

SMITHFIELD IRRIGATION COMPANY DIVERSION SYSTEM IMPROVEMENTS PROJECT

SMITHFIELD, UT

2025

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ENGINEERING CONSULTANTS (SE)

Sunrise Engineering

Scott Archibald, P.E. Principal Engineer

Steven Wood, P.E. Project Manager

Haiming Peng, P.E. Project Engineer

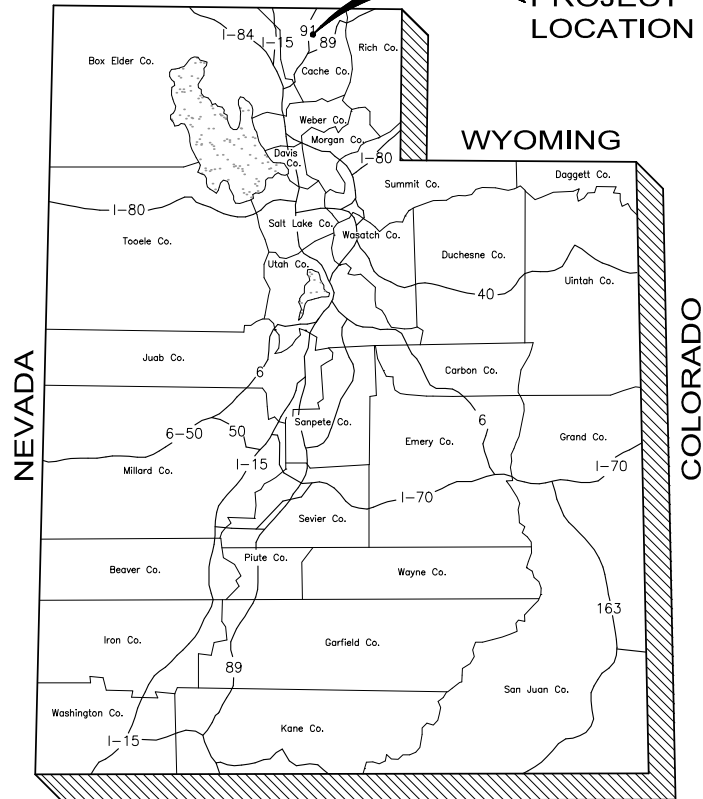


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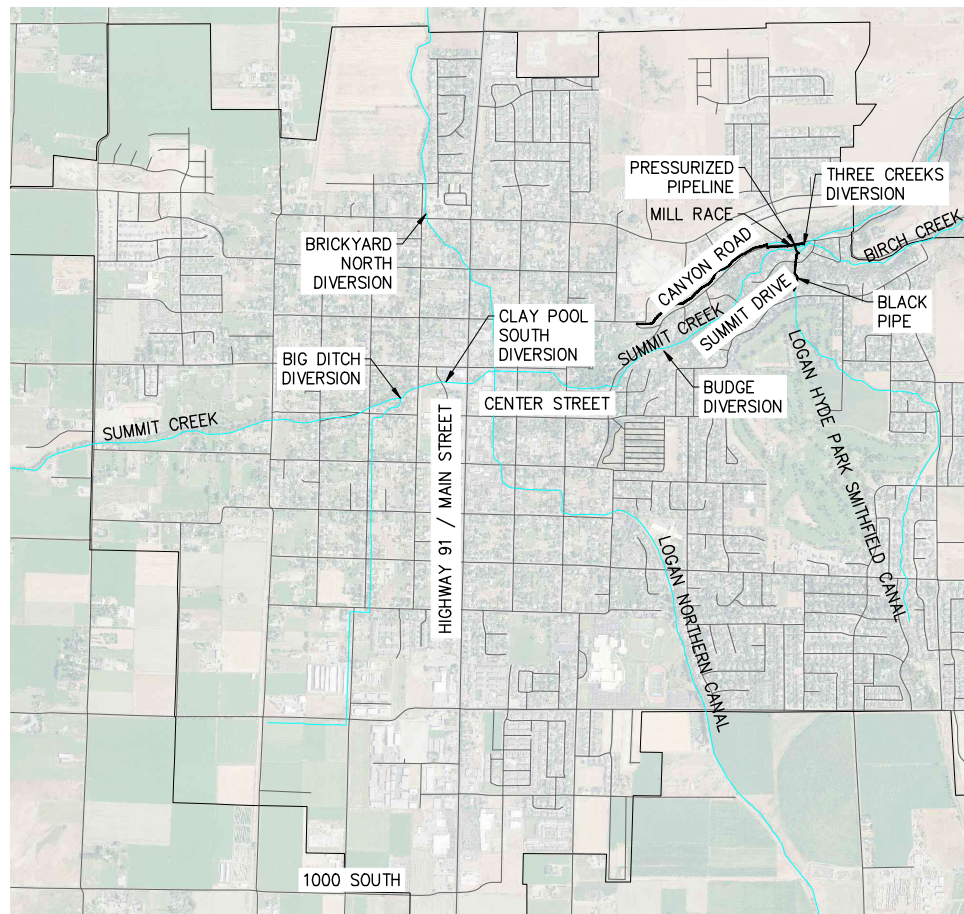
AREA MAP

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LOCATION MAP

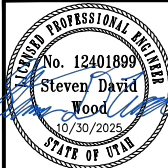


SMITHFIELD, UT

SHEET INDEX

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SUNRISE

ENGINEERING

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SMITHFIELD IRRIGATION COMPANY

DIVERSION SYSTEM IMPROVEMENTS

GENERAL

AREA MAPS AND SHEET INDEX

SEE NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	GN2
12499	HP	JJ	SDW	2 of 61	

P:\Smithfield Irrigation Company\12499 - SIC Diversion System Improvements Project 2025\DWG\Sheets\SIC-DSI-GN2.dwg Oct 30, 2025 4:54pm jjolley

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SE GENERAL NOTES

1. ALL SITE WORK SHALL CONFORM TO THE CURRENT EDITION OF THE AMERICAN PUBLIC WORKS ASSOCIATION UNIFORM STANDARD SPECIFICATIONS AND DETAILS (APWA SPECIFICATIONS AND DETAILS) AND ANY SUPPLEMENTS TO THE APWA SPECIFICATIONS AND DETAILS BY SMITHFIELD CITY UNLESS SPECIFICALLY STATED OTHERWISE IN THESE PLANS.
2. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF EXISTING PERMITS, RENEWAL OF LAPSED PERMITS, AND OBTAINING ANY NEW PERMITS, INCLUDING, BUT NOT LIMITED TO, DUST CONTROL PERMITS, ENCROACHMENT PERMITS, TRAFFIC CONTROL PERMITS, AND/OR UTAH POLLUTANT DISCHARGE ELIMINATE SYSTEM (UPDES) PERMITS.
3. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ARRANGEMENTS FOR INSPECTION AND TESTING BY AN INDEPENDENT AND QUALIFIED LABORATORY.
4. THE CONTRACTOR SHALL NOTIFY SMITHFIELD IRRIGATION COMPANY 24 HOURS PRIOR TO CONSTRUCTION. CONSTRUCTION CONCEALED WITHOUT THE REQUIRED INSPECTION SHALL BE SUBJECT TO EXPOSURE AT THE CONTRACTOR'S EXPENSE.
5. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR MUST CALL BLUE STAKE AT (800) 662-4111 AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION BEGINS.
6. THE CONTRACTOR SHALL FOLLOW GUIDELINES AND REGULATIONS SET FORTH BY O.S.H.A. SUNRISE ENGINEERING WILL NOT BE RESPONSIBLE FOR JOB-SITE SAFETY PROCEDURES OR CONDITIONS.
7. THE CONTRACTOR IS RESPONSIBLE FOR HIS OWN TAKEOFF QUANTITIES. QUANTITIES IF SHOWN HEREON ARE ESTIMATES ONLY AND AS SUCH ARE NOT TO BE USED FOR BID PURPOSES.
8. THE CONTRACTOR IS RESPONSIBLE FOR THE NOTIFICATION OF THE PROPER AUTHORITY(S) IF THERE ARE OBSTRUCTIONS TO PROPOSED IMPROVEMENTS AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY EXISTING ITEM REMOVED TO FACILITATE CONSTRUCTION SHALL BE REPLACED IN THE SAME OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE.
9. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES FOR LOCATION OF SERVICE AND/OR RELOCATION OF UTILITIES IN CONFLICT WITH PROPOSED CONSTRUCTION. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR COORDINATING THE RELOCATION OF UTILITIES, POWER POLES, ETC.
10. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REMOVE AND SAFELY DISPOSE OF ALL REMOVAL MATERIAL AND DEBRIS DEEMED UNSALVAGEABLE BY ENGINEER. THE CONTRACTOR SHALL MAKE APPROPRIATE ARRANGEMENTS FOR DISPOSAL SITES AT WHICH DEBRIS MAY BE LAWFULLY DISPOSED. NO CONSTRUCTION DEBRIS WILL BE BURIED IN THE PIPELINE TRENCH.
11. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL ON AND AROUND THE CONSTRUCTION SITE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS.
12. THE CONTRACTOR SHALL PROVIDE ADEQUATE MEANS FOR CLEANING TRUCKS AND/OR OTHER EQUIPMENT OF MUD PRIOR TO ENTERING PUBLIC STREETS, AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO CLEAN STREETS, AND TAKE WHATEVER MEASURES ARE NECESSARY TO INSURE THAT ALL ROADS ARE MAINTAINED IN A CLEAN, MUD AND DUST FREE CONDITION AT ALL TIMES. NO WORK WILL BE CONSIDERED COMPLETE UNTIL ALL PAVEMENTS HAVE BEEN SWEEPED CLEAN OF DIRT AND DEBRIS.
13. PRIOR TO MOVING OR DESTROYING PROTECTED NATIVE PLANT SPECIES, THE CONTRACTOR SHALL FILE A FORMAL NOTICE OF INTENT WITH THE UTAH DEPARTMENT OF AGRICULTURE NATIVE PLANTS.
14. A THOROUGH ATTEMPT HAS BEEN MADE TO SHOW THE LOCATIONS OF ALL UNDERGROUND OBSTRUCTIONS AND UTILITY LINES IN THE WORK AREA. HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO OBSTRUCTIONS AND UTILITY LINES ENCOUNTERED DURING CONSTRUCTION AND SHALL DETERMINE THE EXACT LOCATION OF UTILITIES IN ADVANCE OF TRENCHING. THE ENGINEER WILL NOT GUARANTEE ANY ELEVATIONS AT LOCATIONS OF THE EXISTING UNDERGROUND UTILITIES SHOWN ON THESE PLANS.
15. THE CONTRACTOR SHALL PROVIDE A LICENSED SURVEYOR FOR THE SURVEYING/CONSTRUCTION STAKING OF ALIGNMENT AND GRADE FOR EACH MAIN AND/OR FACILITY AS SHOWN ON THE PLANS.
16. EXACT POINT OF MATCHING, TERMINATION AND OVERLAY, IF NECESSARY, MAY BE DETERMINED IN THE FIELD BY THE ENGINEER OF RECORD OR THE RESIDENT ENGINEER OVERSEEING THE PROJECT CONSTRUCTION.
17. ANY AMBIGUITIES OR DEFICIENCIES DISCOVERED ON THESE PLANS ARE TO BE RESOLVED BY SUNRISE ENGINEERING OR ITS APPOINTED REPRESENTATIVE. ANY MODIFICATIONS TO THESE PLANS MADE BY ANYONE OTHER THAN SUNRISE ENGINEERING OR ITS APPOINTED REPRESENTATIVE IS SOLELY RESPONSIBLE FOR THOSE MODIFICATIONS.
18. THE CONTRACTOR SHALL NOT REMOVE, TRIM, OR OTHERWISE CUT ANY TREES WITHOUT WRITTEN APPROVAL FROM SMITHFIELD CITY IN RIGHT-OF-WAY AREAS
19. WHEN REMOVING BRANCHES FROM TREES, THE BRANCH IS TO BE CUT WITH A CLEAN (BLEACHED) SAW BLADE AT THE POINT OF CONNECTION OF THE BRANCH TO A PRIMARY BRANCH OR TRUNK
20. ALL NEW CONCRETE STRUCTURES WILL BE BUILT ON A 4" MIN LAYER OF COMPACTED STRUCTURAL FILL. THE STRUCTURAL FILL IS TO BE COMPACTED TO 95% OF A MODIFIED PROCTOR FOR THE STRUCTURAL FILL MATERIAL. THE NATIVE MATERIAL BELOW THE STRUCTURAL FILL IS TO REMAIN UNEXCAVATED AND IS TO BE PLATE COMPACTED PRIOR TO STRUCTURAL FILL PLACEMENT.

ABBREVIATIONS

ABC	AGGREGATE BASE COURSE
AC	ASPHALT CONCRETE
BCF	BRASS CAP FLUSH
BCHH	BRASS CAP IN HAND HOLE
BCR	BEGIN CURB RETURN
BM	BENCHMARK
BSW	BACK OF SIDEWALK
BTM	BOTTOM
CB	CATCH BASIN
C/L	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
CONC	CONCRETE
CONST	CONSTRUCTION
CY	CUBIC YARD
DI	DUCTILE IRON
D/W	DRIVEWAY
DWG	DRAWING
DTL	DETAIL
E	EAST
ECR	END CURB RETURN
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
ESMT	EASEMENT
EX, EXIST	EXISTING
EG	EXISTING GROUND
FC	FACE OF CURB
FES	FLARED END SECTION
FF	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLANGE
FND	FOUND
FO	FIBER OPTIC
FPS	FEET PER SECOND
FSW	FRONT OF SIDEWALK
FT	FOOT, FEET
G	GAS, GUTTER, GRADE
GB	GRADE BREAK
GPM	GALLONS PER MINUTE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HP	HIGH POINT
HW	HIGHWATER
IN.	INCH, INCHES
INV	INVERT
IRR, IRRIG	IRRIGATION
L	LENGTH
LF	LINEAR FEET
LT	LEFT
MH	MANHOLE
MJ	MECHANICAL JOINT
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO.	NUMBER
OHE	OVERHEAD ELECTRIC
OPNG	OPENING
P/L	PROPERTY LINE
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVE
PCC	PORTLAND CEMENT CONCRETE
PRC	POINT OF REVERSE CURVE
PT	POINT OF TANGENCY
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS
R/W	RIGHT-OF-WAY
RGRCP	RUBBER GASKETED REINFORCED CONCRETE PIPE
RJ	RESTRAINED JOINT
RT	RIGHT
S	SEWER, SLOPE, SOUTH
SDMH	STORM DRAIN MANHOLE
SF	SQUARE FEET
SSMH	SANITARY SEWER MANHOLE
STA	STATION
STD	STANDARD
SWK	SIDEWALK
SY	SQUARE YARD
TAN	TANGENT
TBC	TOP BACK OF CURB
T, TEL	TELEPHONE
TL	TRUE LENGTH
TOC	TOP OF CONCRETE
TOW	TOP OF WALL
TYP	TYPICAL
UGE	UNDERGROUND ELECTRIC
UPRR	UNION PACIFIC RAILROAD
VNAE	VEHICLE NON-ACCESS EASEMENT
Vr	VOLUME REQUIRED
Vp	VOLUME PROVIDED
W	WATER, WEST, WITH
XFMR	TRANSFORMER

EXISTING	
	EXISTING CONCRETE
	EXISTING PAVEMENT TO BE REMOVED
	EXISTING PAVEMENT TO REMAIN
	EXISTING IRRIGATION LINE
	EXISTING SEWER LINE
	EXISTING STORM DRAIN
	EXISTING WATER LINE
	EXISTING OVERHEAD ELECTRIC
	EXISTING UNDERGROUND ELECTRIC
	EXISTING CABLE (TV) LINE
	EXISTING FIBER OPTIC LINE
	EXISTING UNDERGROUND TELEPHONE
	EXISTING GAS LINE
	EXISTING BARBED WIRE FENCE
	EXISTING EASEMENT
	EXISTING FLOWLINE
	EXISTING PROPERTY LINE
	EXISTING SPOT ELEVATION
	EXISTING CONTOUR
	EXISTING BRASS CAP MONUMENT
	EXISTING SIGN
	EXISTING IRRIGATION MANHOLE
	EXISTING IRRIGATION VALVE
	EXISTING DRYWELL
	EXISTING SEWER CLEANOUT
	EXISTING SEWER MANHOLE
	EXISTING CATCH BASIN
	EXISTING STORM DRAIN MANHOLE
	EXISTING STORM DRAIN W/ STRUCTURE
	EXISTING AIR VAC
	EXISTING FIRE HYDRANT
	EXISTING UNKNOWN MANHOLE
	EXISTING GATE VALVE
	EXISTING REDUCER
	EXISTING WATER MANHOLE (OR WELL)
	EXISTING WATER METER
	EXISTING CABLE MANHOLE
	EXISTING ELECTRIC MANHOLE
	EXISTING GUY WIRE
	EXISTING LIGHT POLE
	EXISTING POWER POLE
	EXISTING TELEPHONE MANHOLE
	EXISTING TELEPHONE PEDESTAL
	EXISTING GAS MANHOLE
	EXISTING GAS METER
	EXISTING GAS RISER
	EXISTING GAS VALVE
	EXISTING VEGETATION

LEGEND		OTHER	
PROPOSED			
	PROPOSED CONCRETE		GRADE BREAK
	PROPOSED PAVEMENT		HIGH WATERLINE
	EXISTING IRRIGATION LINE		LOT LINE
	PROPOSED SEWER LINE		RIGHT-OF-WAY
	PROPOSED STORM DRAIN		ROADWAY CENTERLINE
	PROPOSED WATER LINE		SECTION LINE
	PROPOSED OVERHEAD ELECTRIC		SETBACK LINE
	PROPOSED UNDERGROUND ELECTRIC		CONSTRUCTION LIMITS
	PROPOSED CABLE (TV) LINE		POINT OF VERTICAL INTERSECTION
	PROPOSED FIBER OPTIC LINE		PLAN, SECTION, OR DETAIL LABEL
	PROPOSED UNDERGROUND TELEPHONE		DRAWING TITLE/SHEET NUMBER
	PROPOSED GAS LINE		TBC ELEVATION (x1000')
	PROPOSED BARBED WIRE FENCE		LOT ELEVATION (x1000')
	PROPOSED EASEMENT		BASIN ULTIMATE OUTFALL LOCATION AND DIRECTION
	PROPOSED FLOWLINE		GRADE BREAK (PROFILE SYMBOL)
	PROPOSED PROPERTY LINE		
	PROPOSED SPOT ELEVATION		
	PROPOSED CONTOUR		
	PROPOSED (PLACED) BRASS CAP MONUMENT		
	PROPOSED SIGN		
	PROPOSED IRRIGATION MANHOLE		
	PROPOSED IRRIGATION VALVE		
	PROPOSED DRYWELL		
	PROPOSED SEWER CLEANOUT		
	PROPOSED SEWER MANHOLE		
	PROPOSED CATCH BASIN		
	PROPOSED STORM DRAIN MANHOLE		
	PROPOSED STORM DRAIN W/ STRUCTURE		
	PROPOSED AIR VAC		
	PROPOSED FIRE HYDRANT		
	PROPOSED FITTINGS		
	PROPOSED GATE VALVE		
	PROPOSED REDUCER		
	PROPOSED WATER MANHOLE (OR WELL)		
	PROPOSED WATER METER		
	PROPOSED CABLE MANHOLE		
	PROPOSED ELECTRIC MANHOLE		
	PROPOSED GUY WIRE		
	PROPOSED LIGHT POLE		
	PROPOSED POWER POLE		
	PROPOSED TELEPHONE MANHOLE		
	PROPOSED GAS MANHOLE		
	PROPOSED GAS METER		
	PROPOSED GAS RISER		
	PROPOSED GAS VALVE		
	PROPOSED VEGETATION		

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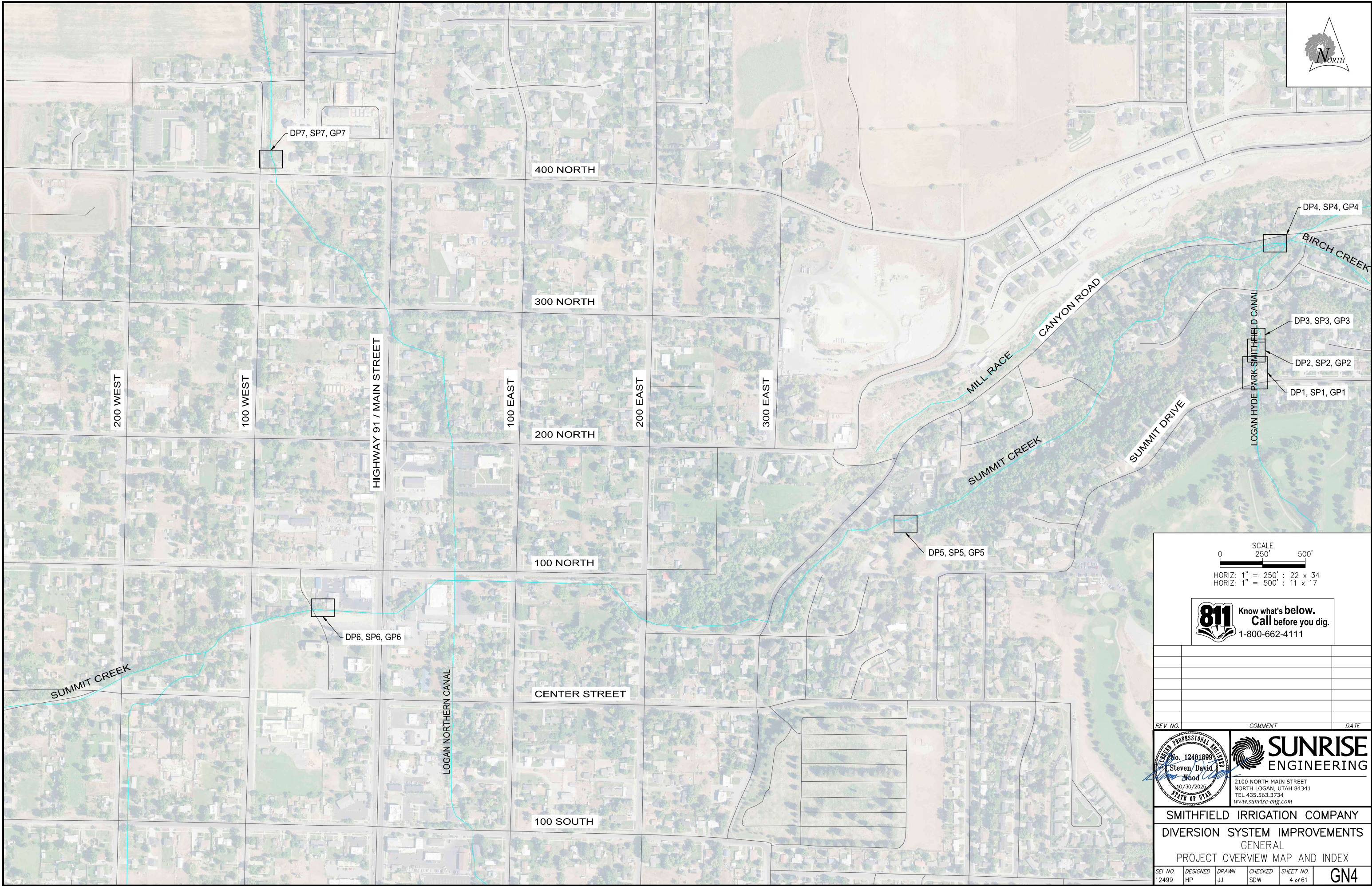
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SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
GENERAL
NOTES, ABBREVIATIONS, AND LEGEND

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	GN3
12499	HP	JJ	SDW	3 of 61	

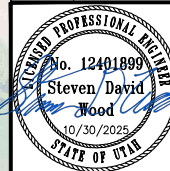


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SCALE
0 250' 500'
HORIZ: 1" = 250' : 22 x 34
HORIZ: 1" = 500' : 11 x 17

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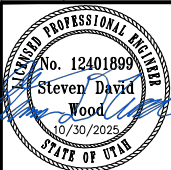
SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
GENERAL
PROJECT OVERVIEW MAP AND INDEX

SEI NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 4 of 61	GN4
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P:\Smithfield Irrigation Company\12499 - SIC Diversion System Improvements Project 2025\DWG\Sheets\SIC-D5-GN4.dwg Oct 30, 2025 4:54pm jolley

DESIGN CRITERIA

<u>BLACK PIPE INTAKE STRUCTURE</u>		<u>BLACK PIPE REHABILITATION</u>		<u>BUDGE DIVERSION</u>		<u>BRICKYARD NORTH DIVERSION</u>	
- DESIGN FLOW:	50 CFS	- PIPE SIZE:	36"	- DESIGN FLOW:	13 CFS	- DESIGN FLOW:	6 CFS
- EMERGENCY PEAK FLOW:	60 CFS	- REHABILITATION METHOD:	PVC FOLD-AND-FORM	- TREATMENT FACILITIES:	OBERMEYER WEIR, SEDIMENT BASIN, WEDGE WIRE SCREEN	- TREATMENT FACILITIES:	ROTARY DRUM SCREEN, SEDIMENT BASIN
<u>TRAVELING WIRE MESH SCREEN</u>		- CONCRETE ANCHOR WITH STEEL STRIPE:		<u>OBERMEYER WEIR</u>		<u>ROTARY DRUM SCREEN</u>	
- VENDOR:	INTERNATIONAL WATER SCREENS (IWS)	- QUANTITY:	8	- VENDOR:	OBERMEYER HYDRO INC	- FILTER CAPACITY:	2500 GPM
- MESH OPENING:	6" WITH 79.6% CLEAR AREA	- DIMENSION:	7' L x 2.5' T x 3' UNDERGROUND	- DIMENSION:	16' L x 3' W x 3' H	- DRUM DIMENSION:	33"
- SCREEN DIMENSIONS:	4' W @ 30"			<u>SETTLING BASIN</u>		<u>SETTLING BASIN</u>	
- HEADLOSS @ 50 CFS:	1.74"	<u>BLACK PIPE ENERGY DISSIPATION STRUCTURE</u>		- SETTLING BASIN DIMENSION:	25' L x 15' W x 3.5' D	- SETTLING BASIN DIMENSION:	18' L x 10' W x 4' D
<u>EMERGENCY BYPASS WEIR</u>		- ENERGY DISSIPATION TYPE:	BAFFLED BLOCKS	- TARGET REMOVED PARTICLE:	0.005" (124 MICROS)	- TARGET REMOVED PARTICLE:	0.005" (121 MICROS)
- WEIR DIMENSIONS:	23' L x 2' H x 1' T	- DIMENSION:		- SEDIMENT REMOVAL EFFICIENCY:	77.8%	- SEDIMENT REMOVAL EFFICIENCY:	79.3%
- WATER DEPTH @ 50 CFS:	2 FT	- CONCRETE CHUTE:	5' x 3'	<u>WEDGE WIRE SCREEN</u>		<u>BIG DITCH DIVERSION</u>	
- WATER DEPTH @ 60 CFS:	3 FT	- CONCRETE BLOCK (TRAPEZOID):	TOP 9" LENGTH x 15" BOTTOM LENGTH x 18" WIDTH x 12" HEIGHT	- VENDOR:	HENDRICK SCREEN COMPANY	- DESIGN FLOW:	6 CFS
<u>SETTLING BASIN</u>				- SCREEN SURFACE AREA:	68.6 S.F. @ 29"	- TREATMENT FACILITIES:	ROTARY DRUM SCREEN, SEDIMENT BASIN
- DESIGN FLOW:	50 CFS	<u>THREE CREEKS DIVERSION</u>		- INTAKE DEMAND:	5834 GPM (13 CFS)	<u>ROTARY DRUM SCREEN</u>	
- BASIN DIMENSIONS:	53' L x 6' D x 12' W (AVG)	- DESIGN FLOW:	5 CFS	- MAXIMUM FILTERED FLOW:	6189 GPM (13.8 CFS)	- FILTER CAPACITY:	2500 GPM
- FLOW VELOCITY:	0.69 FT / S	- TREATMENT FACILITIES:	OBERMEYER WEIR, ROTARY DRUM SCREEN, SEDIMENT BASIN	- SAFETY FACTOR:	1.06	- DRUM DIMENSION:	33"
- HYDRAULIC RETENTION TIME:	76 S	<u>OBERMEYER WEIR</u>		<u>CLAY POOL SOUTH DIVERSION</u>		<u>SETTLING BASIN</u>	
- MINIMAL SETTLING VELOCITY:	0.08 FT / S	- VENDOR:	OBERMEYER HYDRO INC	- DESIGN FLOW:	6 CFS	- SETTLING BASIN DIMENSION:	17' L x 8' W x 4' D
- SETTING PARTICLE SIZE:	0.008" (202 MICROS)	- DIMENSION:	12' L x 3' W x 3' H	- TREATMENT FACILITIES:	SEDIMENT BASIN, WEDGE WIRE SCREEN	- TARGET REMOVED PARTICLE:	0.005" (129 MICROS)
- REMOVAL EFFICIENCY:	68.6%	<u>ROTARY DRUM SCREEN</u>		<u>SETTLING BASIN</u>		- SEDIMENT REMOVAL EFFICIENCY:	77.9%
<u>WEIR AT WEDGE WIRE SCREEN</u>		- FILTER CAPACITY:	2500 GPM	- SETTLING BASIN DIMENSION:	20' L x 8' W x 3.5' D		
- DESIGN FLOW:	50 CFS	- DRUM DIMENSION:	33"	- TARGET REMOVED PARTICLE:	0.005" (126 MICROS)		
- FREE BOARD @ DESIGN FLOW:	2'	<u>SETTLING BASIN</u>		- SEDIMENT REMOVAL EFFICIENCY:	69.9%		
- WEIR TYPE:	SHARPE CRESTED WEIR	- SETTLING BASIN DIMENSION:	25' L x 10' W x 3.5' D	<u>WEDGE WIRE SCREEN</u>			
- WEIR DIMENSION:	16' W x 6' H	- TARGET REMOVED PARTICLE:	0.005" (127 MICROS)	- VENDOR:	HENDRICK SCREEN COMPANY		
<u>WEDGE WIRE SCREEN</u>		- SEDIMENT REMOVAL EFFICIENCY:	94.6%	- SCREEN SURFACE AREA:	40 S.F. @ 37"		
- VENDOR:	HENDRICK SCREEN COMPANY			- INTAKE DEMAND:	2693 GPM (6 CFS)		
- SCREEN SURFACE AREA:	30 S.F. @ 25"			- MAXIMUM FILTERED FLOW:	3609 GPM (8 CFS)		
- INTAKE DEMAND:	1795 GPM (4 CFS)			- SAFETY FACTOR:	1.34		
- MAXIMUM FILTERED FLOW:	2717 GPM (6.1 CFS)						
- SAFETY FACTOR:	1.5						

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SEI NO.	DESIGNED	DRAWN	CHECKED
12499	HP	JJ	SDW
			SHEET NO.
			5 of 61
			GN5

STRUCTURAL SPECIFICATIONS & REQUIREMENTS

A. DESIGN CRITERIA:

1. BUILDING CODES:
2021 INTERNATIONAL BUILDING CODE
ACI 318-14 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND COMMENTARY"
ACI 350-20 "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES"
ASCE 7-16 "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES"

2. RISK CATEGORY III PER IBC TABLE 1604.5

3. DESIGN DEAD LOADS:
CONCRETE = 150 PSF
SOIL LADING PER IBC

4. LIVE LOAD:
DECKING LL = 20 PSF

5. SNOW LOAD: PER ASCE 7-16
IMPORTANCE FACTOR $I_s = 1.5$
GROUND SL = 30 PSF
FLAT/SLOPED ROOF SL USED FOR DESIGN = N/A

6. WIND LOADING: N/A FOR BURIED STRUCTURE SEISMIC GOVERNS

7. SEISMIC LOADING: PER ASCE 7-16
SITE CLASS D "STIFF SOIL", SEISMIC IMPORTANCE FACTOR $I_e = 1.00$
 $S_S = 1.08g$
 $S_1 = 0.32g$
 $S_{ps} = 0.83g$
 $S_{D1} = 0.53g$

SEISMIC DESIGN CATEGORY D PER ASCE 7-16 TABLE 11.6-2

LATERAL FORCE RESISTING SYSTEM IS AS FOLLOWS:

- A.1 SPECIAL REINFORCED CONCRETE SHEAR WALLS
A.7 SPECIAL REINFORCED MASONRY SHEAR WALLS
A.15 LIGHT-FRAME (WOOD) WALLS SHEATHED WITH WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE
A.16 LIGHT-FRAME (COLD-FORMED STEEL) WALLS SHEATHED WITH WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE OR STEEL SHEETS
C.1 STEEL SPECIAL MOMENT FRAMES

B. GENERAL REQUIREMENTS:

1. DIMENSIONS: CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES TO THE ENGINEER OF RECORD.
2. THE CONTRACTOR MUST SUBMIT IN WRITING ANY REQUESTS FOR MODIFICATIONS TO THE PLANS AND SPECIFICATIONS. SHOP DRAWINGS SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW DO NOT CONSTITUTE "IN WRITING" UNLESS IT IS CLEARLY NOTED THAT SPECIFIC CHANGES ARE BEING REQUESTED.
3. LOADS FROM CONSTRUCTION MATERIALS SHALL BE SPREAD OUT IF PLACED ON FRAMED FLOORS OR ROOFS. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT LISTED IN THE DESIGN CRITERIA. CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND OR BRACING WHERE STRUCTURE HAS NOT ATTAINED DESIGN STRENGTH.
4. THESE DOCUMENTS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS AS REQUIRED FOR THIS OR SIMILAR LOCALITIES. THEY ASSUME THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKMEN WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
5. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, LAGGING, SHORING, BRACING, FORM-WORK, ETC. AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION.

C. FOUNDATION REQUIREMENTS:

1. FOUNDATIONS FOR THE STRUCTURES SHOWN IN THE PLANS WERE DESIGNED BASED ON THE RECOMMENDATIONS OF THE INTERNATIONAL BUILDING CODE 2021, CHAPTER 18. LOAD-BEARING VALUES OF THE SOILS ARE PROVIDED IN THE CODE. CONTINUOUS AND SPREAD FOOTINGS DESIGNED FOR ALLOWABLE BEARING PRESSURE OF 1,500 PSF PER THE CODE. IF SOIL CONDITIONS ARE FOUND TO BE DIFFERENT THAN THE TYPES LISTED ABOVE OR OF UNUSUAL MAKE-UP, OR SUB-STANDARD, PLEASE CONTACT THE ENGINEER OF RECORD.

D. CONCRETE REQUIREMENTS:

1. ALL CONCRETE CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ACI 318 AND ACI 301, EXCEPT AS MODIFIED BY THE CONSTRUCTION DOCUMENTS.

CONCRETE	MIN. f'_c (28 DAYS)	SLUMP	W/C RATIO	CLASS
FOUNDATIONS	4500 PSI	3" TO 5"	0.45	F2
INT. SLAB-ON-GRADE	4000 PSI	3" TO 5"	0.45	F2
CONCRETE NOT NOTED	4500 PSI	3" TO 5"	0.45	F2

SLUMP: CONCRETE w/ ADMIXTURES SHALL HAVE A MAXIMUM SLUMP OF 7".

3. ADMIXTURES:

- 3.1. AIR ENTRAINMENT ASTM C-260
3.2. CALCIUM CHLORIDE NOT PERMITTED
3.3. ALUMINUM PRODUCTS NOT PERMITTED

4. CONCRETE MIXES SHALL BE DESIGNED BY A CERTIFIED LABORATORY, STAMPED BY AN APPROPRIATELY LICENSED SPECIALTY ENGINEER, AND APPROVED BY THE ENGINEER OF RECORD. MIX DESIGNS SHALL INCLUDE THE PROJECT NAME AND INDICATE THEIR USE WITHIN THE STRUCTURE. MIX DESIGNS SHALL BE PROPORTIONED TO MINIMIZE SHRINKAGE AND HAVE PROVEN SHRINKAGE CHARACTERISTICS OF 0.05% OR LESS BASED ON TESTING PER ASTM C157.

5. IF USED, EARLY STRENGTH CONCRETE SHALL BE PROPORTIONED TO DEVELOP THE 28 DAY COMPRESSIVE STRENGTH AT THE AGE REQUIRED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT TEST DATA FOR REVIEW BY THE STRUCTURAL ENGINEER TO SUBSTANTIATE THE CONCRETE STRENGTH AT THE REQUIRED AGE.

6. ALL CONCRETE SHALL BE NORMAL WEIGHT OF 145 POUNDS PER CUBIC FOOT USING HARD ROCK AGGREGATES CONFORMING TO ASTM C33 U.N.O. WHERE LIGHTWEIGHT CONCRETE IS SPECIFIED, CONCRETE SHALL BE 110 POUNDS PER CUBIC FOOT USING AGGREGATES CONFORMING TO ASTM C330. LARGEST NOMINAL AGGREGATE SIZE SHALL BE 1-1/2" OR GREATER FOR SLABS ON GRADE AND 3/4" OR GREATER FOR ALL OTHER CONCRETE U.N.O.

7. CEMENT SHALL CONFORM TO THE "STANDARD SPECIFICATION FOR PORTLAND CEMENT," ASTM C 150, TYPE II LOW-ALKALI OR ASTM C595 "STANDARD SPECIFICATION FOR BLENDED HYDRAULIC CEMENT" TYPE II (MS).

8. FLY ASH MAY BE USED IN CONCRETE, SUBJECT TO APPROVAL BY THE ARCHITECT AND ENGINEER, PROVIDED THE FOLLOWING CONDITIONS ARE MET:

- 8.1. FLY ASH SHALL COMPLY WITH ASTM C618.
- 8.2. CEMENT CONTENT SHALL BE REDUCED A MINIMUM OF 15 PERCENT UP TO A MAXIMUM OF 25 PERCENT WHEN COMPARED TO AN EQUIVALENT CONCRETE MIX DESIGN WITHOUT FLY ASH. FLY ASH CONTENT SHALL NOT COMPRISE MORE THAN 35 PERCENT OF THE TOTAL CEMENTITIOUS CONTENT. THE WATER-CEMENT RATIO SHALL BE CALCULATED BASED ON THE TOTAL CEMENTITIOUS MATERIAL IN THE MIX.
- 8.3. CLASS F FLY ASH SHALL BE USED IN SULFATE RESISTANT CONCRETE WITH f'_c EQUAL TO OR GREATER THAN 4000 PSI. CLASS C FLY ASH MAY BE USED ELSEWHERE.

9. WATER SOLUBLE CHLORIDE ION CONCENTRATIONS IN CONCRETE SHALL BE LIMITED PER ACI 318, SECTION 4.4.

10. ALL CONCRETE EXPOSED TO FREEZE/THAW CYCLES OR DEICING CHEMICALS SHALL CONFORM TO ACI 318, SECTION 4.2.

11. TIME BETWEEN CONCRETE BATCHING AND PLACEMENT SHALL BE IN ACCORDANCE WITH ASTM C94.

12. CONCRETE MIXING, PLACEMENT, AND QUALITY SHALL BE PER IBC SECTION 1905. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED. SLABS ON GRADE NEED TO BE VIBRATED ONLY AROUND AND UNDER FLOOR DUCTS OR SIMILAR ELEMENTS. REMOVE ALL DEBRIS FROM FORMS BEFORE PLACING CONCRETE. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL SO AS TO CAUSE SEGREGATION OF AGGREGATES. UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED 5 FEET.

13. PROTECT CONCRETE FROM DAMAGE OR REDUCED STRENGTH DUE TO COLD OR HOT WEATHER IN ACCORDANCE WITH ACI 305 AND 306. CONTRACTOR SHALL TAKE SPECIAL CURING PRECAUTIONS TO MINIMIZE SHRINKAGE CRACKING OF CONCRETE SLABS.

14. ALL REINFORCING STEEL SHALL BE SET AND TIED IN PLACE PRIOR TO POURING OF CONCRETE, EXCEPT VERTICAL DOWELS FOR MASONRY WALL REINFORCING MAY BE "FLOATED" IN PLACE. DO NOT FIELD BEND BARS PARTIALLY EMBEDDED IN HARDENED CONCRETE UNLESS SPECIFICALLY INDICATED OR APPROVED BY THE ENGINEER OF RECORD.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PLACEMENT AND LOCATION OF ANY AND ALL EMBED ITEMS INCLUDING PLATES, BOLTS, AND OTHER INSERTS SPECIFIED IN THE DRAWINGS.

16. ALL ITEMS TO BE CAST IN CONCRETE SUCH AS REINFORCEMENT, DOWELS, BOLTS, ANCHORS, SLEEVES, ETC., SHALL BE SECURELY POSITIONED IN THE FORMS.

D. CONCRETE REQUIREMENTS CONTINUED:

17. MECHANICAL, ELECTRICAL, AND PLUMBING PENETRATIONS / EMBEDDED CONDUITS SHALL COMPLY WITH THE FOLLOWING:

- 17.1. ELECTRICAL CONDUITS MAY BE EMBEDDED IN STRUCTURAL CONCRETE ONLY AS NOTED IN TYPICAL DETAILS FOR WALLS AND CAST-IN-PLACE ELEVATED SLABS (EMBEDDED CONDUITS IN CONCRETE OVER STEEL DECK ARE NOT PERMITTED) OR WHERE SPECIFICALLY APPROVED IN WRITING BY THE ENGINEER. PIPING SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE U.N.O. EMBEDDED ITEMS SHALL NOT IMPAIR THE STRENGTH OF THE MEMBER.

- 17.2. REFER TO TYPICAL DETAILS FOR ACCEPTABLE CONDUIT, PIPING, AND DUCT PENETRATIONS THRU SLABS AND WALLS. DO NOT CUT ANY REINF. THAT MAY INTERFERE WITH PERMITTED PENETRATIONS. OPENINGS SHALL NOT BE CORED WITHOUT PRIOR WRITTEN APPROVAL OF ENGINEER. PENETRATIONS THRU BEAMS AND COLUMNS ARE PERMITTED ONLY WHERE SPECIFICALLY DETAILED.

- 17.3. CONTRACTOR SHALL SUBMIT SHOP DRAWING SHOWING SIZES AND DIMENSIONED LOCATIONS OF ALL PENETRATIONS AND EMBEDDED CONDUITS IN WALLS AND ELEVATED SLABS. SHOP DRAWING MUST BE APPROVED BY ENGINEER PRIOR TO CONCRETE PLACEMENT. PENETRATIONS AND EMBEDDED CONDUITS NOT SHOWN ON APPROVED SHOP DRAWING WILL NOT BE PERMITTED UNLESS SPECIFICALLY APPROVED IN WRITING BY THE ENGINEER.

18. FORMWORK, SHORING, AND RESHORING SHALL BE DESIGNED PER ACI 347 RECOMMENDATIONS BY AN APPROPRIATELY LICENSED SPECIALTY ENGINEER EXPERIENCED IN THIS TYPE OF WORK AND SHALL BE SUBMITTED TO ENGINEER OF RECORD FOR REVIEW. FOR MULTISTORY CONSTRUCTION, SHORING/RESHORING DESIGN SHALL DEMONSTRATE THAT SHORES/RESHORES WILL BE PROVIDED FOR A SUFFICIENT NUMBER OF FLOORS TO DISTRIBUTE IMPOSED CONSTRUCTION LOADS TO SEVERAL SLAB LEVELS WITHOUT CAUSING EXCESSIVE STRESSES AND SLAB DEFLECTIONS. FOR PURPOSES OF SHORING/RESHORING CALCULATIONS, MAGNITUDES OF REDUCED LIVE LOADS SHALL BE TAKEN TO BE 60% OF VALUES INDICATED IN BASIS FOR DESIGN U.N.O.

19. CONSTRUCTION JOINTS OR POUR JOINTS IN STRUCTURAL ELEMENTS (BEAMS, COLUMNS, ELEVATED SLABS, ETC.) NOT SPECIFICALLY SHOWN OR NOTED ON THE DRAWINGS REQUIRE PRIOR APPROVAL OF THE ENGINEER. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING PROPOSED JOINTS TO ENGINEER FOR APPROVAL.

20. CONSTRUCTION JOINT SURFACES SHALL BE CLEANED AND LAITANCE REMOVED. HORIZONTAL JOINT SURFACES SHALL BE ROUGHENED TO 1/4" AMPLITUDE. THOROUGHLY WET ALL JOINT SURFACES AND REMOVE STANDING WATER IMMEDIATELY PRIOR TO NEW CONCRETE PLACEMENT.

21. CONCRETE SHALL BE CURED IN ACCORDANCE WITH ACI 318, SECTIONS 5.11.1 OR 5.11.2, WHICHEVER IS APPLICABLE, UNLESS ALTERNATE METHODS HAVE BEEN APPROVED BY THE ARCHITECT AND ENGINEER. WHERE CURING COMPOUNDS HAVE BEEN APPROVED FOR SLAB CURING, CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPATIBILITY OF COMPOUNDS WITH ANTICIPATED FLOOR FINISH (e.g., RESILIENT TILE) PRIOR TO CURING COMPOUND APPLICATION.

22. CONCRETE FINISH DESIGNATION:
F1 - AS CAST FORM FINISH
F2 - ROUGH FINISH
F3 - SMOOTH FINISH
F4 - SMOOTH RUBBED FINISH
F5 - GROUT CLEANED RUBBED FINISH
F6 - CORK FLOATED RUBBED FINISH
F7 - UNFORMED FINISH
F8 - BLASTED FINISH
F9 - ARCHITECTURAL FINISH
F10 - TOOLED FINISH
S1 - FLOATED FINISH
S2 - TROWEL FINISH
S3 - BROOM FINISH
S4 - EXPOSED AGGREGATE FINISH
S5 - CHEMICAL HARDENER FINISH

E. REINFORCING STEEL REQUIREMENTS:

1. REINFORCING STEEL SHALL BE DETAILED AND PLACED IN ACCORDANCE WITH ACI 318 AND CRSI'S MANUAL OF STANDARD PRACTICE.
2. REINFORCING STEEL SHALL CONFORM TO ASTM A615 OR ASTM A706 (A706 REQUIRED FOR ALL REINFORCING TO BE WELDED) AND SHALL BE GRADE 60 ($f_y = 60$ KSI) DEFORMED BARS U.N.O. REINFORCING IN SLABS ON GRADE MAY BE GRADE 40 ($f_y = 40$ KSI) DEFORMED BARS FOR ALL BARS #4 AND SMALLER U.N.O. ON PLANS OR DETAILS.

3. ALL DIMENSIONS SHOWING THE LOCATION OF REINFORCING STEEL NOT NOTED AS "CLEAR" OR "CLR." ARE TO CENTER OF STEEL. CLEAR COVER FOR NON-PRESTRESSED CONCRETE REINFORCING SHALL BE AS NOTED BELOW, U.N.O. ON PLANS OR DETAILS. CLEAR COVER FOR PRESTRESSED CONCRETE AND FOR PRECAST CONCRETE MANUFACTURED UNDER PLANT CONTROL CONDITIONS SHALL BE PER ACI 318, SECTIONS 7.7.2 AND 7.7.3, RESPECTIVELY.

EXPOSURE CONDITION: COVER:

CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"

EXPOSED TO WEATHER (INCLUDES SLABS ON GRADE) 1 1/2"
NO. 5 AND SMALLER 2"
NO. 6 AND LARGER

NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND STRUCTURAL SLABS, WALLS, JOISTS 3/4"
NO. 11 AND SMALLER

4. LAP SPLICES OF REINFORCING STEEL SHALL CONFORM TO TYPICAL REBAR LAP SCHEDULE U.N.O. NO TACK WELDING OF REINFORCING BARS ALLOWED. LATEST ACI CODE AND DETAILING MANUAL APPLY. AT WALLS AND FOOTINGS, PROVIDE BENT CORNER BARS TO MATCH AND LAP WITH HORIZ. BARS AT ALL CORNERS AND INTERSECTIONS U.N.O. VERT. WALL BARS SHALL BE SPUCED AT OR NEAR FLOOR LINES. SPLICE TOP BARS AT CENTER LINE OF SPAN AND BOTTOM BARS AT THE SUPPORT IN SPANDRELS, BEAMS, GRADE BEAMS, ETC., U.N.O. ON PLANS OR DETAILS.

E. REINFORCING STEEL REQUIREMENTS CONTINUED:

5. MECHANICAL SPLICE COUPLERS SHALL HAVE CURRENT ICC APPROVAL AND SHALL BE CAPABLE OF DEVELOPING 125% OF THE SPLICED BAR'S YIELD STRENGTH.

6. ALL REINFORCING SHALL BE BENT COLD. BARS SHALL NOT BE UN-BENT AND RE-BENT. FIELD BENDING OF REBAR SHALL NOT BE ALLOWED UNLESS SPECIFICALLY NOTED.

7. WELDING OF REINFORCING BARS, METAL INSERTS, AND CONNECTIONS SHALL BE MADE ONLY AT LOCATIONS SHOWN ON PLANS OR DETAILS. SEE WELDING SECTION OF G.S.N. FOR ADDITIONAL REQUIREMENTS.

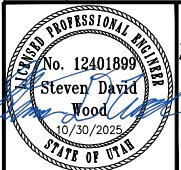
8. REINFORCING BAR SPACINGS SHOWN ON PLANS ARE MAX. ON CENTER DIMENSIONS. DOWEL ALL VERT. REINFORCING TO FOUNDATION. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE. MIN. CLEAR SPACING BETWEEN PARALLEL REINFORCEMENT SHALL BE THE LARGER OF 1-1/2 TIMES NOMINAL BAR DIA. OR 1-1/3 TIMES MAX. AGGREGATE SIZE OR 1-1/2". CLEAR SPACING LIMITATION APPLIES ALSO TO CLEAR DISTANCE BETWEEN A CONTACT LAP SPLICE AND ADJACENT SPLICES OR BARS.

9. MIN. REINFORCING AT EDGES OF CONCRETE WALL OPENINGS SHALL BE (2) #5 BARS. EXTEND THE GREATER OF THE DEVELOPMENT LENGTH OF THE BAR PER TYPICAL REBAR LAP SCHEDULE OR 24" MIN. PAST EDGES OF OPENING U.N.O. HOOK ENDS AT INTERFERENCE WITH EXTENSION.

G. EARTHWORK REQUIREMENTS:

1. CONSULT THE CURRENT ADOPTED BUILDING CODE FOR RECOMMENDED EARTHWORK REQUIREMENTS.
2. ALL SOFT SPOTS SHALL BE REMOVED AND REPLACED WITH COMPACTED STRUCTURAL FILL.
3. THE IN-PLACE DRY DENSITY OF THE COMPACTED STRUCTURAL FILL SHALL NOT BE LESS THAN 90 PERCENT OF THE MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT. THE CONTRACTOR SHALL HAVE ALL FILL TESTED.
4. ALL STRUCTURES SHALL HAVE STRUCTURAL FILL PLACED BENEATH FOOTINGS/SLABS.
5. ALLOWABLE DEAD PLUS LIVE LOAD SOIL PRESSURE = 1,500 PSF (ASSUMED).
6. TRENCHES AND EXCAVATIONS UNDER OR ADJACENT TO FOUNDATIONS SHALL BE PROPERLY BACKFILLED AND COMPACTED.
7. MITIGATE SOIL CORROSION POTENTIAL ON METAL CONSTRUCTION MATERIALS. CONSULT A QUALIFIED CORROSION ENGINEER FOR RECOMMENDATIONS FOR MITIGATING CORROSIVE EFFECTS, IF NECESSARY.
8. WATER PROOFING AS MAY BE REQUIRED AT SOIL FACE OF WALLS BELOW GRADE SHALL BE BY OTHERS.

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N. DEFERRED SUBMITTAL REQUIREMENTS:

- QUALITY CONTROL AND INSPECTIONS SHALL BE PERFORMED AS REQUIRED IN IBC 2021 CHAPTER 17. AS STATED IN IBC 2021 1704.2.1, "THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTORS FOR THE WORK DESIGNED BY THEM, PROVIDED THEY QUALIFY AS SPECIAL INSPECTORS."
- SPECIAL INSPECTION REQUIREMENTS:
1. SPECIAL INSPECTION AND QUALITY ASSURANCE, AS REQUIRED BY SECTION 1705 OF THE IBC, SHALL BE PROVIDED BY AN INDEPENDENT AGENCY EMPLOYED BY THE OWNER UNLESS WAIVED BY THE BUILDING OFFICIAL. THE CONTRACTOR SHALL COORDINATE AND COOPERATE WITH THE REQUIRED INSPECTIONS. ALL TESTING AND INSPECTION REPORTS SHALL BE SENT TO THE ENGINEER OF RECORD FOR REVIEW. ITEMS REQUIRING SPECIAL INSPECTION AND QUALITY ASSURANCE ARE SHOWN IN THIS SECTION.
 2. SOILS PER IBC SECTION 1705.6 AND TABLE 1705.6 BELOW:
 - 2.1. SPECIAL INSPECTION SHALL BE PROVIDED PRIOR TO POURING CONCRETE FOOTINGS.
 - 2.2. SPECIAL INSPECTION SHALL BE PROVIDED PRIOR TO PLACEMENT OF FILL AND DURING PLACEMENT OF FILL.

3. CONCRETE CONSTRUCTION PER IBC SECTION 1705.3 AND TABLE 1705.3 BELOW:

TABLE 1705.3 REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION	
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- | TYPE OF INSPECTION OR TEST | CONTINUOUS SPECIAL INSPECTION | PERIODIC SPECIAL INSPECTION | REFERENCED STANDARD ^a | IBC REFERENCE |
|--|-------------------------------|-----------------------------|---|--------------------------------|
| 1. INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND WELD PLACEMENT. | — | X | ACI 318: CH. 20, 26.2, 26.3, 26.6.1–26.6.3 | 1908.4 |
| 2. REINFORCING BAR WELDING. | | | | |
| a. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706. | | | AWS D1.4
ACI 318: 26.6.4 | — |
| b. INSPECT SINGLE-SPALL FLUET WELDS, MAXIMUM 5/16. | | | | |
| c. INSPECT ALL OTHER WELDS. | | | | |
| 3. INSPECT ANCHORS CAST IN CONCRETE. | — | X | ACI 318: 17.8.2 | — |
| 4. INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS ^b . | | | | |
| a. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS. | | | | — |
| b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.4c. | | | | |
| 5. VERIFY USE OF REQUIRED DESIGN MIX. | — | X | ACI 318: CH. 19, 26.4.3, 26.4.4 | 1904.1, 1904.2, 1908.2, 1908.3 |
| 6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE. | X | — | ASTM C172
ASTM C31
ACI 318: 26.5, 26.12 | 1908.10 |
| 7. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES. | X | — | ACI 318: 26.5 | 1908.6, 1908.7, 1908.8 |
| 8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUE. | — | X | ACI 318: 26.5.3–26.5.5 | 1908.9 |
| 9. INSPECT PRESTRESSED CONCRETE OF:
a. APPLICATION OF PRESTRESSING FORCES.
b. GROUTING OF BONDED PRESTRESSING TENDONS. | — | — | ACI 318: 26.10 | — |
| 10. INSPECT ERECTION OF PRECAST CONCRETE MEMBERS. | — | X | ACI 318: 26.9 | — |
| 11. VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS. | — | X | ACI 318: 26.11.2 | — |
| 12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED. | — | X | ACI 318: 26.11.1.2(b) | — |
- a. WHERE APPLICABLE, SEE SECTION 1705.3, SPECIAL INSPECTION FOR GOOD PRACTICE.
b. SPECIAL REQUIREMENTS FOR SPECIAL REPAIRS MUST BE INCLUDED IN THE RECORDS DUE TO THE ACTION TAKEN BY AN APPROVED SOURCE IN ACCORDANCE WITH 1742.2 AND 206.4 OF THE BUILDING CODE.
c. WHERE SPECIAL REQUIREMENTS ARE NOT PROVIDED, SPECIAL INSPECTION REQUIREMENTS SHALL BE SPECIFIED BY THE EXISTING DESIGN PROFESSIONAL, AND SHALL BE PRINTED BY THE BUILDING OFFICIAL PRIOR TO THE COMMENCEMENT OF THE WORK.

4. ANY SUBSTITUTION OF ANY MEMBERS SHALL BE AT THE WRITTEN CONSENT OF THE STRUCTURAL ENGINEER.

9. REFER TO APPLICABLE G.S.N. SECTIONS FOR FURTHER REQUIREMENTS SPECIFIC TO INDIVIDUAL SUBMITTALS.

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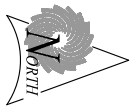
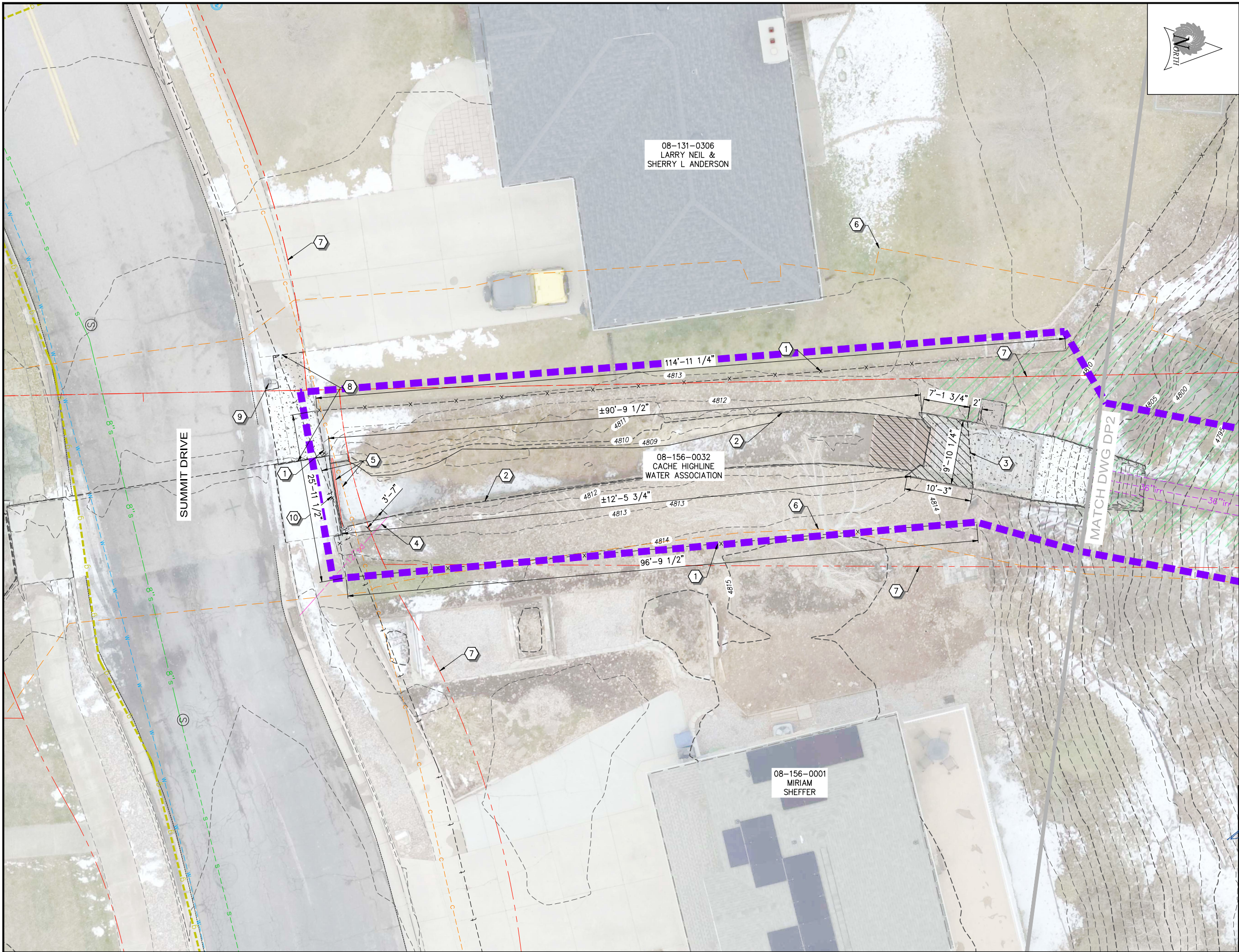


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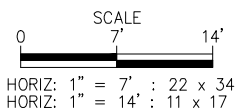
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GENERAL				
STRUCTURAL SPECIFICATIONS AND REQUIREMENTS				
SEI NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 7 of 61 GN7



DEMOLITION NOTES

- 1 REMOVE GALVANIZED CHAIN LINK FENCE
- 2 CUT AND REMOVE EXISTING CONCRETE WALLS
- 3 SAWCUT AND REMOVE PORTION OF EXISTING STRUCTURE AND METAL GRATES – METAL GRATES ARE TO BE DELIVERED TO CHWA IN A PRESERVED STATE
- 4 CUT AND REMOVE 12" HDPE PIPE SECTION – PIPE TO CONNECT TO NEW STRUCTURE
- 5 PROTECT EXISTING UTILITY CONDUITS
- 6 CHWA ROW PROJECTION
- 7 PROPERTY LINE
- 8 SAWCUT AND REMOVE SIDEWALK FROM BRIDGE TO DRIVEWAY
- 9 PROTECT MAILBOX AND CONCRETE BASE IN PLACE
- 10 SAWCUT AND REMOVE PIPE RAILING AT EXISTING BOX CULVERT



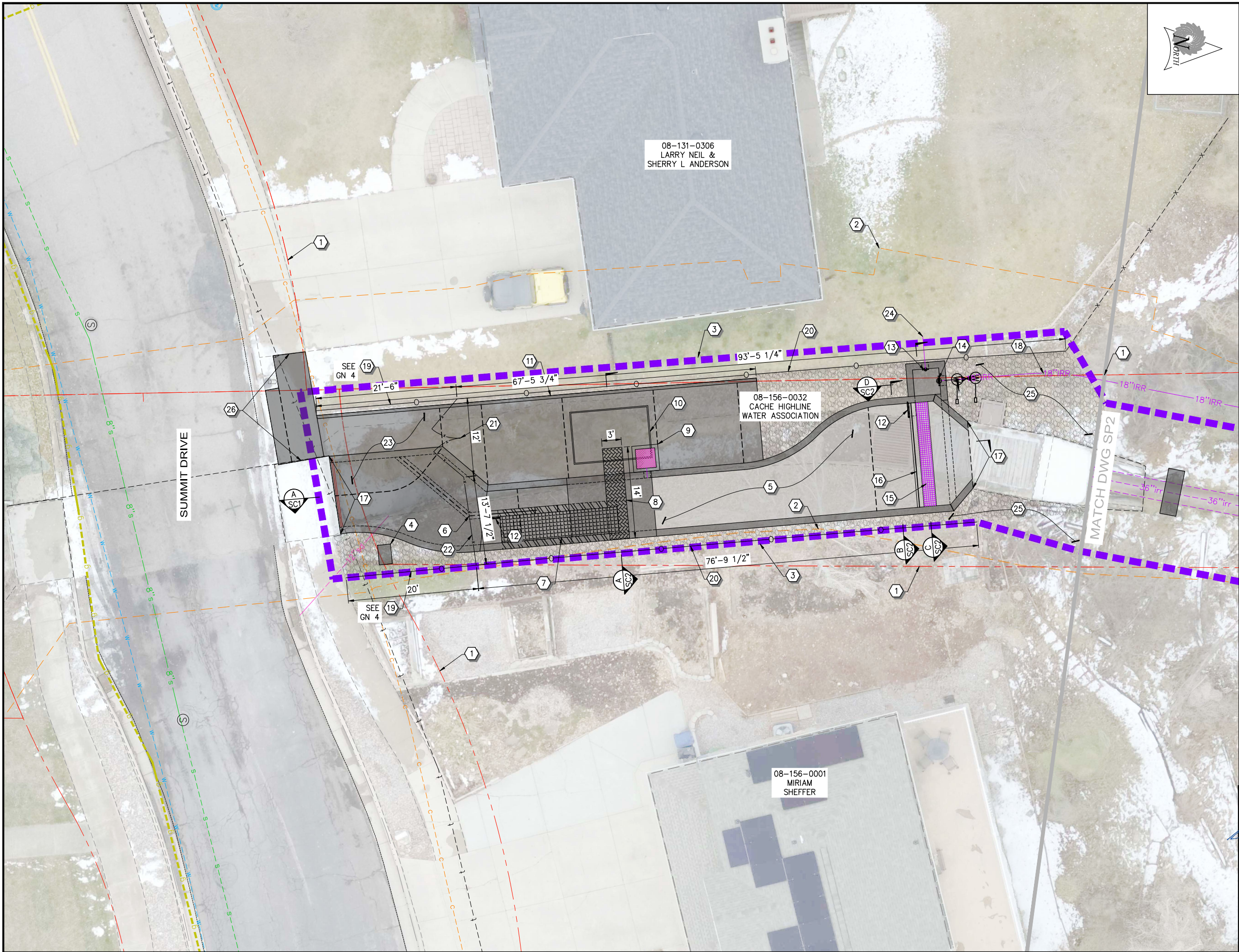
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SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
BLACK PIPE
SCREEN AND INTAKE STRUCTURE DEMOLITION

SEI NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 8 of 61	DP1
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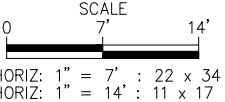


CONSTRUCTION NOTES

- 1 PROPERTY LINE
- 2 CHWA ROW PROJECTION
- 3 CONSTRUCTION LIMITS
- 4 INSTALL 2'x3' CONCRETE PAD FOR TRANSFORMER PER UTILITY COMPANY STANDARDS
- 5 INSTALL SCREEN AND INTAKE STRUCTURE (A, EP1)
- 6 INSTALL EMERGENCY SPILLWAY WEIR (H, J, SC2)
- 7 IWS TRAVELING SCREEN ASSEMBLY
- 8 CONVEYOR BELT ASSEMBLY
- 9 INSTALL 3'x3' CATCH BASIN (B, C, D2)
- 10 DUMPSTER - 11'x8'x2' MAX SIZE (BY IRRIGATION COMPANY)
- 11 6" CONCRETE CURB
- 12 2' SLUICE GATE @ FLOWLINE (L, SC2)
- 13 12" HEADGATE (K, SC2)
- 14 18" HEADGATE (K, SC2)
- 15 WEDGE WIRE SCREEN (M, SC2)
- 16 SHARP CRESTED WEIR (J, N, SC2)
- 17 TIE INTO EXISTING STRUCTURE (H, D4)
- 18 18" HDPE DR11 PIPE (BUILT BY OTHERS)
- 19 4' PVC HIGH IMPACT RESISTANCE FENCE W/ 6" CONCRETE MOWSTRIP - SEE GN #4
- 20 6' PVC HIGH IMPACT RESISTANCE FENCE W/ 6" CONCRETE MOWSTRIP - SEE GN #4
- 21 DOUBLE 6' CHAINLINK GATE (A, D5)
- 22 6' CHAINLINK FENCE (A, D5)
- 23 10'x20' CONCRETE PARKING AREA - OVERBUILD CONCRETE ON TOP OF INTAKE STRUCTURE
- 24 INSTALL 5' LONG 12" HDPE CORRUGATED PIPE W/ CAP
- 25 GRAVELED SURFACE - 3/4" MINUS ROCK 2" THICK W/ A HEAVY WEED BARRIER UNDERLAYMENT THAT ALLOWS DRAINAGE
- 26 INSTALL SIDEWALK RAMP (A, D1)

GENERAL NOTES

- 1. SEE SHEET EP1 FOR DIMENSIONS FOR INTAKE STRUCTURE
- 2. SEE SHEETS SC1 AND SC2 FOR INTAKE STRUCTURE SECTIONS
- 3. SEE SHEETS D3 AND D4 FOR STRUCTURAL DETAILS
- 4. THE NEW PVC FENCE IS TO BE INSTALLED 4" OR LESS FROM THE LOCATION OF THE EXISTING FENCE

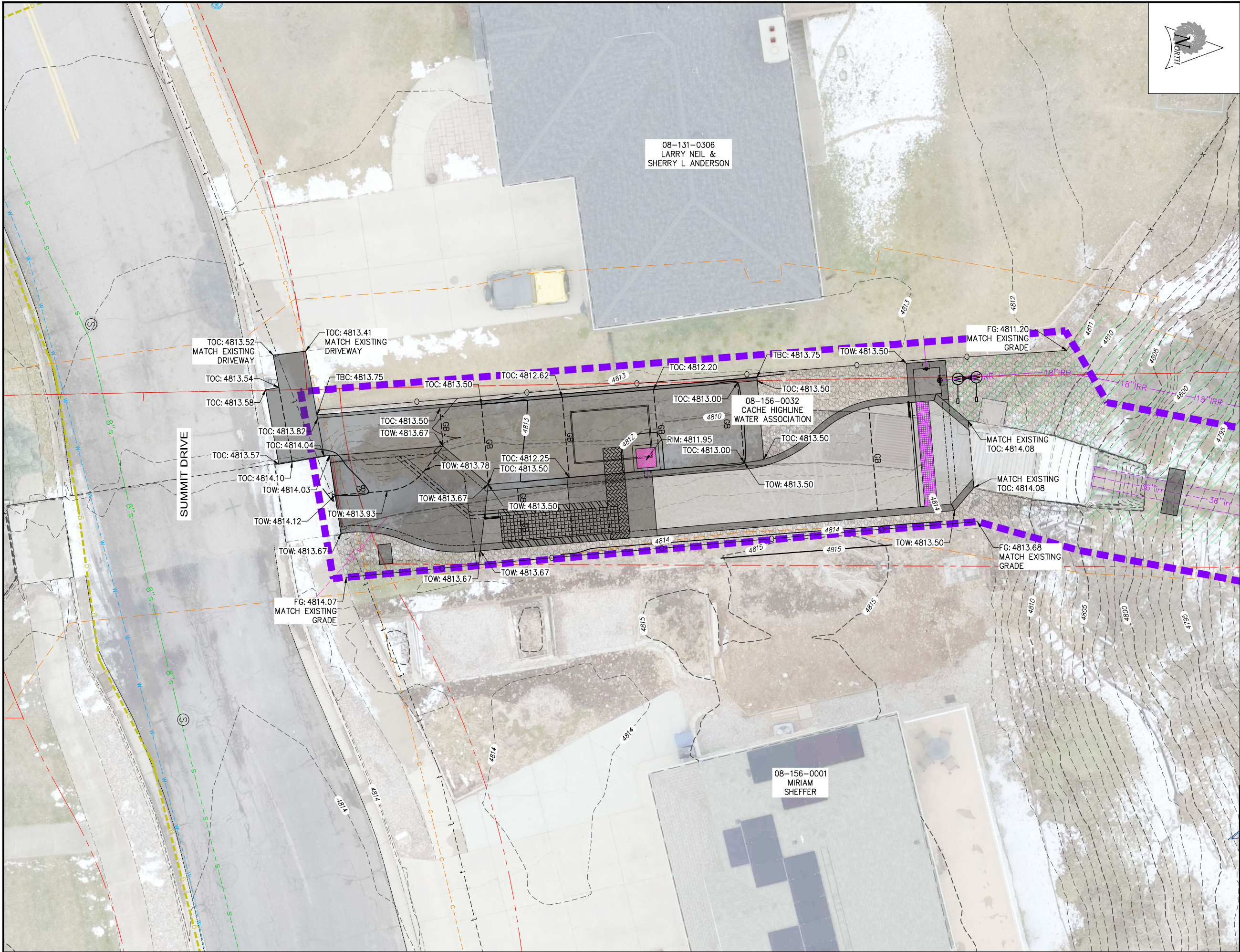


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SMITHFIELD IRRIGATION COMPANY
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BLACK PIPE
SCREEN AND INTAKE STRUCTURE

REV NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
12499	HP	JJ	SDW	9 of 61	SP1

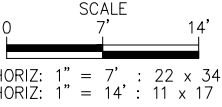


GRADING NOTES

- TBC = TOP BACK OF CURB
TOC = TOP OF CONCRETE/PAVEMENT
TOW = TOP OF WALL
BOW = BOTTOM OF WALL
FG = FUTURE GRADE
FL = FLOW LINE
1. AN APPROVED GRADING AND DRAINAGE PLAN SHALL BE ON THE JOB SITE AT ALL TIMES. DEVIATIONS FROM THE PLAN MUST BE PRECEDED BY AN APPROVED PLAN REVISION.
 2. GRADING AND DRAINAGE PLAN APPROVAL INCLUDES THE CONSTRUCTION OF ALL SURFACE IMPROVEMENTS SHOWN ON THE APPROVED PLAN, INCLUDING, BUT NOT LIMITED TO RETENTION AREAS, SEDIMENTATION BASINS AND/OR OTHER DRAINAGE FACILITIES, DRAINAGE PATTERNS, WALLS, CURBS, ASPHALT PAVEMENT AND BUILDING FLOOR ELEVATIONS.
 3. ALL DRAINAGE PROTECTIVE DEVICES SUCH AS SWALES, INTERCEPTOR DITCHES, PIPES, PROTECTIVE BERMES, CONCRETE CHANNELS OR OTHER MEASURES DESIGNED TO PROTECT ADJACENT BUILDINGS OR PROPERTY FROM STORM RUNOFF MUST BE COMPLETED PRIOR TO STRUCTURE CONSTRUCTION.
 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO OBSTRUCTIONS AND UTILITY LINES ENCOUNTERED DURING CONSTRUCTION AND SHALL DETERMINE THE EXACT LOCATION OF UTILITIES IN ADVANCE OF TRENCHING. THE ENGINEER WILL NOT GUARANTEE ANY ELEVATIONS AT LOCATIONS OF THE EXISTING UNDERGROUND UTILITIES SHOWN ON THESE PLANS.
 5. THE EXISTING TOPOGRAPHY IS REPRESENTED WITH MINOR CONTOURS EVERY 1' AND MAJOR CONTOURS EVERY 5'. THE PROPOSED TOPOGRAPHY IS REPRESENTED WITH MINOR CONTOURS EVERY 1' AND MAJOR CONTOURS EVERY 5'.
 6. CONTRACTOR TO ENSURE ALL GRADE CHANGES ARE TO BE COMPLETED IN A SMOOTH MANNER. INDIVIDUAL VERTICAL CURVES ARE NOT SHOWN FOR CLARITY.

GENERAL NOTES

1. REFER TO CROSS SECTIONS FOR ADDITIONAL GRADING NOTES



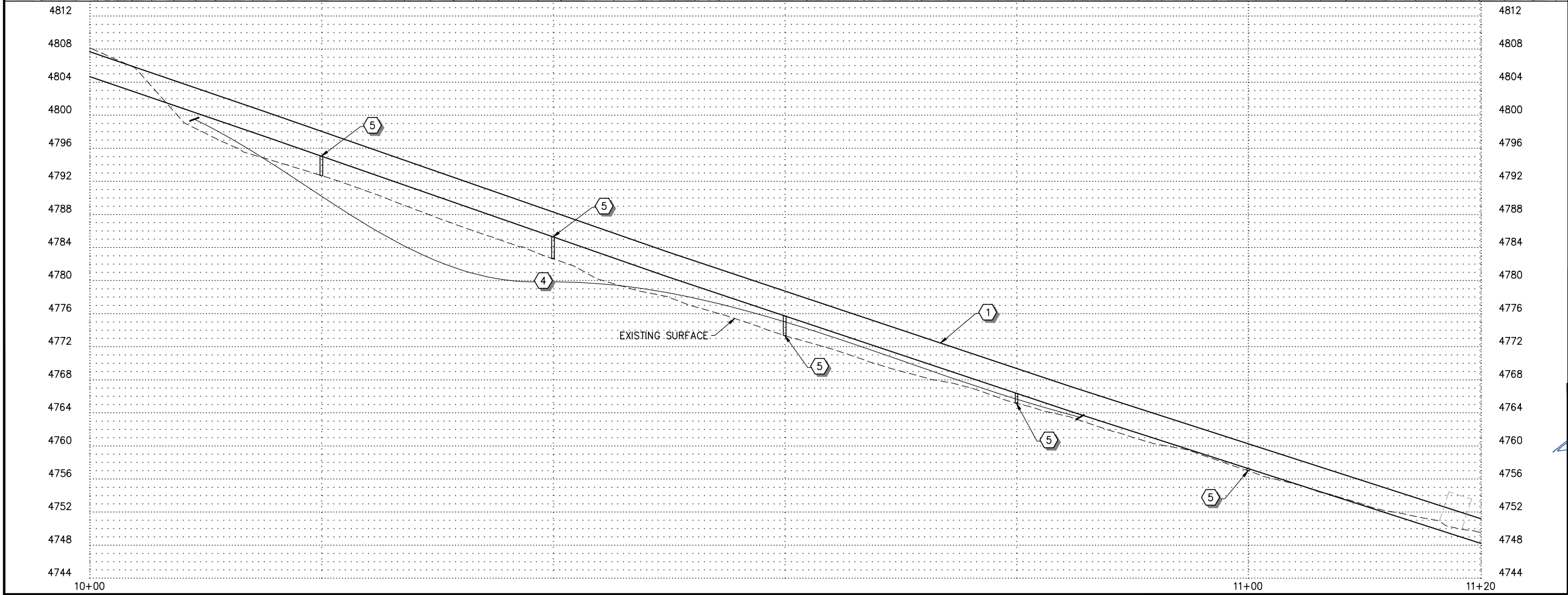
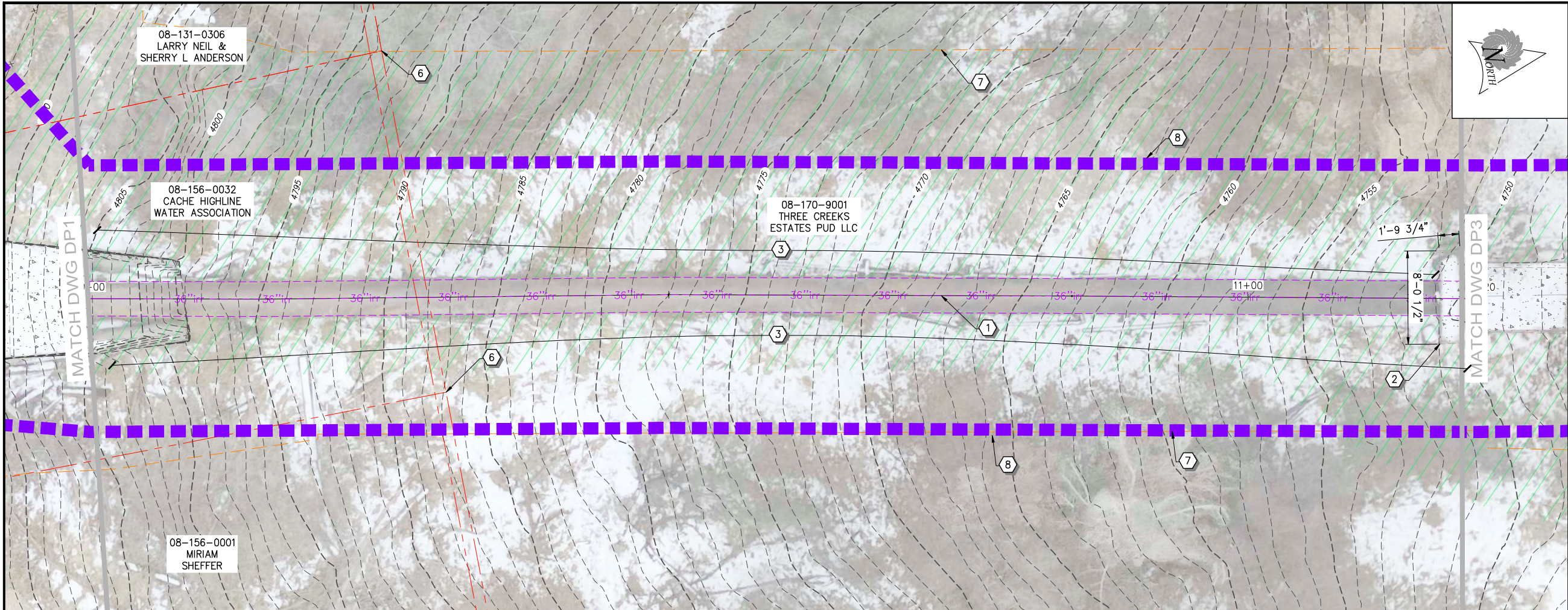
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SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
BLACK PIPE
SCREEN AND INTAKE STRUCTURE GRADING

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
12499	HP	JJ	SDW	10 of 61	GP1



- ### DEMOLITION NOTES
- 1 PROTECT AND MAINTAIN EXISTING 36" BLACK PIPE - THE EXTERIOR OF PIPE IS TO BE SCRAPPED CLEAN OF PEELING PAINT, RUST, DEBRIS, OR OTHER MATERIAL THAT WILL HINDER THE COATING OF THE PIPE - APPROXIMATELY 1,100 SQ. FT. OF EXTERIOR PIPE SURFACE AREA
 - 2 REMOVE EXISTING CONCRETE ANCHOR HEAD WALL
 - 3 VEGETATION IN AREA TO BE TRIMMED / REMOVED AS NEEDED FOR CONSTRUCTION WORK
 - 4 AREA UNDER PIPE TO BE CLEANED OF VEGETATION, DEBRIS AND REMNANTS OF OLD PIPE SUPPORTS
 - 5 TEMPORARY PIPE SHORING IS TO BE PLACED ALONG PIPE @ 20' SPACING
 - 6 PROPERTY LINE
 - 7 CHWA ROW PROJECTION
 - 8 CONSTRUCTION LIMITS

SCALE

0 5' 10'

HORIZ: 1" = 5' : 22 x 34
HORIZ: 1" = 10' : 11 x 17
VERT: 1" = 7' : 22 x 34
VERT: 1" = 14' : 11 x 17

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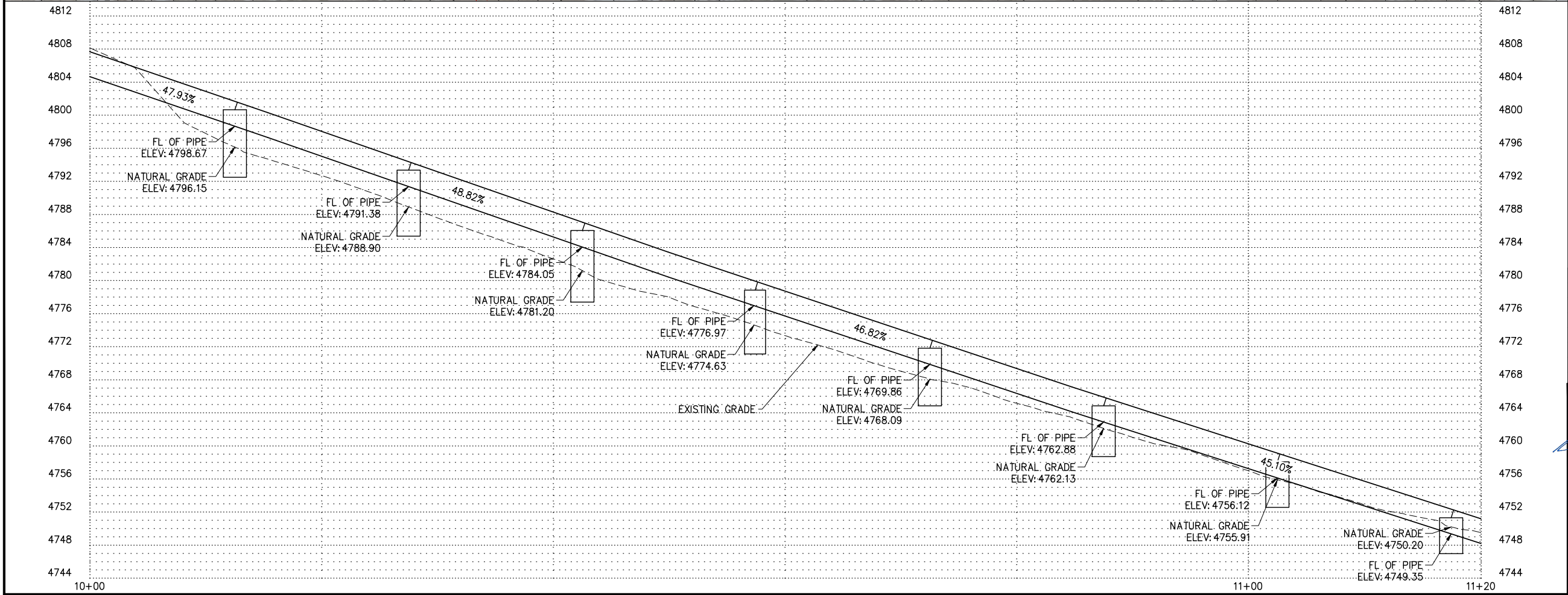
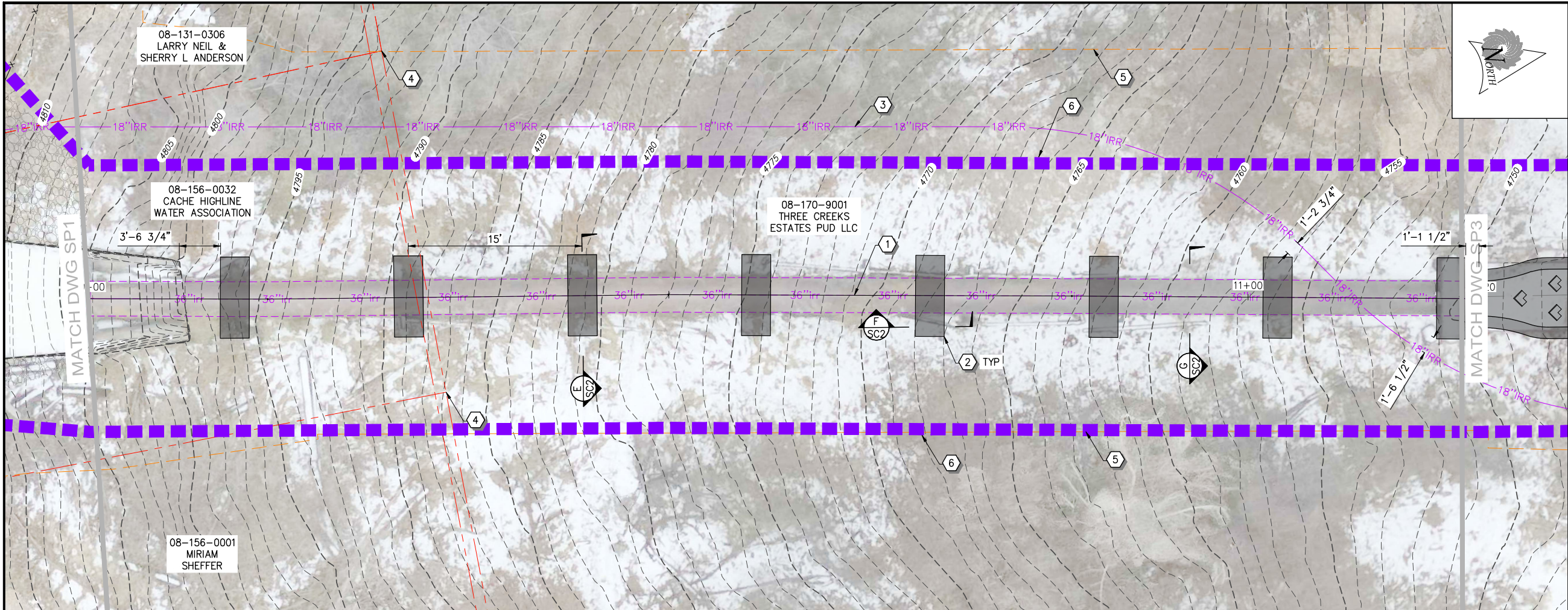
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SMITHFIELD IRRIGATION COMPANY

DIVERSION SYSTEM IMPROVEMENTS
BLACK PIPE
DEMOLITION PLAN AND PROFILE

SET NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 11 of 61	DP2
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- ### CONSTRUCTION NOTES
- 1 FOLD-AND-FORM LINE EXISTING 36" BLACK PIPE - EXTERIOR OF EXISTING 36" BLACK PIPE TO BE COATED WITH A FIELD APPLICATION OF SERIES 27 WB TYPPOXY W/ SERIES 10 PRIMER BY TNEEC OR APPROVED EQUAL - APPROXIMATELY 1,100 SQ. FT. OF PIPE SURFACE AREA
 - 2 INSTALL CONCRETE ANCHORS AT 15' O.C. (E, F SC2)
 - 3 18" HDPE DR11 PIPE INSTALLED BY OTHERS - TO BE PROTECTED IN PLACE
 - 4 PROPERTY LINE
 - 5 CHWA ROW PROJECTION
 - 6 CONSTRUCTION LIMITS

SCALE
0 5' 10'
HORIZ: 1" = 5' : 22 x 34
HORIZ: 1" = 10' : 11 x 17
VERT: 1" = 7' : 22 x 34
VERT: 1" = 14' : 11 x 17

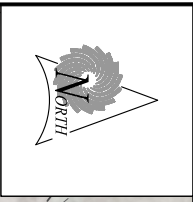
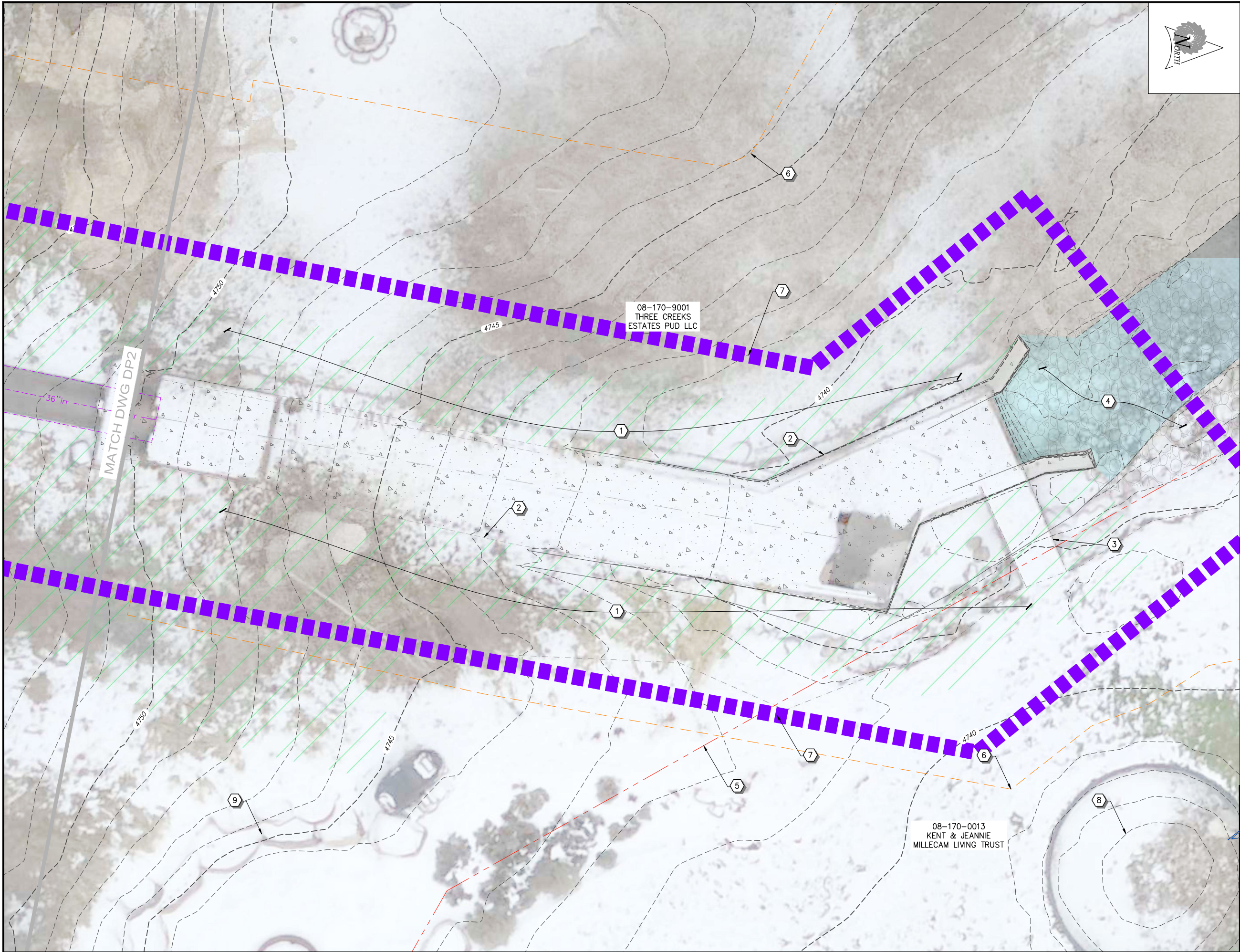
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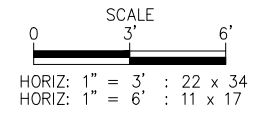
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DIVERSION SYSTEM IMPROVEMENTS
BLACK PIPE
PLAN AND PROFILE

SET NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 12 of 61	SP2
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DEMOLITION NOTES

- 1 VEGETATION IN AREA TO BE TRIMMED / REMOVED AS NEEDED FOR CONSTRUCTION WORK
- 2 REMOVE EXISTING CONCRETE STRUCTURES
- 3 REMOVE EXISTING BRIDGE
- 4 REMOVE EXISTING RIPRAP - TO BE REINSTALLED
- 5 PROPERTY LINE
- 6 CHWA ROW PROJECTION
- 7 CONSTRUCTION LIMITS
- 8 PROTECT EXISTING FIRE PIT
- 9 PROTECT EXISTING ROCK WALL



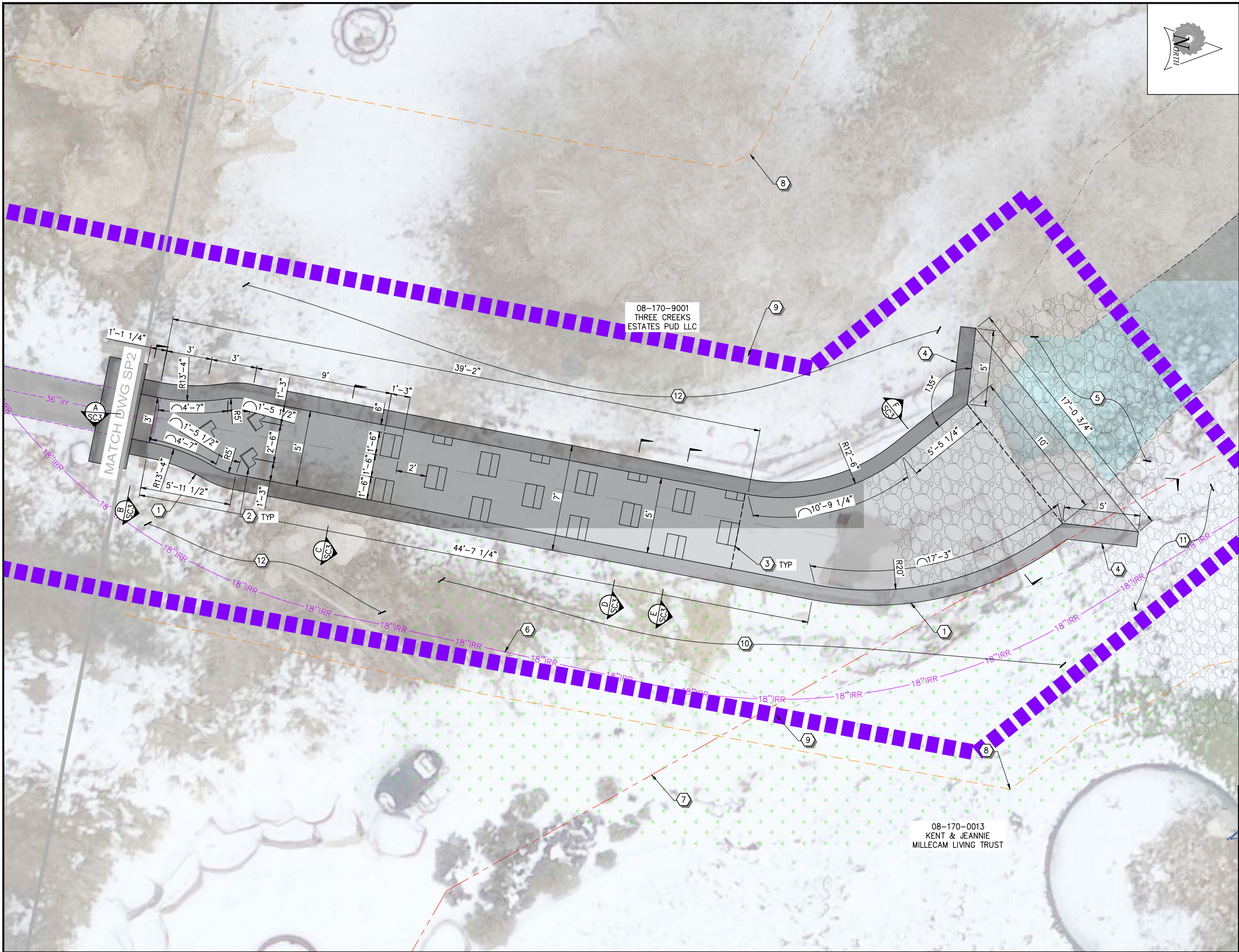
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SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
BLACK PIPE
ENERGY DISSIPATION STRUCTURE DEMOLITION

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
12499	HP	JJ	SDW	13 of 61	DP3



- ### CONSTRUCTION NOTES
- 1 INSTALL CONCRETE ENERGY DISSIPATION STRUCTURE A SC3
 - 2 INSTALL SPLITTER G.H SC3
 - 3 INSTALL BAFFLED CHUTES 1.5' L x 9" (TOP) 1'-3" (BOT) W x 1' H
 - 4 INSTALL CONCRETE WING WALLS
 - 5 INSTALL 20 C.Y. RIPRAP, ROCK TO BE 18" IN SIZE AND LAYERD 24" THICK OVER NATIVE MATERIAL
 - 6 EXISTING 18" HDPE DR11 PIPE
 - 7 PROPERTY LINE
 - 8 CHWA ROW PROJECTION
 - 9 CONSTRUCTION LIMITS
 - 10 DISTURBED LANDSCAPED AREA TO BE RESTORED WITH 6" TOP SOIL AND SOD
 - 11 GRAVEL DISTURBED AREA TO BE RESTORED TO MATCH EXISTING
 - 12 NATIVE DISTURBED AREA TO BE GRADED SMOOTH WITH NATIVE MATERIAL FREE OF ROCK LARGER THAN 2", VEGETATION, DEBRIS AND CONSTRUCTION WASTE - AREA TO BE RESEEDD WITH NATIVE GRASS MIX

GENERAL NOTES

1. DIMENSIONS FOR THE FIRST ROW OF BAFFLE BLOCKS ARE CONSTANT FOR ALL ROWS FOLLOWING WITH EVERY OTHER ROW BEING MIRRORED

SCALE

0 3' 6'

HORIZ: 1" = 3' : 22 x 34

HORIZ: 1" = 6' : 11 x 17

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PROFESSIONAL ENGINEER

No. 12401899

Steven David Wood

10/30/2025

STATE OF UTAH

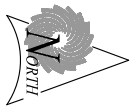
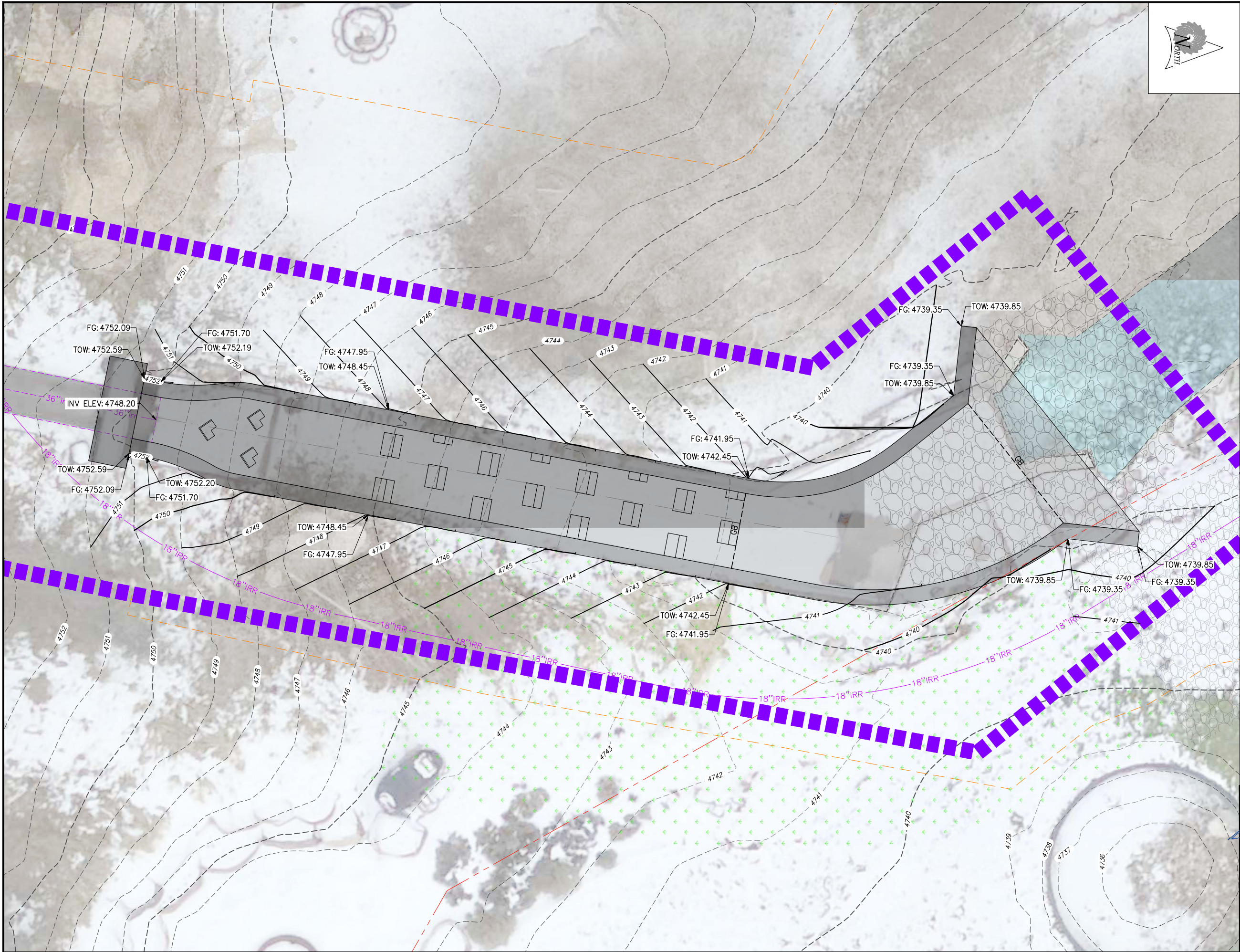
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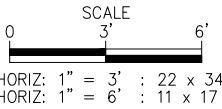


GRADING NOTES

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 5. THE EXISTING TOPOGRAPHY IS REPRESENTED WITH MINOR CONTOURS EVERY 1' AND MAJOR CONTOURS EVERY 5'. THE PROPOSED TOPOGRAPHY IS REPRESENTED WITH MINOR CONTOURS EVERY 1' AND MAJOR CONTOURS EVERY 5'.
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GENERAL NOTES

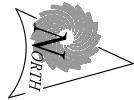
1. REFER TO CROSS SECTIONS FOR ADDITIONAL GRADING NOTES



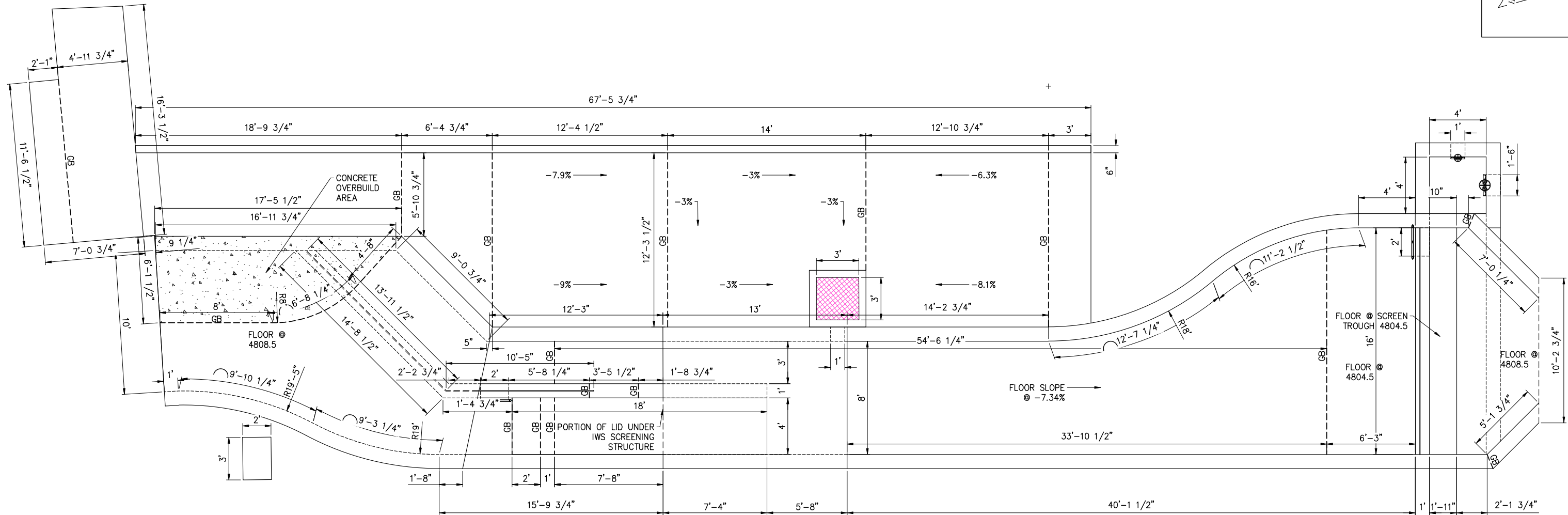
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SMITHFIELD IRRIGATION COMPANY
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BLACK PIPE
ENERGY DISSIPATION STRUCTURE GRADING

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12499	HP	JJ	SDW	15 of 61	GP3

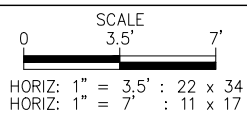


BID SET



A PLAN - INTAKE STRUCTURE
NOT TO SCALE

- NOTES:
1. THE IWS SCREEN ASSEMBLY HAS BEEN REMOVED FOR CLARITY
 2. THE DUMPSTER LINE WORK HAS BEEN REMOVED FOR CLARITY
 3. THE WEDGE WIRE SCREEN HATCH HAS BEEN REMOVED FOR CLARITY



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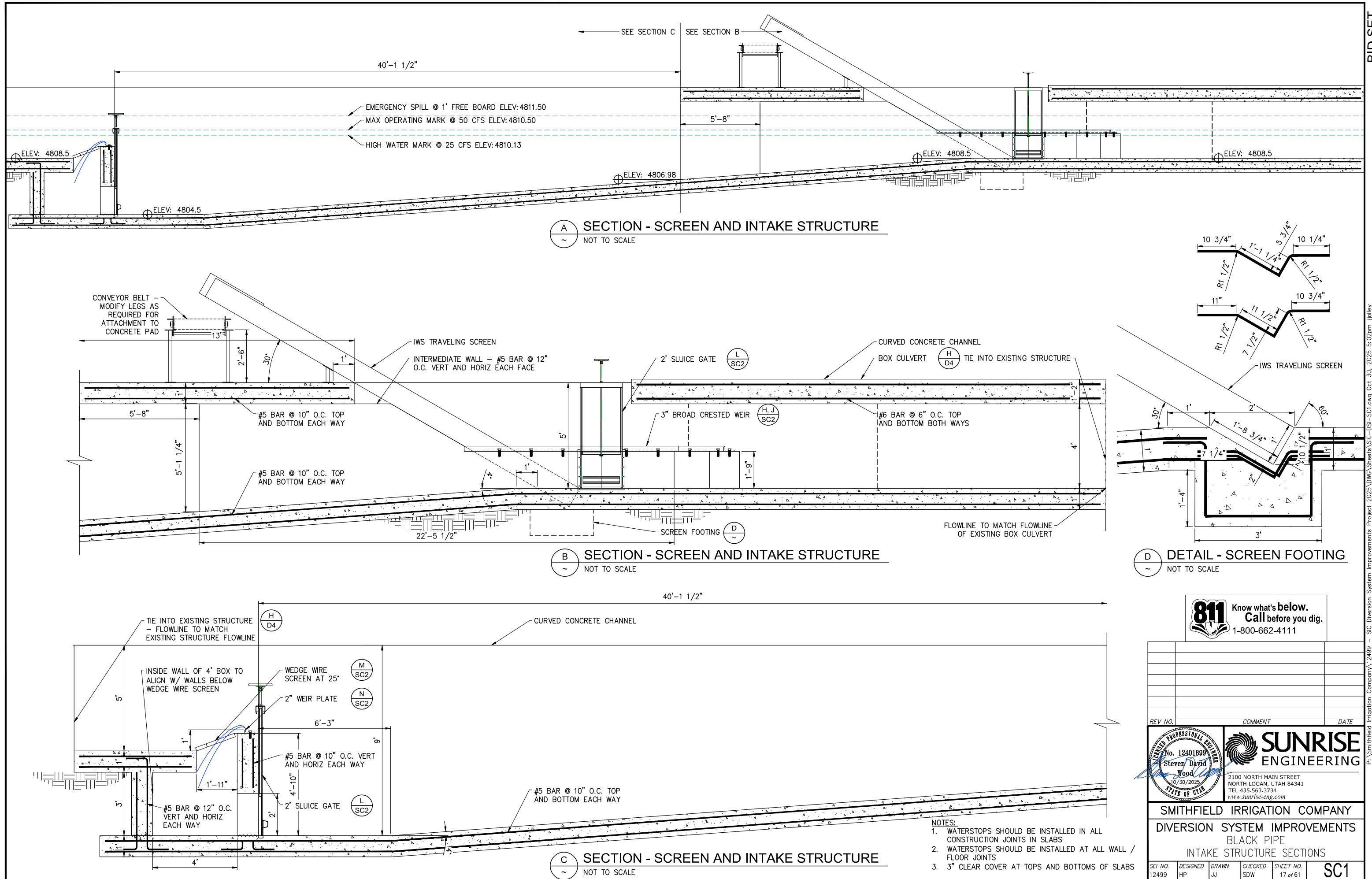
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SMITHFIELD IRRIGATION COMPANY
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BLACK PIPE
INTAKE STRUCTURE ENLARGED PLAN

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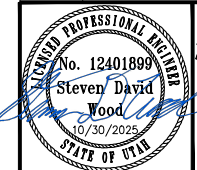


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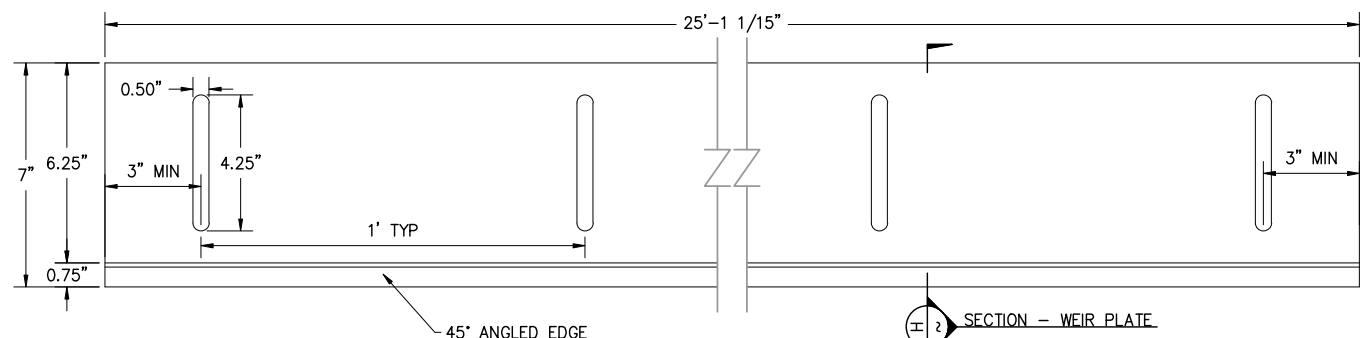
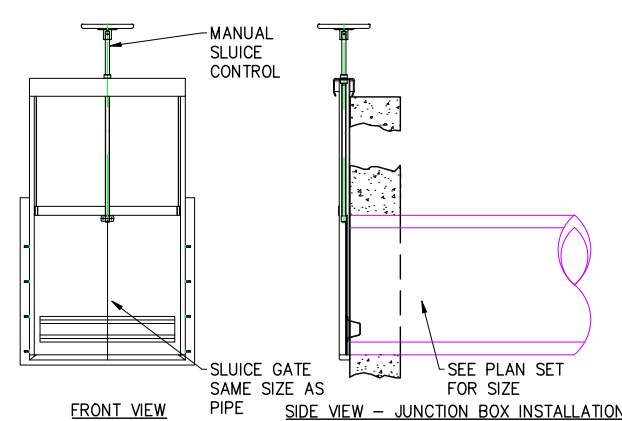
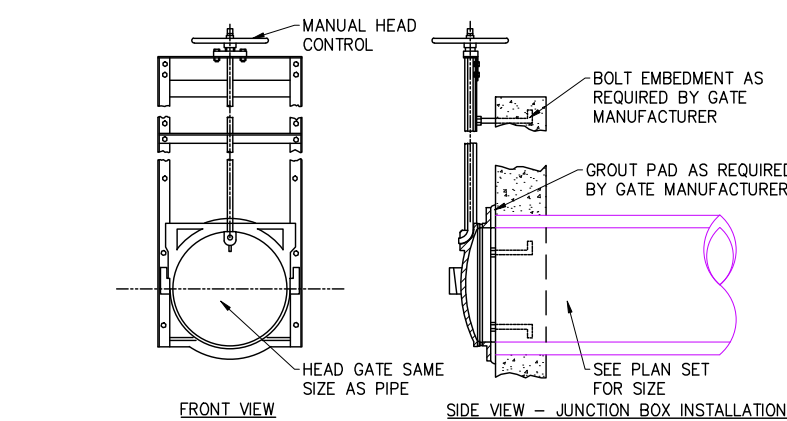
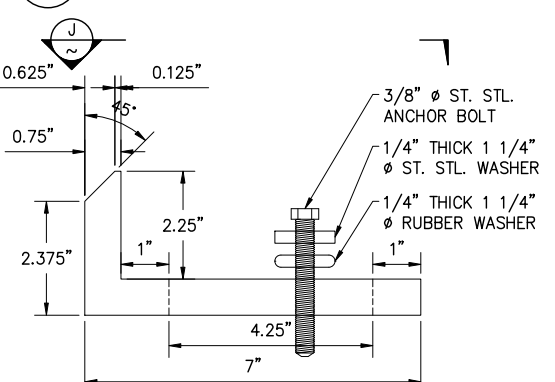
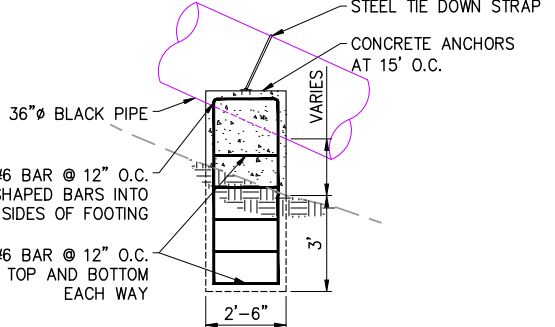
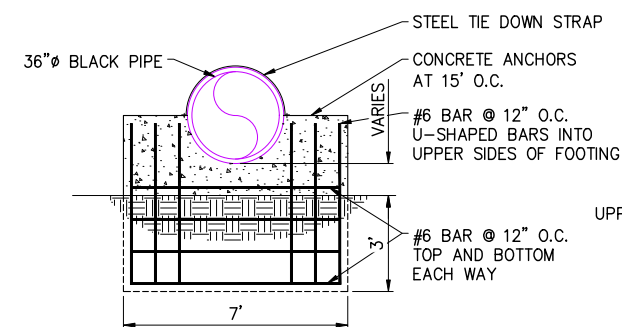
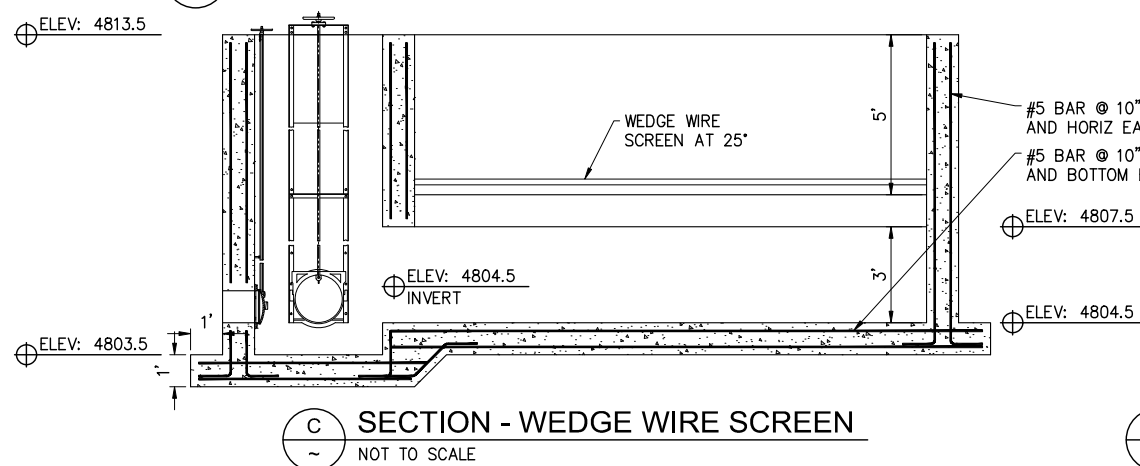
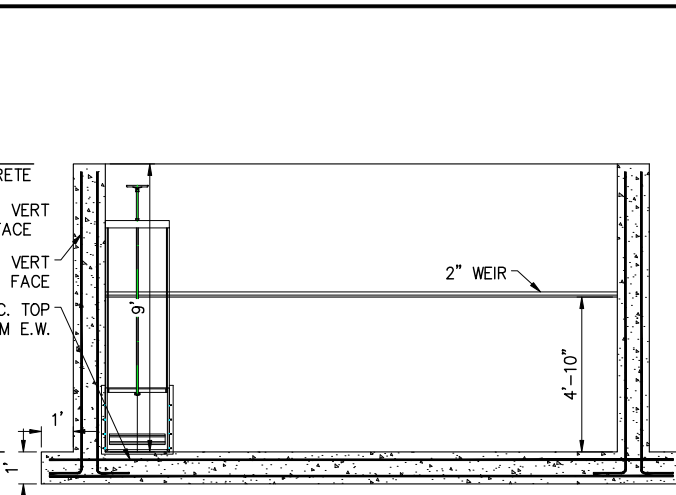
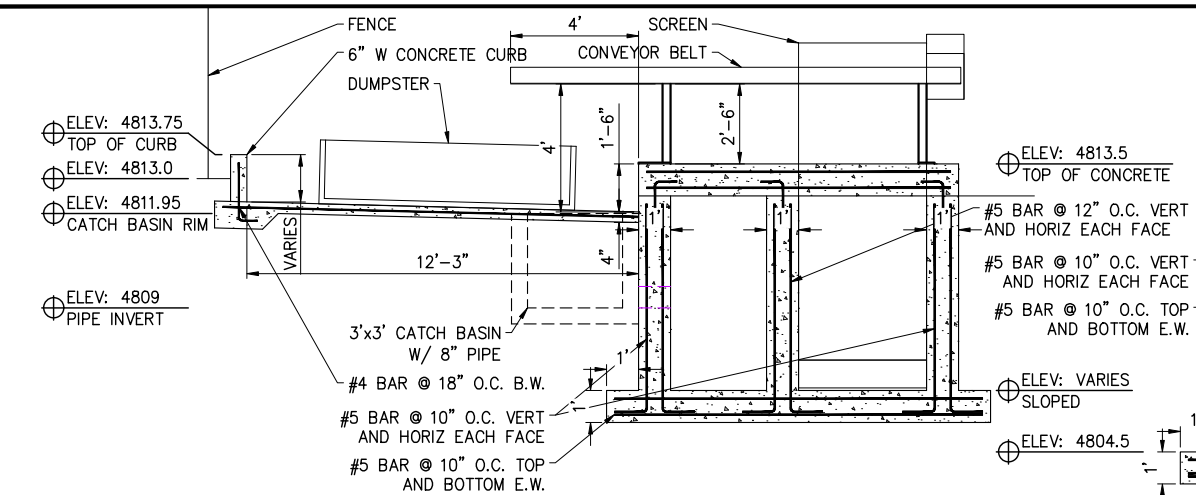


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BLACK PIPE
INTAKE STRUCTURE SECTIONS

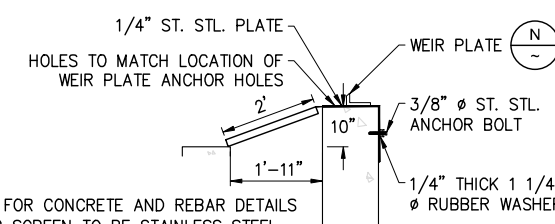
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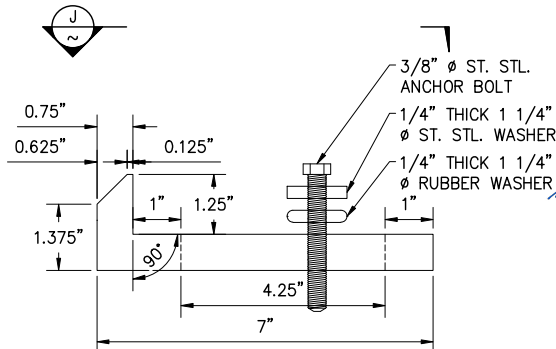
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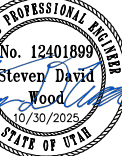
- NOTES:**
- 1) THE WEIR PLATE WILL BE CONNECTED WITH 3/8" DIA. ST. STL. ANCHOR BOLTS SPACED 12" APART ALONG THE TOP EDGE OF THE SCREEN STRUCTURE'S WALL.
 - 2) A 1/4" THICK ST. STL. WASHER AND A 1/4" THICK RUBBER WASHER SHALL BE PLACED ON EACH ANCHOR BOLT SUCH THAT THE RUBBER WASHER IS BETWEEN THE ST. STL. WASHER AND THE WEIR PLATE.
 - 3) SEAL PERIMETER OF WEIR PLATE WITH SIKAFLEX CAULK.
 - 4) THE WEIR EDGE SHALL BE CUT AT A 45 DEG ANGLE.
 - 5) WEIR TO BE MADE OF 3/4" 304 STAINLESS STEEL OR AN APPROVED MATERIAL BY THE ENGINEER
- 811** Know what's below.
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- NOTES:
- 1) SEE F/SC2 FOR CONCRETE AND REBAR DETAILS
 - 2) WEDGE WEIR SCREEN TO BE STAINLESS STEEL
 - 3) SCREEN OPENING ARE TO BE 1.00mm +\ - .05mm
 - 4) MANUFACTURE TO BUILD SCREENS TO MANAGEABLE WIDTH (PREFERABLE 5' TO 6')
 - 5) MANUFACTURE TO VERIFY SCREEN CAN PASS 60 GPM/FT^2 OF SCREEN +\ - 5% W/ DOCUMENTATION
 - 6) MANUFACTURE TO PROVIDE ADEQUATE MOUNTING DETAILS FOR ENGINEERS APPROVAL
 - 7) OVER ALL LENGTH IS 15'
 - 8) MANUFACTURE TO SUBMIT FULL SUBMITTALS FOR ENGINEERS APPROVAL
 - 9) STAINLESS STEEL SECTION THAT EXTENDS OVER TOP AND FRONT OF CONCRETE WALL IS REQUIRED TO BE PART OF THE SCREEN
 - 10) BRACING OF SCREEN PER MANUFACTURING RECOMMENDATIONS

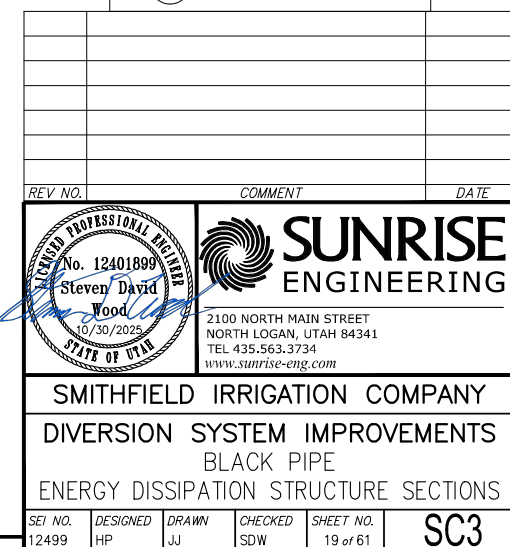


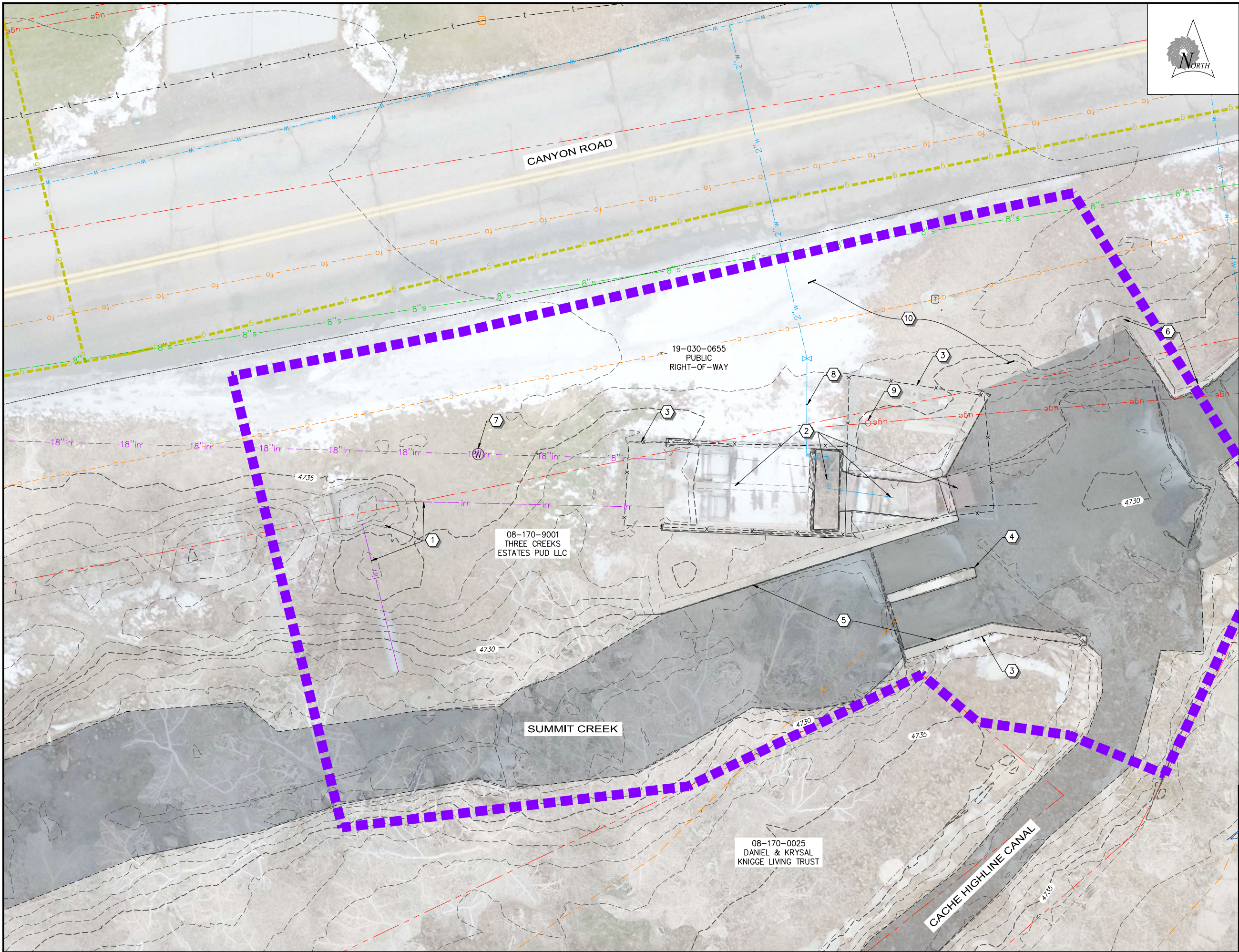
	 Know what's below. Call before you dig. 1-800-662-4111	
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SMITHFIELD IRRIGATION COMPANY DIVERSION SYSTEM IMPROVEMENTS BLACK PIPE INTAKE STRUCTURE SECTIONS
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SEI NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 18 of 61	SC2
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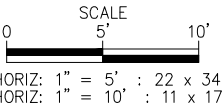


DEMOLITION NOTES

- 1 EXISTING STRUCTURE AND ASSOCIATED PIPE LINES TO BE REMOVED
- 2 REMOVE EXISTING DIVERSION STRUCTURES
- 3 REMOVE SITE FENCING – TO BE RE-USED IF POSSIBLE
- 4 REMOVE CENTER CONCRETE WALL – WALL TO BE CUT FLUSH W/ FLOOR
- 5 MAINTAIN AND PROTECT THE NORTH AND SOUTH CONCRETE WALLS – REPAIR ANY OBSERVED CRACKS OR FISSURES
- 6 MAINTAIN AND PROTECT EXISTING STRUCTURE
- 7 MAINTAIN AND PROTECT EXISTING WATER METER AND ASSOCIATED PIPELINES
- 8 2" WATER SERVICE CONNECTION IS TO BE CUT BACK AWAY FROM THE EXISTING STRUCTURE AND IS TO BE PROTECTED FROM CONSTRUCTION
- 9 SITE ELECTRICAL SYSTEMS ARE TO BE REMOVED AND THE SERVICE IS TO BE TERMINATED AT THE METER – THE EXISTING POWER POLE AND METER ARE TO BE PROTECTED
- 10 CLEAR AND GRUB AREA WITHIN THE CONSTRUCTION LIMITS – .124 ACRES

GENERAL NOTES

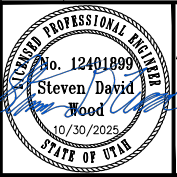
- 1. ALL FENCING MATERIALS, SCREENING EQUIPMENT, HEADGATES OR OTHER POTENTIALLY REUSABLE ELEMENTS ARE TO BE REMOVED WITH THE INTENT OF SIC REUSING THE MATERIALS





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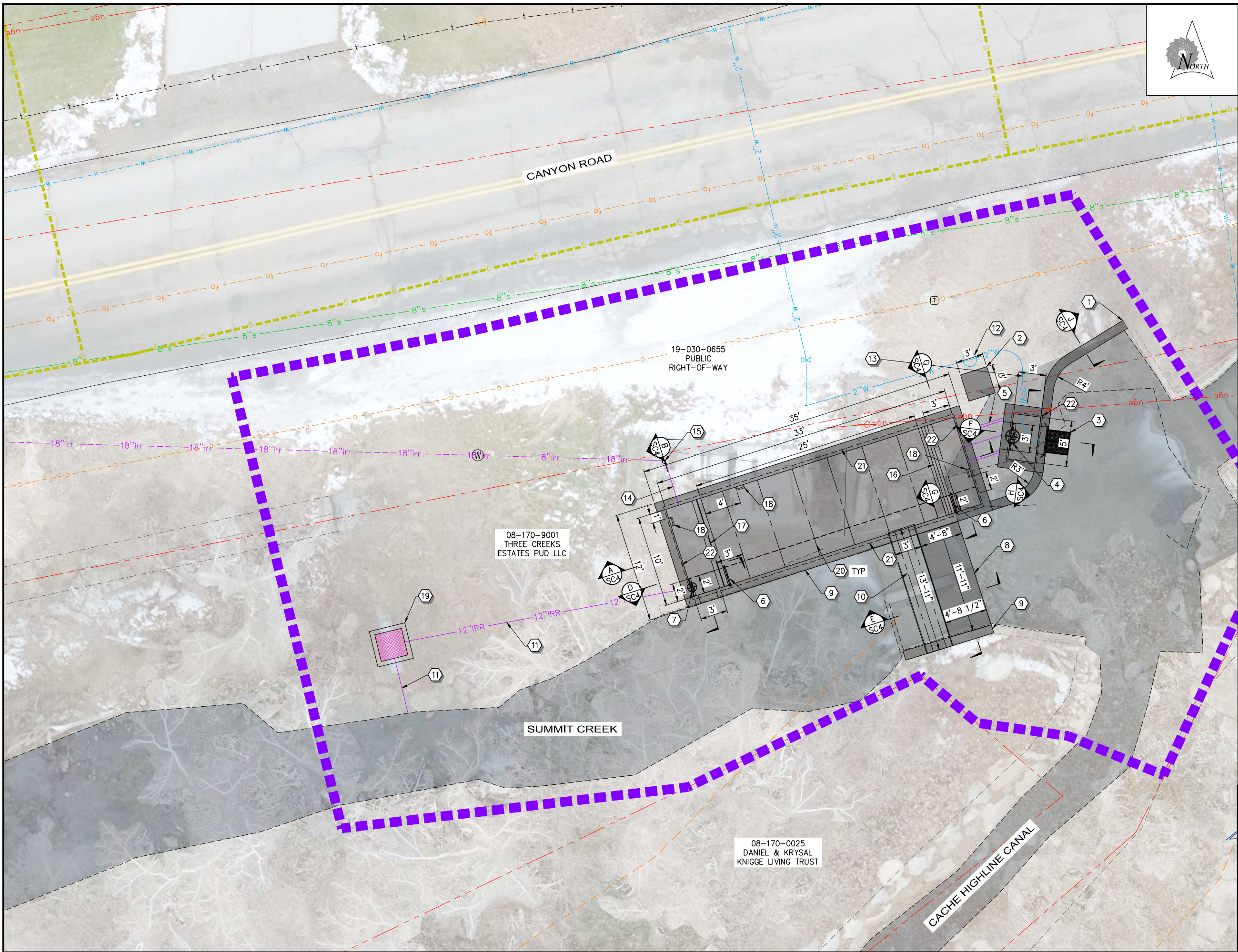


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SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
THREE CREEKS DIVERSION
DEMOLITION PLAN

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
12499	HP	JJ	SDW	20 of 61	DP4



- ### CONSTRUCTION NOTES
1. INSTALL CONCRETE WALL - TIE INTO EXISTING CONCRETE WALL (H D4)
 2. INSTALL 6" CONCRETE PAD FOR COMPRESSOR
 3. INSTALL ROTARY DRUM SCREEN
 4. INSTALL 3' HEADGATE (K SC2)
 5. INSTALL 36" HDPE DUAL WALL CORRUGATED PIPE - PIPE TO BE CAST IN PLACE WITH STRUCTURES
 6. INSTALL 2' SLUICE GATE (L SC2)
 7. INSTALL 12" HEADGATE (K SC2)
 8. INSTALL OBERMEYER WEIR
 9. RAISE CONCRETE WALL TO ELEV: 4735.5 (N SC4)
 10. INSTALL PEDESTRIAN BRIDGE (E, F, G D4)
 11. INSTALL 12" HDPE DUAL WALL CORRUGATED PIPELINE
 12. INSTALL BACKFLOW PREVENTER PER SMITHFIELD CITY STANDARDS
 13. INSTALL 2" POLY PIPE TO CONNECT TO THE NEW ROTARY DRUM SCREEN
 14. INSTALL 18" PVC C900 PIPE (D D1)
 15. INSTALL DI 18" 90° ELBOW
 16. INSTALL INFLOW WEIR
 17. INSTALL OUTFLOW WEIR
 18. INSTALL MANHOLE STEPS @ 10" MAX SPACING
 19. INSTALL 3'x3' PRECAST CATCH BASIN W/ GRATE AND WITH MANHOLE STEPS (B, C D2)
 20. INSTALL W6x12 DECK SUPPORT BEAMS @ 4' O.C. UNLESS NOTED OTHERWISE (K SC4)
 21. INSTALL 2x4x1/4 ANGLE BETWEEN SUPPORT BEAMS (L SC4)
 22. INSTALL 2x2x1/4 ANGLE (M SC4)

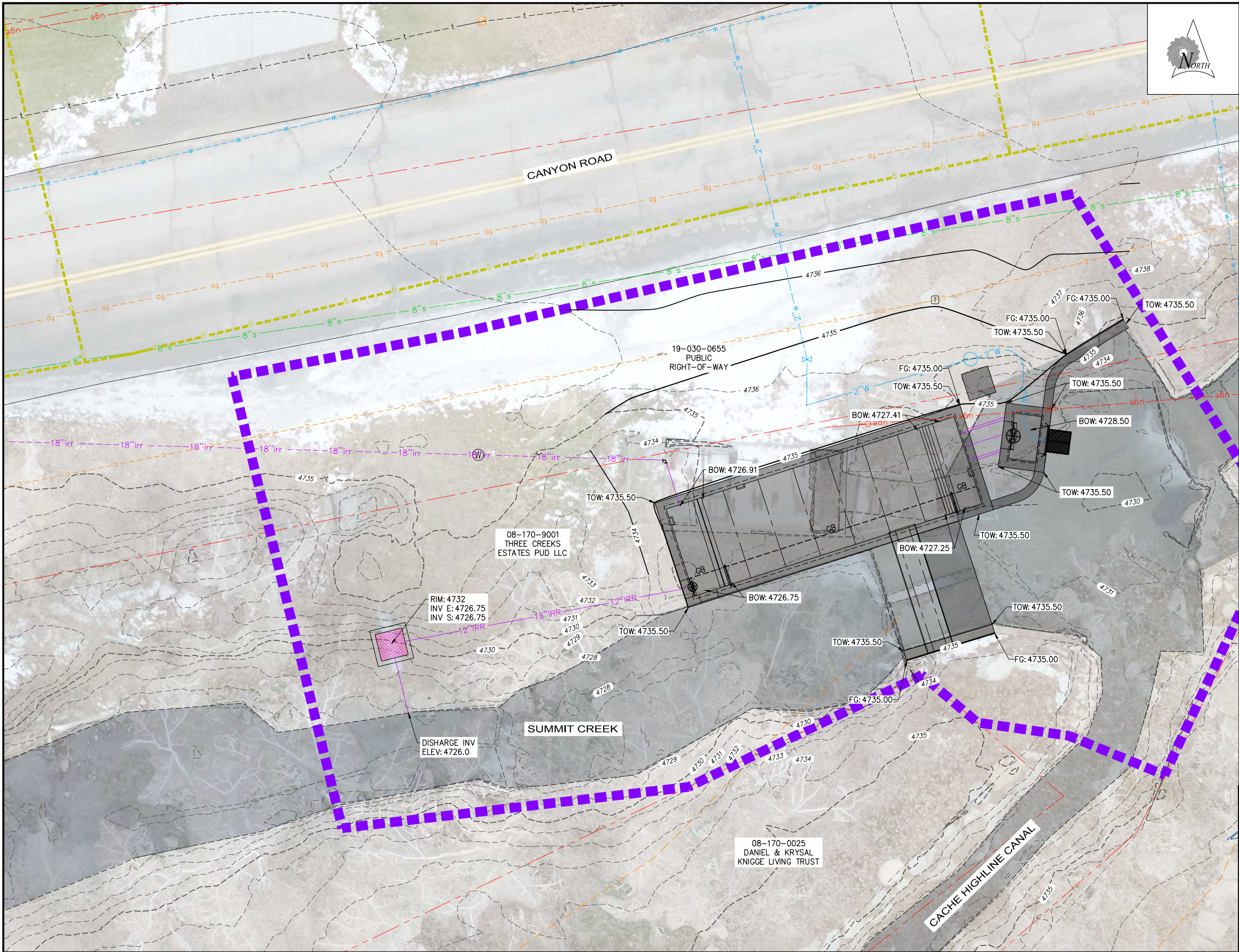
SCALE
0 5' 10'
HORIZ: 1" = 5' : 22 x 34
HORIZ: 1" = 10' : 11 x 17

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SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
THREE CREEKS DIVERSION
SITE PLAN

SEI NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 21 of 61	SP4
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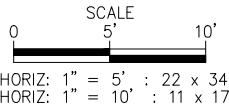


GRADING NOTES

- TBC = TOP BACK OF CURB
TOC = TOP OF CONCRETE/PAVEMENT
TOW = TOP OF WALL
BOW = BOTTOM OF WALL
FG = FUTURE GRADE
FL = FLOW LINE
1. AN APPROVED GRADING AND DRAINAGE PLAN SHALL BE ON THE JOB SITE AT ALL TIMES. DEVIATIONS FROM THE PLAN MUST BE PRECEDED BY AN APPROVED PLAN REVISION.
 2. GRADING AND DRAINAGE PLAN APPROVAL INCLUDES THE CONSTRUCTION OF ALL SURFACE IMPROVEMENTS SHOWN ON THE APPROVED PLAN, INCLUDING, BUT NOT LIMITED TO RETENTION AREAS, SEDIMENTATION BASINS AND/OR OTHER DRAINAGE FACILITIES, DRAINAGE PATTERNS, WALLS, CURBS, ASPHALT PAVEMENT AND BUILDING FLOOR ELEVATIONS.
 3. ALL DRAINAGE PROTECTIVE DEVICES SUCH AS SWALES, INTERCEPTOR DITCHES, PIPES, PROTECTIVE BERMS, CONCRETE CHANNELS OR OTHER MEASURES DESIGNED TO PROTECT ADJACENT BUILDINGS OR PROPERTY FROM STORM RUNOFF MUST BE COMPLETED PRIOR TO STRUCTURE CONSTRUCTION.
 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO OBSTRUCTIONS AND UTILITY LINES ENCOUNTERED DURING CONSTRUCTION AND SHALL DETERMINE THE EXACT LOCATION OF UTILITIES IN ADVANCE OF TRENCHING. THE ENGINEER WILL NOT GUARANTEE ANY ELEVATIONS AT LOCATIONS OF THE EXISTING UNDERGROUND UTILITIES SHOWN ON THESE PLANS.
 5. THE EXISTING TOPOGRAPHY IS REPRESENTED WITH MINOR CONTOURS EVERY 1' AND MAJOR CONTOURS EVERY 5'. THE PROPOSED TOPOGRAPHY IS REPRESENTED WITH MINOR CONTOURS EVERY 1' AND MAJOR CONTOURS EVERY 5'.
 6. CONTRACTOR TO ENSURE ALL GRADE CHANGES ARE TO BE COMPLETED IN A SMOOTH MANNER. INDIVIDUAL VERTICAL CURVES ARE NOT SHOWN FOR CLARITY.

GENERAL NOTES

1. REFER TO CROSS SECTIONS FOR ADDITIONAL GRADING NOTES



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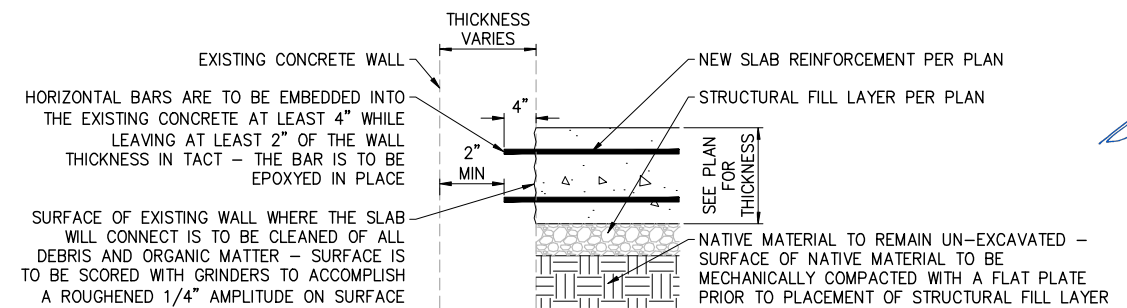
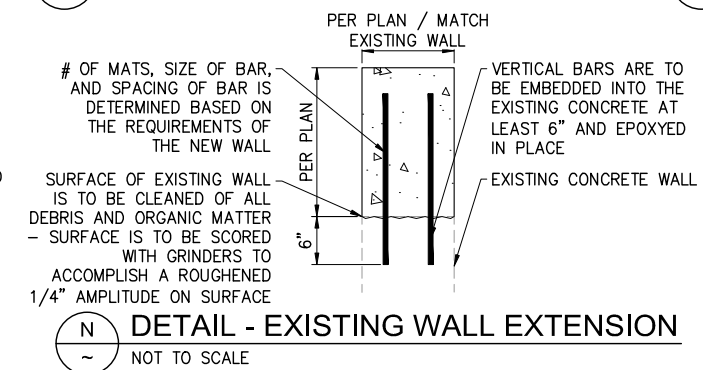
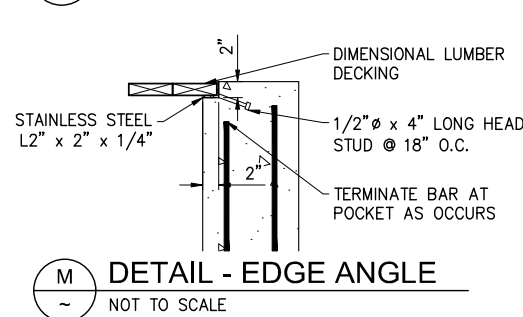
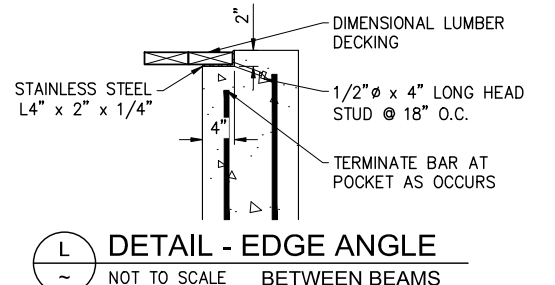
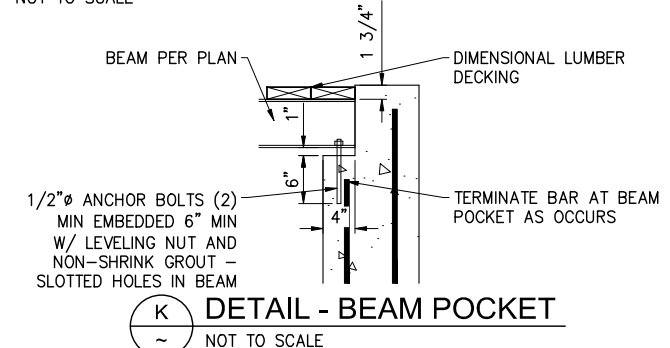
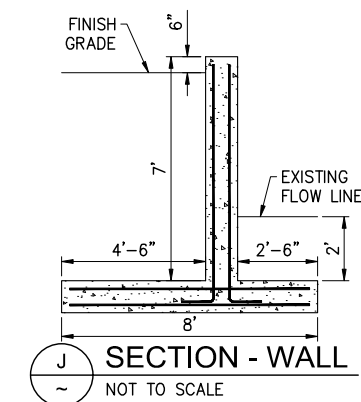
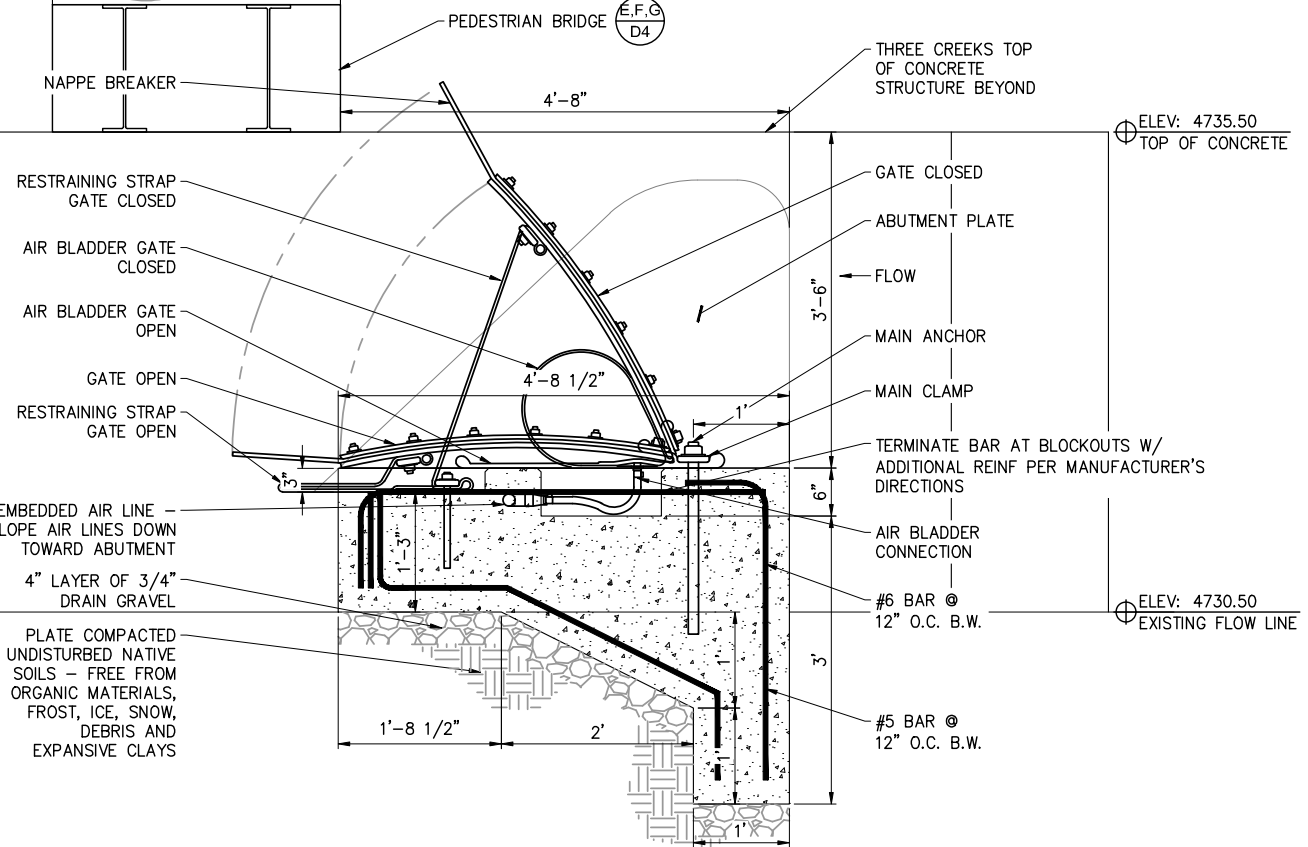
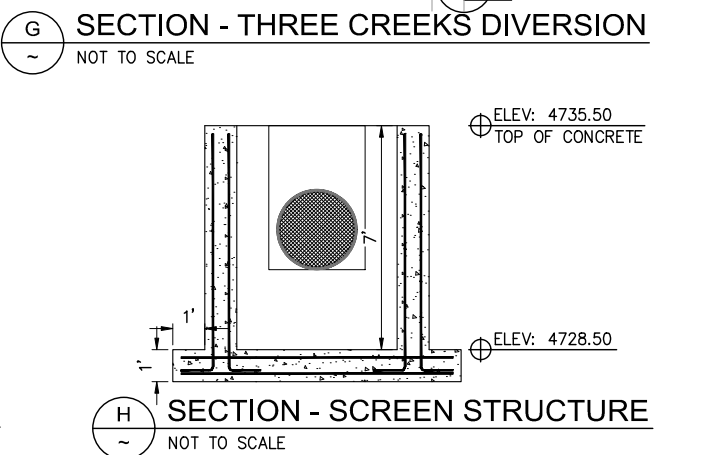
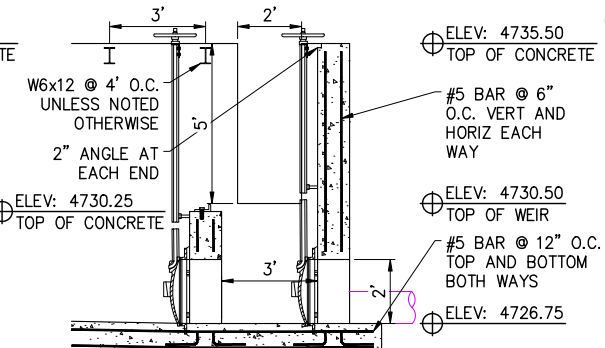
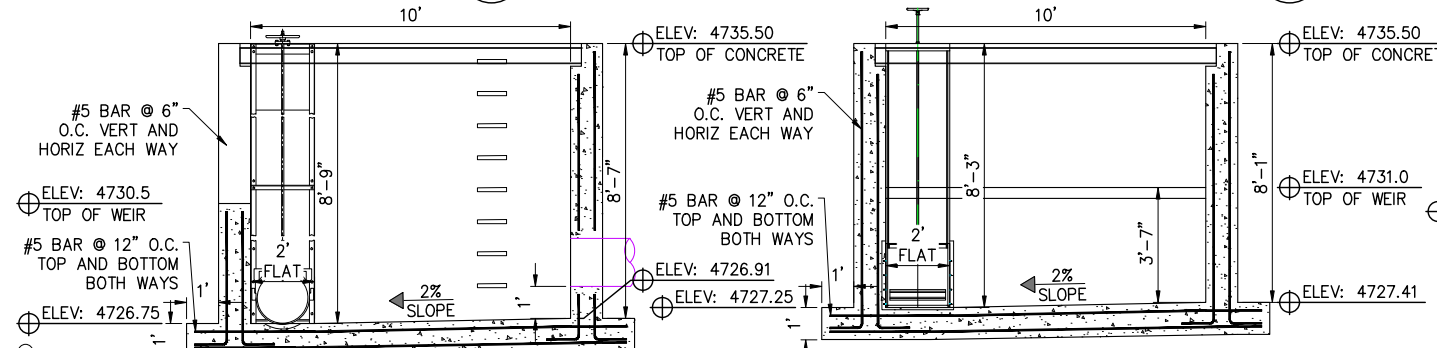
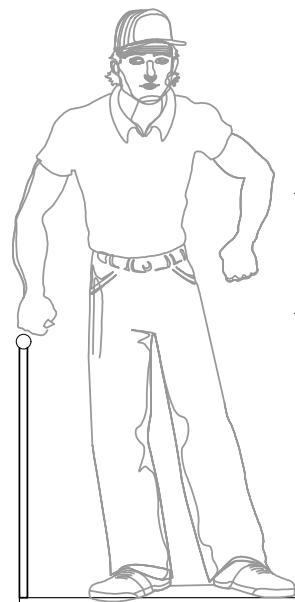
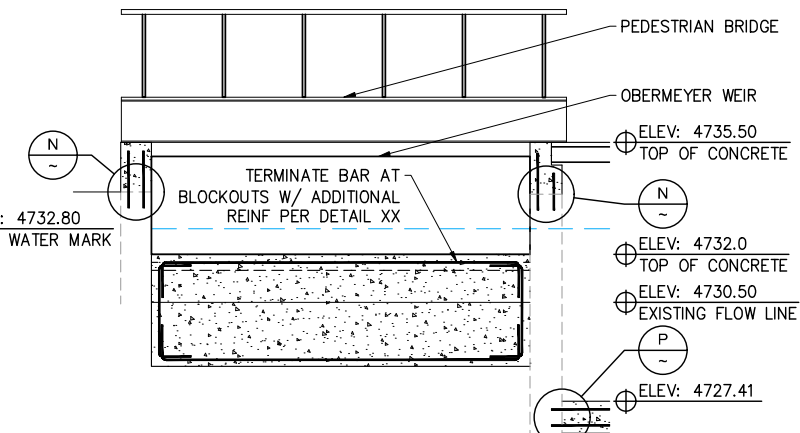
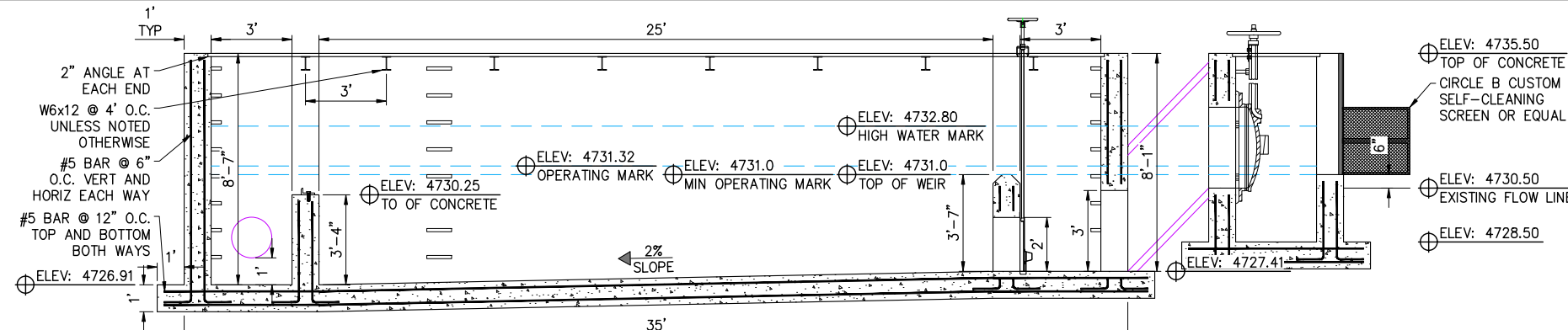
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SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
THREE CREEKS DIVERSION
GRADING PLAN

REV NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
12499	HP	JJ	SDW	22 of 61	GP4

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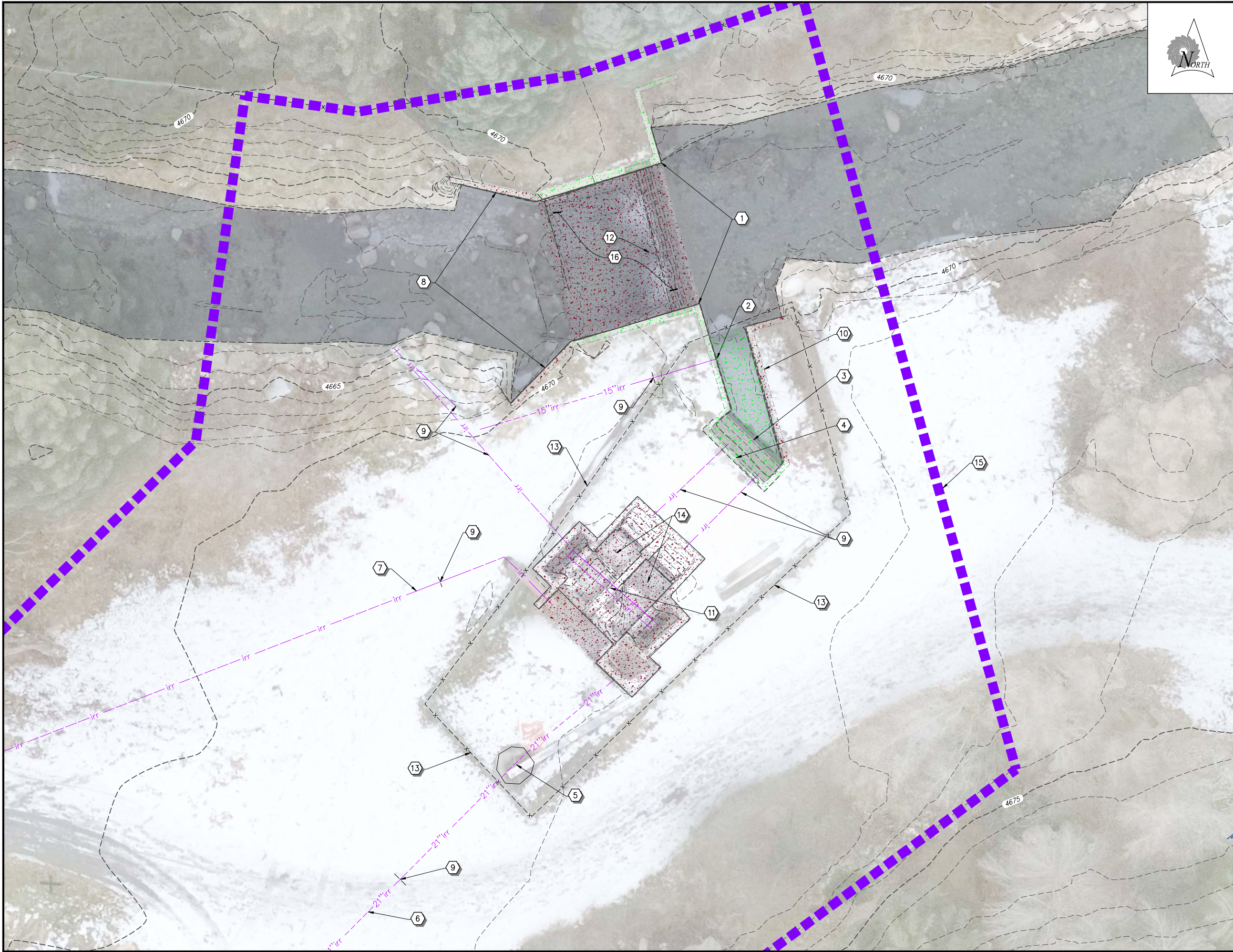
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SMITHFIELD IRRIGATION COMPANY
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THREE CREEKS DIVERSION
SECTIONS

REV NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
12499	HP	JJ	SDW	23 of 61

SC4



DEMOLITION NOTES

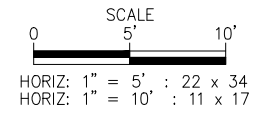
- 1 MAINTAIN AND PROTECT EXISTING CONCRETE STRUCTURE
- 2 MAINTAIN AND PROTECT EXISTING SLIDE GATE AND ASSOCIATED 15" PIPE
- 3 EXISTING COARSE BAR SCREEN AND TOP GRATE TO BE PROTECTED IN PLACE
- 4 MAINTAIN AND PROTECT EXISTING CONCRETE WALL AND HEADGATES
- 5 EXISTING METER WELL TO BE REMOVED - THE METER IS TO BE PROTECTED AND DELIVERED TO SIC
- 6 EXISTING 21" IRRIGATION LINE TO BE PROTECTED IN PLACE
- 7 EXISTING OUTLET FROM BUDGE WELL TO BE PROTECTED IN PLACE
- 8 SAWCUT AND REMOVE EXISTING CONCRETE WING WALLS
- 9 REMOVE EXISTING PIPES - ENDS TO BE CUT CLEANLY FOR FUTURE CONNECTION
- 10 SAWCUT AND REMOVE EXISTING EAST CONCRETE PAD AND WALLS TO PROVIDE CLEAN EDGE
- 11 REMOVE EXISTING DIVERSION STRUCTURE
- 12 EXISTING PEDESTRIAN BRIDGE TO BE RELOCATED
- 13 REMOVE AND RETAIN EXISTING SITE FENCE - FENCE IS TO BE REUSED AS APPROPRIATE
- 14 REMOVE AND RETAIN DRUM SCREENS
- 15 CLEAR AND GRUB AREA WITHIN THE CONSTRUCTION LIMITS AS NEEDED - .25 ACRES
- 16 REMOVE CONCRETE IN STREAM BETWEEN CONCRETE WALLS - SAWCUT AT CONCRETE WALLS TO BE PROTECTED IN PLACE

LEGEND

- CONCRETE TO BE REMOVED
- CONCRETE TO BE PROTECTED

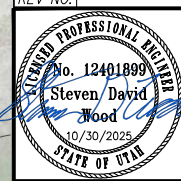
GENERAL NOTES

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SMITHFIELD IRRIGATION COMPANY

DIVERSION SYSTEM IMPROVEMENTS

BUDGE DIVERSION

DEMOLITION PLAN

SEI NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 24 of 61	DP5
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BID SET



CONSTRUCTION NOTES

- 1 INSTALL NEW WING WALLS IN EXISTING LOCATION - TIE INTO EXISTING STRUCTURE
- 2 INSTALL OBERMEYER WEIR
- 3 INSTALL CONCRETE COMPRESSOR PAD
- 4 INSTALL 8' WIDE x 3' HIGH SLUICE GATE (L/SC2)
- 5 WIDEN CHANNEL TO 8'
- 6 INSTALL 1' BROAD CRESTED WEIR
- 7 EXISTING SLIDE GATE
- 8 TIE INTO EXISTING STRUCTURE (H/D4)
- 9 CENTER NEW STRUCTURE ON EXISTING STRUCTURE
- 10 INSTALL HEAD GATE (K/SC2)
- 11 INSTALL 4' Ø MANHOLE (H/SC6)
- 12 INSTALL 5' Ø MANHOLE (H/SC6)
- 13 INSTALL 18" PVC C900 DR18 PIPE (D/D1)
- 14 INSTALL 12" PVC C900 DR18 PIPE (D/D1)
- 15 INSTALL WEDGE WIRE SCREEN (M/SC2)
- 16 INSTALL 4'x4' BOX W/ WATERMAIN HEADGATE ON OUTLET PIPE (K/SC2)
- 17 NEW 21" OUTLET PIPE - CONNECT TO EXISTING 21" PIPE (D/D1)
- 18 INSTALL METER MANHOLE (B,C/D1)
- 19 OUTLET FROM BUDGE WELL TO BE RE-ROUTED THROUGH 12" PIPE DOWN AND INTO NEW STRUCTURE
- 20 INSTALL INFLOW WEIR
- 21 INSTALL OUTFLOW WEIR
- 22 INSTALL MANHOLE STEPS @ 10" MAX SPACING
- 23 RELOCATED EXISTING PEDESTRIAN BRIDGE
- 24 INSTALL FITTING PER PLAN

SCALE
0 5' 10'
HORIZ: 1" = 5' : 22 x 34
HORIZ: 1" = 10' : 11 x 17

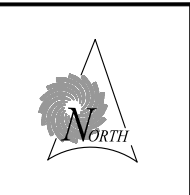
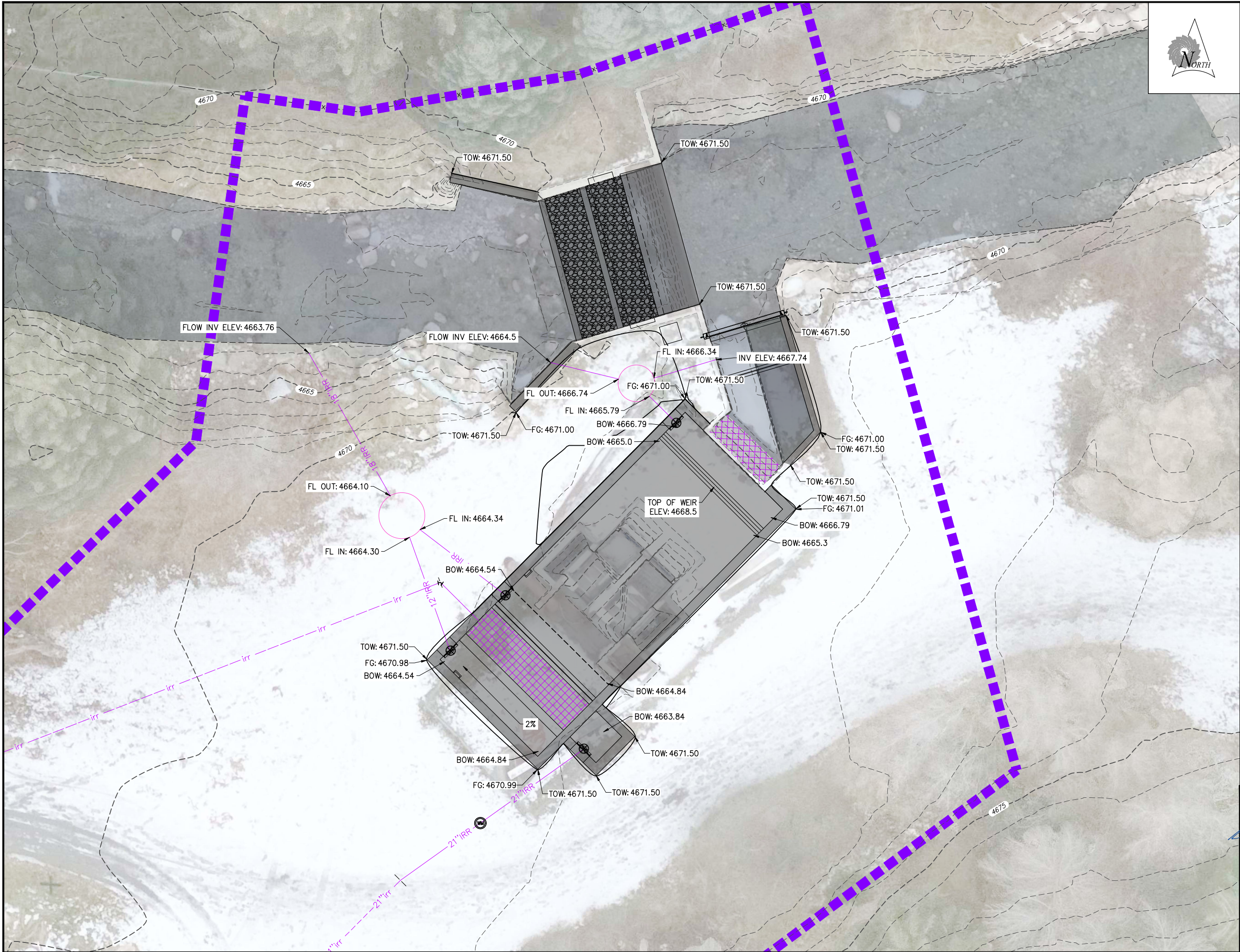
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SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
BUDGE DIVERSION
SITE PLAN

SET NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 25 of 61	SP5
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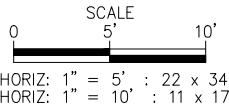


GRADING NOTES

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GENERAL NOTES

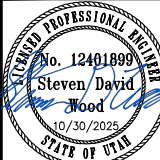
1. REFER TO CROSS SECTIONS FOR ADDITIONAL GRADING NOTES





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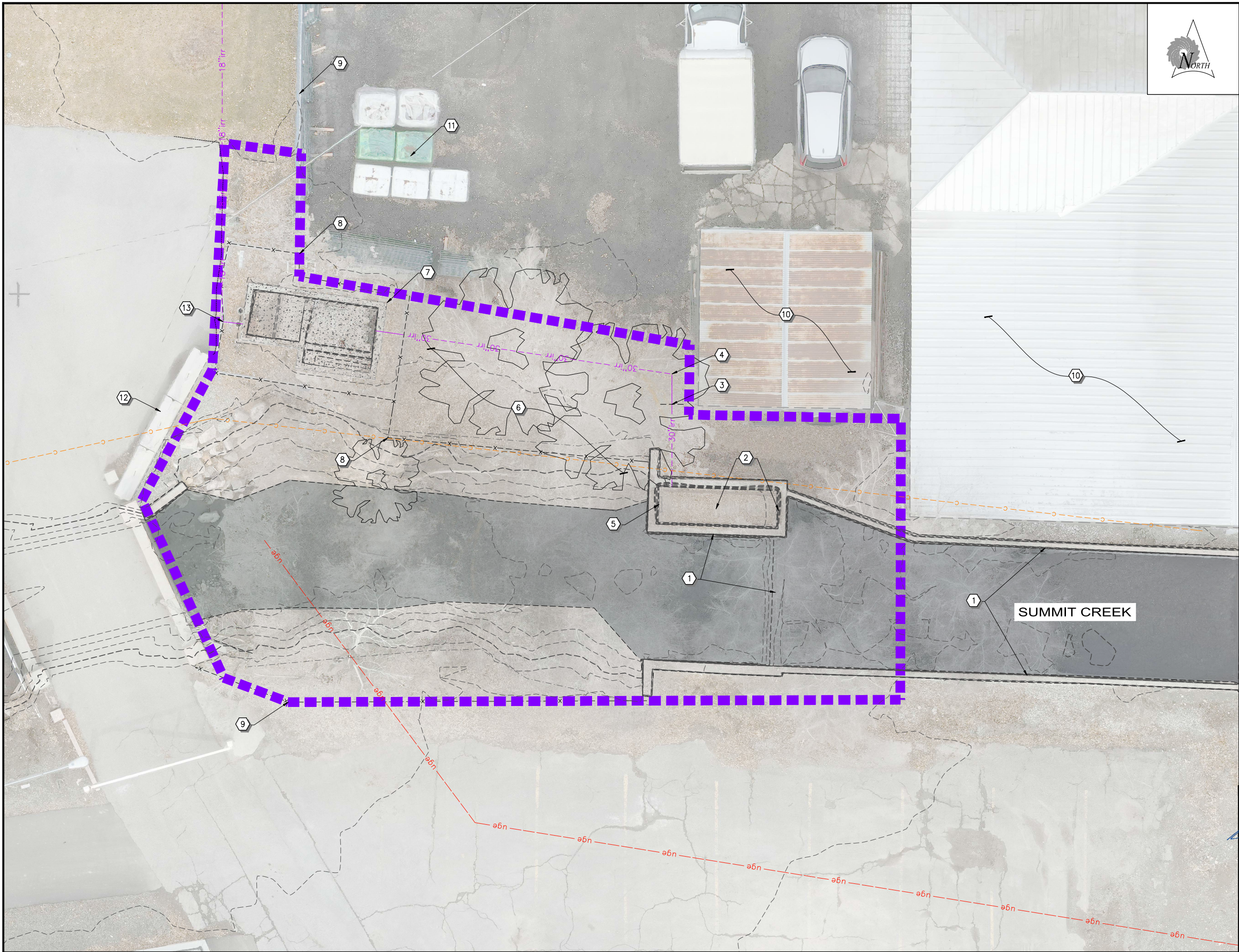


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SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
BUDGE DIVERSION
GRADING PLAN

SET NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 26 of 61	GP5
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DEMOLITION NOTES

- 1 PROTECT EXISTING STRUCTURE IN PLACE
- 2 EXISTING BOX AND INLET ARE TO BE CLEANED OUT FROM SEDIMENT AND DEBRIS
- 3 SAWCUT AND REMOVE THE NORTH CMP SECTION - A SECTION OF EXISTING 30" PIPE IS TO BE RE-USED PER SP6 - PIPE IS TO BE INSPECTED BY ENGINEER PRIOR TO PLACEMENT
- 4 EXISTING 30" FITTING IS TO BE REMOVED AND RE-INSTALLED PER SP6 - FITTING IS TO BE INSPECTED BY ENGINEER FOR CONDITION PRIOR TO PLACEMENT
- 5 REMOVE EXISTING 8" HEADGATE
- 6 CLEAR AND GRUB AREA WITHIN THE CONSTRUCTION LIMITS - .074 ACRES
- 7 REMOVE EXISTING STRUCTURE
- 8 REMOVE EXISTING FENCE
- 9 PROTECT EXISTING FENCE
- 10 PROTECT EXISTING BUILDINGS AND STRUCTURES
- 11 PROTECT EXISTING STOCKED MATERIAL
- 12 REMOVE AND REPLACE CONCRETE BLOCKS FOR CONSTRUCTION EFFORTS
- 13 PROTECT EXISTING 18" LINE IN PLACE

GENERAL NOTES

1. ALL FENCING MATERIALS, SCREENING EQUIPMENT, HEADGATES OR OTHER POTENTIALLY REUSABLE ELEMENTS ARE TO BE REMOVED WITH THE INTENT OF SIC REUSING THE MATERIALS

SCALE
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HORIZ: 1" = 5' : 22 x 34
HORIZ: 1" = 10' : 11 x 17

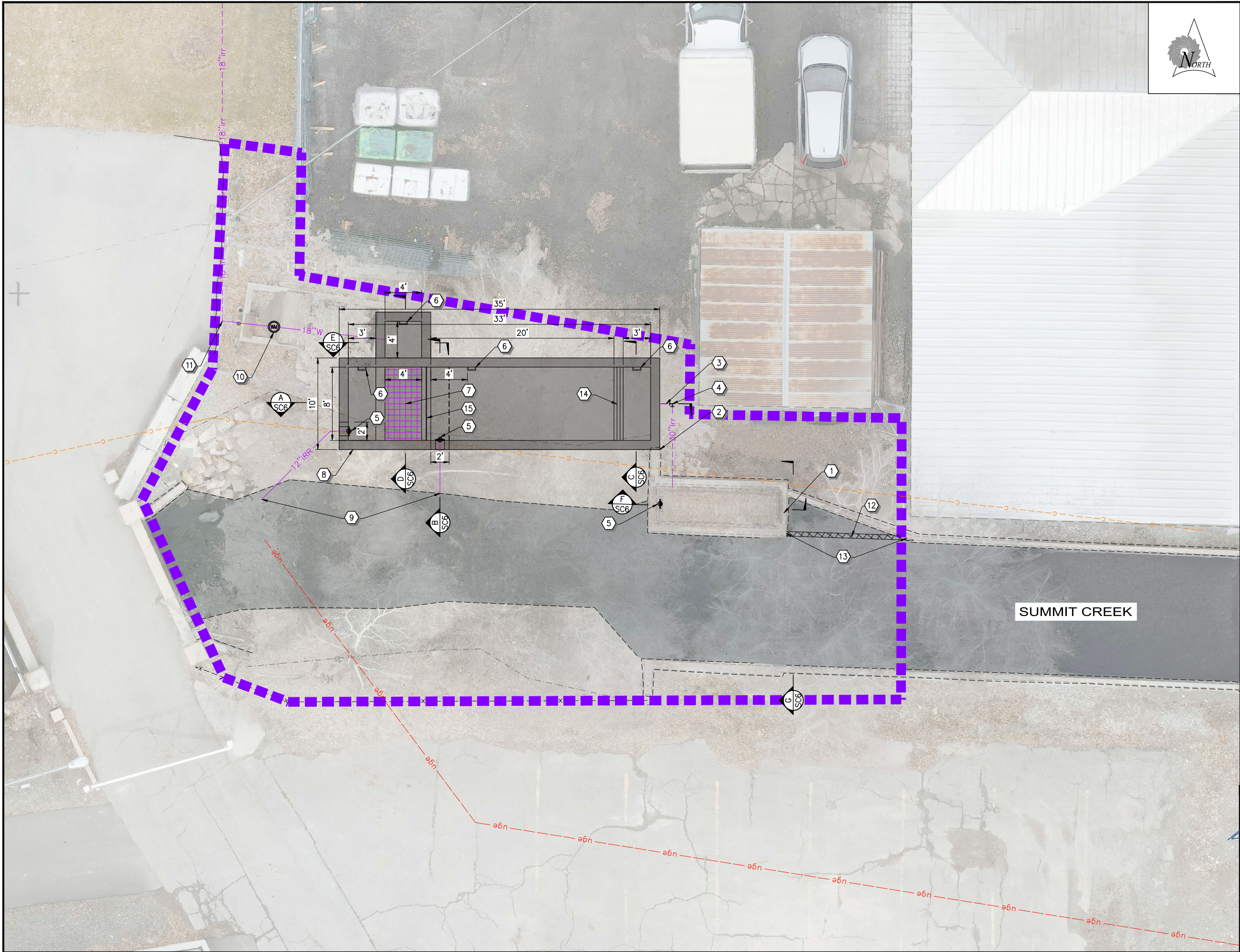
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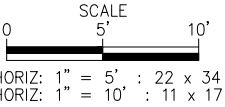
SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
CLAY POOL SOUTH DIVERSION
DEMOLITION PLAN

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
12499	HP	JJ	SDW	28 of 61	DP6



CONSTRUCTION NOTES

- 1 EXISTING UNDERSHOT GATE
- 2 LOCATE NEW STRUCTURE AGAINST EXISTING WALL
- 3 INSTALL RE-USED 30" INLET PIPE – PIPE IS TO BE CAST INTO NEW CONCRETE STRUCTURE
- 4 INSTALL RE-USED 30" 90° ELBOW
- 5 INSTALL 12" HEADGATE (K SC2)
- 6 INSTALL MANHOLE STEPS @ 10" MAX SPACING
- 7 INSTALL WEDGE WIRE SCREEN (M SC2)
- 8 INSTALL RECESSED RECTANGULAR WEIR
- 9 INSTALL 12" PVC PIPE – MAINTAIN NEGATIVE GRADE TOWARD CREEK
- 10 INSTALL METER MANHOLE (B.C D1)
- 11 INSTALL 18" C900 PVC PIPE AND CONNECT TO EXISTING PIPELINE (D D1)
- 12 INSTALL COARSE BAR SCREEN
- 13 INSTALL C CHANNEL
- 14 INSTALL INFLOW WEIR
- 15 INSTALL OUTFLOW WEIR



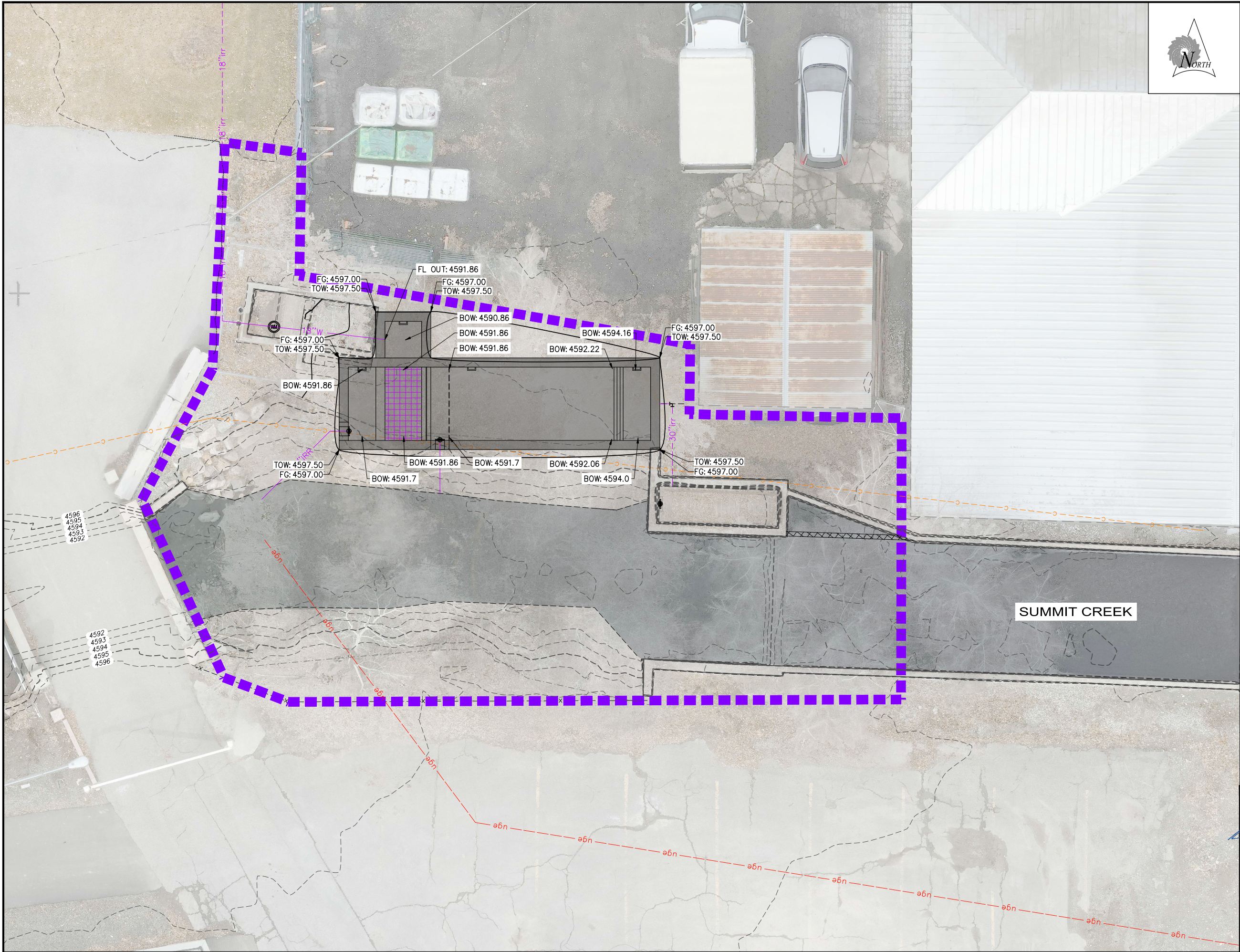
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CLAY POOL SOUTH DIVERSION
SITE PLAN

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
12499	HP	JJ	SDW	29 of 61	SP6

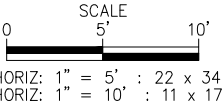


GRADING NOTES

- TBC = TOP BACK OF CURB
TOC = TOP OF CONCRETE/PAVEMENT
TOW = TOP OF WALL
BOW = BOTTOM OF WALL
FG = FUTURE GRADE
FL = FLOW LINE
1. AN APPROVED GRADING AND DRAINAGE PLAN SHALL BE ON THE JOB SITE AT ALL TIMES. DEVIATIONS FROM THE PLAN MUST BE PRECEDED BY AN APPROVED PLAN REVISION.
 2. GRADING AND DRAINAGE PLAN APPROVAL INCLUDES THE CONSTRUCTION OF ALL SURFACE IMPROVEMENTS SHOWN ON THE APPROVED PLAN, INCLUDING, BUT NOT LIMITED TO RETENTION AREAS, SEDIMENTATION BASINS AND/OR OTHER DRAINAGE FACILITIES, DRAINAGE PATTERNS, WALLS, CURBS, ASPHALT PAVEMENT AND BUILDING FLOOR ELEVATIONS.
 3. ALL DRAINAGE PROTECTIVE DEVICES SUCH AS SWALES, INTERCEPTOR DITCHES, PIPES, PROTECTIVE BERMS, CONCRETE CHANNELS OR OTHER MEASURES DESIGNED TO PROTECT ADJACENT BUILDINGS OR PROPERTY FROM STORM RUNOFF MUST BE COMPLETED PRIOR TO STRUCTURE CONSTRUCTION.
 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO OBSTRUCTIONS AND UTILITY LINES ENCOUNTERED DURING CONSTRUCTION AND SHALL DETERMINE THE EXACT LOCATION OF UTILITIES IN ADVANCE OF TRENCHING. THE ENGINEER WILL NOT GUARANTEE ANY ELEVATIONS AT LOCATIONS OF THE EXISTING UNDERGROUND UTILITIES SHOWN ON THESE PLANS.
 5. THE EXISTING TOPOGRAPHY IS REPRESENTED WITH MINOR CONTOURS EVERY 1' AND MAJOR CONTOURS EVERY 5'. THE PROPOSED TOPOGRAPHY IS REPRESENTED WITH MINOR CONTOURS EVERY 1' AND MAJOR CONTOURS EVERY 5'.
 6. CONTRACTOR TO ENSURE ALL GRADE CHANGES ARE TO BE COMPLETED IN A SMOOTH MANNER. INDIVIDUAL VERTICAL CURVES ARE NOT SHOWN FOR CLARITY.

GENERAL NOTES

1. REFER TO CROSS SECTIONS FOR ADDITIONAL GRADING NOTES



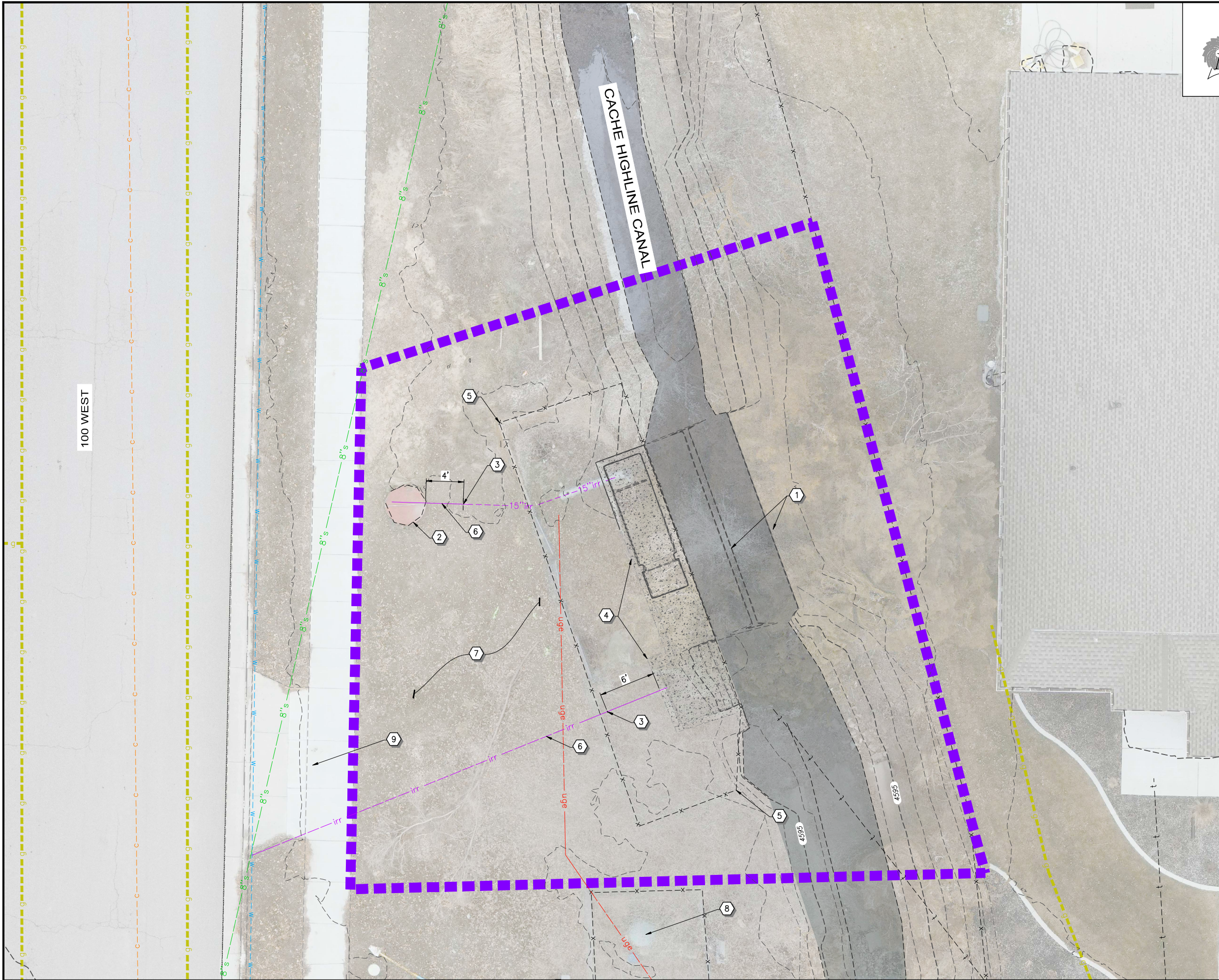
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CLAY POOL SOUTH DIVERSION
GRADING PLAN

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
12499	HP	JJ	SDW	30 of 61	GP6

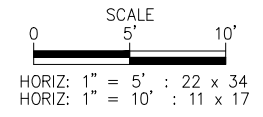


DEMOLITION NOTES

- 1 PROTECT EXISTING CONCRETE WALLS
- 2 EXISTING METER MANHOLE TO REMAIN
- 3 SAWCUT AND REMOVE EXISTING PIPE SECTION
- 4 REMOVE EXISTING STRUCTURE
- 5 REMOVE EXISTING FENCE – 616 LN FT
- 6 MAINTAIN AND PROTECT EXISTING IRRIGATION LINE
- 7 CLEAR AND GRUB AREA WITHIN CONSTRUCTION LIMITS – .084 ACRES
- 8 PROTECT CACHE HIGHLINE WELL HEAD AND FENCE
- 9 PROTECT CONCRETE SIDEWALK AND DRIVE APPROACH

GENERAL NOTES

1. ALL FENCING MATERIALS, SCREENING EQUIPMENT, HEADGATES OR OTHER POTENTIALLY REUSABLE ELEMENTS ARE TO BE REMOVED WITH THE INTENT OF SIC REUSING THE MATERIALS



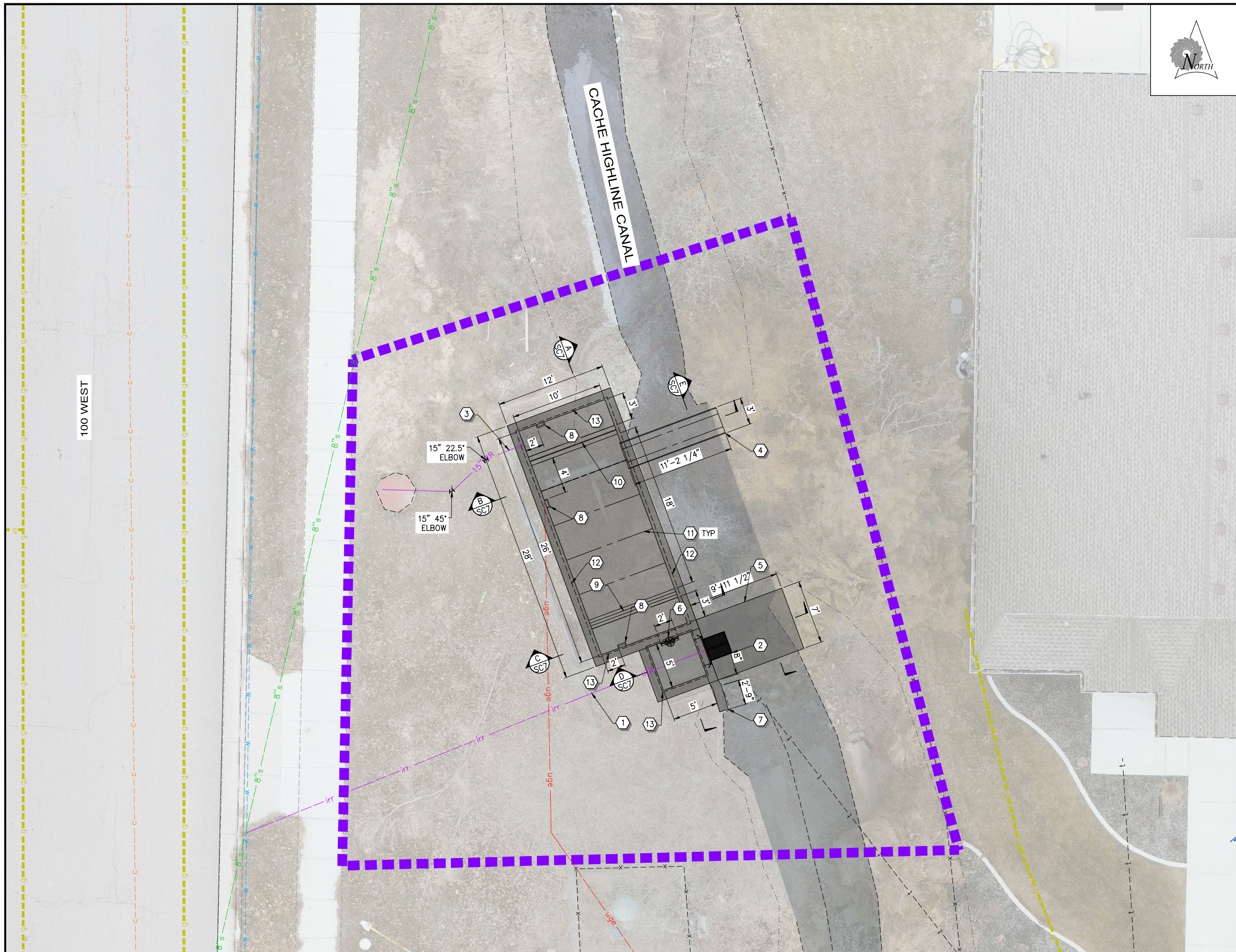
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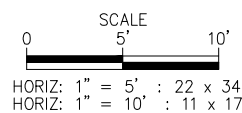
SMITHFIELD IRRIGATION COMPANY
DIVERSION SYSTEM IMPROVEMENTS
BRICKYARD NORTH DIVERSION
DEMOLITION PLAN

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
12499	HP	JJ	SDW	32 of 61	DP7

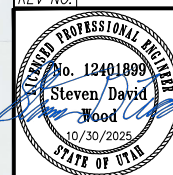


CONSTRUCTION NOTES

1. CONNECT NEW ROTARY DRUM SCREEN TO EXISTING 2" IRRIGATION LINE
2. INSTALL NEW ROTARY DRUM SCREEN
3. INSTALL 15" PVC TO EXISTING METER W/ FITTINGS PER PLAN
4. INSTALL PEDESTRIAN BRIDGE 
5. INSTALL CONCRETE PAD ON CANAL BOTTOM
6. INSTALL 2' HEAD GATE 
7. INSTALL NEW CONCRETE WALL ALONG THE CANAL
8. INSTALL MANHOLE STEPS @ 10" MAX SPACING
9. INSTALL INFLOW WEIR
10. INSTALL OUTFLOW WEIR
11. INSTALL W6x12 DECK SUPPORT BEAMS @ 4' O.C. 
12. INSTALL 2x4x1/4 ANGLE BETWEEN SUPPORT BEAMS 
13. INSTALL 2x2x1/4 ANGLE 



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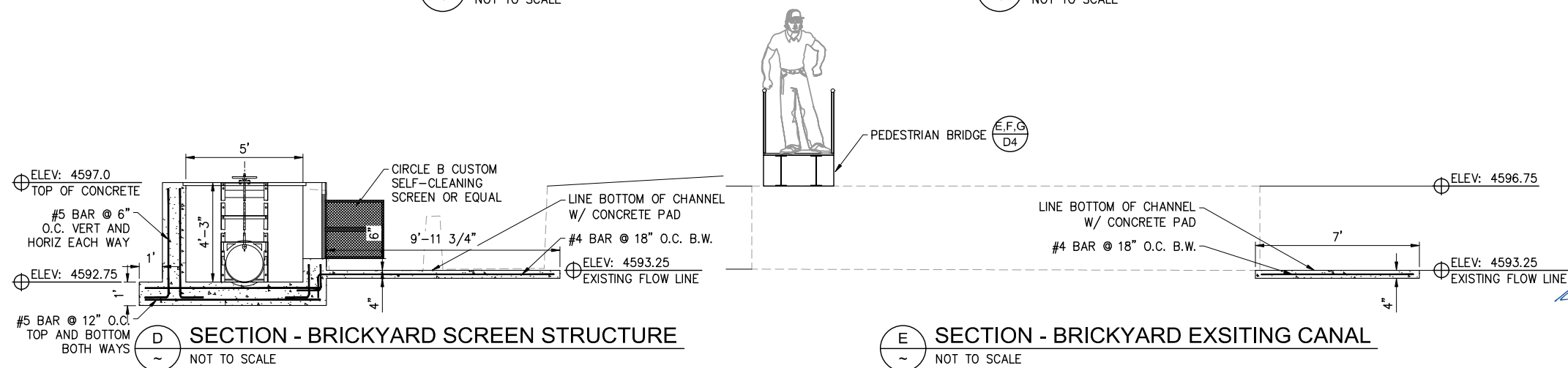
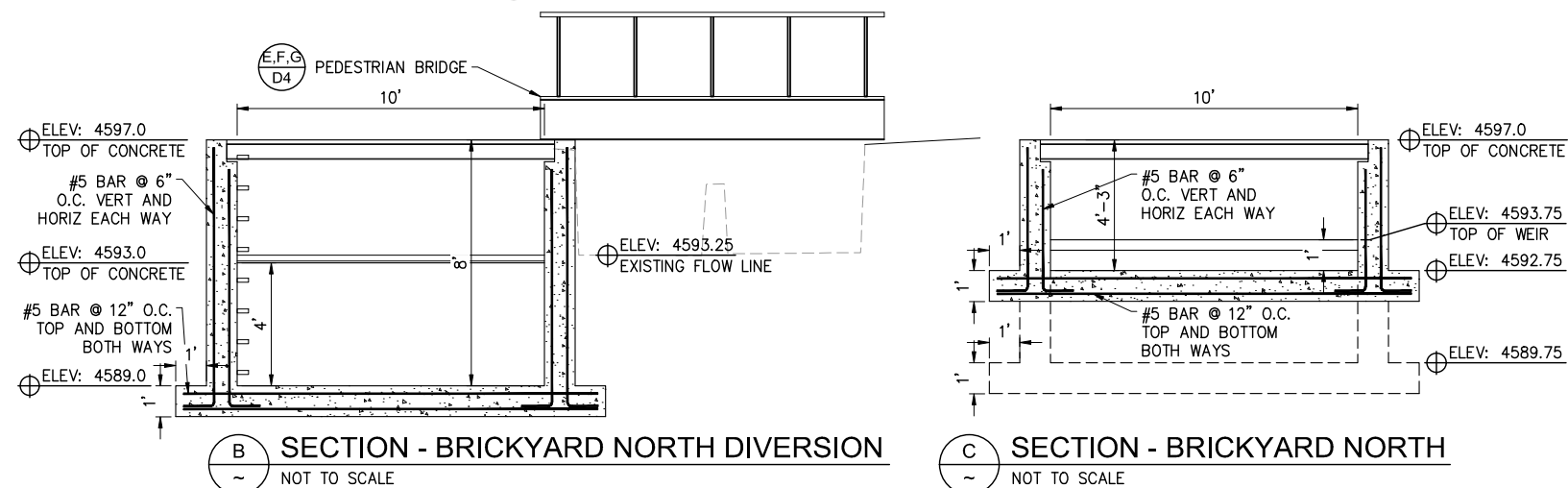
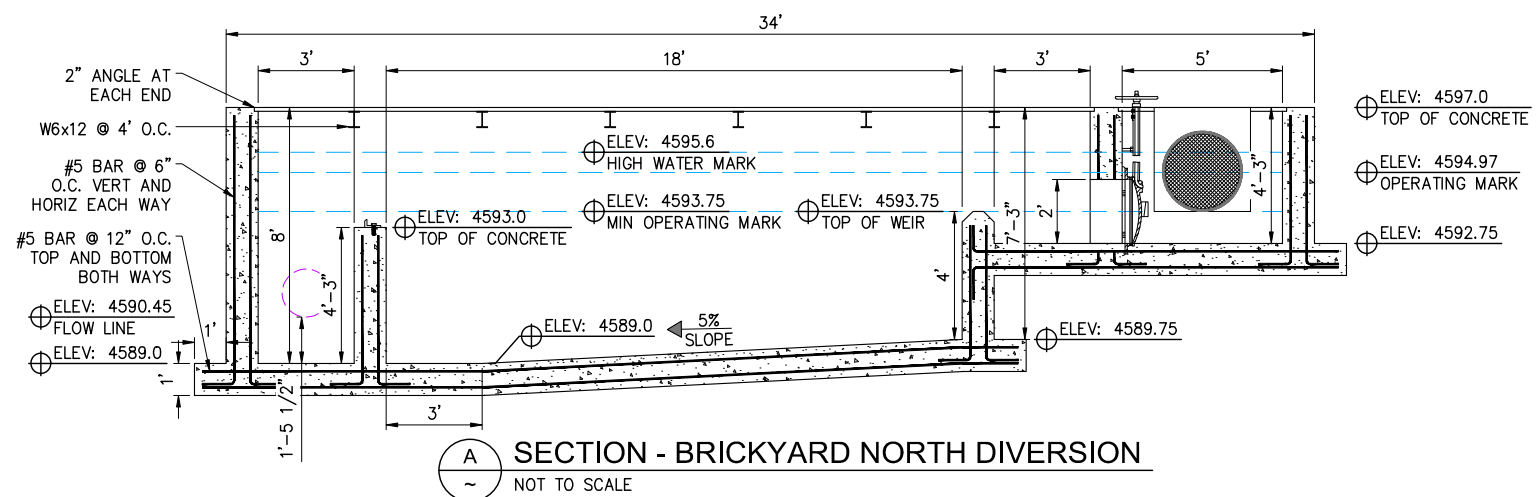
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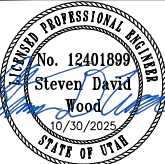
DIVERSION SYSTEM IMPROVEMENTS BRICKYARD NORTH DIVERSION SITE PLAN

SEI NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 33 of 61	SP7
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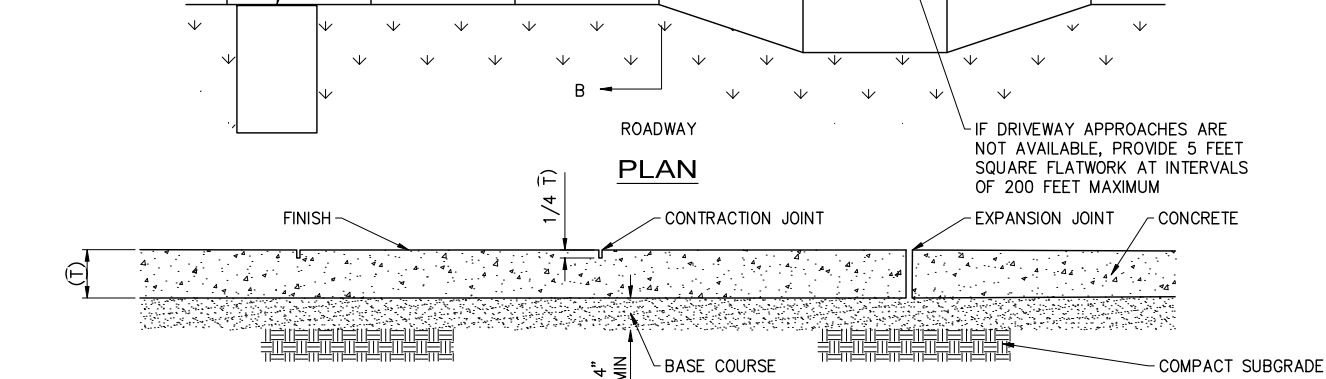
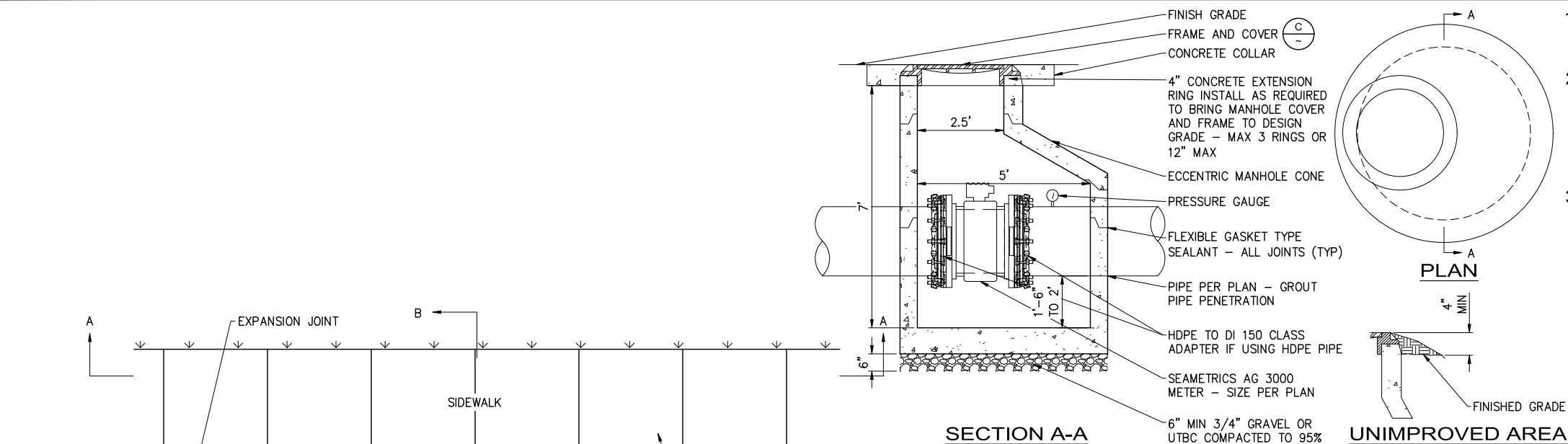
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DIVERSION SYSTEM IMPROVEMENTS

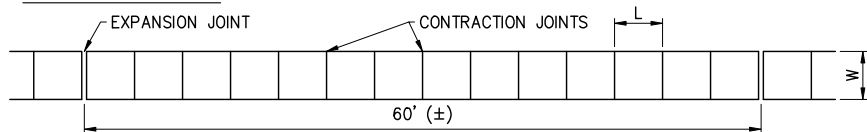
BRICKYARD NORTH DIVERSION SECTIONS

SET NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 35 OF 61
SC7				



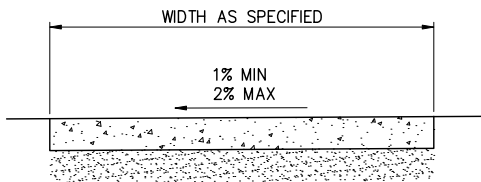
○ STREET TYPE	T
RESIDENTIAL (WITH PARK STRIP)	4"
RESIDENTIAL (NO PARK STRIP)	6"
OTHER	6"
REPLACING EXISTING SIDEWALK	MATCH EXISTING (4" MIN)

SECTION A-A



$$L_{MIN} = W$$
$$L_{MAX} \text{ (IN FEET)} = 2.5 \times T \text{ (IN INCHES)}$$
$$\text{OR}$$
$$= 15 \text{ FEET MAX}$$

SIDEWALK JOINT DETAIL



SECTION B-B

1. GENERAL

- A. VARIANCE FROM SPECIFIED DIMENSIONS AND SLOPES MUST BE ACCEPTABLE TO THE ENGINEER. SYSTEM CONFIGURATION MAY BE CHANGED AT ENGINEER'S DISCRETION
- B. ADDITIONAL REQUIREMENTS ARE SPECIFIED IN APWA SECTION 32 16 14

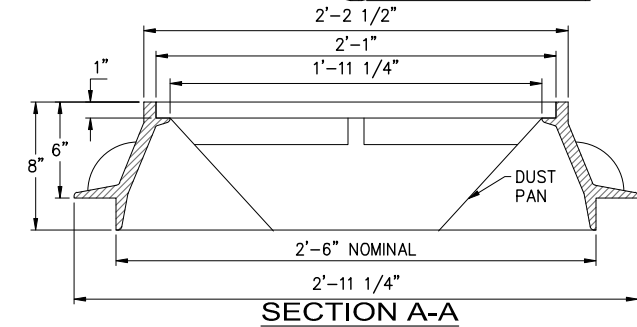
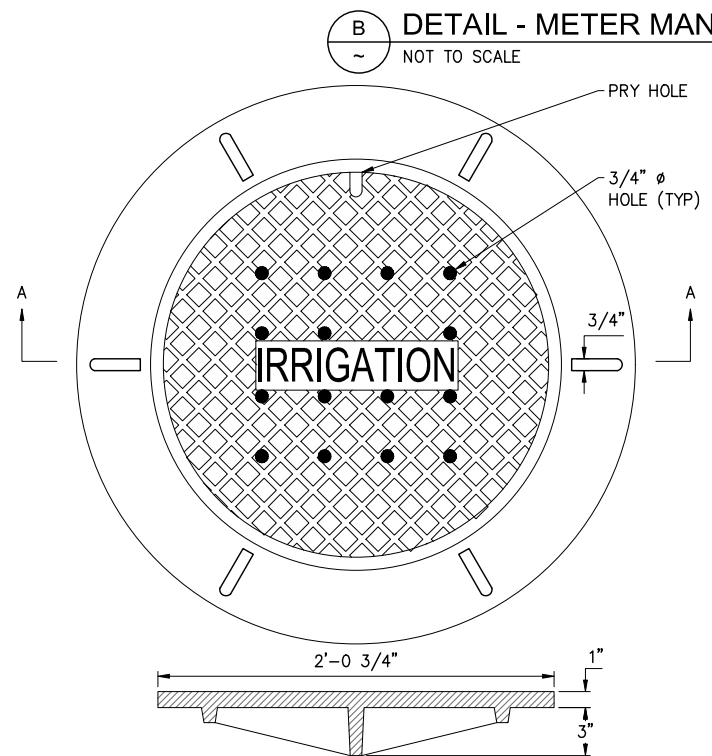
2. PRODUCTS

- A. BASE COURSE: UNTREATED BASE COURSE, APWA SECTION 32 11 23. DO NOT USE GRAVEL AS A BASE COURSE WITHOUT ENGINEER'S PERMISSION
- B. EXPANSION JOINT FILLER: 1/2-INCH THICK TYPE F1 FULL DEPTH, APWA SECTION 32 13 73
- C. CONCRETE: CLASS 4000, APWA SECTION 03 30 04. IF NECESSARY, PROVIDE CONCRETE THAT ACHIEVES DESIGN STRENGTH IN LESS THAN 7 DAYS. USE CAUTION; HOWEVER, AS CONCRETE CRACKING (SPIDER CRACKS) MAY DEVELOP IF AIR TEMPERATURE EXCEEDS 90 DEGREES F
- D. CONCRETE CURING AGENT: CLEAR MEMBRANE FORMING COMPOUND WITH FUGITIVE DYE (TYPE ID CLASS A), APWA SECTION 03 39 00

3. EXECUTION

- A. BASE COURSE PLACEMENT: APWA SECTION 32 05 10. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8-INCHES WHEN USING RIDING EQUIPMENT OR 6-INCHES WHEN USING HAND HELD EQUIPMENT. COMPACTION IS 95 PERCENT OR GREATER RELATIVE TO A MODIFIED PROCTOR DENSITY, APWA SECTION 31 23 26
- B. CONCRETE PLACEMENT: APWA SECTION 03 30 10
1. INSTALL EXPANSION JOINTS VERTICAL, FULL DEPTH, WITH TOP OF FILLER SET FLUSH WITH CONCRETE SURFACE
 2. INSTALL CONTRACTION JOINTS VERTICAL, 1/8-INCH WIDE OR 1/4 SLAB THICKNESS IF THE SLAB IS GREATER THAN 8-INCHES THICK. MAXIMUM LENGTH TO WIDTH RATIO FOR NON-SQUARE PANELS IS 1.5 TO 1. MINIMUM PANEL LENGTH (IN FEET) IS 1.5 TIMES THE SLAB THICKNESS (IN INCHES)
 3. PROVIDE 1/2-INCH RADIUS EDGES. APPLY A BROOM FINISH. APPLY A CURING AGENT

A
~
NOT TO SCALE APWA PLAN 231



SECTION A-A

1. GENERAL

- A. THE FRAME AND COVER FITS THE MANHOLE B

2. PRODUCTS

- A. CASTINGS: GREY IRON CLASS 35 MINIMUM, ASTM A48, COATED WITH ASPHALT BASED PAINT OR BETTER (EXCEPT ON MACHINED SURFACES)
1. CAST THE HEAT NUMBER ON THE FRAME AND COVER
 2. GIVE THE FRAME AND COVER A MACHINE FINISH SO THE COVER WILL NOT ROCK
 3. A CHECK MARK DESIGNATES MACHINED SURFACE
 4. CAST THE WORDS 'IRRIGATION' ON THE COVER IN UPPER CASE FLUSH WITH THE SURFACE FINISH

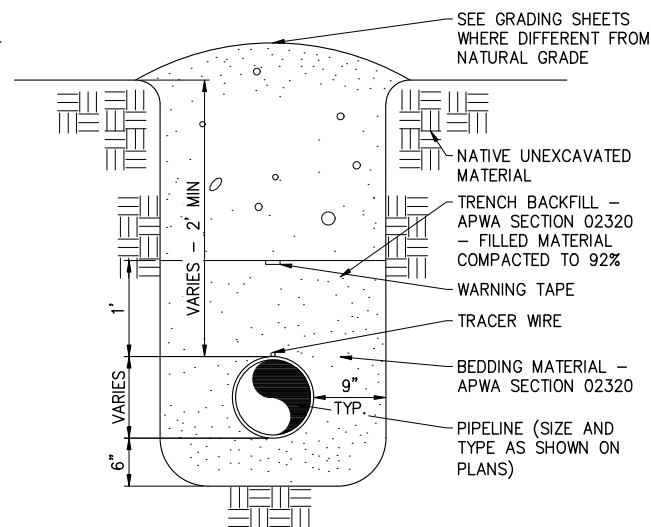
C
~
NOT TO SCALE

1. GENERAL

- A. MANHOLE
1. DIAMETER IS 5 FEET
- B. ALL MANHOLE BASES AND BARRELS SHALL BE PRECAST UNLESS OTHERWISE APPROVED
2. PRODUCTS
- A. BASE COURSE: UNTREATED BASE COURSE, APWA SECTION 32 11 23. DO NOT USE GRAVEL AS A BASE COURSE WITHOUT ENGINEER'S PERMISSION
- B. BACKFILL: COMMON FILL, APWA SECTION 31 05 13. MAX PARTICLE SIZE 2-INCHES
- C. CONCRETE: CLASS 4000, APWA SECTION 03 30 04.
- D. RISER AND REDUCING RISER: ASTM C478
- E. REINFORCEMENT: DEFORMED, 60 KSI YIELD GRADE STEEL, ASTM A615
- F. GROUT: 2 PARTS SAND TO 1 PART CEMENT MORTAR, ASTM C1329

3. EXECUTION

- A. FOUNDATION STABILIZATION: GET ENGINEER'S PERMISSION TO USE A SEWER ROCK OR A GRANULAR BACKFILL BORROW IN A GEOTEXTILE WRAP TO STABILIZE AN UNSTABLE FOUNDATION
- B. BASE COURSE PLACEMENT: APWA SECTION 32 11 23. MAX LIFT THICKNESS IS 8-INCHES BEFORE COMPACTION. COMPACTION IS 95 PERCENT OR GREATER RELATIVE TO A MODIFIED PROCTOR DENSITY, APWA SECTION 31 23 26
- C. ADJUSTMENT: IF THE REQUIRED MANHOLE ADJUSTMENT IS MORE THAN 12", REMOVE THE CONE AND GRADE RINGS AND ADJUST THE MANHOLE ELEVATION WITH THE APPROPRIATE MANHOLE SECTION, THE CONE SECTION, AND THE GRADE RINGS OR PLASTIC FORM TO MAKE FRAME AND LID MATCH FINISH GRADE.
- D. FINISH: PROVIDE SMOOTH AND NEAT FINISHES ON INTERIOR OF CONES, SHAFT, AND RINGS. IMPERFECT MOLDINGS OR HONEYCOMBS WILL NOT BE ACCEPTED
- E. BACKFILL: PROVIDE BACKFILL AGAINST THE MANHOLE SHAFT. PEA GRAVEL AND RECYCLED RAP AGGREGATE IS NOT ALLOWED. WATER JETTING NOT ALLOWED. MAX LIFT THICKNESS IS 8-INCHES BEFORE COMPACTION. COMPACTION IS 95 PERCENT OR GREATER RELATIVE TO A STANDARD PROCTOR DENSITY, APWA SECTION 31 23 26



1. BEDDING MATERIAL SURROUNDING PIPE SHALL BE LESS THAN 3/4" FOR PVC PIPE AND LESS THAN 1" FOR HDPE PIPE
2. NATIVE BACKFILL MATERIAL SHALL INCLUDE NO ROCKS LARGER THAN 6" DIAMETER, ORGANIC MATERIAL, SNOW, ICE, CONSTRUCTION WASTE, OR DEBRIS

D
~
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DIVERSION SYSTEM IMPROVEMENTS
DETAILS

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
12499	HP	JJ	SDW	36 of 61	D1

1. **GENERAL**

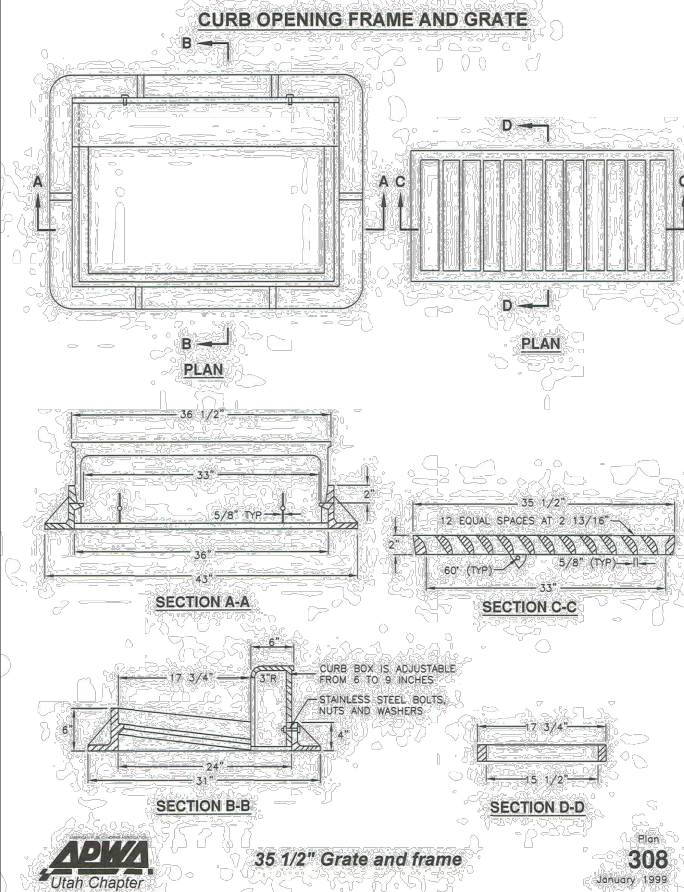
A. The grate and frame fits concrete boxes in Plan 315.

2. **PRODUCTS**

A. Castings: Grey iron class 35 minimum per ASTM A48, coated with asphalt based paint or better.

B. Bolts, Nuts, Washers, Accessories: Stainless steel, APIWA Section 05 05 23.

3. **EXECUTION** (Not used)



308

308

DETAIL - GRATE AND FRAME
NOT TO SCALE

1. GENERAL

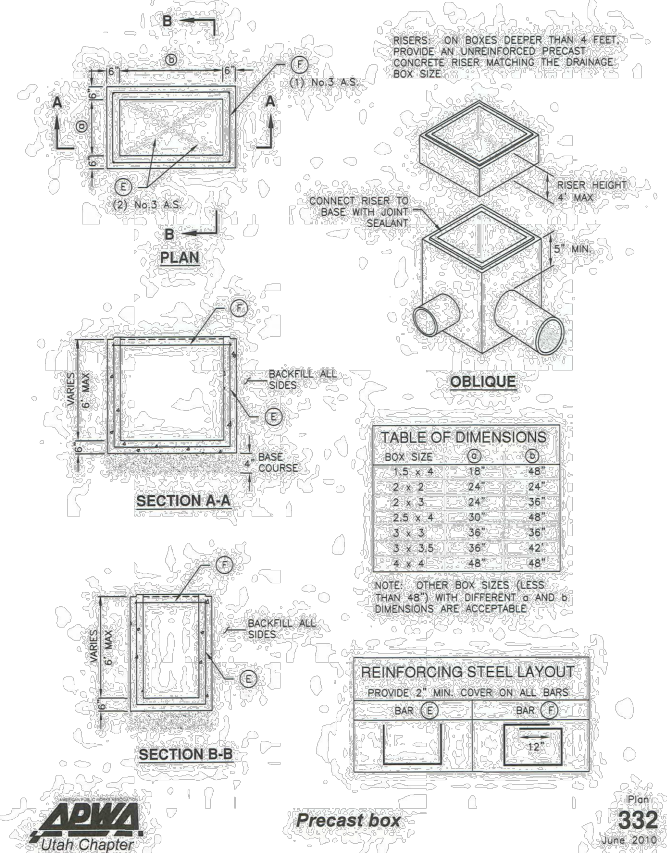
- A. The drawing shows typical pipe connections. Refer to construction drawings for connection locations or refer to field location of existing piping when engineering pipe connection to the box.
- B. This drawing is acceptable where the water table elevation is less than 3 feet above the floor of the box. If elevation of water table is higher, engineering calculations and drawings must be submitted to and approved by the ENGINEER.
- C. Submit bar design detail for ENGINEER's review.

2. PRODUCTS

- A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
- B. Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 2-inches.
- C. Precast Concrete: Class 4000 precast, APWA Section 03 40 00.
- D. Reinforcement: Deformed, 60 ksi yield grade steel, ASTM A615. Coated steel is not required for small drainage structures shown on this drawing.
- E. Frame and Cover (or Grate): Use the appropriate unit indicated in the Contract Documents.
- F. Joint Sealant: Rubber-based, compressible.

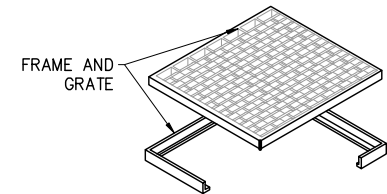
3. EXECUTION

- A. Concrete Placement: Provide 2-inches of concrete cover over reinforcing steel.
- B. Lifting Points: Provide at least 2 lifting points per section that avoid interference with the reinforcing steel and that are designed according to PCI (Prestressed Concrete Institute) design handbook. Lift only from the engineered lifting points.
- C. Depth: Drainage boxes and riser combinations that exceed 8-feet from finished grade to the bottom of the box requires ENGINEER's approval. Submit design calculations and shop drawings.
- D. Core Holes:
 - 1) Provide core holes that are at least 4" larger than attaching outer pipe diameter. Cut core holes at the manufacturing plant unless ENGINEER permits field core holes.
 - 2) Center core holes to leave 2" of concrete measured horizontally from inside wall of the box to core hole. Locate core hole vertically so bottom of core hole will be at or above floor elevation with at least 5-inches of concrete directly above the core hole to the top of the box.
 - 3) Deviations from core hole tolerances require shop drawings. Shop drawings will identify lifting point number and location.
- E. Precast Top: Design precast top for AASHTO HL-93 live loads and submit rebar detail and stamped design drawings to ENGINEER. Show connection detail for frame and grate or cover.



332

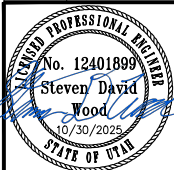
DETAIL - PRECAST BOX
NOT TO SCALE



- NOTES:
1. CATCH BASINS SHALL MEET ASTM C858 WITH AASHTO HS-20 LOADING
 2. OPENINGS MAY BE LOCATED AS REQUIRED
 3. FOR CATCH BASIN DETAILS SEE (R)

C DETAIL - FRAME AND GRATE
~ NOT TO SCALE



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DETAILS					
CATCH BASINS					
SEI NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 37 of 61	D2

P:\Smithfield Irrigation Company\12499 - SIC Diversion System Improvements Project 2025\DWG\Sheets\SIC-DSI-STRUCT-D3.dwg Oct 30, 2025 5:16pm jolley

DETAIL - WATER STOP / COLD JOINT AT FOUNDATION WALL
NOT TO SCALE

- ①. TOP BARS ARE HORIZ. BARS PLACED SUCH THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN MEMBER BELOW SPLICE
- ②. WHERE BARS OF UNEQUAL SIZE LAP ONE ANOTHER, USE TABULATED LAP LENGTH FOR SMALLER BAR U.N.O.
- ③. LAP SPLICE LENGTH PER SCHEDULE
- ④. CLEAR DISTANCE BETWEEN ADJACENT BARS OR SPLICES TO BE USED IN DETERMINING APPLICABLE LAP LENGTH FROM SCHEDULE
- ⑤. OPTIONAL OFFSET. SEE STANDARD REBAR BEND DETAILS FOR OFFSET REQUIREMENTS
- ⑥. FOR NON-CONTACT LAP SPLICES, MIN. CLEAR DISTANCE BETWEEN SPLICED BARS SHALL BE PER GENERAL STRUCTURAL NOTES. MAX. CLEAR DISTANCE SHALL BE 1/5 THE TABULATED LAP LENGTH OR (6"- "DB"), WHICHEVER IS LESS, WHERE "DB" = BAR DIA.

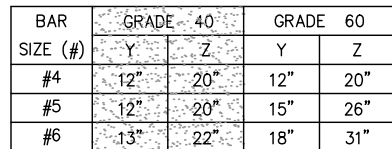
C
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DETAIL - HORIZONTAL REINFORCEMENT AT WALL INTERSECTIONS

NOT TO SCALE

(1)– A STANDARD HOOK FOR STIRRUPS, TIES, AND HOOPS INCLUDES THE SPECIFIC INSIDE BEND DIAMETER AND STRAIGHT EXTENSION LENGTH. IT SHALL BE PERMITTED TO USE A LONGER STRAIGHT EXTENSION AT THE END OF A HOOK. A LONGER EXTENSION SHALL NOT BE CONSIDERED TO INCREASE THE ANCHORAGE CAPACITY OF THE HOOK.

E DETAIL - VERT CONTROL / COLD JOINT AT WALL
~ NOT TO SCALE

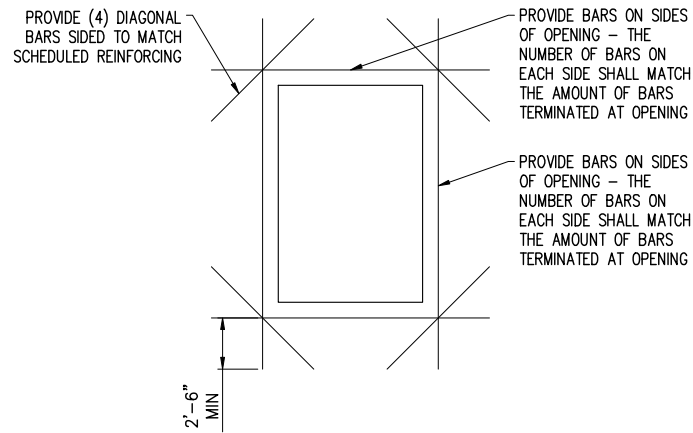


BAR SIZE (#)	GRADE 40		GRADE 60	
	Y	Z	Y	Z
# 7	18"	31"	23"	39"
# 8	23"	39"	30"	51"
# 9	29"	49"	38"	65"

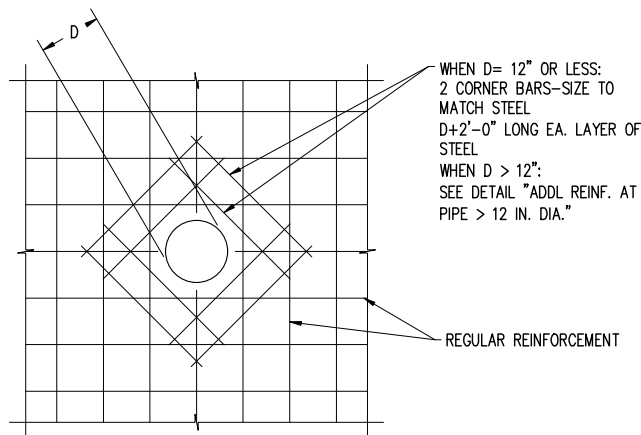
1. REFER TO STD. HOOK DETAIL FOR LENGTH OF DIMENSION "X"
2. THIS DETAIL TO BE USED ONLY WHEN NO OTHER DETAIL IS INDICATED ON THE DRAWINGS.

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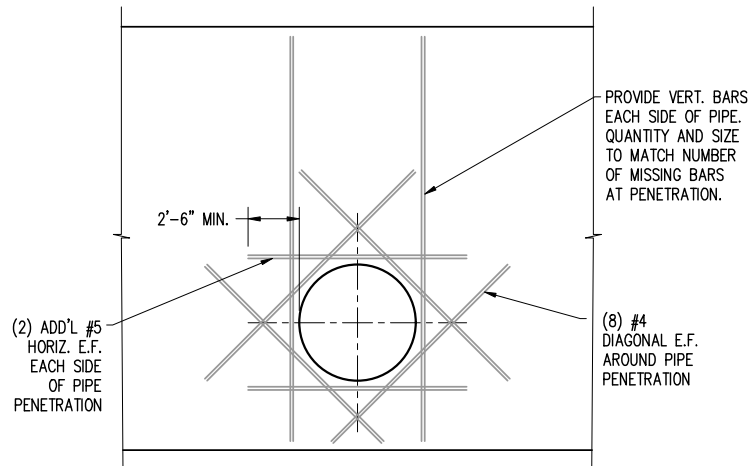
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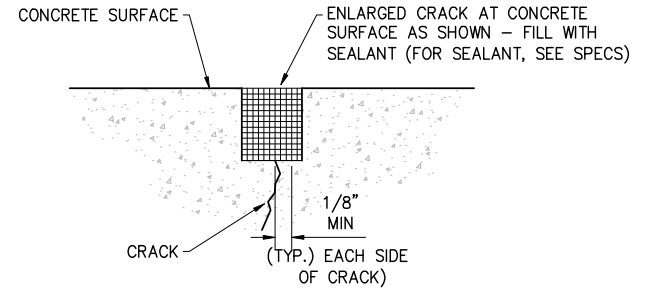
A DETAIL - ADDL REINF AT OPENING BLOCKOUT
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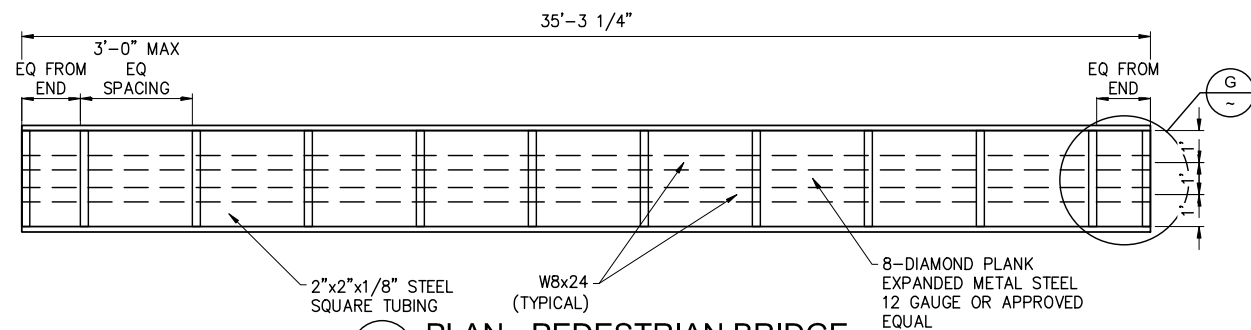
B DETAIL - ADDL REINF AT PIPE PENETRATION
~ NOT TO SCALE



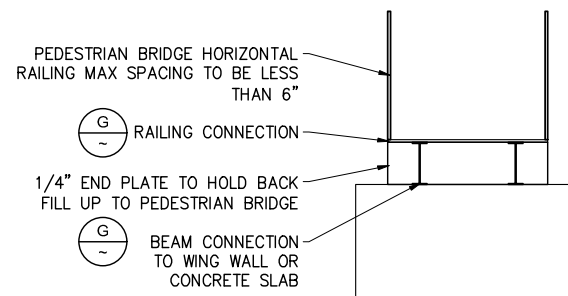
C DETAIL - ADDL REINF AT PIPE > 12"Ø
~ NOT TO SCALE



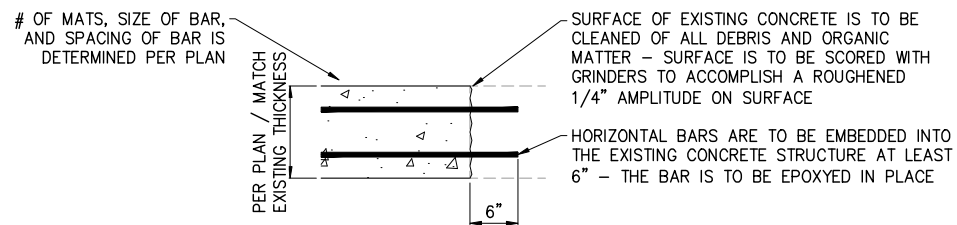
E DETAIL - CONCRETE CRACK REPAIR
~ NOT TO SCALE



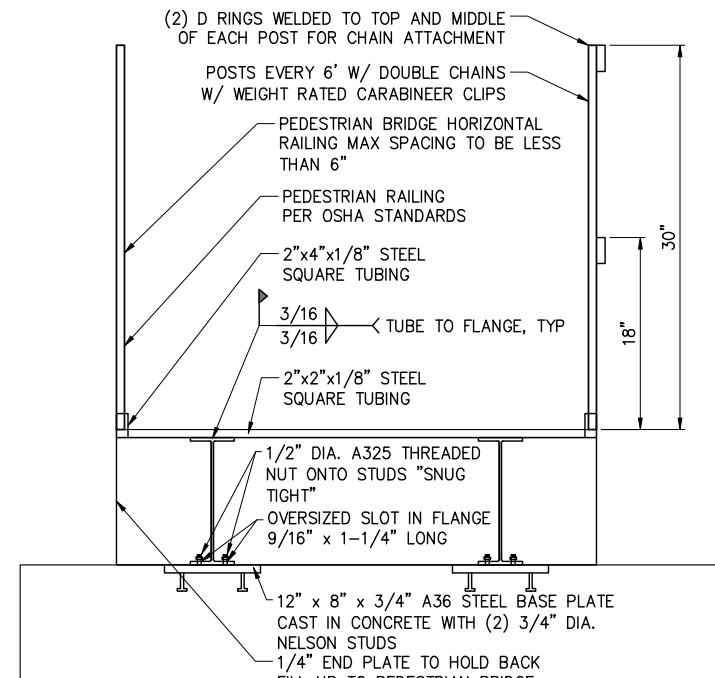
E PLAN - PEDESTRIAN BRIDGE
~ NOT TO SCALE



F DETAIL - PEDESTRIAN BRIDGE
~ NOT TO SCALE



H DETAIL - CONNECTION TO EXISTING STRUCTURE
~ NOT TO SCALE
SLAB TO SLAB OR WALL TO WALL CONNECTION

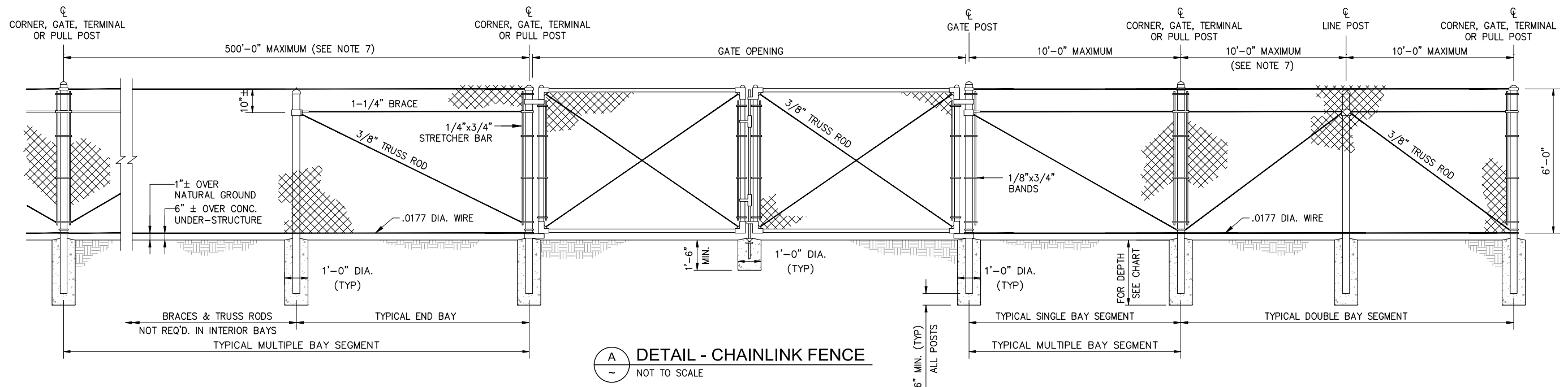


G DETAIL - PEDESTRIAN BRIDGE
~ NOT TO SCALE

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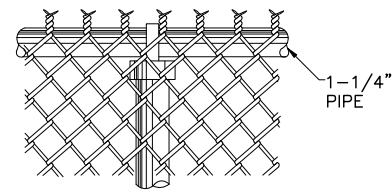
REV NO.	COMMENT	DATE

	SUNRISE ENGINEERING 2100 NORTH MAIN STREET NORTH LOGAN, UTAH 84341 TEL 435.563.3734 www.sunrise-eng.com				
SMITHFIELD IRRIGATION COMPANY					
DIVERSION SYSTEM IMPROVEMENTS					
DETAILS					
STRUCTURAL DETAILS					
SEI NO. 12499	DESIGNED HP	DRAWN JJ	CHECKED SDW	SHEET NO. 39 of 61	D4

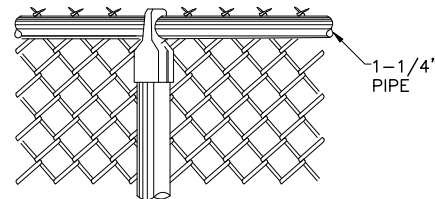


- NOTES:

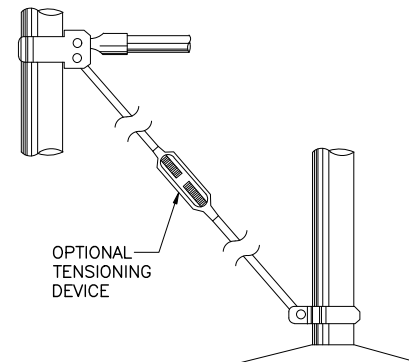
1. FENCE SHALL BE PRIVACYMASTER TYPE FENCE MANUFACTURED BY PRIVACYLINK. 9 GAUGE GALVANIZED FENCE WITH PRIVACY SLATS. FENCE SHALL BE 6' IN HEIGHT. PRIVACY SLAT COLOR TO BE APPROVED BY OWNER DURING SUBMITTAL PROCESS.
2. MATERIALS, CONSTRUCTION AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE WRITTEN SPECIFICATIONS.
3. THE TOP SUPPORT SHALL BE TUBULAR RAIL.
4. BARBED WIRE SHALL NOT BE USED.
5. ALL STEEL PIPE MEMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A-120, SCHEDULE 40, HOT DIPPED ZINC COATED STEEL PIPE.
6. OPTIONS EXERCISED SHALL BE UNIFORM THROUGHOUT THE PROJECT.
7. LINE POSTS SHALL BE LOCATED AT EQUAL SPACINGS FOR EACH SEGMENT WITH MAXIMUM SPACING AS FOLLOWS: A) TANGENT SECTIONS TO 500 FEET RADIUS-NOT MORE THAN 10 FEET. B) UNDER 500 FEET RADIUS TO 200 FEET RADIUS-NOT MORE THAN 8 FEET. C) UNDER 200 FEET RADIUS TO 100 FEET RADIUS-NOT MORE THAN 6 FEET. D) UNDER 100 FEET RADIUS-NOT MORE THAN 5 FEET.
8. ALL CONCRETE SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD



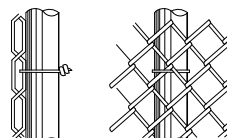
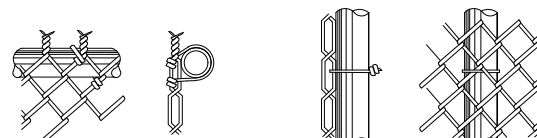
TWISTED & BARBED SELVAGE



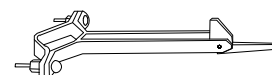
BARBED WIRE ARM



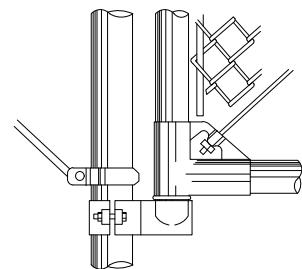
BRACE & TRUSS CONNECTIONS



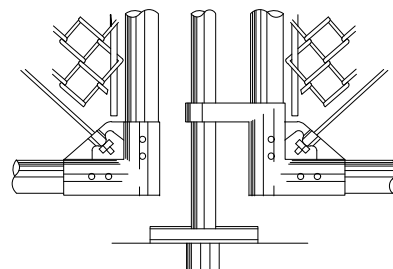
TYPICAL TIE DETAILS



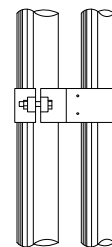
HATE HOLD BACK



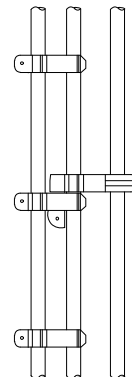
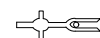
BOTTOM GATE HINGE & GATE DETAILS



CENTER GATE STOP & GATE DETAILS



TOP GATE HINGE



DROP ROD ASSEMBLY

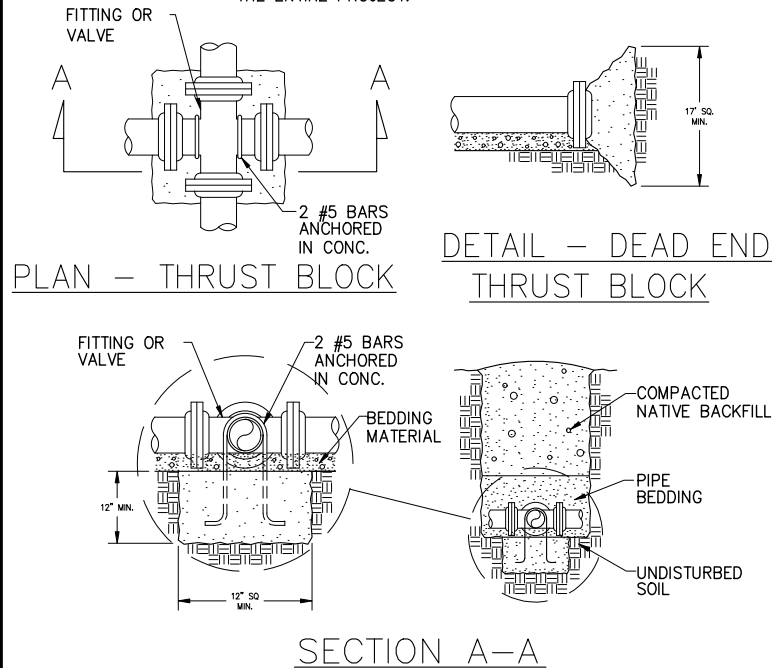
GATES			
GATE POSTS AND GATE FRAMES			
HEIGHT	GATE OPENING	GATE POST	GATE FRAME
UNDER 6 FEET	SINGLE TO 6' OR DOUBLE TO 12'	2"	1"
	SINGLE OVER 6' TO 8' OR DOUBLE OVER 12' TO 16'	2-1/2"	1-1/2"
	SINGLE OVER 8' TO 12' OR DOUBLE 16' TO 24'	3-1/2"	
6 FEET AND OVER	SINGLE TO 6' OR DOUBLE TO 12'	2-1/2"	1-1/2"
	SINGLE OVER 6' TO 13' OR DOUBLE OVER 12' TO 24'	3-1/2"	
	SINGLE OVER 13' TO 18' OR DOUBLE OVER 24' TO 36'	6"	
	SINGLE OVER 18' OR DOUBLE OVER 36'	8"	

HEIGHT OF FABRIC	DEPTH OF POSTS	LENGTH OF END, CORNER OR PULL POSTS	LENGTH OF LINE POSTS	SIZE OF POSTS				GATE POST
				END, CORNER & PULL		LINE POSTS (MIN SIZE)		
				PIPE OPTION	RECTANGULAR OPTION	PIPE OPTION	H POST OPTION	
7'	3'	10'	9'-8"	2-1/2"	3-1/2"	2"	1-7/8"x1-5/8"	SEE GATE POST TABLE
6'	3'	9'	8'-8"	2-1/2"	3-1/2"	2"	1-7/8"x1-5/8"	
5'	3'	8'	7'-8"	2"	3-1/2"	1-1/2"	1-5/16"x1-1/2"	
4'	2'	6'	5'-8"	2"	3-1/2"	1-1/2"	1-5/16"x1-1/2"	
3'	2'	5'	4'-8"	2"	3-1/2"	1-1/2"	1-5/16"x1-1/2"	

[illegible]

CONCRETE THRUST BLOCK
RESTRAINING SYSTEM DETAILS

NOTE
CONTRACTOR SHALL USE EITHER MEGALUG OR
CONCRETE THRUST RESTRAINING SYSTEM FOR
THE ENTIRE PROJECT.



THRUST BLOCK BEARING AREA IN SQ. FT.									
PIPE SIZE	CROSS	TEE	WYE	DEAD END	VALVE	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4	2.4	1.7	1.7	1.7	1.7	2.4	1.3	1.0	1.0
6	5.4	3.8	3.8	3.8	3.8	5.4	2.9	1.5	1.0
8	9.6	6.8	6.8	6.8	6.8	9.6	5.2	2.7	1.4
10	15.0	10.6	10.6	10.6	10.6	15.0	8.1	4.2	2.1
12	21.5	15.2	15.2	15.2	15.2	21.5	11.7	6.0	3.0
14	29.3	20.7	20.7	20.7	20.7	29.3	15.9	8.1	4.1
16	38.2	27.0	27.0	27.0	27.0	38.2	20.7	10.6	5.3
18	48.4	34.2	34.2	34.2	34.2	48.4	26.2	13.4	6.7
20	59.7	42.2	42.2	42.2	42.2	59.7	32.3	16.5	8.3
24	85.9	60.8	60.8	60.8	60.8	85.9	46.5	23.7	11.9

REDUCER									
D2 \ D1	6	8	10	12	14	16	18	20	24
4	2.1	5.1	8.8	13.4	—	—	—	—	—
6	—	3.0	6.7	11.3	16.8	23.1	—	—	—
8	—	—	3.8	8.4	13.8	20.1	27.2	—	—
10	—	—	—	4.6	10.1	16.3	23.5	31.4	—
12	—	—	—	—	5.5	11.7	18.8	26.8	45.2
14	—	—	—	—	—	6.3	13.4	21.3	39.8
16	—	—	—	—	—	—	7.1	15.1	33.5
18	—	—	—	—	—	—	—	8.0	26.3
20	—	—	—	—	—	—	—	—	18.4

NOTES:

- ALL THRUST BLOCK BEARING FACES SHALL BE PLACED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL.
- SQUARE ALL EDGES TO RECEIVE CONCRETE.
- CONCRETE SHALL BE CLASS C.
- CALCULATED ON 200 PSI TEST PRESSURE AND ALLOWABLE BEARING PRESSURE OF 1500 LBS. PER SQ. FT.
- IN POORER SOILS SPECIAL DESIGN IS REQUIRED.
- ALL FITTINGS AND VALVES SHALL BE ANCHORED WITH TWO #5 REBAR. ONLY ONE REQ'D FOR REDUCER
- CENTER ALL FITTINGS OVER THRUST BLOCKS.

A DETAIL - THRUST BLOCK
NOT TO SCALE

NOTE
CONTRACTOR SHALL USE EITHER MEGALUG OR
CONCRETE THRUST RESTRAINING SYSTEM FOR
THE ENTIRE PROJECT.

MEGALUG
THRUST RESTRAINING SYSTEM DETAILS

* CALCULATIONS DERIVED FROM EBAA IRON SALES

BASED ON:
TEST PRESSURE 200 PSI
SOIL TYPE: GM - SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURE
BURIAL DEPTH: 4 FT.
TRENCH TYPE: 5 - PIPE BEDDED IN COMPACTED GRANULAR

MATERIAL TO THE CENTER LINE OF PIPE, 4" MIN. UNDER PIPE.
COMPACTED GRANULAR OR SELECT MATERIAL TO TOP OF PIPE.
(APPROX. 90% STANDARD PROCTOR, AASHTO T-99)
SAFETY FACTOR: 1.5

PVC VERTICLE BEND RESTRAINED LENGTHS IN FT. (L ₁ —BEFORE CONNECTION/L ₂ AFTER CONNECTION)										
BEND ANGLE	PIPE SIZE									
11.25	4	6	8	10	12	14	16	18	20	24
22.5	4/1	5/2	7/2	9/3	10/3	12/4	13/4	15/5	16/5	19/6
45	8/3	11/4	15/5	17/6	21/7	24/8	27/9	30/9	33/10	38/12
90	16/5	23/8	30/10	36/12	43/14	49/16	56/18	62/20	68/21	79/25

CALCULATIONS BASED ON THE ELEVATION OF THE PIPE REMAINING CONSTANT WITH THE CONTOUR OF THE GROUND. FOR TWO WAY FLOW, SUCH AS FOUND IN DISTRIBUTION SYSTEMS, USE L₁ ON BOTH SIDES OF FITTING.

PVC HORIZONTAL BEND RESTRAINED LENGTHS L, IN FT.										
BEND ANGLE	PIPE SIZE									
11.25	4	6	8	10	12	14	16	18	20	24
22.5	1	2	2	3	3	4	4	5	5	6
45	3	4	5	6	7	8	9	9	10	12
90	5	8	10	12	14	16	18	20	21	25
180	13	18	24	29	34	38	43	47	52	60

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

PVC TEE RESTRAINED LENGTHS L, IN FT.										
BRANCH SIZE DIA.	RUN SIZE DIAMETER									
4	4	6	8	10	12	14	16	18	20	24
4	*	*	*	*	*	*	*	*	*	*
6	—	*	*	*	*	*	*	*	*	*
8	—	—	*	*	*	*	*	*	*	*
10	—	—	—	*	*	*	*	*	*	*
12	—	—	—	—	*	*	*	*	*	*
14	—	—	—	—	—	*	*	*	*	*
16	—	—	—	—	—	—	7	*	*	*
18	—	—	—	—	—	—	—	20	4	*
20	—	—	—	—	—	—	—	—	34	3
24	—	—	—	—	—	—	—	—	—	60

* = FOR THIS CONDITION NEED ONLY RESTRAIN THE OUTLETS OF TEE

NOTES:

- RESTRAIN THE THREE MECHANICAL JOINTS ON THE TEE.
- ALL JOINTS WITHIN THE "L" DISTANCE ON THE BRANCH SIDE OF TEE SHALL BE RESTRAINED AND ALL JOINTS WITHIN 18' ON THE RUN SIDE OF THE TEE SHALL BE RESTRAINED.

PVC REDUCER RESTRAINED LENGTHS L, IN FT. (SMALL SIDE/LARGE SIDE)										
D2 \ D1	6	8	10	12	14	16	18	20	24	
4	42/29	100/52	171/71	258/90	—	—	—	—	—	
6	—	40/31	88/54	147/75	217/95	297/113	—	—	—	
8	—	—	37/29	82/55	135/77	197/98	266/117	—	—	
10	—	—	—	36/30	79/56	128/80	183/100	244/120	—	
12	—	—	—	—	36/30	77/57	123/80	174/102	293/142	
14	—	—	—	—	—	35/30	74/57	118/81	219/124	
16	—	—	—	—	—	—	34/30	73/57	161/104	
18	—	—	—	—	—	—	—	34/30	111/82	
20	—	—	—	—	—	—	—	—	70/57	

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DIP VERTICLE BEND RESTRAINED LENGTHS IN FT. (L ₁ BEFORE CONNECTION/L ₂ AFTER CONNECTION)										
BEND ANGLE	PIPE SIZE									
11.25	4	6	8	10	12	14	16	18	20	24
22.5	2/1	4/2	5/2	6/2	7/3	8/3	8/4	9/4	10/4	12/5
45	5/2	7/3	9/4	11/5	13/6	15/6	17/7	19/8	21/9	24/10
90	11/5	15/6	20/8	23/10	28/12	32/13	36/15	40/17	43/18	51/21

CALCULATIONS BASED ON THE ELEVATION OF THE PIPE REMAINING CONSTANT WITH THE CONTOUR OF THE GROUND.

DIP HORIZONTAL BEND RESTRAINED LENGTHS L, IN FT.										
BEND ANGLE	PIPE SIZE									
11.25	4	6	8	10	12	14	16	18	20	24
22.5	1	2	2	2	3	3	4	4	4	5
45	2	3	4	5	6	6	7	8	9	10
90	5	6	8	10	12	13	15	17	18	21
180	11	15	20	24	28	32	36	40	44	51

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DIP TEE RESTRAINED LENGTHS L, IN FT.										
BRANCH SIZE DIA.	RUN SIZE DIAMETER									
4	4	6	8	10	12	14	16	18	20	24
4	*	*	*	*	*	*	*	*	*	*
6	—	*	*	*	*	*	*	*	*	*
8	—	—	*	*	*	*	*	*	*	*
10	—	—	—	*	*	*	*	*	*	*
12	—	—	—	—	*	*	*	*	*	*
14	—	—	—	—	—	*	*	*	*	*
16	—	—	—	—	—	—	12	2	*	*
18	—	—	—	—	—	—	—	21	12	*
20	—	—	—	—	—	—	—	—	30	12
24	—	—	—	—	—	—	—	—	—	47

* = FOR THIS CONDITION NEED ONLY RESTRAIN THE OUTLETS OF TEE

NOTES:

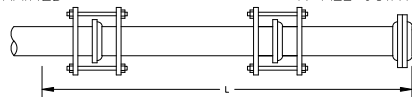
- RESTRAIN THE THREE MECHANICAL JOINTS ON THE TEE.
- ALL JOINTS WITHIN THE "L" DISTANCE ON THE BRANCH SIDE OF TEE SHALL BE RESTRAINED AND ALL JOINTS WITHIN 18' ON THE RUN SIDE OF THE TEE SHALL BE RESTRAINED.

DIP REDUCER RESTRAINED LENGTHS L, IN FT. (SMALL SIDE/LARGE SIDE)										
D2 \ D1	6	8	10	12	14	16	18	20	24	
4	27/18	65/34	110/46	166/58	—	—	—	—	—	
6	—	26/20	57/35	95/48	140/61	192/73	—	—	—	
8	—	—	24/19	53/35	87/50	127/63	171/75	—	—	
10	—	—	—	23/20	51/36	82/51	118/64	158/77	—	
12	—	—	—	—	23/20	49/37	79/52	112/66	188/91	
14	—	—	—	—	—	22/20	48/37	76/52	141/80	
16	—	—	—	—	—	—	22/19	47/37	103/67	
18	—	—	—	—	—	—	—	22/19	72/53	
20	—	—	—	—	—	—	—	—	45/37	

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

PVC DEAD END RESTRAINED LENGTHS L, IN FT.										
PIPE SIZE										
4	6	8	10	12	14	16	18	20	24	
39	55	73	88	104	119	134	149	163	192	

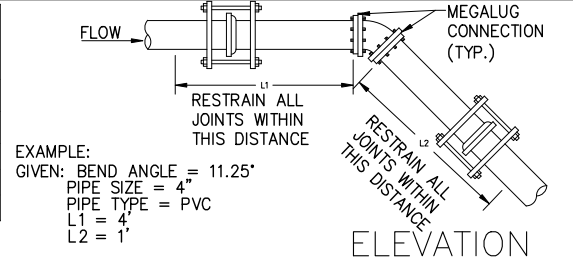
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED



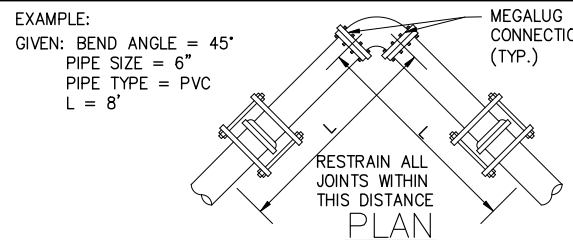
EXAMPLE:
PIPE TYPE = DIP
PIPE SIZE = 10"
L = 57'

DIP DEAD END RESTRAINED LENGTHS L, IN FT.										
PIPE SIZE										
4	6	8	10	12	14	16	18	20	24	
25	36	47	57	67	76	86	95	105	123	

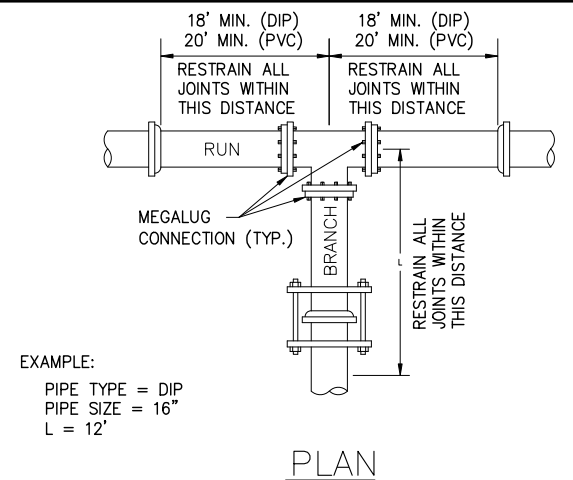
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED



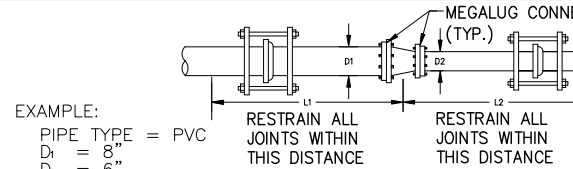
EXAMPLE:
GIVEN: BEND ANGLE = 11.25°
PIPE SIZE = 4"
PIPE TYPE = PVC
L₁ = 4'
L₂ = 1'



EXAMPLE:
GIVEN: BEND ANGLE = 45°
PIPE SIZE = 6"
PIPE TYPE = PVC
L = 8'



EXAMPLE:
PIPE TYPE = DIP
PIPE SIZE = 16"
L = 12'



EXAMPLE:
PIPE TYPE = PVC
D₁ = 8"
D₂ = 6"
L₁ = 31'
L₂ = 40'

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REV NO.	COMMENT	DATE

SUNRISE ENGINEERING

2100 NORTH MAIN STREET
NORTH LOGAN, UTAH 84341
TEL 435.563.3734
www.sunrise-eng.com

SMITHFIELD IRRIGATION COMPANY

MILL RACE PRESSURIZED PIPELINE

DETAILS

THRUST BLOCK DETAILS

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
12499	HP	JJ	SDW	41 of 26	D6