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Intensive Archeological Survey Of Fort Richardson State Park And Historic Site

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Intensive Archeological Survey Of Fort Richardson State Park And Historic Site

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INTENSIVE ARCHEOLOGICAL SURVEY OF FORT RICHARDSON STATE PARK AND HISTORIC SITE

Jack County, Texas

Final Report
September 2018

Texas Historical Commission
TAC Permit # 8362

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aci Project No.: 32-17-140

Abstract

On March 28 and 29, 2018, aci consulting conducted a cultural resources survey of the Fort Richardson State Park and Historic Site in Jack County, Texas for the proposed wastewater system and lift stations. The Texas Parks and Wildlife Department (TPWD) proposes to replace a 50-year old wastewater system, water distribution system, and main lift station with a modernized and efficient system.

The Area of Potential Effect (APE) for the Fort Richardson State Park and Historic Site (FRSPHS) project is the water and wastewater replacement system which is approximately 1.49 miles in length with a 20-foot buffer, resulting in approximately 3.6 acres (1.46 hectares). The proposed project includes two proposed lift stations, the replacement of nine manholes, four new manholes, approximately eighteen trunk lines for waste water that emerge from the main waste water line to serve various campsites, and two equipment storage areas.

The survey was conducted entirely within the Fort Richardson National Historic Landmark and within the boundary of previously recorded site 41JA2, which is the historic U.S. Army Post. An area for a proposed new lift station near the site buildings was scraped and metal detected. This work was conducted in compliance with Texas Administrative Code (13 TAC 26) under Texas Antiquities Code permit number 8362, as well as Section 106 of the National Historic Preservation Act of 1966, as amended. The survey did not result in the location of any new archeological sites, historic structures, or additional historic properties. Based on these results, no further archeological work is recommended. However, a monitoring plan is included which outlines specific recommendations. Records from this investigation will be curated at the TPWD Laboratory. Julie Shipp served as Principal Investigator, Brandy Harris as Project Historian, Katie Canavan as Lab Director, and Douglas Shaver as Geophysical expert.

TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 BACKGROUND INFORMATION	5
2.1 Fort Richardson	5
2.2 Literature Review	7
2.3 Natural Setting	11
2.3.1 Physiography	11
2.3.2 Soils	11
2.3.3 Geology	13
3.0 METHODS	13
3.1 Archival Research	13
3.2 Field Method	13
3.2.1 Metal Detecting	13
3.2.2 Intensive Pedestrian Survey	14
3.2.3 National Register of Historic Places (NRHP) Testing	17
3.2.4 Unanticipated Discoveries	17
3.3 Lab Methods	17
3.4 Curation	18
4.0 RESULTS	19
5.0 SUMMARY AND RECOMMENDATIONS	28
5.1 Recommendations for Monitoring	28

LIST OF TABLES

Table 1: Previous Cultural Resource Surveys within NRHP Boundary	8
Table 2: Previously Recorded Archeological Sites within NRHP Boundaries	9
Table 3: Soils mapped within APE	11
Table 4: Recovered Artifacts by Shovel Test	23
Table 5: Temporally Diagnostic Artifacts	27

LIST OF FIGURES

Figure 1: Project Area on <i>Jacksboro</i> USGS 7.5-minute Topographic Quadrangle	2
Figure 2: Project Area on Aerial Photographic Background	3
Figure 3: Location of Lift Stations and Manholes	4
Figure 4: Archeological sites, previous investigations, and cultural resources	10
Figure 5: Project area soils	12
Figure 6: Fort Worth Hybrid Potential Archeological Liability Map (HPALM)	16
Figure 7: Overall Field results	20
Figure 8: Field Results Near Hospital	21
Figure 9: Lift Station No. 2 Excavation	22
Figure 10: Square nails found in hospital yard from PH 11	25



Figure 11: Porcelain button in hospital yard from SF4.....25
Figure 12: Glass on surface near hospital from SF426

LIST OF APPENDICES

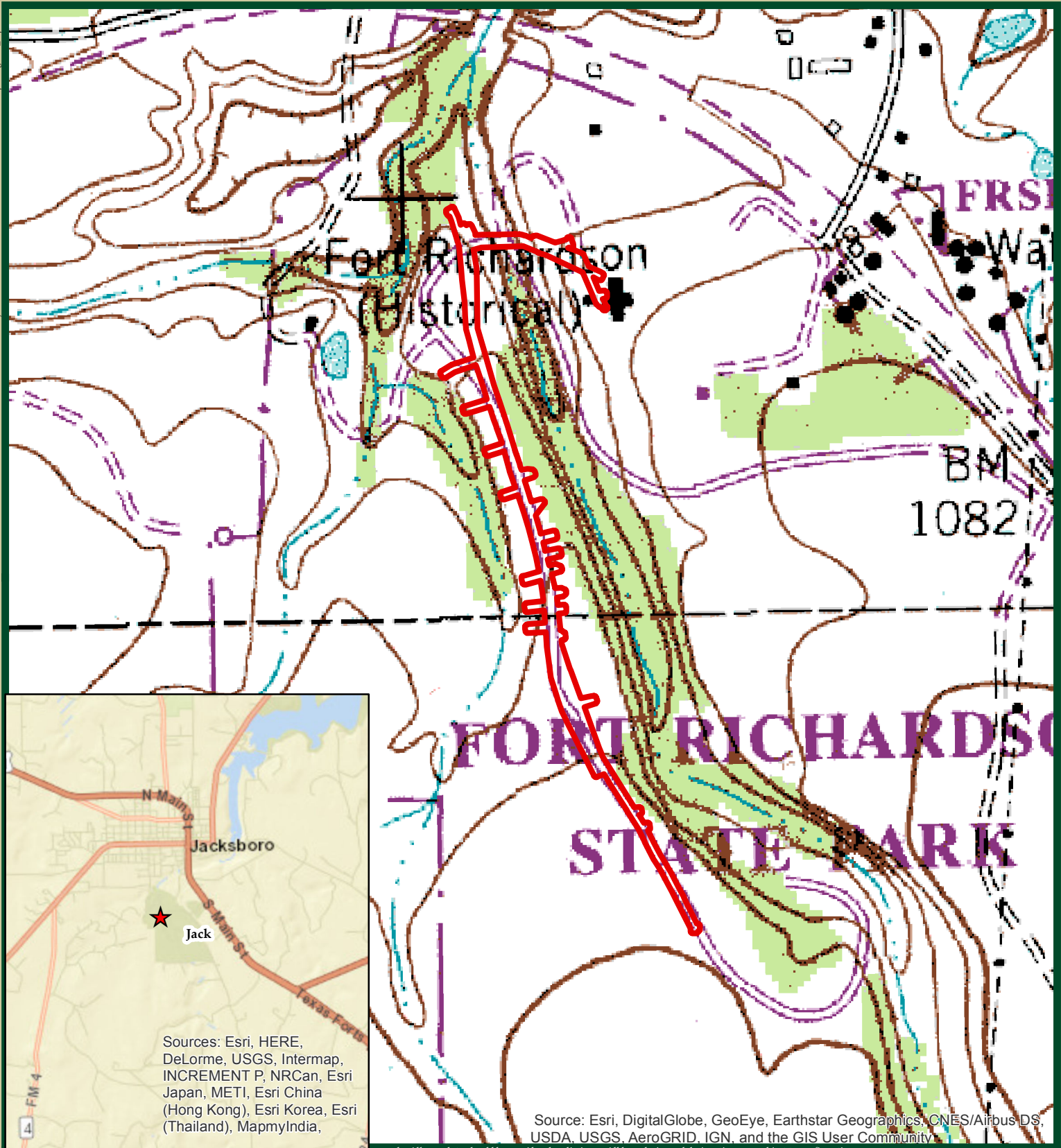
- Appendix A: Water and Wastewater Plans
- Appendix B: Specimen Inventory
- Appendix C: Monitoring Plan

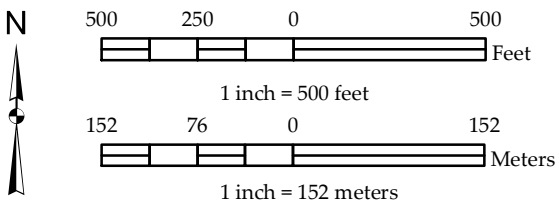
Intensive Archeological Survey of Fort Richardson State Park and Historic Site, Jack County, Texas

1.0 INTRODUCTION

The Texas Parks and Wildlife Department (TPWD) proposes to replace a 50-year old wastewater system, water distribution system, and main lift station with a modernized and efficient system (Figures 1 and 2). The Area of Potential Effect (APE) for the Fort Richardson State Park and Historic Site (FRSPHS) project is the water and wastewater replacement system which is approximately 1.49 miles in length with a 20-foot buffer, resulting in approximately 3.6 acres (1.46 hectares). In addition to the main water and waste water lines are two proposed lift stations, the replacement of nine manholes, four new manholes, and approximately eighteen trunk lines for waste water that emerge from the main waste water line to various campsites (Figure 3). The depths of impacts typically do not exceed approximately 2-4 feet, with the exception of the manholes and lift stations, which have deep impacts (Appendix A).

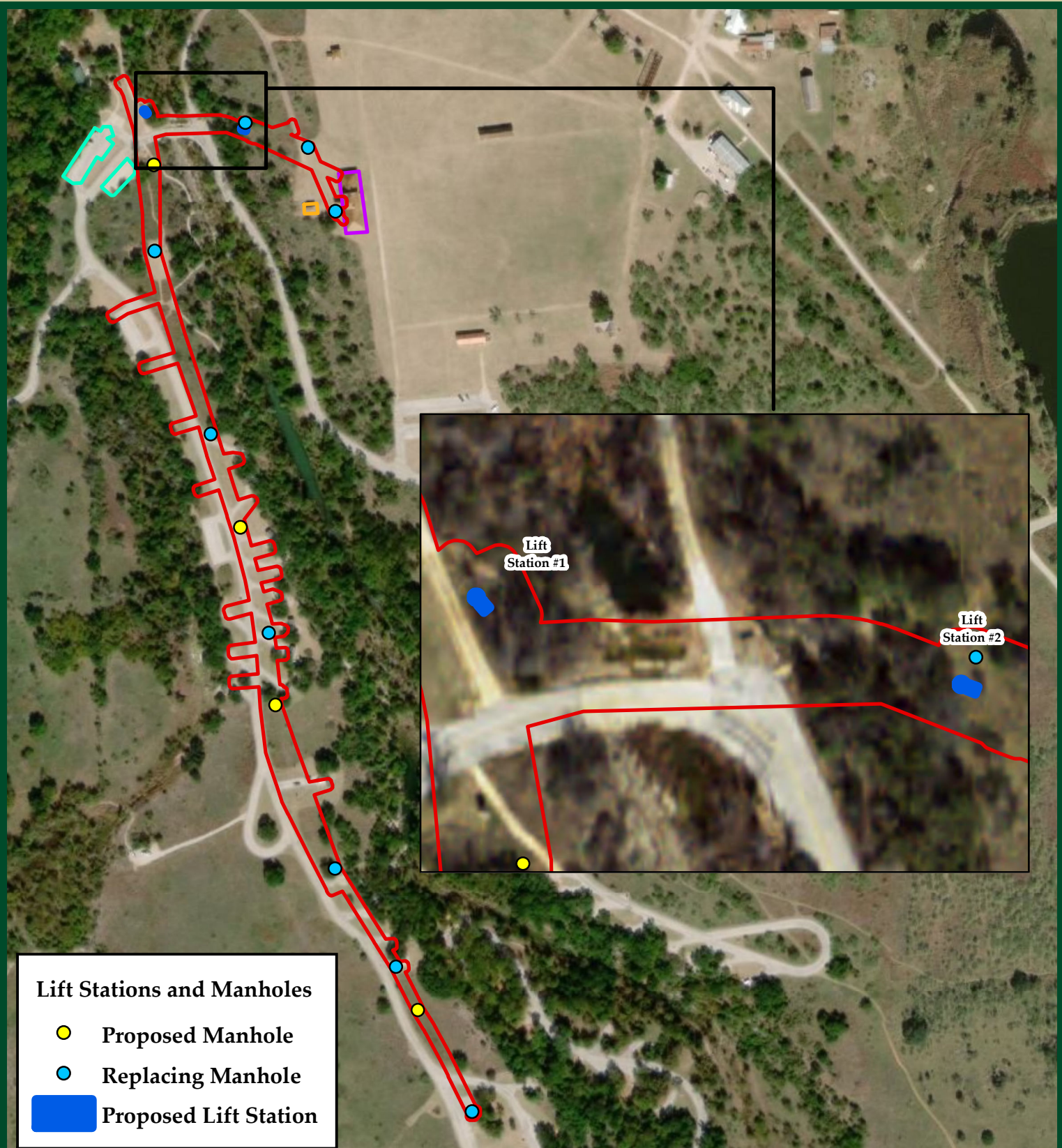
This investigation consisted of an intensive archeological survey of the FRSPHS project area pursuant to the Texas Administrative Code (13 TAC 26.20[2]). The overall investigation included the Texas Antiquities Permit Application, background study, archival research, metal detecting, pedestrian survey, mechanical scraping, and reporting in accordance with the Texas Historical Commission (THC) and Council of Texas Archeologists (CTA) standards. The survey was conducted entirely within the Fort Richardson National Historic Landmark and within the boundary of previously recorded site 41JA2, which is the historic U.S. Army Post. An area for a proposed new lift station near the site buildings was scraped and metal detected.





 APE

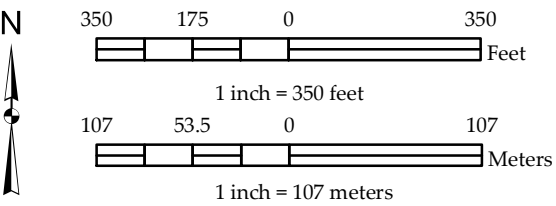




Lift Stations and Manholes

- Proposed Manhole
- Replacing Manhole
- Proposed Lift Station

This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.



- APE
- Hospital
- Morgue
- Equipment Storage



Fort Richardson State Park and Historic Site
 Figure 3: Location of Lift Stations and Manholes

2.0 BACKGROUND INFORMATION

2.1 Fort Richardson

The history of the Fort has been detailed in a number of articles, reports, and monographs, including Dennis (1964), Hamilton (1988), and others. The following statement provides a brief context within which to evaluate artifacts, features, or deposits recorded during the survey and NRHP testing. This context statement will be expanded and modified as needed based on the types and temporal affiliation of artifacts or features recovered in the field.

Founded in 1867, Fort Richardson was established as part of a larger Reconstruction-era attempt by the Federal government to “reclaim” the frontier after the end of the Civil War. Between 1865 and 1866, much of the Texas frontier was abandoned by Euroamericans due to the increased frequency of Indian raids (Black and Kegley 1998). In 1867, Fort Richardson became the “northern base of operations for a chain of federal forts designed to protect the western stagecoach routes and the Texas frontier settlements” against various native groups, including the Kiowa and Comanche (Dickson 1976). The defensive line, roughly between Eagle Pass and Jacksboro, included new outposts such as Fort Richardson and reoccupied forts abandoned during the Civil War (Black and Kegley 1998). Soldiers at the Fort were also tasked with local enforcement of Reconstruction, including trying and imprisoning criminals and guarding elections (Ippolito 1977; Whisenhunt 1966).

Fort Richardson was sited by Major S.H. Starr and intended to be “the northern of the Texas frontier forts, and the one closest to...Indian Territory” (Black and Kegley 1998). Prior to permanent construction, the garrison camped on the opposite (west) bank of Lost Creek. Very few archeological investigations have been conducted in this area. Construction at the current location began in November 1867 and included both enlisted men and civilian laborers. By February of 1868, the group had completed construction of “the commissary and quartermaster storehouses” and part of the hospital (Black and Kegley 1998). By that summer, the Fort included “two storehouses, the bakery, a hospital, and a kitchen, possibly associated with the hospital” (Black and Kegley 1998).

In the fall of 1868, Brevet Brigadier-General James Oakes assumed control of the post. Oakes remained the commander until the Fort’s abandonment 10 years later (University of Texas n.d.). He oversaw additional construction over the next several years, comprising completion of the hospital, a guardhouse, wood-frame officers’ quarters, and numerous picket structures, including enlisted men’s housing, kitchens, mess rooms, latrines, and workshops (Black and Kegley 1998). By 1870, “the fort had assumed its

final configuration of a parade ground lined with opposing rows of quarters for officers and enlisted men” (Black and Kegley 1998). The enlisted barracks held up to 350 men at different times, while up to four companies remained housed in tents, some on the opposite bank of Lost Creek.

The troops’ primary mission was to protect the region from Indian attack and to open it for permanent Euroamerican settlement. This work included “escorting freight trains, stages, and cattle drives...conducting routine patrols and scouting” (Black and Kegley 1998). Patrols from the Fort explored much of the surrounding territory, and the data collected during their reconnaissance “proved invaluable in the subsequent settlement of the area” (Whisenhunt 1966). While some expeditions were uneventful, “others frequently encountered Indian war parties” (Whisenhunt 1966). Prisoners were brought back to Fort Richardson, including the leaders of an infamous 1871 raid on a wagon train at Salt Creek west of Jacksboro. Additionally, soldiers stationed at Fort Richardson participated directly in the Red River War of 1874 and 1875. The success of this campaign and the relegation of the Plains tribes to reservations in Indian territory meant the fort was no longer needed. It was ordered to be abandoned by the army in 1878 (Mendingham 1978).

Upon abandonment of the property by the U.S. military, “the land and buildings reverted to the lessor, Frederick F. Foscue” (TPWD 2014). After its abandonment, the facility was occupied variously by “settlers and transients” some of whom apparently “salvaged building materials or used the lumber for heating” (TPWD 2014), ushering in a period of prolonged decline. The Chicago, Rock Island & Texas Railway purchased a portion of the property in 1898. The company constructed their line through the northeastern portion of the former parade ground and erected a depot “near the site of the former fort commissary” (TPWD 2014). These developments signaled the beginning of the property’s fragmentation during the ensuing years. The landscape was changed further by City of Jacksboro-sponsored waterworks projects during the early twentieth century and by the Fort’s temporary use by a Texas National Guard unit during the same period (TPWD 2014).

The Texas Centennial in 1936 brought about renewed interest in the historic Fort. The Texas Centennial Commission purchased what remained of the property and repaired some of the remaining buildings. The Fort received National Historic Landmark (NHL) designation in 1966, and opened as a state park soon after (TPWD 2014). Preservation, research, and archeological investigations have been ongoing since, although relatively few excavations have occurred on the property since the 1980s.

2.2 Literature Review

At present, the Fort is listed on the NRHP and is designated as an NHL, a Recorded Texas Historic Landmark (RTHL), and a State Antiquities Landmark (SAL). It was recorded as archaeological site 41JA2 in 1971, although the site boundaries do not encompass the entire NRHP boundaries, and site 41JA47 represents a portion of a stone wall historically associated with the Fort recorded during a pipeline survey in 2012 (Figure 4). Site 41JA47 is located south of and outside the NRHP boundary.

A number of excavations have been conducted within the boundaries of the NRHP-district (Table 1). The last documented excavations at the fort occurred in 2004, and none occurred within the current APE. Other smaller scale investigations have occurred within the boundaries of the NRHP district, and are documented and on file at TPWD.

Table 1: Previous Cultural Resource Surveys within NRHP Boundary

Date	Consultant	Planner	Agency	Intersects APE	Comments
1972	University of Texas at Austin	TPWD	TPWD	No	Excavations at location of two barrack buildings and two officer's quarters
1973	TPWD	TPWD	TPWD	No	Excavations at the north end of the commissary and quartermaster's storehouse
1974	TPWD	TPWD	TPWD	No	Excavations at the bakery building
1976	Texas A&M University	TPWD	TPWD	No	Mitigation/excavations at enlisted man's barracks, picket officer's quarters, and officer's kitchen
1977	Texas A&M University	TPWD	TPWD	No	Pre-reconstruction excavations at enlisted men's barracks and officer's quarters
1998	TPWD	TPWD	TPWD	No	Summary of archeological investigations conducted between 1978 and 1986; excavations at officer's quarters, enlisted men's barracks, and guardhouse

In addition to the surveys, several archeological sites have been recorded within the NRHP-district boundaries (Table 2; Figure 4). With the exception of 41JA2, none of the resources have direct associations with the Fort, and all are outside of the direct APE.

Table 2: Previously Recorded Archeological Sites within NRHP Boundaries

Trinomial	Site Name	Site Type	NRHP Eligibility	Intersects APE
41JA2	Fort Richardson State Historic Park	U.S. Military Fort (1867-1878)	Eligible; also SAL	Yes
41JA7	N/A	Unknown prehistoric campsite	Undetermined	No
41JA8	N/A	Unknown prehistoric campsite and historic period trash dump	Undetermined	No
41JA9	N/A	Historic period trash dump	Undetermined	No
41JA10	N/A	Historic dwelling (ca. 1860s)	Recommended Eligible	No

2.3 Natural Setting

2.3.1 Physiography

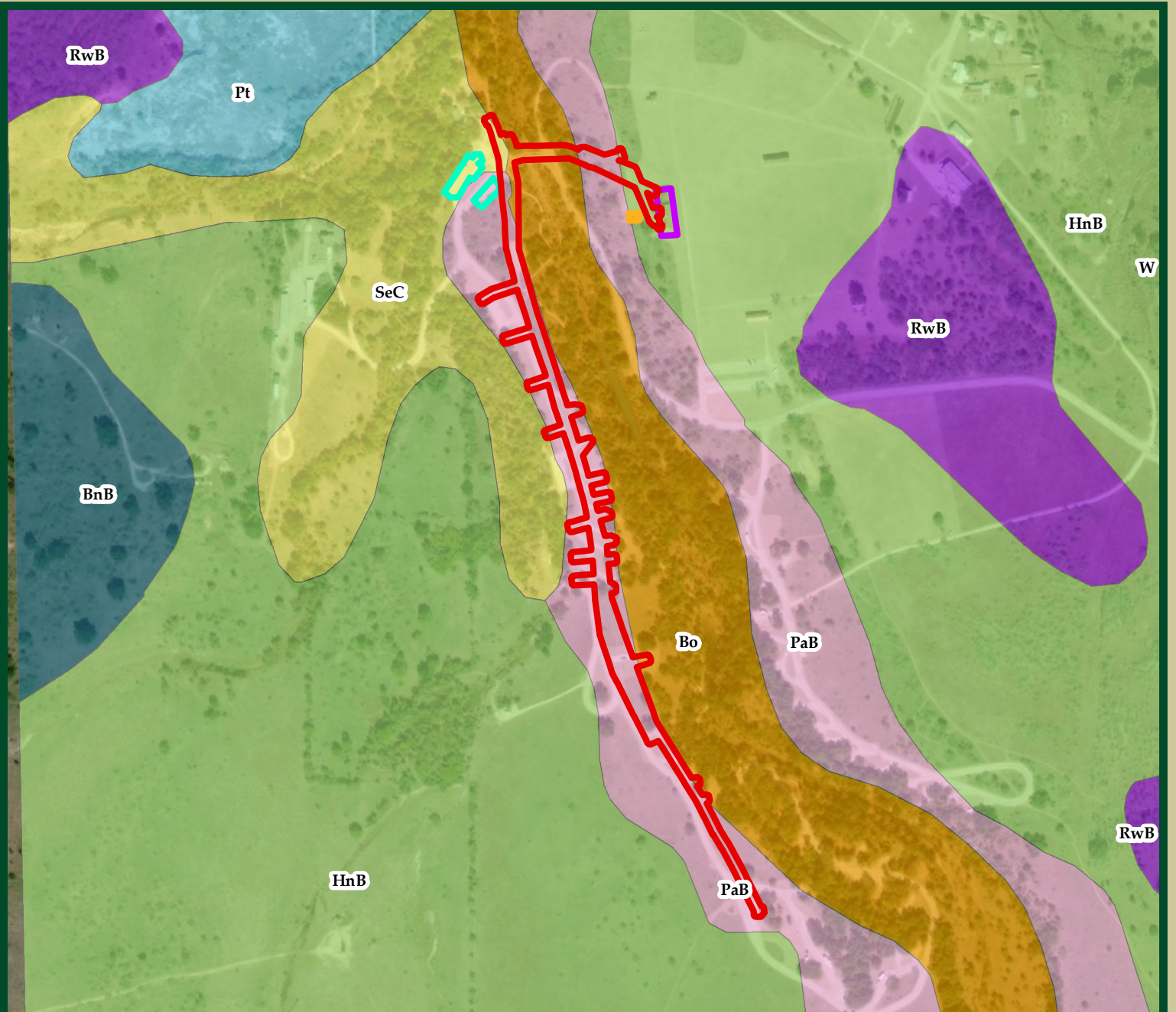
The project area is located in north central Texas in the Cross Timbers ecoregion, and furthermore in the Western (or Upper) Cross Timbers. The Western Cross Timbers comprises an irregularly bounded wooded region with extensive open grasslands and brushy rangelands. The Western Cross Timbers vegetative sub-region, located immediately west of the Fort Worth Prairie and north of the Lampasas Cut Plain, extends from the Red River in Montague and Cooke counties south and southwestward to the Lampasas Cut Plain and west to the Rolling Plains. Post oak woodlands characterize much of the West Cross Timbers. Other associated woody species include shin oak, Spanish oak, live oak, Texas ash, mesquite, osage orange, Ashe juniper, eastern red cedar, cedar elm, skunkbush sumac, elbowbush, lotebush, tasajillo, rough-leafed dogwood, flame-leaf sumac, hawthorn, and hackberry (TPWD 2018).

2.3.2 Soils





Four soils are mapped within the APE (NRCS 2018) (Table 3; Figure 5). Hensley, Palopinto, and Set soils are all shallow soils that formed *in situ* from weathered limestone bedrock. These soils have a low probability of containing intact cultural deposits, although the fourth soil, Bosque loam, has a very high archeological potential (Abbott 2011). This soil is only present at the crossing of Lost Creek, which is approximately 240 feet (73 meters) in length. It was anticipated, however, that the soil would be eroded and shallow in this location, which was the case in the field.

Table 3: Soils mapped within APE

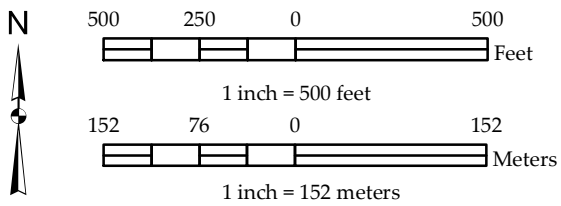
<i>Series</i>	<i>Texture</i>	<i>Parent Material</i>	<i>Landform</i>	<i>Age</i>
Bosque	Loam	Residuum	Floodplain tread	Cretaceous
Hensley	Loam	Residuum	Ridge summits and shoulders	Cretaceous
Palopinto	Very stony clay loam	Residuum	Ridge summits and shoulders	Pennsylvanian
Set	Stony clay	Residuum	Footslopes and backslopes	Pennsylvanian



Soils within APE

-  **Bo:** Bosque clay loam, occasionally flooded
-  **HnB:** Hensley loam, 1 to 3 percent slopes, extremely stony
-  **PaB:** Palopinto very stony clay loam, 1 to 8 percent slopes, rubbly
-  **SeC:** Set clay, 3 to 5 percent slopes

Map data: Earthstar Geographics, CNES/Airbus DS, GeoEye, IGN, AerGRID, Ordnance Survey, and the GIS User Community. This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.



-  **APE**
-  **Hospital**
-  **Morgue**
-  **Equipment Storage**



2.3.3 Geology

The Western Cross Timbers is underlain by the hard rocks of the various Pennsylvanian formations. The geology of the region includes the Thrifty and Graham Formations, undivided mudstone, shale, sandstone, and limestone (BEG 1999). The Pennsylvanian outcrops form a plateau dissected by the channels of major streams that have been cut considerably below the surface level. Among the Pennsylvanian outcrops occur scattered exposures of hard limestones; without exception, such exposures are characterized by a typical savanna landscape, comprised of scattered mesquite shrubs underlain by a floor of sod-forming short grasses (BEG 1996).

3.0 METHODS

3.1 Archival Research

Multiple investigators have conducted archival research into the history and material culture of Fort Richardson. Their work has been summarized in a number of secondary sources, architectural history and archeological testing and mitigation reports, and TWPD planning documents. These resources contain copies of primary source materials, original architectural plans, and historic period maps and are located at various repositories including the Texas State Library and Archives and the Center for American History at the University of Texas. The TPWD archeology laboratory also maintains a collection of reports, files, and artifacts that could be relevant. Their files were used to prepare the historic background included in this document. The Project Historian would have consulted these sources in depth if historic period artifacts, deposits, or features were encountered during the fieldwork and or as needed to expand the historic context.

3.2 Field Method

Project schematics were provided by KSA Engineering in order to plan the survey effort, and were attached as an appendix to the research design, as they are in this report. aci consulting created a digital alignment, georeferenced from these plans, and uploaded the APE to a Trimble GeoXH unit. The proposed APE was located in the field using the Trimble unit. Metal detecting was conducted along a 20-foot corridor situated over the center lines, and in other areas of proposed construction, such as lift stations and manholes, and the shovel tests were dug within metal detector hit locations.

3.2.1 Metal Detecting

Metal detecting was conducted within the entire APE prior to the pedestrian survey. All artifacts located as a result were collected and recorded on a log. The locations of the

artifacts were recorded with a Trimble data collector. The field methods were applied according to TPWD protocols for metal detecting, which are attached as Appendix B. However, metal detecting field methods may be modified in conjunction with pre-field line-locating work and input from the design/engineering team. The collection strategy will take into account modern park construction with heavily disturbed areas, if these can be documented. Park staff may have input in locating modern buried utilities as well.

A Garrett AT Pro (Garrett) was utilized for the metal detection portion of the survey. The Garrett uses an 8.5" by 11" DD search coil and operates at an adjustable frequency of 15 kilohertz (kHz). Prior to the start of the metal detection survey the Garrett was manually ground balanced. Each time the Garrett was turned off or was relocated to a new survey location, it was manually ground balanced. During the metal detection survey the Garrett settings were adjusted to read all metal types with the sensitivity adjustments set at the highest setting for the soil conditions within the survey area.

Prior to the metal detection survey, the operator practiced good magnetic hygiene by removing all ferrous metal items from below their waist. Both footwear and snake-guards were void of metal. During the survey all sweeps of the metal detector overlapped by a minimum of 50 percent with the coil parallel to and as close to the ground surface as possible. When metal was detected by the Garrett, the operator activated the "all metal pinpoint" function to zero in on the positive hit and a fiberglass pin flag was placed to mark the location.

Excavation of positive metal detector targets was conducted by shovel a small distance behind the target. Once surface vegetation was removed a Garrett Pro-Pointer II was utilized to pin point the targets location for removal with minimal impacts to the surrounding soils. All extracted soils were screened through 1/4-inch metal hardware cloth. Once the positive metal detector identified target was excavated and identified, the artifact and location were documented, the hole buried, and the divot tapped down.

3.2.2 Intensive Pedestrian Survey

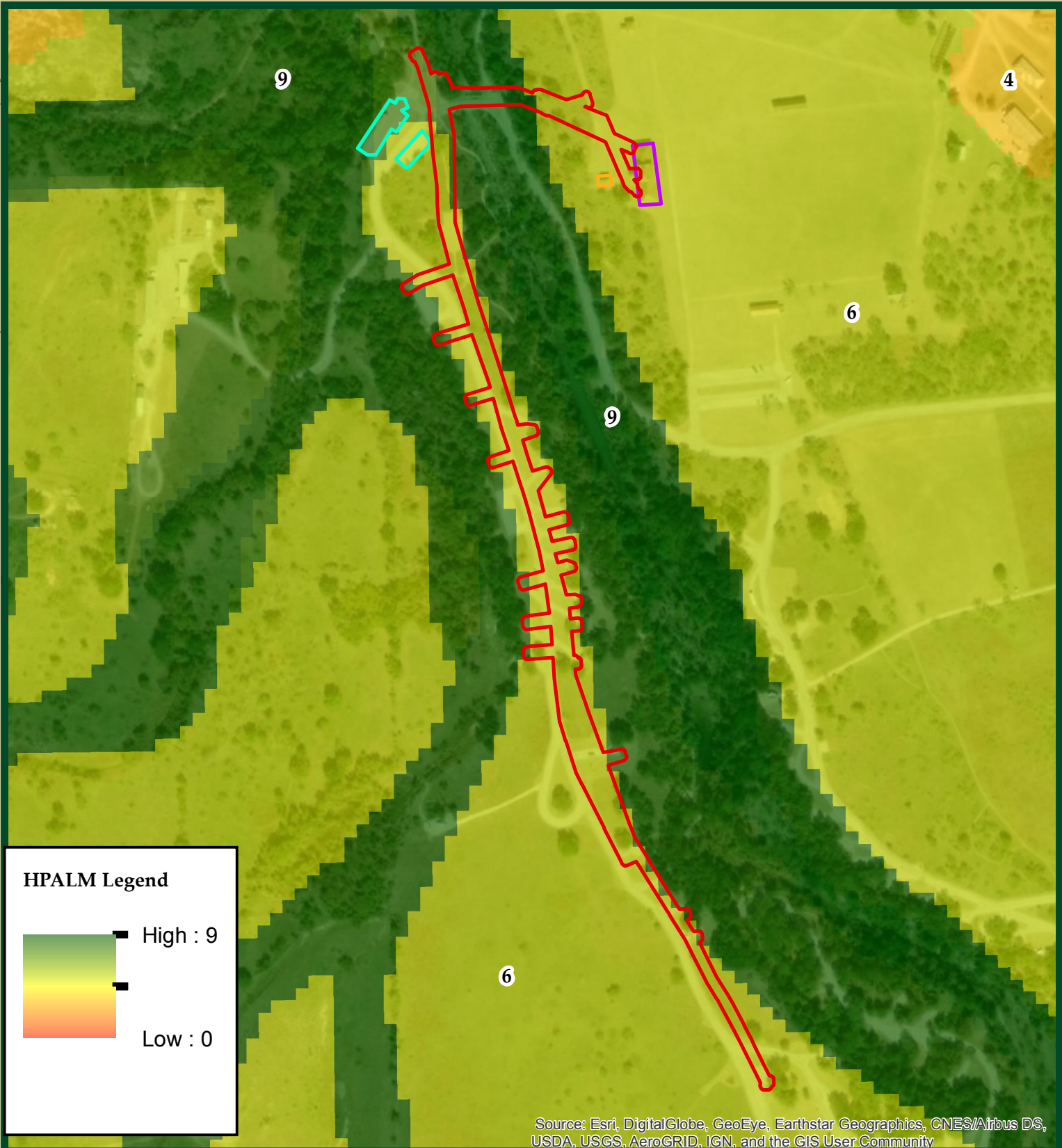
The team conducted an intensive pedestrian survey of the entire APE in accordance with guidelines set forth by the THC and CTA. The survey included shovel testing, the intensity of which depended on the archeological probability areas within the APE, which is mapped as both medium and high probability (Abbott 2011) (Figure 6). Shovel test locations also depended on the depth of the soil and surface visibility.

The probability areas were primarily determined using the Hybrid Archeological Potential Liability Model (HPALM) developed by the Texas Department of Transportation (TxDOT) for the Fort Worth District. These models are primarily utilized for the determining the probability of locating prehistoric sites with data sets such as soils, streams, landforms, etc. One of the data sets includes all previously recorded archeological sites, which inadvertently includes historic sites. However, the HPALM model was used here to determine the probability of prehistoric sites, as the project area is located on a known historic site and a metal detector was utilized to locate associated artifacts.

The high probability area within the APE consists primarily of the crossing of Lost Creek, within the Bosque clay loam. This area is approximately 70 meters in length and 0.27 acre in area. It was estimated that ten shovel tests would be placed within this area in addition to tests placed in this area as a result of the metal detecting, assuming field conditions were good. However, it was noted in the field that no shovel tests were needed at the creek crossing due to the degree of slope and bedrock at surface.

The remainder of the APE, approximately 3.33 acres, is medium probability (Abbott 2011). It was estimated that 25 shovel tests would be placed within the main and trunk water and waste water lines, assuming field conditions were good, and in addition to tests placed in this area as a result of the metal detecting. It was determined in the field that the shovel tests dug as a result of metal detector hits was sufficient to test the area, as much of the area was previously disturbed from the construction of the campground and bedrock was shallow or at surface.

The team was prepared to identify and record all newly discovered prehistoric and historic archeological sites or features, inclusive of any buildings and structures in the APE, and to characterize their age, integrity, context, depth, extent, and artifact content within the defined project area.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.

HPALM Legend

High : 9

Low : 0

N

350 175 0 350

Feet

1 inch = 350 feet

107 53.5 0 107

Meters

1 inch = 107 meters

- APE
- Hospital
- Morgue
- Equipment Storage



3.2.3 National Register of Historic Places (NRHP) Testing

Two manholes will be replaced in the vicinity of the historic hospital and morgue, and two new lift stations are proposed near Lost Creek. NRHP testing was established necessary for these areas. However, in the field it was determined that the locations near the manholes were significantly impacted during their original construction (see Figure 3).

One of the locations for the proposed lift stations was surveyed by metal detecting and one was not. Lift Station 1, on the west side of Lost Creek (see Figure 3), was located on a very rocky creek bank with little soil. This area was pedestrian surveyed with no additional work necessary.

The location of the proposed Lift Station 2 (see Figure 3), within view of the historic fort hospital, was further investigated. The metal detecting and shovel testing near the hospital revealed that the shallow soil contained various metal and glass objects related to historic occupations of the hospital. The area was overgrown with prickly pear cactus and other plants and it was decided in the field to mechanically scrape this area, metal detect, and then shovel test all positive hits.

3.2.4 Unanticipated Discoveries

Upon the unanticipated discovery of human remains, Fort Richardson State Park, and the Cultural Resources Coordinator (Tony Lyle) have agreed the least destructive methods possible would be used to identify additional burials within the adjacent areas. All identified burials would be covered and remain protected from disturbances. aci consulting has a commitment to compliance with all applicable statutes, regulations, and rules regarding burial treatment and disinterment, and would comply with the TPWD protocols for unanticipated discoveries, attached as Appendix C. No human remains were discovered in the investigation.

3.3 Lab Methods

All specimens were collected for processing, cataloguing, and analysis to be carried out in the aci laboratory located in Austin, Texas. Artifacts collected in the field were bagged by material and recorded on a Lot Record Form in the field laboratory. Specimens were assigned lot numbers based on provenience and tags were completed with lot number, site and project information, and basic material type. Artifacts and field bags were stored and then transported to the aci laboratory in plastic bins. After arriving at the laboratory, all artifact bags were accounted for and the lot record was entered into an electronic database created for the project.

The laboratory staff inventoried the artifact bags and prepared the artifacts for in-house analysis. Artifacts and paperwork will be further prepared for permanent curation at the TPWD Laboratory in Austin, Texas in accordance with the facility's requirements for curation, detailed below.

Once in the laboratory, artifacts were cleaned and re-bagged as necessary. After the artifact bags were cross checked with the field records and electronic database, artifact bags were then sorted into analytical categories. All recovered artifacts were historic or modern and were initially divided by material into six broad categories based on material. These categories are glass, metal, ceramic, brick, concrete, and faunal. While the faunal specimen could be from any time period, based on context it was categorized as historic. Additional attributes such as surface treatment, decorative element, morphological characteristics, technological and manufacturing variables, form, color, size, and condition were evaluated as warranted.

3.4 Curation

All artifacts and original records associated with archeological investigations on TPWD lands will be curated at the TPWD Archeology Laboratory in Austin. There is no cost for curation. aci consulting personnel has been coordinating curation efforts with the TPWD collections manager Aina Dodge. Prior to final delivery to TPWD, all artifacts and records will be prepared according to the standards defined by the University of Texas Archeological Research Laboratory (TARL). All artifacts and records for this investigation are attributed to Fort Richardson State Park and Historic Site 41JA2 and will be added to the site's collection. Therefore, lot numbers for this investigation began with 364, as that is the next sequential number in the site's lot record, as provided by the TPWD Archeology Laboratory.

Artifacts were cleaned for analysis and in accordance with TARL's suggested cleaning methods which include nondestructive and reversible techniques. Artifacts were counted, analyzed, and weighed. Soiled field bags were replaced with clean new polyethylene bags. Diagnostic artifacts and a sample of non-diagnostic artifacts were photographed. Unique artifacts will be individually bagged and will correspond with the artifact catalogue numbering. Each artifact bag will contain a paper tag with all necessary project and artifact information. An artifact catalogue will be generated and each unique artifact will have its own line and unique catalogue number.

All original records will be curated on acid-free and lignin-free paper. Any pages that are dirty, have torn or frayed edges, or have been written on with felt tipped pens or pencil lead that smears will be placed in archival page protectors. The paperwork,

including daily journals, lot inventory records, photographic log, metal detector log form, field site sketches, and shovel test records, will be organized into their record group and numbered accordingly. Artifact photographs and field photographs will be printed and submitted with the paper records.

Upon final approval of this report, aci consulting will finalize curation of the artifacts and paperwork with TPWD collections manager.

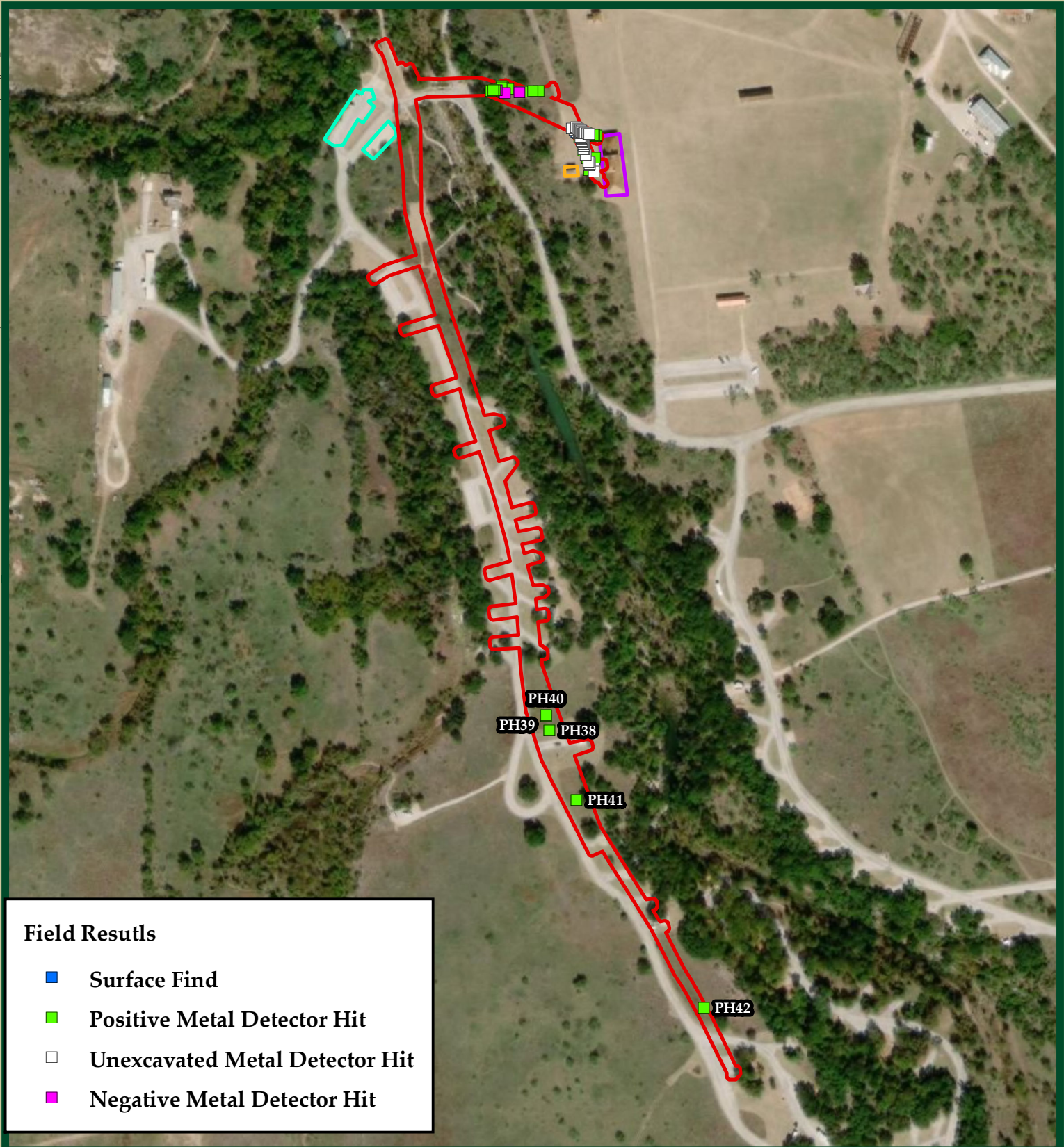
4.0 RESULTS

The entire APE was surveyed with a metal detector. The majority of the APE was either previously disturbed or exhibited bedrock at the surface. A total of 44 shovel tests were excavated, of which 41 were positive, in addition to 4 surface expressions that were collected (Figure 7). Fourteen shovel tests were excavated in medium probability area near the hospital (PH 1-14) (Figure 8). This area of the proposed alignment also included significant surficial expressions of historic artifacts (SF 1-4). Twenty-five shovel tests were excavated in high probability area, including the mechanically scraped area near the proposed site for Lift Station No. 2 (PH 15-36) (Figure 9).

An additional five shovel tests were excavated along the southern portion of the proposed alignment per the metal detector (PH 38-42) (see Figure 7). The number of PH37 was erroneously skipped in the field. None of the hits outside of the historic fort hospital yard resulted in the location of historic artifacts. These tests were dug in the area of the campground, which has been previously disturbed by the construction of the campground and existing water line.

A total of 55 metal detector hits were flagged during the metal detecting survey of the hospital yard. Because of the high number of hits in close proximity, 50-cm shovel tests were dug in 5-meter intervals at the marked metal detector hits. Fourteen of the 55 metal detector hits (25%) were excavated. Generally, the tests contained square nails (Figure 10) or unidentified metal fragments; one of the tests contained a porcelain button (Figure 11).

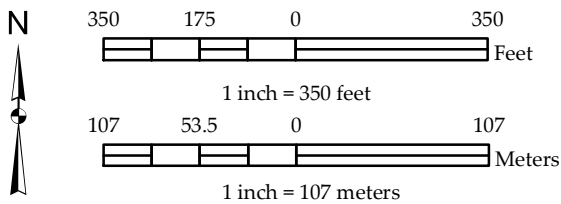
A representative sample of the surface artifacts immediately adjacent to the hospital and near the location of one of the manholes was collected (SF4). The majority of these artifacts were glass (Figure 12, Table 4, Appendix B). The ubiquity of artifacts in this location at the corner of the hospital was unique to this location; the remainder of the hospital yard contained an ephemeral artifact scatter on the surface.



Field Results

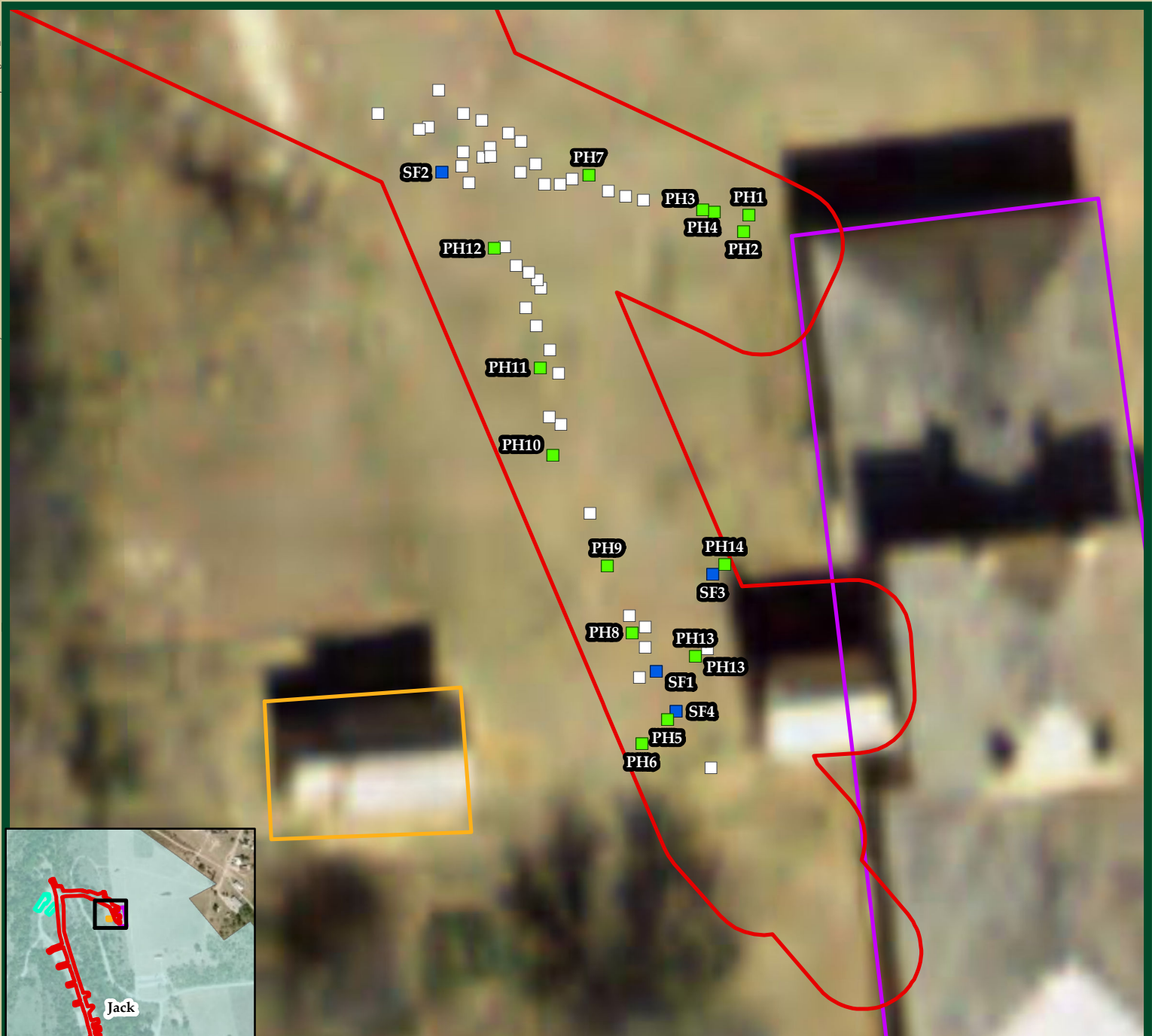
- Surface Find
- Positive Metal Detector Hit
- Unexcavated Metal Detector Hit
- Negative Metal Detector Hit

This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.



- APE
- Hospital
- Morgue
- Equipment Storage





Field Results

- Surface Find
- Positive Metal Detector Hit
- Unexcavated Metal Detector Hit

This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.

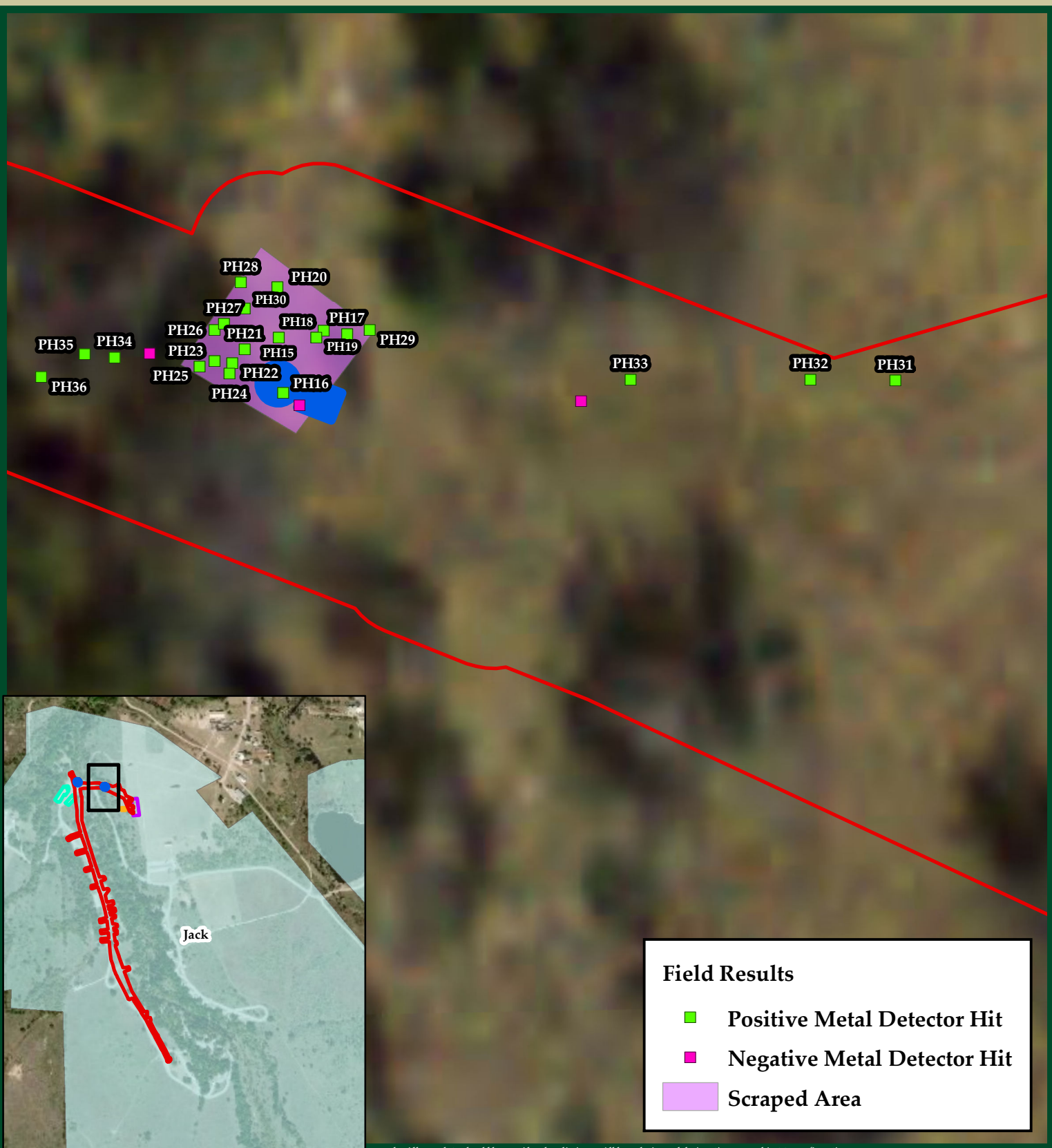
N

25 12.5 0 25
Feet
1 inch = 25 feet

8 4 0 8
Meters
1 inch = 8 meters

- ▭ APE
- ▭ Hospital
- ▭ Morgue
- ▭ Equipment Storage

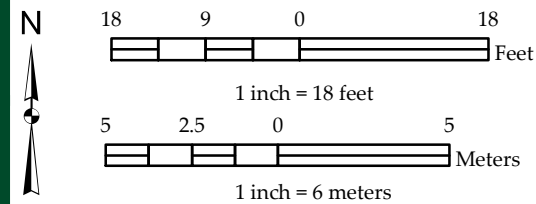




Field Results

- Positive Metal Detector Hit
- Negative Metal Detector Hit
- Scraped Area

this map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.



- APE
- Proposed Lift Station #2



Table 4: Recovered Artifacts by Shovel Test

Lot Number	Field Shovel Test	Depth	Artifacts
1	Surface Find 1	Surface	2 glass
2	Surface Find 2	Surface	15 glass 1 metal 2 brick
3	Surface Find 3	Surface	6 concrete
4	Surface Find 4	Surface	201 glass 59 metal 6 ceramic (1 button) 1 faunal 7 brick
5	Positive Hit 5	0-5 cmbs	16 glass 1 metal
6	Positive Hit 1	0-5 cmbs	1 metal
7	Positive Hit 2	0-5 cmbs	1 metal 1 brick
8	Positive Hit 3	0-5 cmbs	1 metal
9	Positive Hit 4	0-5 cmbs	1 metal
10	Positive Hit 6	0-5 cmbs	2 metal
11	Positive Hit 7	0-5 cmbs	2 metal (1 buckle)
12	Positive Hit 8	0-5 cmbs	1 metal
13	Positive Hit 9	0-5 cmbs	1 metal
14	Positive Hit 10	0-5 cmbs	1 metal
15	Positive Hit 11	0-5 cmbs	10 metal
16	Positive Hit 12	0-5 cmbs	2 glass 7 metal
17	Positive Hit 13	0-5 cmbs	6 glass 5 metal (1 snap)
18	Positive Hit 14	0-5 cmbs	6 glass 3 metal
19	Positive Hit 15	0-5 cmbs	1 metal
20	Positive Hit 16	0-5 cmbs	1 metal

Lot Number	Field Shovel Test	Depth	Artifacts
21	Positive Hit 17	0-5 cmbs	1 metal
22	Positive Hit 18	0-5 cmbs	1 metal
23	Positive Hit 19	0-5 cmbs	1 metal
24	Positive Hit 20	0-5 cmbs	2 metal
25	Positive Hit 21	0-5 cmbs	1 metal
26	Positive Hit 22	0-5 cmbs	1 glass
27	Positive Hit 23	0-5 cmbs	1 metal
28	Positive Hit 24	0-5 cmbs	1 metal
29	Positive Hit 25	0-5 cmbs	1 metal
30	Positive Hit 26	0-5 cmbs	1 metal
31	Positive Hit 27	0-5 cmbs	1 metal
32	Positive Hit 28	0-5 cmbs	2 metal
33	Positive Hit 29	0-5 cmbs	1 metal
34	Positive Hit 30	0-5 cmbs	1 metal
35	Positive Hit 31	0-5 cmbs	2 metal
36	Positive Hit 32	0-5 cmbs	1 metal
37	Positive Hit 33	0-5 cmbs	1 metal
38	Positive Hit 34	0-5 cmbs	1 metal
39	Positive Hit 35	0-5 cmbs	1 metal
40	Positive Hit 36	0-5 cmbs	2 metal
41	Positive Hit 38	0-5 cmbs	1 metal
42	Positive Hit 39	0-5 cmbs	1 metal
43	Positive Hit 40	0-5 cmbs	1 metal
44	Positive Hit 41	0-5 cmbs	1 metal
45	Positive Hit 42	0-5 cmbs	1 metal



Figure 10: Square nails found in hospital yard from PH 11



Figure 11: Porcelain button in hospital yard from SF4



Figure 12: Glass on surface near hospital from SF4

The proposed areas for NRHP testing included any deep disturbances within 15 feet of the fort hospital and morgue, and at Lift Stations 1 and 2 (see Figure 3). The manholes that are within 15 feet of the hospital are being replaced, and thus the soil was already disturbed during original construction. Lift Station 1 was on a bedrock creek bank with no soil, thus subsurface investigations were not necessary or suitable. Lift Station 2 also had some bedrock at surface, but was adjacent to the yard of the fort hospital, within view of the hospital. We had recovered numerous artifacts from the surface and within 10 centimeters of the surface near the hospital, thus some level of subsurface investigation was determined necessary at the nearby proposed lift station, albeit not as an intensive investigation as NRHP testing.

As an intensive survey level of effort to locate any possible significant artifact deposits or features within the area of Lift Station 2, the dense vegetation was mechanically scraped, the area metal detected, and each hit was excavated as a shovel test. Seventeen hits/shovel test (PH15-30) were excavated within the scraped area and sixteen of those were positive. These artifacts consisted of several metal vessel fragments and wires, a bottle cap liner, metal band fragments, and unknown fragments. They also consisted of one glass vessel fragment and one ironstone body fragment (Table 4, Appendix B).

Overall, the artifact assemblage consists of artifacts expected to be found within site 41JA2 and FRSPHS. Certain temporally diagnostic artifacts were included in the assemblage and the general dates are provided in Table 5, largely representing occupations from the turn of the century. The artifact assemblage from this investigation is similar to artifacts found in previous excavations (Lorrain 1972a; Lorrain 1972b; Dickson 1975; Black and Kegley 1998).

Table 5: Temporally Diagnostic Artifacts

Artifact	Dates
Frosted glass	Post-1870
Aqua glass	1880-1920
Amethyst glass	1880-1920
Embossed glass "E"	1880-1910
Olive amber glass	Pre-1900
Milk glass	Late 19 th c – early 20 th c
Ironstone ceramic	1850-1940
Porcelain prosser button	Post-1840
Square nail	Pre-1890
Bottle cap	1892-1994
Bottle cap liner	20 th century
Conduit wire cable	1960s

In summary, 36 positive shovel tests were excavated in the yard of the fort hospital and the area adjacent to the yard that contained Lift Station 2. The assemblage represents common items expected to be affiliated with Fort Richardson. No features were located, and the soils were found to be very shallow. In light of this data, no NRHP testing was deemed necessary, and the intensive pedestrian survey to be complete.

5.0 SUMMARY AND RECOMMENDATIONS

The entire APE was surveyed with a metal detector. In summary, 41 positive shovel tests were excavated in the yard of the fort hospital and the area adjacent to the yard that contained Lift Station 2. The artifact assemblage from this investigation is similar to artifacts found in previous excavations (references). The assemblage represents common items expected to be affiliated with Fort Richardson. No features were located, and the soils were found to be very shallow. In light of this data, no NRHP testing was deemed necessary, and the intensive pedestrian survey to be complete.

5.1 Recommendations for Monitoring

No significant portions of the Fort Richardson Historic Site (41JA2) should be affected by the proposed upgrades to the water and wastewater systems at the park. The artifacts recovered were at the surface or were shallowly buried (10 cm). The manholes near the hospital are being replaced and thus those areas have been previously disturbed. The newly disturbed areas of the water line and the two proposed lift stations are located in areas of shallow soil with exposures of bedrock at surface. It does not appear necessary to have an archeologist on site during construction.

Fort Richardson State Park and Historic Site was listed on the NRHP in 1983. Any modifications to the cultural landscape, such as above ground intrusions related to the proposed project should be considered as impacts to the site and subject to additional review. The current scope of work was to: intensively survey within the limits of construction and make recommendations for additional resource management planning. Therefore, it is the professional opinion of aci consulting that monitoring of construction within the currently defined limits of construction are not warranted (except for inadvertent discoveries), but that cultural landscape and viewshed impacts should be considered as part of a comprehensive monitoring plan. Also, archeological monitoring of construction for additional impacts may be necessary.

6.0 REFERENCES CITED

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University of Texas at Austin, School of Architecture

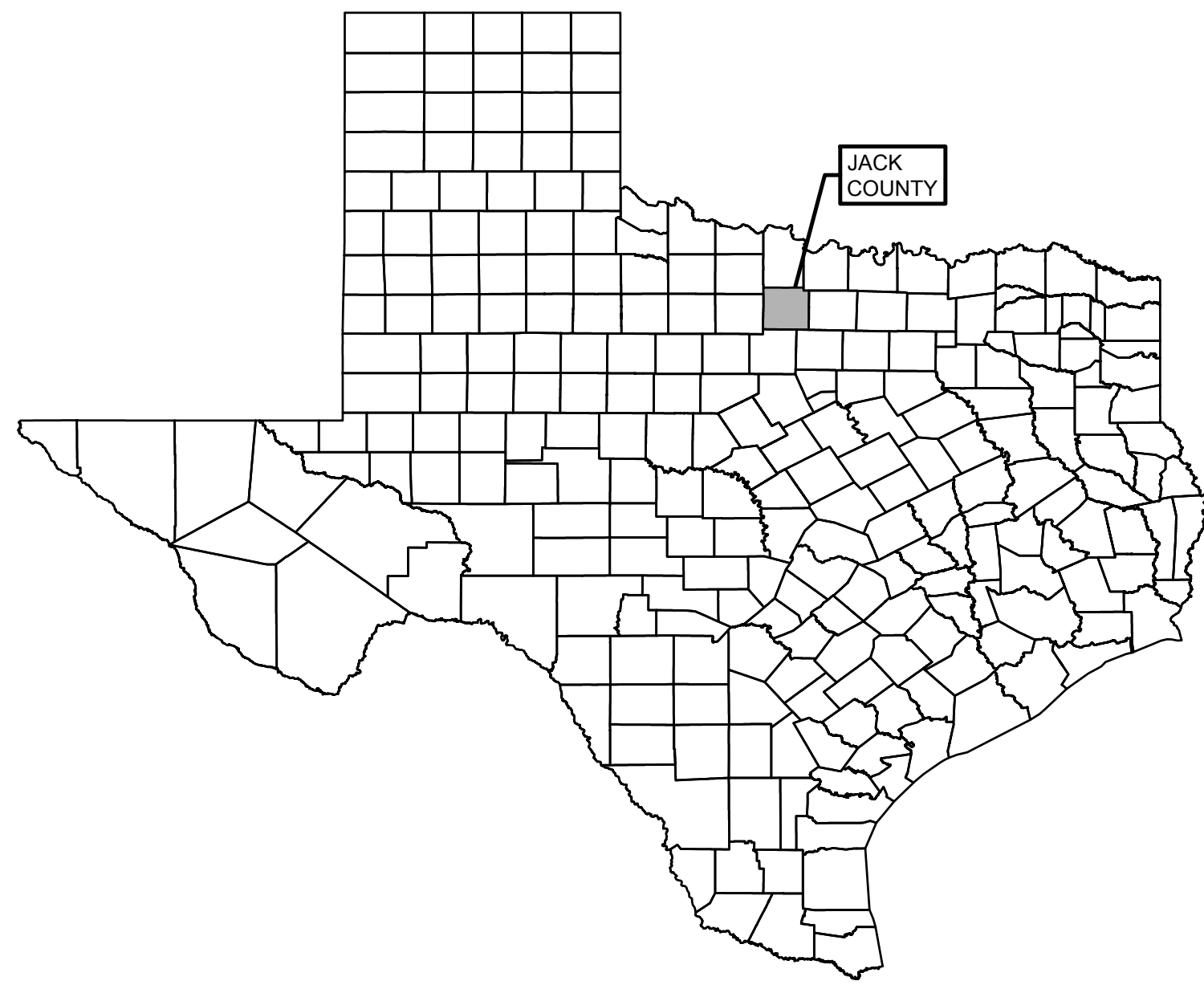
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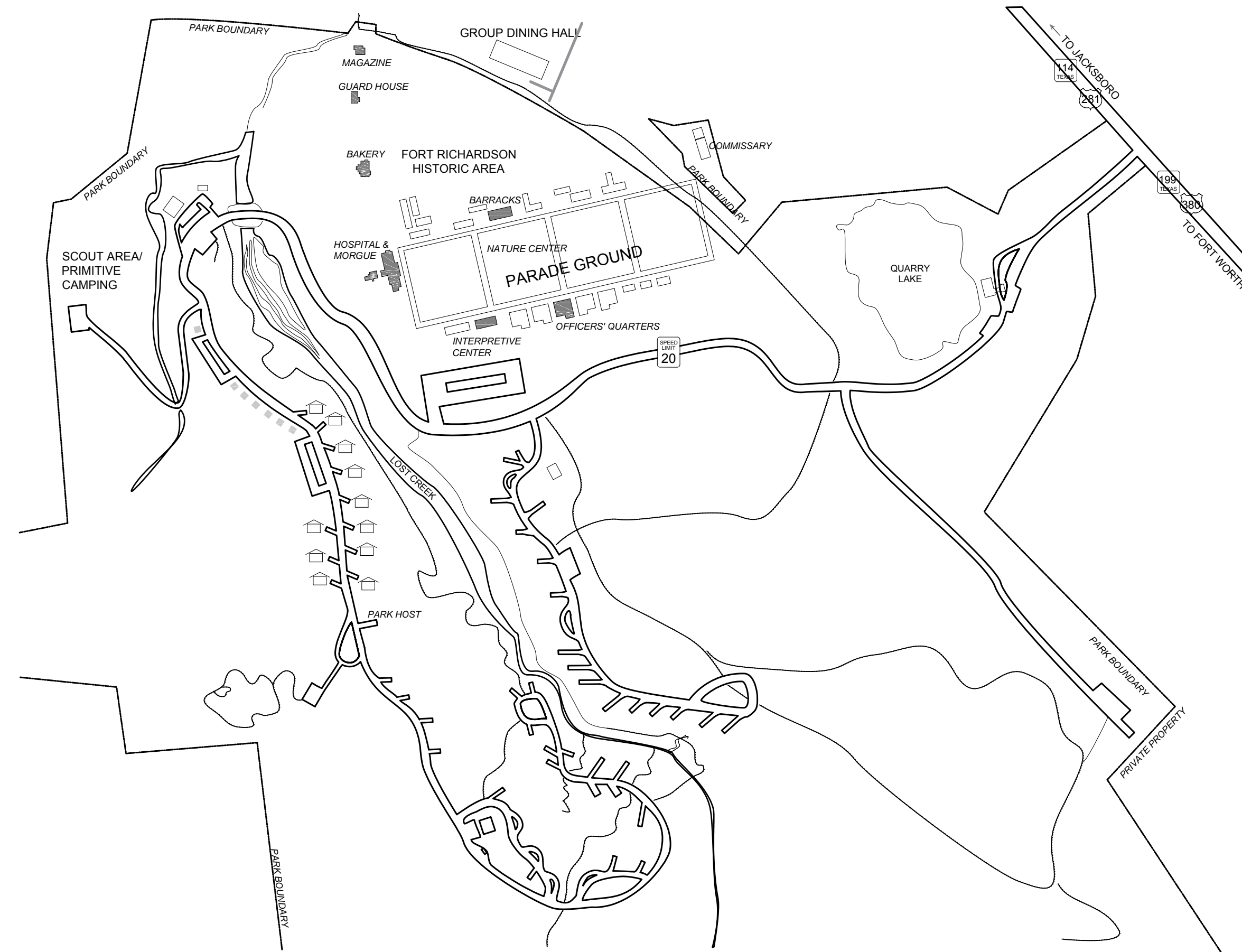
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Appendix A: Water and Wastewater Plans



COUNTY LOCATION MAP
NOT TO SCALE



SITE LOCATION MAP
NOT TO SCALE



PROJECT SITE ADDRESS
FORT RICHARDSON STATE PARK
228 PARK ROAD 61
JACKSBORO, TX 76458

PROJECT

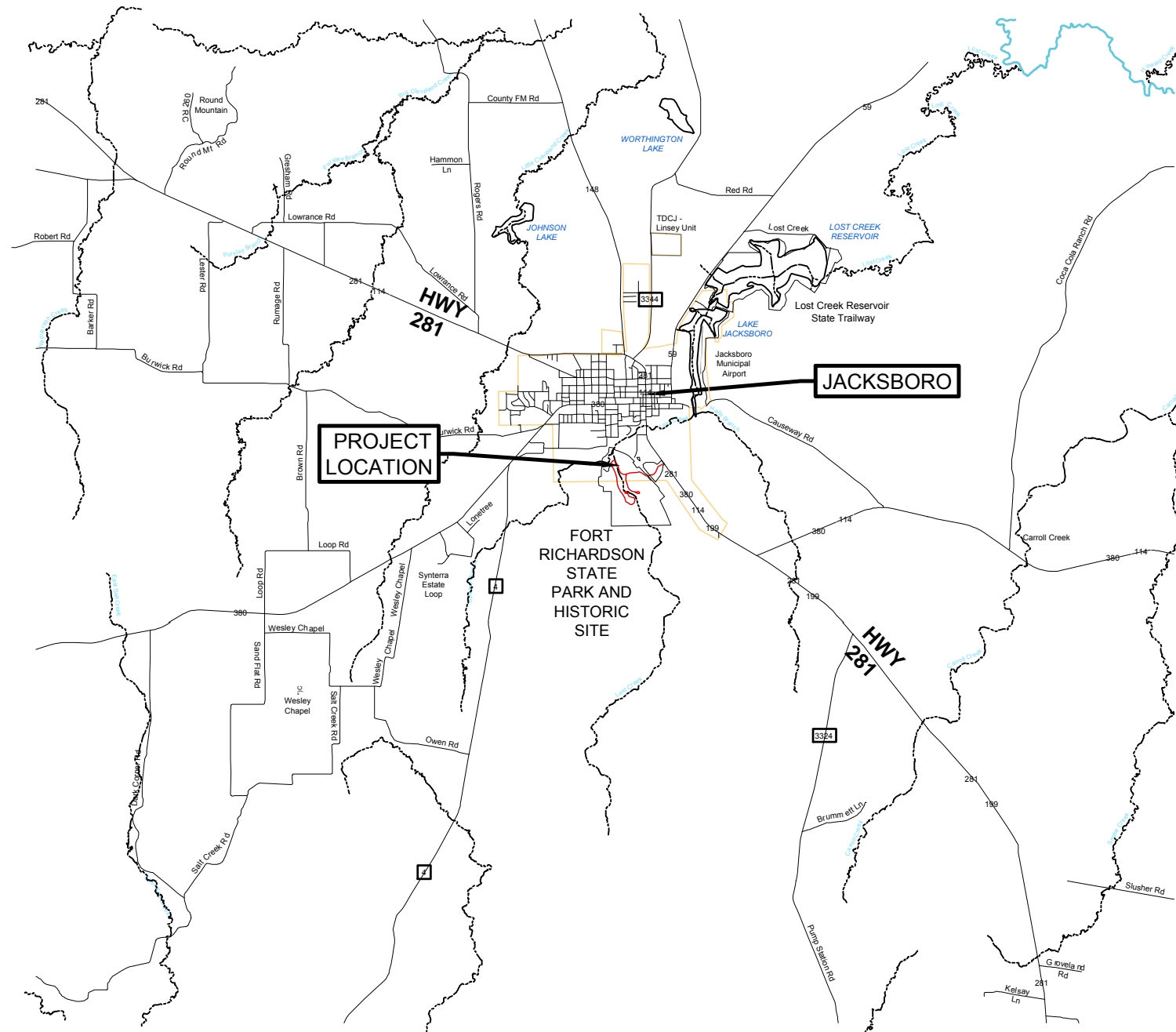
**FORT RICHARDSON STATE PARK
WATER AND WASTEWATER
SYSTEM REPLACEMENT**

PROJECT NO: 116818

DATE: 7/17/2017

INDEX OF DRAWINGS

SHEET INDEX	
SHEET NO	SHEET TITLE
1	COVER
2	GENERAL ABBREVIATIONS AND CONSTRUCTION NOTES
3	PROPOSED OVERALL SITE
4	LIFT STATION NO.1 SITE PLAN & DETAILS
5	LIFT STATION NO.2 SITE PLAN & DETAILS
6	MISC DETAILS 1
7	MISC DETAILS 2
8	MISC DETAILS 3
9	SEWER LINE A P&P 1
10	SEWER LINE A P&P 2
11	SEWER LINE A P&P 3
12	SEWER LINE A P&P 4
13	SEWER LINE A P&P 5
14	SEWER LINE C P&P
15	FORCE MAIN P&P
16	WATERLINE A P&P-1
17	WATERLINE A P&P-2
18	WATERLINE A P&P-3
19	WATERLINE A P&P-4
20	WATERLINE B P&P



VICINITY MAP
NOT TO SCALE



SCOPE OF WORK

CONSTRUCTION OF WASTEWATER AND WATER SYSTEM IMPROVEMENTS AT THE FORT RICHARDSON STATE PARK INCLUDING APPROXIMATELY 2,095 LINEAR FEET OF 8-IN SANITARY SEWER LINE, APPROXIMATELY 2,743 LINEAR FEET OF 3-IN WATER LINES, TWO (2) SANITARY SEWER LIFT STATIONS, AND ASSOCIATED APPURTENANCES.*

BUILDING CODE SUMMARY

- A. INTERNATIONAL CODE COUNCIL
 - i. BUILDING CODE INTERNATIONAL BUILDING CODE 2012
 - ii. RESIDENTIAL CODE INTERNATIONAL RESIDENTIAL CODE 2012
 - iii. EXISTING BUILDINGS INTERNATIONAL EXISTING BUILDINGS CODE 2012
 - iv. STRUCTURAL CODE INTERNATIONAL BUILDING CODE 2012
 - v. PLUMBING CODE INTERNATIONAL PLUMBING CODE 2012
 - vi. MECHANICAL CODE INTERNATIONAL MECHANICAL CODE 2012
 - vii. ENERGY CODE INTERNATIONAL ENERGY CODE 2012Z E
 - viii. GAS CODE INTERNATIONAL FUEL GAS CODE 2012
- *Note: The International fire code specifically excluded from this list/not applicable to TPWD sites and facilities, however fire protection should be followed as stated in all other codes listed.
- B. NATIONAL FIRE PROTECTION ASSOCIATION
 - i. ELECTRICAL CODE NATIONAL ELECTRICAL CODE 2014
- C. STATE ENERGY CONSERVATION OFFICE/TEXAS COMPTROLLERS OFFICE
 - i. ENERGY CODES FOR STATE BUILDINGS Title 34, Part 1, Ch. 19, Sub C, Rule 19.31
 - 1. CERTIFICATION FOR RESIDENTIAL AND NON-RESIDENTIAL BUILDINGS REQUIRED BY ARCHITECT/ENGINEER
- D. ACCESSIBILITY CODE
 - i. AMERICANS WITH DISABILITIES ACT TITLE II Amended 7-23-2010
 - 1. 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN, 9-15-2010
 - ii. TEXAS ACCESSIBILITY STANDARDS TDLR, ABA- Art. 9102
 - iii. DRAFT FINAL ADA Accessibility Guidelines for Outdoor Developed Areas 10-19-2009
 - a. Proposed Rule, not yet adopted by the Department of Justice and TDLR Architectural Barriers, *Variance Required from TDLR for each TPWD project using this guideline.*
- E. PLAYGROUND SAFETY CODE
 - i. Public Playground Safety Handbook, U.S. Consumer Product Safety Commission.

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**TEXAS PARKS AND WILDLIFE
INFRASTRUCTURE DIVISION**

4200 SMITH SCHOOL ROAD - AUSTIN, TEXAS 78744-3292

APPROVED

PROJECT MANAGER, INFRASTRUCTURE DIVISION	DATE
DESIGN BRANCH HEAD, INFRASTRUCTURE DIVISION	DATE
PM BRANCH HEAD, INFRASTRUCTURE DIVISION	DATE
DEPUTY DIRECTOR, INFRASTRUCTURE DIVISION	DATE

SET NO.

GENERAL NOTES

- FORT RICHARDSON STATE PARK IS ON THE NATIONAL REGISTER OF HISTORIC PLACES (NRHP). ALL WORK WITHIN THE PARK IS SUBJECT TO THE HIGHEST LEVEL OF CULTURAL RESOURCES PROTECTION
- THE CONTRACTOR SHALL ANTICIPATE ALL UNDERGROUND OBSTRUCTIONS SUCH AS, BUT NOT LIMITED TO, WATER MAINS, GAS LINES, STORM AND SANITARY SEWERS, TELEPHONE OR ELECTRIC LIGHT OR POWER DUCTS, CONCRETE, AND DEBRIS. ANY SUCH LINES OR OBSTRUCTIONS INDICATED ON THE DRAWINGS SHOW ONLY THE APPROXIMATE LOCATIONS AND SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR. THE OWNER AND ENGINEER WILL ENDEAVOR TO FAMILIARIZE THE CONTRACTOR WITH ALL KNOWN UTILITIES AND OBSTRUCTIONS, BUT THIS SHALL NOT RELIEVE THE CONTRACTOR FROM FULL RESPONSIBILITY IN ANTICIPATING ALL UNDERGROUND OBSTRUCTIONS WHETHER OR NOT SHOWN ON THE DRAWINGS.
- THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, MAINTAIN IN PROPER WORKING ORDER AND WITHOUT INTERRUPTION OF SERVICE ALL EXISTING UTILITIES AND SERVICES WHICH MAY BE ENCOUNTERED IN THE WORK. WITH THE CONSENT OF THE ENGINEER AND UTILITY OWNER SUCH SERVICE CONNECTIONS MAY BE TEMPORARILY INTERRUPTED TO PERMIT THE CONTRACTOR TO REMOVE DESIGNATED LINES OR TO MAKE TEMPORARY CHANGES IN THE LOCATIONS OF SERVICES. THE COST OF MAKING ANY CHANGES SHALL BE AT THE CONTRACTOR'S EXPENSE.
- NOTIFY ALL UTILITY COMPANIES INVOLVED TO HAVE THEIR UTILITIES LOCATED AND MARKED IN THE FIELD. ALL UNDERGROUND UTILITIES SHALL THEN BE UNCOVERED TO VERIFY LOCATION AND ELEVATION BEFORE CONSTRUCTION BEGINS. COORDINATE WITH UTILITY OWNER IF UTILITY INSPECTOR MUST BE ON SITE WHEN LOCATING OR EXCAVATING NEAR UTILITIES.
- SHEETING AND BRACING: INSTALL SHEETING AND BRACING NECESSARY TO SUPPORT THE SIDES OF TRENCHES AND OTHER EXCAVATIONS WITH VERTICAL SIDES, AS REQUIRED BY CURRENT OSHA REGULATIONS.
- WATER IN EXCAVATION: KEEP WORK FREE FROM GROUND OR SURFACE WATER AT ALL TIMES. PROVIDE PUMPS OF ADEQUATE CAPACITY OR OTHER APPROVED METHOD TO REMOVE WATER FROM THE EXCAVATION IN SUCH A MANNER THAT IT WILL NOT INTERFERE WITH THE PROGRESS OF THE WORK OR THE PROPER PLACING OF OTHER WORK. THE COST OF DEWATERING THE EXCAVATION SHALL BE SUBSIDIARY TO CONSTRUCTION.
- MINIMUM COVER: ALL PIPES SHALL HAVE A MINIMUM COVER OF TWO (2) FEET. COVER SHALL BE MEASURED IN ALL DIRECTIONS (HORIZONTAL, VERTICAL, AND DIAGONAL) FROM THE OUTSIDE EDGE OF THE PIPE. IF TWO (2) FEET OF COVER CAN NOT BE MAINTAINED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND CORRECTIVE MEASURES SHALL BE MADE.
- THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL HORIZONTAL AND VERTICAL CONSTRUCTION STAKING AS REQUIRED FOR THE PROJECT DEVELOPMENT.
- ALL DUCTILE IRON PIPE, FITTINGS, AND VALVES SHALL BE ENCASED WITH 8 ML. POLYETHYLENE WRAP.
- TOPSOIL REPLACEMENT IS REQUIRED IN ALL AREAS. TOPSOIL SHALL INCLUDE THE TOP FOUR (4) INCHES OF TRENCH OR EXCAVATION. TOPSOIL SHALL BE KEPT SEPARATE FROM GENERAL EXCAVATED MATERIAL. IN CULTIVATED AREAS ROCK FROM THE EXCAVATION SHALL NOT BE INCLUDED IN THE TOP FOUR INCHES OF TOPSOIL BACKFILL. ALL AREAS OF BACKFILL OR EXCAVATION SHALL BE BROUGHT TO WITHIN FOUR (4) INCHES OF FINAL GRADE AND BROUGHT TO GRADE WITH COMPACTED TOP SOIL.
- UPON COMPLETION OF FINAL GRADING, ALL AREAS DISTURBED BY CONTRACTOR SHALL BE SEEDED BY HYDOMULCH. CONTRACTOR SHALL INSTALL EROSION CONTROL MATTING ON ALL SLOPES GREATER THAN 5:1. THE CONTRACTOR SHALL WATER, AND MAINTAIN GRASS FOR AT LEAST TWO CUTTINGS, OR AS REQUIRED TO ENSURE GROWTH. SEEDING IS A PLANNED QUANTITY MEASUREMENT AND INCLUDES TOPSOIL AND A 15' WIDE DISTURBED AREA FOR THE LENGTH OF THE PROPOSED UTILITIES DISTURBED AREA OUTSIDE OF THE DESIGNATED AREA SHALL BE SEEDED AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.
- EXISTING SITE IMPROVEMENTS DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION AT THE CONTRACTORS EXPENSE.
- ALL BURIED VALVES SHALL BE AWWA COMPLIANT AND SHALL HAVE GEAR ACTUATORS WITH WATERTIGHT VALVE EXTENSION TO ABOVE GRADE. ALL UNDERGROUND VALVES SHALL BE SUPPLIED WITH VALVE BOXES PER TECHNICAL SPECIFICATIONS.
- ALL EXISTING PAVEMENT DAMAGED DURING CONSTRUCTION AND/OR INSTALLATION OF ALL PROPOSED PIPING SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION.
- ALL BENDS SHALL UTILIZE DUCTILE IRON MECHANICAL JOINTS WITH MEGA-LUGS UNLESS SPECIFIED OTHERWISE.
- CONTRACTORS SHALL VERIFY ROUTING OF PROPOSED PIPING PRIOR TO LAYING EACH LINE. ANY GRADES SHOWN FOR SLOPING PIPES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL PROVIDE VERTICAL BENDS AND OTHER FITTINGS AS SHOWN AND AS REQUIRED TO AVOID CONFLICTS WITH NEW, EXISTING, AND FUTURE PIPING AT NO ADDITION COST TO OWNER
- CONTRACTOR SHALL PROVIDE THRUST BLOCKING FOR ALL HORIZONTAL AND VERTICAL BENDS IN ACCORDANCE WITH THE MISCELLANEOUS DETAILS.
- ALL NON-DI PIPES SHALL BE PROVIDED WITH TRACER WIRE (16 GAUGE MINIMUM) AND LOCATION TAPE BURIAL 1.5' BELOW GROUND. TAPE SHALL INDICATE WARNING OF WATERLINE. SEWER LINE OR FORCE MAIN BELOW AS APPLICABLE.
- ALL VALVES AND GATES SHALL BE PROVIDED WITH VALVE MARKERS AS SPECIFIED. CONTRACTOR SHALL SUBMIT MARKERS FOR APPROVAL.
- IN THE EVENT OF A DISCREPANCY IN THE DRAWINGS (PLAN, SECTION, OR DETAILS) OR BETWEEN THE DRAWINGS AND SPECIFICATIONS, THE MOST INVOLVED WORK SHALL BE REQUIRED BY THE CONTRACTOR.
- THE CONTRACTOR SHALL FURNISH THE ENGINEER A COPY OF THE SIGNED AGREEMENT WITH THE PROPERTY OWNER FOR EACH DISPOSAL SITE WHICH THE CONTRACTOR INTENDS TO USE FOR "WASTE" MATERIALS. CONDITIONS AND RESTRICTIONS, IF ANY, WILL BE CLEARLY STATED. COMPLIANCE WILL BE REQUIRED AND A RELEASE FROM THE PROPERTY OWNER MUST BE OBTAINED UPON COMPLETION OF THE PROJECT.
- ALL MANHOLES AND LINES SHALL BE TESTED IN ACCORDANCE WITH THE SPECIFICATIONS AND THE LATEST RULES OF THE TCEQ.
- THE CONTRACTOR SHALL MAINTAIN A CLEAN SAFE CONSTRUCTION AREA. THE CONTRACTOR SHALL PERFORM CLEANUP OPERATIONS ON DAILY BASIS. ALL MUD, DIRT AND DEBRIS TO BE REMOVED DAILY.
- CONTRACTOR MUST MAINTAIN ACCESS TO CABINS, LODGES AND FACILITIES THROUGHOUT THE CONSTRUCTION PHASE. INSTALL TEMPORARY WALKWAYS AND/OR DRIVEWAYS TO EXISTING CABINS, LODGES AND FACILITIES AS NEEDED AND DIRECTED BY OWNER.
- NO OPEN TRENCHES ARE ALLOWED TO REMAIN OVERNIGHT.
- THE STATE PARK WILL REMAIN OPEN TO THE PUBLIC THROUGHOUT THE CONSTRUCTION PHASE, AND ALL CONSTRUCTION SITES SHALL BE MAINTAINED WITH FENCING TO PROTECT THE PUBLIC.
- CONTRACTOR SHALL NOT DRIVE OR PARK OFF MARKED ROADS EXCEPT WITHIN DESIGNATED CONSTRUCTION OR MAINTENANCE ZONES.
- CONTRACTOR SHALL PROVIDE BORROW PIT ASSESSMENT REPORT FOR ALL SELECT FILL, COMMON FILL AND CLAY LINER.
- ALL BACKFILL, SELECT FILL, COMMON FILL AND ROAD BASE SHALL BE STERILE OF CULTURAL RESOURCES. CONTRACTOR SHALL PROVIDE A LETTER CERTIFICATION FROM AN ARCHAEOLOGIST STATING THAT CULTURAL RESOURCES ARE NOT PRESENT FOR ALL BORROW PITS OR SOURCES OF MATERIAL. IE CLAY LINER, GENERAL FILL, SAND, ROAD BASE, ETC. TXDOT CERTIFICATIONS OF EXISTING STOCKPILES ARE ALSO ACCEPTABLE. NO BORROW MATERIAL IS AVAILABLE ON TPWD. CONTRACTOR SHALL PLAN TO PROVIDE ALL BORROW MATERIAL FROM OFF SITE. ASSESSMENT REPORT SHALL INCLUDE SUFFICIENT GEOTECHNICAL DATA TO CONFIRM HE BORROW MATERIAL COMPLIES WITH THE MATERIAL SPECIFICATIONS. IN ADDITION, ALL BORROW MATERIAL MUST BE CERTIFIED AS FREE OF CULTURAL RESOURCES.

LIFT STATION NOTES

- LOCATION OF ALL ANCHOR BOLTS, RELATIVE POSITION OF PUMPS AND ACCESS COVER, MUST BE INSTALLED AND MAINTAINED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
- PUMPS TO BE AS SPECIFIED. LEVEL CONTROL SHALL BE BY FLOAT SWITCHES. ELECTRICAL CONTROLS SHALL INCLUDE HIGH WATER ALARM WITH FLASHING LIGHT AND HORN MOUNTED TO CONTROL PANEL.
- PUMP SUPPLIER SHALL PROVIDE DIMENSIONS OF THE GUIDE RAILS TO ENSURE COMPATIBILITY WITH SUPPLIED EQUIPMENT. THE PUMP SHALL BE EASILY REMOVED FOR INSPECTION OR SERVICE. PERSONNEL SHALL HAVE NO REASON TO ENTER THE WET WELL. GUIDE RAILS SHALL BE SUPPORTED EVERY 10 FEET WITH STAINLESS STEEL SUPPORTS.
- THE GUIDE BRACKETS SHALL BE 316 STAINLESS STEEL. GUIDE BRACKETS FOR EACH PUMP MUST BE SUPPLIED BY THE PUMP MANUFACTURER TO ENSURE COMPATIBILITY WITH SUPPLIED EQUIPMENT.
- EACH PUMPING UNIT SHALL BE PROVIDED WITH A STAINLESS STEEL "GRIP-EYE" LIFTING SYSTEM. LIFTING SYSTEM SHALL EXTEND FROM THE PUMPS TO AT LEAST 4 FEET ABOVE WET WELL.
- ALL HARDWARE IN THE WET WELL SHALL BE 316 SERIES STAINLESS STEEL.
- ALL STATIONARY PIPING USED IN THE LIFT STATION OR VALVE VAULT SHALL BE DUCTILE IRON OR 316 SERIES STAINLESS STEEL.

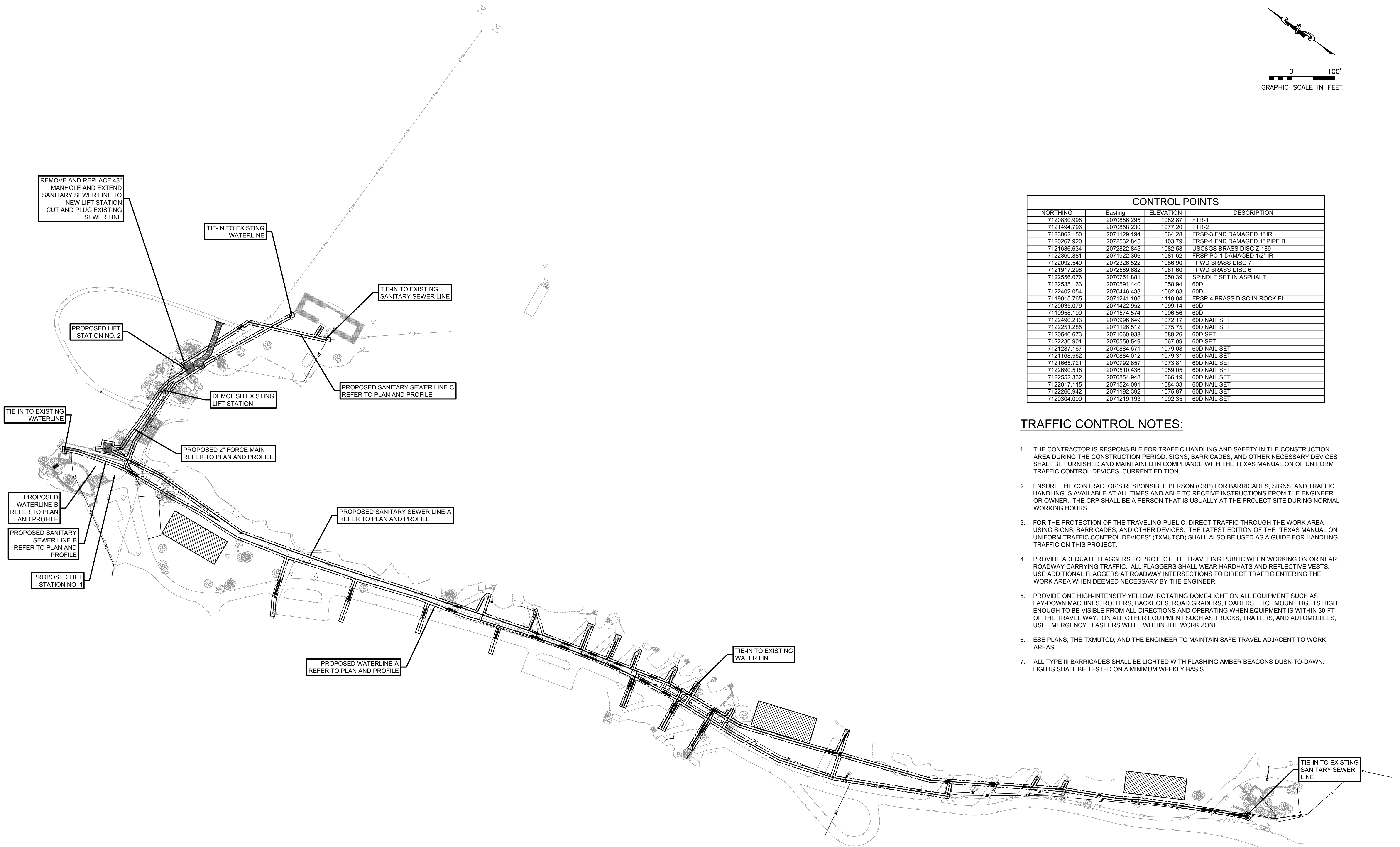
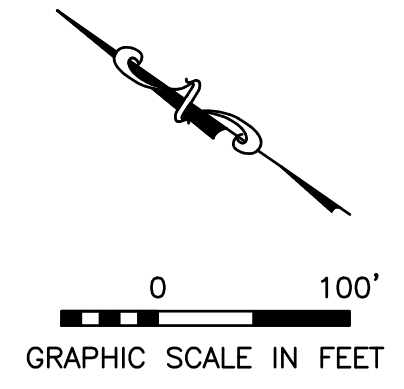
- ALL DISCHARGE LINES SHALL HAVE ADEQUATE THRUST SUPPORT MEMBERS AT EACH FITTING. WHERE POSSIBLE, LONG RADIUS 90 DEGREE BENDS SHALL BE USED.
- ALL FORCE MAIN BENDS SHALL INCLUDE CONCRETE THRUST BLOCKING.
- PIPE AND CONDUIT PENETRATIONS IN WET WELL AND VALVE VAULT SHALL BE GAS TIGHT AND SEALED WITH CORROSION RESISTANT FLEXIBLE GROUT AS PER 30 TAC 217.60(5)(2)
- CONCRETE SHALL HAVE A MIN. COMPRESSIVE STRENGTH OF 3500 PSI AT 28 DAYS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONCRETE CYLINDERS AND TESTING AT HIS EXPENSE. MINIMUM 3 CYLINDERS PER CONCRETE TRUCK.
- THE EDGE OF EXPOSED CONCRETE SLAB(S) SHALL RECEIVE A 3/4" CHAMFER.
- REINFORCING STEEL SHALL BE GRADE 60.
- DUCTILE IRON PIPING AND FITTINGS SHALL HAVE A NON-CORROSIIVE LINING WITH A WORKING PRESSURE RATING OF NOT LESS THAN 150 PSI. JOINTS SHALL HAVE FULL FACE GASKETS WITH A MIN. THICKNESS OF 1/8". FLANGES SHALL BE DUCTILE IRON CLASS 125, INSTALLED BY THE PIPE MANUFACTURER. PAINT ALL D.I. PIPE PER SPECIFICATIONS.
- CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO FABRICATION OR CONSTRUCTION.
- WET WELL AND VALVE VAULT ACCESS COVERS SHALL INCLUDE AN ALUMINUM DOOR AND SAFETY HATCH FRAME ASSEMBLY.
- PROVIDE COMBINATION LOCKS ON WET WELL, VALVE VAULT, AND HINGED ELECTRICAL PANELS.
- SHOP DRAWINGS AND SUBMITTALS FOR THE LIFT STATION, INCLUDING, BUT NOT LIMITED TO PUMPS, CONTROLS, ELECTRICAL SERVICE, ETC. SHALL BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
- PROVIDE AND INSTALL NECESSARY ELECTRICAL, CONTROLS, PIPING, FITTINGS, HOIST, DOORS, HATCHES, ETC. FOR A COMPLETE AND OPERABLE LIFT STATION. TRANSITION FROM D.I. WALL PIPE TO PVC OUTSIDE OF VALVE VAULT.
- THE CONTRACTOR SHALL INSTALL SHEETING AND BRACING NECESSARY TO SUPPORT THE SIDES OF TRENCHES AND OTHER EXCAVATIONS WHERE REQUIRED BY CURRENT OSHA REGULATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF GROUND WATER AND SURFACE WATER AS NECESSARY FOR THE CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR SHALL INSTALL AND MAINTAIN PUMPS, WELL POINTS, WELL POINT COLLECTION SYSTEM, AND OTHER DEVICES AS NECESSARY TO MAINTAIN A STABLE AND DRY EXCAVATION OR TRENCH FOR THE CONSTRUCTION OF THE PROJECT. THE CONTRACTOR SHALL IMMEDIATELY INSTALL SURFACE WATER OR GROUND WATER CONTROL SYSTEMS AS NECESSARY TO PROTECT EXISTING PROPERTY AND IS NECESSARY FOR THE CONSTRUCTION. NO DIRECT PAYMENT WILL BE MADE FOR THE CONTROL OF SURFACE WATER OR GROUND WATER.
- THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH, AND SIZES OF EXISTING UTILITIES, WHETHER SHOWN ON THESE DRAWINGS OR NOT, PRIOR TO CONSTRUCTION.
- ALL BACKFILL SHALL BE REPLACED TO EXISTING GRADE.

TCEQ WATER DISTRIBUTION SYSTEM GENERAL CONSTRUCTION NOTES

- THIS WATER DISTRIBUTION SYSTEM MUST BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS 30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 290 SUBCHAPTER D. WHEN CONFLICTS ARE NOTED WITH LOCAL STANDARDS, THE MORE STRINGENT REQUIREMENT SHALL BE APPLIED. CONSTRUCTION FOR PUBLIC WATER SYSTEMS MUST ALWAYS, AT A MINIMUM, MEET TCEQ'S RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS.
- ALL NEWLY INSTALLED PIPES AND RELATED PRODUCTS MUST CONFORM TO AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)/NSF INTERNATIONAL STANDARD 61 AND MUST BE CERTIFIED BY AN ORGANIZATION ACCREDITED BY ANSI, AS REQUIRED BY 30 TAC §290.44(A)(1).
- PLASTIC PIPE FOR USE IN PUBLIC WATER SYSTEMS MUST BEAR THE NSF INTERNATIONAL SEAL OF APPROVAL (NSF-PW) AND HAVE AN ASTM DESIGN PRESSURE RATING OF AT LEAST 150 PSI OR A STANDARD DIMENSION RATIO OF 26 OR LESS, AS REQUIRED BY 30 TAC §290.44(A)(2).
- NO PIPE WHICH HAS BEEN USED FOR ANY PURPOSE OTHER THAN THE CONVEYANCE OF DRINKING WATER SHALL BE ACCEPTED OR RELOCATED FOR USE IN ANY PUBLIC DRINKING WATER SUPPLY, AS REQUIRED BY 30 TAC §290.44(A)(3).
- WATER TRANSMISSION AND DISTRIBUTION LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. HOWEVER, THE TOP OF THE WATER LINE MUST BE LOCATED BELOW THE FROST LINE AND IN NO CASE SHALL THE TOP OF THE WATER LINE BE LESS THAN 24 INCHES BELOW GROUND SURFACE, AS REQUIRED BY 30 TAC §290.44(A)(4). REVISED MARCH 4, 2015
- PURSUANT TO 30 TAC §290.44(A)(5), THE HYDROSTATIC LEAKAGE RATE SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY THE MOST CURRENT AWWA FORMULAS FOR PVC PIPE, CAST IRON AND DUCTILE IRON PIPE.
- THE MAXIMUM ALLOWABLE LEAD CONTENT OF PIPES, PIPE FITTINGS, PLUMBING FITTINGS, AND FIXTURES TO 0.25 PERCENT.
- THE SYSTEM MUST BE DESIGNED TO MAINTAIN A MINIMUM PRESSURE OF 35 PSI AT ALL POINTS WITHIN THE DISTRIBUTION NETWORK AT FLOW RATES OF AT LEAST 1.5 GALLONS PER MINUTE PER CONNECTION. WHEN THE SYSTEM IS INTENDED TO PROVIDE FIREFIGHTING CAPABILITY, IT MUST ALSO BE DESIGNED TO MAINTAIN A MINIMUM PRESSURE OF 20 PSI UNDER COMBINED FIRE AND DRINKING WATER FLOW CONDITIONS AS REQUIRED BY 30 TAC §290.44(D). REVISED MARCH 4, 2015
- THE CONTRACTOR SHALL INSTALL APPROPRIATE AIR RELEASE DEVICES IN THE DISTRIBUTION SYSTEM AT ALL POINTS WHERE TOPOGRAPHY OR OTHER FACTORS MAY CREATE AIR LOCKS IN THE LINES. ALL VENT OPENINGS TO THE ATMOSPHERE SHALL BE COVERED WITH 16-MESH OR FINER, CORROSION RESISTANT SCREENING MATERIAL OR AN ACCEPTABLE EQUIVALENT AS REQUIRED BY 30 TAC §290.44(D)(1).
- PURSUANT TO 30 TAC §290.44(D)(4), ACCURATE WATER METERS SHALL BE PROVIDED. SERVICE CONNECTIONS AND METER LOCATIONS SHOULD BE SHOWN ON THE PLANS.
- PURSUANT TO 30 TAC §290.44(D)(5), SUFFICIENT VALVES AND BLOWOFFS TO MAKE REPAIRS. THE ENGINEERING REPORT SHALL ESTABLISH CRITERIA FOR THIS DESIGN.
- PURSUANT TO 30 TAC §290.44(D)(6), THE SYSTEM SHALL BE DESIGNED TO AFFORD EFFECTIVE CIRCULATION OF WATER WITH A MINIMUM OF DEAD ENDS. ALL DEAD-END MAINS SHALL BE PROVIDED WITH ACCEPTABLE FLUSH VALVES AND DISCHARGE PIPING. ALL DEAD-END LINES LESS THAN TWO INCHES IN DIAMETER WILL NOT REQUIRE FLUSH VALVES IF THEY END AT A CUSTOMER SERVICE. WHERE DEAD ENDS ARE NECESSARY AS A STAGE IN THE GROWTH OF THE SYSTEM, THEY SHALL BE LOCATED AND ARRANGED TO ULTIMATELY CONNECT THE ENDS TO PROVIDE CIRCULATION.
- THE CONTRACTOR SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE IN ALL DIRECTIONS OF NINE FEET BETWEEN THE PROPOSED WATERLINE AND WASTEWATER COLLECTION FACILITIES INCLUDING MANHOLES AND SEPTIC TANK DRAINFIELDS. IF THIS DISTANCE CANNOT BE MAINTAINED, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE PROJECT ENGINEER FOR FURTHER DIRECTION. SEPARATION DISTANCES, INSTALLATION METHODS, AND MATERIALS UTILIZED MUST MEET 30 TAC §290.44(E)(1- 4) OF THE CURRENT RULES.
- PURSUANT TO 30 TAC §290.44(E)(5), THE SEPARATION DISTANCE FROM A POTABLE WATERLINE TO A WASTEWATER MAIN OR LATERAL MANHOLE OR CLEANOUT SHALL BE A MINIMUM OF NINE FEET. WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE POTABLE WATERLINE SHALL BE ENCASED IN A JOINT OF AT LEAST 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHALL BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEALANT.
- PURSUANT TO 30 TAC §290.44(E)(6), FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER LINE, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION.
- PURSUANT TO 30 TAC §290.44(E)(8), WATERLINES SHALL NOT BE INSTALLED CLOSER THAN TEN FEET TO SEPTIC TANK DRAINFIELDS. REVISED MARCH 4, 2015
- PURSUANT TO 30 TAC §290.44(F)(1), THE CONTRACTOR SHALL NOT PLACE THE PIPE IN WATER OR WHERE IT CAN BE FLOODED WITH WATER OR SEWAGE DURING ITS STORAGE OR INSTALLATION.
- PURSUANT TO 30 TAC §290.44(F)(2), WHEN WATERLINES ARE LAID UNDER ANY FLOWING OR INTERMITTENT STREAM OR SEMI-PERMANENT BODY OF WATER THE WATER MAIN SHALL BE INSTALLED IN A SEPARATE WATERTIGHT PIPE ENCASEMENT. VALVES MUST BE PROVIDED ON EACH SIDE OF THE CROSSING WITH FACILITIES TO ALLOW THE UNDERWATER PORTION OF THE SYSTEM TO BE ISOLATED AND TESTED.
- THE CONTRACTOR SHALL DISINFECT THE NEW WATER MAINS IN ACCORDANCE WITH THE LATEST VERSION OF AWWA STANDARD C-651 AND THEN FLUSH AND SAMPLE THE LINES BEFORE BEING PLACED INTO SERVICE. SAMPLES SHALL BE COLLECTED FOR MICROBIOLOGICAL ANALYSIS TO CHECK THE EFFECTIVENESS OF THE DISINFECTION PROCEDURE WHICH SHALL BE REPEATED IF CONTAMINATION PERSISTS. A MINIMUM OF ONE SAMPLE FOR EACH 1,000 FEET OF COMPLETED WATER LINE WILL BE REQUIRED OR AT THE NEXT AVAILABLE SAMPLING POINT BEYOND 1,000 FEET AS DESIGNATED BY THE DESIGN ENGINEER, IN ACCORDANCE WITH 30 TAC §290.44(F)(3).

ABBREVIATIONS

@	AT	MISC.	MISCELLANEOUS
APPROX.	APPROXIMATE	N	NORTH
BLDG.	BUILDING	N.T.S.	NOT TO SCALE
BM	BENCH MARK	N/A	NOT APPLICABLE
BS	BACKWASH SUPPLY	NO.	NUMBER
BWP	BACKWASH PUMP	O.C.E.W.	OFF CENTER EACH WAY
CF	CUBIC FEET	O.D.	OUTSIDE DIAMETER
CI	CAST IRON	P.C.	POINT OF CURVATURE
C.I.P.	CAST IN PLACE	P.R.	PRESSURE RATED
CK	CREEK	P.T.	POINT OF TANGENCY
CO	CLEAN OUT	P/L	PIPELINE
CMP	CORRUGATED METAL PIPE	PP	UTILITY POLE
CONC	CONCRETE	PROP.	PROPOSED
CONST	CONSTRUCT	PSI	POUNDS PER SQUARE INCH
CONT	CONTINUOUS	PVC	POLYVINYL CHLORIDE
CU	CUBIC	PVMT.	PAVEMENT
CULV.	CULVERT	R.O.W.	RIGHT OF WAY
Δ	DEFLECTION ANGLE	RCP	REINFORCED CONCRETE PIPE
DI	DUCTILE IRON	RD.	ROAD
DIA	DIAMETER	REINF.	REINFORCEMENT
DG	DOWN GUY	RT.	RIGHT
EA	EACH	S	SOUTH
ELEC.	ELECTRIC	S.S.	STAINLESS STEEL
ELEV.	ELEVATION	WW	SANITARY SEWER
ENC.	ENCASEMENT	SB.	SLUDGE BLOWDOWN
EXIST.	EXISTING	SCH.	SCHEDULE
EXP.	EXPOSED	SPEC'S	SPECIFICATIONS
FEN.	FENCE	SQ.	SQUARE
FH	FIRE HYDRANT	ST.	STREET
FL	FLOWLINE	STA.	STATION
FT.	FEET (FOOT)	STD.	STANDARD
GAL.	GALLON	STL.	STEEL
GALV.	GALVANIZED	T.O.B.	TOP OF BANK
HMAC	HOT MIX ASPHALTIC CONCRETE	T.O.P.	TOP OF PIPE
HORZ.	HORIZONTAL	TEL.	TELEPHONE
HP.	HIGH SERVICE PUMP	TFR.	TRANSFORMER
I.D.	INSIDE DIAMETER	TPT	SURVEY TRAVERSE POINT
INST.	INSTALL	V.	VOLT
JT.	JOINT	VERT.	VERTICAL
L.F.	LINEAR FEET	W	WEST
L.S.	LIFT STATION	W.	WATT
LT.	LEFT	W.W. MECH	WELDED WIRE MESH
LEN.	LENGTH	W/	WITH
M.H.	MANHOLE	W/O	WITHOUT
M.J.	MECHANICAL JOINT	W.L.	WATER LINE
		WM	WATER METER
MIN.	MINIMUM	WT.	WATERTIGHT
		WV	WATER VALVE



CONTROL POINTS				
NORTHING	Easting	ELEVATION	DESCRIPTION	
7120830.998	2070866.295	1082.87	FTR-1	
7121494.796	2070858.230	1077.20	FTR-2	
7123062.150	2071129.194	1064.28	FRSP-3 FND DAMAGED 1" IR	
7120267.920	2072532.845	1103.79	FRSP-1 FND DAMAGED 1" PIPE B	
7121636.634	2072822.845	1082.58	USC&GS BRASS DISC Z-189	
7122360.881	2071922.306	1081.62	FRSP PC-1 DAMAGED 1/2" IR	
7122092.549	2072326.522	1086.90	TPWD BRASS DISC 7	
7121917.298	2072589.682	1081.60	TPWD BRASS DISC 6	
7122555.076	2070751.881	1050.39	SPINDLE SET IN ASPHALT	
7122535.163	2070591.440	1058.94	60D	
7122402.054	2070446.433	1062.63	60D	
7119015.765	2071241.106	1110.04	FRSP-4 BRASS DISC IN ROCK EL	
7120035.079	2071422.952	1099.14	60D	
7119958.199	2071574.574	1096.56	60D	
7122490.213	2070996.649	1072.17	60D NAIL SET	
7122251.285	2071126.512	1075.75	60D NAIL SET	
7120546.673	2071060.938	1089.26	60D SET	
7122230.901	2070559.549	1067.09	60D SET	
7121287.167	2070884.671	1079.08	60D NAIL SET	
7121168.562	2070884.012	1079.31	60D NAIL SET	
7121665.721	2070792.857	1073.81	60D NAIL SET	
7122690.518	2070510.436	1059.05	60D NAIL SET	
7122552.332	2070854.948	1066.19	60D NAIL SET	
7122017.115	2071524.091	1084.33	60D NAIL SET	
7122266.942	2071192.392	1075.87	60D NAIL SET	
7120304.099	2071219.193	1092.35	60D NAIL SET	

TRAFFIC CONTROL NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC HANDLING AND SAFETY IN THE CONSTRUCTION AREA DURING THE CONSTRUCTION PERIOD. SIGNS, BARRICADES, AND OTHER NECESSARY DEVICES SHALL BE FURNISHED AND MAINTAINED IN COMPLIANCE WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION.
2. ENSURE THE CONTRACTOR'S RESPONSIBLE PERSON (CRP) FOR BARRICADES, SIGNS, AND TRAFFIC HANDLING IS AVAILABLE AT ALL TIMES AND ABLE TO RECEIVE INSTRUCTIONS FROM THE ENGINEER OR OWNER. THE CRP SHALL BE A PERSON THAT IS USUALLY AT THE PROJECT SITE DURING NORMAL WORKING HOURS.
3. FOR THE PROTECTION OF THE TRAVELING PUBLIC, DIRECT TRAFFIC THROUGH THE WORK AREA USING SIGNS, BARRICADES, AND OTHER DEVICES. THE LATEST EDITION OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (TXMUTCD) SHALL ALSO BE USED AS A GUIDE FOR HANDLING TRAFFIC ON THIS PROJECT.
4. PROVIDE ADEQUATE FLAGGERS TO PROTECT THE TRAVELING PUBLIC WHEN WORKING ON OR NEAR ROADWAY CARRYING TRAFFIC. ALL FLAGGERS SHALL WEAR HARDHATS AND REFLECTIVE VESTS. USE ADDITIONAL FLAGGERS AT ROADWAY INTERSECTIONS TO DIRECT TRAFFIC ENTERING THE WORK AREA WHEN DEEMED NECESSARY BY THE ENGINEER.
5. PROVIDE ONE HIGH-INTENSITY YELLOW, ROTATING DOME-LIGHT ON ALL EQUIPMENT SUCH AS LAY-DOWN MACHINES, ROLLERS, BACKHOES, ROAD GRADERS, LOADERS, ETC. MOUNT LIGHTS HIGH ENOUGH TO BE VISIBLE FROM ALL DIRECTIONS AND OPERATING WHEN EQUIPMENT IS WITHIN 30-FT OF THE TRAVEL WAY. ON ALL OTHER EQUIPMENT SUCH AS TRUCKS, TRAILERS, AND AUTOMOBILES, USE EMERGENCY FLASHERS WHILE WITHIN THE WORK ZONE.
6. ESE PLANS, THE TXMUTCD, AND THE ENGINEER TO MAINTAIN SAFE TRAVEL ADJACENT TO WORK AREAS.
7. ALL TYPE III BARRICADES SHALL BE LIGHTED WITH FLASHING AMBER BEACONS DUSK-TO-DAWN. LIGHTS SHALL BE TESTED ON A MINIMUM WEEKLY BASIS.

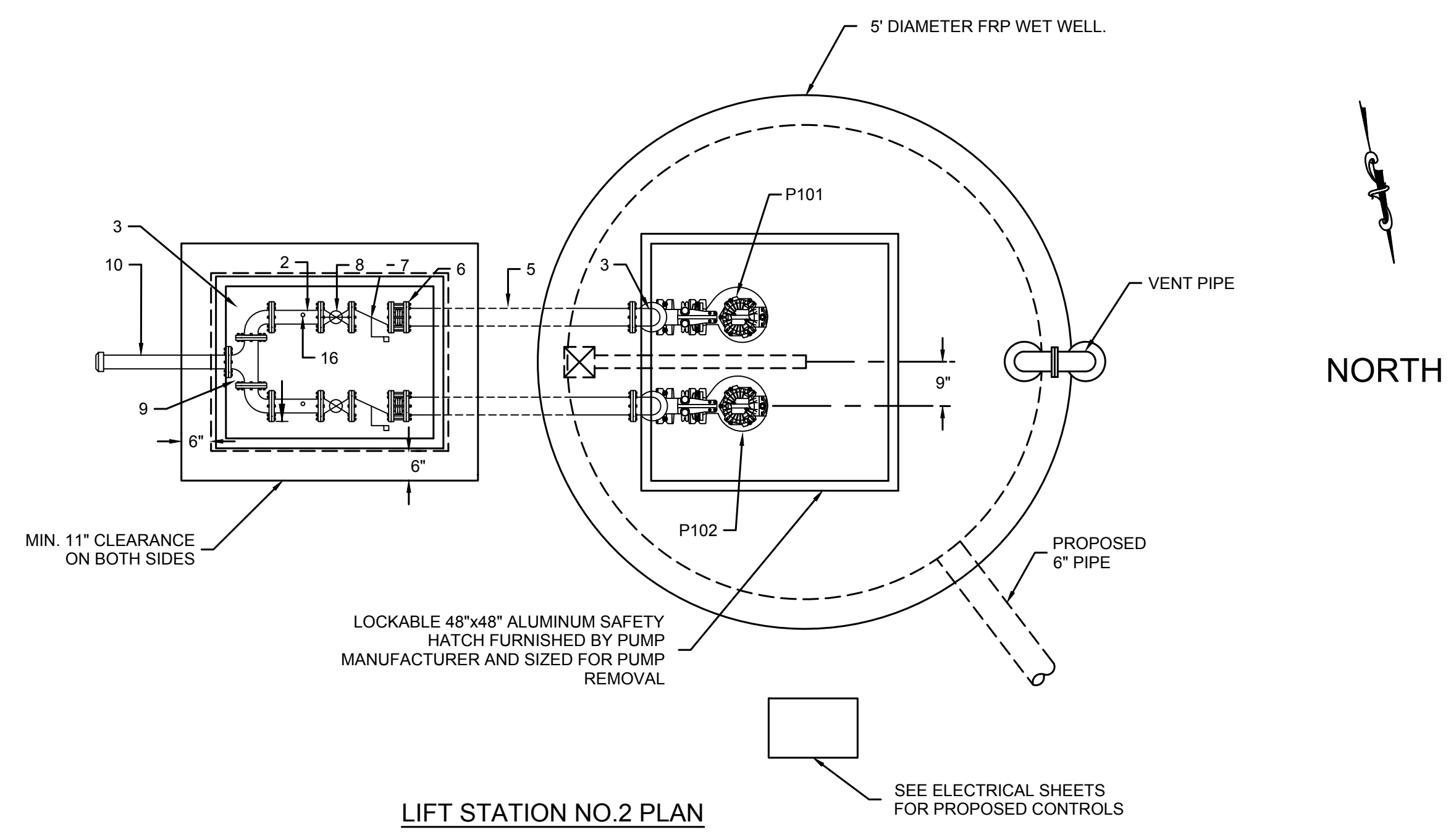
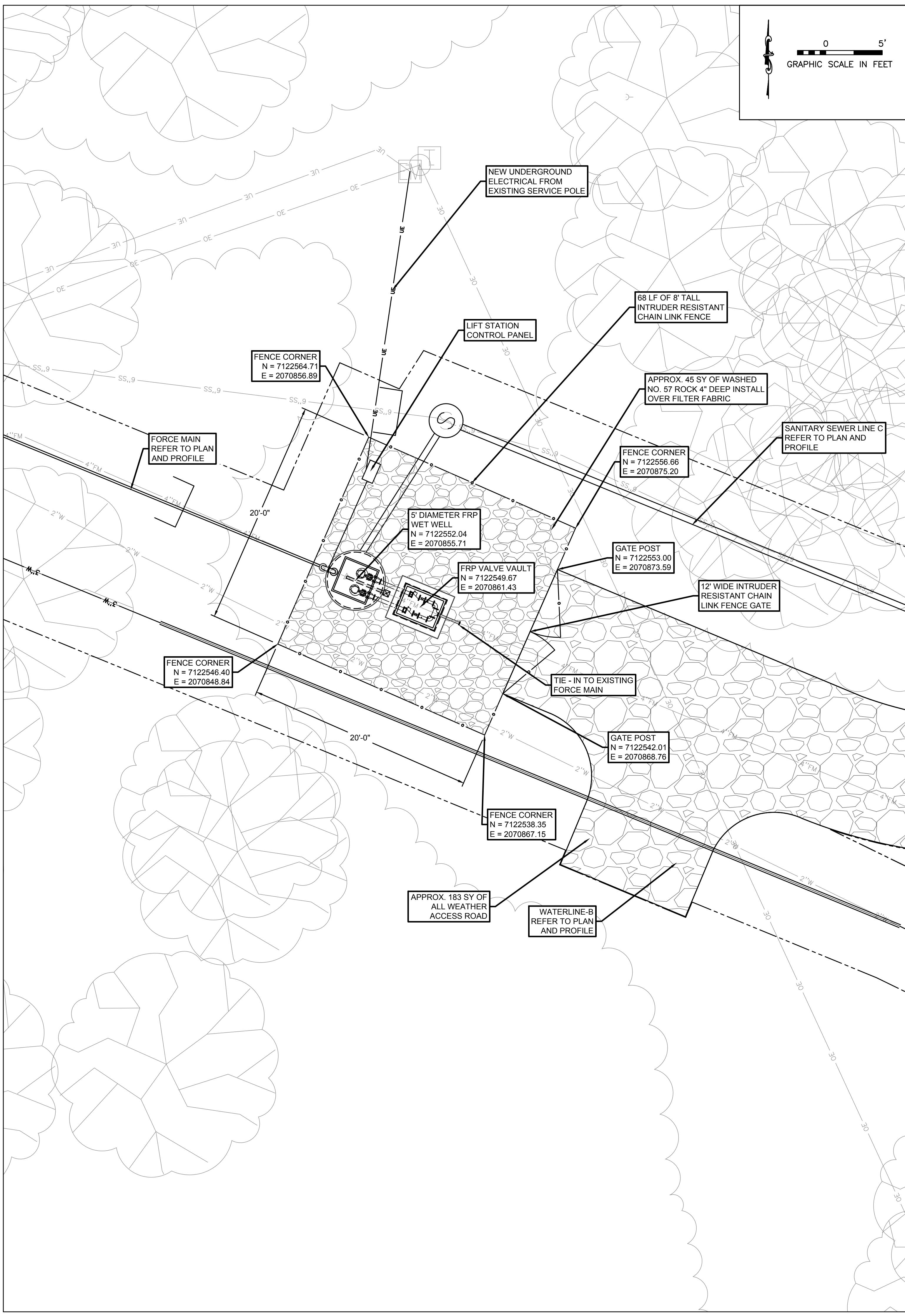
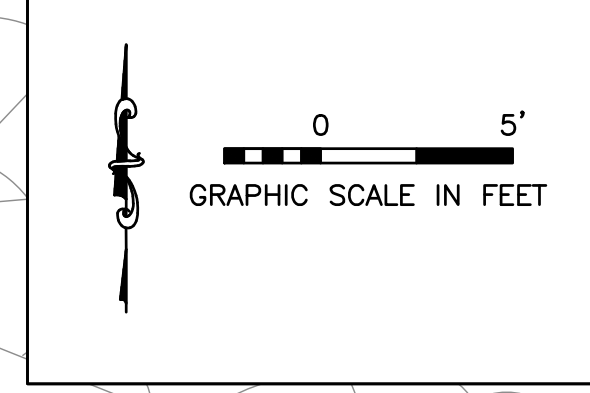
**FORT RICHARDSON STATE PARK
WATER AND WASTEWATER SYSTEM REPLACEMENT**

PROJECT NUMBER: 116818

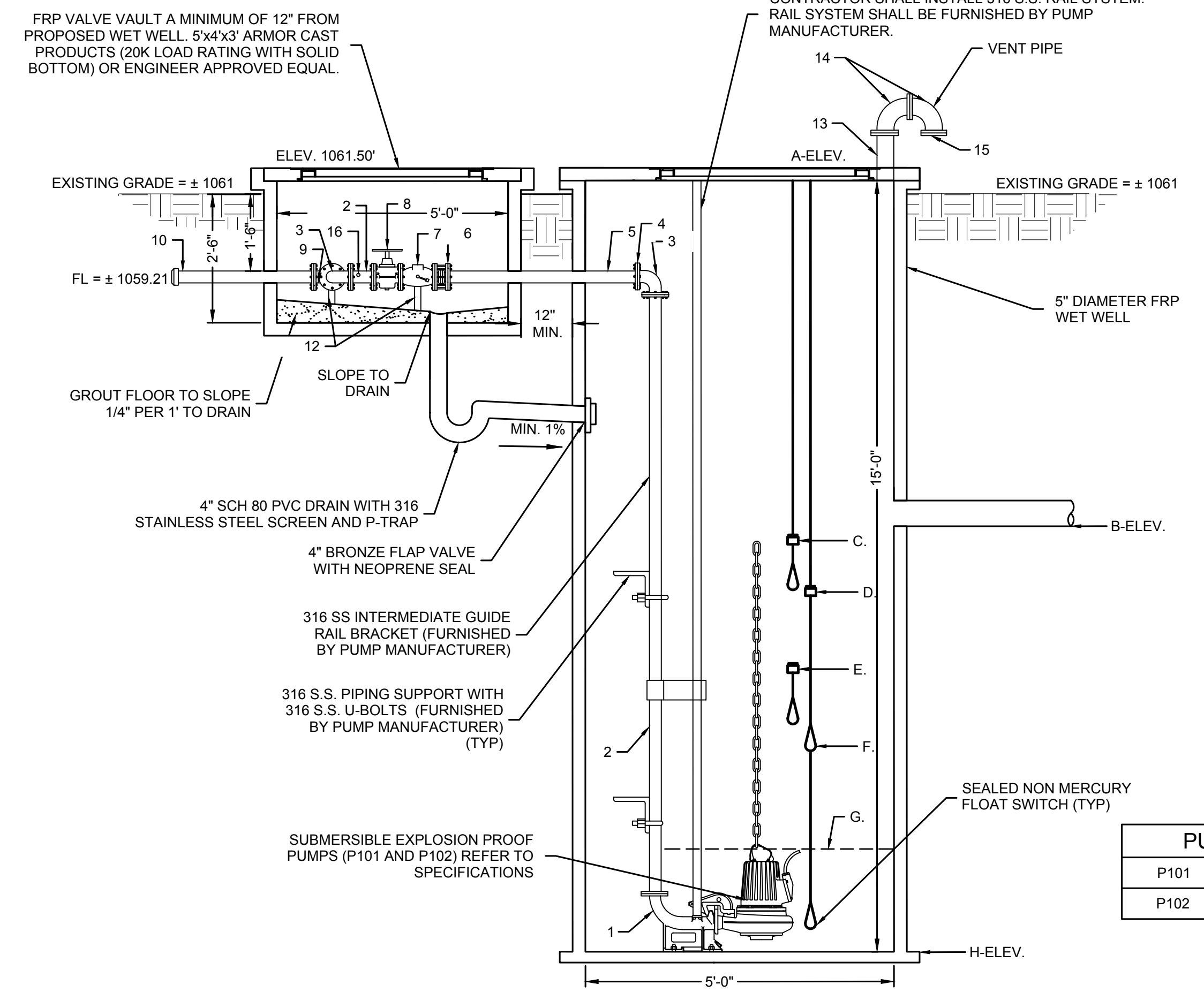
DATE: 6/30/17
DESIGNED BY: CBA
DRAWN BY: JAM
REVIEWED BY: CBA
REVISED:
REVISED:

SHEET TITLE
**PROPOSED
OVERALL SITE**

SHEET NUMBER
3
OF 20



LIFT STATION NO.2 PLAN



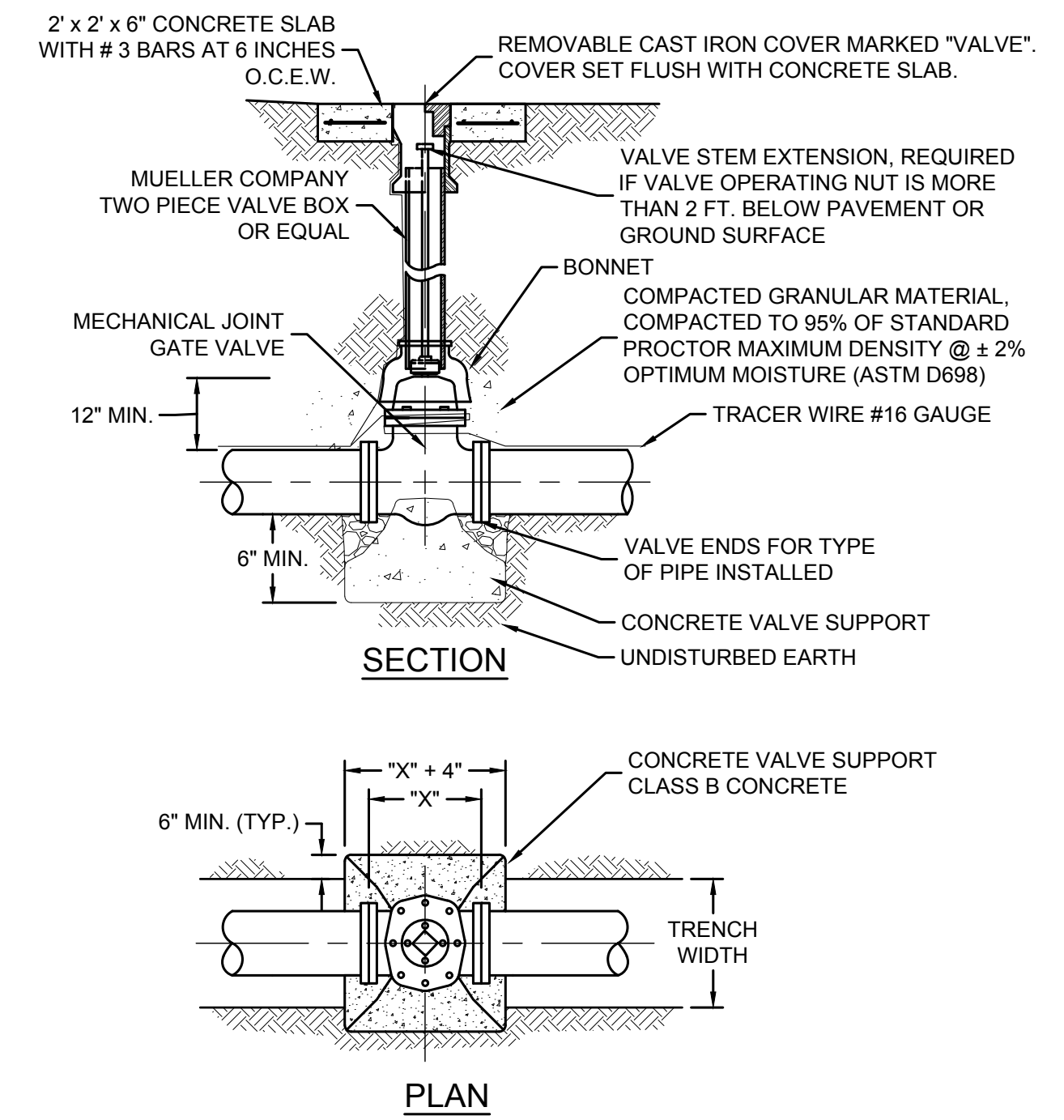
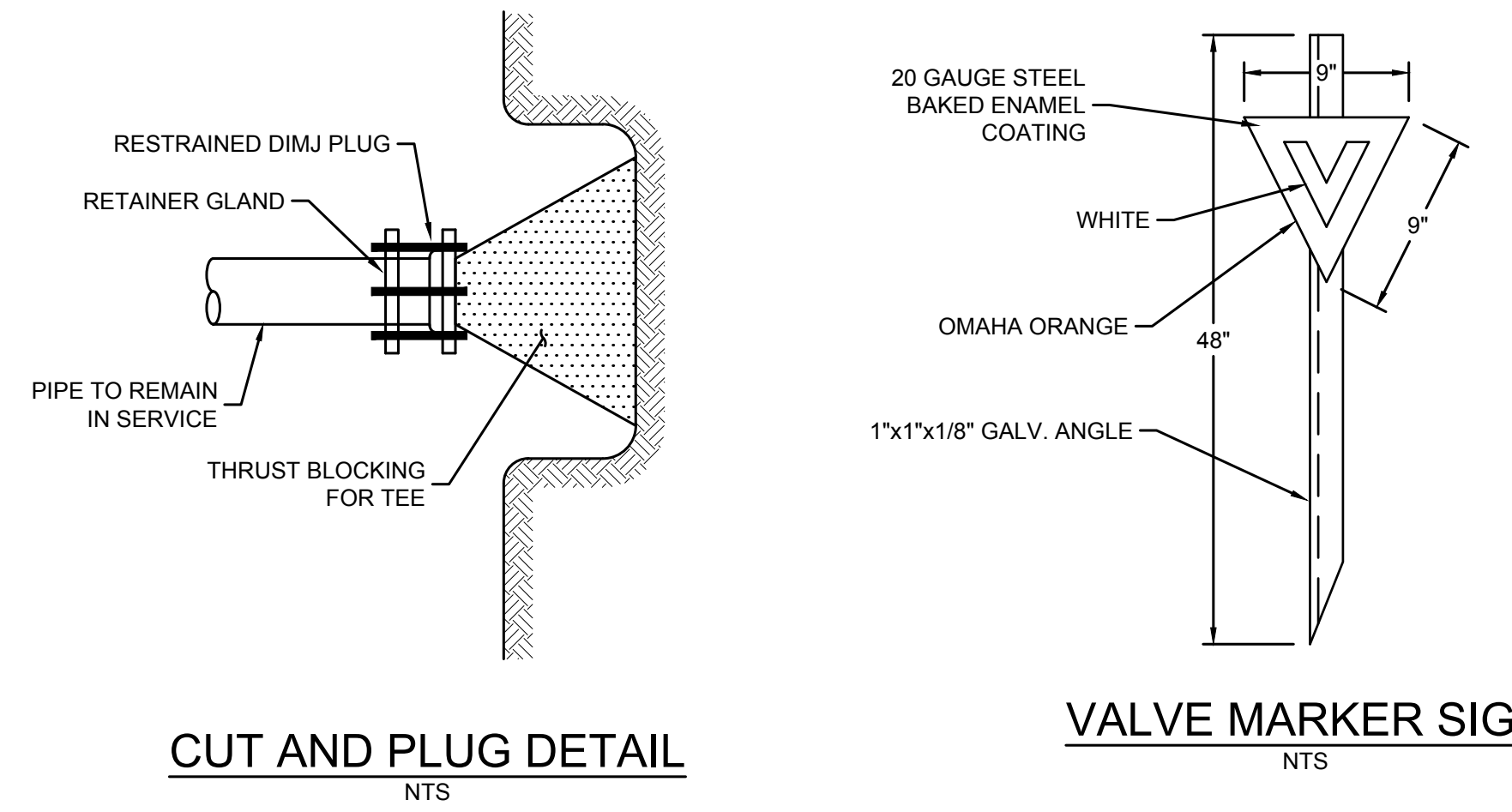
LIFT STATION NO.2 SECTION

LIFT STATION NO.2 DETAIL
NTS

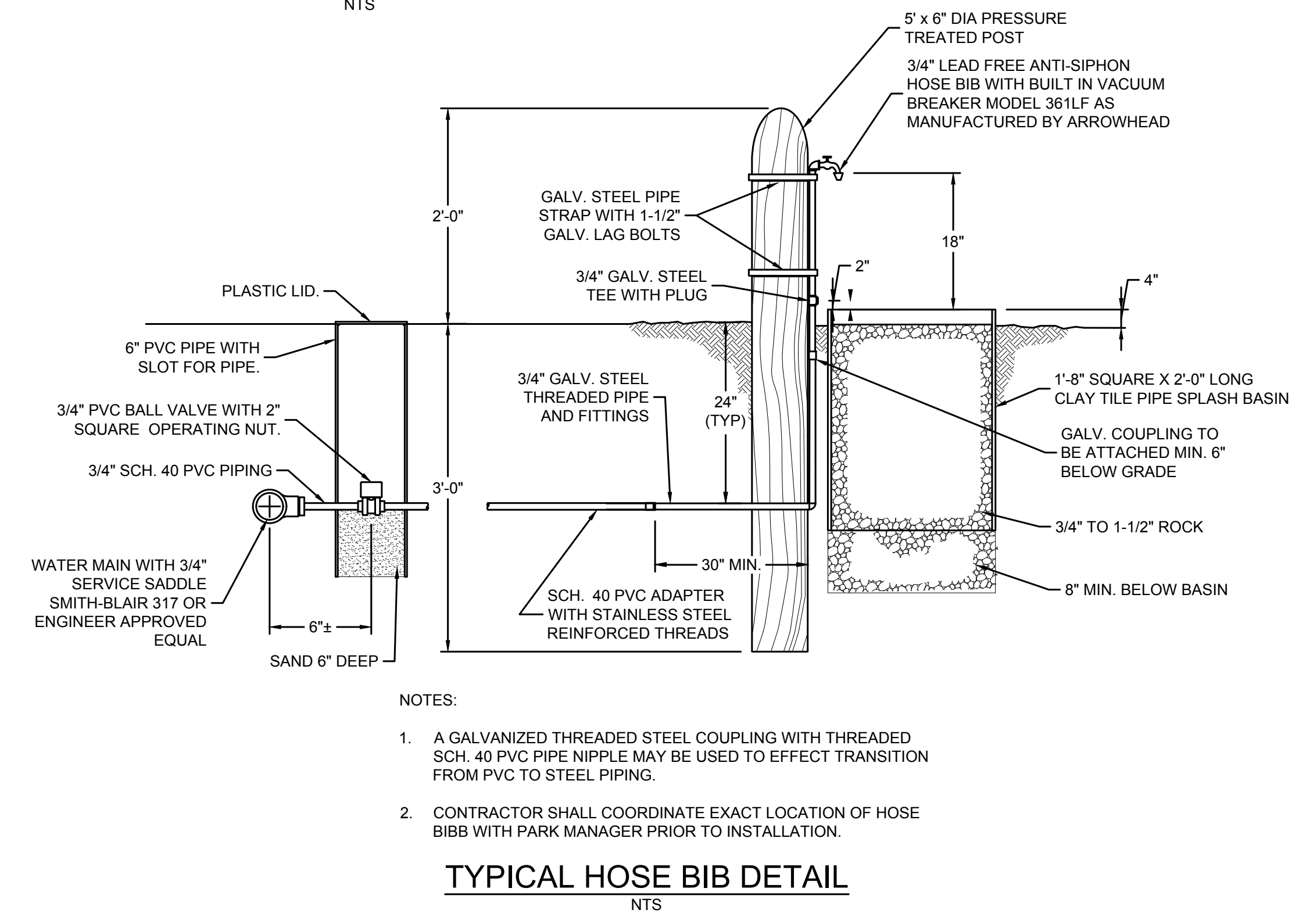
PROPOSED ELEVATION		
DESCRIPTION	MSL (ft)	
A. TOP OF WET WELL ELEVATION	1061.38	
B. INLET ELEVATION	1061.50	
C. HIGH LEVEL ALARM ELEVATION	1055	
D. TWO PUMP ON ELEVATION	1054	
E. ONE PUMP ON ELEVATION	1053.5	
F. ALL PUMPS OFF ELEVATION	1048.5	
G. MIN. WSEL AND LOW LEVEL ELEVATION	1048	
H. BOTTOM OF WET WELL ELEVATION	1046.50	
I. WET WELL DEPTH	15	

PUMP SCHEDULE		
P101	50 GPM	TBD
P102	50 GPM	TBD

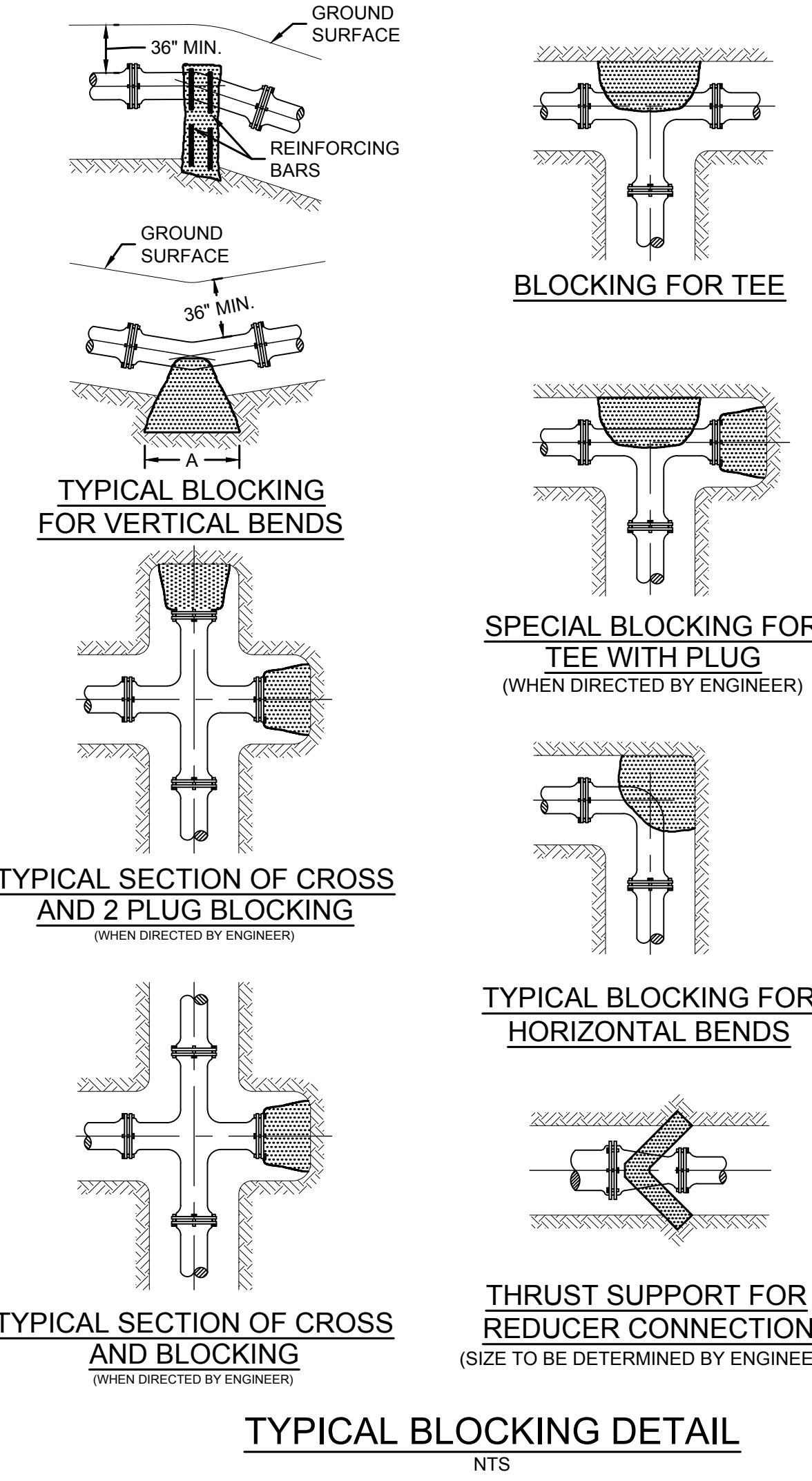
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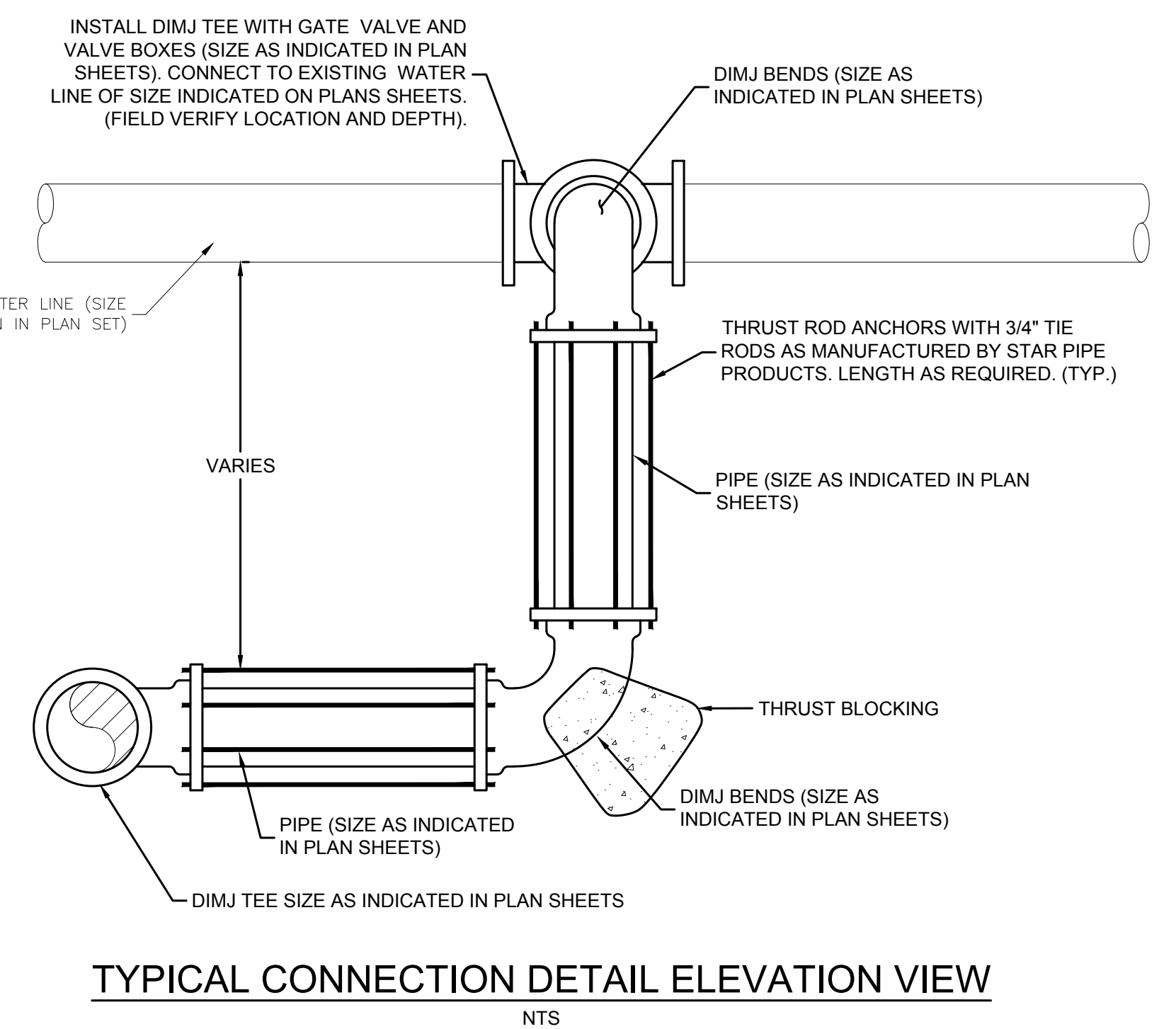
TYPICAL VALVE, VALVE BOX, AND EXTENSION STEM DETAIL
(VALVES 3" AND LARGER)
NTS



TYPICAL HOSE BIB DETAIL
NTS



TYPICAL BLOCKING DETAIL
NTS

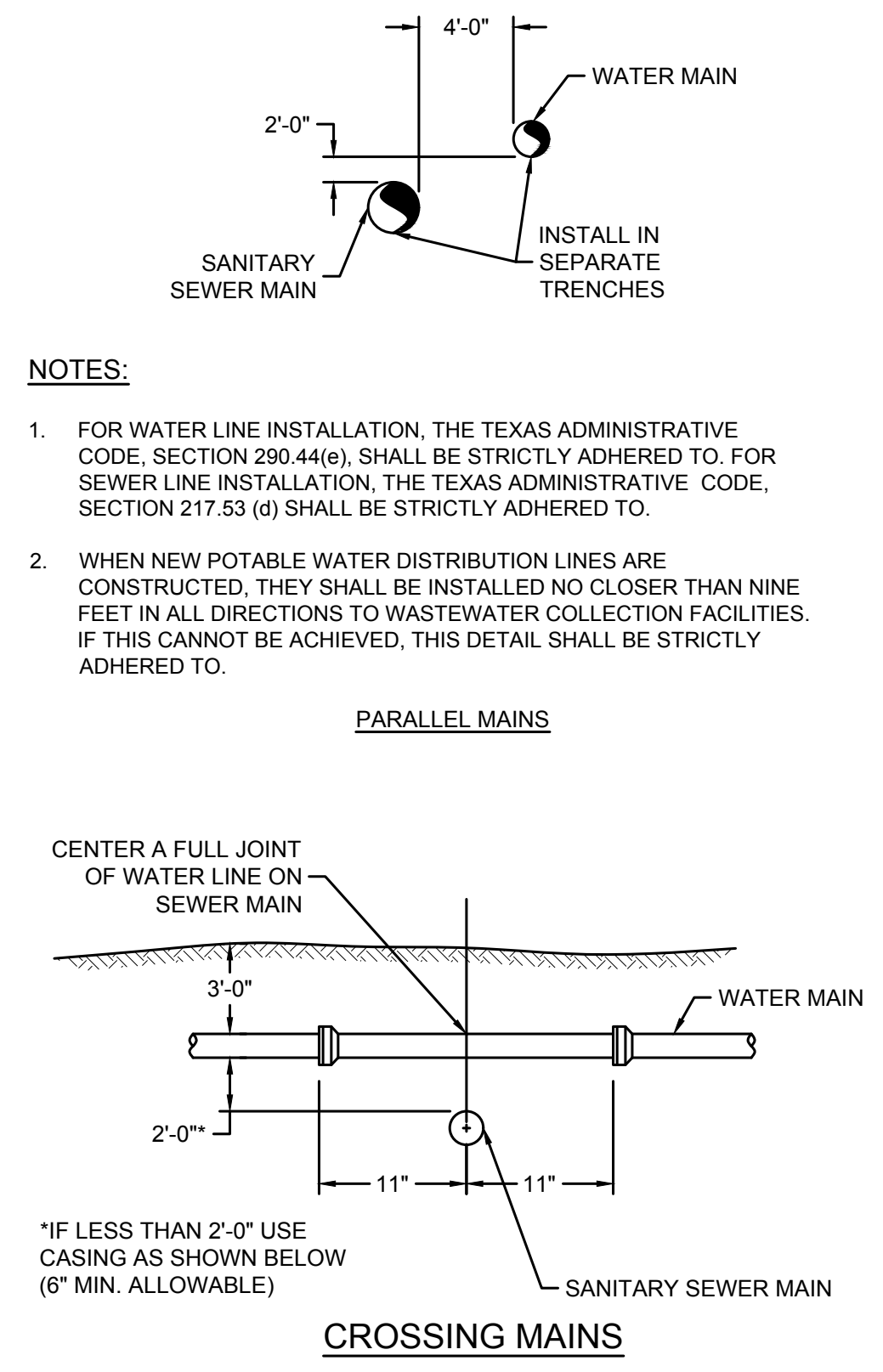


TYPICAL CONNECTION DETAIL ELEVATION VIEW
NTS

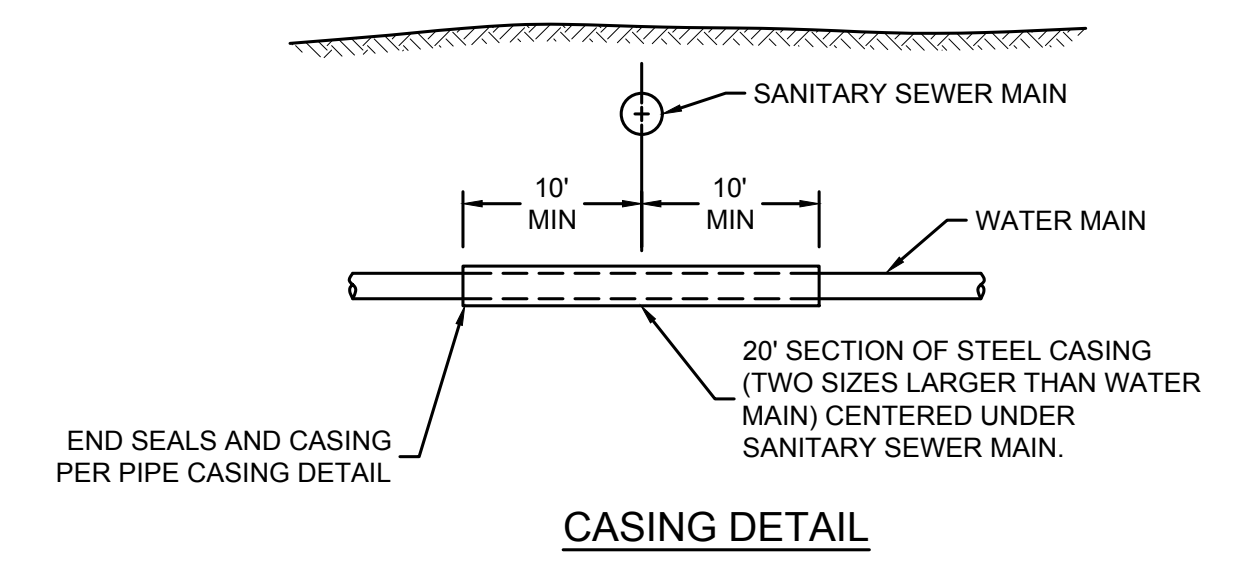
NOTE:
THRUST BLOCKING REQUIRED AT ALL FITTINGS. THRUST BLOCKING IS NOT SHOWN IN DETAILS FOR CLARITY.

- NOTES ON THRUST BLOCKING:**
- ALL BLOCKING SHALL BE AGAINST UNDISTURBED HAND DUG SOIL AND SHALL BE CONCRETE HAVING A MINIMUM 28 DAY STRENGTH OF 3000 LB. PER SQUARE INCH.
 - THRUST CALCULATIONS TO BE BASED ON THRUST DUE TO WATER PRESSURE AT 100% OF TEST PRESSURE.
THRUST = 2 AP SIN 1/2 Ø
WHERE A = AREA OF PIPE
P = WATER PRESSURE
Ø = DEFLECTION ANGLE.
 - VERTICAL UPLIFT BLOCKS SHALL BE DESIGNED ON THE BASIS OF 150 LBS. PER CU. FT. FOR CONCRETE AND SOIL AT 120 LBS. PER CU. FT. OVER THE AREA OF BLOCK.
 - VERTICAL DOWN THRUST BLOCKS SHALL BE DESIGNED ON THE BASIS OF 3000 LB. PER SQ. FT. ALLOWABLE SOIL BEARING PRESSURE. DIMENSIONS MAY BE DECREASED WITH APPROVAL OF THE ENGINEER OR MEASURED SOIL CONDITIONS PERMIT. IN POOR SOIL CONDITIONS, BLOCK DIMENSIONS SHALL BE INCREASED IN PROPORTION TO ALLOWABLE BEARING VALUE.
 - THRUST BLOCKS ON HORIZONTAL BENDS, TEES, CROSSES, AND REDUCERS SHALL BE SIZED BASED ON 2400 LBS. PER SQ. FT. OF BLOCKING SURFACE AREA IN CONTACT WITH UNDISTURBED SOIL. BLOCK DIMENSIONS MAY BE DECREASED WITH APPROVAL OF THE ENGINEER OR MEASURED SOIL CONDITIONS PERMIT. IN POOR SOIL CONDITIONS, BLOCK DIMENSIONS SHALL BE INCREASED IN PROPORTION TO THE ALLOWABLE BEARING VALUE.
 - ALL BLOCKING SHALL HAVE A MINIMUM SOIL COVER OF 1 FT.
 - ADDITIONAL REINFORCING MAY BE REQUIRED FOR HORIZONTAL BLOCKING TO HANDLE UNUSUAL SHEAR LOADING CONDITIONS.
 - ANCHOR COLLARS SHALL BE REINFORCED IN ACCORDANCE WITH REINFORCING BAR SCHEDULE FOR REDUCED BLOCKS SHOWN ABOVE. STEEL ANCHOR RING IN ACCORDANCE WITH DIMENSIONS OF ANCHOR COLLAR.

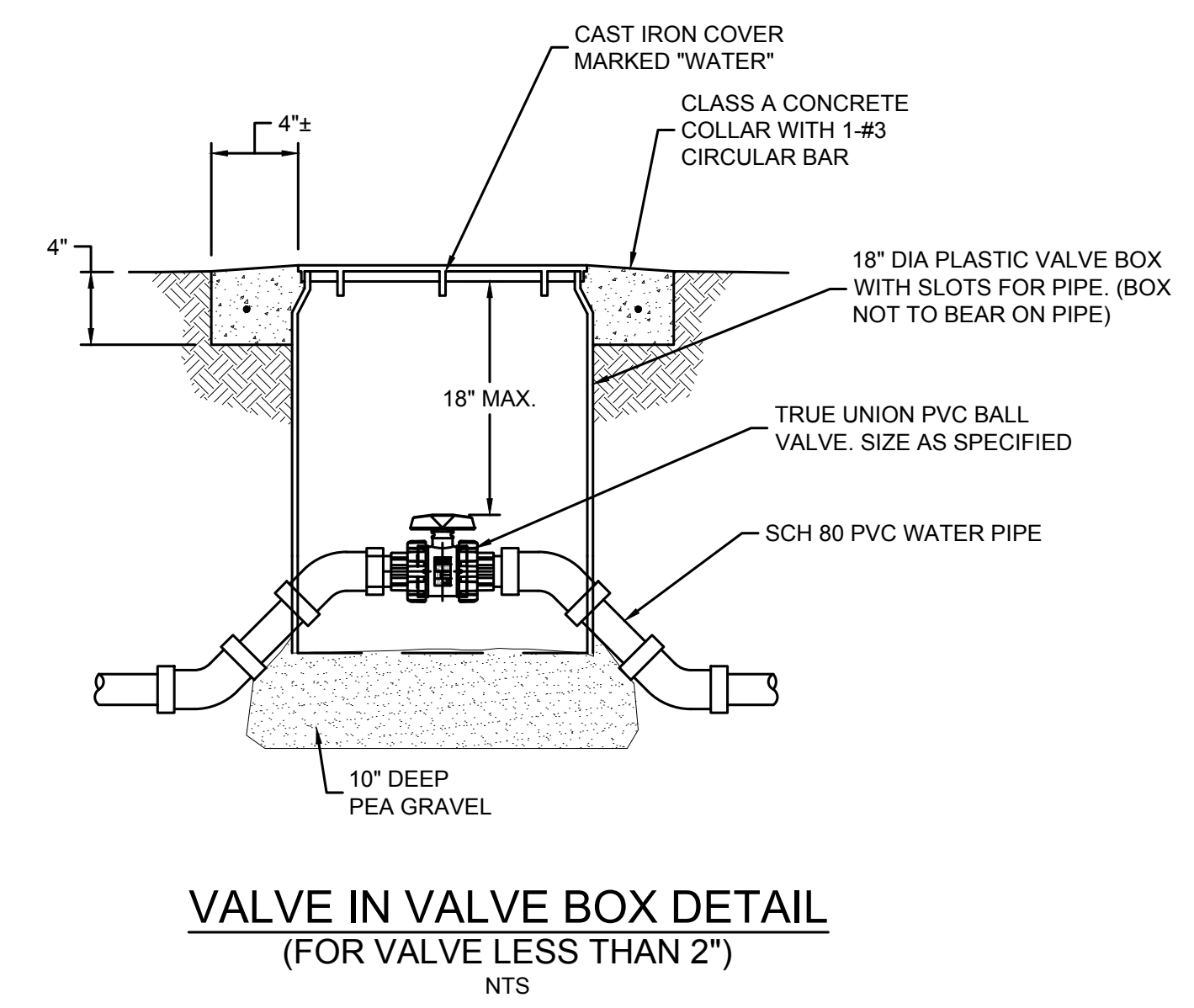
PIPE SIZE	TEES				BENDS				REDUCER		
	THRUST BLOCKING REQUIRED (SF)	90° THRUST BLOCKING REQUIRED (SF)	45° THRUST BLOCKING REQUIRED (SF)	22 1/2° THRUST BLOCKING REQUIRED (SF)	PIPE SIZE (IN.)	ANGLE (THETA)	THRUST BLOCKING REQUIRED (SF)				
2 1/2"	0.61	0.43	0.23	0.12	4 - 3	8.2	0.05				
3"	0.88	0.62	0.34	0.17	6 - 3	19.5	0.45				
4"	1.57	1.11	0.60	0.31	6 - 4	12.8	0.22				
6"	3.53	2.50	1.35	0.69	8 - 6	10.5	0.25				
8"	6.28	4.44	2.40	1.23	10 - 8	9.6	0.30				
10"	9.82	6.94	3.76	1.92	12 - 10	8.2	0.31				
12"	14.14	10.00	5.41	2.76	14 - 12	7.2	0.32				
14"	19.24	13.61	7.36	3.75	18 - 12	18.4	2.83				
16"	25.13	17.77	9.62	4.90	20 - 14	17.5	3.04				
18"	31.81	22.49	12.17	6.21	20 - 16	11.5	1.42				
20"	39.27	27.77	15.03	7.86	24 - 18	14.5	3.12				
24"	56.55	39.99	21.64	11.03	24 - 20	9.6	1.44				
30"	88.36	62.48	33.81	17.24	30 - 20	19.5	8.30				
36"	127.23	89.97	48.69	24.82	30 - 24	11.5	3.20				



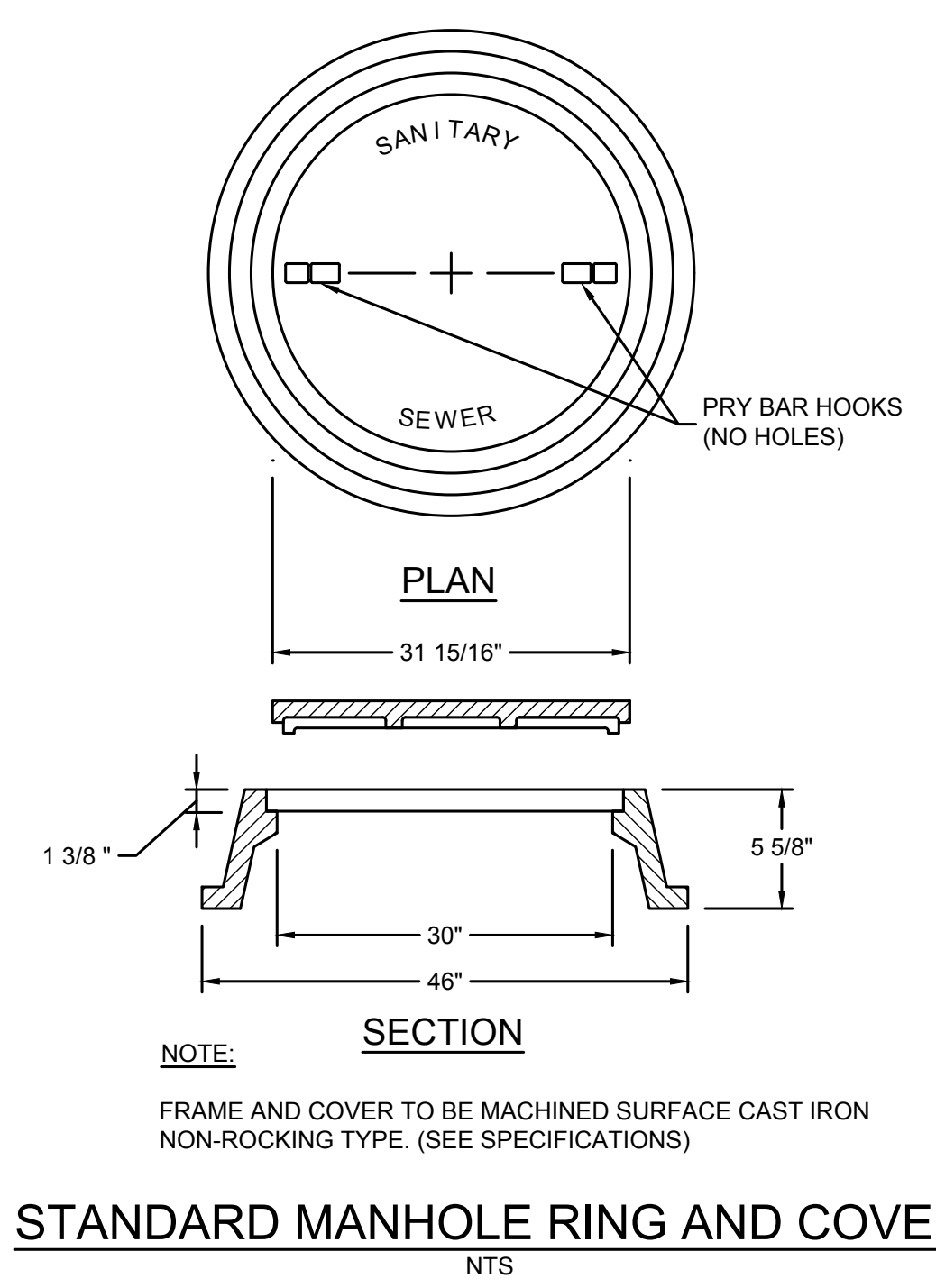
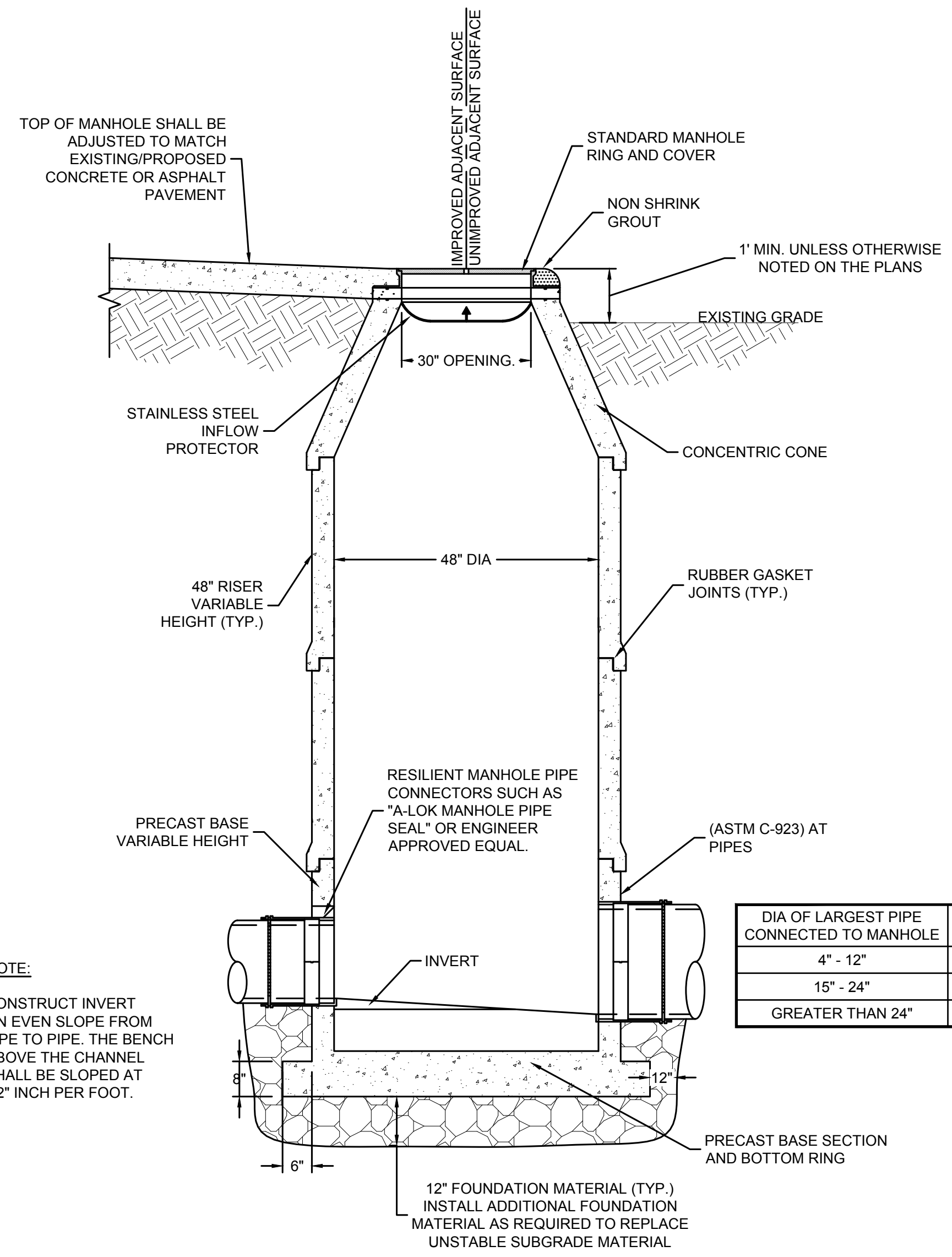
- NOTES:**
- REQUIRED FOR WATER MAINS CROSSING BELOW, OR WITHIN 2 FEET ABOVE, SANITARY SEWER MAINS.
 - IN LIEU OF THIS PROCEDURE THIS 20' SECTION OF WATER LINE CASING PIPE CAN BE DELETED AND THE SEWER LINE REPLACED WITH DUCTILE IRON PIPE WITH WATERTIGHT JOINTS TO MAINTAIN 10.0 FT. CLEARANCE EITHER SIDE OF WATERLINE.
 - CEMENT STABILIZER SAND BACKFILL INITIAL BACKFILL ZONE OF SEWER FOR 10.0 FT. EACH SIDE OF CROSSING. CENTER ONE JOINT OF WATER MAIN ON SEWER PIPE.



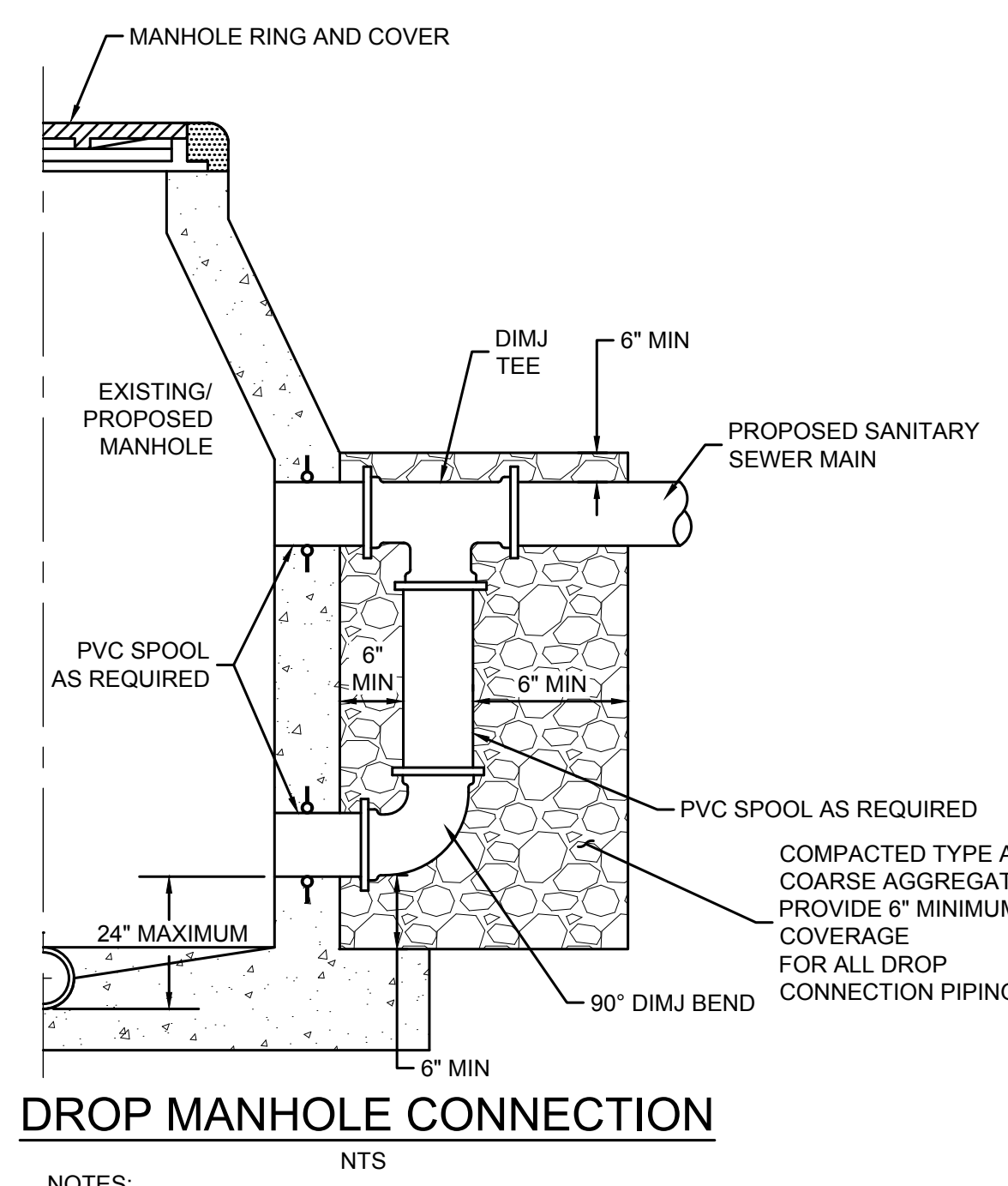
UTILITY CROSSINGS DETAIL
NTS



VALVE IN VALVE BOX DETAIL
(FOR VALVE LESS THAN 2")
NTS

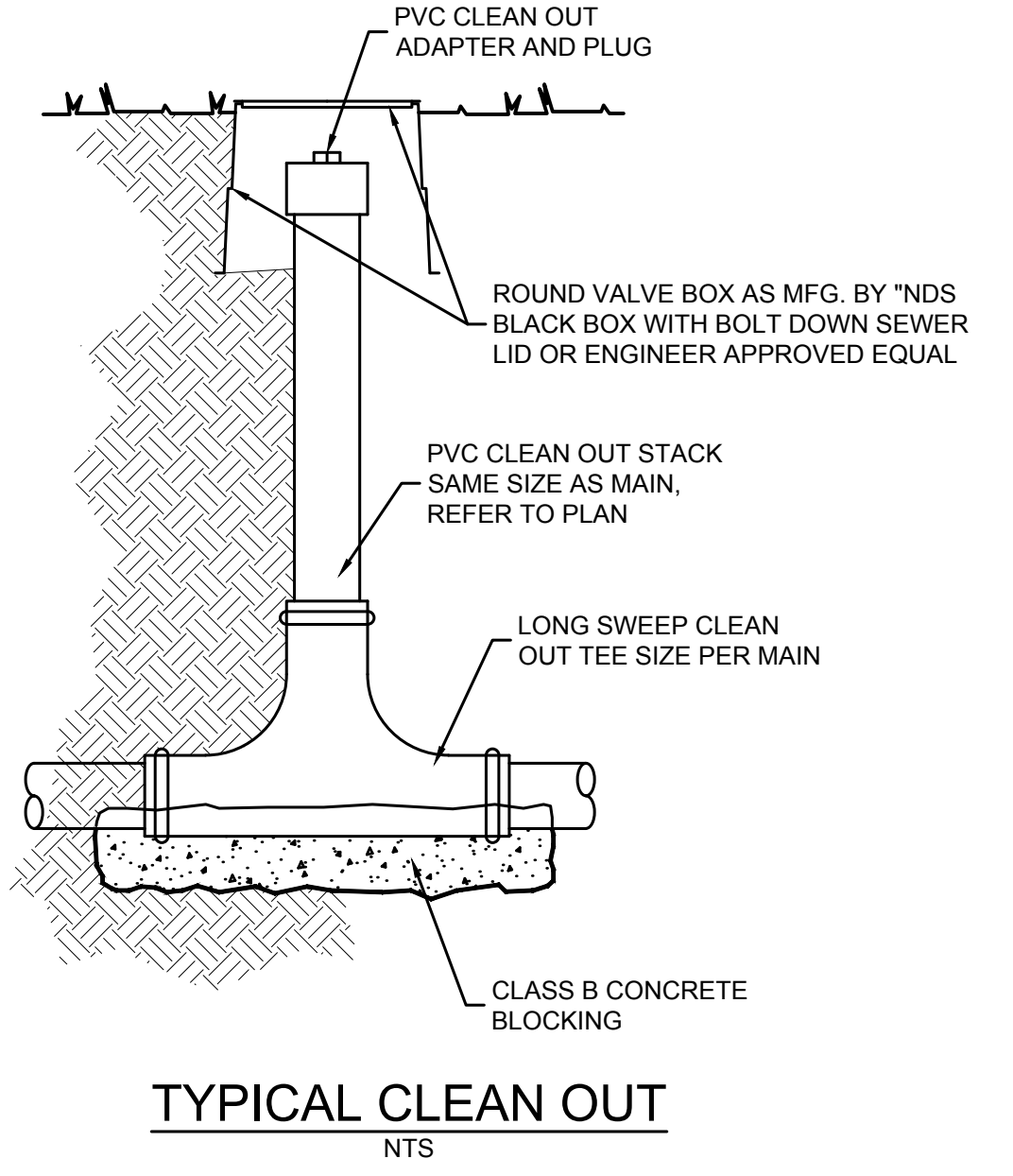


STANDARD MANHOLE RING AND COVER
NTS



DROP MANHOLE CONNECTION
NTS

NOTES:
DROP MANHOLE CONNECTIONS SHALL BE CONSTRUCTED WHERE A CONNECTION PIPE ENTERS A MANHOLE MORE THAN 24\"/>



TYPICAL CLEAN OUT
NTS

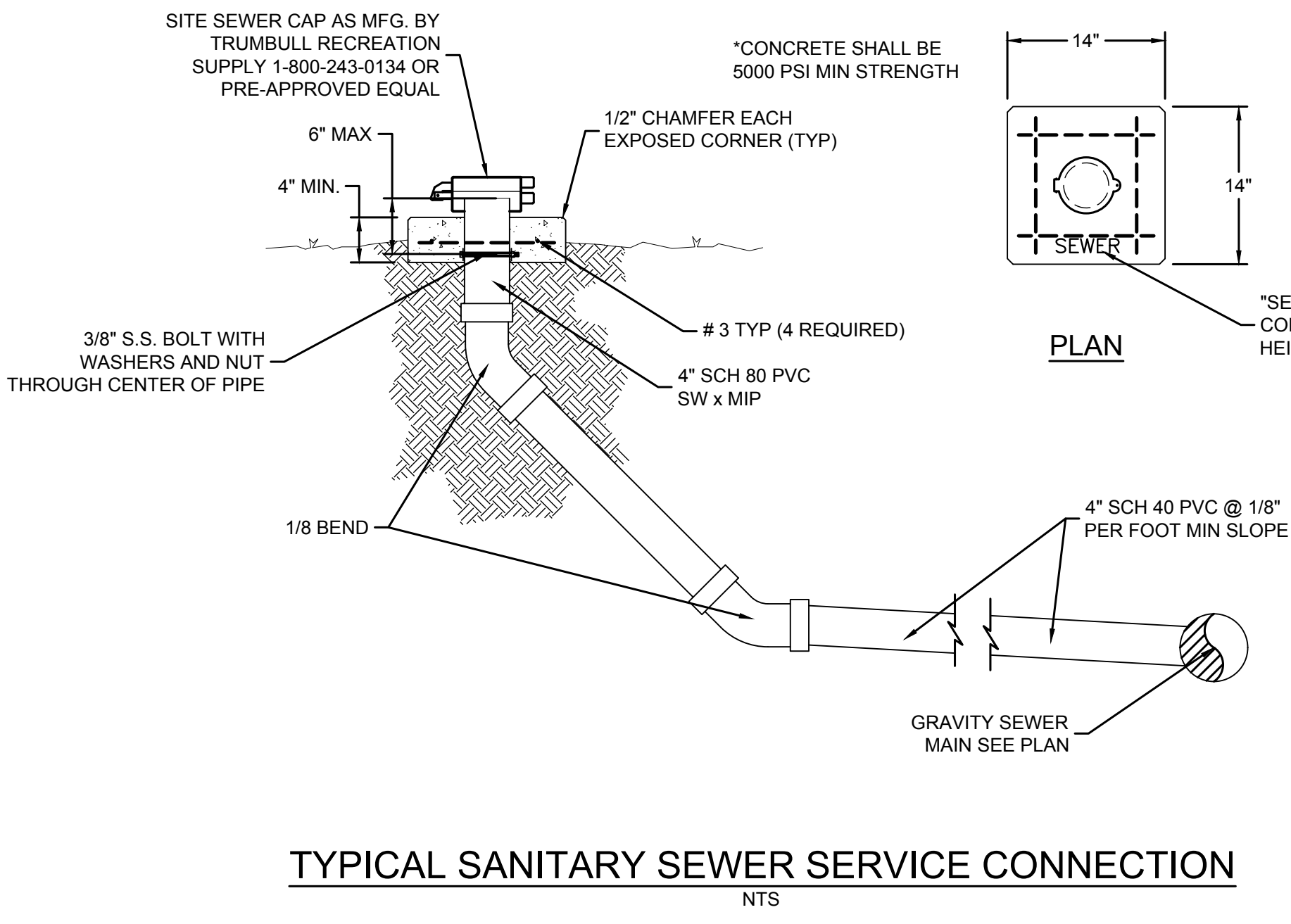
NOTE:
CONSTRUCT INVERT ON EVEN SLOPE FROM PIPE TO PIPE. THE BENCH ABOVE THE CHANNEL SHALL BE SLOPED AT 1/2\"/>

DIA OF LARGEST PIPE CONNECTED TO MANHOLE	DEPTH OF MANHOLE CHANNEL
4" - 12"	EQUAL TO 1/2 DIA OF LARGEST PIPE
15" - 24"	EQUAL TO 3/4 DIA OF LARGEST PIPE
GREATER THAN 24"	EQUAL TO DIA OF LARGEST PIPE

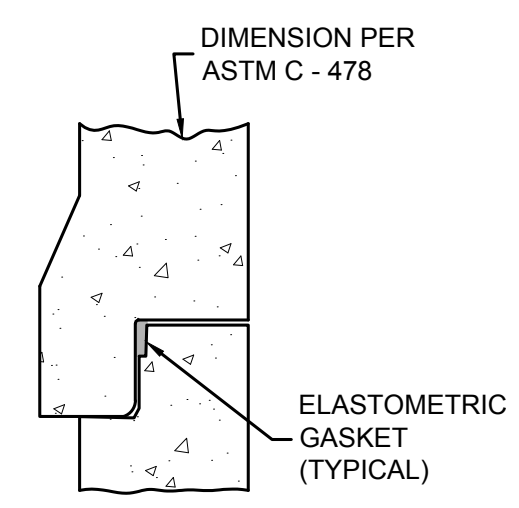
TYPICAL MANHOLE SECTION
NTS

CONCRETE MANHOLE GENERAL NOTES:

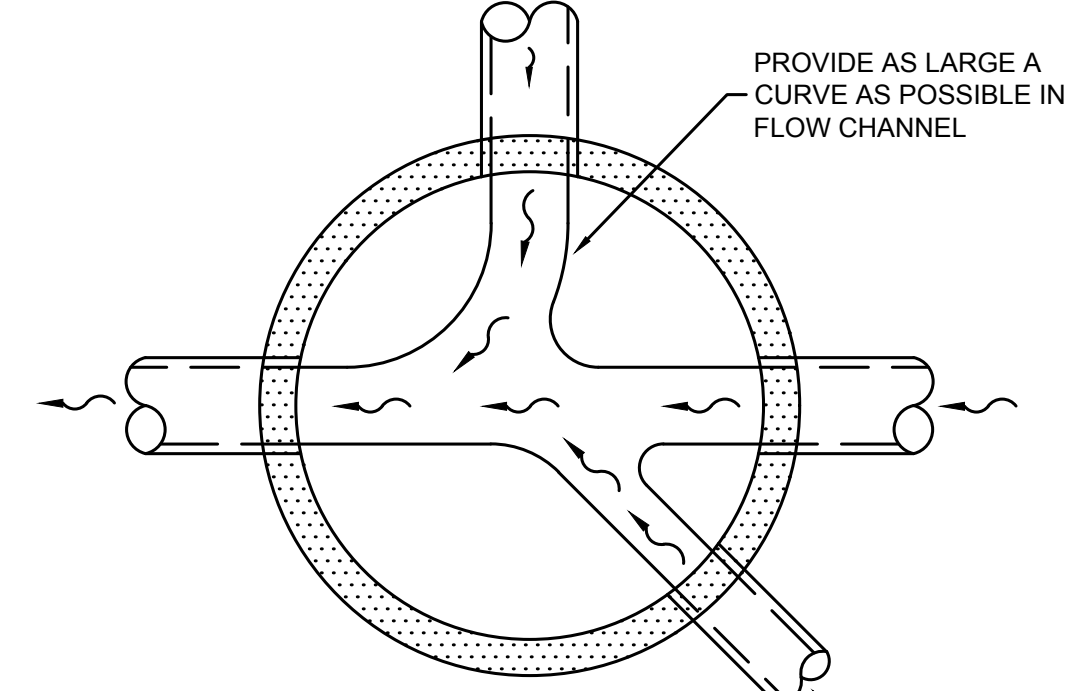
1. PRECAST RISERS, CONES, FLOORS, GRADE RINGS, AND RINGS AND COVERS SHALL BE MANUFACTURED ACCORDING TO THE MOST RECENT ASTM C-478
2. ALL MANHOLE CONSTRUCTION SHALL BE WATERTIGHT. JOINTS SHALL BE RUBBER GASKET MANHOLE SECTIONS WITH PROFILE JOINT AND FORSHEDA 114 JOINT SEALS OR APPROVED EQUALS.
3. ANY ERECTION HOLES, STEP HOLES, OR OTHER HOLES THROUGH THE WALL OF THE MANHOLE SHALL BE COVERED WITH 3\"/>



TYPICAL SANITARY SEWER SERVICE CONNECTION
NTS

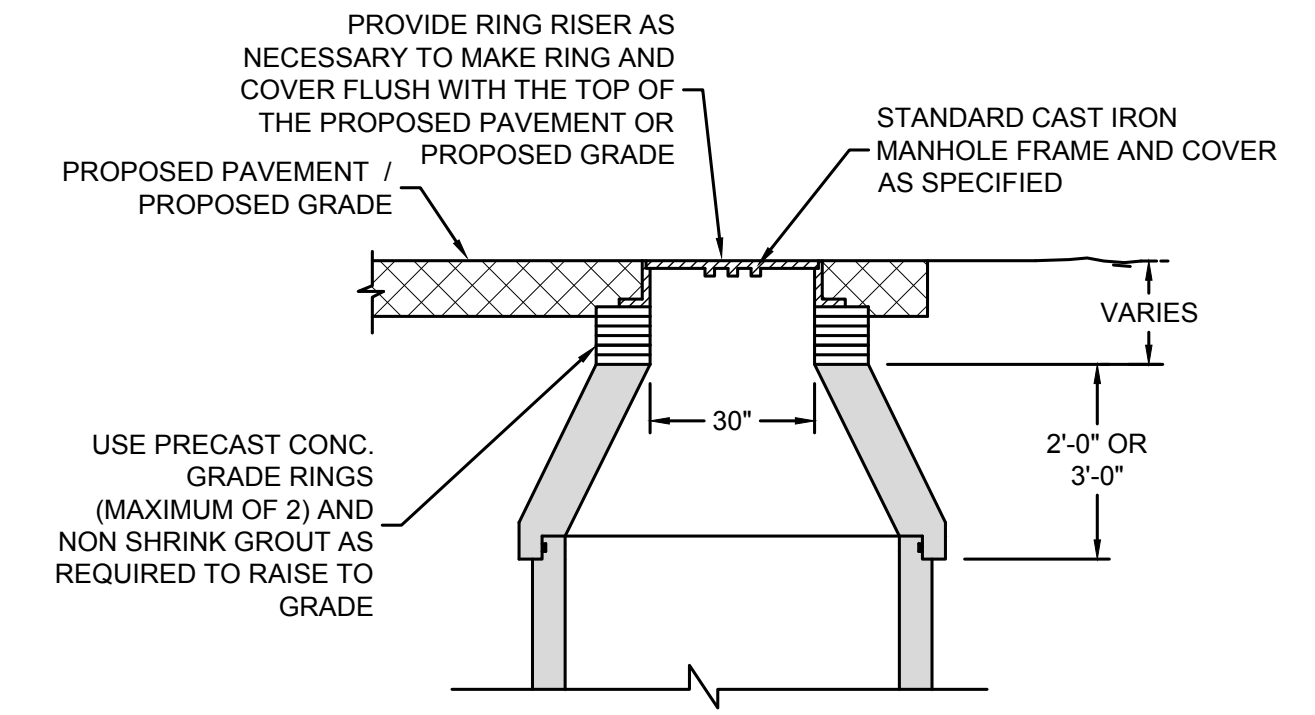


TYPICAL MANHOLE JOINT
NTS



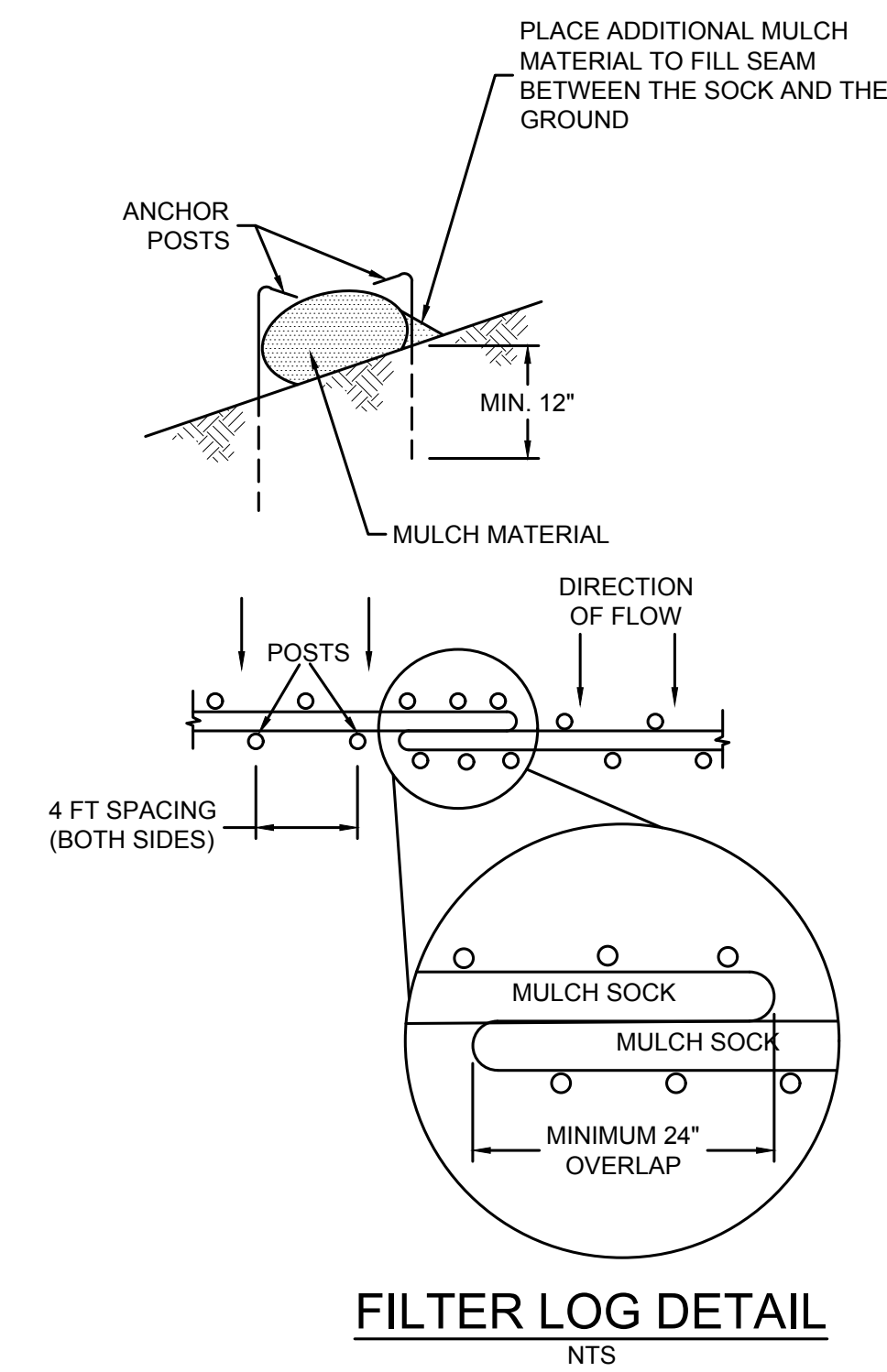
MANHOLE BOTTOM DETAIL
NTS

- NOTES:**
1. CENTERLINE OF ALL PIPES ENTERING AND LEAVING MANHOLE SHALL PASS THROUGH CENTER OF MANHOLE.
 2. CONSTRUCT FLOW CHANNEL FOR ALL PIPES ENTERING MANHOLE, INCLUDING SERVICES MAINTAIN A CONSTANT GRADE THROUGHOUT EACH INVERT.
 3. GROUT FILLET MANHOLE INVERTS FOR PIPES ENTERING MANHOLE WITHOUT DROP CONNECTION.



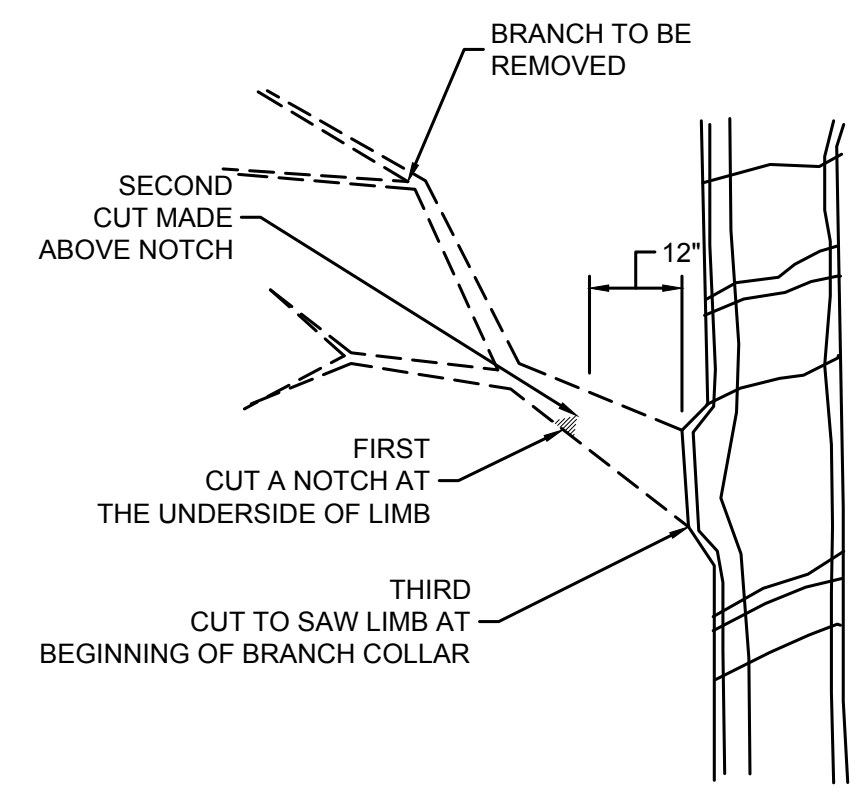
WASTEWATER MANHOLE ADJUSTMENT DETAIL
NTS

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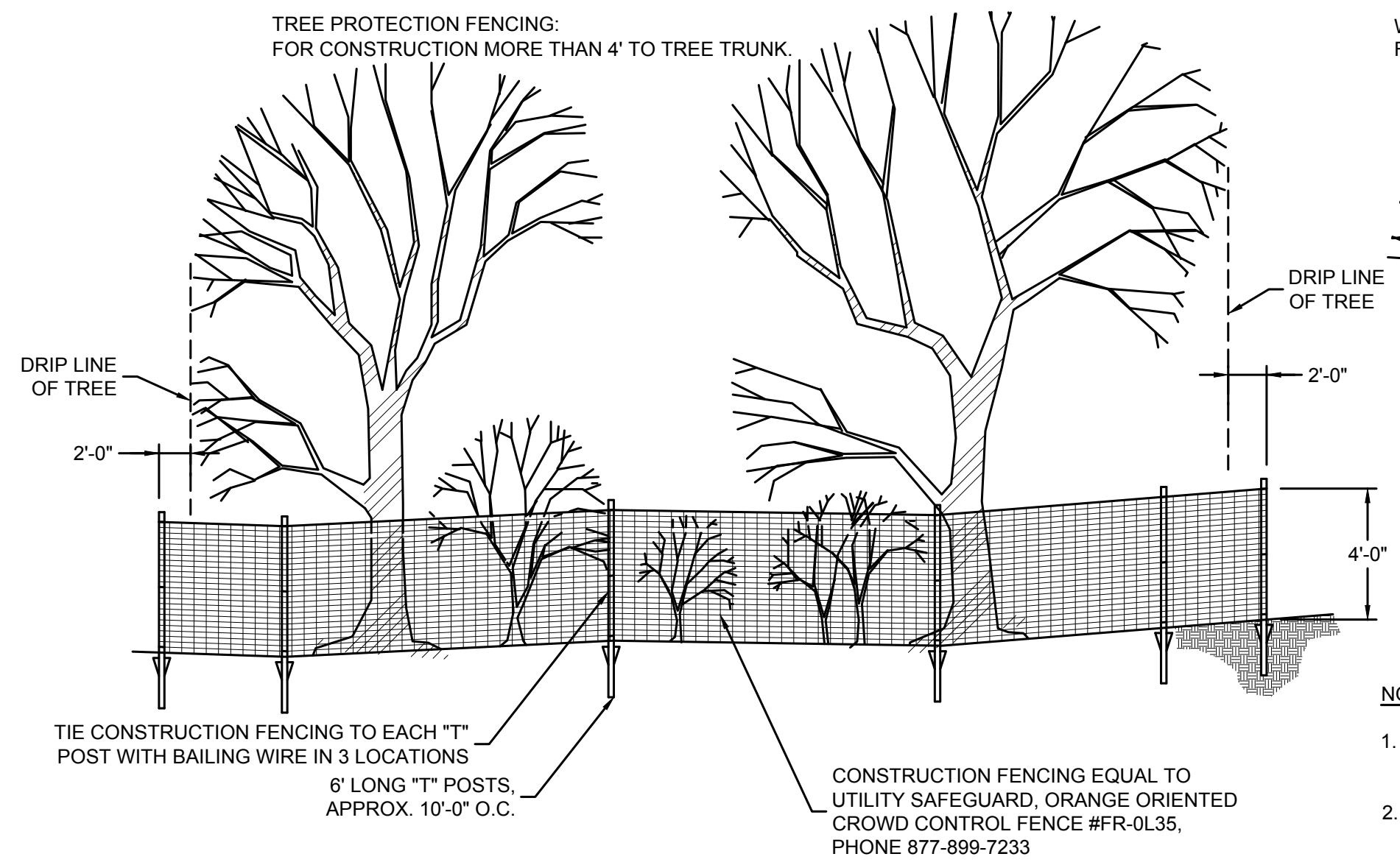
FILTER LOG DETAIL
NTS

- NOTES:**
- MULCH SOCKS SHALL BE 12" DIAMETER AND MADE OUT OF BIO-DEGRADABLE OR RECYCLABLE MATERIAL SUCH AS BURLAP, TWINE AND SOME DEGRADABLE PLASTICS. IT IS PREFERRED THAT ON-SITE MULCH PRODUCED FROM TREE TRIMMING REQUIRED FOR THIS PROJECT IS USED TO FILL THE SOCKS. OTHER MATERIAL MAY BE ACCEPTABLE AT THE ENGINEER'S DISCRETION.
 - WOOD POSTS ARE PREFERRED IF THEY ARE ABLE TO BE DRIVEN INTO SOIL ON-SITE. END PROTECTION SHALL BE REQUIRED TO PREVENT IMPALEMENT. STAKES SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE.
 - THE TOE OF THE MULCH SOCK SHALL BE PLACED SO THAT THE MULCH SOCK IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.
 - MULCH MATERIAL MUST BE FREE OF INVASIVE PLANT SEEDS, REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH; IT IS NOT ACCEPTABLE FOR THE MULCH MATERIAL TO CONTAIN GROUND CONSTRUCTION DEBRIS, BIOSOLIDS, OR MANURE.
 - ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.
 - AT THE CONCLUSION OF CONSTRUCTION, SOCKS MAY BE CUT OPEN AND MULCH SPREAD ON-SITE. ALL OTHER DEBRIS TO BE REMOVED FROM SITE.



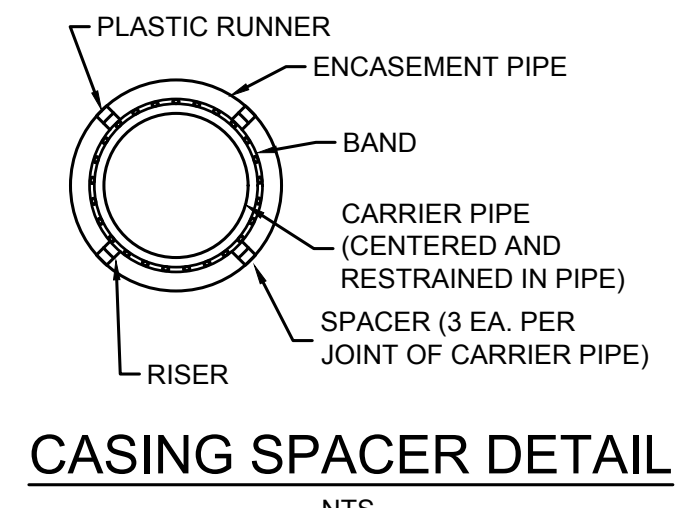
TREE PRUNING
NTS

- NOTES:**
- ALL PRUNING SHALL BE PERFORMED BY A ISA CERTIFIED ARBORIST UNLESS AUTHORIZED IN WRITING BY OWNER OTHERWISE.
 - ALL PRUNING SHALL BE DONE WITH CURVED PRUNING SAW, SHARP SHEARS, OR APPROVED EQUAL.
 - OMIT THE FIRST AND SECOND CUTS ON LIMBS THAT CAN BE SUPPORTED BY ONE HAND WHILE TRIMMING.

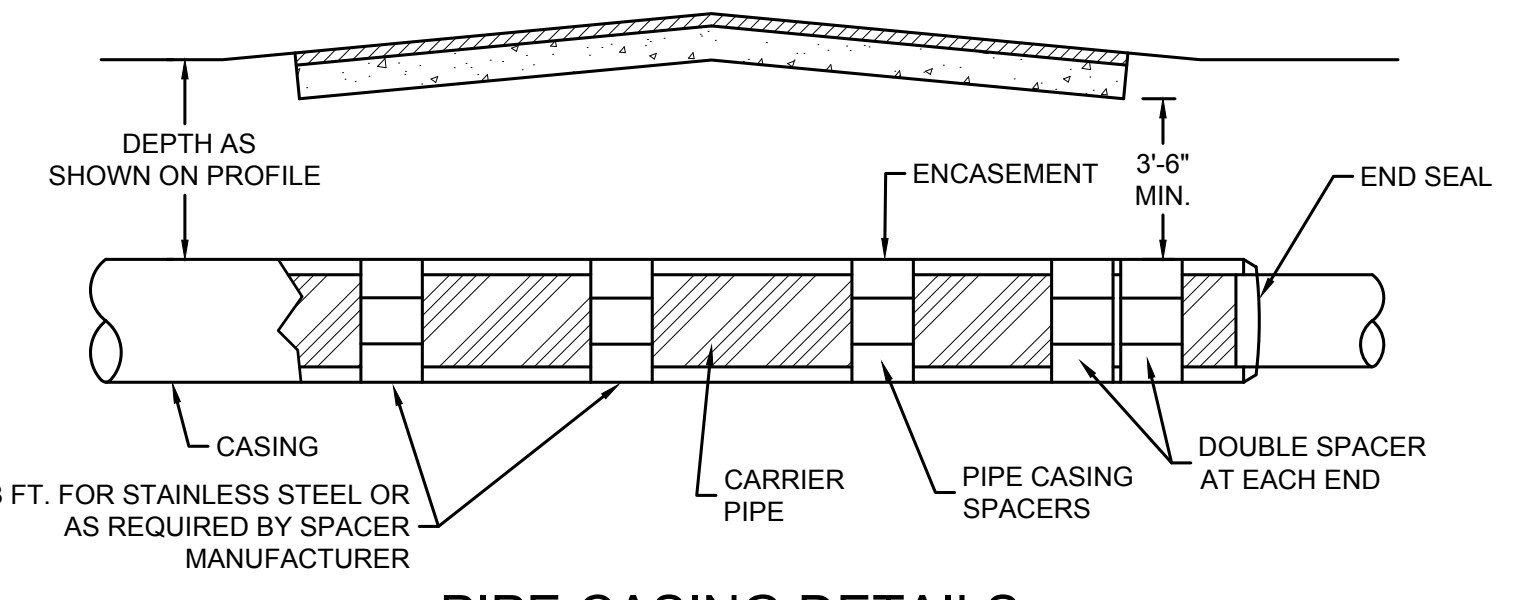


TREE PRUNING
NTS

- NOTES:**
- TREE PROTECTION IS REQUIRED FOR ALL EXISTING TREES WITHIN 20' OF THE LIMITS OF CONSTRUCTION.
 - INSTALL WOOD SLAT TREE PROTECTION WHEN CONSTRUCTION IS CLOSER THAN 4' TO TREE TRUNK.
 - INSTALL TREE PROTECTION FENCING WHEN CONSTRUCTION IS FURTHER THAN 4' TO TRUNK.
 - PARKING OR VEHICULAR TRAFFIC WITHIN TREE DRIP LINES SHALL BE PROHIBITED UNLESS AUTHORIZED BY OWNER'S REPRESENTATIVE.

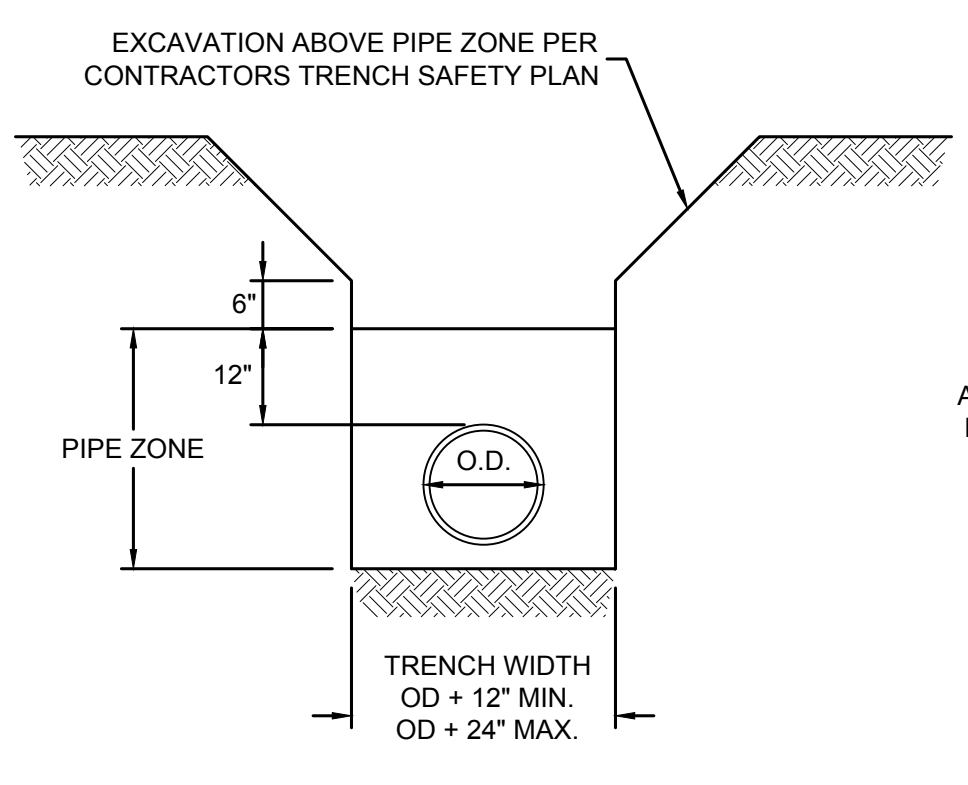


CASING SPACER DETAIL
NTS

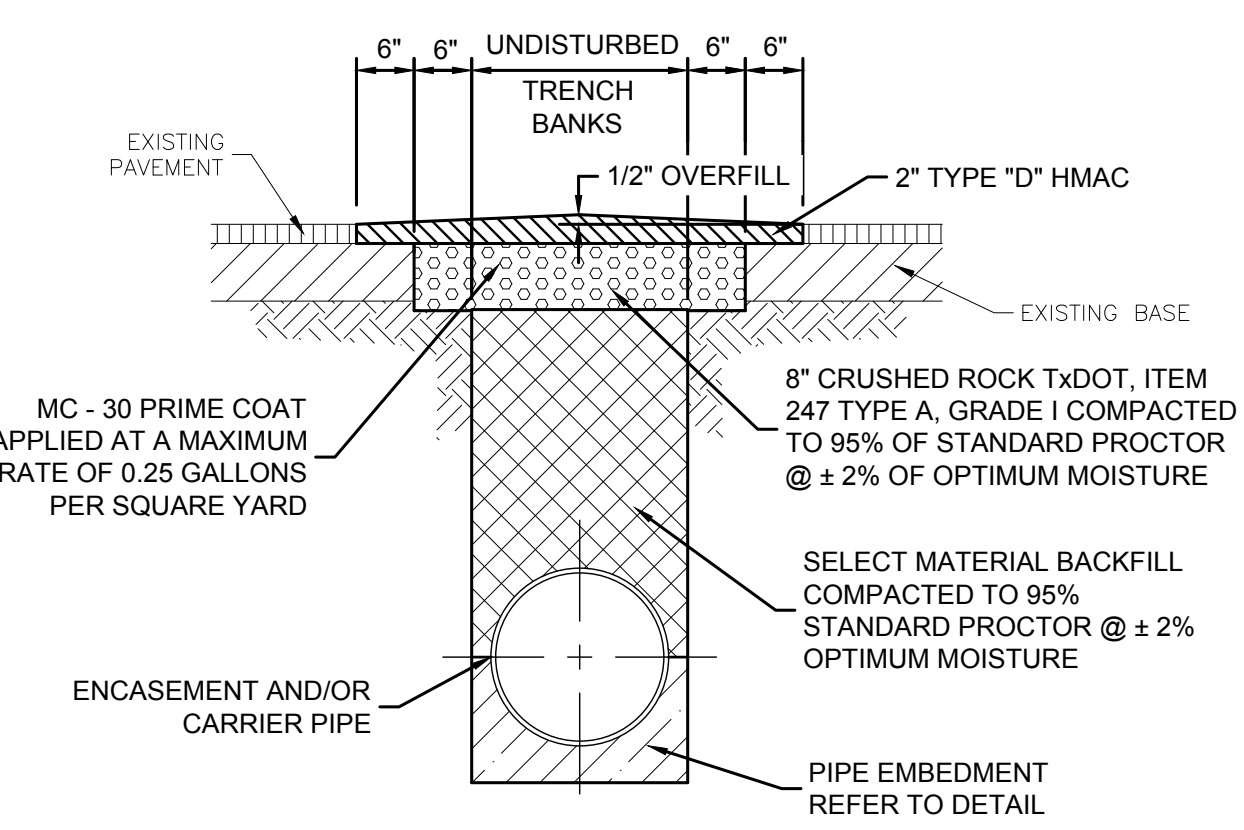


PIPE CASING DETAILS
NTS

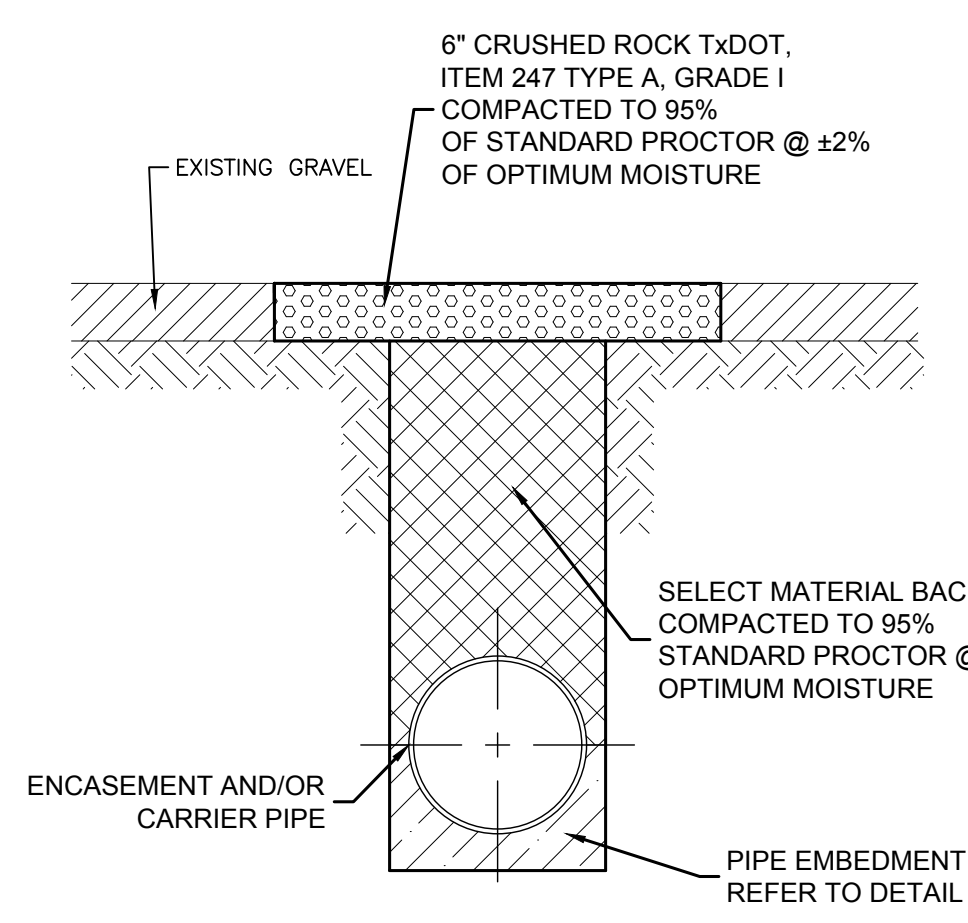
- NOTES:**
- CASING SPACERS SHALL BE STAINLESS STEEL.
 - ENCASEMENT PIPE SHALL BE OF SIZE AND THICKNESS SPECIFIED IN THE TECHNICAL SPECIFICATIONS.
 - CASING SPACERS SHALL CENTER AND RESTRAIN CARRIER PIPE IN CASING.
 - CASING END SEALS SHALL BE "PULLON" TYPE. "WRAP AROUND" END SEALS ARE PROHIBITED.



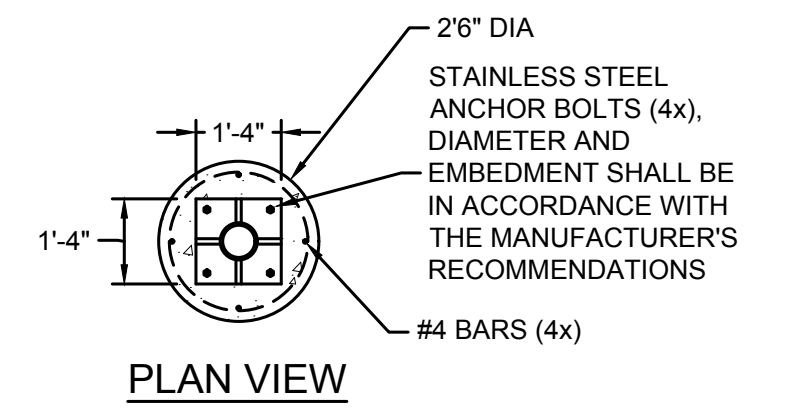
TYPICAL TRENCH SECTION
NTS



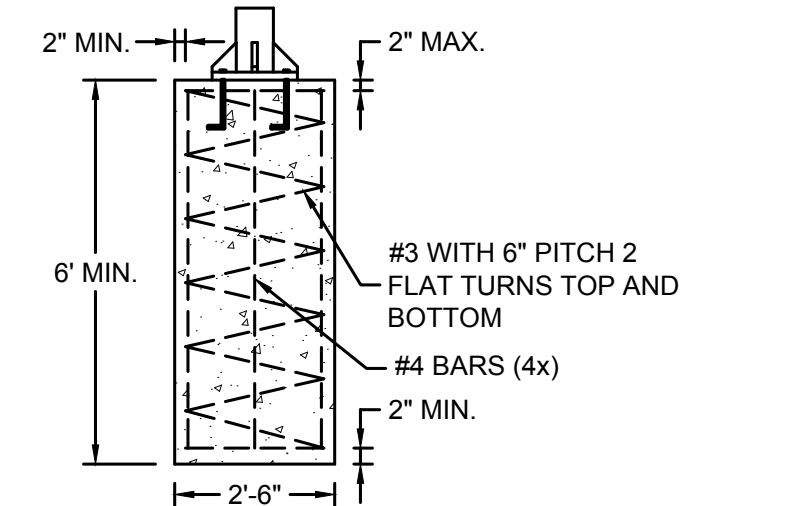
OPEN-CUT REPAIR DETAIL
ASPHALT PAVEMENT



OPEN-CUT REPAIR DETAIL
GRAVEL PAVEMENT



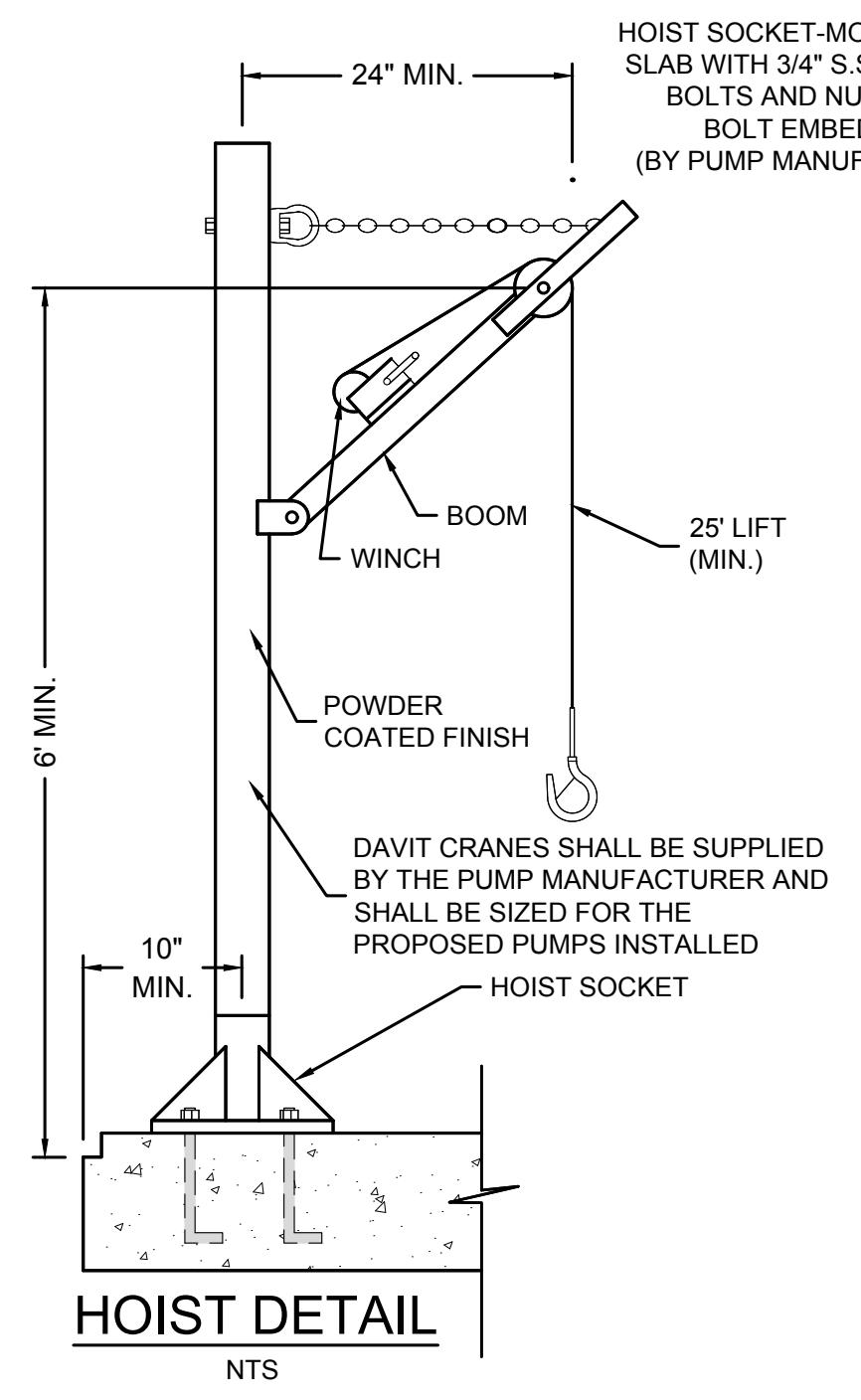
PLAN VIEW



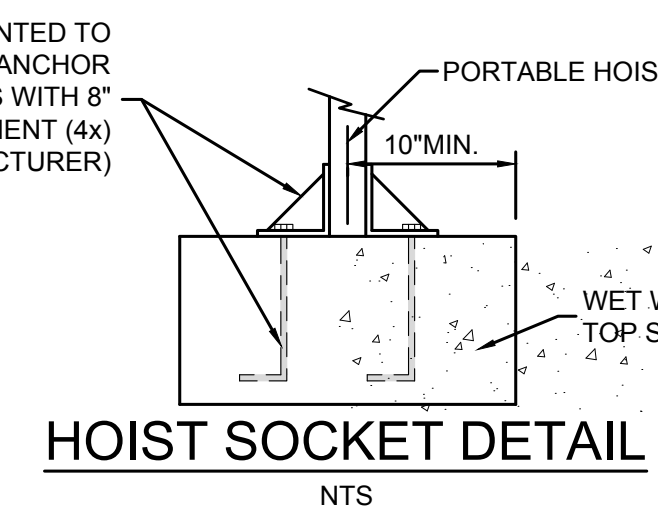
ELEVATION

HOIST SOCKET FOUNDATION DETAILS
NTS

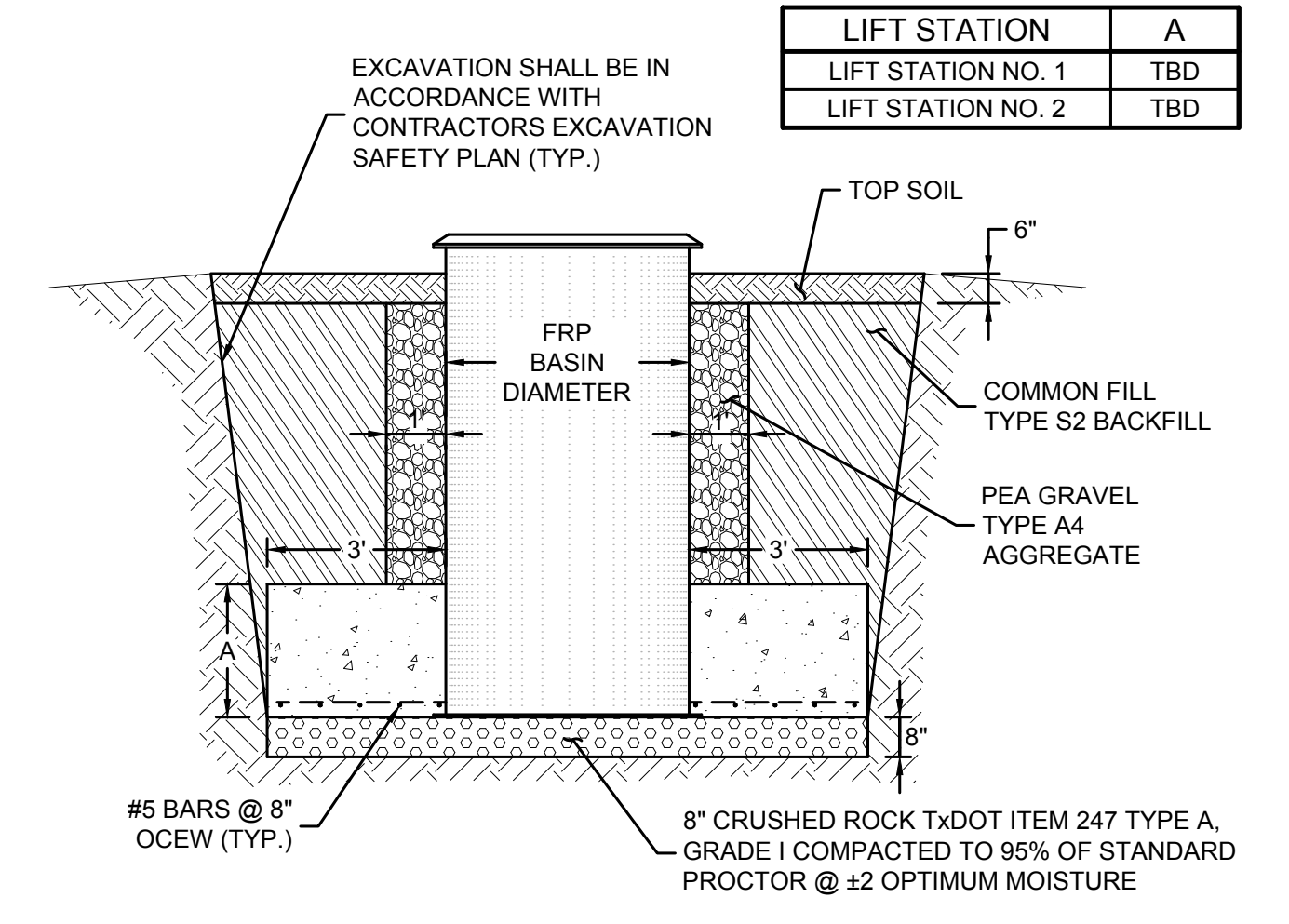
- NOTE:**
CONCRETE SHALL BE CLASS A.



HOIST DETAIL
NTS



HOIST SOCKET DETAIL
NTS

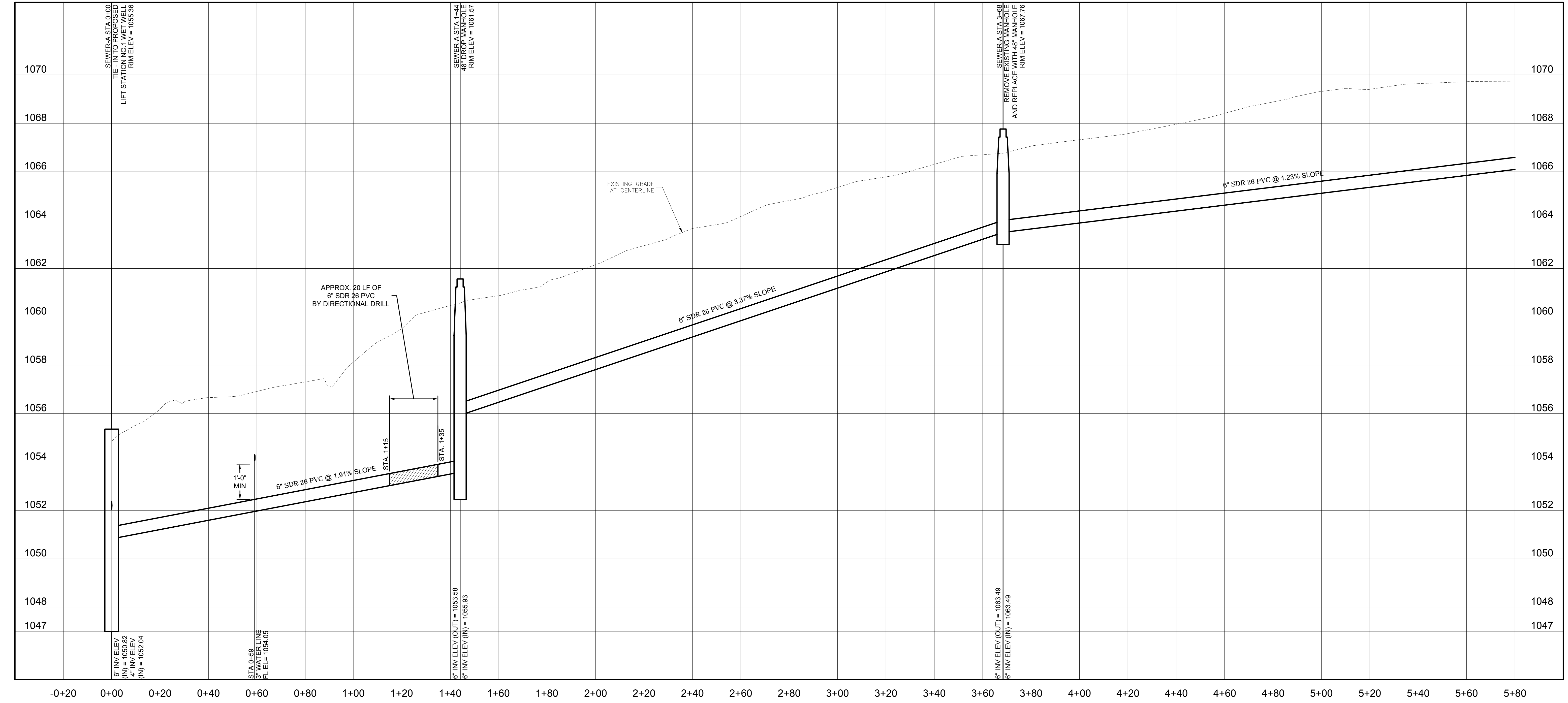
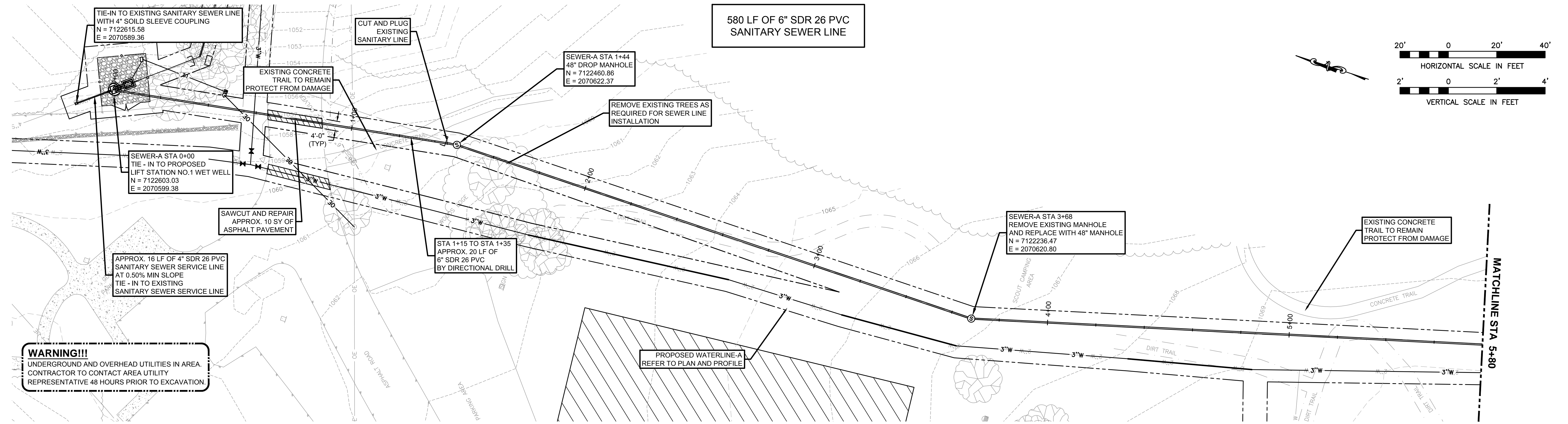
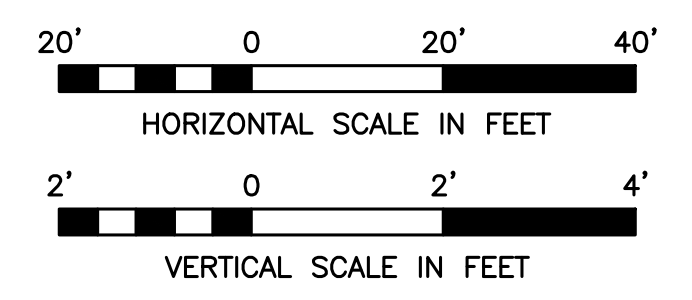


FPR LIFT STATION TYPICAL INSTALLATION
NTS

- NOTES:**
- CONCRETE SHALL BE CLASS A.
 - FRP LIFT STATION SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS.

LIFT STATION	A
LIFT STATION NO. 1	TBD
LIFT STATION NO. 2	TBD

PATH: \\KSA-TLY-SERVER3\Projects\TPW017\00.07_CAD\02_Project\30_Sheets\TPW017-C-DT-MISC-001.dwg



FORT RICHARDSON STATE PARK
WATER AND WASTEWATER SYSTEM REPLACEMENT

PROJECT NUMBER: 116818

DATE: 3/10/17
DESIGNED BY: CBA
DRAWN BY: JAM
REVIEWED BY: CBA
REVISED:
REVISED:

SHEET TITLE
SEWER
LINE A P&P
1

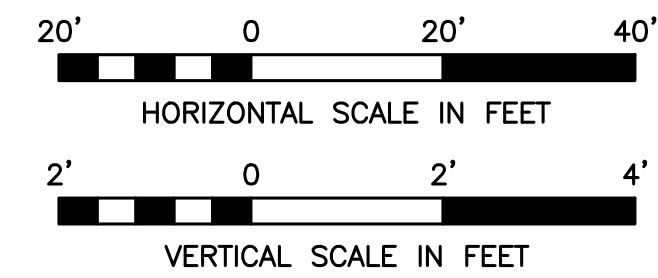
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OF 20

PERCENTAGE 50% CD DOCUMENT

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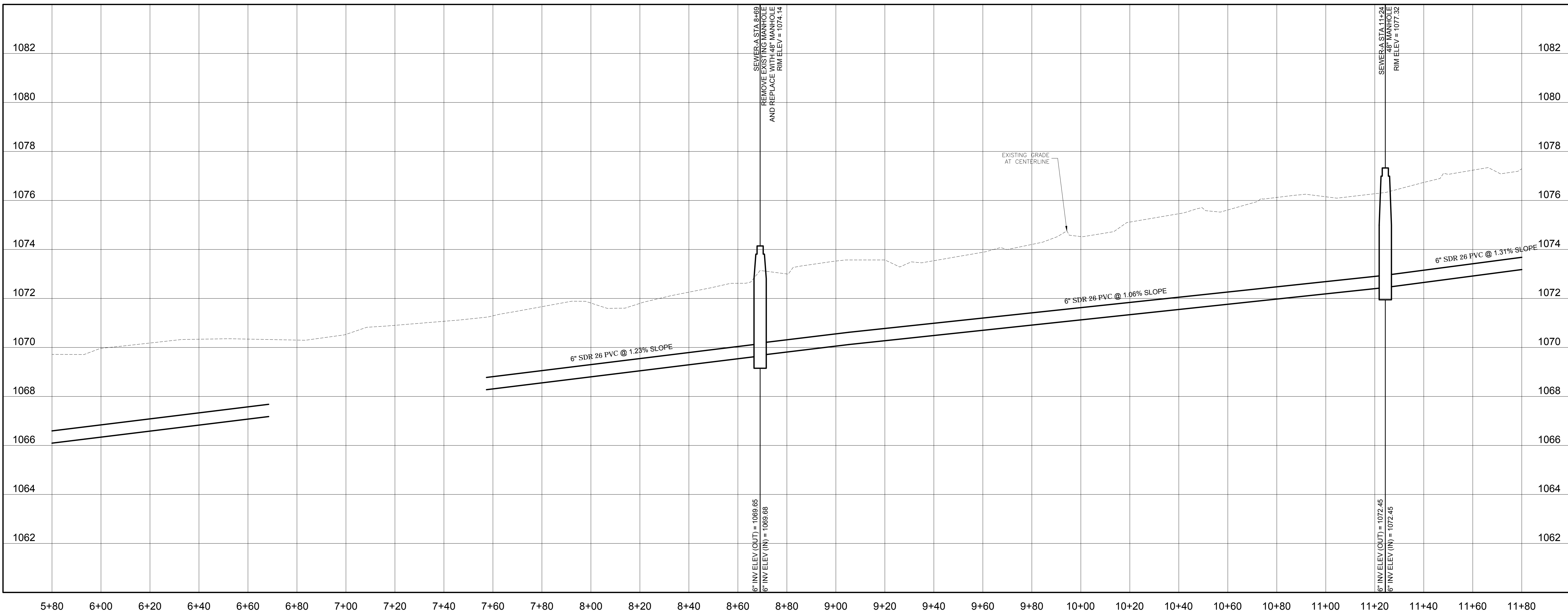
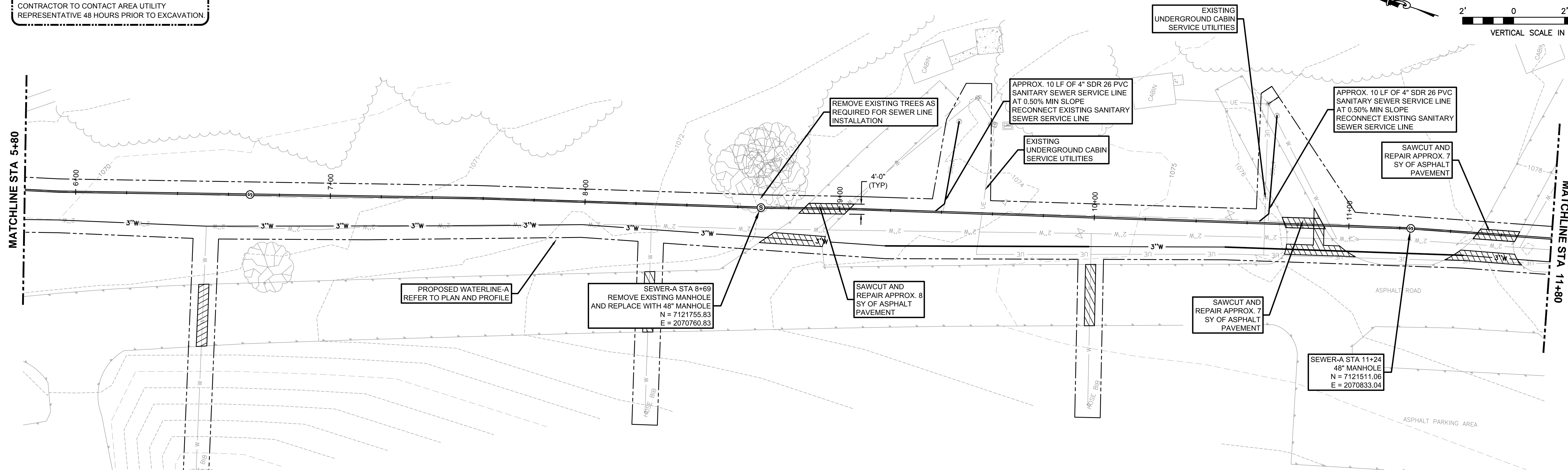
WARNING!!!
 UNDERGROUND AND OVERHEAD UTILITIES IN AREA.
 CONTRACTOR TO CONTACT AREA UTILITY
 REPRESENTATIVE 48 HOURS PRIOR TO EXCAVATION.

600 LF OF 6" SDR 26 PVC
 SANITARY SEWER LINE



MATCHLINE STA 5+80

MATCHLINE STA 11+80



TEXAS
 PARKS &
 WILDLIFE

FORT RICHARDSON STATE PARK
 WATER AND WASTEWATER SYSTEM REPLACEMENT

PROJECT NUMBER: 116818

DATE: 3/10/17
 DESIGNED BY: CBA
 DRAWN BY: JAM
 REVIEWED BY: CBA
 REVISED:

SHEET TITLE
 SEWER
 LINE A
 P&P 2

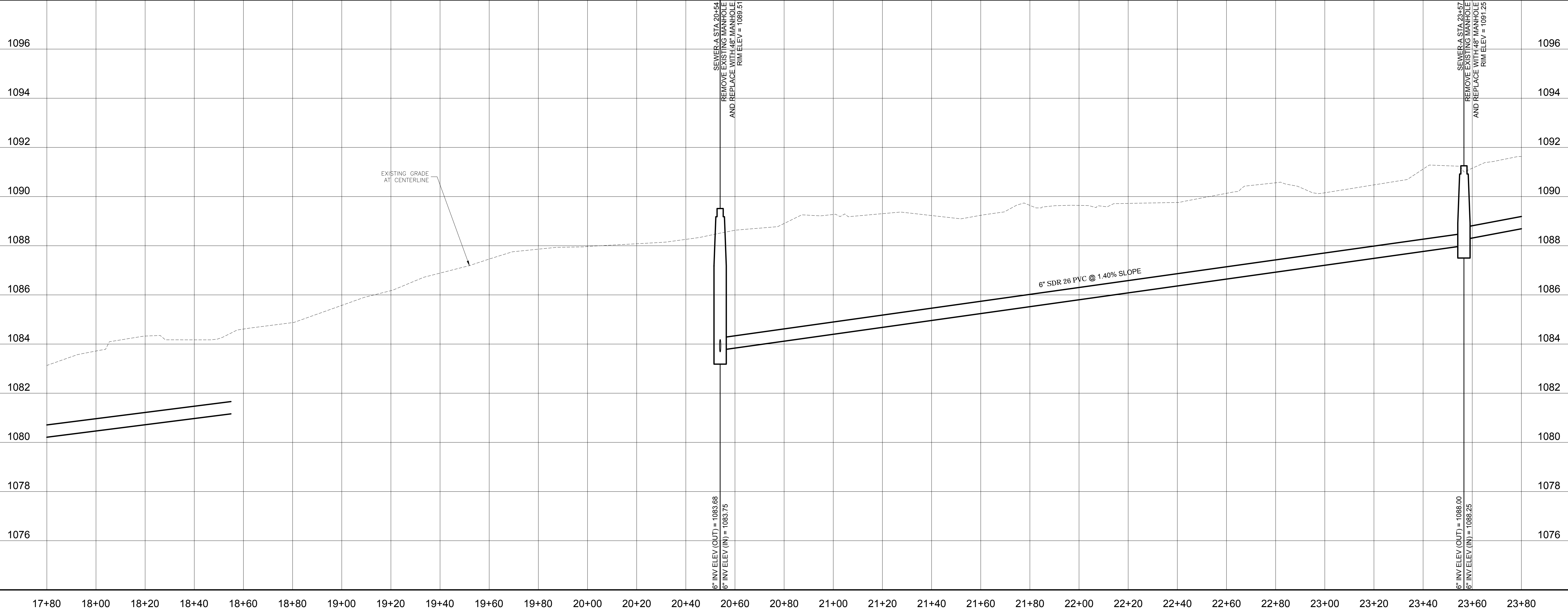
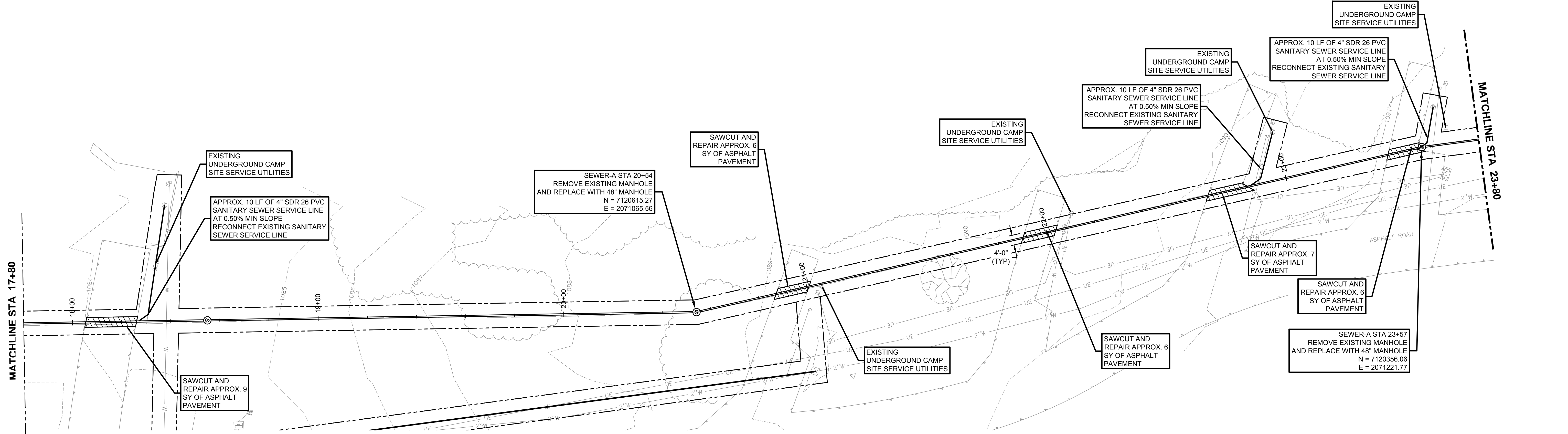
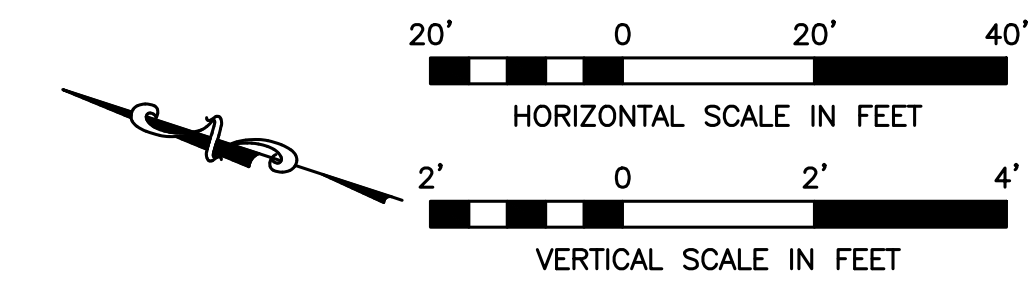
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PERCENTAGE 50% CD DOCUMENT

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WARNING!!!
 UNDERGROUND AND OVERHEAD UTILITIES IN AREA.
 CONTRACTOR TO CONTACT AREA UTILITY
 REPRESENTATIVE 48 HOURS PRIOR TO EXCAVATION.

600 LF OF 6" SDR 26 PVC
 SANITARY SEWER LINE



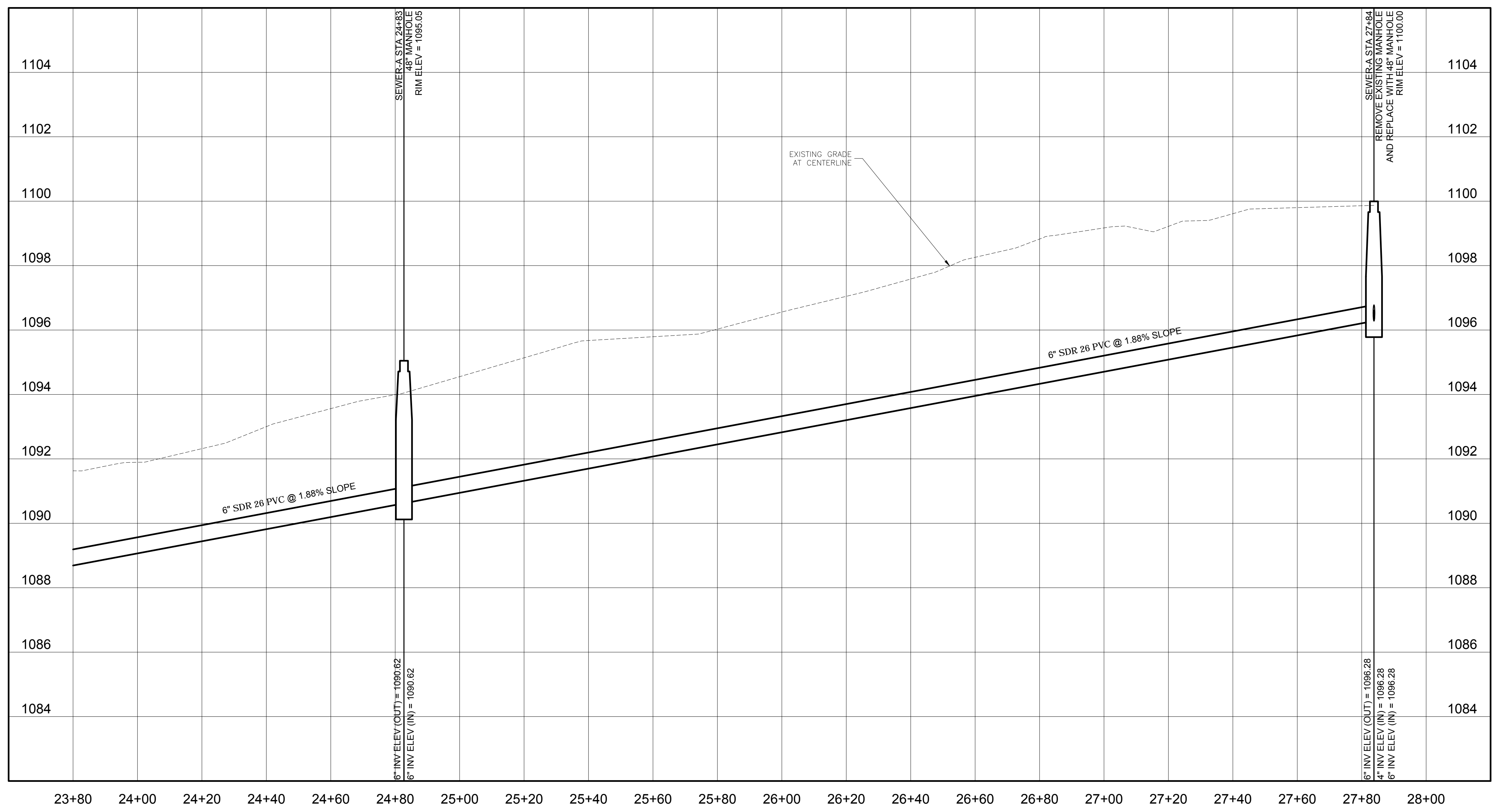
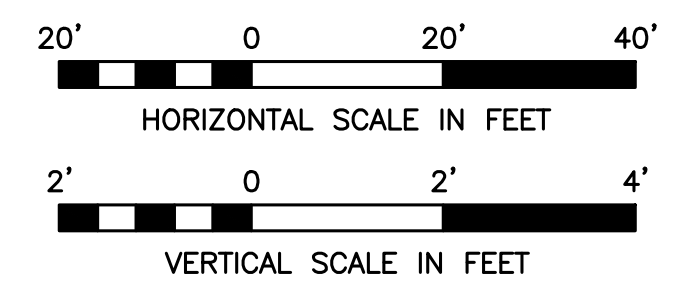
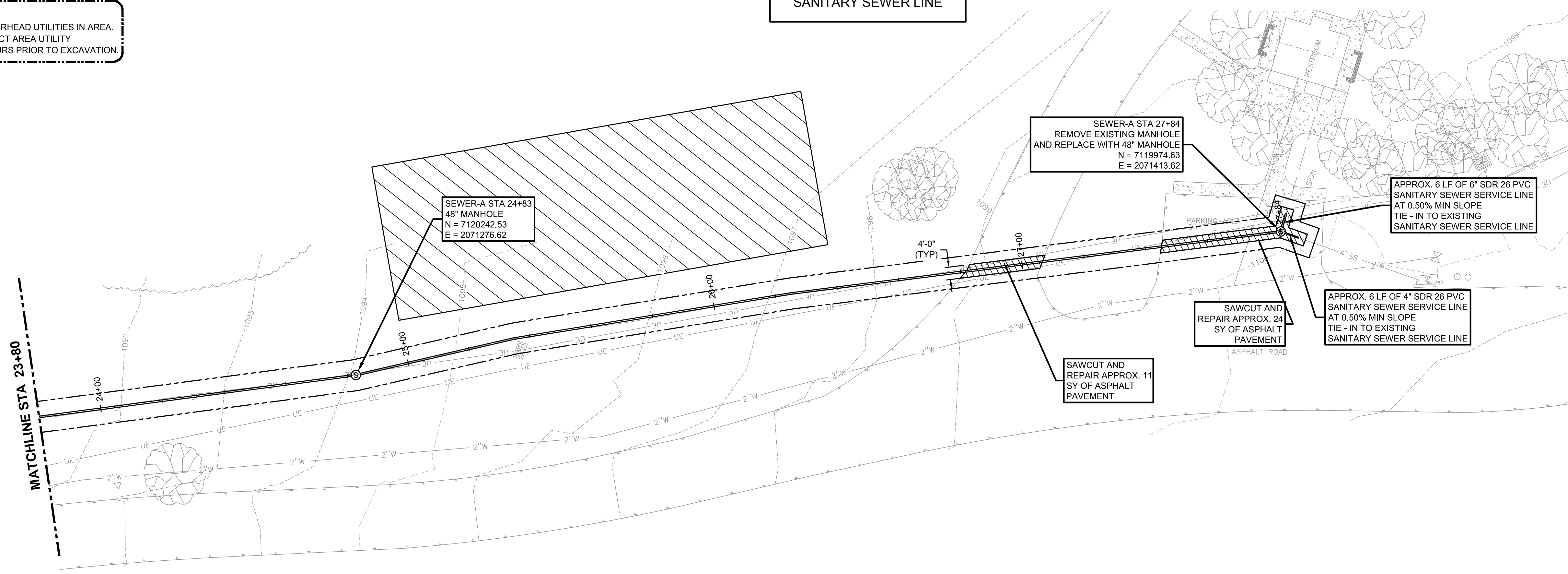
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 DRAWN BY: JAM
 REVIEWED BY: CBA
 REVISED:
 REVISED:

SHEET TITLE
 SEWER
 LINE A P&P
 4

SHEET NUMBER
 12
 OF 20

WARNING!!!
 UNDERGROUND AND OVERHEAD UTILITIES IN AREA.
 CONTRACTOR TO CONTACT AREA UTILITY
 REPRESENTATIVE 48 HOURS PRIOR TO EXCAVATION.

404 LF OF 6" SDR 26 PVC
 SANITARY SEWER LINE



FORT RICHARDSON STATE PARK
 WATER AND WASTEWATER SYSTEM REPLACEMENT

PROJECT NUMBER: 116818

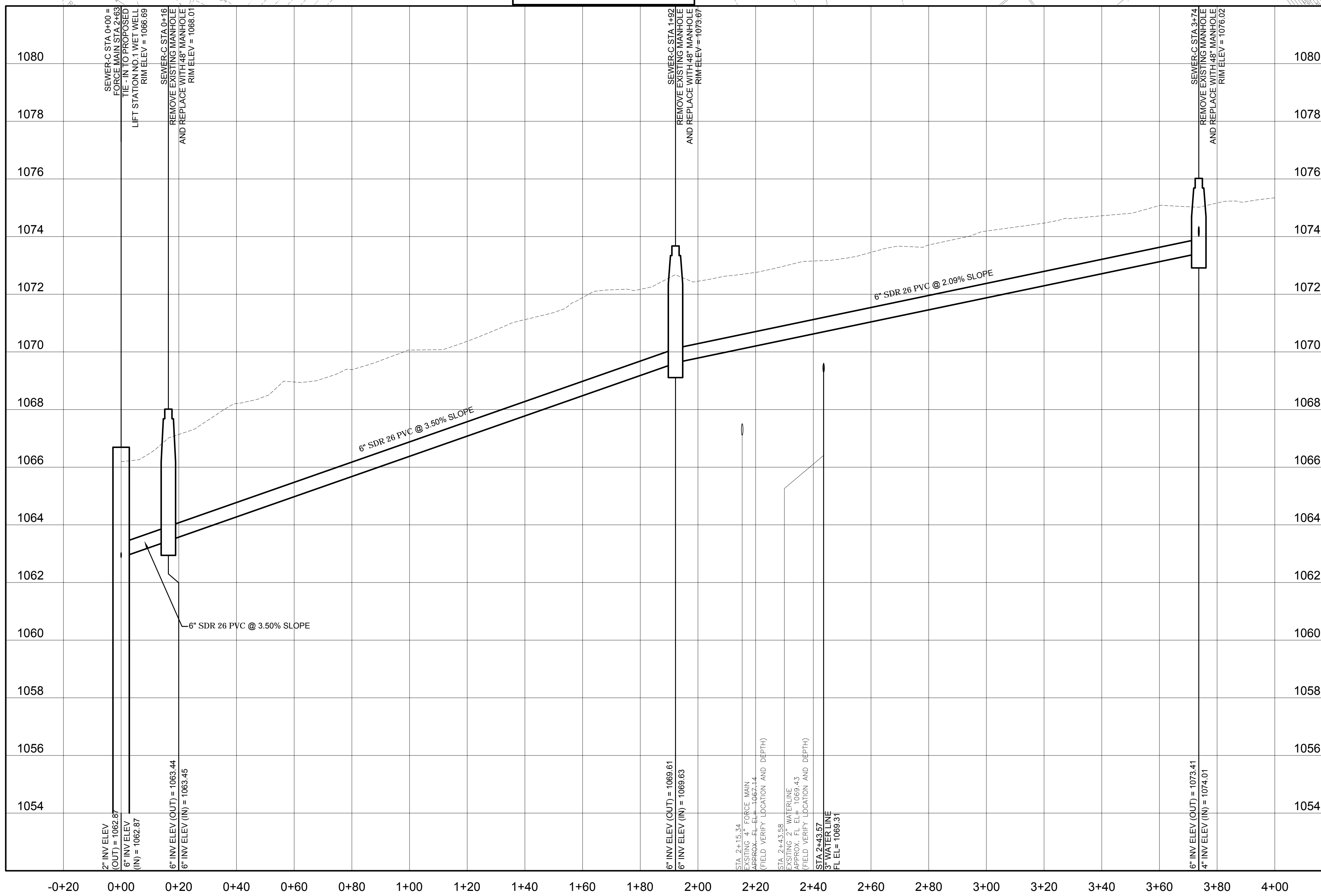
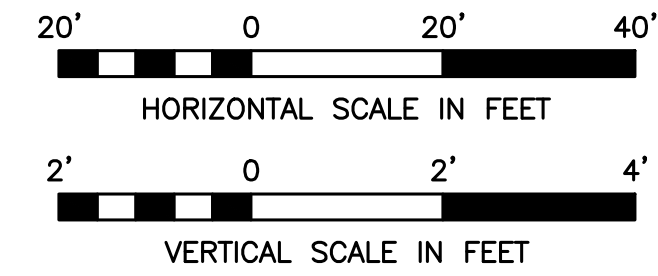
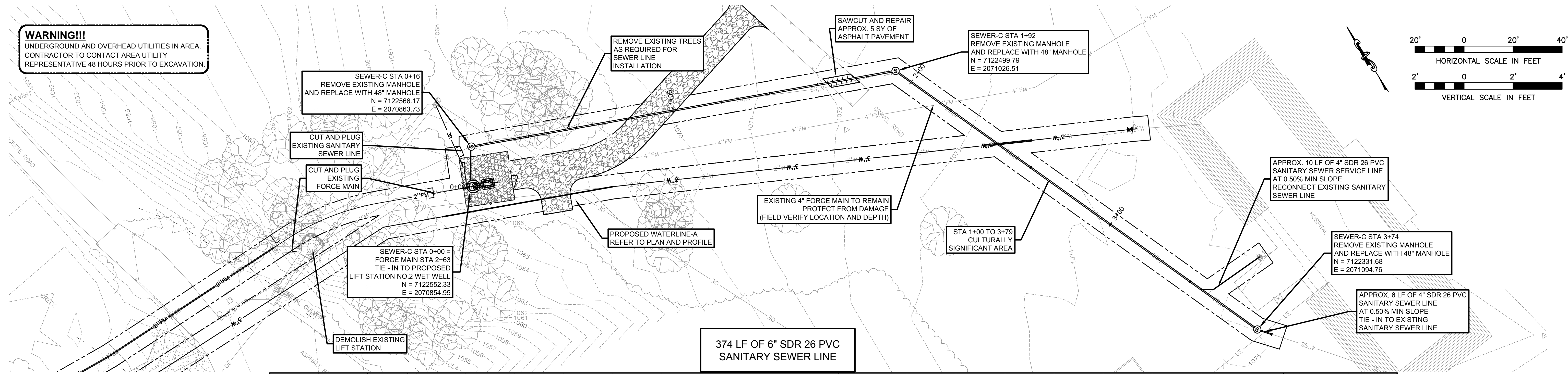
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 DRAWN BY: JAM
 REVIEWED BY: CBA
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SHEET TITLE
 SEWER
 LINE A
 P&P 5

SHEET NUMBER
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 OF 20

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WARNING!!!
UNDERGROUND AND OVERHEAD UTILITIES IN AREA.
CONTRACTOR TO CONTACT AREA UTILITY
REPRESENTATIVE 48 HOURS PRIOR TO EXCAVATION.



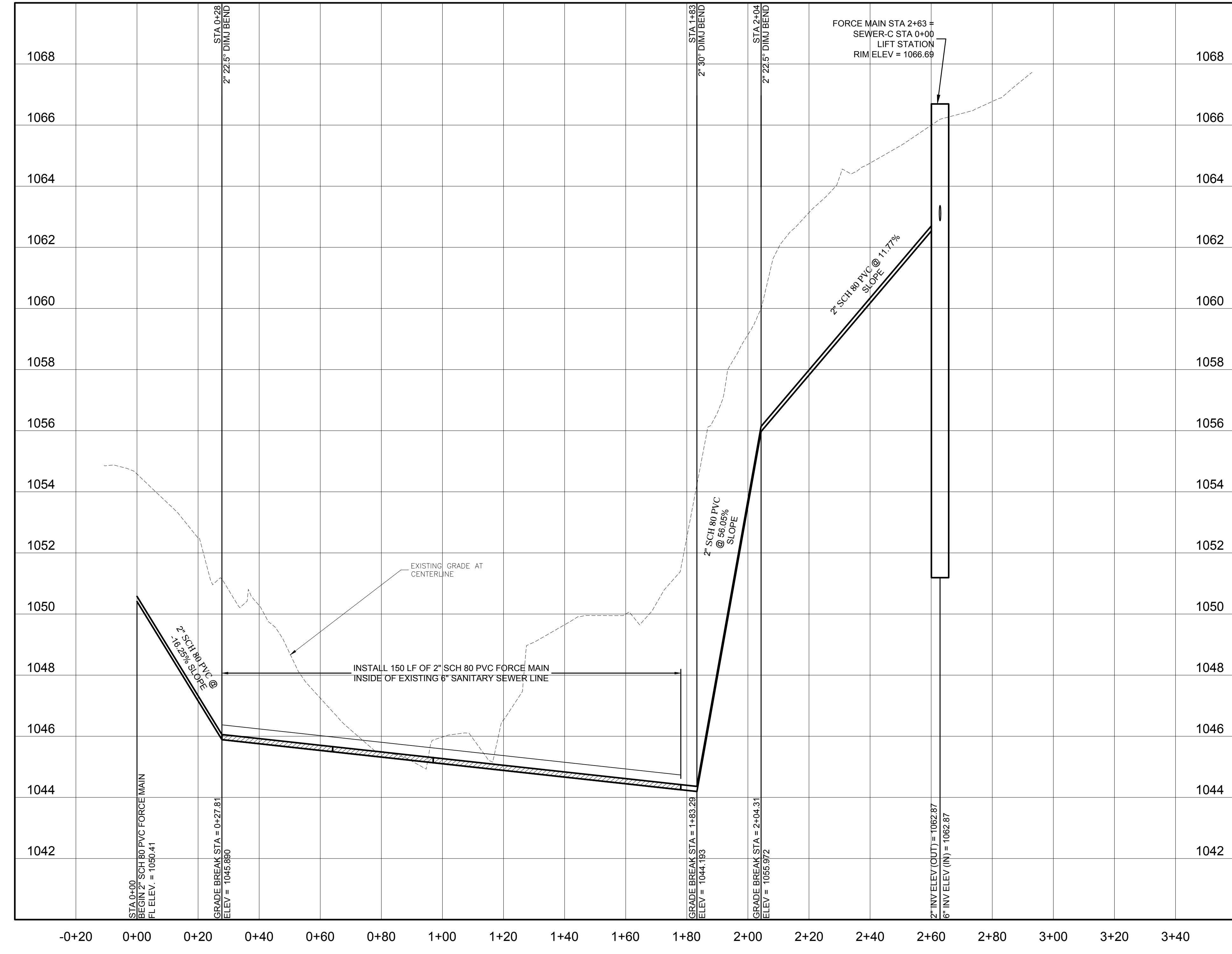
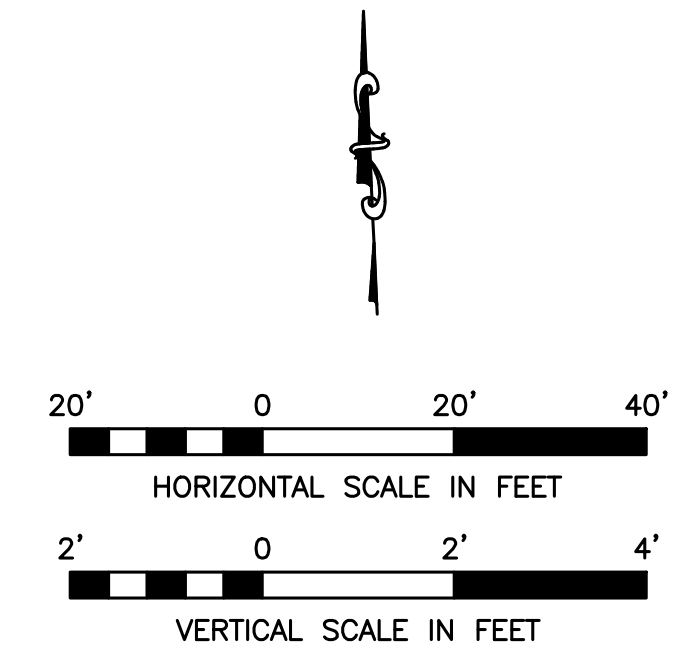
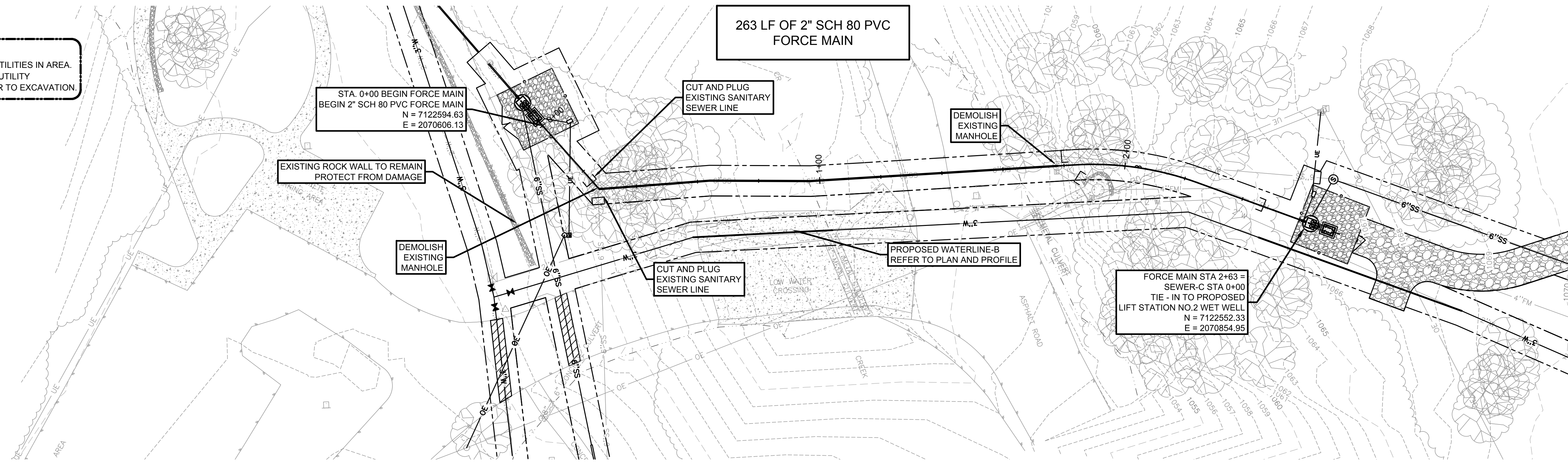
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DRAWN BY: JAM
REVIEWED BY: CBA
REVISED:
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SHEET TITLE
SEWER
LINE C
P&P

SHEET NUMBER
14
OF 20

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WARNING!!!
 UNDERGROUND AND OVERHEAD UTILITIES IN AREA.
 CONTRACTOR TO CONTACT AREA UTILITY
 REPRESENTATIVE 48 HOURS PRIOR TO EXCAVATION.



TEXAS
 PARKS &
 WILDLIFE

FORT RICHARDSON STATE PARK
 WATER AND WASTEWATER SYSTEM REPLACEMENT

PROJECT NUMBER: 116818

DATE: 3/10/17
 DESIGNED BY: CBA
 DRAWN BY: JAM
 REVIEWED BY: CBA
 REVISED:
 REVISED:

SHEET TITLE
 FORCE MAIN P&P

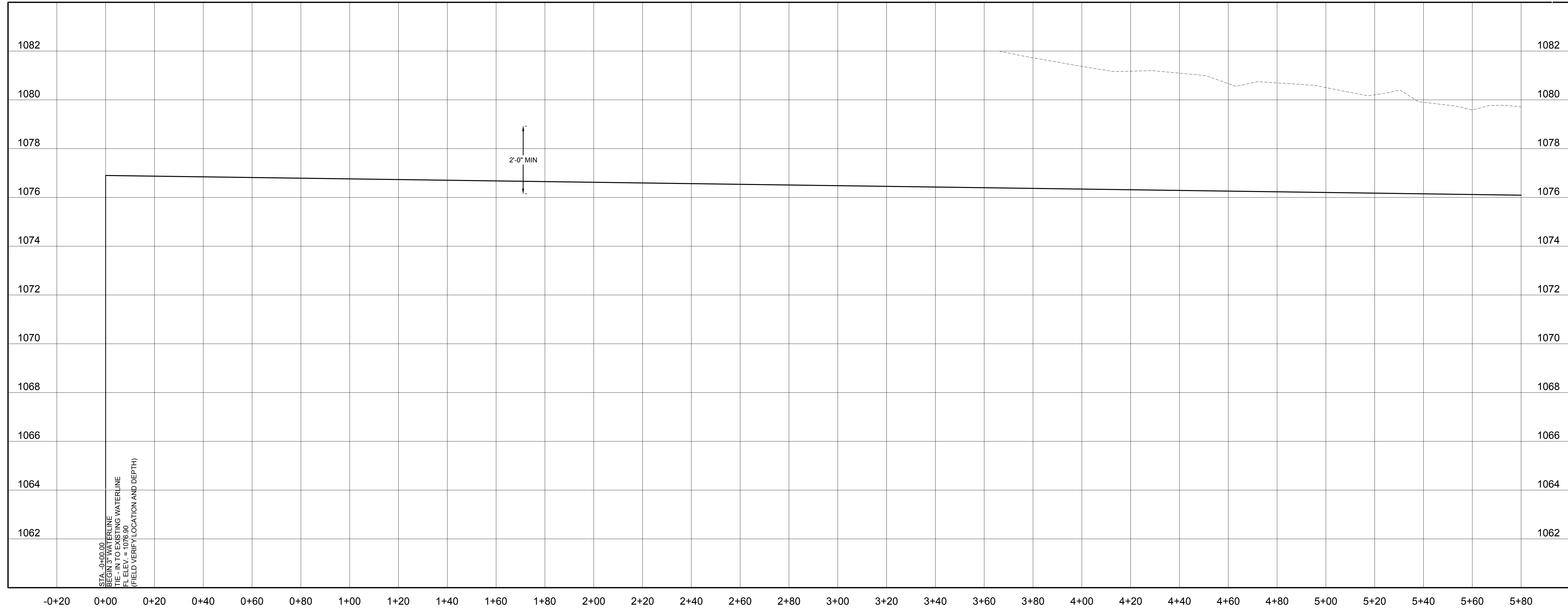
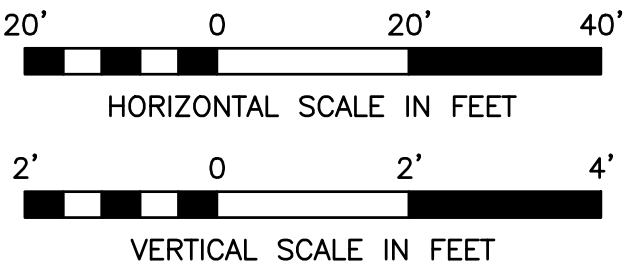
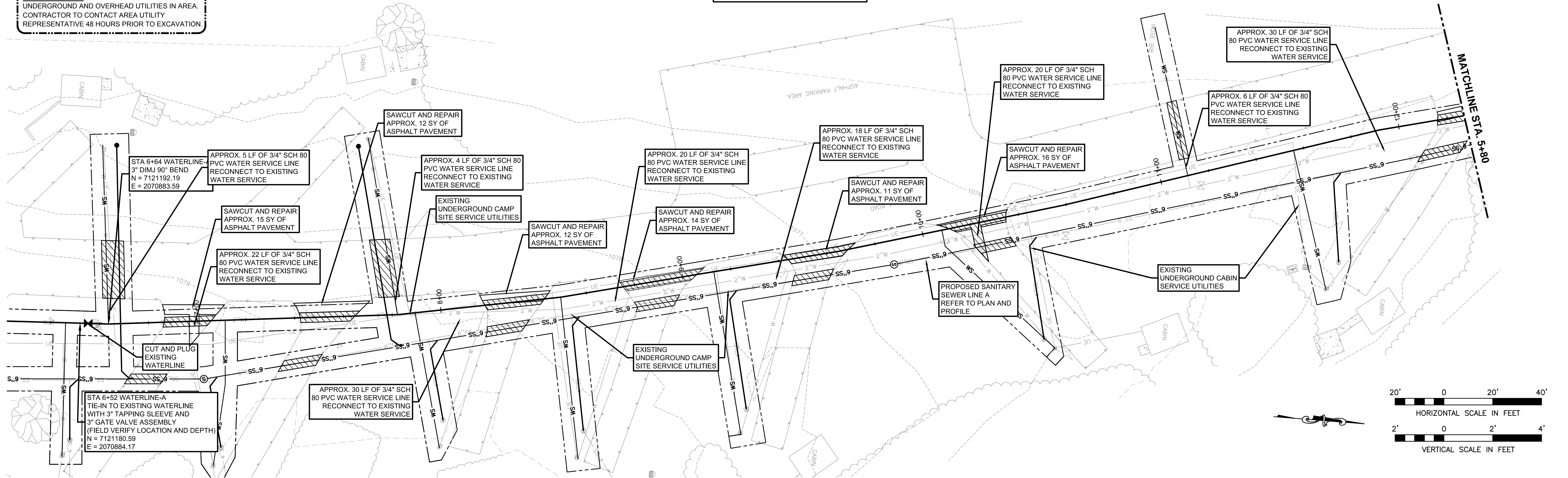
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PERCENTAGE 50% CD DOCUMENT

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WARNING!!!
 UNDERGROUND AND OVERHEAD UTILITIES IN AREA.
 CONTRACTOR TO CONTACT AREA UTILITY
 REPRESENTATIVE 48 HOURS PRIOR TO EXCAVATION.

580 LF OF 3" SDR 21
 PVC WATERLINE



DATE: 3/7/17
 DESIGNED BY: CBA
 DRAWN BY: JAM
 REVIEWED BY: CBA
 REVISED:
 REVISED:

SHEET TITLE
 WATERLINE A
 P&P-1

SHEET NUMBER
 16
 OF 20

FORT RICHARDSON STATE PARK
WATER AND WASTEWATER SYSTEM REPLACEMENT

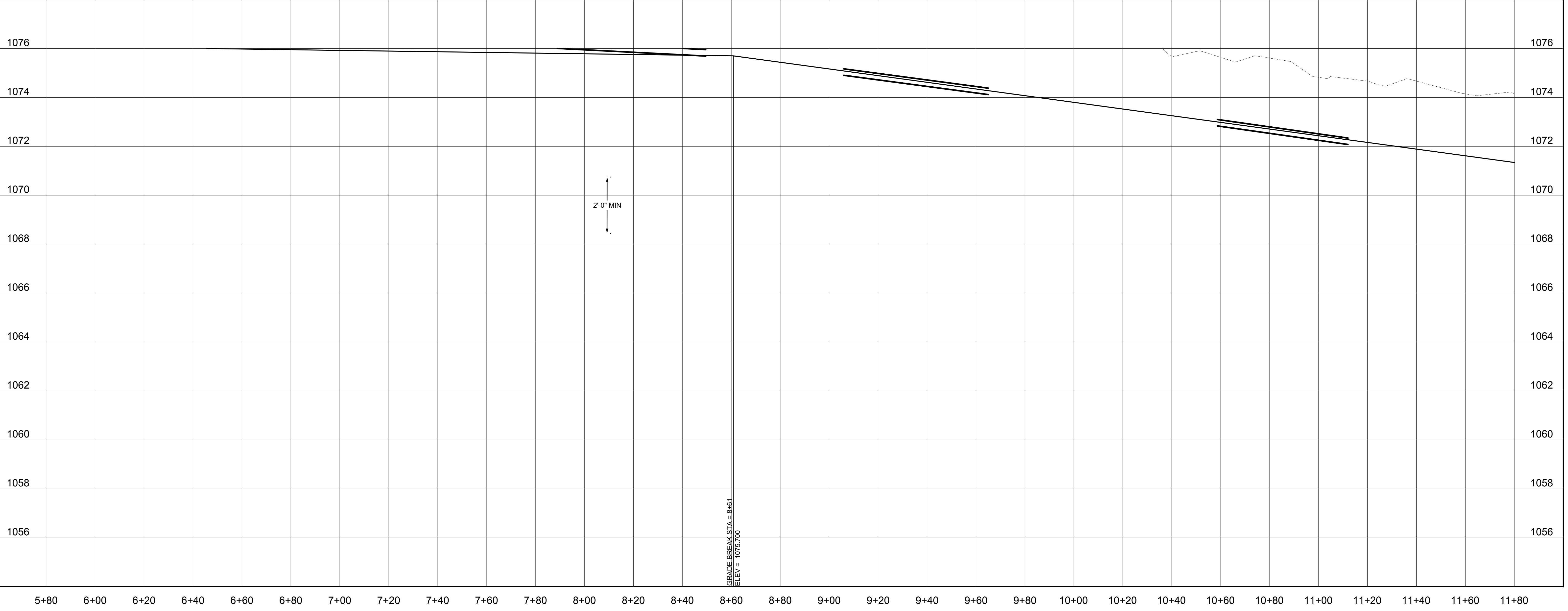
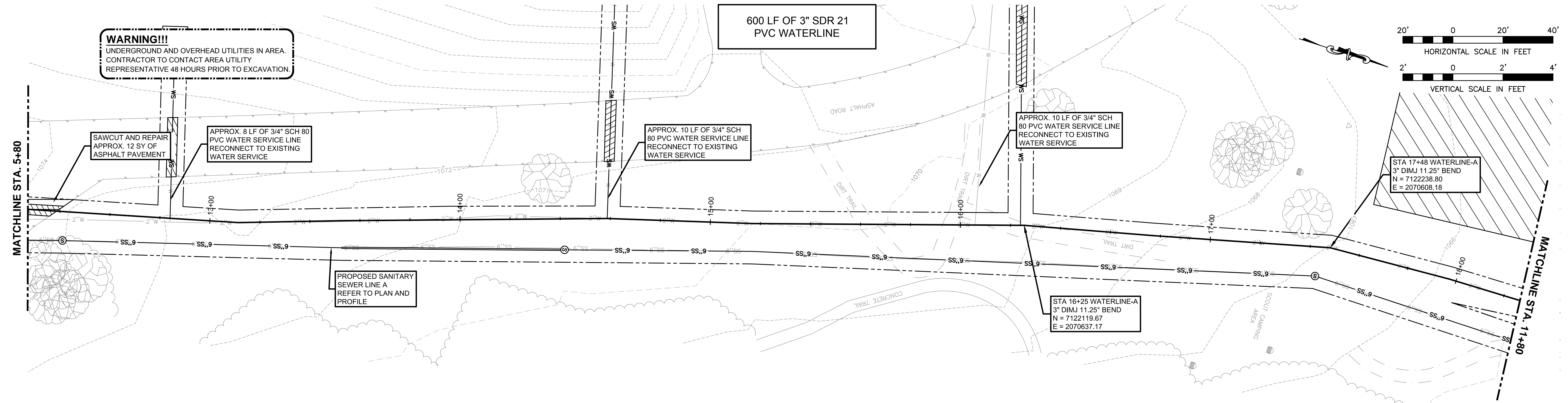
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REVISED:

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WATERLINE A
P&P-2

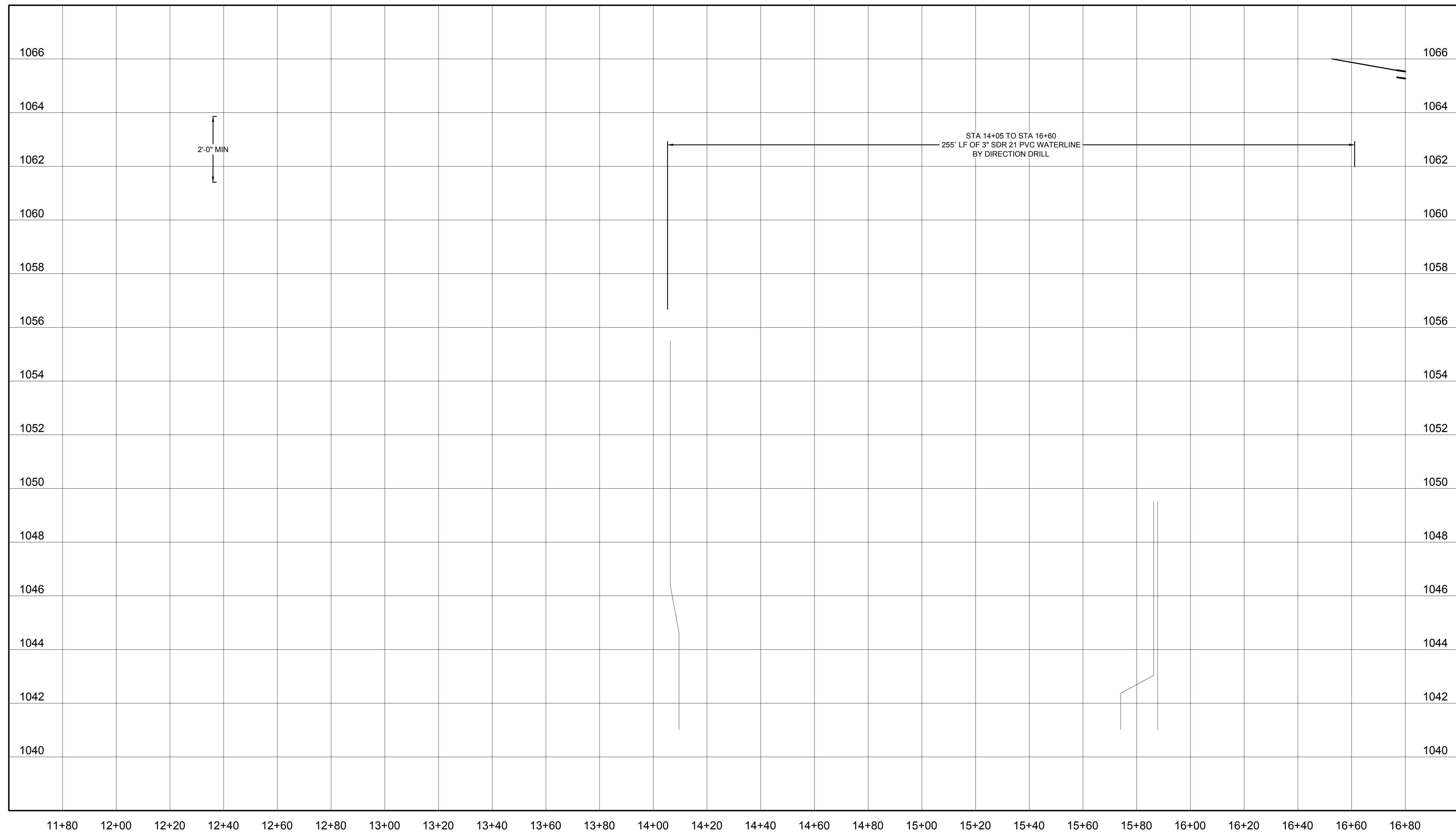
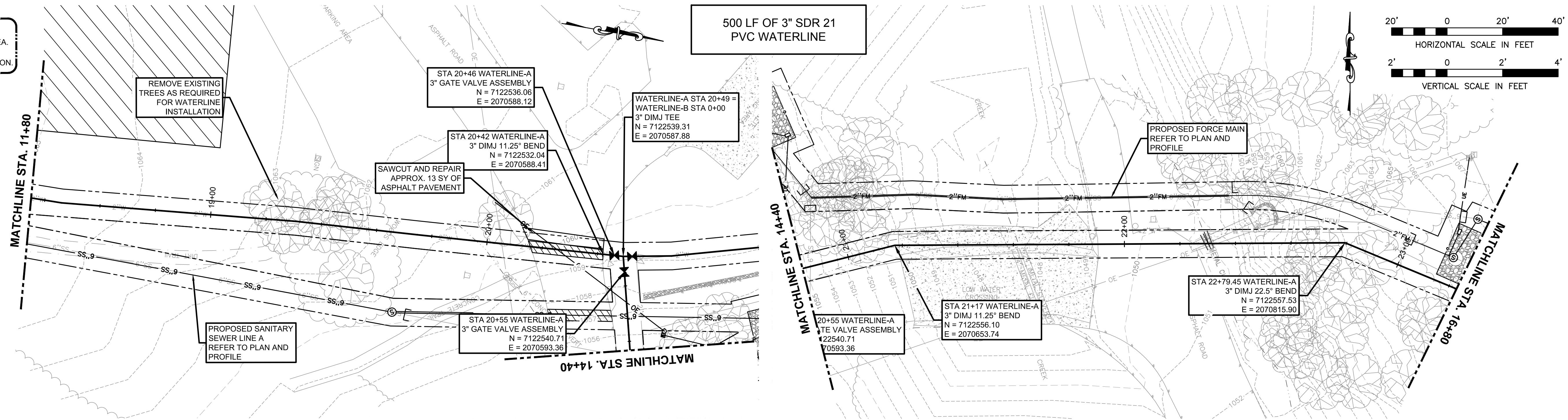
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PERCENTAGE 50% CD DOCUMENT



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WARNING!!!
 UNDERGROUND AND OVERHEAD UTILITIES IN AREA.
 CONTRACTOR TO CONTACT AREA UTILITY
 REPRESENTATIVE 48 HOURS PRIOR TO EXCAVATION.



DATE: 3/7/17
 DESIGNED BY: CBA
 DRAWN BY: JAM
 REVIEWED BY: CBA
 REVISED:
 REVISED:

SHEET TITLE
 WATERLINE A
 P&P-3

SHEET NUMBER
 18
 OF 20

Appendix B: Specimen Inventory

Lot No.	Unit No.	No. o	Material	Use Conte	Category	Subcategory	Color	Notes	Dates	Date Collected	Excavator
1	SF1	1	Glass		Vessel	Rim	Colorless			3/28/18	Brandy Harris
1	SF1	1	Glass		Vessel	Body	Colorless			3/28/18	Brandy Harris
2	SF2	1	Glass		Window		Colorless			3/28/18	Brandy Harris
2	SF2	5	Glass				Frosted		Post-1870	3/28/18	Brandy Harris
2	SF2	2	Glass		Vessel	Body	Aqua		1880-1920	3/28/18	Brandy Harris
2	SF2	7	Glass		Vessel	Body	Amethyst		1880-1920	3/28/18	Brandy Harris
2	SF2	1	Metal		Nail	Square			Pre-1890	3/28/18	Brandy Harris
2	SF2	2	Brick		Handmade		Red			3/28/18	Brandy Harris
3	SF3	6	Concrete				Gray		Post-1980	3/28/18	Brandy Harris
4	SF4	4	Glass		Vessel	Body	Amethyst		1880-1920	3/28/18	Brandy Harris
4	SF4	49	Glass				Frosted		Post-1870	3/28/18	Brandy Harris
4	SF4	5	Glass		Vessel	Rim	Colorless			3/28/18	Brandy Harris
4	SF4	1	Glass		Vessel	Body	Colorless	Embossed "E"	1880-1910	3/28/18	Brandy Harris
4	SF4	9	Glass		Vessel	Body	Brown			3/28/18	Brandy Harris
4	SF4	95	Glass		Window		Colorless			3/28/18	Brandy Harris
4	SF4	14	Glass		Vessel	Body	Colorless			3/28/18	Brandy Harris
4	SF4	24	Glass		Window?		Aqua	Flat		3/28/18	Brandy Harris
4	SF4	3	Metal		Nail	Wrought				3/28/18	Brandy Harris
4	SF4	16	Metal		Nail	Square				3/28/18	Brandy Harris
4	SF4	9	Metal		Nail	Wire				3/28/18	Brandy Harris
4	SF4	19	Metal		Nail	Wire Modern				3/28/18	Brandy Harris
4	SF4	1	Metal		Screw	Phillips				3/28/18	Brandy Harris
4	SF4	2	Metal		Screw					3/28/18	Brandy Harris
4	SF4	1	Metal	Clothes	Hook					3/28/18	Brandy Harris
4	SF4	1	Metal		Washer					3/28/18	Brandy Harris
4	SF4	1	Metal		Bottle Cap				1892-1994	3/28/18	Brandy Harris
4	SF4	4	Metal		Rings					3/28/18	Brandy Harris
4	SF4	1	Metal		Bullet Shell					3/29/18	Brandy Harris
4	SF4	1	Metal		Unknown	Fragment				3/29/18	Brandy Harris
4	SF4	2	Ceramic		Ironstone	Rim	White		1850-1940	3/29/18	Brandy Harris
4	SF4	3	Ceramic		Ironstone	Body	White		1850-1940	3/29/18	Brandy Harris
4	SF4	1	Ceramic	Clothes	Porcelain	Prosser Button			Post-1840	3/29/18	Brandy Harris
4	SF4	1	Faunal		Bird	Tibia				3/29/18	Brandy Harris
4	SF4	7	Brick		Handmade		Red			3/29/18	Brandy Harris
5	PH5	2	Glass		Vessel	Body	Aqua		1880-1920	3/29/18	Brandy Harris
5	PH5	4	Glass		Vessel	Body	Brown			3/29/18	Brandy Harris
5	PH5	10	Glass		Window		Colorless			3/29/18	Brandy Harris
5	PH5	1	Metal		Nail	Wire Modern				3/29/18	Brandy Harris
6	PH1	1	Metal		Nail	Square				3/29/18	Katie Canavan
7	PH2	1	Metal		Hinge					3/29/18	Katie Canavan
7	PH2	1	Brick		Handmade		Red			3/29/18	Katie Canavan
8	PH3	1	Metal		Nail	Square				3/29/18	Katie Canavan
9	PH4	1	Metal		Nail	Square				3/29/18	Katie Canavan
10	PH6	2	Metal		Nail	Square				3/29/18	Brandy Harris
11	PH7	1	Metal	Clothes	Buckle					3/29/18	Katie Canavan
11	PH7	1	Metal		Spike					3/29/18	Katie Canavan
12	PH8	1	Metal		Nail	Wire				3/29/18	Brandy Harris
13	PH9	1	Metal		Nail	Square				3/29/18	Brandy Harris
14	PH10	1	Metal		Unknown	Fragment				3/29/18	Doug Shaver
15	PH11	6	Metal		Nail	Square				3/29/18	Doug Shaver
15	PH11	1	Metal		Spike					3/29/18	Doug Shaver
15	PH11	3	Metal		Unknown	Fragment				3/29/18	Doug Shaver
16	PH12	1	Glass		Vessel	Body	Amethyst		1880-1920	3/29/18	Brandy Harris
16	PH12	1	Glass		Vessel	Body	Olive Amber		Pre-1900	3/29/18	Brandy Harris
16	PH12	4	Metal		Nail	Square				3/29/18	Brandy Harris
16	PH12	1	Metal		Unknown					3/29/18	Brandy Harris
16	PH12	1	Metal		Wire					3/29/18	Brandy Harris
16	PH12	1	Metal		Bottle Cap Liner				20th Century	3/29/18	Brandy Harris
17	PH13	1	Glass		Window		Colorless			3/29/18	Julie Shipp
17	PH13	4	Glass				Frosted		Post-1870	3/29/18	Julie Shipp
17	PH13	1	Glass		Vessel	Rim	Milk		Late 19th - Early 20th	3/29/18	Julie Shipp
17	PH13	1	Metal	Clothes	Snap					3/29/18	Julie Shipp
17	PH13	1	Metal		Nail	Square				3/29/18	Julie Shipp
17	PH13	2	Metal		Nail	Wire				3/29/18	Julie Shipp
17	PH13	1	Metal		Bullet Shell					3/29/18	Julie Shipp
18	PH14	4	Glass		Vessel	Body	Amethyst	Solarized	1880-1920	3/29/18	Brandy Harris
18	PH14	2	Glass		Vessel	Body	Colorless	Stippled		3/29/18	Brandy Harris
18	PH14	2	Metal		Nail	Wire				3/29/18	Brandy Harris
18	PH14	1	Metal		Wire	Cable		Conduit	1960s	3/29/18	Brandy Harris
19	PH15	1	Metal		Unknown	Fragment		Can?		3/29/18	Brandy Harris
20	PH16	1	Metal		Vessel	Lid				3/29/18	Brandy Harris
21	PH17	1	Metal		Wire					3/29/18	Brandy Harris
22	PH18	1	Metal		Unknown	Fragment				3/29/18	Brandy Harris

Appendix C: Monitoring Plan

Memo

To: Chris Aylor, PE., KSE Engineering
From: Julie Shipp, Cultural Resources Specialist, aci consulting
Subject: Monitoring Plan for Upgrades to the Water Distribution Systems at Fort Richardson State Park and Historic Site, Jack County, Texas
Date: August 24, 2018

aci consulting developed monitoring recommendations for the proposed upgrades to the water distribution systems at Fort Richardson State Park and Historic Site, Jack County, Texas. A monitoring plan was to be developed subsequent to the intensive pedestrian survey conducted in March, fitting to the results of the survey. Below is a brief summary of the survey findings and the recommendations for monitoring, which are limited.

Introduction

The Area of Potential Effect (APE) for the Fort Richardson State Park and Historic Site (FRSPHS) project is the water and wastewater replacement system which is approximately 1.49-miles in length with a 20-foot buffer, resulting in approximately 3.6 acres (1.46 hectares). In addition to the main water and waste water lines are two proposed lift stations, the replacement of nine manholes, four new manholes, and approximately eighteen trunk lines for waste water that emerge from the main waste water line to various campsites (Exhibit A).

Previous work on the current project

On March 28 and 29, 2018, aci consulting conducted a cultural resources survey of the Fort Richardson State Park and Historic Site in Jack County, Texas for the proposed wastewater system and lift stations. The Texas Parks and Wildlife Department (TPWD) proposes to replace a 50-year old wastewater system, water distribution system, and main lift station with a modernized and efficient system. The survey was conducted entirely within the Fort Richardson National Historic Landmark and within the boundary of previously recorded site 41JA2, which is the historic U.S. Army Post. An area for a proposed new lift station near the historic buildings including the hospital, morgue and bakery buildings was scraped and metal detected. This work was conducted in compliance with Texas Administrative Code (13 TAC 26) under Texas Antiquities Code permit number 8362, as well as Section 106 of the National Historic Preservation Act of 1966, as amended. The survey did not result in the location of any new archeological sites, historic structures, or additional historic properties.

The entire APE was surveyed with a metal detector. It was decided in the field to shovel test only in places with metal detector hits. A total of 46 shovel tests were excavated, of which 41 were positive, in addition to 4 surface expressions. Fifteen shovel tests were excavated in medium to high probability area near the hospital. The artifacts primarily included metal artifacts such as square nails and unidentified fragments. This area of the proposed alignment also included significant surficial expressions of historic artifacts, primarily consisting of glass fragments. Twenty-seven shovel tests were excavated in high probability area, including the mechanically scraped area near the proposed site for Lift Station No. 2. An additional four shovel tests were excavated along the southern portion of the proposed alignment after positive indication per the metal detector.

The results of the metal detector and pedestrian survey within the APE showed that there is shallow soil in all areas of the project, and often bedrock at surface. An historic artifact scatter was located on the surface near the historic fort hospital, and some artifacts were located by metal detector approximately 5-10 centimeters below ground surface. The majority of the artifacts were glass shards and metal specimens, primarily nails. Nails and other metal artifacts were also located within 10 centimeters of the ground surface at the proposed lift station approximately 75 meters from the hospital building perimeter, and within view of the hospital. The artifacts collected during the survey are representative of the types of artifacts that may be encountered during the construction of the water lines and lift stations.. Some of these artifacts (e.g. square nails) are consistent with modern materials used in maintenance of the historic building envelope. There were metal detector hits outside of the area of the historic hospital, but none of those specimens were historic artifacts or related to the archeological site 41JA2.

Recommendations for Monitoring

No significant portions of the Fort Richardson Historic Site (41JA2) should be affected by the proposed upgrades to the water and wastewater systems at the park. The artifacts recovered were at the surface or were shallowly buried (10 cm). The manholes near the hospital are being replaced and are not new, and thus those areas are already disturbed. The newly disturbed areas of water line and the two proposed lift stations are located in areas of shallow soil with exposures of bedrock at surface. It is not appear necessary to have an archeologist on site during construction.

Fort Richardson State Park and Historic Site was listed on the NRHP in 1983. Any modifications to the cultural landscape, such as above ground intrusions related to the proposed project should be considered as impacts to the site and subject to additional review. The current scope of work was to: intensively survey within the limits of construction and make recommendations for additional resource management planning. Therefore, it is the professional opinion of aci that monitoring of construction within the currently defined limits of construction are not warranted (except for inadvertant discoveries), but that cultural landscape and viewshed impacts should be considered as part of a comprehensive monitoring plan. Also, archeological monitoring of construction for additional impacts may be necessary.