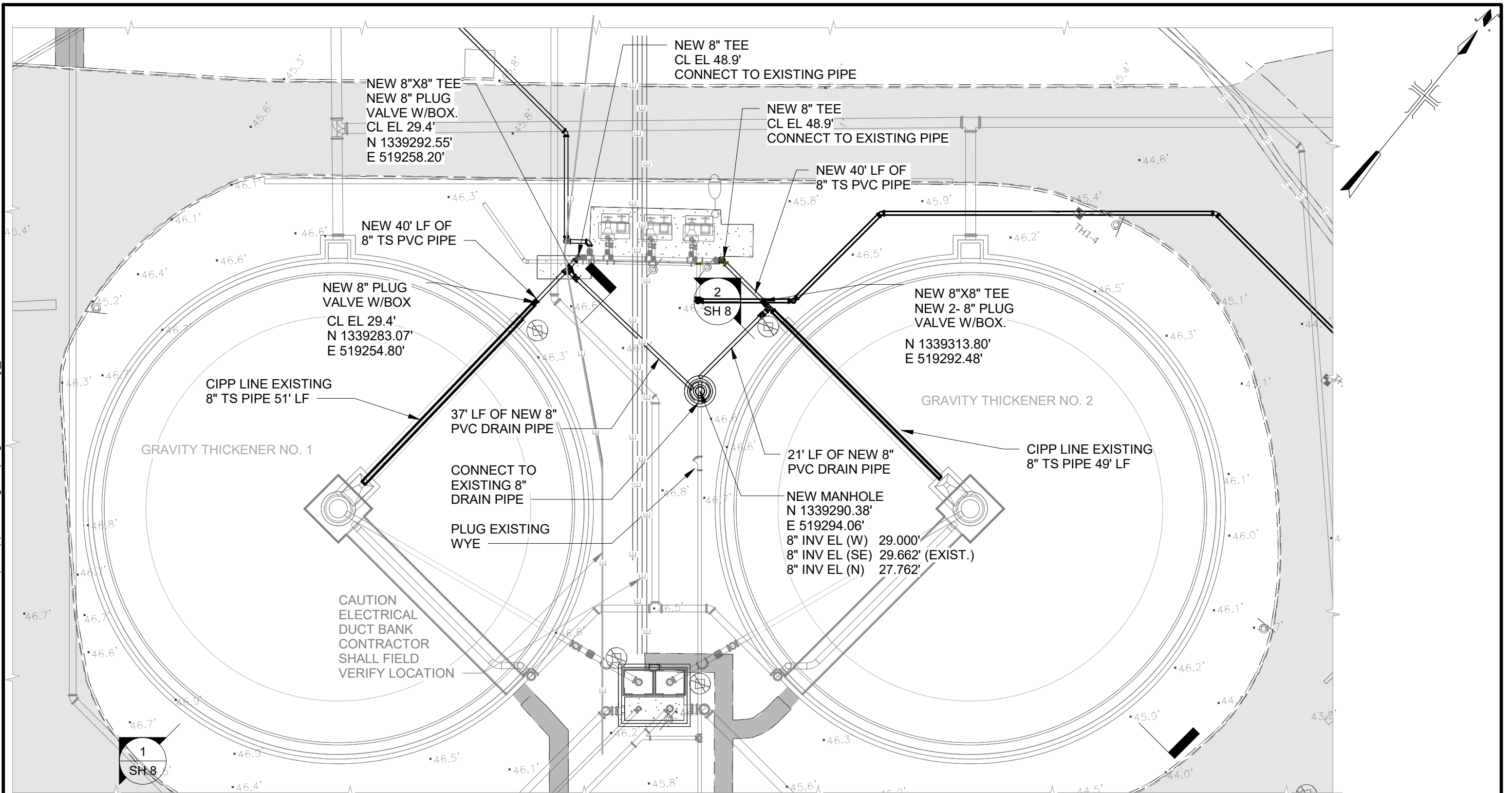
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				DRAWN	AJS
				CHECKED	FJB
				DATE	10/30/18

DLTWTF SLUDGE PIPING REPLACEMENT  
 SLUDGE THICKENER 4 PIPELINE DEMOLITION PLAN



100% PLANS  
 WORK ORDER NO. WTR-18-0009  
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 ATLAS PAGE D-14 SHEET 6 OF 22

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SCALE : 1" = 20'-0"  
 0 20' 40'



NITA NAIK  
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 3109 WEST DR. MARTIN LUTHER KING JR  
 BLVD, SUITE 350, TAMPA, FLA. 33607  
 C.A. NO. 7917

NO.	DATE	DESCRIPTION	BY	DESIGNED NMN
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				SLUDGE THICKENER 1 AND 2 PROPOSED PIPING PLAN
				DATE 10/30/18

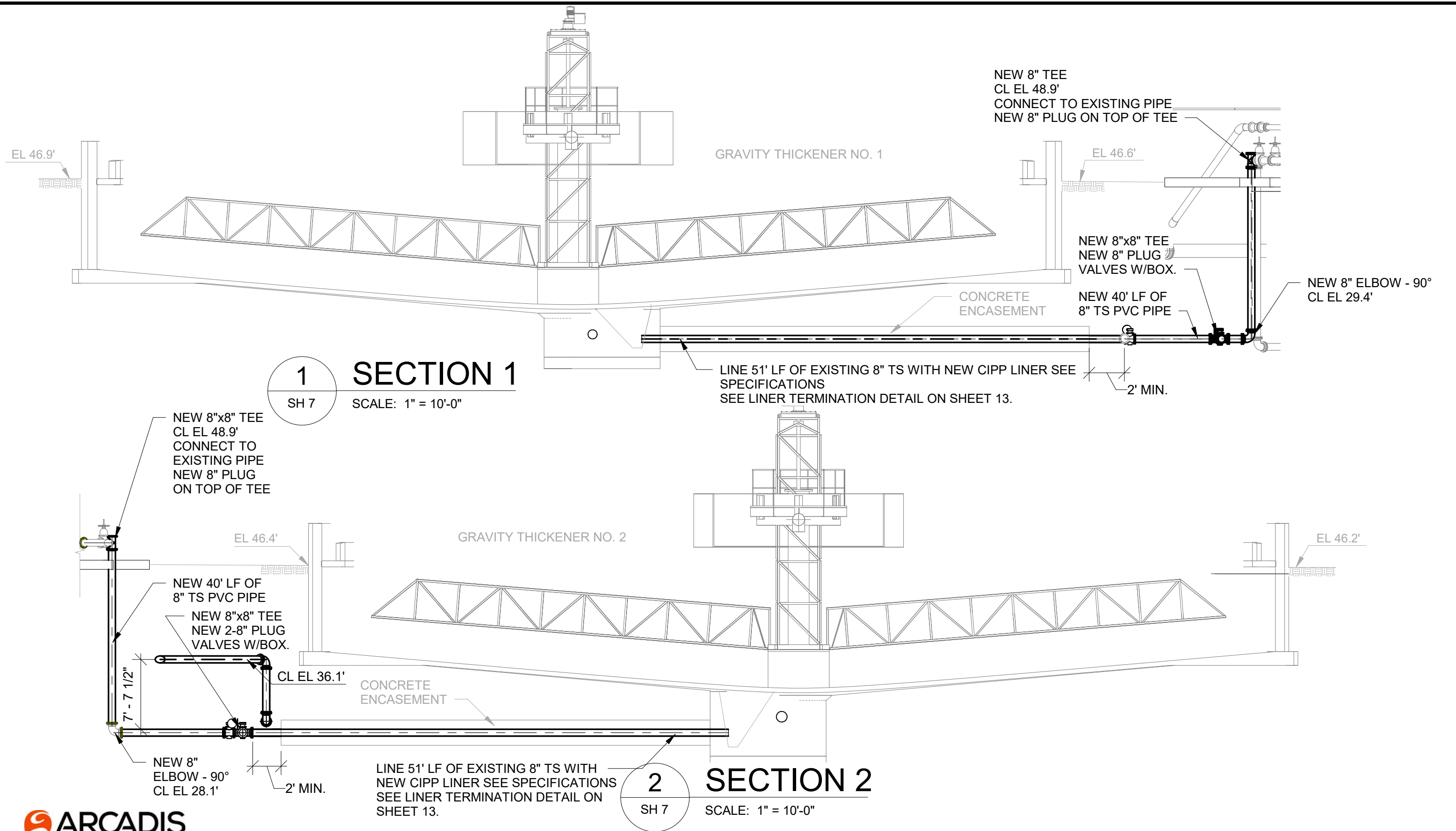
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100% PLANS	
WORK ORDER NO. WTR-18-0009	
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C.A. NO. 7917

NO.	DATE	DESCRIPTION	BY

DESIGNED NMN  
DRAWN AJS  
CHECKED FJB  
DATE 10/30/18

DLTWTF SLUDGE PIPING REPLACEMENT

SLUDGE THICKENER 1 AND 2 PROPOSED PIPING PROFILE



100% PLANS

WORK ORDER NO. WTR-18-0009

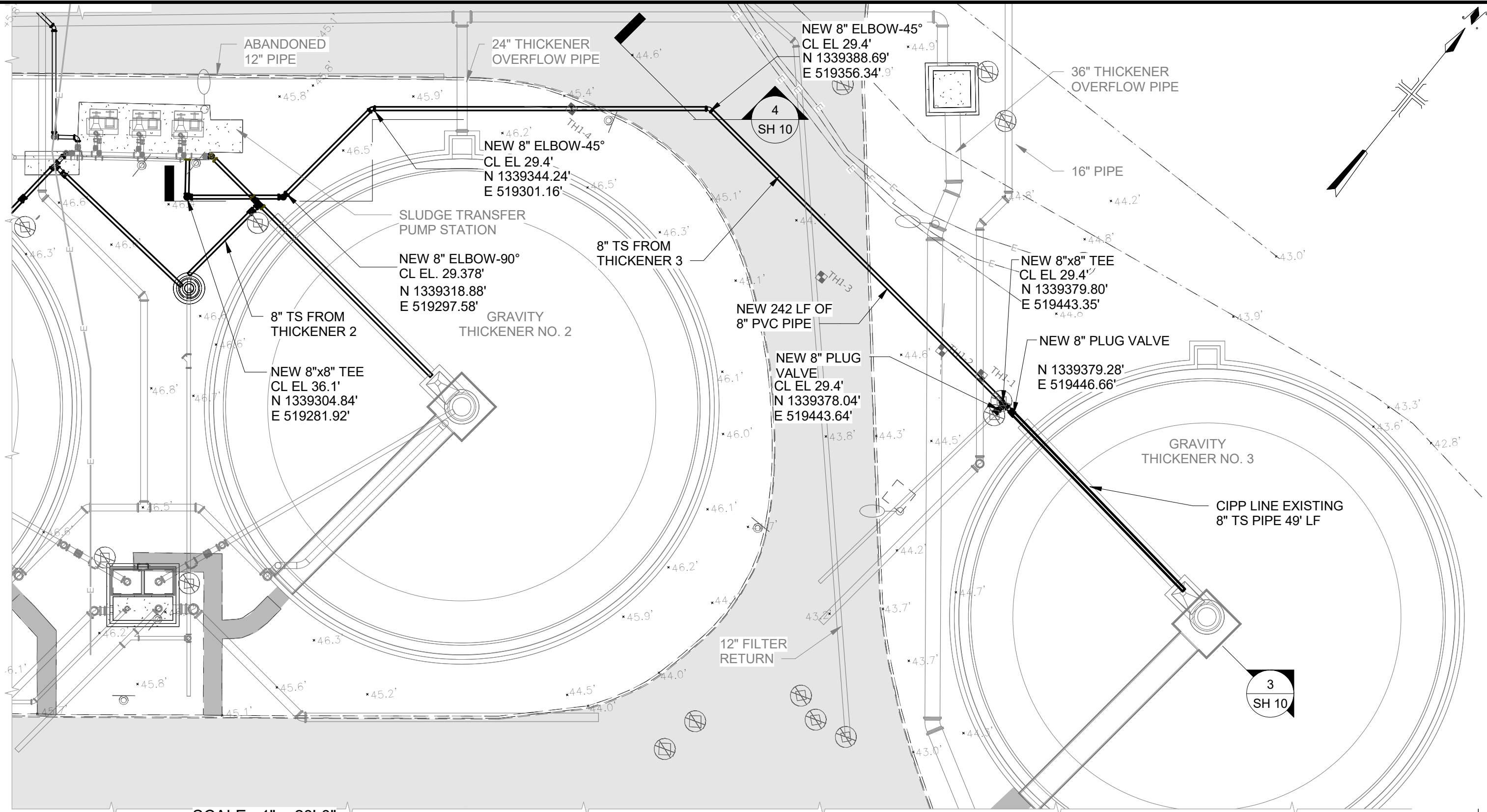
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ATLAS PAGE D-14 SHEET 8 OF 22

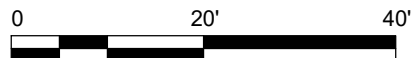


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SCALE : 1" = 20'-0"



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 3109 WEST DR. MARTIN LUTHER KING JR  
 BLVD, SUITE 350, TAMPA, FLA. 33607  
 C.A. NO. 7917

NO.	DATE	DESCRIPTION	BY

DESIGNED NMN  
 DRAWN AJS  
 CHECKED FJB  
 DATE 10/30/18

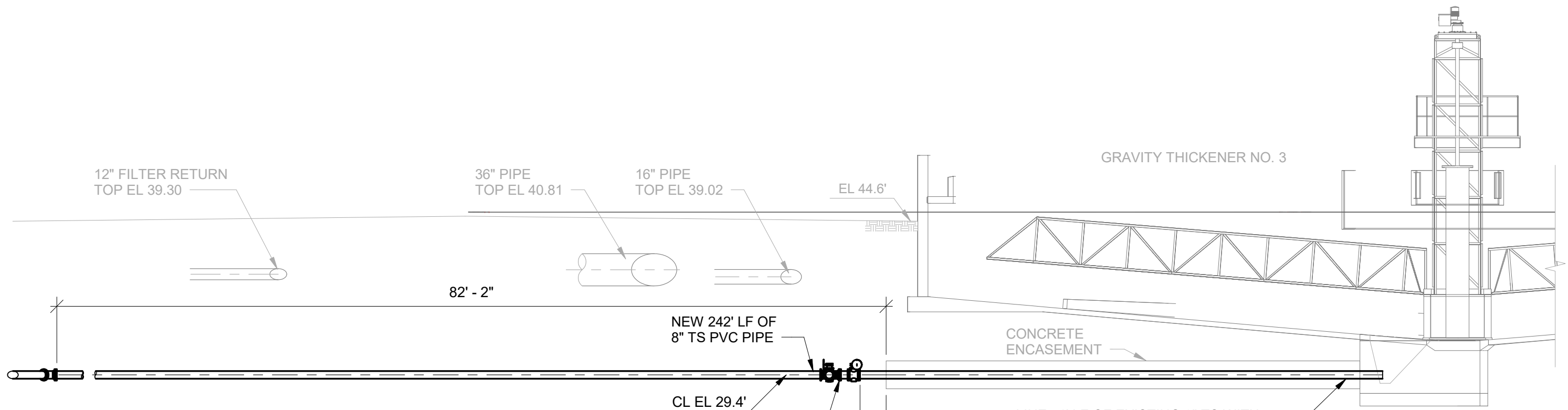
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 SLUDGE THICKENER 3 PROPOSED PIPING PLAN



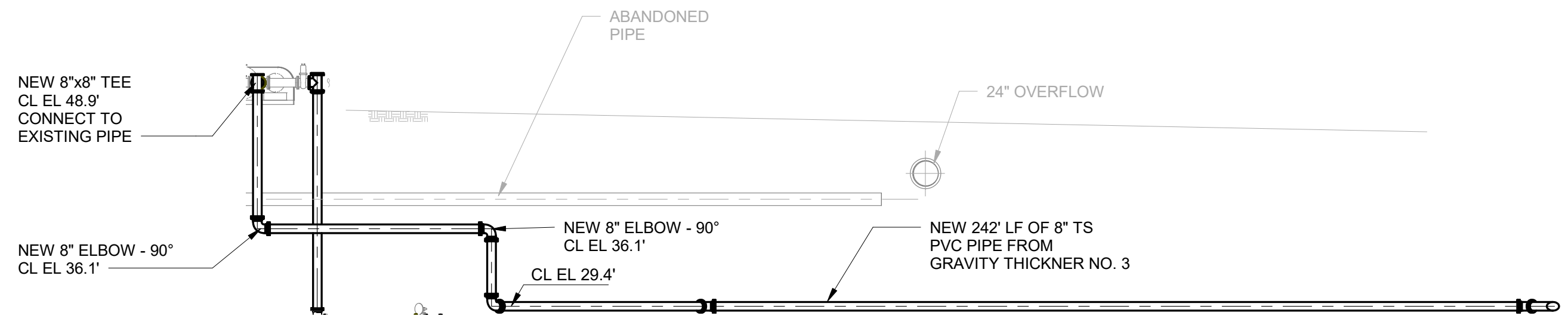
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**3 SECTION 3**  
SH 9 SCALE: 1" = 10'-0"



**4 SECTION 4**  
SH 9 SCALE: 1" = 10'-0"



NITA NAIK  
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C.A. NO. 7917

NO.	DATE	DESCRIPTION	BY

DESIGNED NMN  
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CHECKED FJB  
DATE 10/30/18

DLTWTF SLUDGE PIPING REPLACEMENT  
SLUDGE THICKENER 3 PROPOSED PIPING PROFILE



100% PLANS  
WORK ORDER NO. WTR-18-0009  
RECORD DRAWING NO.  
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SCALE : 1" = 20'-0"

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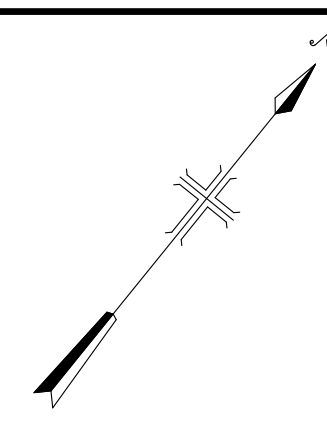
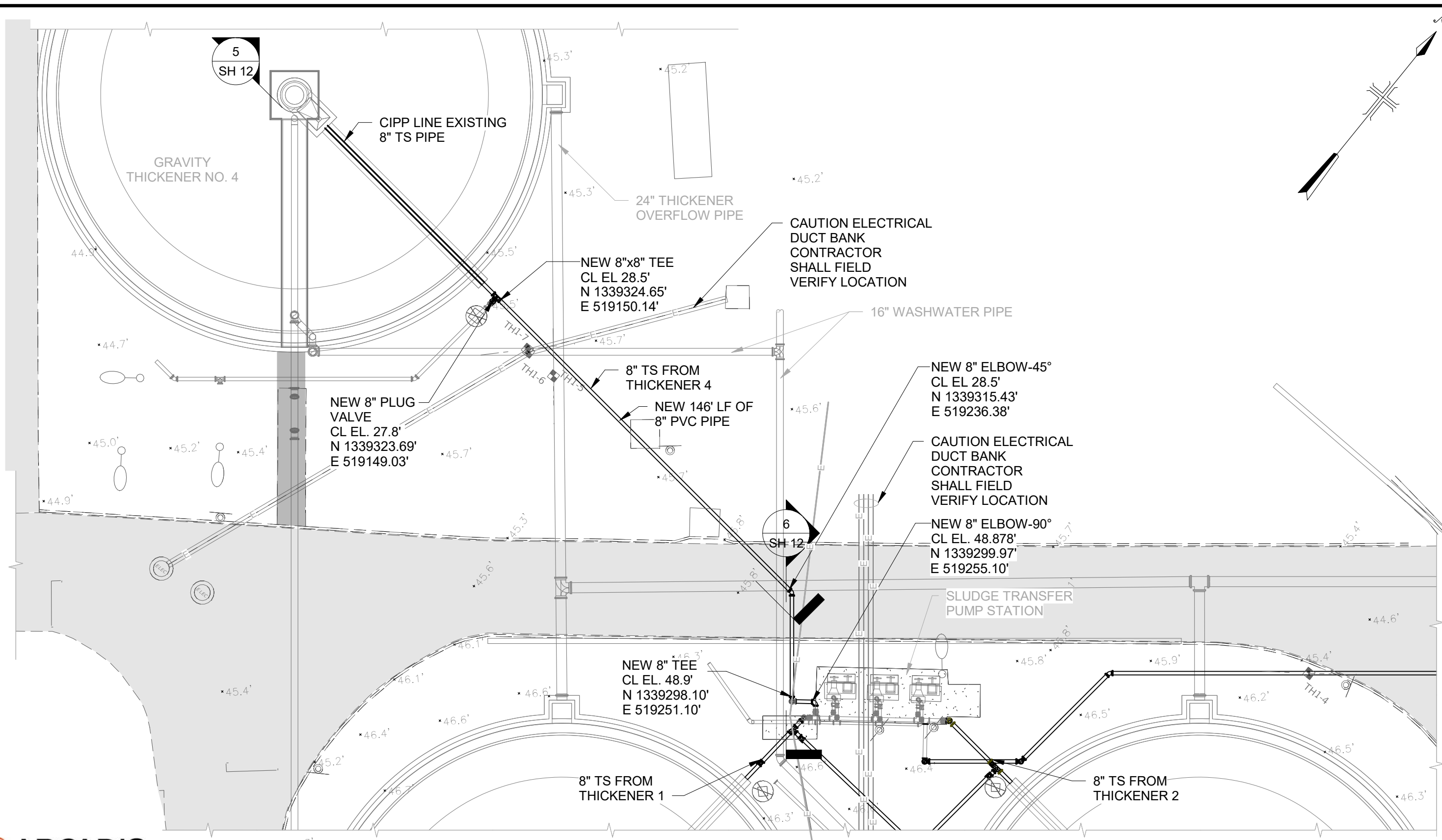
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 CHECKED FJB  
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DLTWTF SLUDGE PIPING REPLACEMENT  
 SLUDGE THICKENER 4 PROPOSED PIPING PLAN



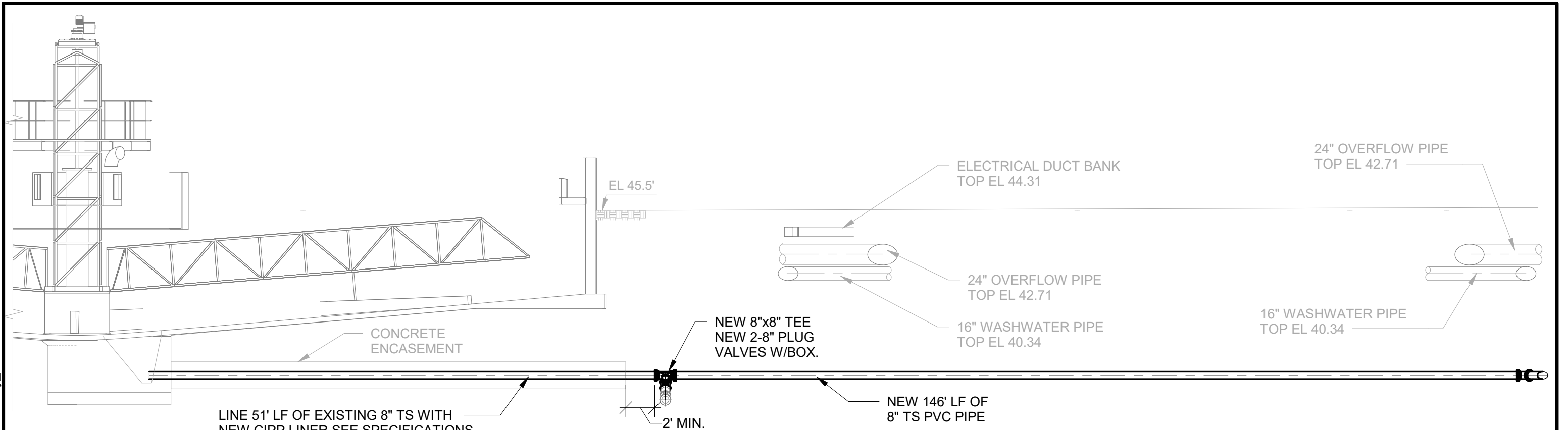
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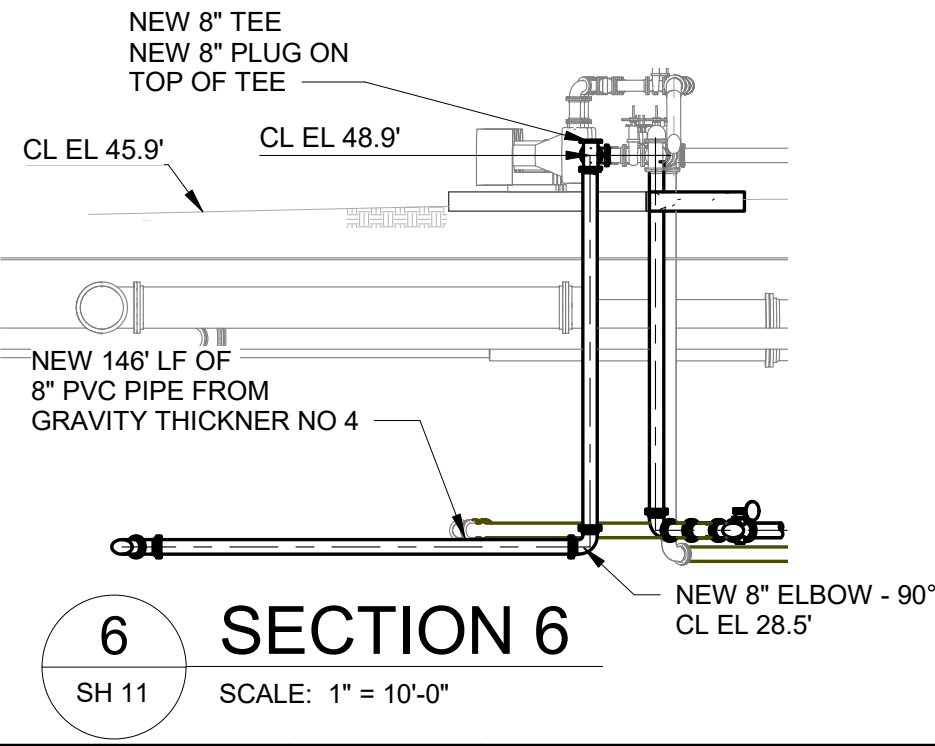
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LINE 51' LF OF EXISTING 8" TS WITH NEW CIPP LINER SEE SPECIFICATIONS SEE LINER TERMINATION DETAIL ON SHEET 13.

**5 SECTION 5**  
SH 11 SCALE: 1" = 10'-0"



**6 SECTION 6**  
SH 11 SCALE: 1" = 10'-0"



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NO.	DATE	DESCRIPTION	BY

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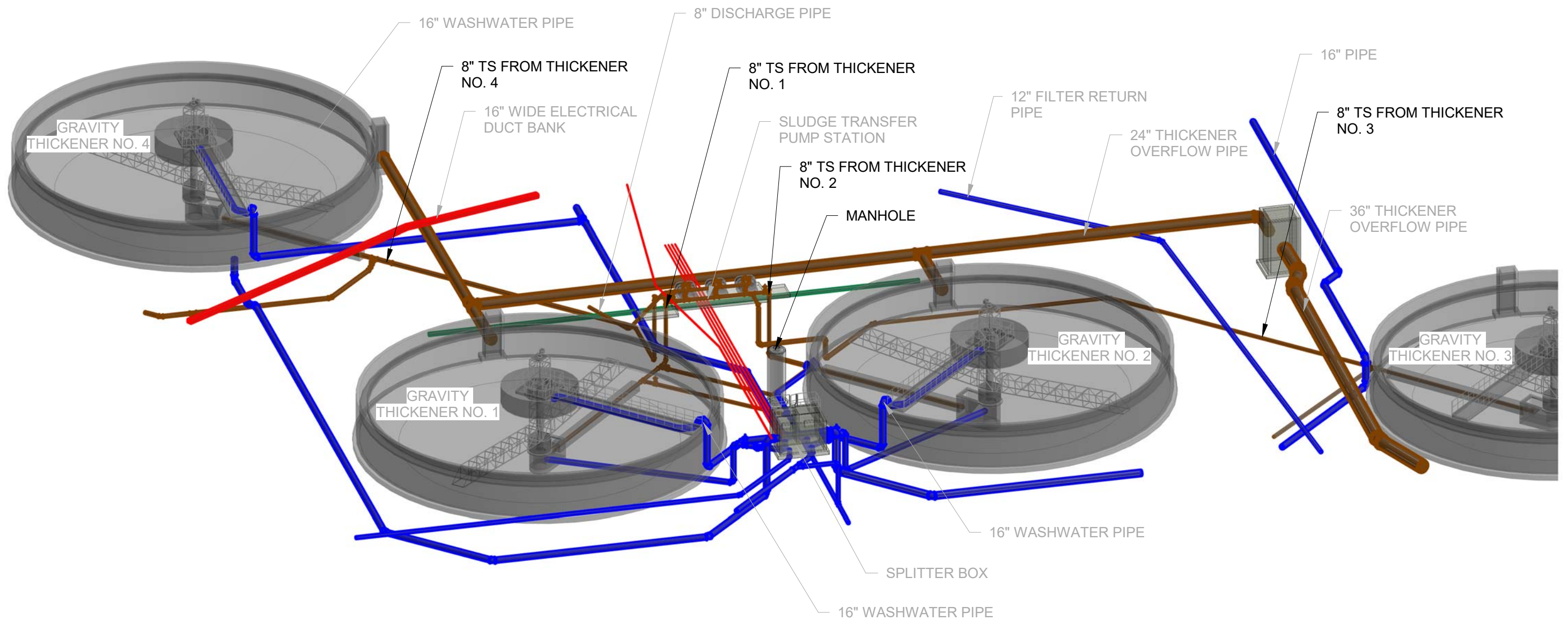
DLTWTF SLUDGE PIPING REPLACEMENT  
SLUDGE THICKENER 4 PROPOSED PIPING PROFILE



100% PLANS  
WORK ORDER NO. WTR-18-0009  
RECORD DRAWING NO.  
ATLAS PAGE D-14 SHEET 12 OF 22

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 BLVD, SUITE 350, TAMPA, FLA. 33607  
 C.A. NO. 7917

NO.	DATE	DESCRIPTION	BY

DESIGNED NMN  
 DRAWN AJS  
 CHECKED FJB  
 DATE 10/10/18

DLTWTF SLUDGE PIPING REPLACEMENT  
 ISOMETRIC VIEW 1



100% PLANS  
 WORK ORDER NO. WTR-18-0009  
 RECORD DRAWING NO.  
 ATLAS PAGE D-14 | SHEET 13 OF 22

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NITA NAIK  
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 3109 WEST DR. MARTIN LUTHER KING JR  
 BLVD, SUITE 350, TAMPA, FLA. 33607  
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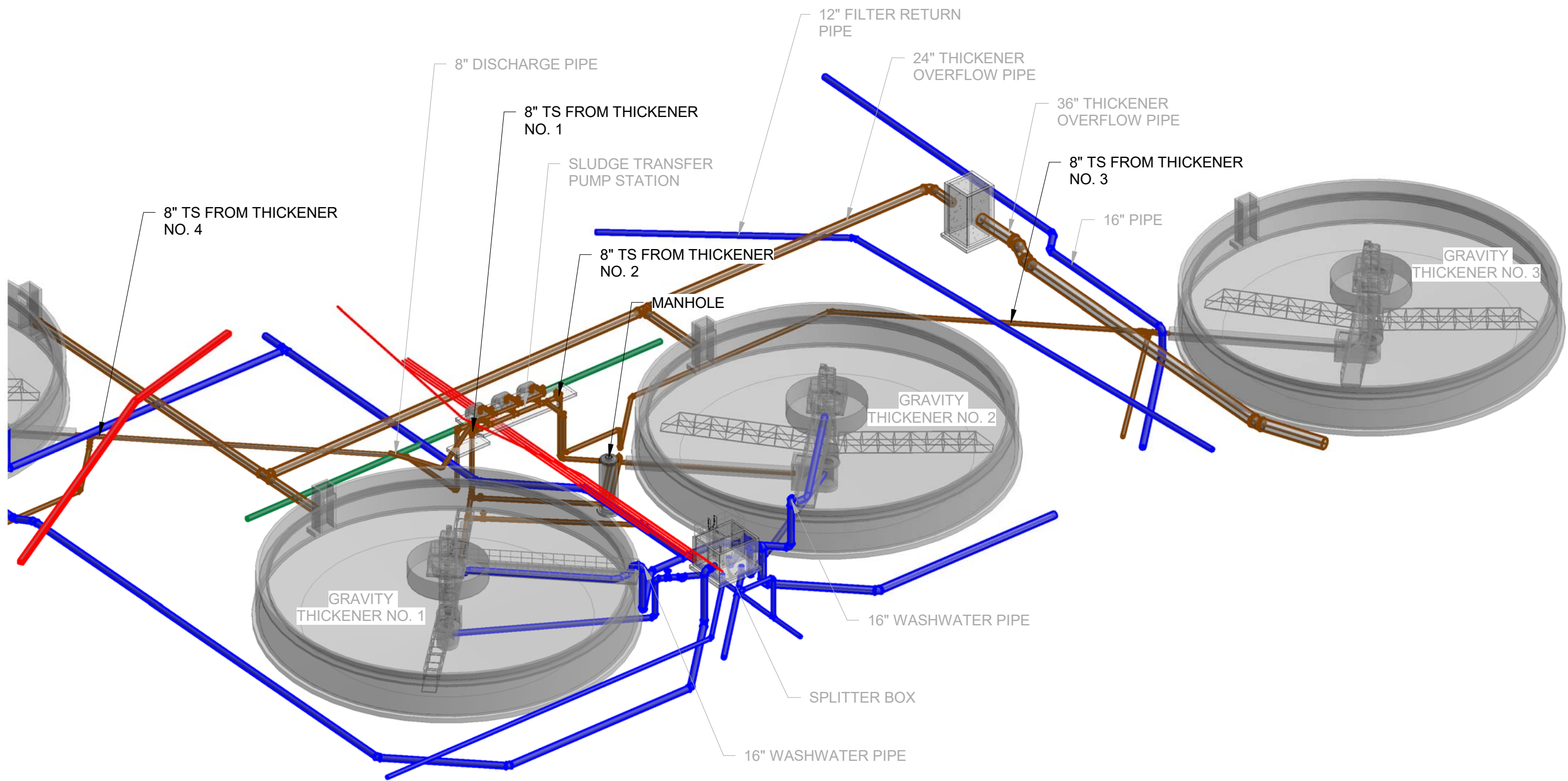
NO.	DATE	DESCRIPTION	BY

DESIGNED NMN  
 DRAWN AJS  
 CHECKED FJB  
 DATE 10/10/18

DLTWTF SLUDGE PIPING REPLACEMENT  
 ISOMETRIC VIEW 2



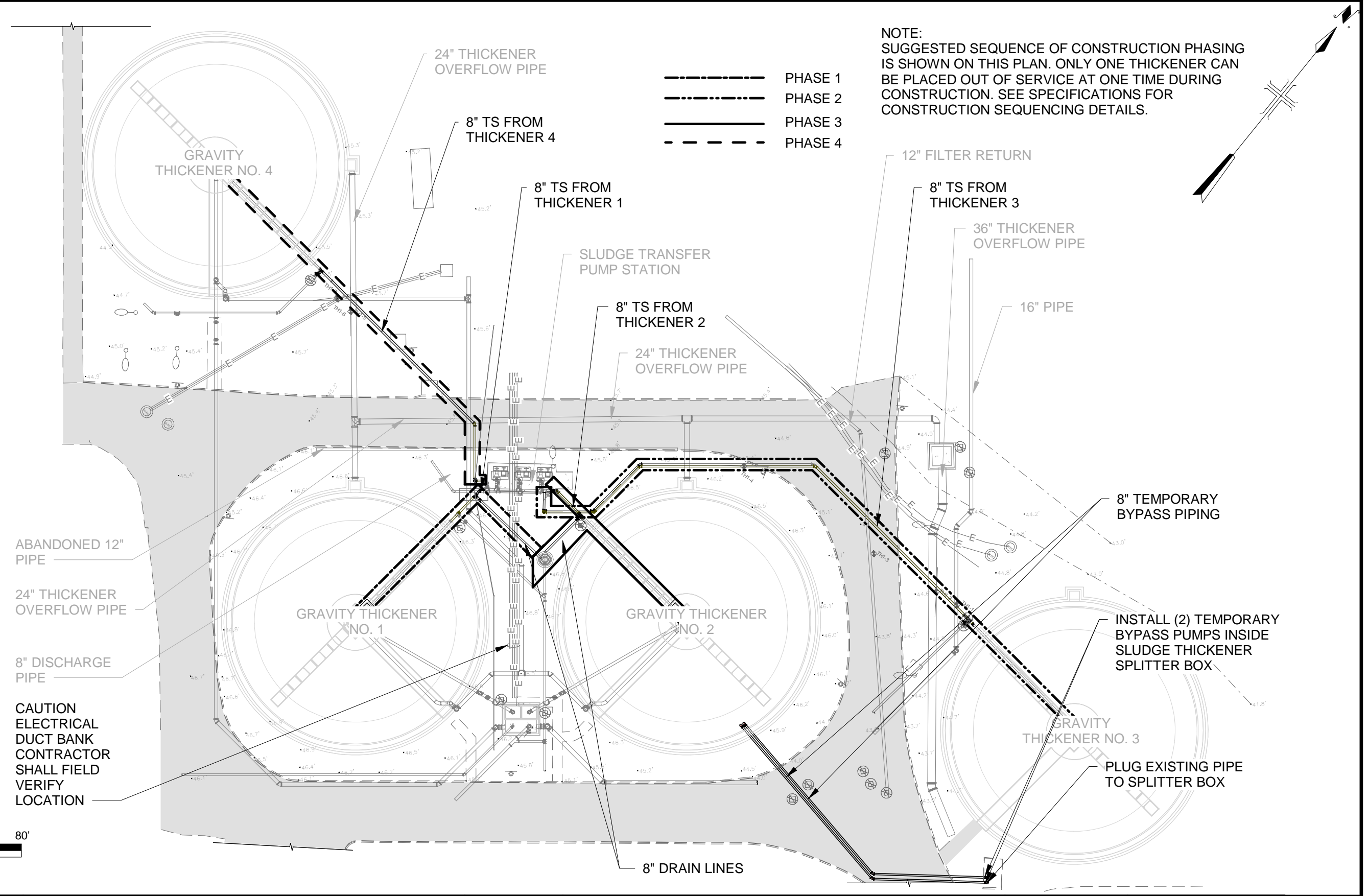
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 WORK ORDER NO. WTR-18-0009  
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9/25/2019 3:23:35 PM



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 3109 WEST DR. MARTIN LUTHER KING JR  
 BLVD, SUITE 350, TAMPA, FLA. 33607  
 C.A. NO. 7917

NO.	DATE	DESCRIPTION	BY

DESIGNED NMN  
 DRAWN AJS  
 CHECKED FJB  
 DATE 12/06/18

**DLTWTF SLUDGE PIPING REPLACEMENT**  
**SEQUENCE OF CONSTRUCTION**



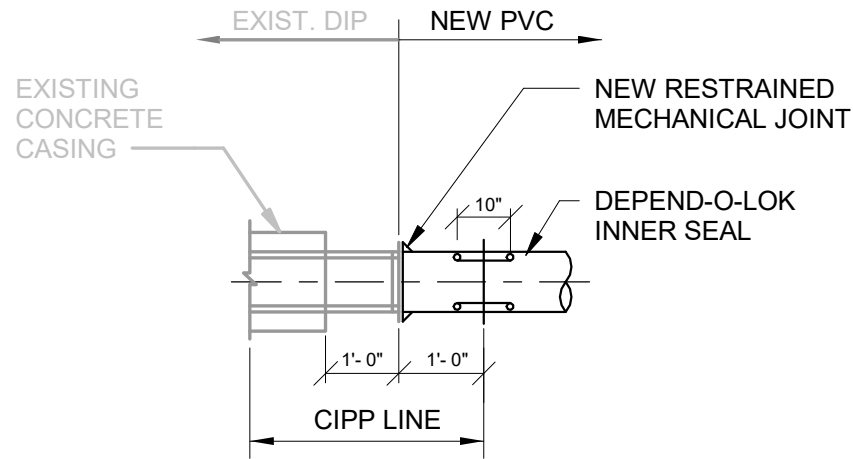
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 WORK ORDER NO. WTR-18-0009  
 RECORD DRAWING NO.  
 ATLAS PAGE D-14 SHEET 15 OF 22

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6/25/2019 7:34:41 PM

**STANDARD DETAILS FOR RESTORATION WITHIN ROADWAY**

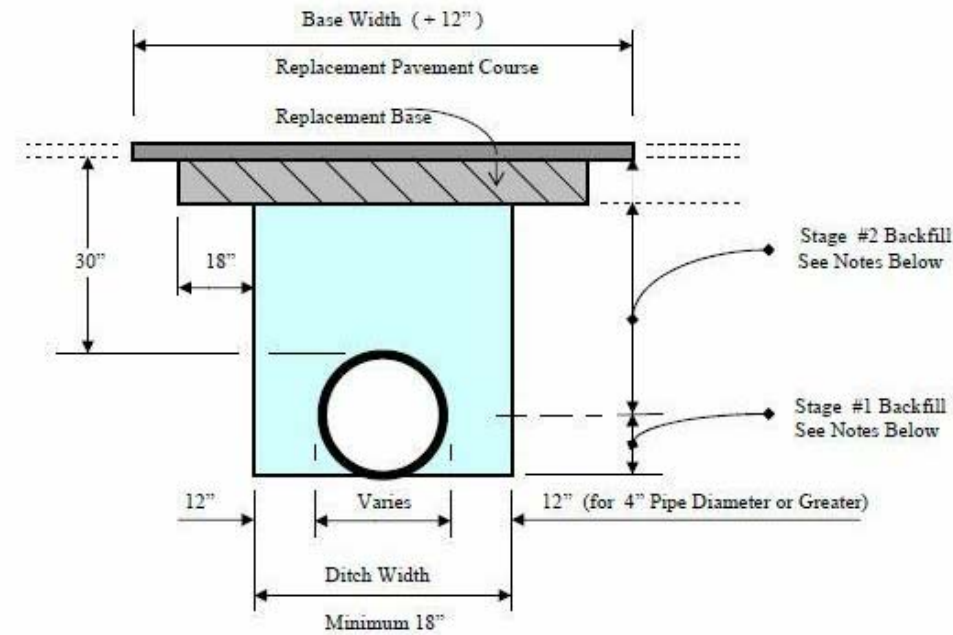
(Details Modified From FDOT Design Standards Index 307))



**NOTES:**

- COORDINATE WITH THE CITY REGARDING SHUTTING DOWN OF THE THICKENERS. EXCAVATE CAREFULLY NEAR THE FOUNDATION OF THE THICKENERS. CLEAN EXISTING PIPE UNDERNEATH THE THICKENER WITH COMPOSITE LINER AS SPECIFIED. LINE EXISTING CONCRETE ENCASED PIPE WITH COMPOSITE LINER TO LIMITS SHOWN IN THE DETAIL AND INSTALL DEPEND-O-LOK INNER SEAL TO TERMINATE THE LINER. TERMINATE LINER FLUSH WITH END OF PIPE LOCATED INSIDE THE THICKENER DISCHARGE WELL.
- CONNECT NEW PVC PIPE TO THE LINED DUCTILE IRON PIPE USING A RESTRAINED MECHANICAL JOINT. ALL ACCESSORIES SHALL BE TYPE 316 SS AND PROVIDE EPDM GASKET.

**LINER TERMINATION DETAIL**



**FLEXIBLE PAVEMENT NOTES:**

**Pavement shall be mechanically sawed.**

Pavement, Base, and Backfill material shall be placed in accordance with **City of Tampa Pavement Restoration Requirements – 2009**

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage # 2, construct compacted fill along sides of the pipe and up to the bottom of the base. Compact material using mechanical tamps suitable to achieve Density meeting 98% of AASHTO T-180, lifts not to exceed 12" compacted.

If mechanical compaction is difficult to achieve, then flowable fill may be used. In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2. If a method is provided to prevent floatation from occurring, Stage #1 and #2 can be combined, if approved by the Engineer.

Note: Specification Standards and Requirements not illustrated shall meet latest FDOT Standard Specifications.



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C.A. NO. 7917

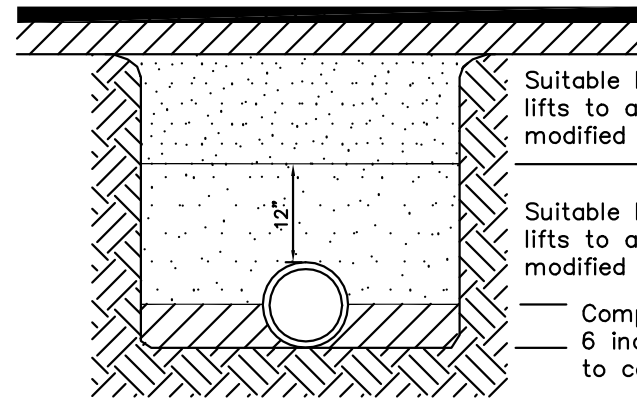
NO.	DATE	DESCRIPTION	BY

DESIGNED NMN  
DRAWN AJJ  
CHECKED FJB  
DATE 10/30/18

DLTWTF SLUDGE PIPING REPLACEMENT  
**DETAILS**



100% PLANS  
WORK ORDER NO. WTR-18-0009  
RECORD DRAWING NO.  
ATLAS PAGE D-14 SHEET 16 OF 22



Suitable backfill compacted in 12-inch lifts to a minimum 98% of the maximum modified proctor density

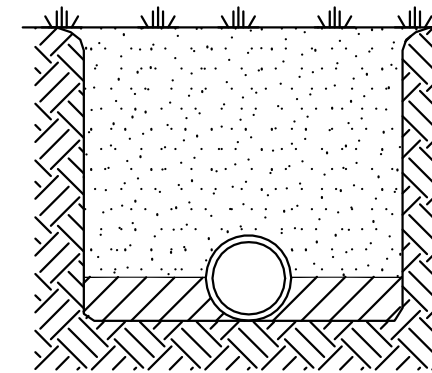
Suitable backfill compacted in 6-inch lifts to a minimum 98% of the maximum modified proctor density

— Compaction by hand in layers of 6 inches, lightly consolidated to centerline

**NOTES:**

1. Type 2 trench is defined as a flat-bottom trench. Lightly consolidate backfill to centerline of pipe.
2. This standard shall be utilized in the absence of specific standards. The standard of the agency controlling the Right-of-Way shall govern unless otherwise directed by the Engineer.
3. Suitable backfill shall be defined as material free from cinders, ashes, refuse, clay, organic matter, boulders, rocks or stones, or other material that in the opinion of the Engineer is unsuitable.
4. Non-pervious areas shall mean any concrete or asphalt curb, sidewalk, trail, driveway, or roadway.

TAMPA WATER DEPARTMENT	APPROVED Sept. 2011	REVISED _____ _____ _____	TRENCHING, BEDDING AND BACKFILL DETAIL FOR NON-PERVIOUS (paved) AREAS	2.01
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Suitable backfill compacted in 12-inch lifts to a minimum 95% of the maximum modified proctor density

— Compaction by hand in layers of 6 inches, lightly consolidated to centerline

**NOTES:**

1. Type 2 trench is defined as a flat-bottom trench. Lightly consolidate backfill to centerline of pipe.
2. This standard shall be utilized in the absence of specific standards. The standard of the agency controlling the Right-of-Way shall govern unless otherwise directed by the Engineer.
3. Suitable backfill shall be defined as material free from cinders, ashes, refuse, clay, organic matter, boulders, rocks or stones, or other material that in the opinion of the Engineer is unsuitable.
4. Non-paved area is a pervious area. If any part of the trench is within a concrete or asphalt curb, sidewalk, driveway, or roadway, then Standard Detail 2.01 applies.

TAMPA WATER DEPARTMENT	APPROVED Sept. 2011	REVISED _____ _____ _____	TRENCHING, BEDDING AND BACKFILL DETAIL FOR PERVIOUS (non-paved) AREAS	2.02
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NO.	DATE	DESCRIPTION	BY

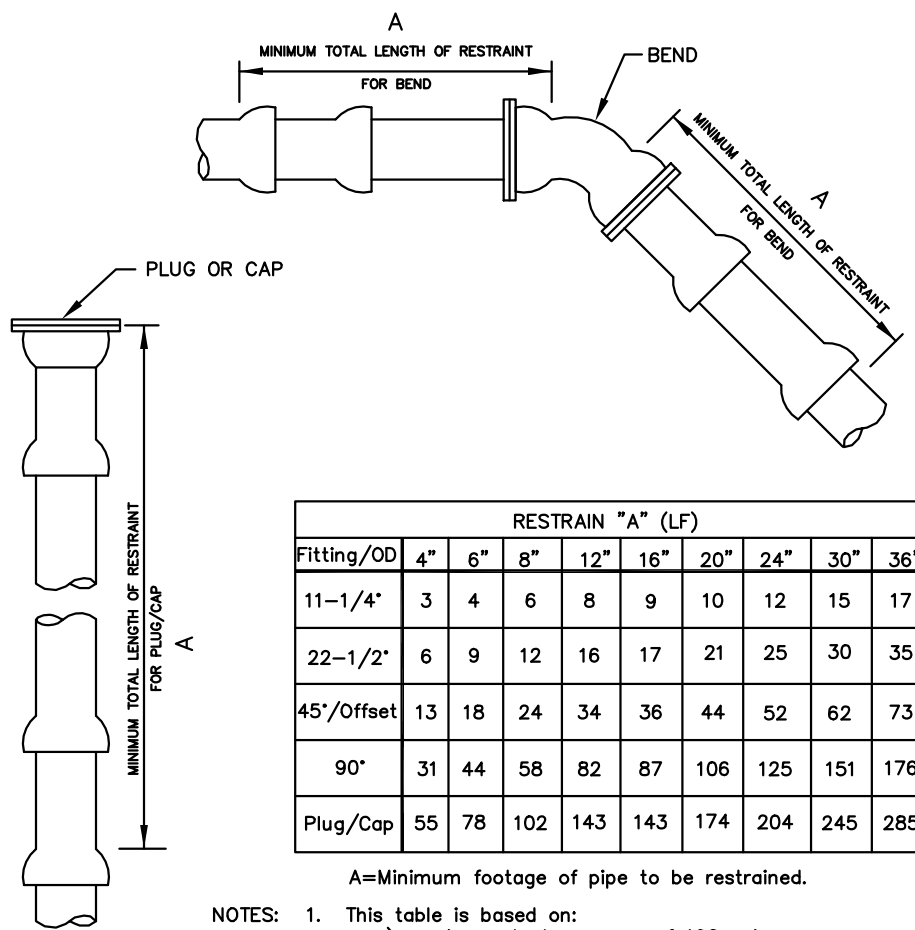
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DRAWN AJS  
CHECKED FJB  
DATE 10/30/18

DLTWTF SLUDGE PIPING REPLACEMENT  
DETAILS



100% PLANS  
WORK ORDER NO. WTR-18-0009  
RECORD DRAWING NO.  
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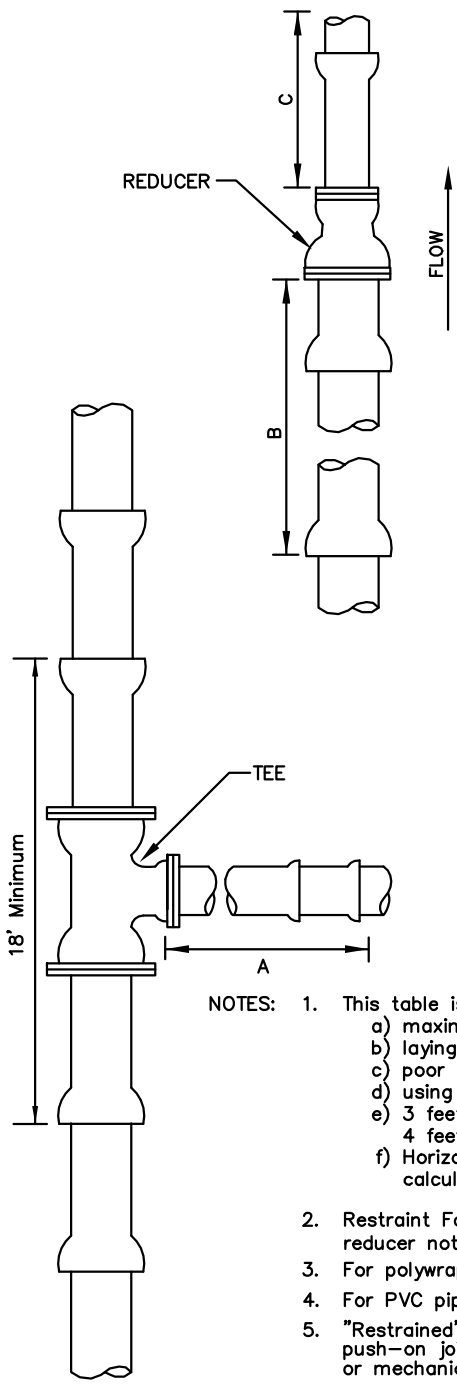




RESTRAIN "A" (LF)									
Fitting/OD	4"	6"	8"	12"	16"	20"	24"	30"	36"
11-1/4"	3	4	6	8	9	10	12	15	17
22-1/2"	6	9	12	16	17	21	25	30	35
45°/Offset	13	18	24	34	36	44	52	62	73
90°	31	44	58	82	87	106	125	151	176
Plug/Cap	55	78	102	143	143	174	204	245	285

- A=Minimum footage of pipe to be restrained.
- NOTES:
- This table is based on:
    - maximum test pressure of 190 psi
    - laying condition type 2 (see Details 2.01 and 2.02)
    - poor soil conditions
    - using D.I.P.
    - 3 feet of cover for 12" and smaller mains; 4 feet of cover for 16" and larger mains
    - Horizontal bends only – Engineer to submit calculations for vertical restraints
  - For polywrapped D.I.P., increase the footage to restrain by 25%.
  - For PVC pipe, increase the footage to restrain by 20%.
  - "Restrained" pipe shall be Manufactured Restrained Joint pipe, push-on joint pipe restrained w/gasket-type "Gripper Restraints", or mechanical joint pipe restrained by Megalug (or approved equivalent).
  - Any additional fittings within the restrained section shall be restrained accordingly.

TAMPA WATER DEPARTMENT	APPROVED Sept. 2011	REVISED _____ _____ _____	RESTRAINED JOINT STANDARD FOR BENDS, PLUGS, AND CAPS	2.11
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Fitting Size	Restrain (LF)		Unrestrained Straight Run (LF)
	Tee "A"	Reducer "B"	Reducer "C"
4x4	25	*	*
6x4	11	40	59
6x6	48	*	*
8x4	A.T.	73	142
8x6	38	43	56
8x8	72	*	*
12x4	A.T.	124	364
12x6	19	104	208
12x8	57	76	115
12x12	114	*	*
16x6	A.T.	121	321
16x8	27	104	212
16x12	77	61	82
16x16	118	*	*
20x6	A.T.	156	527
20x8	14	144	369
20x12	68	109	186
20x16	111	61	77
20x20	149	*	*
24x6	A.T.	189	777
24x8	A.T.	179	560
24x12	59	150	313
24x16	104	111	172
24x20	144	61	74
24x24	179	*	*
30x6	A.T.	234	1227
30x8	A.T.	226	904
30x12	45	204	542
30x16	94	173	341
30x20	135	134	208
30x24	172	86	110
30x30	220	*	*
36x6	A.T.	276	1784
36x8	A.T.	269	1328
36x12	30	251	824
36x16	83	226	551
36x20	127	195	373
36x24	165	156	245
36x30	215	86	106
36x36	261	*	*

- A.T.—Restrain required at Tee only. \*—not applicable
- NOTES:
- This table is based on:
    - maximum test pressure of 190 psi
    - laying condition type 2 (see Details 2.01 and 2.02)
    - poor soil conditions
    - using D.I.P.
    - 3 feet of cover for 12" and smaller mains; 4 feet of cover for 16" and larger mains
    - Horizontal bends only – Engineer to submit calculations for vertical restraints
  - Restraint For Reducers: If "C" straight run of pipe downstream of reducer not available, then restrain "B" upstream of reducer.
  - For polywrapped D.I.P., increase the footage to restrain by 25%.
  - For PVC pipe, increase the footage to restrain by 20%.
  - "Restrained" pipe shall be Manufactured Restrained Joint pipe, push-on joint pipe restrained w/gasket-type "Gripper Restraints", or mechanical joint pipe restrained by Megalug (or approved equivalent).
  - Any additional fittings within the restrained section shall be restrained accordingly.

TAMPA WATER DEPARTMENT	APPROVED Sept., 2011	REVISED _____ _____ _____	RESTRAINED JOINT STANDARD FOR TEES AND REDUCERS	2.12
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NOTE: THIS DETAIL IS FOR OTHER INCIDENTAL PIPE WORK. ALL NEW SLUDGE REPLACEMENT PIPE SHALL BE RESTRAINED.



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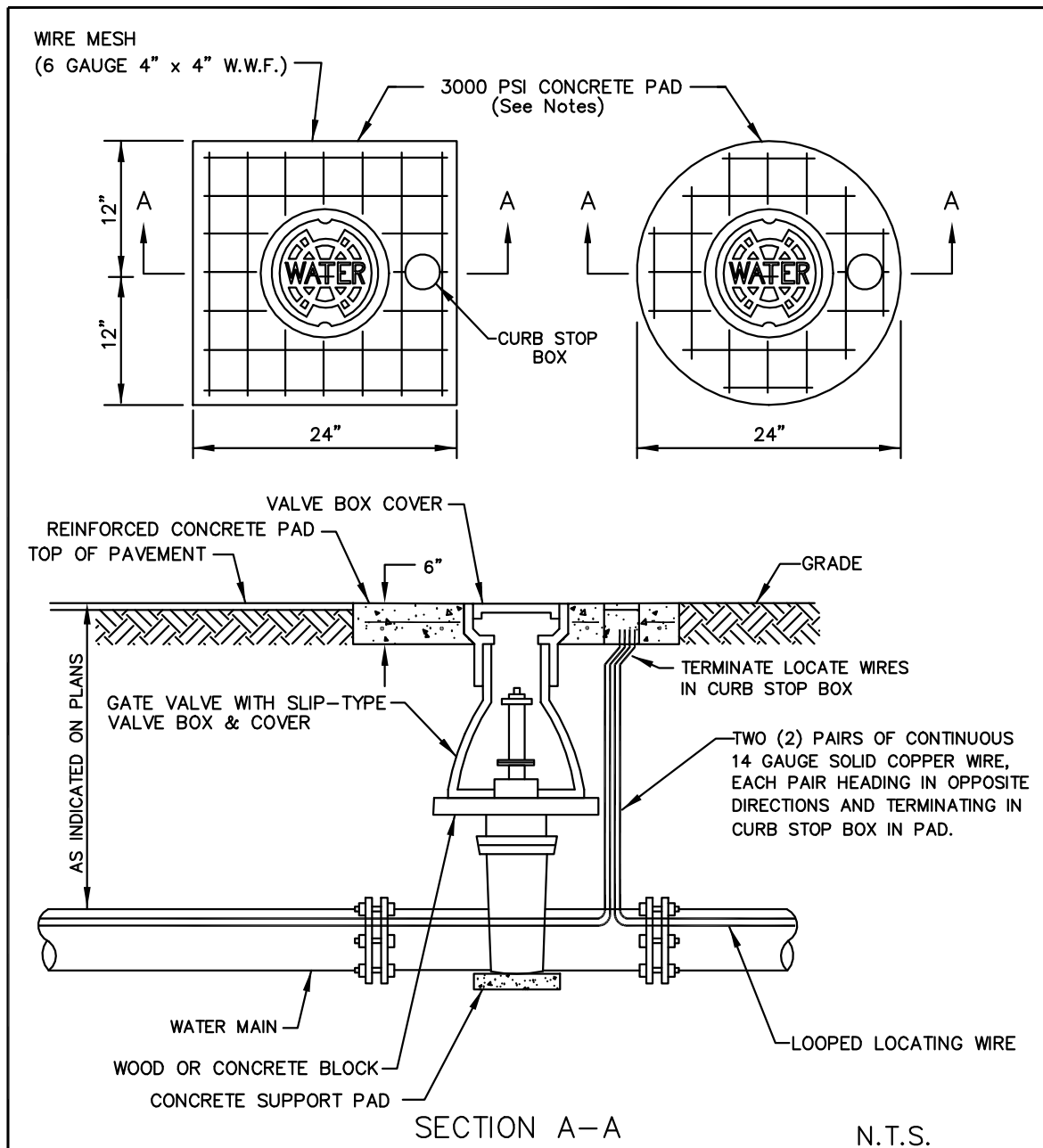
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DATE 10/30/18

DLTWTF SLUDGE PIPING REPLACEMENT  
DETAILS



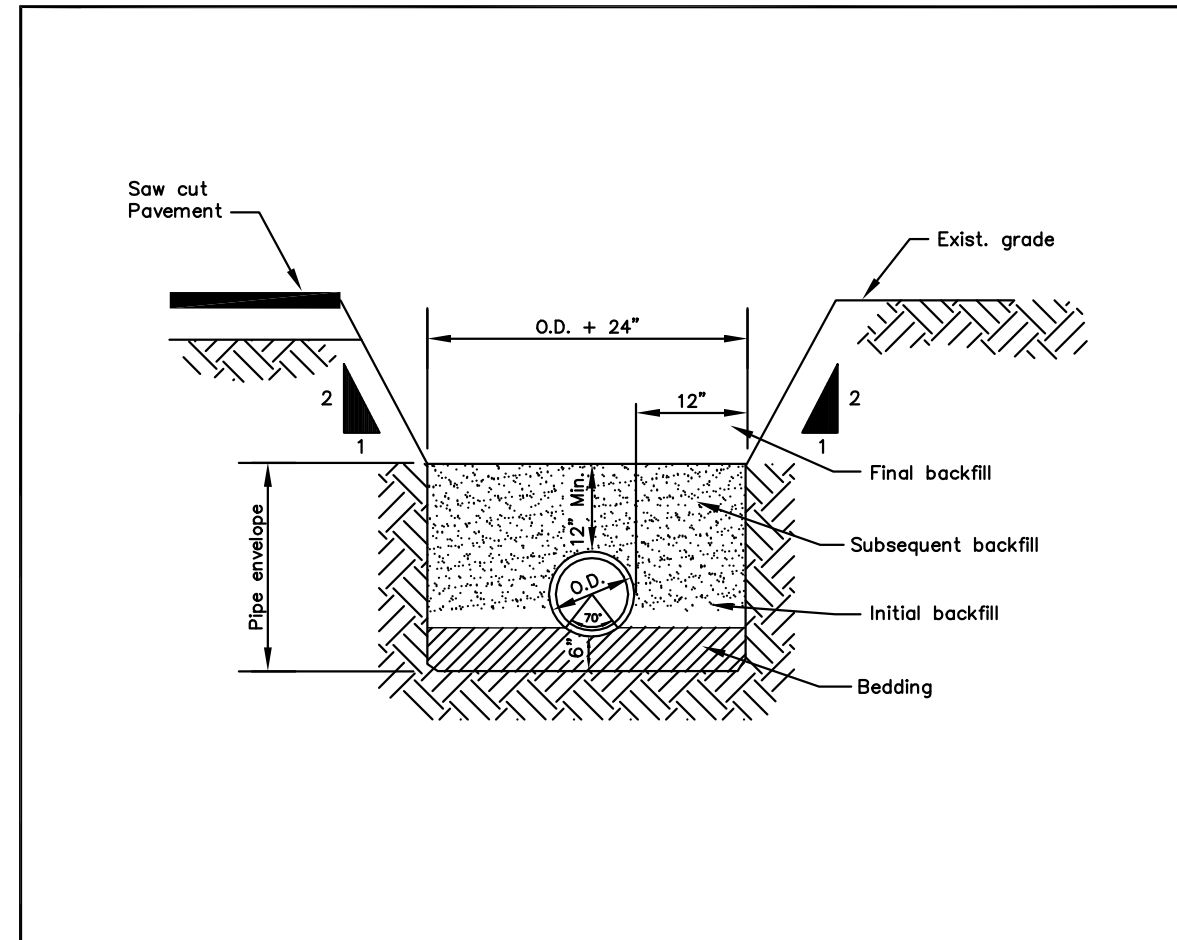
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WORK ORDER NO. WTR-18-0009  
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- Notes :
1. Circular or square concrete pad required for all valve box installations.
  2. Cast iron valve boxes shall be firmly supported and centered and plumb over the operating nut of the valve. Valve box cover shall be flush with the surface of finished pavement or grade or at such other level as may be directed by the Department.
  3. "Blue" Water Valve locate markers required for all valve installations.

TAMPA WATER DEPARTMENT	APPROVED Sept. 2011	REVISED _____ _____ _____	VALVE INSTALLATION W/VALVE BOX & PAD FOR PLASTIC PIPE	3.02
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- NOTES:
1. Pipe envelope bedding and backfill shall be compacted in 6" loose lifts.
  2. Backfill above pipe envelope shall be compacted in 12" loose lifts maximum.
  3. Backfill must be compacted to 98% of the maximum modified proctor density in paved and non-paved areas.

TAMPA WATER DEPARTMENT	APPROVED Sept. 2011	REVISED _____ _____ _____	PIPE BEDDING AND TRENCH FOR PVC PIPE	7.01
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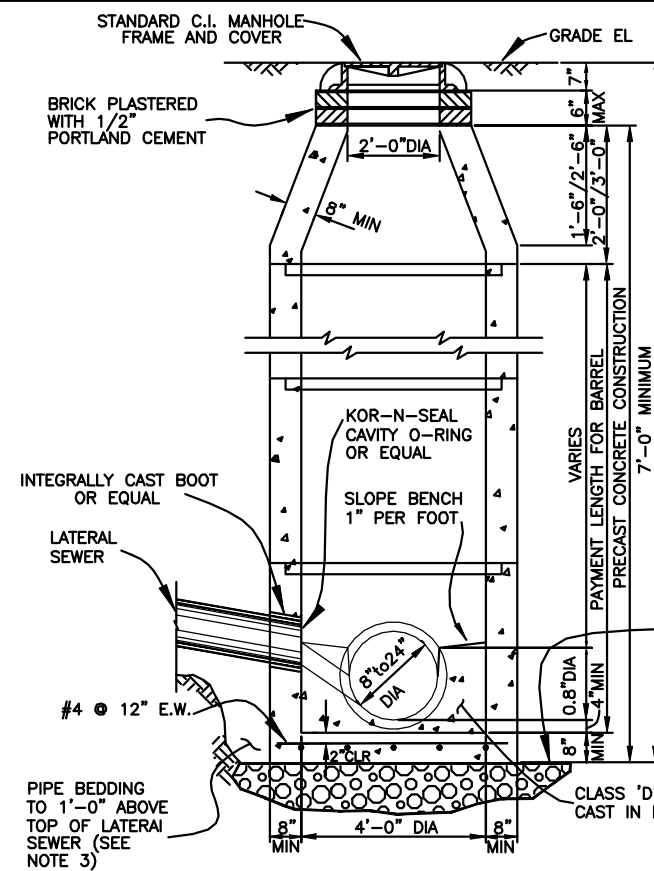
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DATE 10/30/18

DLTWTf SLUDGE PIPING REPLACEMENT  
MANHOLE STANDARD DETAILS



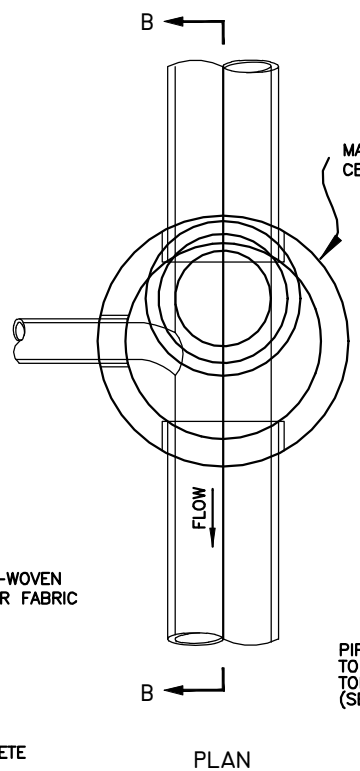
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WORK ORDER NO. WTR-18-0009  
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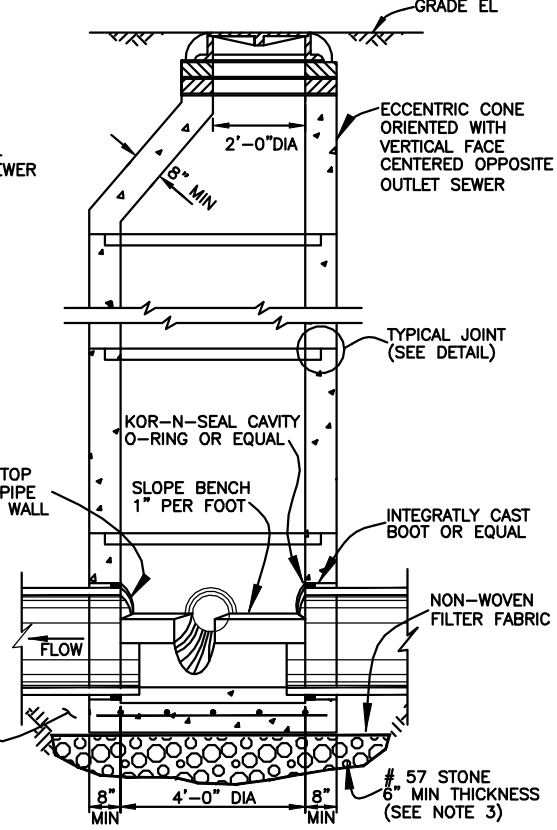


SECTION A-A

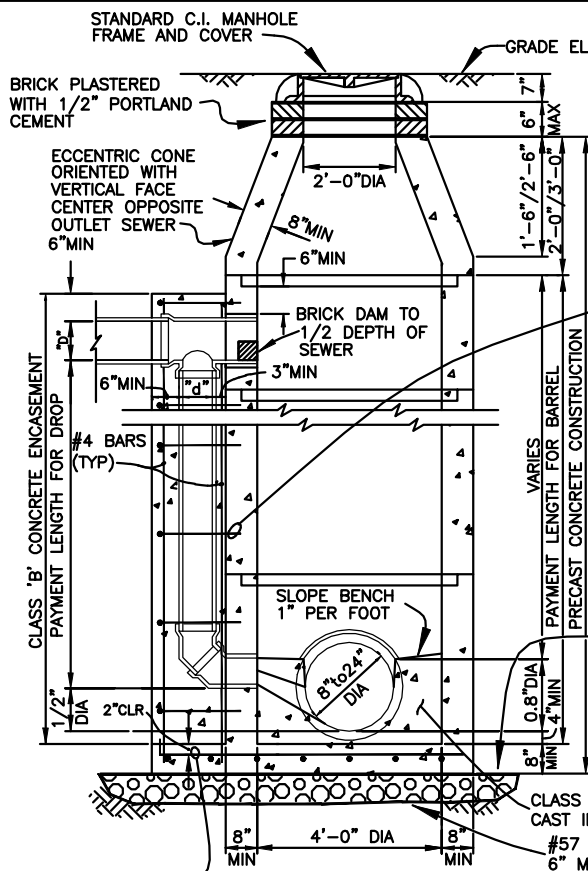
STANDARD MANHOLE - DEEP TYPE  
FOR SEWERS 24" OR LESS IN DIAMETER



PLAN

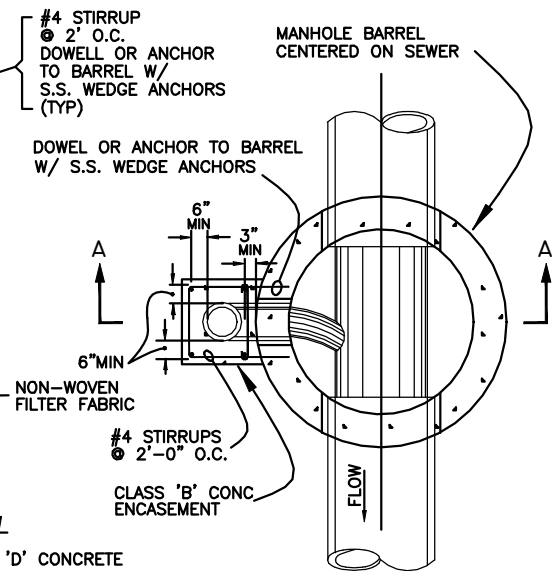


SECTION B-B

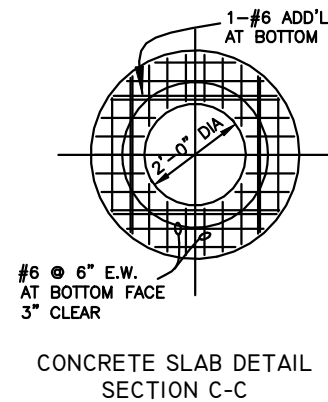


SECTION A-A

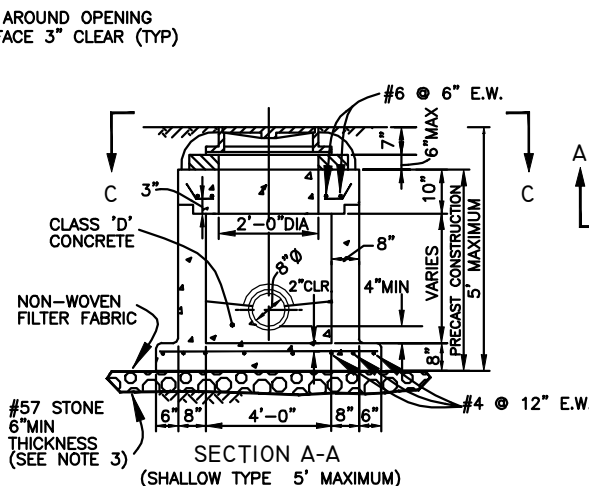
STANDARD DROP MANHOLE  
FOR SEWERS 24" OR LESS IN DIAMETER



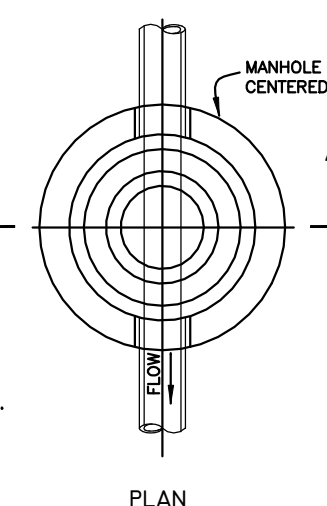
SECTIONAL PLAN



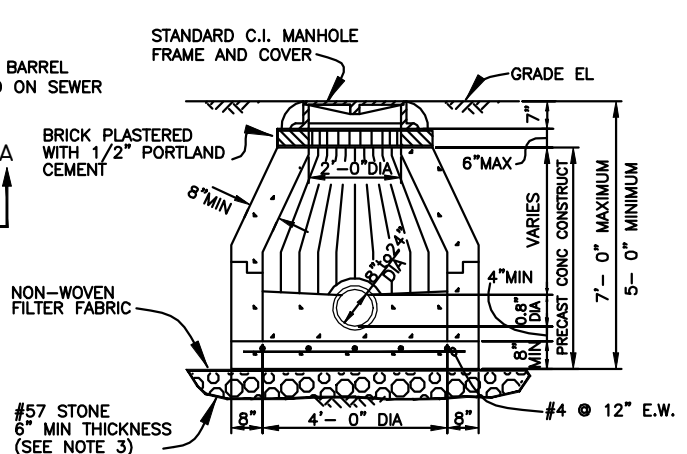
CONCRETE SLAB DETAIL  
SECTION C-C



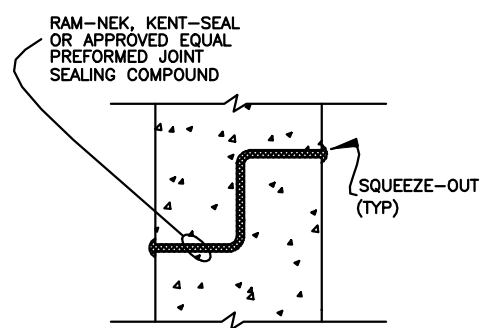
SECTION A-A  
(SHALLOW TYPE 5' MAXIMUM)  
STANDARD MANHOLE - SHALLOW TYPE  
FOR SEWERS 24" OR LESS IN DIAMETER



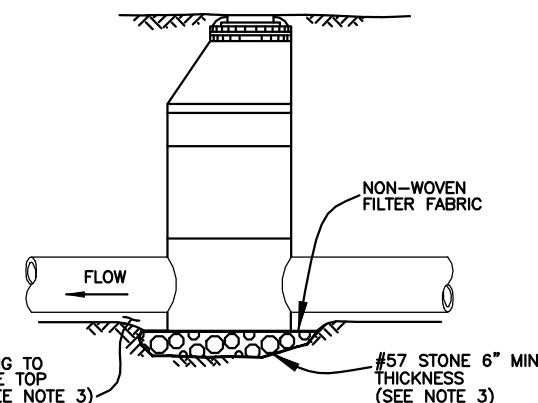
PLAN



SECTION A-A  
5'-0" TO 7'-0" DEEP  
(SEE NOTE 4)



MANHOLE BARREL  
JOINT DETAIL  
NOT TO SCALE  
(SEE NOTE 5)



ELEVATION  
FOR SEWERS 24" OR LESS IN DIAMETER  
NOT TO SCALE

SCHEDULE FOR DROP MANHOLE	
INLET PIPE DIAMETER "D"	DROP PIPE DIAMETER "d"
8"	8"
10"	8"
12"	10"
15"	12"
18"	15"
21"	18"
24"	18"

- NOTES
1. REINFORCING STEEL FOR ALL MANHOLES SHALL CONFORM TO ASTM-DES: C-48 AND PLACED AS DESCRIBED IN THE SPECIFICATIONS.
  2. ALL PIPE STUBS FROM MANHOLES FOR FUTURE CONNECTIONS OR OTHER CONTRACT DIVISIONS SHALL BE PROVIDED WITH WATER TIGHT PLUGS PLACED FROM WITHIN THE MANHOLE.
  3. SEE SPECIFICATIONS FOR MATERIALS REQUIREMENTS AND PLACEMENTS AND COMPACTION OF PIPE AND STRUCTURE BEDDING.
  4. STANDARD SHALLOW-TYPE MANHOLES WITH DEPTHS BETWEEN A MAXIMUM OF 7'-0" AND A MINIMUM OF 5'-0" MUST HAVE A CONCRETE CONE FOR THE TOP SECTION.
  5. ALL MANHOLE JOINTS MUST BE SEALED WITH AN ACCEPTABLE JOINT SEALING COMPOUND REGARDLESS OF WHETHER AN O-RING GASKET IN A PREFORMED GROOVE IS USED.
  6. FILTER FABRIC SHALL BE NON-WOVEN FABRIC PER D.O.T. SPECIFICATION SECTIONS 514 AND 985 AND SHALL BE WRAPPED ENTIRELY AROUND THE #57 STONE.



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DLTWF SLUDGE PIPING REPLACEMENT  
MANHOLE STANDARD DETAILS

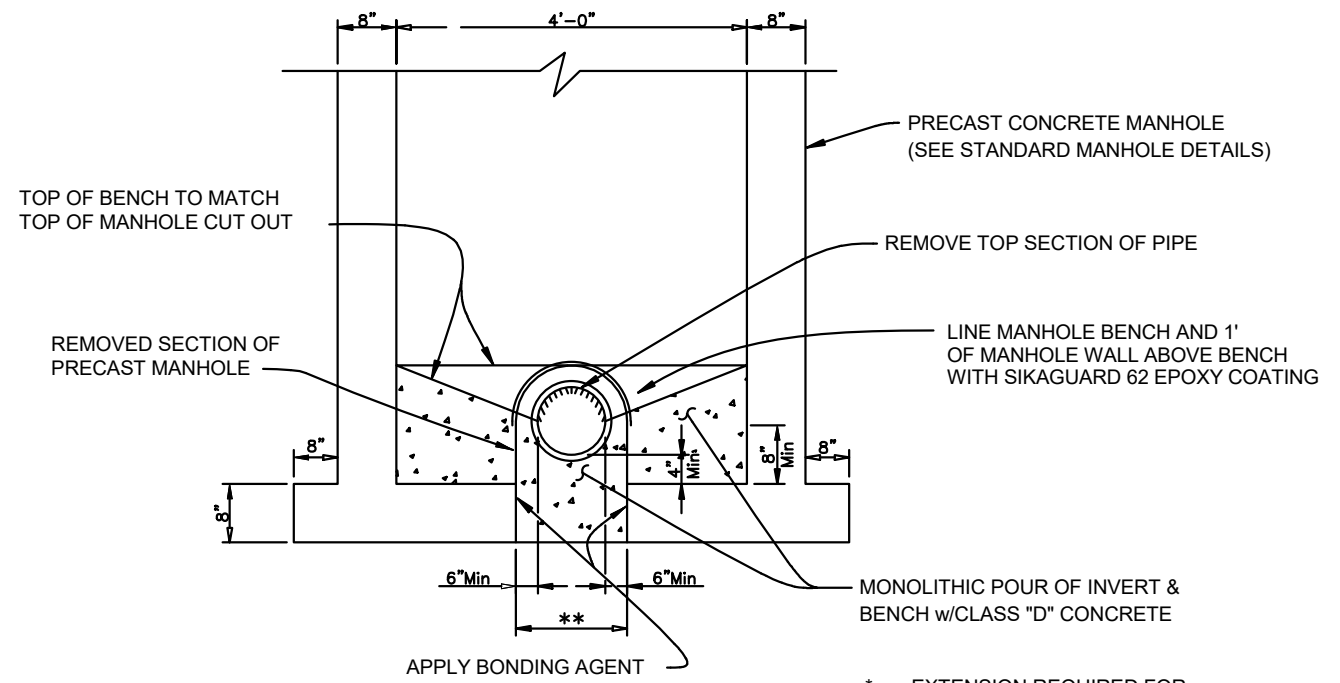
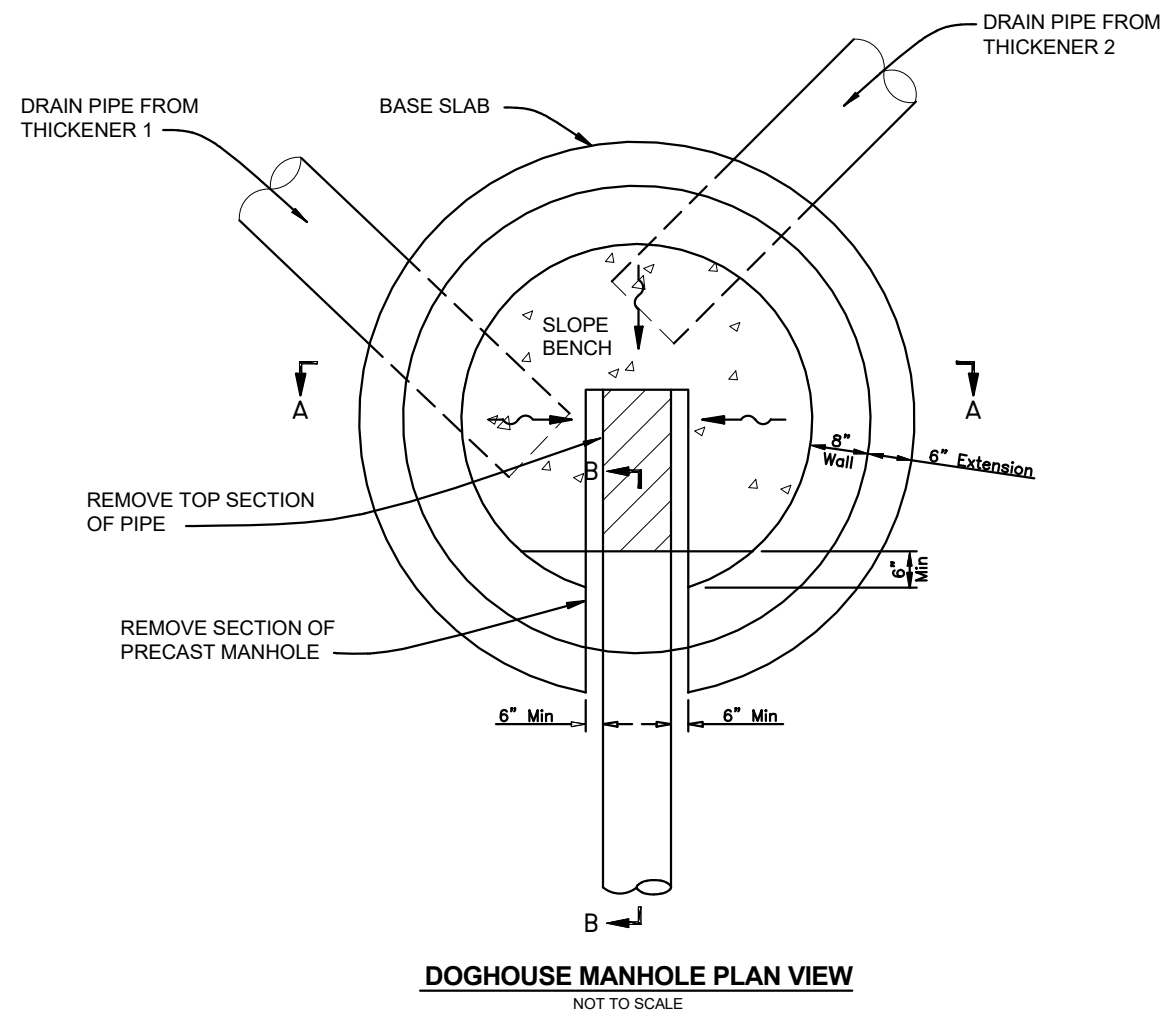


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WORK ORDER NO. WTR-18-0009  
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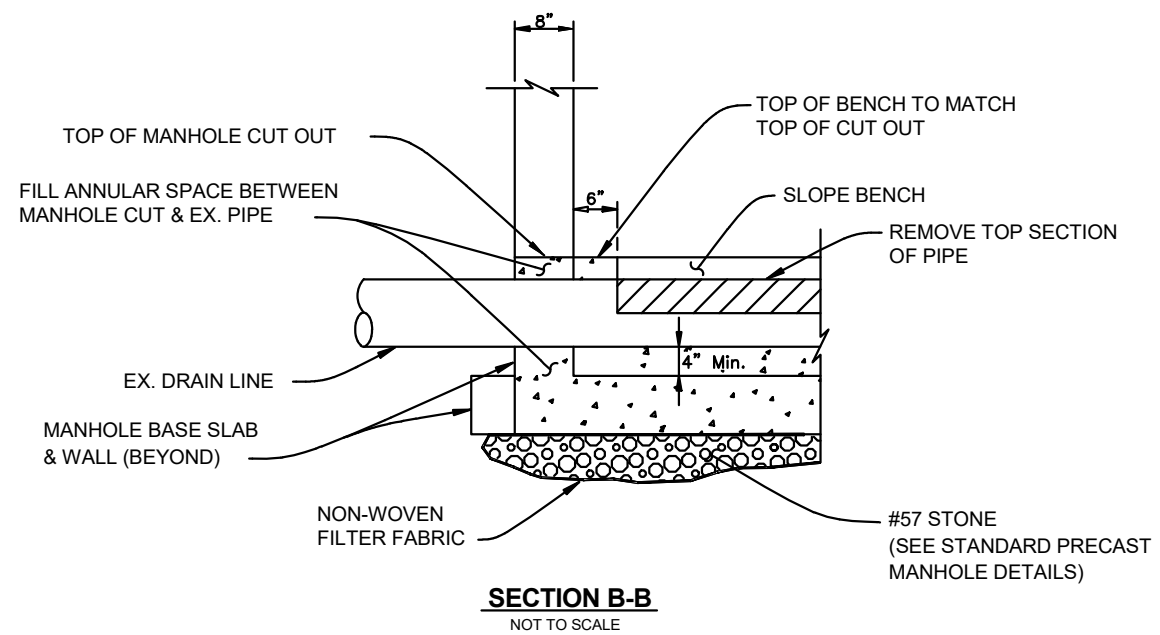


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\* EXTENSION REQUIRED FOR DOGHOUSE STYLE MANHOLES  
 \*\* TYPICAL WIDTH OF OPENING IS 24" FOR AN EX. 8" PIPE



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 MANHOLE STANDARD DETAILS



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### Subsurface Utility Engineering Test Hole Data

Test Hole (TH)	Utility Type	Utility Material	Utility Size Outside Diameter inches	Utility Manual Depth feet	Datums:		Ground Elevation	Utility Elevation
					Horizontal:			
					Northing	Easting		
1-1	WM	DIP	16"	5.76'	1339381.34'	519436.23'	44.78'	39.02'
1-2	WM	DIP	36"	3.78'	1339380.16'	519426.36'	44.59'	40.81'
1-3	FM	PVC	16"	4.80'	1339376.27'	519396.78'	44.10'	39.30'
1-4	SLUDGE	DIP	8"	5.70'	1339370.77'	519333.25'	45.66'	39.96'
1-5	SAN	DIP	20"	3.04'	1339319.30'	519169.04'	45.75'	42.71'
1-6	BE	CONC	16"	1.24'	1339319.96'	519161.77'	45.55'	44.31'
1-7	FM	DIP	16"	5.26'	1339320.24'	519161.20'	45.60'	40.34'

**Notes:** 1-6 - Pin is set at center of buried electric duct bank.

1-7 - Pin is set on north edge, force main runs underneath the electrical duct bank.



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NO.	DATE	DESCRIPTION	BY

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DRAWN AJS  
CHECKED FJB  
DATE 06/03/19

DLTWTF SLUDGE PIPING REPLACEMENT

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SUE INFORMATION



WORK ORDER NO. WTR-18-0009  
RECORD DRAWING NO.  
ATLAS PAGE D-14 SHEET 22 OF 22