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Short Report On The Archeological Investigations For Haskell County's Paint Creek Water Improvements Project, Haskell County, Texas

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Short Report On The Archeological Investigations For Haskell County's Paint Creek Water Improvements Project, Haskell County, Texas

SHORT REPORT ON THE ARCHEOLOGICAL INVESTIGATIONS FOR HASKELL COUNTY'S PAINT CREEK WATER IMPROVEMENTS PROJECT, HASKELL COUNTY, TEXAS

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Josh Haefner

Written by:
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Antiquities Permit #7302

Submitted to:
HowCo and Haskell County

Hicks & Company Archeology Series #270

August 2015

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PROJECT DESCRIPTION AND MANAGEMENT SUMMARY

Hicks & Company archaeologists, working on behalf of HowCo, Incorporated, and Haskell County (the County), recently conducted an intensive archaeological survey for the County's proposed Paint Creek Water Improvements Project, located east of downtown Haskell in Haskell County, Texas. According to current design plans, the proposed project consists of the installation of a new water well and approximately 3,670 meters (m) of new, 15 centimeter-diameter, waterline within a 10 meter-wide corridor (**Appendix A:** Design Plans). Depth of impacts for the waterline installation is expected to be no more than 1.25 meters below ground surface.

The project will be funded through a Texas Community Block Grant Program, as managed by the Texas Department of Agriculture, a political entity of the state of Texas, and is therefore subject to the Antiquities Code of Texas (ACT). This project was initially reviewed by the Texas Historical Commission (THC) in 2015. Following this review, the THC recommended that archeological survey was warranted for the waterline segment located along Callaway Road between State Highway (SH) 380 and East Road, a distance of approximately 1,540 m (**Figure 1**). According to the THC, this segment had never been surveyed and, being adjacent to Buffalo Creek, is located within an area of high probability for cultural resources (letter Wolfe to Howard May 6, 2015: See **Appendix B:** Regulatory Correspondence).

Totaling approximately 16 field hours, archeological investigations were conducted on June 22 and 23, 2015, and consisted of pedestrian survey of the Callaway Road segment, supplemented with 13 shovel tests, all of which were negative for cultural materials. In addition to these shovel tests, one backhoe trench was excavated just south of Buffalo Creek. No artifactual materials greater than 50 years in age, features, or archeological sites were encountered during this investigation. Based on the results of the current survey, it is recommended that no archeological historic properties (36 CFR 800.16(1)) or State Antiquities Landmarks (SALs) (13 TAC 26.12) will be affected by the proposed project and no further archeological investigations are recommended prior to construction.

Josh Haefner, as Principal Investigator, and Gregg Cestaro, as Project Archeologist, conducted the investigations and authored the report. As Geographic Information System (GIS) specialist, Jerod McCleland produced all maps and graphics. In addition to this Project Description and Management Summary, this report includes sections on Environmental Setting, Methodology, Results of the Field Investigations, and Conclusions and Recommendations. Also included, as appendices, are design plans illustrating the various design segments (**Appendix A**), regulatory correspondence (**Appendix B**), and shovel test and backhoe trench locations (**Appendix C**). All project-generated notes, forms, and photographs will be curated at the Center for Archeological Studies (CAS) in San Marcos, Texas. This report is offered in partial fulfillment of Texas Antiquities Permit #7302.

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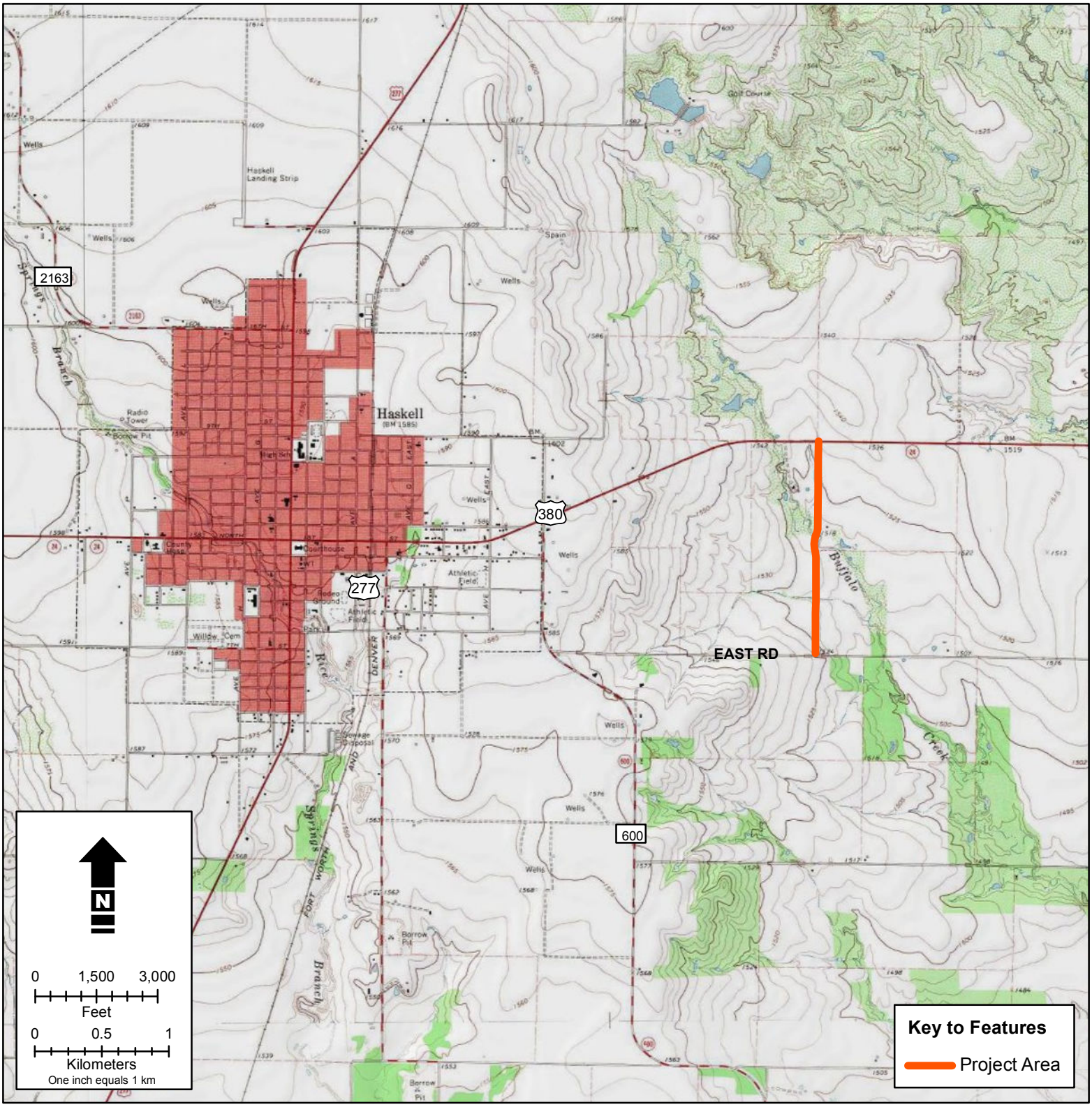
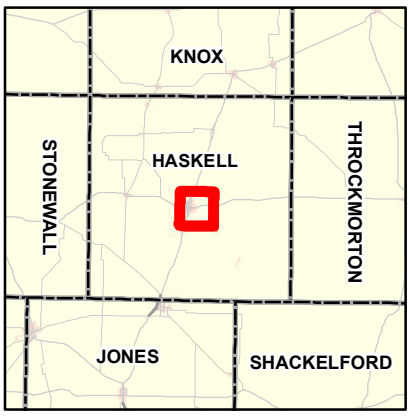


Figure 1
Project Location

USGS 7.5-minute Topographic Quadrangle:
Haskell (USGS# 33099-B6), TX



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ENVIRONMENTAL SETTING

Physiography

According to the Bureau of Economic Geology, the proposed project area is located in the North Central Plains region of Texas (Wermund 2015). This area is a heavily eroded surface of the Upper Paleozoic and is characterized by meandering rivers that have eroded softer shales and sandstones, creating gently rolling hills and plains. In areas of sandstone and limestone, erosion has created steep slopes and severely dissected riverine edges. The North Central Plains rise in elevation from 900 feet to 3000 feet above sea level. Flora for the area transitions from mesquite and lotebush in the west to oak, ash and juniper stands in the east.

Geology and Soils

According to the Geologic Atlas of Texas, Wichita Falls-Lawton Sheet, the underlying geology of the proposed project area consists entirely of the Clear Fork Group (Barnes 1987). This formation is dominantly mudstone, commonly silty, brownish-red in color with calcareous nodules present in its lower parts. Dating to the Cretaceous, which long predates human arrival in the Americas, cultural deposits in such areas can be expected to be contained within overlying soils/sediment or on the surface itself.

Four soil series have been mapped as underlying the proposed project area: Vernon clay loam; Miles fine sandy loam; Wheatwood silty clay loam; and Tillman clay loam (USDA NRCS 2015b). Vernon clay loam is described as moderately deep soils that are found on gently sloping to steep plains and escarpments (USDA NRCS 2015a). These soils are derived from residuum weathered from bedrock or dense clays of Permian age. The Miles series is noted to consist of very deep, well drained soils formed in loamy materials dating from the Pleistocene to the Permian. These soils are most often located on nearly level to moderately sloping terrace pediments or dissected plains. Consisting of very deep, well drained soils formed from calcareous loamy alluvium, the Wheatwood Series is typically located on nearly level to gently sloping flood plains of rivers and wide creeks. The Tillman series is composed of very deep, well drained soils formed in loamy and clayey alluvium parented from Permian age redbed clays and claystone.

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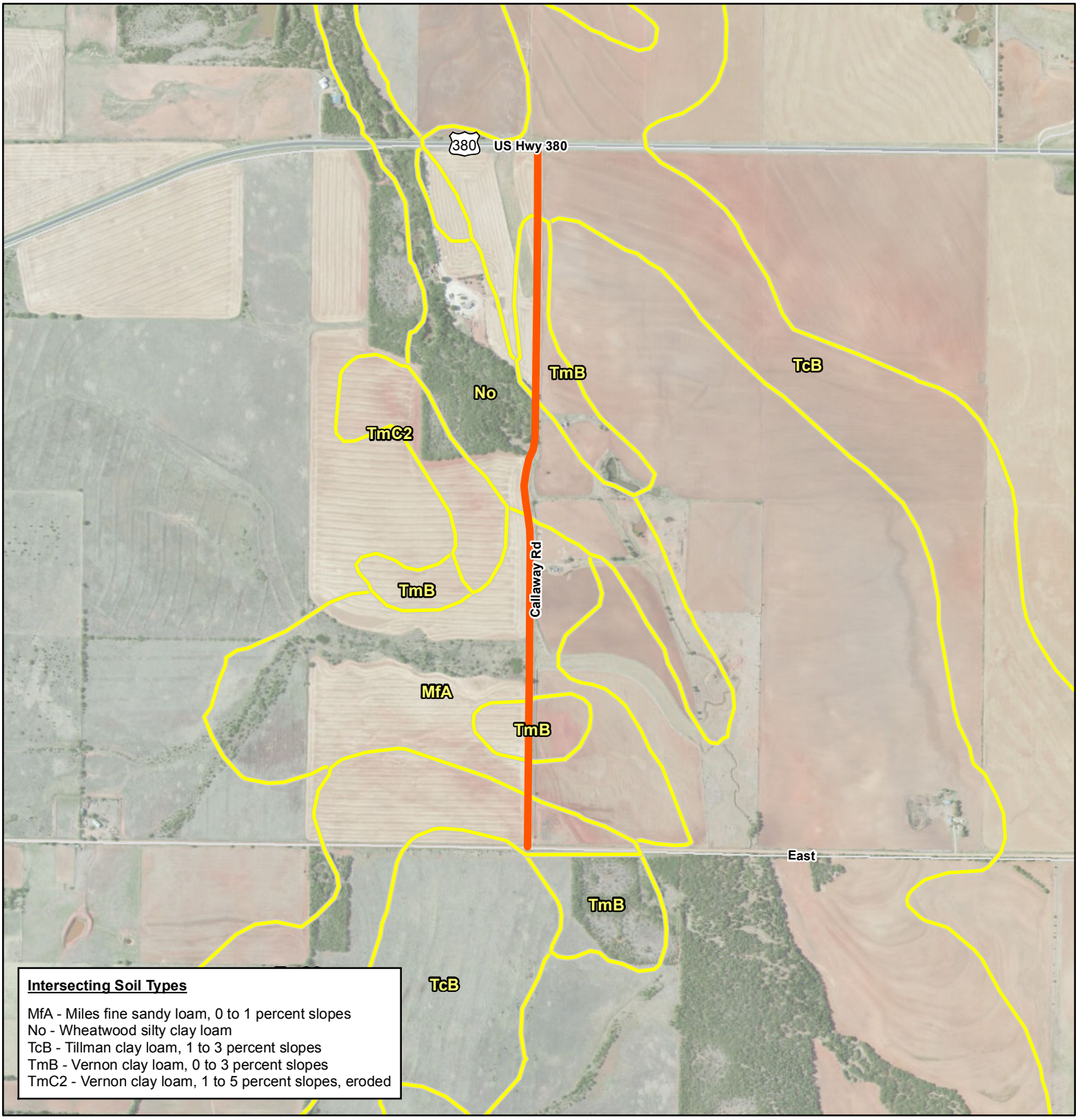

N

0 480 960
Feet

0 150 300
Meters

One inch equals 300 m

Figure 2
Project Area
Geology & Soils

Key to Features

Project Area

Soil Boundaries

Entire view of this map is located within the Pcf - Clear Fork Group Geologic Formation

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METHODOLOGY

During initial consultation between the THC and Haskell County it was noted that the "proposed project area has never been formally surveyed" and that the proposed location "is situated in a topographic location with moderate to high potential for the presence of previously unrecorded cultural resources" which warranted survey before initiation of construction (See **Appendix B**: letter from Wolf to Howard, May 6, 2015). In preparation for survey, Hicks & Company staff conducted background research utilizing the THC's Archeological Sites Atlas (the Atlas) online database in order to identify previous cultural resources survey efforts and determine locations of cultural resources within the vicinity of the proposed project.

Previous Investigations

According to the Atlas (2015b), no survey-level investigations or previously recorded sites have been previously conducted within one kilometer of the proposed project area. Located approximately 14,000 meters east of the project location, the nearest recorded site is 41HK25. Site 41HK25 is described as a moderate to heavy lithic scatter, deposited on the surface across an area approximately 3,000 square meters in size. The nearest cemetery to the project area is Willow Cemetery, located in the City of Haskell, approximately 4,300 meters to the west.

Field Methodology

During the field investigations, Hicks & Company archeologists traversed the entirety of the survey area in a single transect. A total of 13 shovel tests were excavated during the survey. In addition, a single backhoe trench was excavated just south of Buffalo Creek. Excavation intervals conformed to the minimum standards outlined by the THC and the Council of Texas Archeologists' practices and procedures (13 TAC 26.5 and 26.20) (THC 2015a), generally conforming to one excavation per 100 m, with spacing widened slightly in areas of greater than 30 percent ground surface visibility. Subsurface test locations were recorded using GPS technology with sub-meter accuracy. Shovel tests were excavated to impenetrable clays or bedrock and sediment from all shovel tests was screened through ¼-inch hardware cloth. The single conducted backhoe trench was excavated to well below the anticipated depth of impacts.

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RESULTS OF FIELD INVESTIGATIONS

On June 22 and 23, 2015, Hicks & Company archaeologists performed an intensive linear survey, supplemented by shovel testing and backhoe trenching for the segment of Haskell County's Paint Creek Water Improvements project located along the western extent of Callaway Road, a distance of approximately 1540 m. Impacts along this segment consist of the installation of new waterline to be located between the existing road limits and current property lines (see **Appendix A:** Design Plans). During survey, it was noted that much of the proposed waterline will be placed within an existing drainage ditch that runs parallel to Callaway Road, with an approximate average depth of 50 cmbs (**Figure 3**).

Field investigations initiated at the intersection of SH 380 and Callaway Road and proceeded south to the intersection of Callaway Road and East Road. During survey, variable levels of disturbance were noted, including the construction of the above-mentioned drainage ditch and, recently from plowing and harvesting of adjacent agricultural fields (**Figures 4** and **5**). In total, 13 shovel tests (STJH1-STJH6, and STGC1-STGC7) were excavated within the proposed waterline corridor (**Table 1**). These excavations noted very silty clay and sandy loams ranging from dark yellowish brown (10YR 3/4) to red (2.5YR 4/6) in color, with inclusions of gravel and rounded and angular igneous and sedimentary cobbles that decreased in density from the upper stratum to the lower stratum. These shovel tests terminated at depths between 10-63 centimeters below surface (cmbs) within thick clay loams, or within water inundation, a result of recent torrential rains. None of these shovel tests were positive for cultural materials and no sites or cultural features were noted within or immediately adjacent to the project area.

Figure 3: Overview of project area with drainage ditch at center, facing north from STJH1.

Figure 4: Overview facing south along Callaway Road from SH 380.

Figure 5: Overview facing north along Callaway Road from East Road.

Table 1: Shovel Test Data.							
Shovel Test	**Level**	**Depth (cmbs)**	**P=Pos N=Neg**	**Munsell**	**Soil Texture Description**	**Inclusions**	**Notes**
STJH1	1	0-50	N	10YR 3/4	Silty Clay Loam	Rootlets	Moist. Terminated at water table.
STJH2	1	0-20	N	10YR 3/4	Silty Clay Loam	Rootlets	
	2	20-60+	N	7.5YR4/6	Clay Loam		Terminated within thick clay loam.
STJH3	1	0-10	N	10YR 4/6	Silty Clay Loam	Rootlets	
	2	10-28	N	2.5YR 4/6	Clay Loam		
	3	28-63	N	7.5YR 5/1	Clay Loam	Grit and gravel	Terminated within thick clay loam.
STJH4	1	0-10	N	10YR 4/6	Silty Clay Loam	Rootlets	
	2	10-28	N	2.5YR 4/6	Clay Loam		
	3	28-70	N	7.5YR 5/1	Clay Loam	Grit and gravel	Terminated within thick clay loam.
STJH5	1	0-20	N	7.5YR 3/5	Clay Loam	Rootlets	
	2	20-45	N	10YR 4/3	Clay		Terminated within thick clay loam.
STJH6	1	0-10	N	10YR 4/3	Silty Clay Loam	Rootlets	Disturbed- road gravel below top-sediment.
STGC1	1	0-33	N	10YR 4/4	Silty Clay Loam	60% Grit and gravel	Quartzite and granitic gravel and cobbles.
	2	33-58	N	10YR 5/6	Silty Loam	20% Grit and gravel	Large cobble terminates test
STGC2	1	0-40	N	10YR 4/4	Silty Clay Loam	20% Grit and gravel	Some mottles of 10YR 4/5. Water table at 40 cmbs.
STGC3	1	0-35	N	10YR 4/4	Silty Clay Loam	10% Grit and gravel	Water table at 40 cmbs.
STGC4	1	0-38	N	10YR 4/4	Silty Clay Loam	10% Grit and gravel	Some Mottles of 10YR 4/5 sand. Water table.
STGC5	1	0-50	N	7.5YR 3/4	Silty Clay	5% Grit and gravel	Harder clay at terminus.
STGC6	1	0-35	N	7.5YR 3/4	Silty Clay Loam		Recently plowed field.
STGC7	1	0-10	N	7.5YR 3/4	Silty Clay Loam	5% Grit and gravel	Plowed field. Quartzite granitic gravel cobbles.

In addition to the above-described shovel tests, a single mechanical backhoe trench (BHT1), approximately 5 meters in length and oriented parallel to Callaway Road, was excavated at the southern edge of Buffalo Creek (**Figure 6**). Stratum 1 of BHT1, extending from 0-40 cmbs, was noted to be a reddish brown (2.5YR 5/4) silty clay with a moderate amount of gravel and rounded cobble inclusions. Initiating at a diffuse boundary, Stratum 2 was noted to be a reddish brown (2.5YR 5/4) silty clay with smaller and more granular inclusions of rounded gravel. It was in the lower part of this stratum, at 70—80 cmbs, that fragments of a highly deteriorated thin-walled metal jar with evidence of exterior enameling was noted. Also noted near this depth in the west wall were two isolated charcoal fragments (**Figure 8**). In order to further explore these occurrences in plan-view, sediment above this level was excavated to approximately 65 cmbs and then shovel scraped to 85 cmbs (**Figure 9**). This widening of BHT1 yielded no additional charcoal or artifacts and only localized oxidation surrounding the exposed carbonized wood. The jar fragments contained no distinct maker's marks or other definitively datable adornments making temporal assignment beyond early to late 20th Century impossible. A direct association between this artifact and the charcoal staining, which could well be root-burn, is spurious at best. As such, these occurrences are not considered to be an archeological feature or site. Stratum 2 terminates at a distinct and wavy boundary, 80 cmbs. Strata 3 was observed to be a red (2.5YR 5/6) sandy loam. Excavations were terminated within this stratum at130 cmbs, well below the anticipated depths of impacts associated with the waterline installation.

Figure 6: Overview of Buffalo Creek, facing west from Callaway Road.

Figure 7: East wall of BHT1. Carbon and enameled jar level at bottom of darker silt clay layer.

Figure 8: Plan view of BHT1 exposed to 80 cmbs.

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CONCLUSIONS AND RECOMMENDATIONS

Archeological investigations for Haskell County's Paint Creek Water Improvements Project revealed no archeological sites or features greater than 50 years in age. Based on the results of the current survey, it is recommended that no archeological historic properties (36 CFR 800.16(1)) or SALs (13 TAC 26.12) will be affected by the undertaking and no further cultural resource investigations are recommended for the proposed project area prior to construction. In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area will cease and THC archeological staff will be contacted to initiate post-review discovery procedures. No cultural materials were collected during the survey. All project-generated notes, forms, and photographs will be curated at CAS in San Marcos, Texas. Hicks & Company offers this draft report in partial fulfillment of Antiquities Permit #7302.

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APPENDIX A

DESIGN PLANS

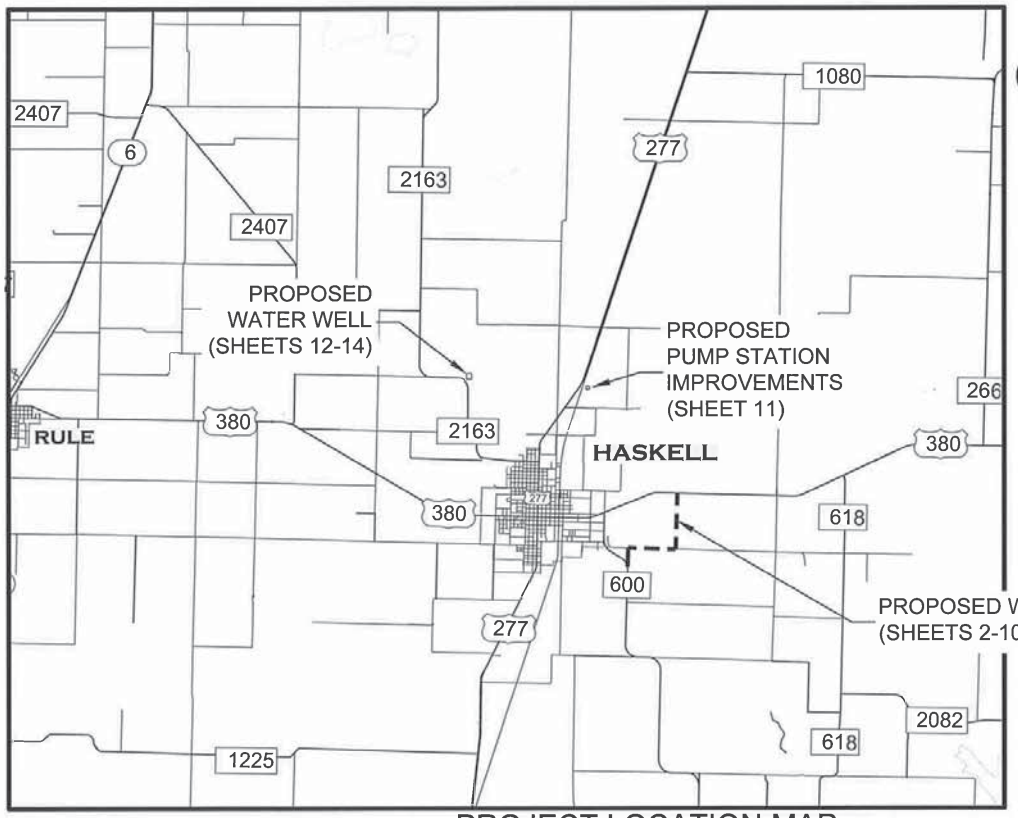
CONSTRUCTION PLANS FOR

PAINT CREEK WATER SUPPLY CORPORATION WATER SUPPLY IMPROVEMENTS

TEXAS DEPARTMENT OF AGRICULTURE

DISASTER RELIEF WATER SUPPLY PROJECT #7215017

MAY 2015



PROJECT LOCATION MAP

SCALE: 1" = 6,000'

HASKELL COUNTY, TEXAS

DAVID C. DAVIS,	COUNTY JUDGE
BILLY WAYNE HESTER,	PCT 1 COMMISSIONER
TIFFEN MAYFIELD,	PCT 2 COMMISSIONER
KENNY THOMPSON,	PCT 3 COMMISSIONER
NEAL KREGER,	PCT 4 COMMISSIONER

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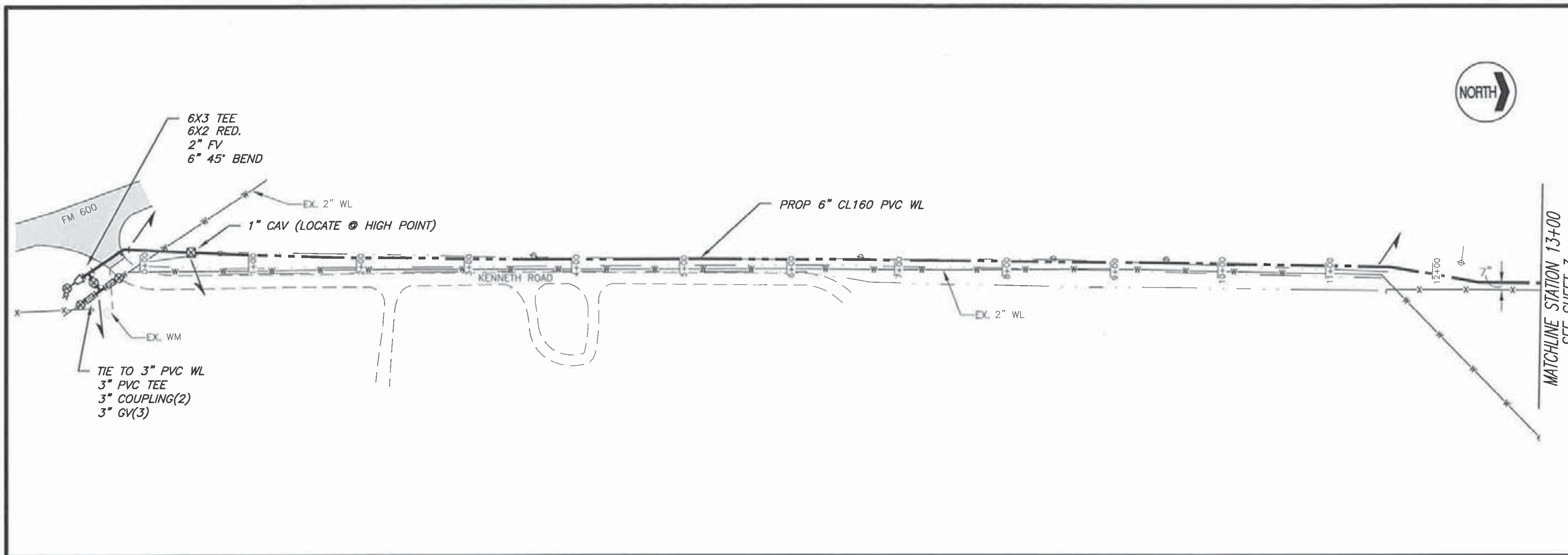

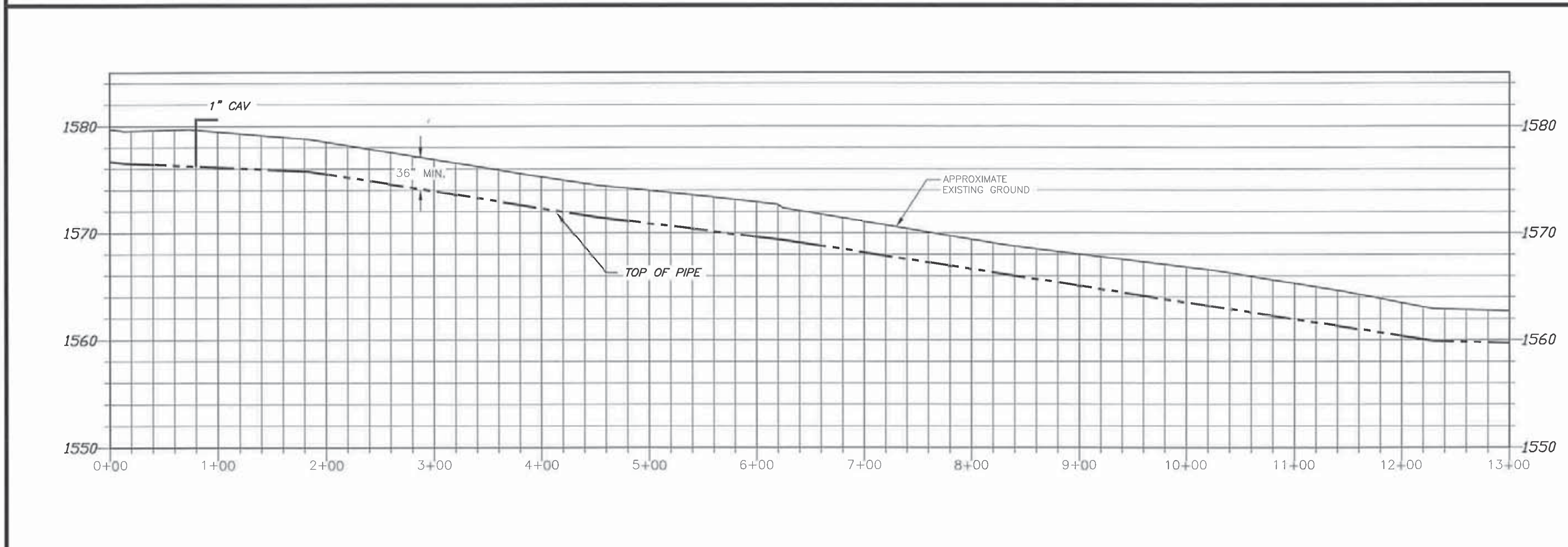

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WATER SUPPLY IMPROVEMENTS

WATER LINE PLAN & PROFILE

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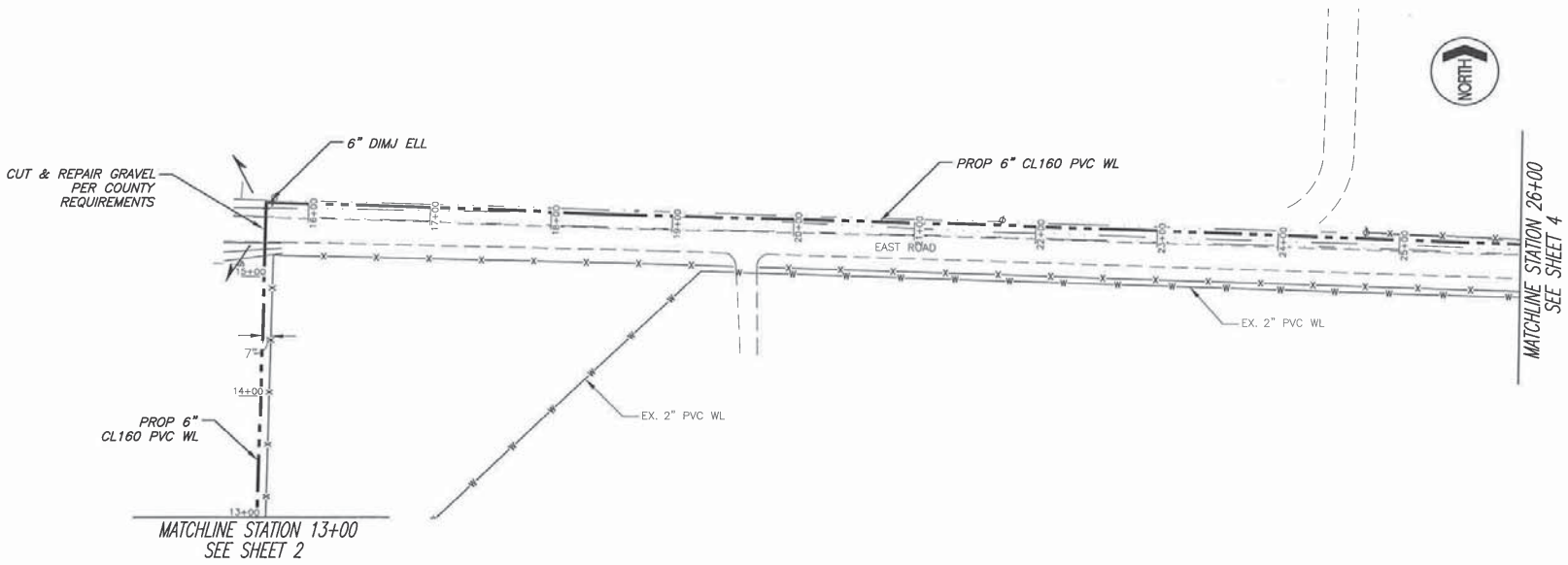

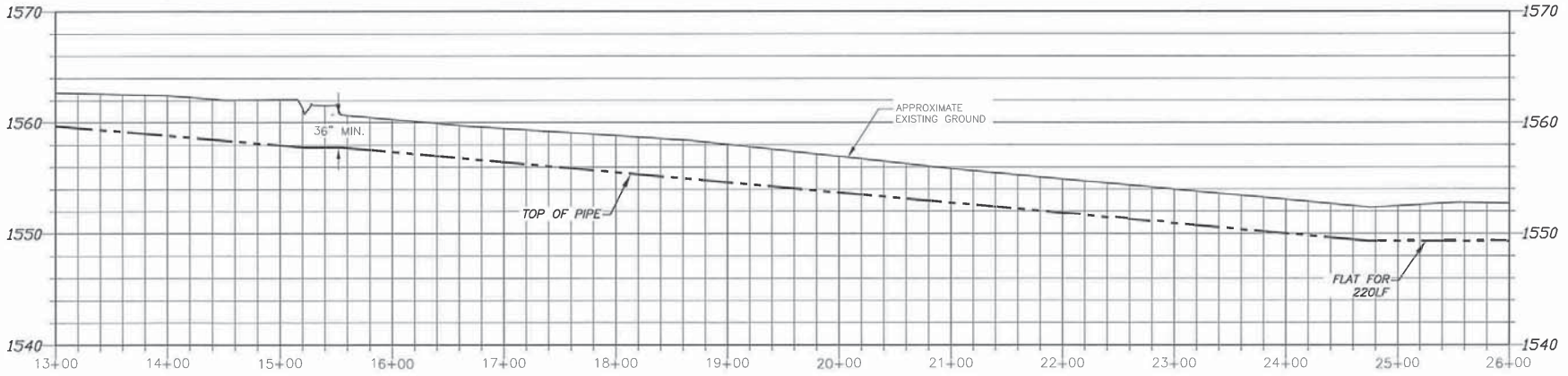

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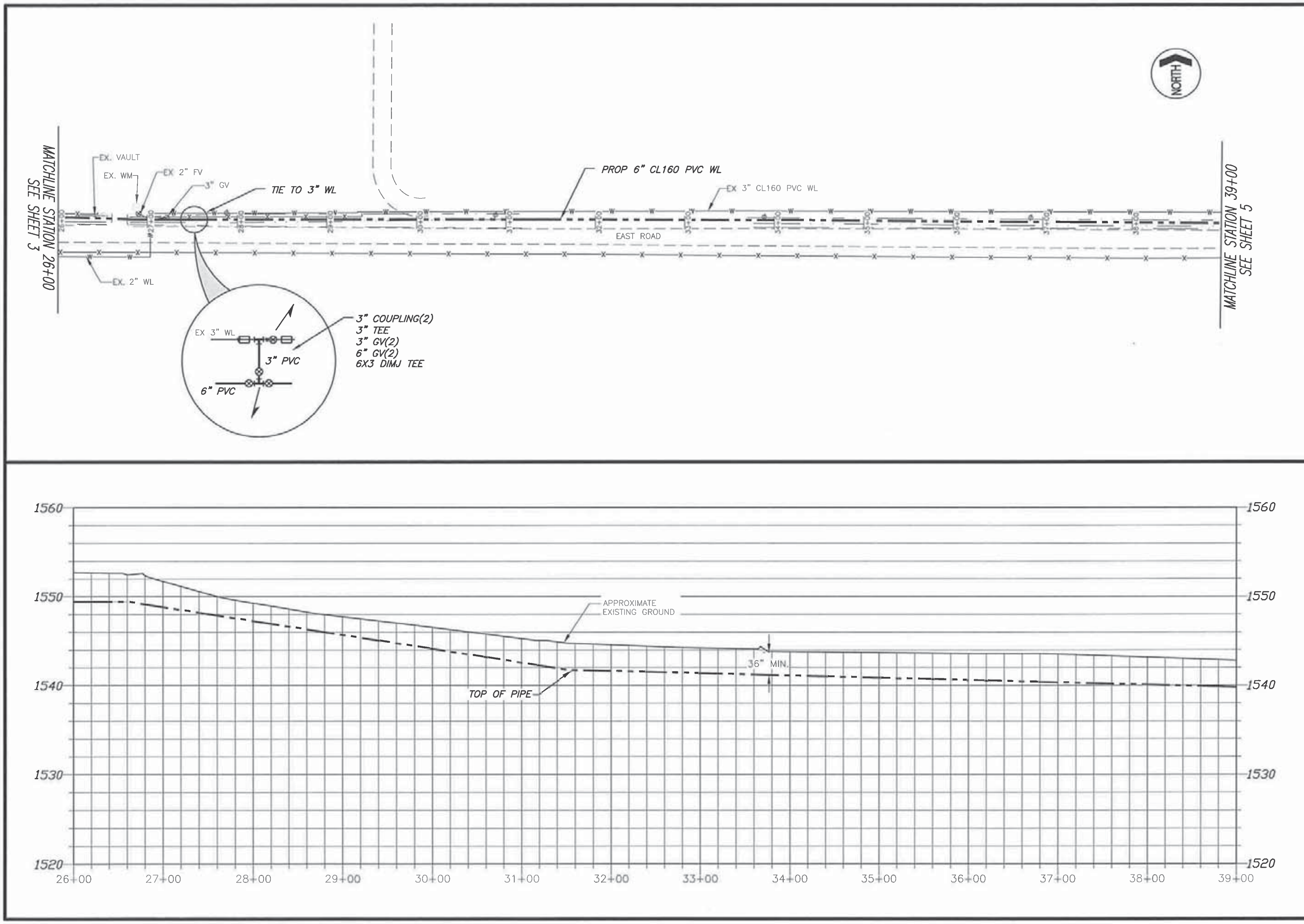

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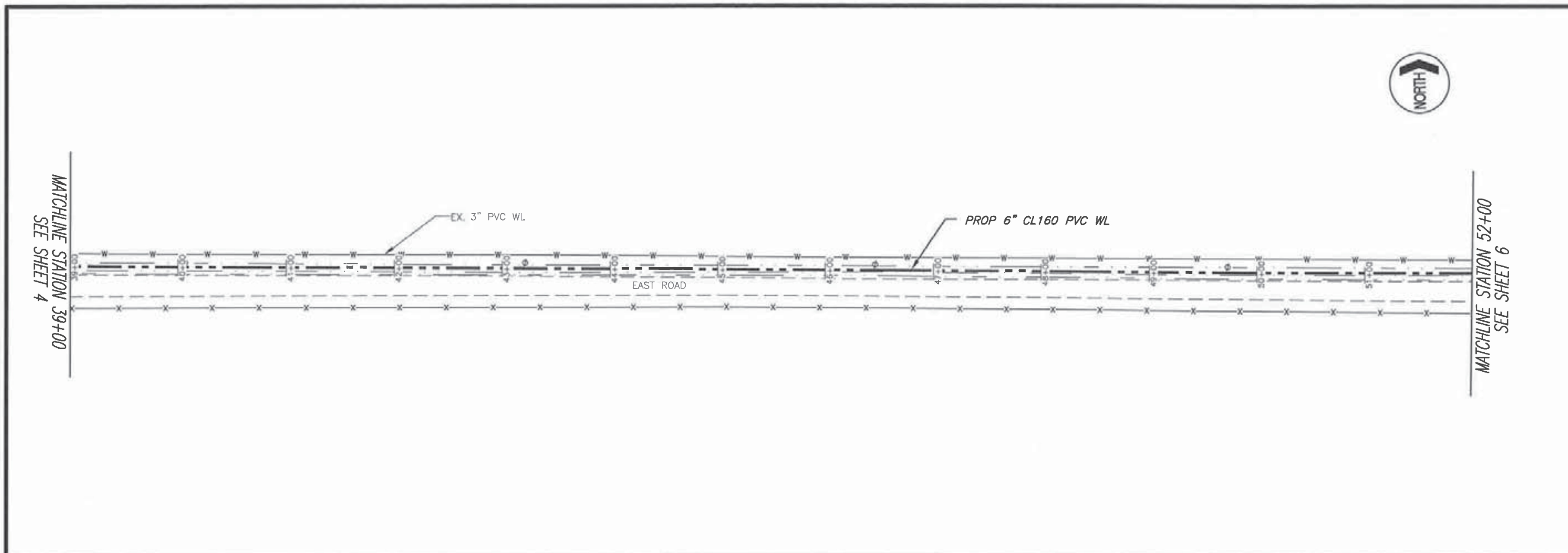

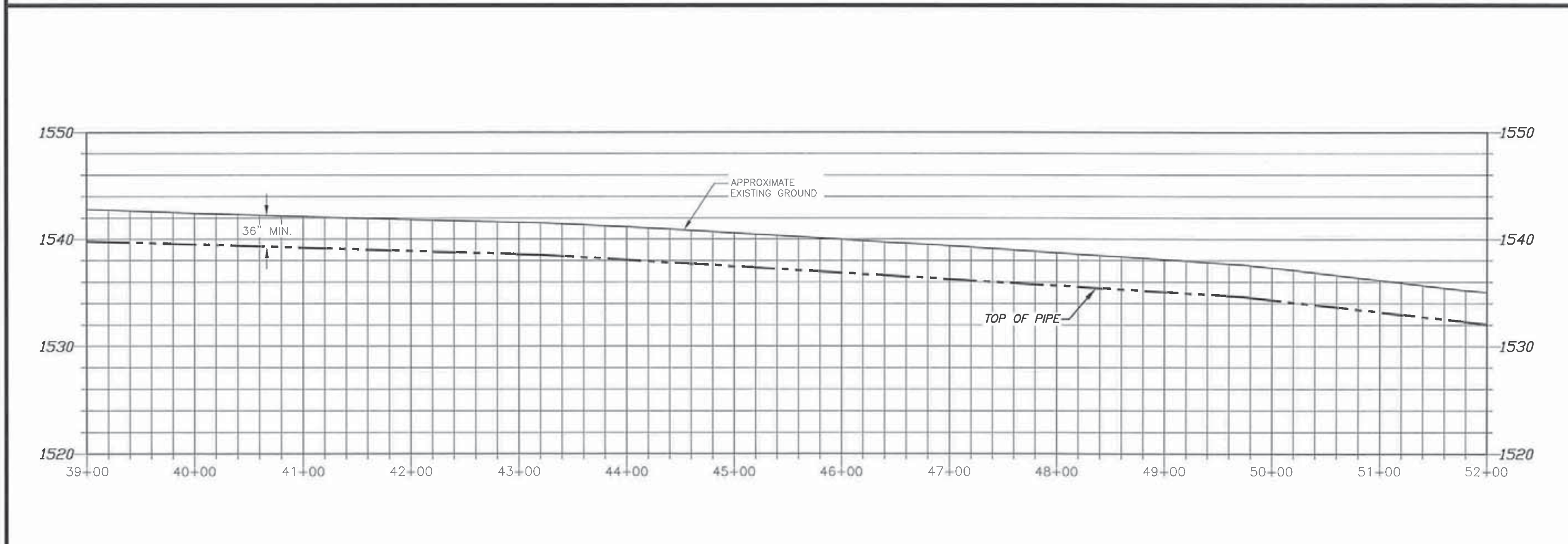

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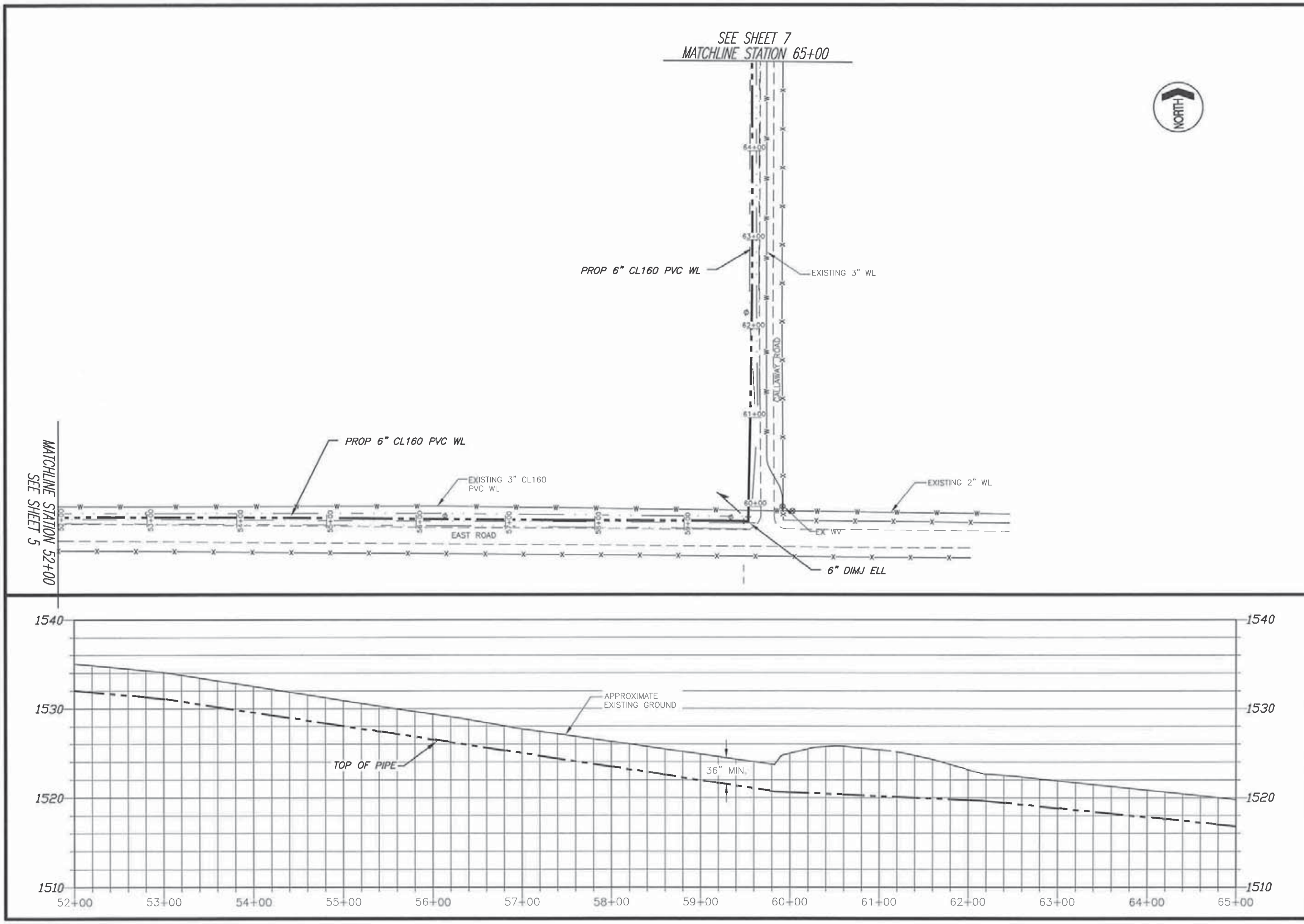

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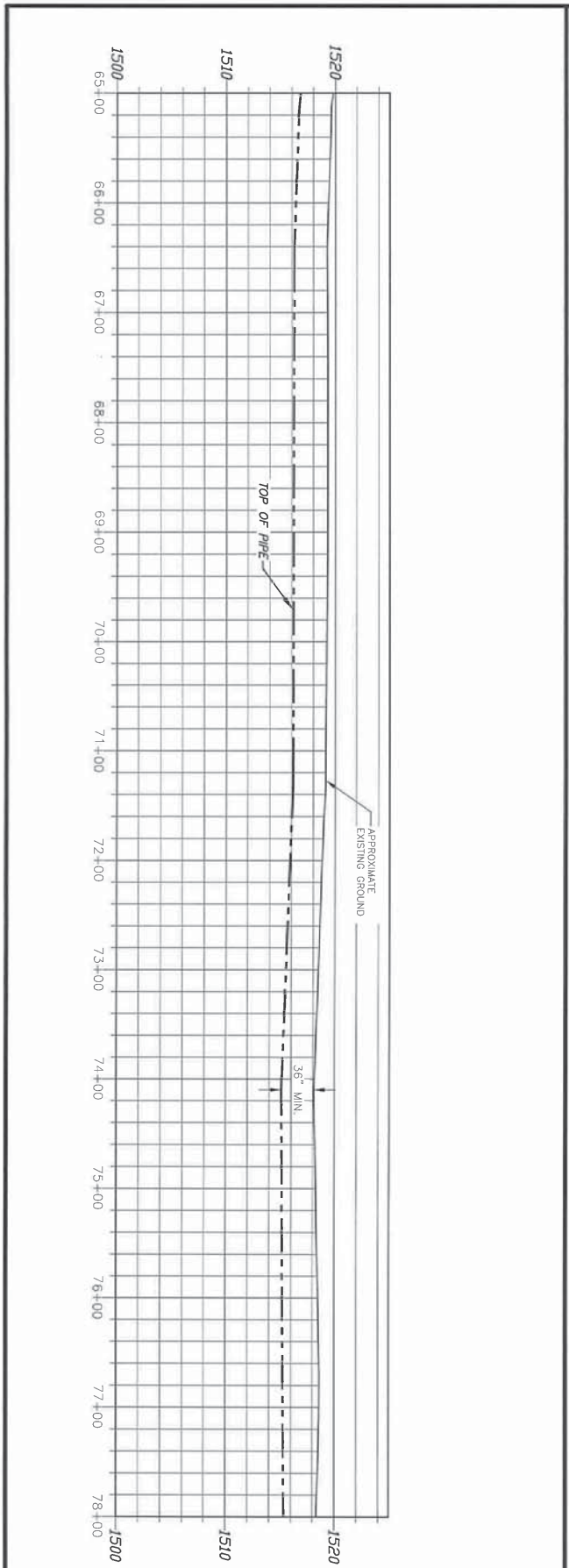

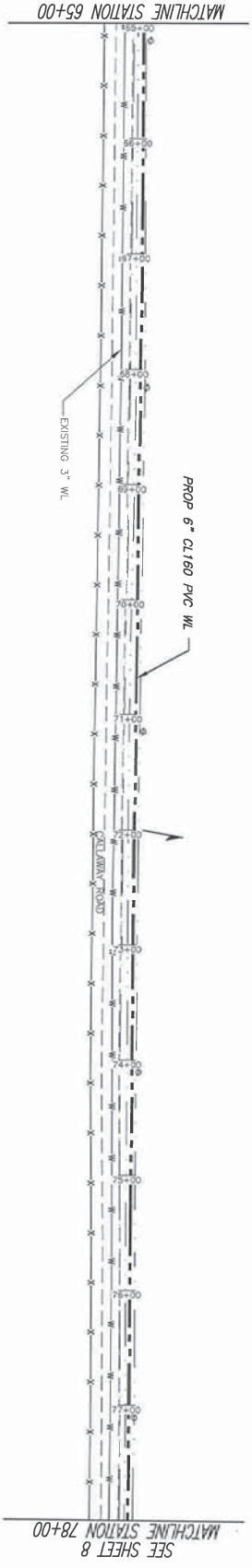

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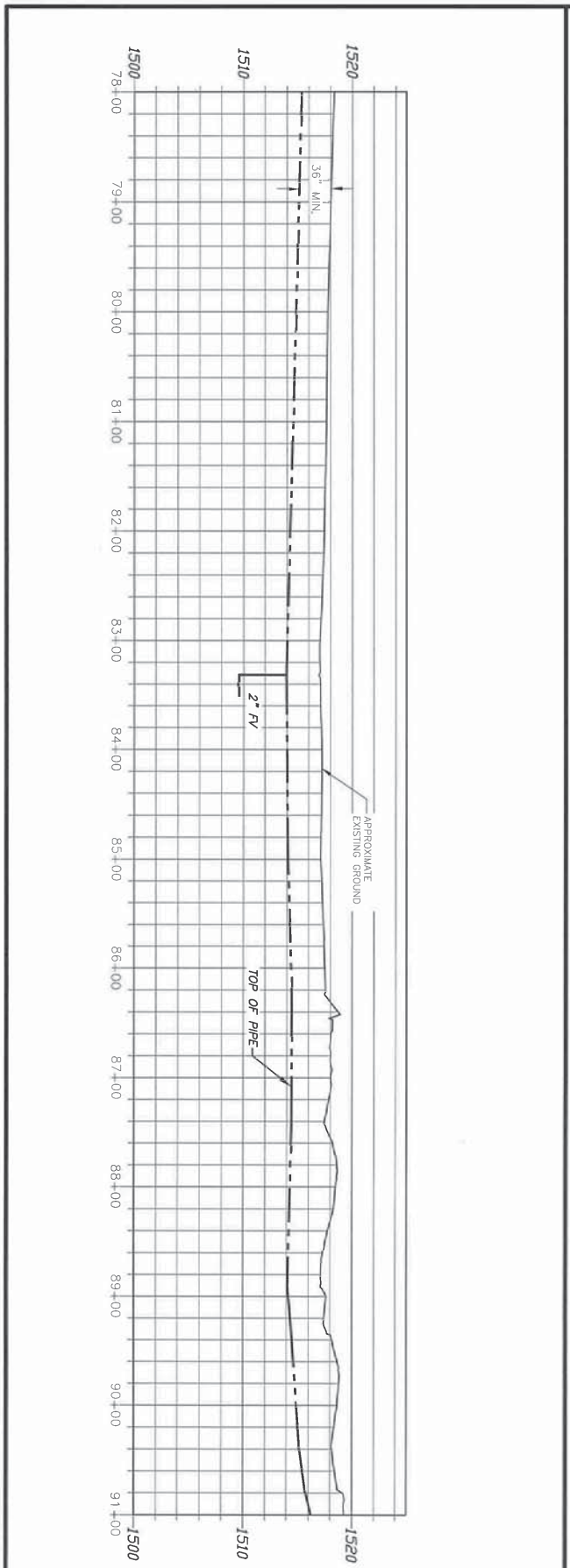

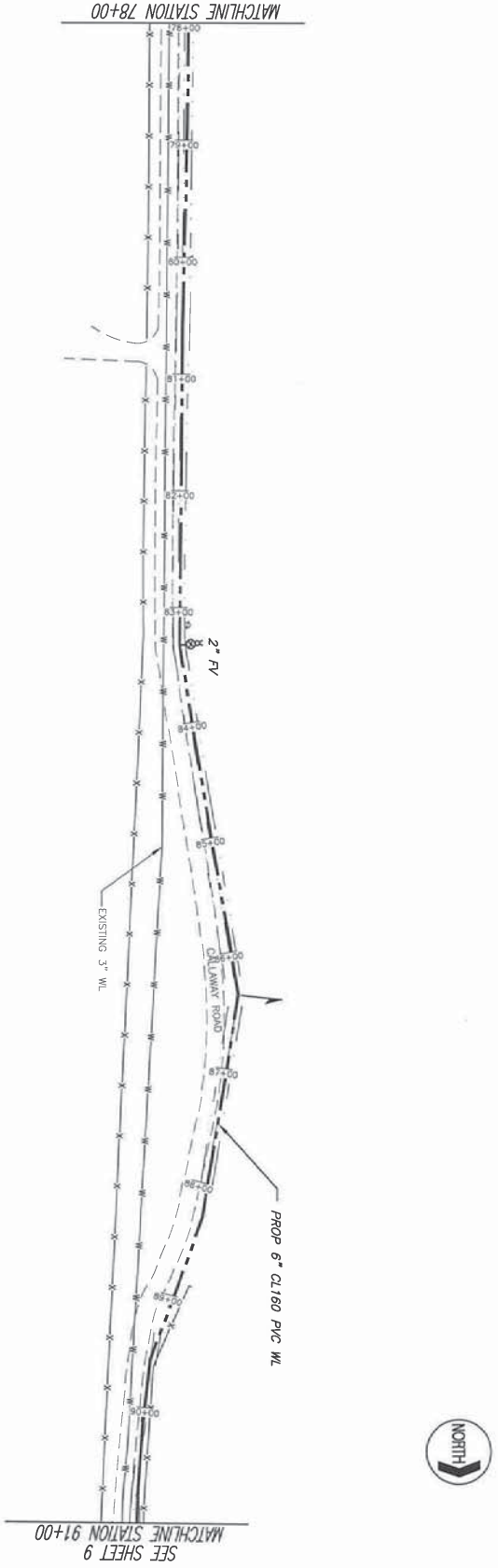

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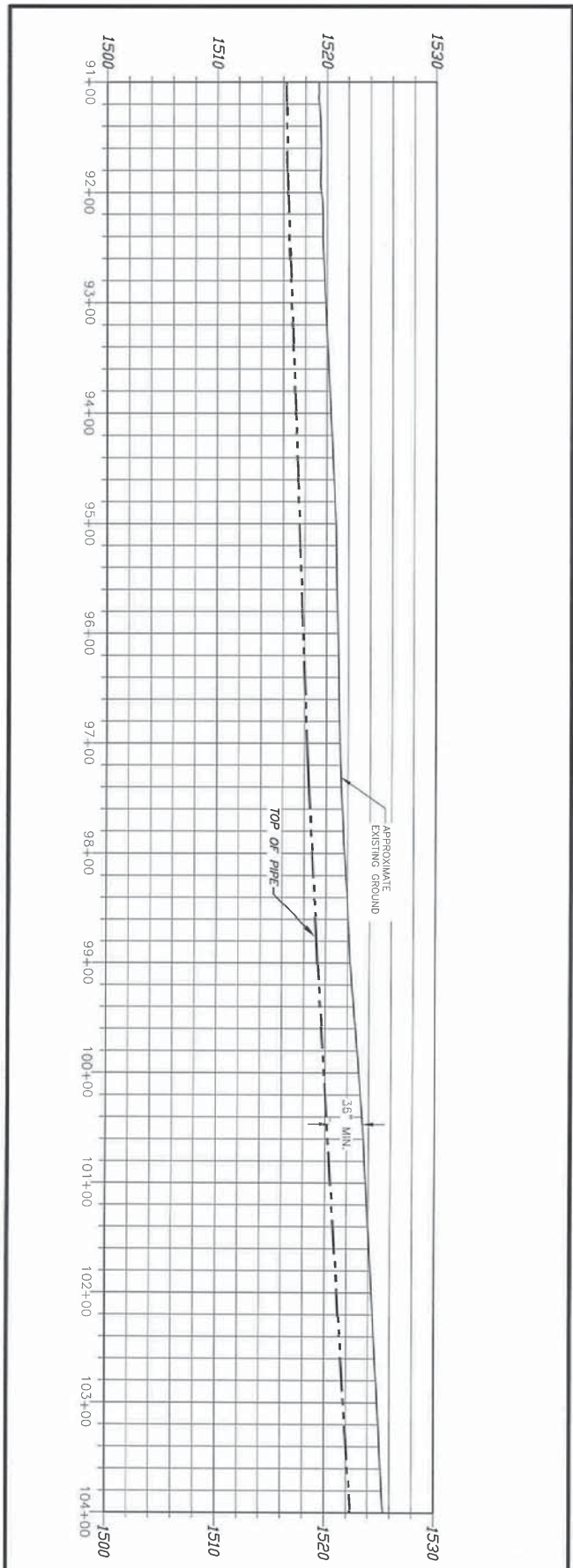
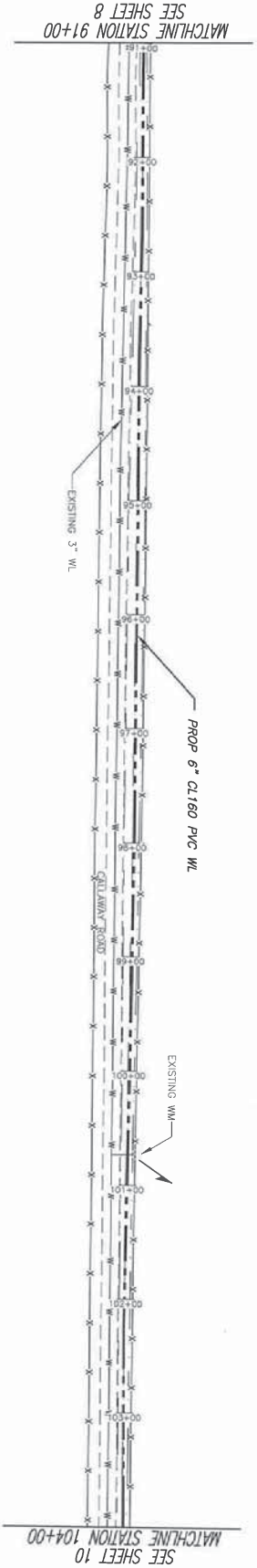




NO.	REVISION	BY	DATE	SCALE VERT: 1"=10' HORZ: 1"=100'	
				FILE	SHEET 9
				DATE	APR. 2015
				DESIGNED	KM
				DRAWN	CV
				CHECKED	KM

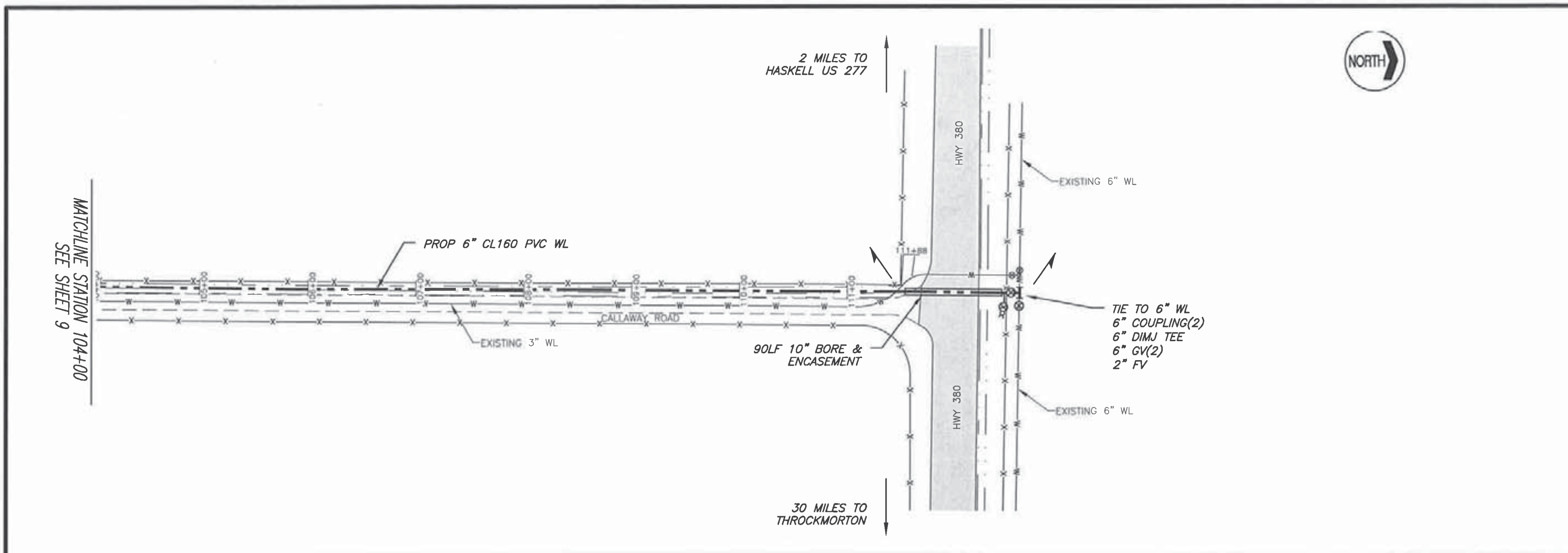
SHEET 9 TOTAL 23

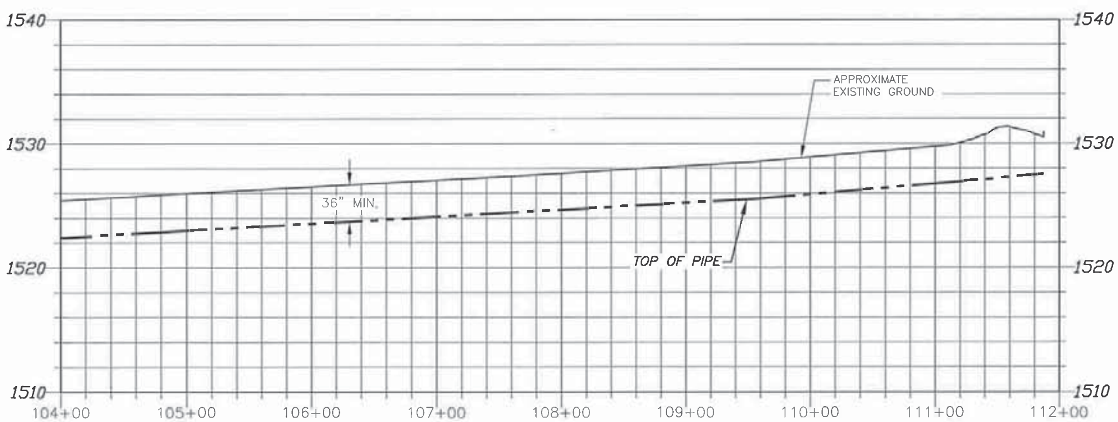
PAINT CREEK WSC

WATER SUPPLY IMPROVEMENTS

WATER LINE PLAN & PROFILE

JACOB & MARTIN, LLC.
CONSULTING ENGINEERS
3465 CURRY LANE
ABILENE, TEXAS 79606
325-695-1070
1508 SANTA FE DR, SUITE 204
WEATHERFORD, TEXAS 76086
817-594-9880
FIRM # F-2448





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817-594-9880
FIRM# F-2448

PAINT CREEK WSC

WATER SUPPLY IMPROVEMENTS

WATER LINE PLAN & PROFILE

SCALE	VERT: 1"=10' HORZ: 1"=100'
FILE	SHEET 10
DATE	APR. 2015
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CHECKED	KM

NO.	REVISION	BY	DATE

SHEET 10
TOTAL 23

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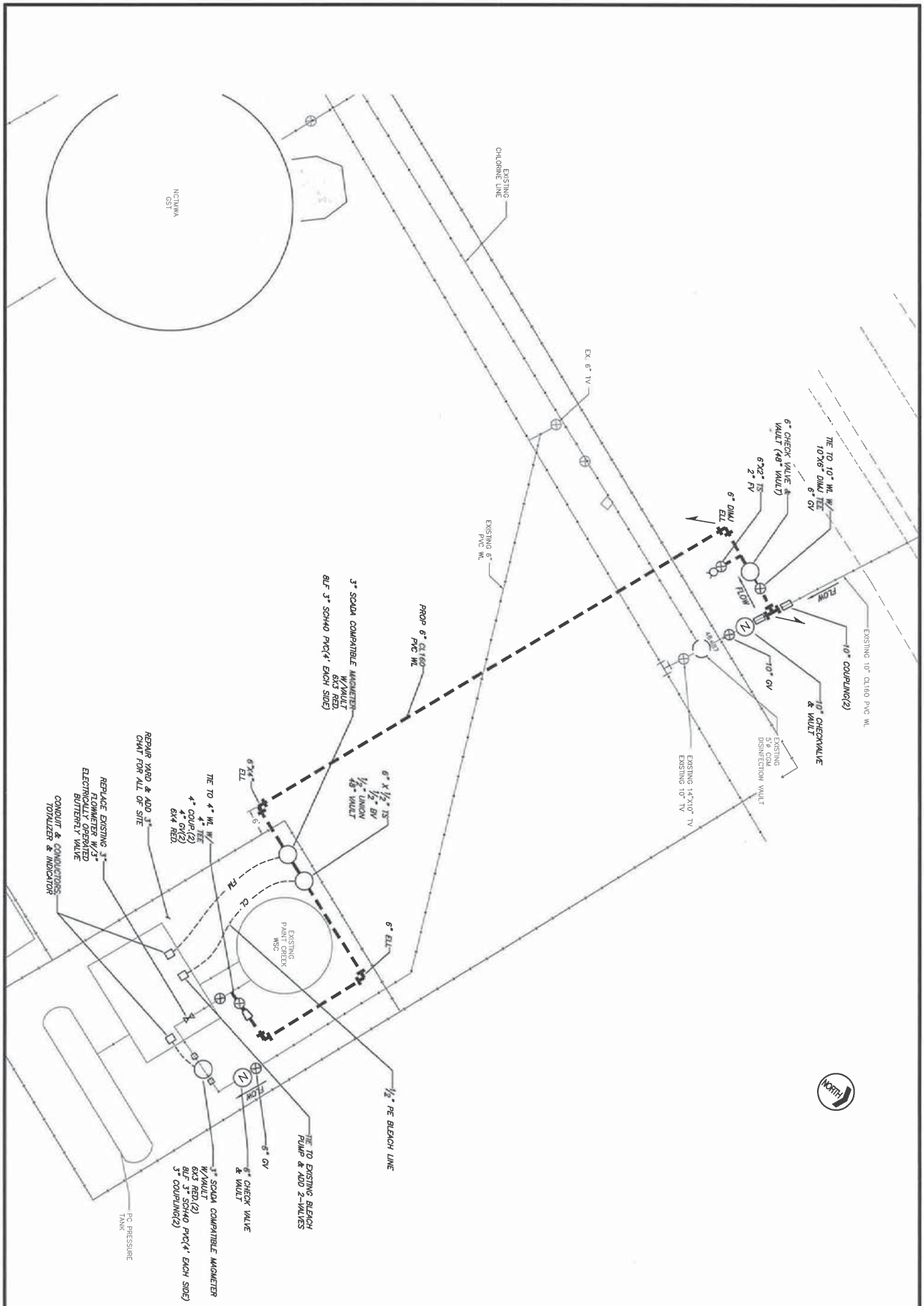

NO.	REVISION	BY	DATE

SCALE 1"=20'
FILE SHEET 11
DATE APR, 2015
DESIGNED KM
DRAWN CV
CHECKED KM

TOTAL SHEET 11 23

PAINT CREEK SUD

WATER SUPPLY IMPROVEMENTS

HASKELL PUMP STATION SITE PLAN

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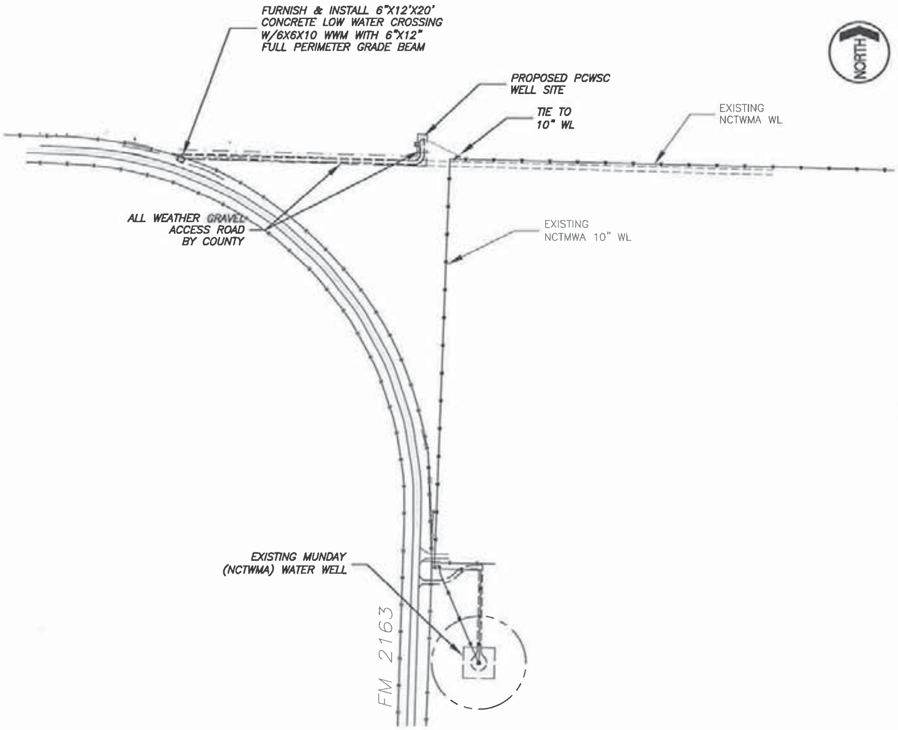
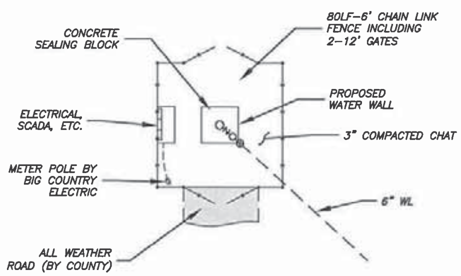


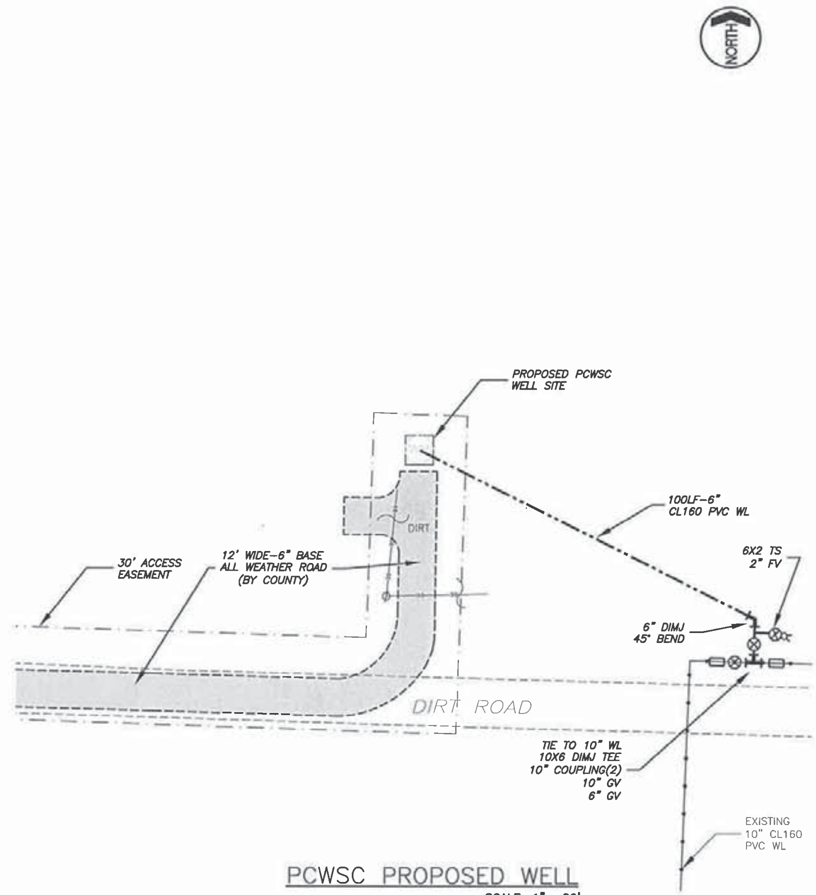
PCWSC WELL VICINITY MAP

SCALE: 1"= 200'



WELL SITE PLAN

SCALE: 1"=10'



PCWSC PROPOSED WELL

SCALE: 1"= 20'

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PAINT CREEK WSC

WATER SUPPLY IMPROVEMENTS

WATER WELL SITE PLAN

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DATE	APR 2015
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CHECKED	KM

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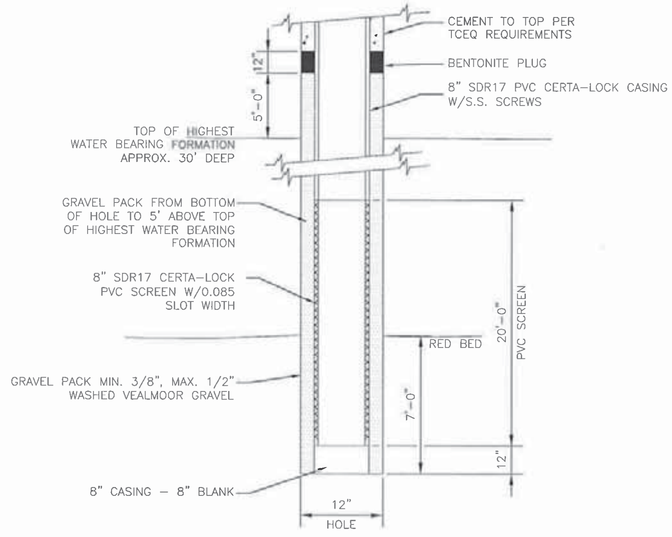
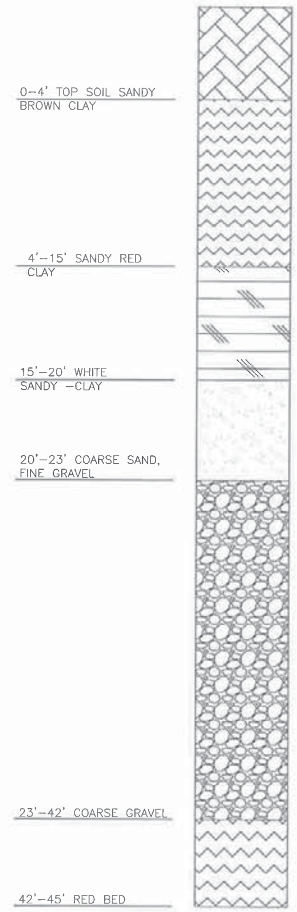
TOTAL 23



TYPICAL WELL SECTION
NTS



ESTIMATED WELL LOG
NTS

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PAINT CREEK WSC
WATER SUPPLY IMPROVEMENTS
WELL SECTIONS

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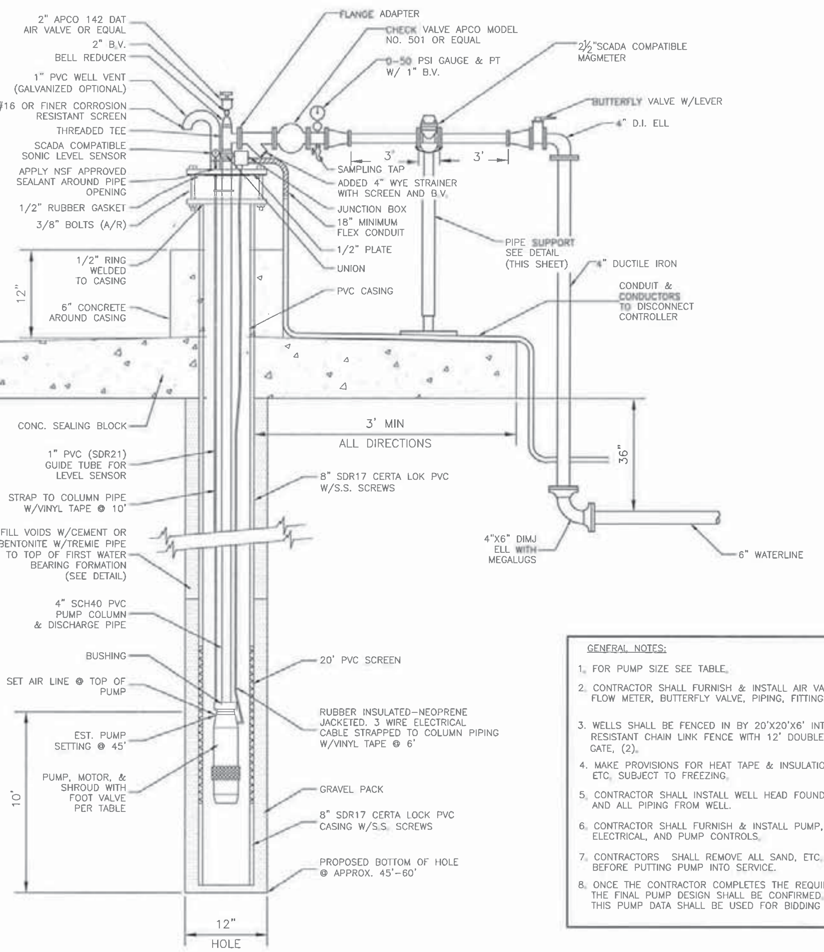
SHEET 13
TOTAL 23



WELL SECTION
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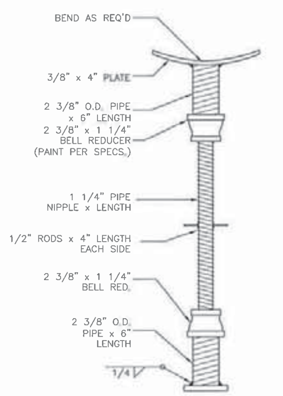
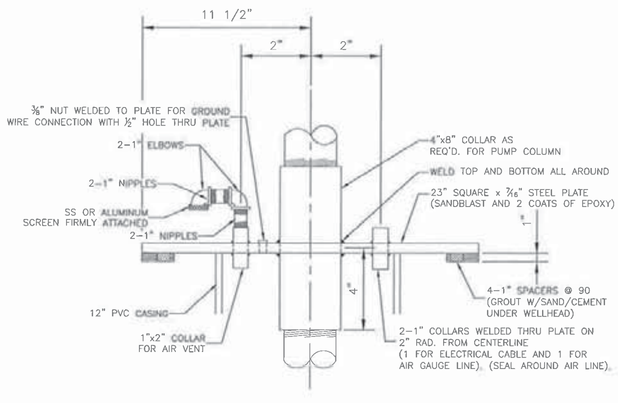
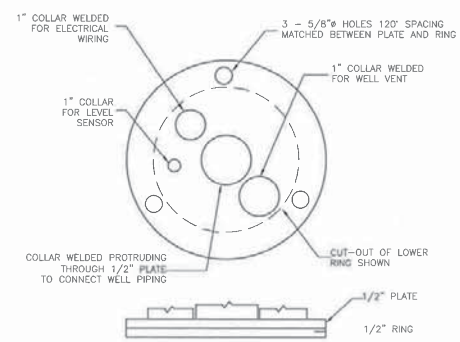


PIPE SUPPORT
NTS



WELL HEAD DETAIL
NTS



ALTERNATE WELL HEADS MUST BE SUBMITTED FOR APPROVAL IF THIS DESIGN IS NOT UTILIZED.

COVER DETAIL
NTS

GENERAL NOTES:

1. FOR PUMP SIZE SEE TABLE.
2. CONTRACTOR SHALL FURNISH & INSTALL AIR VALVE, CHECK VALVE, FLOW METER, BUTTERFLY VALVE, PIPING, FITTINGS & CONNECTIONS.
3. WELLS SHALL BE FENCED IN BY 20'X20'X6' INTRUDER RESISTANT CHAIN LINK FENCE WITH 12' DOUBLE GATE, (2).
4. MAKE PROVISIONS FOR HEAT TAPE & INSULATION OF ALL PIPING, ETC. SUBJECT TO FREEZING.
5. CONTRACTOR SHALL INSTALL WELL HEAD FOUNDATION, CONDUIT, AND ALL PIPING FROM WELL.
6. CONTRACTOR SHALL FURNISH & INSTALL PUMP, PIPING VALVES, WELL ELECTRICAL, AND PUMP CONTROLS.
7. CONTRACTORS SHALL REMOVE ALL SAND, ETC., FROM WELLS BEFORE PUTTING PUMP INTO SERVICE.
8. ONCE THE CONTRACTOR COMPLETES THE REQUIRED PUMP TEST, THE FINAL PUMP DESIGN SHALL BE CONFIRMED. THIS PUMP DATA SHALL BE USED FOR BIDDING PURPOSES.

PUMP DATA

Well #	Estimated Well Depth (ft)	Pump Column & Discharge Pipe Size	Proposed WL Size	Design Flow & Head Efficiency	BERKLEY Pump Model & RPM	# of Stages	Bowl Dia.	Motor Horsepower
THOMAS #1	60	4"	6"	125 gpm @ 125-74.4% Eff.	5TMH5-110 3500 rpm	3	4.15"	10 HP

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PAINT CREEK WSC
WATER SUPPLY IMPROVEMENTS
WELL DETAILS

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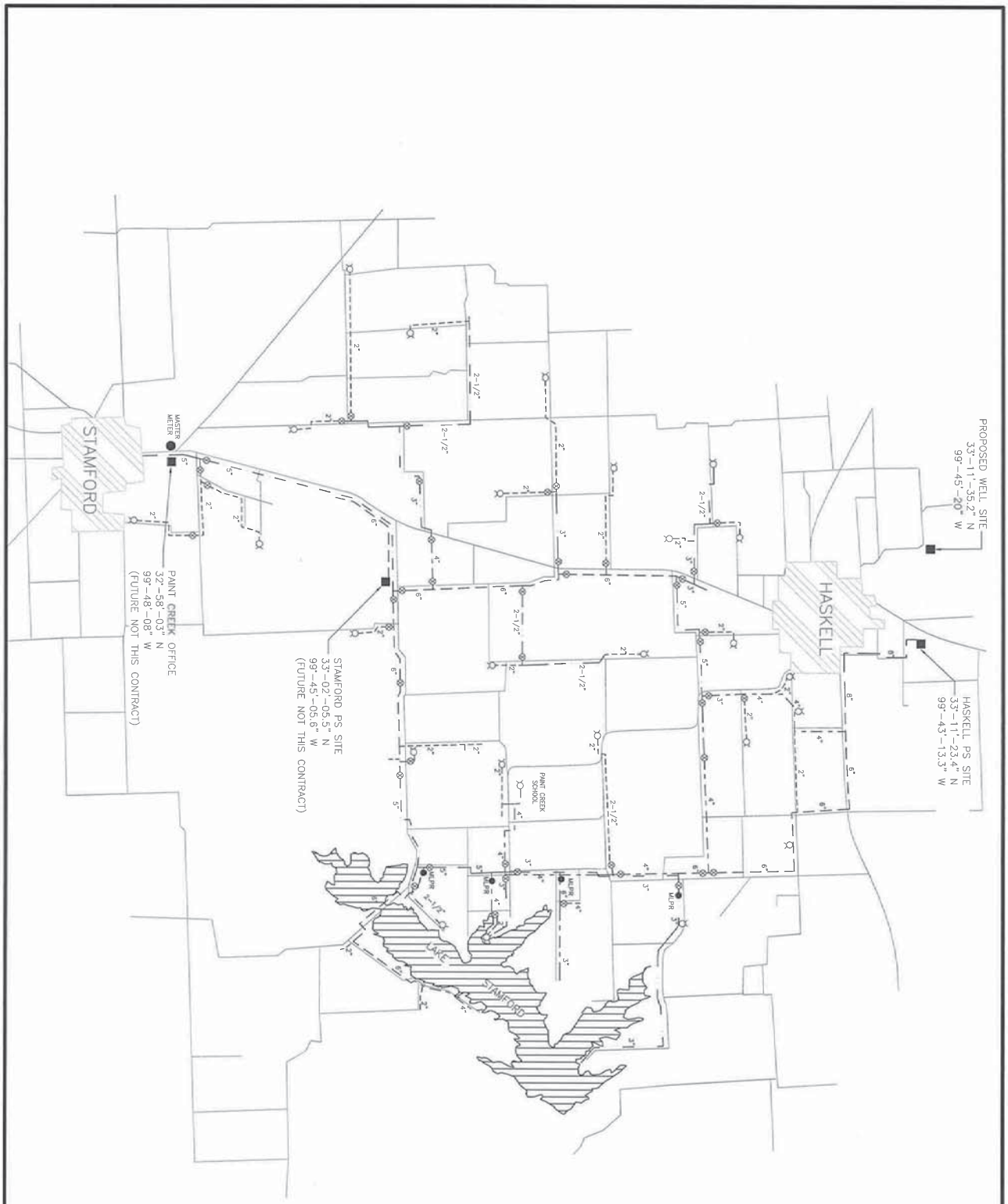
SHEET 14
TOTAL 23



TOTAL SHEET	NO.	REVISION	BY	DATE	
23 / 15					SCALE: AS SHOWN
					FILE: 14-11564
					DATE: APR 2015
					DESIGNED: KM
					DRAWN: CV
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PAINT CREEK WSC

WATER SUPPLY IMPROVEMENTS

PROPOSED SCADA SITES

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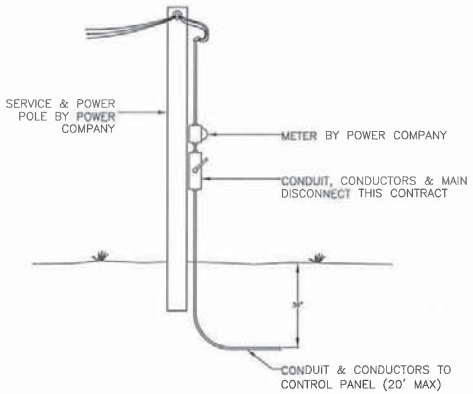
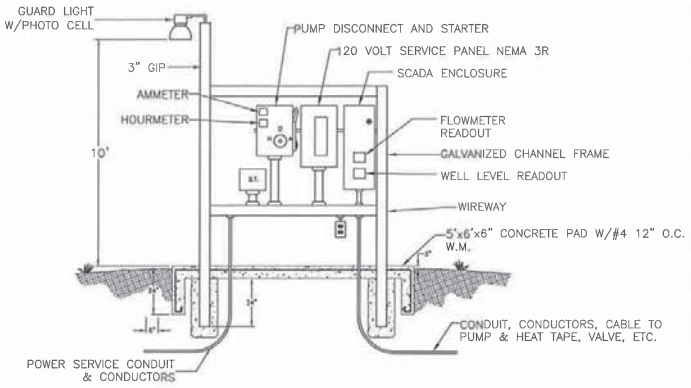


POWER SERVICE DETAIL



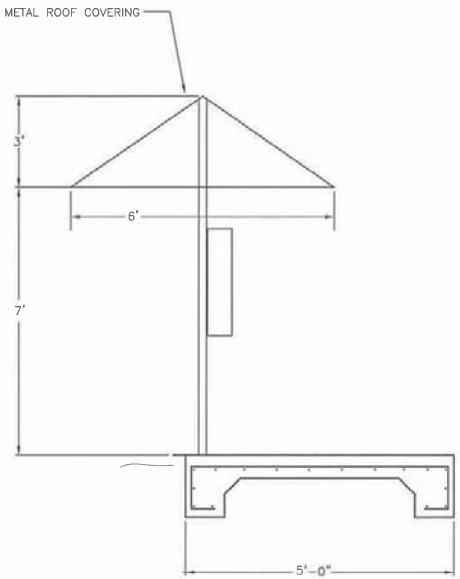
CONTROL PANEL

Haskell County, Texas

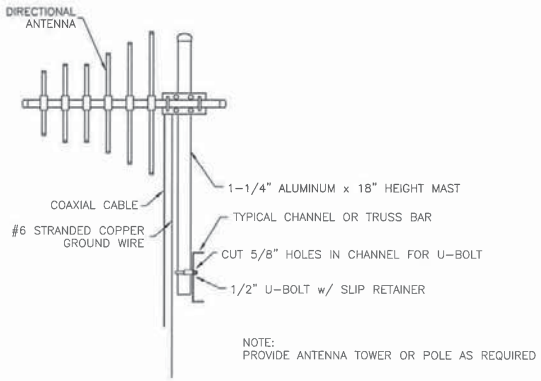
Paint Creek Water Supply Corporation

SCADA OPERATIONAL DATA

1. There shall be two (2) SCADA sites as shown on the plans, and the NCTMWA and Paint Creek WSC shall have operational capabilities as called for in the specifications.
2. All sites shall monitor and report power and pump status.
3. The contractor shall furnish and install antennas, coaxial cable, etc. as required and towers if required.
4. The contractor shall furnish and install a 0-30 foot pressure transmitter (PT) for the PCWSC ground storage tank at the Haskell pump station, 0-60psi PT for the PCWSC pressure tank at the Haskell Pump Station. The contractor shall furnish and install all taps, ball valves, piping, conduit, etc. as required for all SCADA and pressure facilities. All pressure transmitters and all facilities subject to freezing shall be heat taped, insulated or installed inside a heated building. No electrical equipment shall be installed where it can be submerged in a vault, etc. The contractor shall furnish and install all required electrical equipment for adding SCADA to the existing Haskell pump station and well site.
5. At the proposed well site, the aquifer water level, pump status, flow meter rate and totalizer, and motor amperage, shall be reported. The pump operation shall have HOA capability and the automatic operation shall be based upon the water level in the Haskell Ground Storage Tank (GST) or as controlled by the NCTMWA.
6. At the existing Haskell Pump Station, the contractor shall furnish and install HOA switches for the existing bleach pump, and for the proposed electrically operated butterfly valve. Automatic operation shall be through the SCADA system according to the adjustable settings of the water level in the GST. The SCADA shall monitor and report tank levels in the GST, pressures in the Pressure Tank, flow rate and totalizer for both proposed flow meters, motor amperage and run times (2). The proposed electrically operated butterfly valve shall indicate percent open the operator shall have the capability of having a pre-set percent open in the automatic or manual operation.



COVERED SCADA



TYPICAL ANTENNA MOUNTING DETAIL

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3465 CURRY LANE
ABILENE, TEXAS 79606
325-695-1070
1508 SANTA FE DR. SUITE 204
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817-594-9880
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PAINT CREEK SWC
WATER SUPPLY IMPROVEMENTS

WATER WELL ELECTRICAL SCADA DETAILS

NO.	REVISION	BY	DATE

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FILE SHEET 16
DATE APR. 2015
DESIGNED KM
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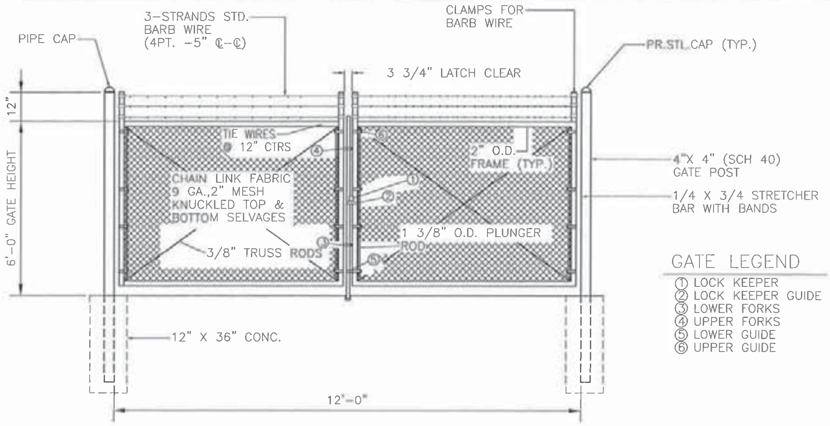
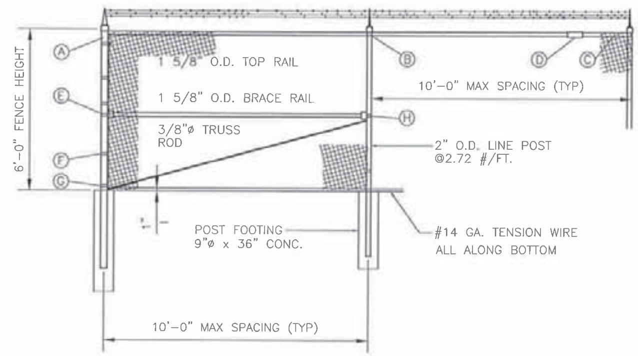
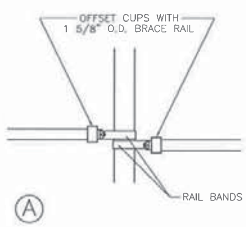
TOTAL 23



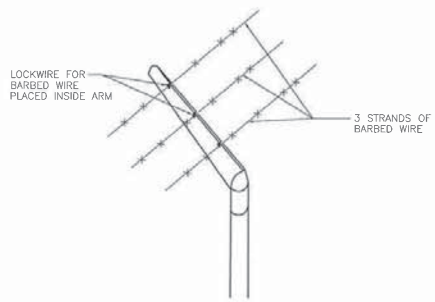
STANDARD DOUBLE SWING GATE DETAIL (2 REQUIRED)



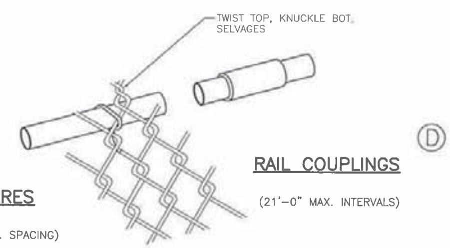
TYPICAL FENCE DETAIL



Ⓐ RAILS @ CORNER



Ⓑ LINE POST TOP

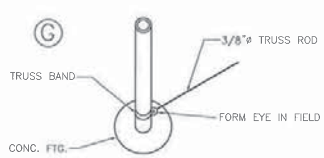


Ⓒ TIE WIRES

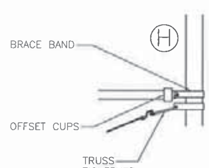
(24" MAX. SPACING)

Ⓓ RAIL COUPLINGS

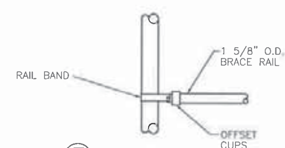
(21'-0" MAX. INTERVALS)



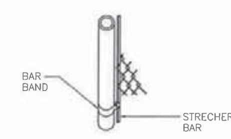
Ⓖ TRUSS CONNECTION @ TERMINALS



Ⓗ BRACE & TRUSS CONN. @ LINE POSTS



Ⓔ RAILS @ END



Ⓕ CHAIN LINK CONN. @ TERMINALS

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PAINT CREEK WSC
WATER SUPPLY IMPROVEMENTS

CHAIN LINK FENCE & GATE DETAILS

NO.	REVISION	BY	DATE

SCALE	AS SHOWN
FILE	14-11564
DATE	APR 2015
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SHEET 17
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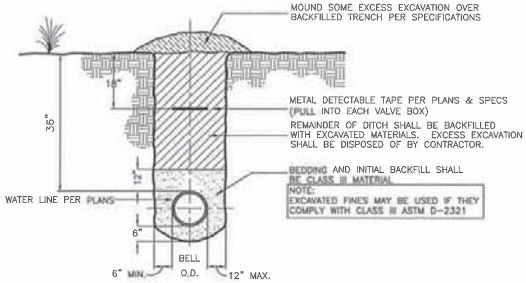
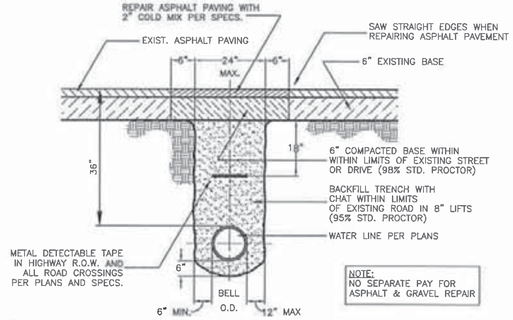
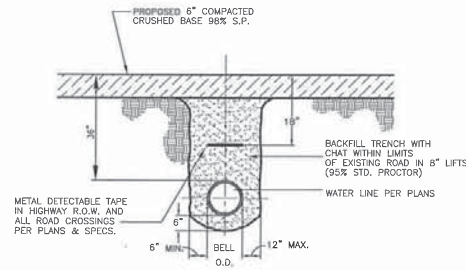


TYPICAL CROSS COUNTRY TRENCH

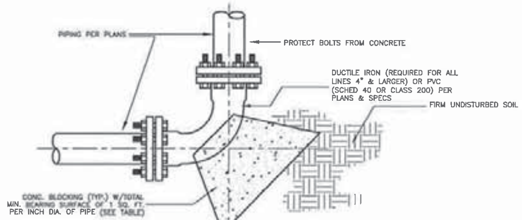


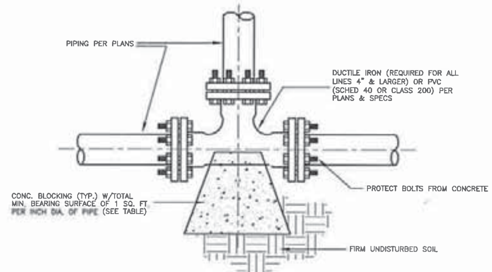
TRENCH @ EXISTING ASPHALT ROADS



TRENCH FOR OPEN CUT GRAVEL

TYPICAL WATER LINE TRENCH SECTIONS





NOTE:
ALL IRON FITTINGS, VALVES, ETC SHALL BE ENCAPSULATED WITH 8 MIL POLYETHYLENE WRAP. ALL FITTINGS SHALL HAVE MEGALUG RESTRAINTS. VALVE FITTING COMBINATIONS SHALL HAVE FOSTER ADAPTORS

NOTE:
WHERE CUTTING ROADWAYS AND DRIVEWAYS, THE ENTIRE TRENCH SHALL BE BACKFILLED WITH GRAVEL & COMPACTED.

TYPICAL BLOCKING DETAILS

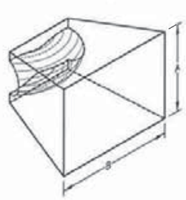
NOTES:

BLOCKING REQ'D. ON ALL FITTINGS 2" & LARGER.

ALL REQUIRED BENDS & FITTINGS MAY NOT BE LABELLED ON THE PLANS.

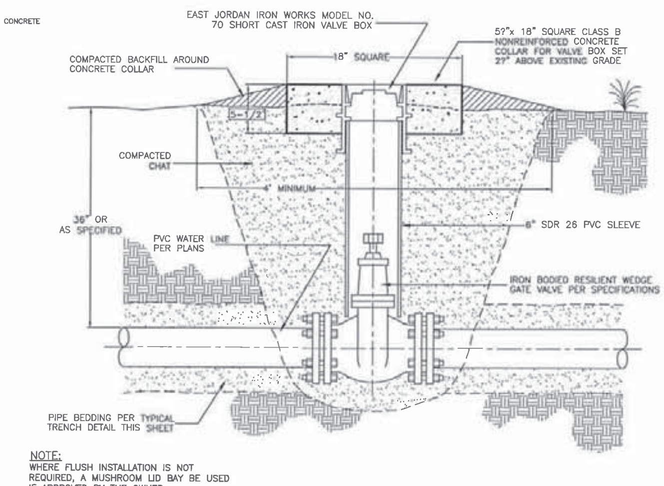
PIPE MAY BE CURVED UP TO 75% OF MANUFACTURER'S RECOMMENDED MAXIMUM CURVATURE WITHOUT A BEND AS APPROVED BY OWNER & ENGINEER.

PVC FITTINGS TO BE PROTECTED FROM CONCRETE WITH A WRAPPING OF 30# ROOFING FELT.



DIMENSIONS FOR CONCRETE THRUST BLOCKS			
PIPE DIA. SIZE (INCHES)	MINIMUM SOIL BEARING AREA REQUIRED (SQUARE FEET)	TYPICAL DIMENSIONS OF BEARING AREA IN INCHES (A X B)	TYPICAL VOLUME OF CONC. REQUIRED (CUBIC FEET)*
2	2.0	12" x 24"	3.0
2 1/2	2.5	15" x 24"	4.0
3	3.0	16" x 27"	4.5
4	4.0	18" x 32"	6.0
6	6.0	24" x 36"	9.0
8	8.0	29" x 40"	12.0
10	10.0	30" x 48"	15.0
12	12.0	36" x 48"	18.0
14	14.0	36" x 56"	21.0
16	16.0	39" x 59"	24.0
18	18.0	42" x 62"	27.0

* VARIES CONSIDERABLY W/DISTANCE BETWEEN PIPE AND BEARING POINT



NOTE:
WHERE FLUSH INSTALLATION IS NOT REQUIRED, A MUSHROOM LID BAY BE USED IF APPROVED BY THE OWNER.

GATE VALVE & BOX

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PAINT CREEK SWC
WATER SUPPLY IMPROVEMENTS
MISCELLANEOUS DETAILS

SCALE	N.T.S.
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DATE	APR, 2015
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SHEET 18
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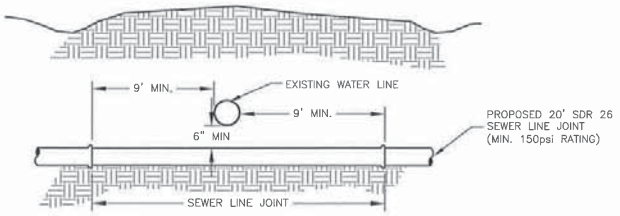
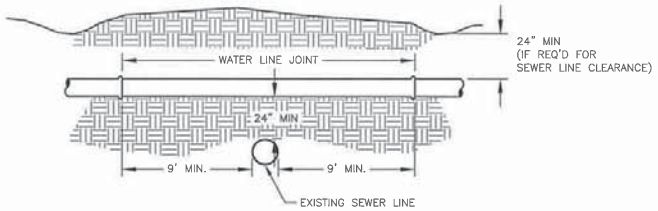
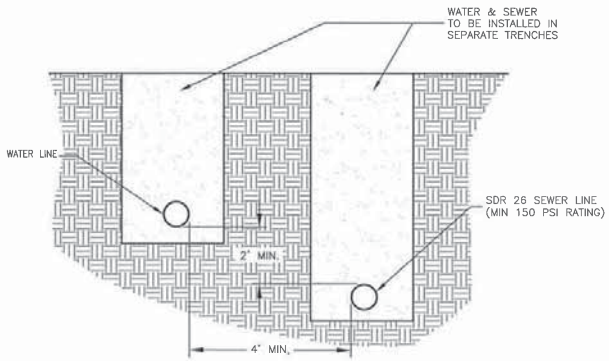


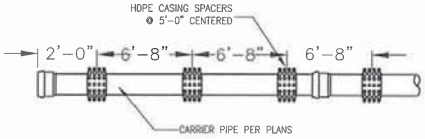
PROPOSED SEWER LINE CROSSING UNDER EXISTING WATER LINE
(PER TCEQ SEE SPECIFICATIONS) NTS



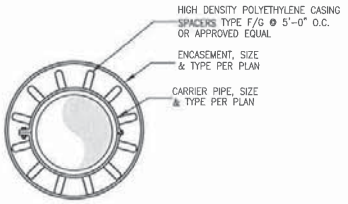
PROPOSED WATER LINE CROSSING OVER EXISTING SEWER LINE
(PER TCEQ SEE SPECIFICATIONS) NTS



PARALLEL WATER AND SEWER LINES
(WHEN 9' SEPARATION IS NOT POSSIBLE) NTS

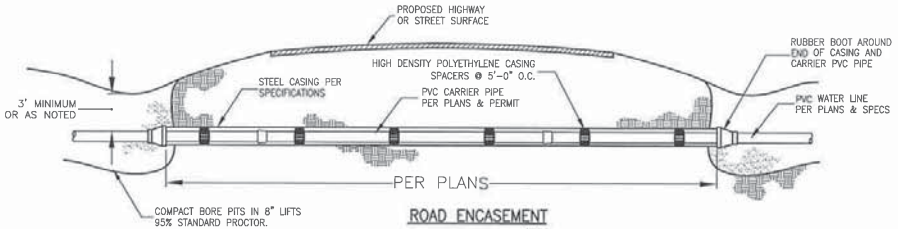


SPACING DETAIL

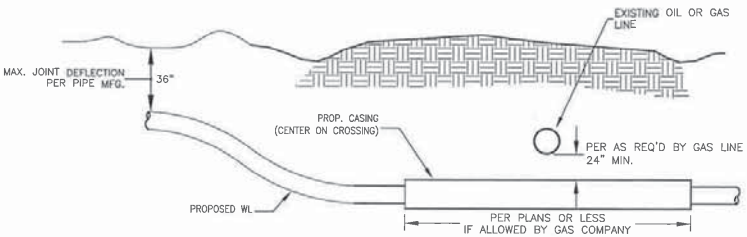


SPACER SECTION DETAIL

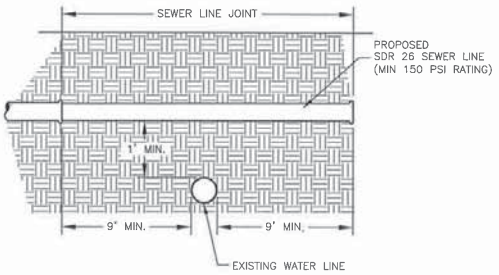
ENCASEMENT SPACER DETAILS



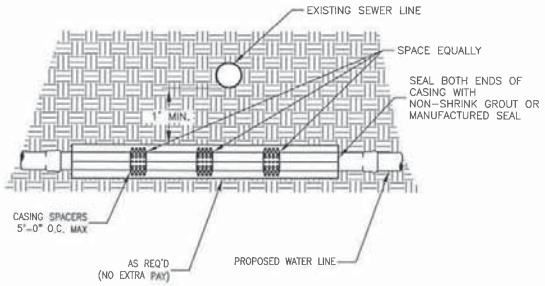
ROAD ENCASEMENT
NTS



OIL OR GAS LINE CROSSING
NTS



PROPOSED SEWER LINE CROSSING OVER EXISTING WATER LINE
NTS



PROPOSED WATER LINE CROSSING UNDER EXISTING SEWER LINE
NTS

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FIRM # F-2448

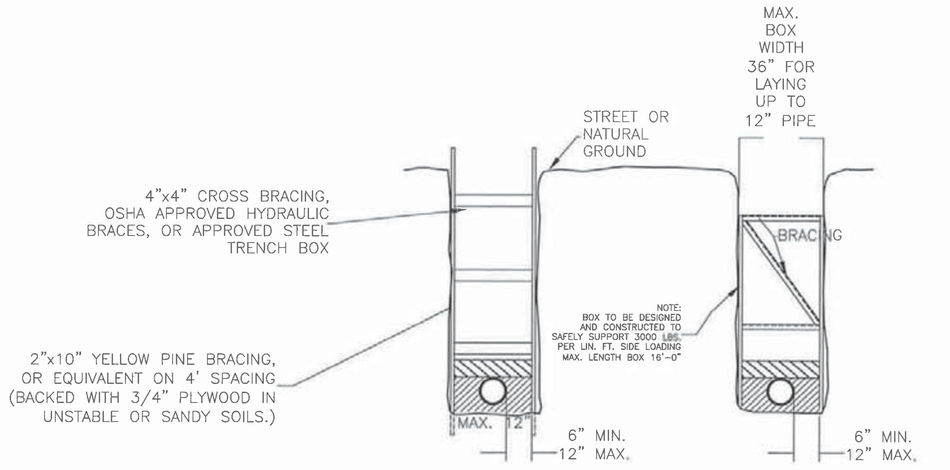
PAINT CREEK SWC
WATER SUPPLY IMPROVEMENTS

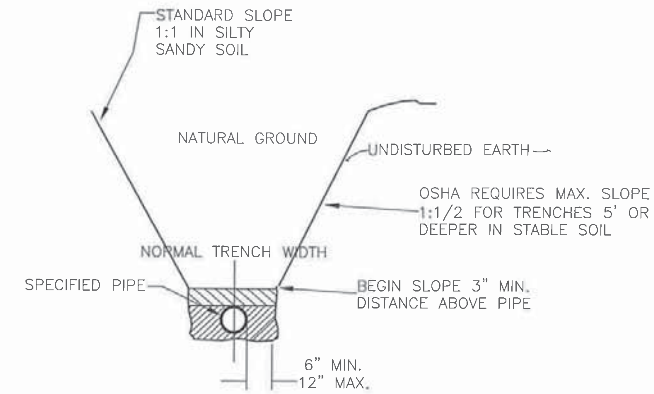
MISCELLANEOUS DETAILS

SCALE	N.T.S.
FILE	SHEET 19
DATE	APR. 2015
DESIGNED	KM
DRAWN	CV
CHECKED	KM

NO.	REVISION	BY	DATE

SHEET 19
TOTAL 23





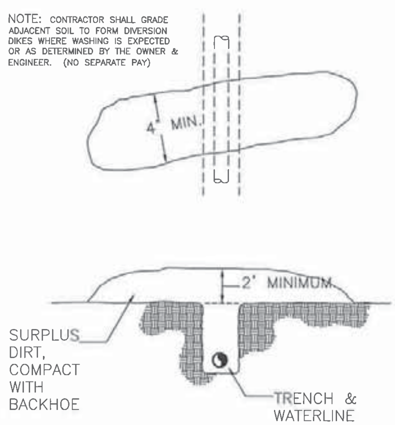
NOTE:
TRENCH WALL PROTECTION SHALL BE PROVIDED FOR ALL TRENCHES GREATER THAN 5' DEEP. SEE TYPICAL TRENCH DETAIL FOR BACKFILL AND BEDDING REQUIREMENTS.

WALL BRACING DETAIL

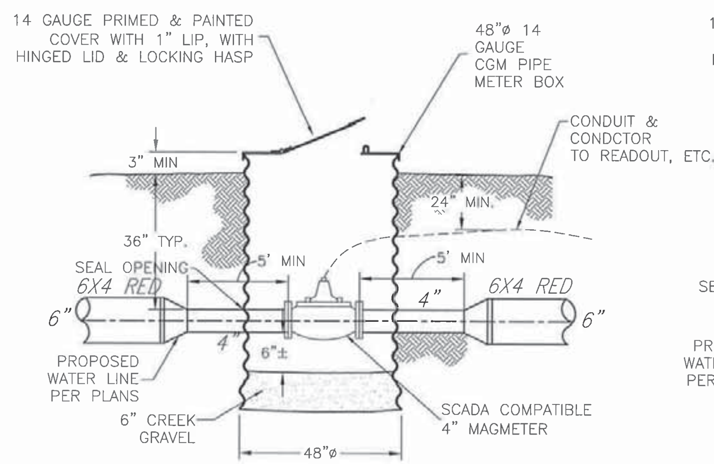
MOVABLE SHIELD

TRENCH WALL SLOPING

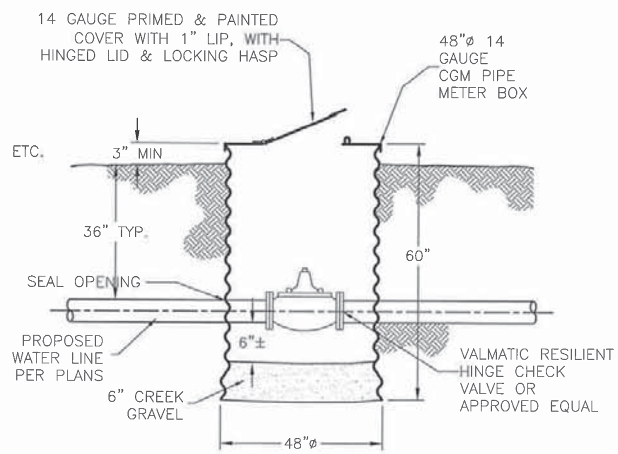
TRENCH WALL PROTECTION



PLAN & ELEVATION OF DIVERSION DIKES



IN-LINE FLOW METER



CGM VAULT WITH CHECK VALVE

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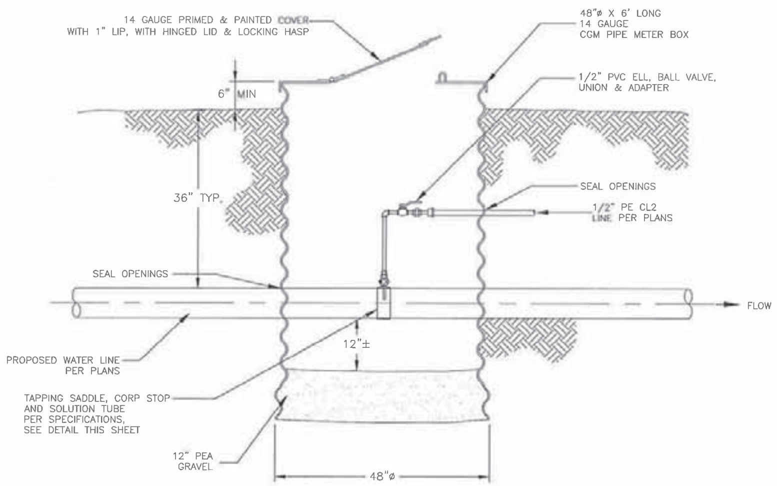
PAINT CREEK SWC
WATER SUPPLY IMPROVEMENTS
MISCELLANEOUS DETAILS

NO.	REVISION	BY	DATE

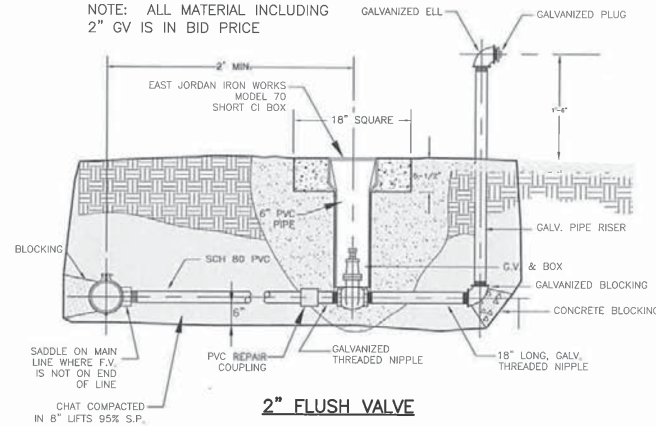
SCALE N.T.S.
FILE SHEET 19
DATE APR. 2015
DESIGNED KM
DRAWN CV
CHECKED KM

SHEET 20
TOTAL 23

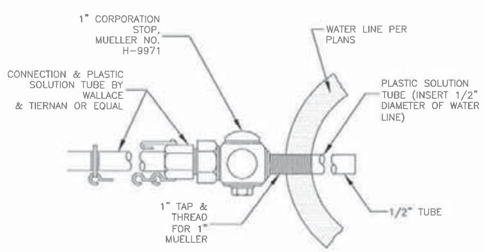


CHLORINE INJECTION BOX DETAIL
NTS

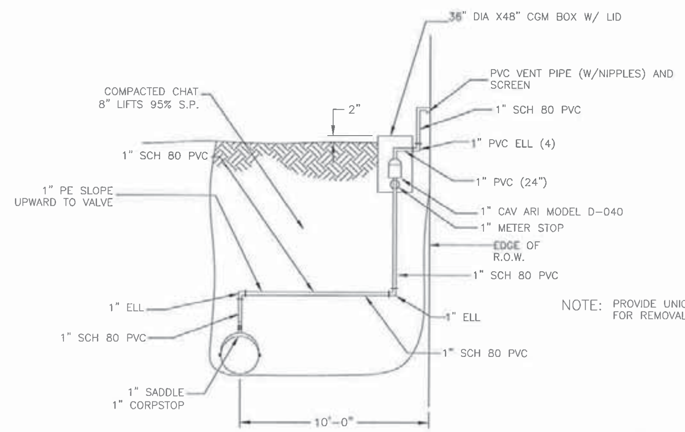
NOTE: ALL MATERIAL INCLUDING 2" GV IS IN BID PRICE



2" FLUSH VALVE



CHEMICAL DIFFUSER DETAIL
NTS



NOTE: PROVIDE UNIONS FOR REMOVAL

1" COMBINATION AIR/VACUUM VALVE SCHEMATIC
NTS

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PAINT CREEK SWC
WATER SUPPLY IMPROVEMENTS
MISCELLANEOUS DETAILS

SCALE	N.T.S.
FILE	SHEET 21
DATE	APR, 2015
DESIGNED	KM
DRAWN	CV
CHECKED	KM

NO.	REVISION	BY	DATE

SHEET 21
TOTAL 23

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
WATER DISTRIBUTION SYSTEM
GENERAL CONSTRUCTION NOTES

1. 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.

2. An appointed engineer shall notify in writing the local TCEQ's Regional Office when construction will start. Please keep in mind that upon completion of the water works project, the engineer or owner shall notify the commission's Water Supply Division, in writing, as to its completion and attest to the fact that the work has been completed essentially according to the plans and change orders on file with the commission as required in 30 TAC §290.39(h)(3).

3. All newly installed pipes and related products must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61-G and must be certified by an organization accredited by ANSI, as required by 30 TAC §290.44(a)(1).

4. Plastic pipe for use in public water systems must bear the National Sanitation Foundation Seal of Approval (NSF pw-G) 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).

5. 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).

6. 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).

7. 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. Include the formulas in the notes on the plans.

   - The hydrostatic leakage rate for polyvinyl chloride (PVC) pipe and appurtenances shall not exceed the amount allowed or recommended by formulas in America Water Works Association (AWWA) C-605 as required in 30 TAC §290.44(a)(5). Please ensure that the formula for this calculation is correct and most current formula is in use;

$$Q = \frac{LD\sqrt{P}}{148,000}$$

   Where:

   - Q = the quantity of makeup water in gallons per hour,
   - L = the length of the pipe section being tested, in feet,
   - D = the nominal diameter of the pipe in inches, and
   - P = the average test pressure during the hydrostatic test in pounds per square inch (psi).

   - The hydrostatic leakage rate for ductile iron (DI) pipe and appurtenances shall not exceed the amount allowed or recommended by formulas in America Water Works Association (AWWA) C-600 as required in 30 TAC §290.44(a)(5). Please ensure that the formula for this calculation is correct and most current formula is in use;

$$L = \frac{SD\sqrt{P}}{148,000}$$

   Where:

   - L = the quantity of makeup water in gallons per hour,
   - S = the length of the pipe section being tested, in feet,
   - D = the nominal diameter of the pipe in inches, and
   - P = the average test pressure during the hydrostatic test in pounds per square inch (psi).

8. Projects constructed on or after January 4, 2014 must comply with changes to the Safe Drinking Water Act that reduce the maximum allowable lead content of pipes, pipe fittings, plumbing fittings, and fixtures to 0.25 percent.

9. 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).

10. 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).

11. 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.

12. Pursuant to 30 TAC §290.44(d)(5), sufficient valves and blowoffs to make repairs. The engineering report shall establish criteria for this design.

13. 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.

14. 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.

15. 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.

16. 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.

17. Pursuant to 30 TAC §290.44(e)(7), suction mains to pumping equipment shall not cross wastewater mains, wastewater laterals, or wastewater service lines. Raw water supply lines shall not be installed within five feet of any tile or concrete wastewater main, wastewater lateral, or wastewater service line.

18. Pursuant to 30 TAC §290.44(e)(8), waterlines shall not be installed closer than ten feet to septic tank drainfields.

19. 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.

20. 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.

21. The contractor shall disinfect the new water mains in accordance with 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).

GENERAL CONSTRUCTION NOTES:

1. CONTRACTOR TO FIELD VERIFY SIZE AND LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. (TEXAS ONE CALL SYSTEM 1-800-545-6005). CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES WHICH ARE TO REMAIN. BURIED UTILITIES SHOWN ON THE PLANS HAVE BEEN ESTABLISHED BY ON GROUND INFORMATION AS WELL AS COORDINATION WITH UTILITY COMPANIES. LOCATIONS MAY NOT BE EXACT AND OTHER UTILITIES MAY EXIST.

2. WORKS SHALL BE CONDUCTED IN A WAY AS TO MINIMIZE INTERFERENCE WITH TRAFFIC. CONTRACTOR SHALL PROVIDE ADVANCED WARNING CONSTRUCTION SIGNING AND TYPE III BARRICADES WITH "ROAD CLOSED" SIGNS, LOCATED AT THE START OF CONSTRUCTION. ALL SIGNING AND BARRICADES PROVIDED SHALL BE IN ACCORDANCE WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).

3. PRIOR TO COMMENCEMENT OF CONSTRUCTION, ALL PARTIES THAT MEET THE DEFINITION OF OPERATOR AS DEFINED BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) TPDES CONSTRUCTION GENERAL PERMIT TXR150000 SHALL SUBMIT REQUIRED NOTIFICATION WHICH MAY INCLUDE A COPY OF THE NOTICE OF INTENT (NOI) FILED WITH THE TCEQ AND/OR A CONSTRUCTION SITE NOTICE (CSN). A COPY OF THE NOI OR THE CSN SHALL BE PROVIDED TO THE CITY. THE NOI/CSN FORMS AND PERMIT REQUIREMENTS MAY BE OBTAINED FROM TCEQ AT www.TCEQ.state.tx.us/nav/permits/wq_construction.html. A STORMWATER POLLUTION PREVENTION PLAN (SWP3) SHALL BE DEVELOPED AND IMPLEMENTED PRIOR TO COMMENCEMENT OF CONSTRUCTION. QUESTIONS CONCERNING THESE REQUIREMENTS MAY BE ADDRESSED TO TCEQ SMALL BUSINESS LOCAL GOVERNMENT ASSISTANCE PROGRAM AT 800-447-2827.

4. ALL EXCAVATION GREATER THAN 5 FEET DEEP SHALL COMPLY WITH O.S.H.A. TRENCH SAFETY STANDARDS.

5. ALL MATERIAL INSTALLATION SHALL FULLY COMPLY WITH TAC TCEQ CHAPTER 217 FOR NO EXTRA PAYMENT. CHAPTER 217 REQUIREMENTS SHALL TAKE PRIORITY OVER ALL OTHER SPECIFICATIONS, PLANS AND CONTRACT DOCUMENTS.

6. ALL MATERIAL FOR THIS PROJECT SHALL BE FURNISHED BY THE CONTRACTOR. ALL MATERIAL FOR THIS PROJECT SHALL BE INSTALLED BY THE CONTRACTOR.

7. CONTRACTOR SHALL CONTACT A REPRESENTATIVE FROM THE GAS COMPANY BEFORE COMPLETING GAS LINE CROSSINGS.

8. NO CHANGE IN THE WORK PERFORMED SHALL BE AUTHORIZED WITHOUT APPROVAL OF THE ENGINEER.

9. ALL CITY PAVED AND GRAVEL STREETS SHALL BE CUT AND REPAIRED WITHOUT ADDITIONAL PAY.

10. ALL DRIVEWAYS WITHIN TxDOT RIGHT OF WAY SHALL BE SLICK BORED. ALL TxDOT ROAD SHALL BE BORED AND ENCASED AS INDICATED ON THE PLAN SHEETS.

11. ALL FENCES SHALL BE PROTECTED AS MUCH AS POSSIBLE. IF AN EXISTING FENCE MUST BE CUT OR ALTERED AS A RESULT OF THE WORK THE FENCE SHALL BE REPAIRED TO ORIGINAL OR BETTER CONDITION. IF THE FENCE MUST REMAIN CUT AND UNMANNED TEMPORARY FENCING SHALL BE CONSTRUCTED BY THE CONTRACTOR. ALL FENCE ALTERATIONS SHALL BE COORDINATED WITH THE PROPERTY OWNER TO ENSURE THAT LIVESTOCK WILL NOT BE ALLOWED TO LEAVE THE PROPERTY AS A RESULT OF THE CONSTRUCTION OPERATION.

12. ALL BRUSH CLEARING REQUIRED ON THIS PROJECT SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT.

13. WHERE BRUSH CLEARING IS REQUIRED CONTRACTOR SHALL HAUL OFF AND DISPOSE OF CUT BRUSH OR CHIP PER THE DIRECTION OF THE PROPERTY OWNER.

14. THE CONTRACTOR SHALL FULLY COMPLY WITH ALL TCEQ REGULATIONS PERTAINING TO SEPARATION DISTANCES AS DESCRIBED IN SECTION 217.13 OF THE ATC DESIGN CRITERIA FOR SEWERAGE SYSTEMS.

15. ALL PIPE AND ACCESSORIES SHALL BE LAID, JOINTED TESTED FOR DEFECTS AND LEAKAGE WITH PRESSURE, AND DISINFECTED ACCORDING TO AWWA CM651-05. CONTRACTOR SHALL MAINTAIN APPROPRIATE BACKFLOW PREVENTION ACCORDING TO AWWA C651-05 SECTION 4.3.9.

16. ALL ABANDONED FIRE HYDRANTS SHALL BE REMOVED & DISPOSED OF BY THE CONTRACTOR.

17. THE CONTRACTOR SHALL CONTROL EROSION AND SEDIMENTATION PER THE APPLICABLE PERMITS, LAWS, AND REGULATIONS.

18. CONTRACTOR SHALL MINIMIZE DAMAGE TO EXISTING LANDSCAPING ON PRIVATE PROPERTY. EXISTING LANDSCAPING SHALL BE REPAIRED TO ITS ORIGINAL CONDITION INCLUDING THE REPLACEMENT OF EXISTING LAWN AREAS WITH THE SAME TYPE OF LAWN AS WAS REMOVED.

19. ALL ABOVE GROUND STRUCTURES SHALL BE PROTECTED BY THE CONTRACTOR FROM DAMAGE DURING THE CONSTRUCTION PROCESS. ANY DAMAGE DONE ON PRIVATE PROPERTY SHALL BE REPLACED OR REPAIRED TO ORIGINAL OR BETTER CONDITIONS.

20. WATER SERVICE WATER LINES SHALL BE 1"OR 3/4" SDR 9 HOPE UNLESS NOTED OTHERWISE. ALL EXISTING ASPHALT & CONCRETE PAVEMENT SHALL BE SAW CUT. NO EXTRA PAYMENT SHALL BE PAID FOR PAVEMENT & BASE REPAIR.

21. NO EXTRA PAYMENT WILL BE MADE FOR SPECIAL PROVISIONS REQUIRED TO MEET TCEQ REGULATIONS WHEN WATER & SEWER LINES CROSS OR WHEN THEY ARE LAID PARALLEL PER DETAILS & PER TCEQ REGS.

STANDARD EMERGENCY CONDITIONS:

ARCHAEOLOGICAL DISCOVERIES AND CULTURAL RESOURCES

NO ACTIVITY WHICH MAY AFFECT PROPERTIES LISTED OR PROPERTIES ELIGIBLE FOR LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES OR ELIGIBLE FOR DESIGNATION AS A STATE ARCHEOLOGICAL LANDMARK IS AUTHORIZED UNTIL THE OWNER HAS COMPLIED WITH THE PROVISIONS OF THE NATIONAL HISTORIC PRESERVATION ACT AND THE ANTIQUITIES CODE OF TEXAS. THE OWNER HAS PREVIOUSLY COORDINATED WITH THE APPROPRIATE AGENCIES AND IMPACTS TO KNOWN CULTURAL OR ARCHEOLOGICAL DEPOSITS HAVE BEEN AVOIDED OR MITIGATED. HOWEVER, THE CONTRACTOR MAY ENCOUNTER UNANTICIPATED CULTURAL OR ARCHEOLOGICAL DEPOSITS DURING CONSTRUCTION.

IF ARCHEOLOGICAL SITES OR HISTORIC STRUCTURES WHICH MAY QUALIFY FOR DESIGNATION AS A STATE ARCHEOLOGICAL LANDMARK ACCORDING TO THE CRITERIA IN 13 TAC §§41.6-41.10, OR THAT MAY BE ELIGIBLE FOR LISTING ON THE NATIONAL REGISTER OF HISTORIC PLACES IN ACCORDANCE WITH 36 CFR PART 800, ARE DISCOVERED AFTER CONSTRUCTION OPERATIONS ARE BEGUN, THE CONTRACTOR SHALL IMMEDIATELY CEASE OPERATIONS IN THAT PARTICULAR AREA AND NOTIFY THE OWNER, THE TWDB, AND THE TEXAS ANTIQUITIES COMMITTEE, P.O. BOX 12276, CAPITOL STATION, AUSTIN, TEXAS 78711-2276. THE CONTRACTOR SHALL TAKE REASONABLE STEPS TO PROTECT AND PRESERVE THE DISCOVERIES UNTIL THEY HAVE BEEN INSPECTED BY THE OWNER'S REPRESENTATIVE AND THE TWDB. THE OWNER WILL PROMPTLY COORDINATE WITH STATE HISTORIC PRESERVATION OFFICER AND OTHER APPROPRIATE AGENCIES TO OBTAIN ANY NECESSARY APPROVALS OR PERMITS TO ENABLE THE WORK TO CONTINUE. THE CONTRACTOR SHALL NOT RESUME WORK IN THE AREA OF THE DISCOVERY UNTIL AUTHORIZED TO DO SO BY THE OWNER.

ENDANGERED SPECIES

NO ACTIVITY IS AUTHORIZED THAT IS LIKELY TO JEOPARDIZE THE CONTINUED EXISTENCE OF A THREATENED OR ENDANGERED SPECIES AS LISTED OR PROPOSED FOR LISTING UNDER THE FEDERAL ENDANGERED SPECIES ACT (ESA), AND/OR STATE OF TEXAS PARKS AND WILDLIFE CODE ON ENDANGERED SPECIES, OR TO DESTROY OR ADVERSELY MODIFY THE HABITAT OF SUCH SPECIES

IF A THREATENED OR ENDANGERED SPECIES IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY CEASE WORK IN THE AREA OF THE ENCOUNTER AND NOTIFY THE OWNER, WHO WILL IMMEDIATELY IMPLEMENT ACTIONSIN ACCORDANCE WITH THE ESA AND APPLICABLE STATE STATUTES. THESE ACTIONS SHALL INCLUDE REPORTING THE ENCOUNTER TO THE TWDB, U.S. FISH AND WILDLIFE SERVICE, AND THE TEXAS PARKS AND WILDLIFE DEPARTMENT, OBTAINING ANY NECESSARY APPROVALS OR PERMITS TO ENABLE THE WORK TO CONTINUE, OR IMPLEMENT OTHER MITIGATIVE ACTIONS. THE CONTRACTOR SHALL NOT RESUME CONSTRUCTION IN THE AREA OF THE ENCOUNTER UNTIL AUTHORIZED TO DO SO BY THE OWNER.

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817-594-9880

PAINT CREEK SWC

WATER SUPPLY IMPROVEMENTS

PROJECT NOTES

NO.	REVISION	BY	DATE	SCALE N.T.S.
				FILE SHEET 22
				DATE APR, 2015
				DESIGNED KM
				DRAWN CV
				CHECKED KM

EROSION CONTROL REQUIREMENTS

It is required that all construction activity be in compliance with the latest regulations of the environmental protection agency, the texas commission of environmental quality, and all other city, state, and federal regulations.

To be in compliance the contractor will furnish, install and maintain all devices necessary to insure the environment is protected as required by said regulations. protection will be in place before construction begins. upon completion of the project, the contractor is responsible for leaving the project in a stabilized condition that assures prevention of future erosion and sedimentation pollution.

"Stabilized Condition" implies that disturbed areas affected by this activity have been restored to a condition equal to, or better than, they were before the activity occurred. different methods such as permanent grass sod, concrete riprap, concrete retards, grass covered earth berms, and other methods may accomplish the restoration. until permanent pollution and sedimentation control is established, the contractor will provide temporary control such as silt fence, rock retards, berms, etc.

The cost associated with providing these controls will be considered subsidiary unless specific bid items are included in the plans.

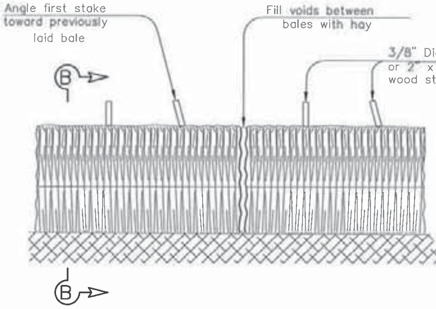
SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour A sediment control fence may be constructed near the to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

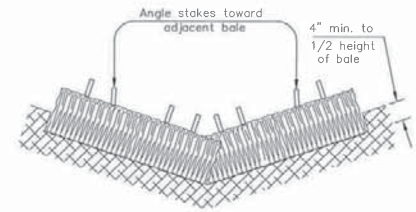
Sediment control fence should be sized to filter a max. flow through rate of 100 GPM/FT . Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

GENERAL NOTES

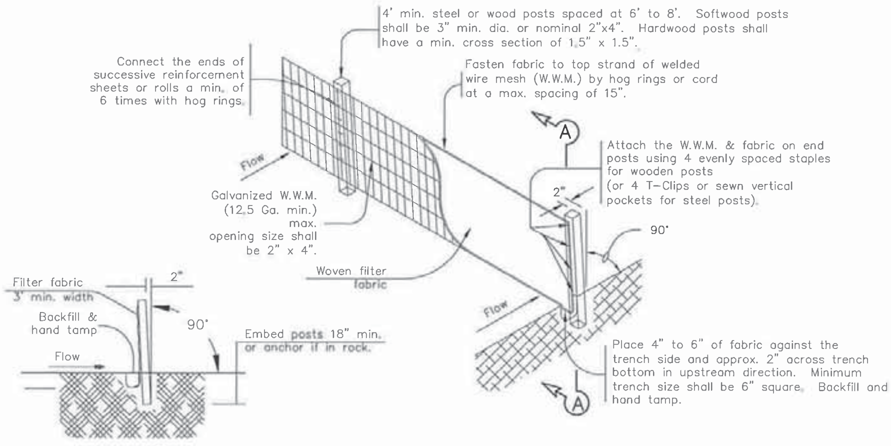
1. The guidelines shown hereon are suggestions only and may be modified by the Engineer.



BALED HAY FOR EROSION CONTROL

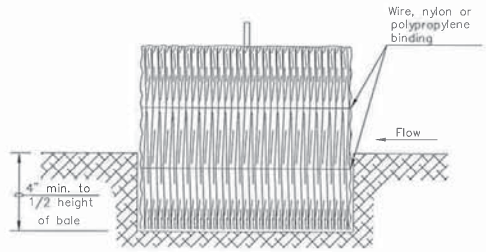


PROFILE VIEW

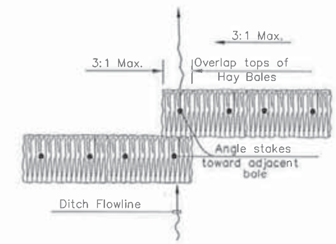


SECTION A–A

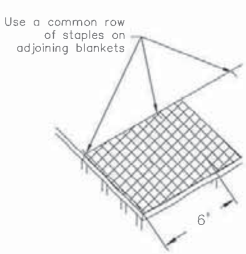
TEMPORARY SEDIMENT CONTROL FENCE



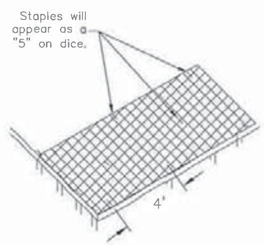
SECTION B–B



PLAN VIEW



SLOPE INSTALLATION



DITCH INSTALLATION

SOIL RETENTION BLANKET EROSION CONTROL

NOTE: CONTRACTOR SHALL BE RESPONSIBLE FOR SWPPP, NOI , ETC. AT HIS COST.

GENERAL NOTES:

1. Use wire staples, .091" in diameter or greater "U" shaped with legs 6" in length and a 1" crown. Size and shape of staples used will vary with soil conditions. Drive staples vertically into the ground. Use four staples across at the start of each roll.

2. For slope installation, continue to staple along the length of the roll at 6 ft. intervals.

3. For ditch liner, staple along the length of the roll at 4 ft. intervals.

4. Another row of stables in the center of each blanket should be alternately spaced between each side for either slope or ditch.

5. Use a common row of staples on adjoining blankets.

BALED HAY USAGE GUIDELINES

A Baled Hay installation may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A two year storm frequency may be used to calculate the flow rate to be filtered. The installation should be sized to filter a maximum flow thru rate of 5 GPM/FT of cross sectional area. Baled hay may be used at the following locations:

1. Where the runoff approaching the baled hay flows over disturbed soil for less than 100'. If the slope of the disturbed soil exceeds 10%, the length of slope upstream the baled hay should be less than 50'.

2. Where the installation will be required for less than 3 months.

3. Where the contributing drainage area is less than 1/2 acre. For Baled Hay installations in small ditches, the additional following considerations apply:

1. The ditch sideslopes should be graded as flat as possible to maximize the drainage flow rate thru the hay.

2. The ditch should be graded large enough to contain the overtopping drainage when sediment has filled to the top of the baled hay. Bales should be replaced usually every 2 months or more often during wet weather when loss of structural integrity is accelerated.

GENERAL NOTES

1. Hay bales shall be a minimum of 30" in length and weigh a minimum of 50 Lbs.

2. Hay bales shall be bound by either wire or nylon or polypropylene string. The bales shall be composed entirely of vegetative matter.

3. Hay bales shall be embedded in the soil a minimum of 4" and where possible ½ the height of the bale.

4. Hay bales shall be placed in a row with ends tightly abutting the adjacent bales. The bales shall be placed with bindings parallel to the ground.

5. Hay bales shall be securely anchored in place with 3/8" Dia. rebar or 2" x 2" wood stakes, driven through the bales. The first stake shall be angled towards the previously laid bale to force the bales together.

6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

JACOB & MARTIN, LLC.
CONSULTING ENGINEERS
3465 CURRY LANE
ABILENE, TEXAS 79606
325-695-1070
1508 SANTA FE DR, SUITE 204
WEATHERFORD, TEXAS 76086
817-594-9880

PAINT CREEK SWC
WATER SUPPLY IMPROVEMENTS
EROSION CONTROL DETAILS

NO.	REVISION	BY	DATE

SCALE	N.T.S.
FILE	SHEET 23
DATE	APR, 2015
DESIGNED	KM
DRAWN	CV
CHECKED	KM

SHEET 23
TOTAL 23

APPENDIX B

REGULATORY CORRESPONDENCE

May 6, 2015

Kay Howard
PO Box 64780
Lubbock, TX 79464

Re: Project review under the Antiquities Code of Texas and the National Historic Preservation Act: Haskell County Contract 7215017- Paint Creek Water Improvements (CDBG; Track #201507361)

Dear Ms. Howard:

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Tiffany Osburn, has examined our records. According to our maps, portions of the proposed project area have never been surveyed by a professional archeologist and may contain cultural resources. We recommend that a professional archeologist survey the portions of the proposed project that fall along Callaway Road. Survey should include shovel testing in areas with the potential for alluvial deposition regardless of surface visibility. If there is a potential for deeply buried cultural deposits within the depth of impacts, deeper subsurface investigations (such as backhoe trenching) may be required.

The work should meet the minimum archeological survey standards posted on-line at www.thc.state.tx.us. A report of investigations should be produced in conformance with the Secretary of the Interior's Guidelines for Archaeology and Historic Preservation, and submitted to this office for review. You may obtain lists of most professional archeologists in Texas on-line at: www.c-tx-arch.org or www.rpanet.org. Please note that other potentially qualified archeologists not included on these lists may be used.

If the survey is being performed on public land or within a public easement your contract archeologist must obtain an Antiquities Permit from our office before any investigations are undertaken. An Antiquities Permit can be issued as soon as we have a completed permit application.

Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Tiffany Osburn at 512/463-8883 or tiffany.osburn@thc.state.tx.us.**

Sincerely,

for
Mark Wolfe, State Historic Preservation Officer

MW/to

APPENDIX C

SHOVEL TEST AND TRENCH LOCATIONS

APPENDIX C

Shovel Test & Backhoe Trench Locations