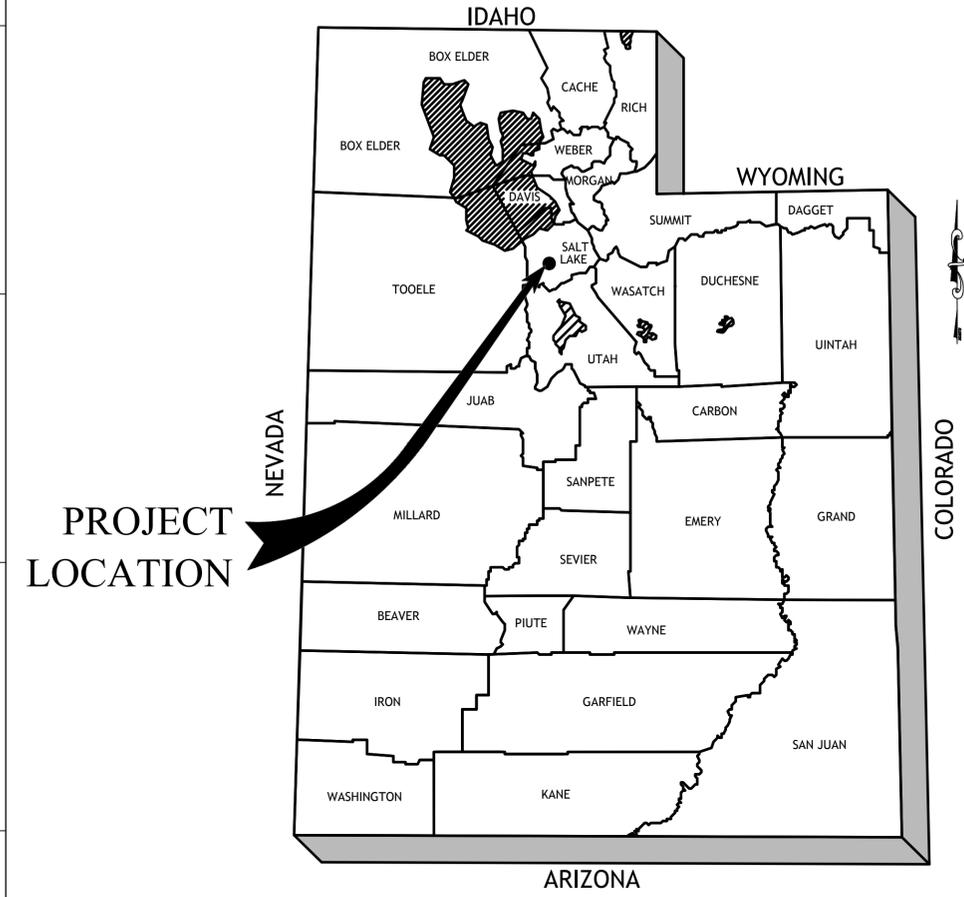


# 7000 SOUTH AND BANGERTER HIGHWAY UTILITY BETTERMENTS

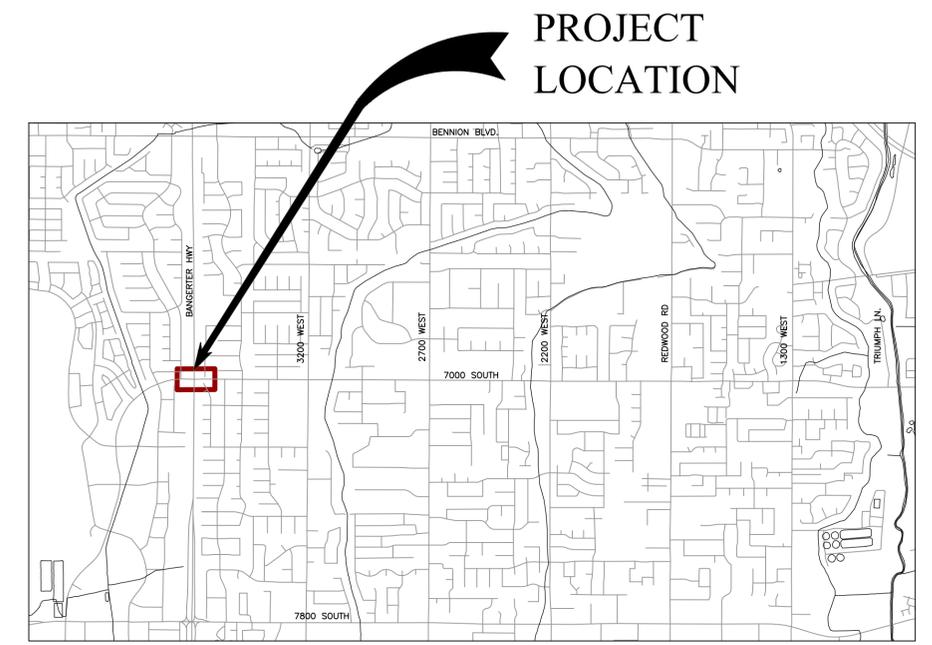
ISSUED FOR REVIEW



DRAFT



**LOCATION MAP**  
N.T.S



**VICINITY MAP**  
N.T.S

**INDEX OF DRAWINGS**

SHEET NO.	DWG. NO.	DESCRIPTION
1	G-001	PROJECT LOCATION AND SHEET INDEX
2	G-002	LEGEND
3	G-003	GENERAL NOTES
4	C-100	PLAN AND PROFILE - SANITARY SEWER SHEET 1
5	C-200	PLAN AND PROFILE - SECONDARY WATER SHEET 1
6	C-201	PLAN AND PROFILE - SECONDARY WATER SHEET 2
7	C-610	SANITARY SEWER DETAIL SHEET 1
8	C-611	SANITARY SEWER DETAIL SHEET 2
9	C-620	SECONDARY WATER DETAIL SHEET 1
10	C-621	SECONDARY WATER DETAIL SHEET 2

B	ISSUED FOR RFP	AKF	GST	DWJ	09/08/16
A	ISSUED FOR REVIEW	AKF	GST	DWJ	07/07/16
NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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385 West Vine Street, Suite 400, Murray, Utah 84123  
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CITY OF WEST JORDAN  
7000 SOUTH UTILITY BETTERMENTS  
PROJECT LOCATION AND SHEET INDEX

DESIGNED	AKF/JDU	SCALE:	AS SHOWN
DRAWN	IL	NO.	
CHECKED	GST	REV.	
APPROVED	GST		
APPROVED	DWJ	G-001	B
DATE	7/5/16		

# EXHIBIT D-1

SYMBOL LEGEND		
DESCRIPTION	EXIST.	PROP.
<b>SANITARY SEWER</b>		
SANITARY SEWER MANHOLE		
STORM SEWER MANHOLE		
<b>STORM DRAIN</b>		
CATCH BASIN		
DROP INLET		
STORM DRAIN		
<b>COMMUNICATION</b>		
TELE. PEDESTAL		
TV PEDESTAL		
CABLE TV		
<b>DOMESTIC WATER</b>		
FIRE HYDRANT		
WATER MANHOLE		
WATER METER		
WATER VALVE		
<b>ELECTRIC</b>		
ELEC. MANHOLE		
JUNCTION BOX		
ELEC. TRANS.		
GUY WIRE		
LIGHT POLE		
POWER POLE		
<b>SIGNALS</b>		
SIGNAL CONTROLLER		
SIGNAL POLE		
<b>MANHOLES</b>		
MANHOLE		
<b>NATURAL GAS</b>		
GAS VALVE		
GAS MANHOLE		
<b>SITE</b>		
SIGN		

DESCRIPTION	EXIST.	PROP.
<b>SURVEY</b>		
CAP		
CTRL PT		

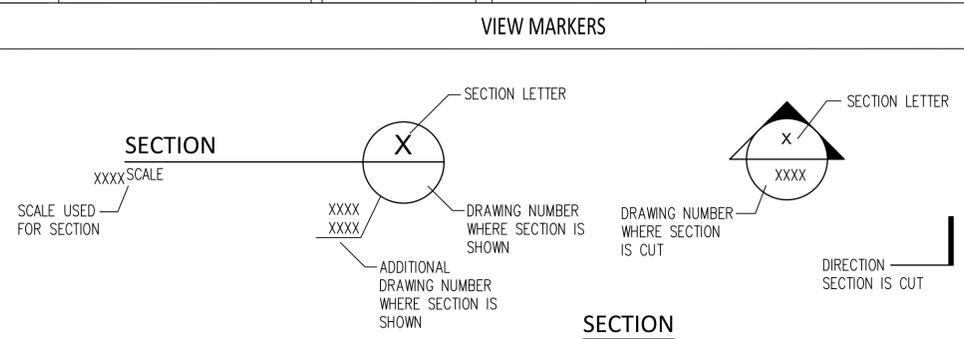
LINE LEGEND		
DESCRIPTION	EXIST.	PROP.
STORM DRAIN		
MIDVALE STORM DRAIN		
UDOT STORM DRAIN		
SANITARY SEWER		
MIDVALE SANITARY SEWER		
WATER		
IRRIGATION		
NATURAL GAS		
HIGH PRESSURE NATURAL GAS		
OVERHEAD POWER		
UNDERGROUND POWER		
POWER		
TELEPHONE		
FIBER OPTIC		
CABLE TELEVISION		
FENCE		
MAJOR CONTOUR		
MINOR CONTOUR		
PROPERTY LINE		
RIGHT OF WAY		
SECTION LINES		
QUARTER SECTION LINES		
CURB AND GUTTER		
ROAD CENTERLINE		

ABBREVIATIONS	
ABBREV.	TERM
A	GRADE CHANGE
ALUM	ALUMINUM
ASSY	ASSEMBLY
Z	ANGLE
@	AT (MEASUREMENTS)
BC	BEGINNING OF CURVE
BFS	BEGIN FULL SUPER
BLDG	BUILDING
B.M.	BENCH MARK
BNC	BEGIN NORMAL CROWN
BNS	BEGIN NORMAL SHOULDER
BOA	BEGINNING OF ALIGNMENT
BP	ALIGNMENT BEGINNING
BREAK	GRADE BREAK
BSC	BITUMINOUS SURFACE COURSE
BSW	BACK OF SIDEWALK
BVC	BEGIN VERTICAL CURVE
BVCE	BVC ELEVATION
BVCS	BVC STATION
BVP	PROFILE START
B.W.	BOTH WAYS
C	CHANNEL (STRUCTURAL)
CJ	CONTROL JOINT
CL	CENTER LINE
CLR	CLEARANCE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
CONC	CONCRETE
CONT	CONTINUOUS
CPLG	COUPLING
CS	CURVE-SPIRAL INTERSECT
CS_LRB	COMPOUND SPIRAL LARGE RADIUS AT BEGINNING
CS_LRE	COMPOUND SPIRAL LARGE RADIUS AT END
CS_SRB	COMPOUND SPIRAL SMALL RADIUS AT BEGINNING
CS_SRE	COMPOUND SPIRAL SMALL RADIUS AT END
CTR	CENTER
CU FT	CUBIC FEET
CU YD	CUBIC YARD
DEG OR °	DEGREE
DET	DETAIL
DIA OR Ø	DIAMETER
D.I.P.	DUCTILE IRON PIPE

ABBREVIATIONS	
ABBREV.	TERM
DIST	DISTRIBUTION
DWG	DRAWING
EA	EACH
EC	END OF CURVE
EFS	END FULL SUPER
ELB	ELBOW
ELEV OR EL.	ELEVATION
ENC	END NORMAL CROWN
ENS	END NORMAL SHOULDER
EOA	END OF ALIGNMENT
EP	ALIGNMENT END
EVP	PROFILE END
E.W.	EACH WAY
EXIST	EXISTING
EVC	END VERTICAL CURVE
EVCE	EVC ELEVATION
EVCS	EVC STATION
FF	FINISH FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FLG	FLANGE
FT OR '	FEET
FTG	FOOTING
GALV	GALVANIZED
GB	GRADE BREAK
GV	GATE VALVE
HORIZ	HORIZONTAL
HP	HIGH POINT
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN. OR "	INCH
INV.	INVERT
K	CURVE COEFFICIENT
L	LEFT
LB	LINE BEGINNING
LB OR #	POUND
LC	LEVEL CROWN
LE	LINE END
LF	LINEAL FEET
LN	LINEAL
LP	LOW POINT
LSM	LOW SHOULDER MATCH
MAN	MANUAL
MAX	MAXIMUM
MIN	MINIMUM
NO. OR #	NUMBER

ABBREVIATIONS	
ABBREV.	TERM
OVERALL HP	OVERALL HIGH POINT
OVERALL LP	OVERALL LOW POINT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PE	POLYETHYLENE
PI	TANGENT-TANGENT INTERSECT
PL OR R	PLATE OR PROPERTY LINE
PRC	POINT OF REVERSE CURVATURE
PT	END OF CURVE
PVC	POLYVINYL-CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS OR RIGHT
R&R	REMOVE & REPLACE
RC	REVERSE CROWN
REM	REMOVE
REQ'D	REQUIRED
REV	REVISION
R/W	RIGHT-OF-WAY
S	SLOPE
SBO	SHOULDER BREAKOVER
SC	SPIRAL-CURVE INTERSECT
SPI	REVERSE SPIRAL INTERSECT
SPEC	SPECIFICATION
SS_LRB	SIMPLE SPIRAL LARGE RADIUS AT BEGINNING
SS_LRE	SIMPLE SPIRAL LARGE RADIUS AT END
SS_SRB	SIMPLE SPIRAL SMALL RADIUS AT BEGINNING
SS_SRE	SIMPLE SPIRAL SMALL RADIUS AT END
ST	SPIRAL-TANGENT INTERSECT
STA	STATION
STD	STANDARD
STL	STEEL
ST STL	STAINLESS STEEL
SS	SPIRAL-SPIRAL INTERSECT
TBC	TOP BACK OF CURB

ABBREVIATIONS	
ABBREV.	TERM
TFC	TOP FACE OF CONCRETE
TOB	TOP OF BEAM
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOP	TOP OF PIPE
TOW	TOP OF WALL
TS	TANGENT-SPIRAL INTERSECT
TYP	TYPICAL
UDOT	UTAH DEPARTMENT OF TRANSPORTATION
VCC	VERTICAL COMPOUND CURVE
VCCE	VCC ELEVATION
VCCS	VCC STATION
VRC	VERTICAL REVERSE CURVE
VRCE	VRC ELEVATION
VRCS	VRC STATION
W/	WITH
W/O	WITHOUT
W/REQ'D	WHERE REQUIRED



B	ISSUED FOR RFP	AKF	GST	DWJ	09/08/16
A	ISSUED FOR REVIEW	AKF	GST	DWJ	07/07/16
NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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CITY OF WEST JORDAN  
 7000 SOUTH UTILITY BETTERMENTS

## LEGEND SHEET

DESIGNED	AKF/JDU	SCALE:	AS SHOWN
DRAWN	IL	NO.	G-002
CHECKED	GST	REV.	B
APPROVED	GST		
APPROVED	DWJ		
DATE	7/5/16		

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 CADD DS-R4

# EXHIBIT D-1

## GENERAL NOTES

1. SYMBOLS FOR STRUCTURES, PIPE, ETC. USED FOR IDENTIFICATION ARE SHOWN IN LEGENDS AND SHALL BE FOLLOWED THROUGHOUT THE PLANS WHERE APPLICABLE. NOT ALL COMPONENTS FOUND IN SAID LEGENDS ARE NECESSARILY USED IN THE PROJECT.
2. THE SIZE OF THE ORIGINAL PLOTTED DRAWINGS ARE 22"x34". THEREFORE CARE SHOULD BE TAKEN TO REVIEW AND VERIFY THE SCALE BAR TO ADEQUATELY DETERMINE THE SCALE OF THE REDUCED REPRODUCTIONS.
3. KNOWN SEWER MAINS, WATER MAINS, GAS MAINS, STORM DRAINS, IRRIGATION LINES, TELEPHONE CONDUITS, ELECTRIC CABLES AND OTHER UNDERGROUND STRUCTURES ARE SHOWN ON THE DRAWING ONLY TO THE EXTENT SUCH INFORMATION HAS BEEN MADE AVAILABLE TO OR DISCOVERED BY THE ENGINEER. IT IS EXPECTED THAT THERE MAY BE DISCREPANCIES AND OMISSIONS IN THE LOCATION AND QUANTITIES OF THE UTILITIES AND STRUCTURES SHOWN. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR BUT IS NOT GUARANTEED TO BE EITHER CORRECT OR COMPLETE, AND ALL RESPONSIBILITY FOR THE ACCURACY AND COMPLETENESS THEREOF IS EXPRESSLY DISCLAIMED. THE CONTRACTOR SHALL MAKE SUCH INVESTIGATION, AS HE THINKS NECESSARY TO VERIFY ITS CORRECTNESS AND COMPLETENESS. THE CONTRACTOR SHALL, AHEAD OF THE EXCAVATOR, LOCATE UNDERGROUND UTILITIES AND STRUCTURES SO THAT THEY WILL NOT BE ACCIDENTALLY CUT OR DAMAGED BY HIS CONSTRUCTION OPERATION, AND SO THAT THE GRADE OF THE PIPE CAN BE ADJUSTED.
4. NOTIFY "BLUESTAKES" AT 1(800) 662-4111 PRIOR TO ANY EXCAVATION. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN IN THE DRAWINGS ARE APPROXIMATE. DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BY POTHOLING IN ADVANCE OF TRENCHING OPERATIONS. NOTIFY THE OWNER'S AUTHORIZED REPRESENTATIVE OF ANY POTHOLED UTILITIES IN CONFLICT WITH PROPOSED CONSTRUCTION IN ADVANCE OF CONSTRUCTION OPERATIONS.
5. CONTRACTOR WILL BE RESPONSIBLE FOR CORRECTING ANY SETTLEMENT OF OR DAMAGE TO EXISTING UTILITIES.
6. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO AND REPAIR OF ADJACENT SURFACE IMPROVEMENTS OR FACILITIES DURING CONSTRUCTION.
7. CONTRACTOR IS RESPONSIBLE TO FURNISH ALL MATERIALS NECESSARY TO COMPLETE THE PROJECT.
8. DEFLECTION OF PIPE SHALL BE KEPT UNDER 50% OF THE PIPE MANUFACTURE'S ALLOWABLE DEFLECTION.
9. EXCAVATION LIMITS SHOWN ARE FOR GRAPHICAL REPRESENTATION ONLY AND DO NOT REPRESENT ACTUAL EXCAVATION LIMITS OR SAFE TRENCH CONDITIONS REQUIRED TO COMPLETE THE WORK. CONTRACTOR IS SOLELY RESPONSIBLE FOR CONFORMANCE WITH LOCAL AND FEDERAL CODES GOVERNING SHORING AND BRACING OF EXCAVATIONS AND TRENCHES. CONTRACTOR IS RESPONSIBLE FOR THE SAFETY AND PROTECTION OF PERSONNEL AND WORKERS.
10. ONLY CITY OF WEST JORDAN INFRASTRUCTURE MAINTENANCE AND OPERATIONS DEPARTMENT PERSONNEL ARE TO OPERATE CULINARY WATER SYSTEM VALVES.
11. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS ALONG HORIZONTAL ALIGNMENT AS DEFINED IN THESE DRAWINGS. CONTRACTOR SHALL NOT DEVIATE FROM PROPOSED ALIGNMENT WITHOUT A WRITTEN APPROVAL BY THE CONSTRUCTION MANAGER.
12. ALL LENGTHS OF SANITARY SEWER ARE MEASURED INSIDE FACE TO INSIDE FACE.

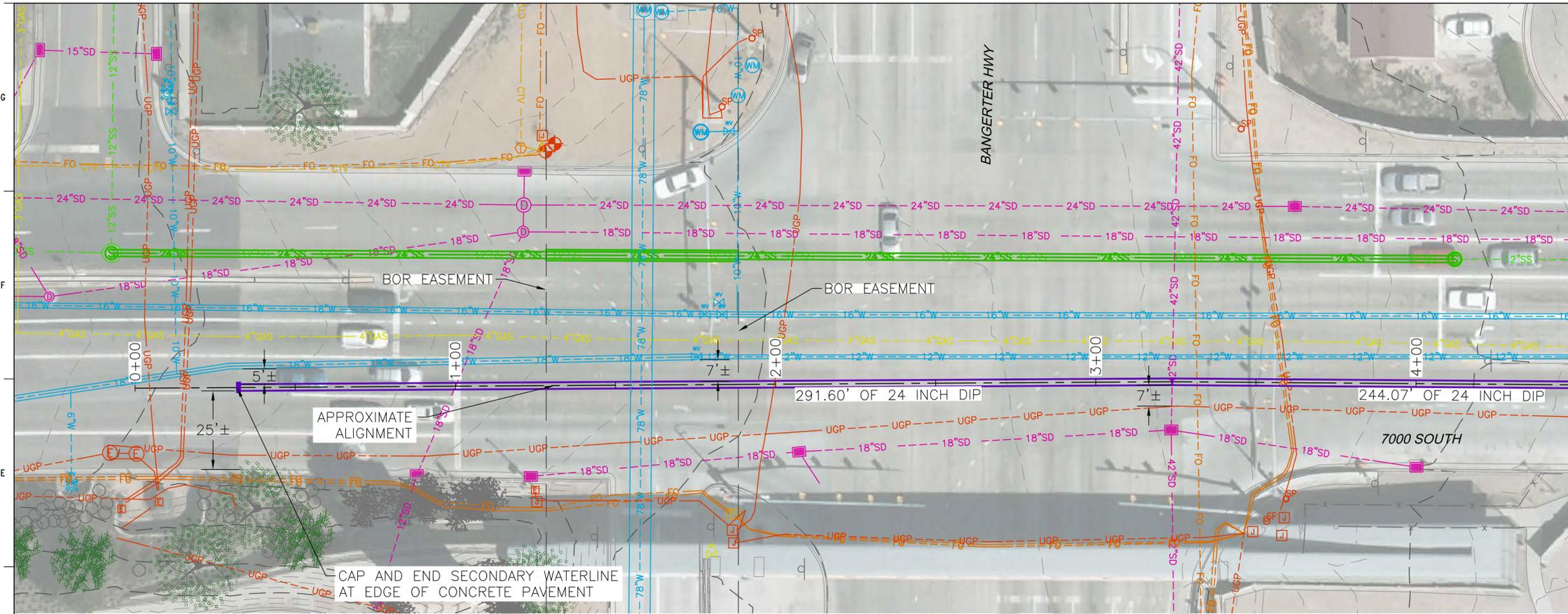
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B	ISSUED FOR RFP	AKF	GST	DWJ	09/08/16		
A	ISSUED FOR REVIEW	AKF	GST	DWJ	07/07/16		
NO.	REVISIONS	DSGN	CHKD	APVD	DATE		
 <b>Stanley Consultants inc.</b> <small>385 West Vine Street, Suite 400, Murray, Utah 84123 www.stanleyconsultants.com</small>				<b>PRELIMINARY NOT FOR CONSTRUCTION</b>			
<b>CITY OF WEST JORDAN 7000 SOUTH UTILITY BETTERMENTS</b>							
<b>GENERAL NOTES</b>							
DESIGNED	AKF/JDU	SCALE:		AS SHOWN			
DRAWN	IL	NO.		REV.			
CHECKED	GST	<b>G-003</b>		<b>B</b>			
APPROVED	GST						
APPROVED	DWJ						
DATE	7/5/16						
10 © STANLEY CONSULTANTS				11			

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CADD D3-R4

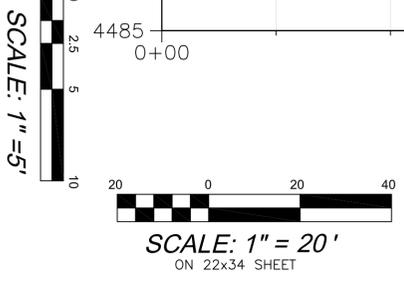
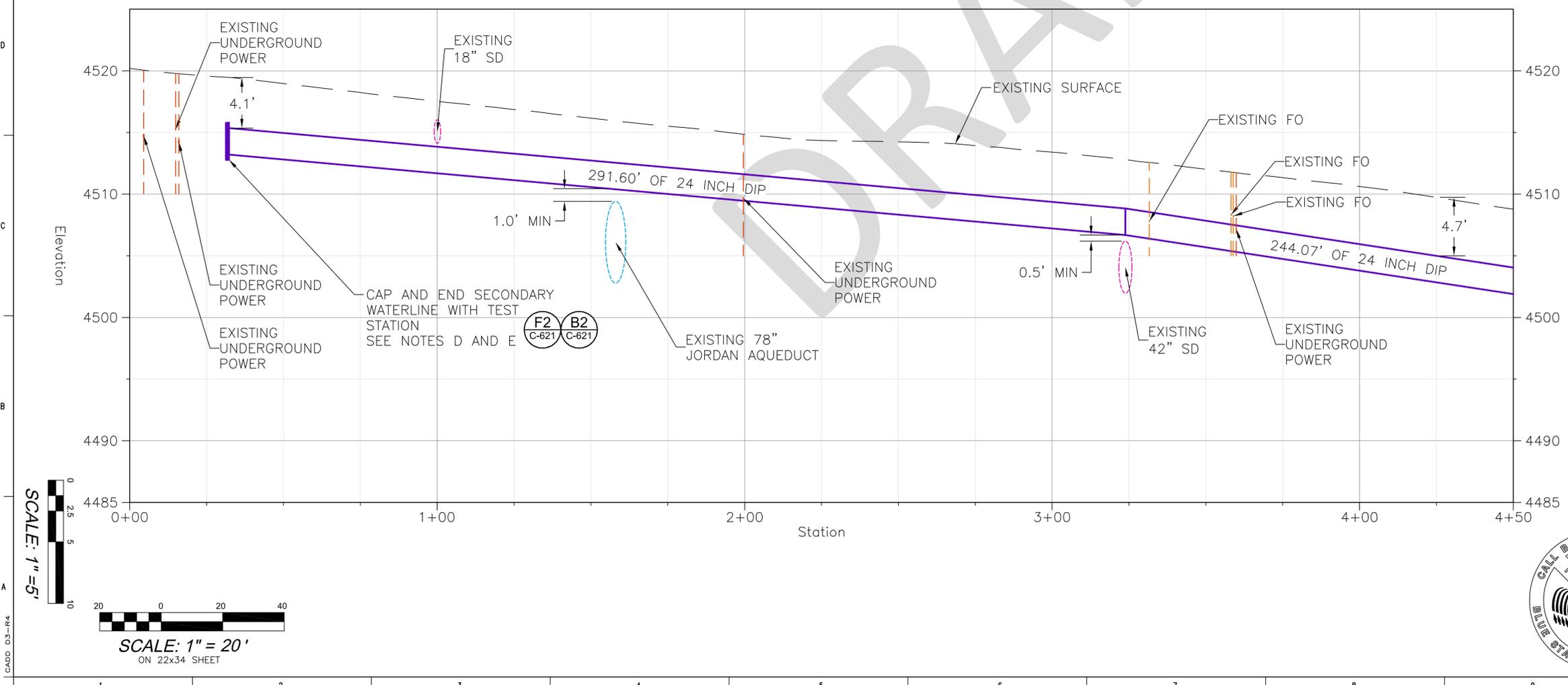


# EXHIBIT D-1



MATCH LINE STA 4+50  
SEE SHEET C-201

- NOTES:**
- SECONDARY WATER PIPE SHALL BE DUCTILE IRON PIPE PC250. REFER TO SPECIFICATION SECTION 33 05 05.
  - ALL FITTING, VALVES AND APPURTENANCES SHALL BE MECHANICALLY RESTRAINED AS PER DETAIL F8 ON SHEET C-620. RESTRAINED JOINT PIPE (MCWANE TR FLEX OR APPROVED EQUAL) MAY BE USED IN LIEU OF MECHANICAL RESTRAINTS (E.G. MEGA-LUGS).
  - PROVIDE JOINT BONDS AT ALL JOINTS AS PER DETAIL F10 ON SHEET C-621.
  - PROVIDE TEST STATIONS AT EACH END OF SECONDARY WATER LINE AS PER DETAIL F2 ON SHEET C-621. DESIGN BUILD CONTRACTOR TO FIELD LOCATE TEST STATION AND VERIFY WITH CITY OF WEST JORDAN.
  - DESIGN BUILD CONTRACTOR SHALL CONDUCT HYDROSTATIC PRESSURE TESTING OF 24" SECONDARY WATERLINE AFTER CONCRETE PAVEMENT IS INSTALLED. PROVIDE 2" GALVANIZED PIPING AND APPURTENANCES NECESSARY TO FACILITATE HYDROSTATIC PRESSURE TESTING THAT TERMINATE OUTSIDE THE ROADWAY. 2" GALVANIZED PIPING AND APPURTENANCES SHALL BE REMOVED AND TERMINATED WITH CAP 2' BELOW GRADE OUTSIDE ROADWAY AND ABANDONED WITHIN THE ROADWAY.



B	ISSUED FOR RFP	AKF	GST	DWJ	09/08/16
A	ISSUED FOR REVIEW	AKF	GST	DWJ	07/07/16
NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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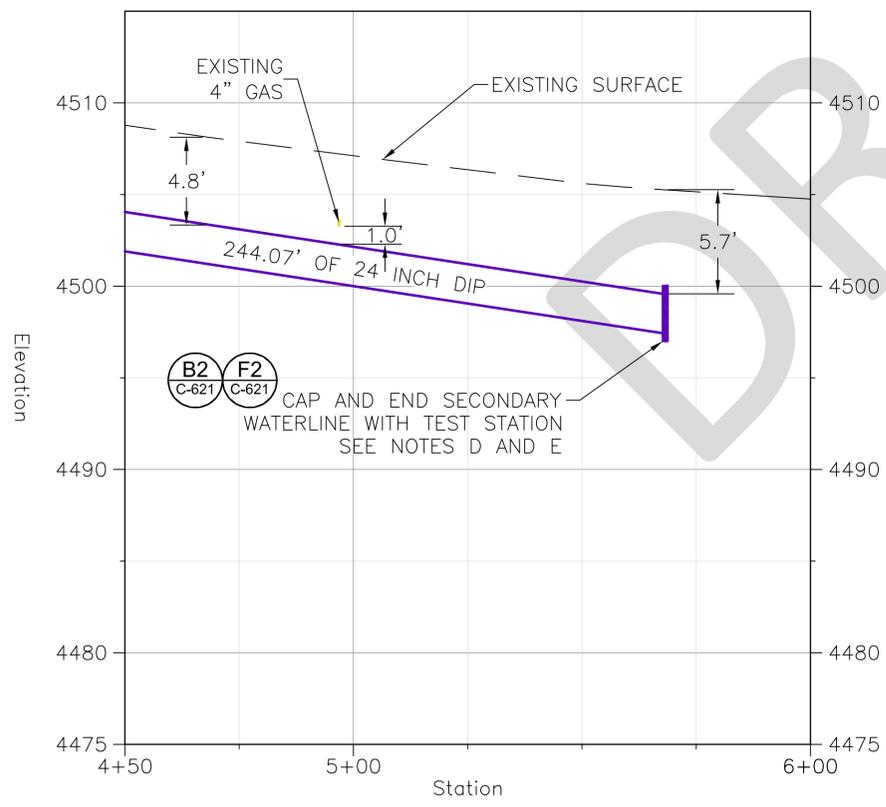
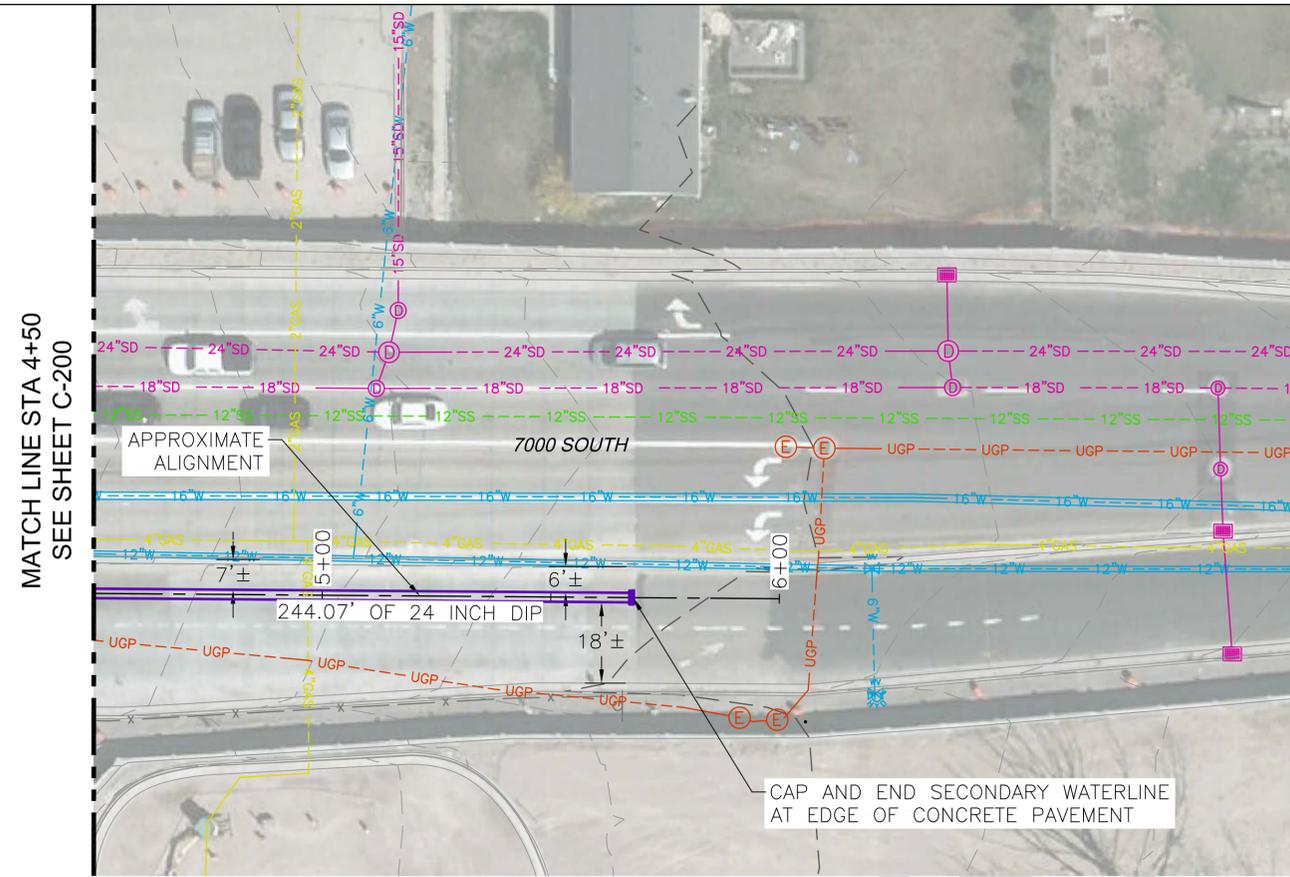
**CITY OF WEST JORDAN  
7000 SOUTH UTILITY BETTERMENTS**

**PLAN AND PROFILE  
SECONDARY WATER SHEET 1**

DESIGNED	AKF	SCALE:	AS SHOWN
DRAWN	AKF	NO.	C-200
CHECKED	GST	REV.	B
APPROVED	GST		
APPROVED	DWJ		
DATE	7/5/16		

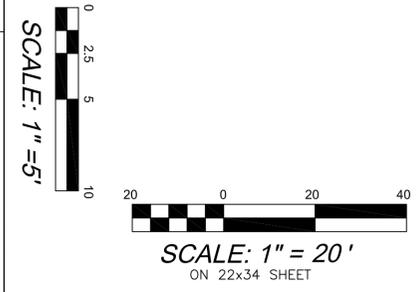
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CADD D3-R4

# EXHIBIT D-1



## NOTES:

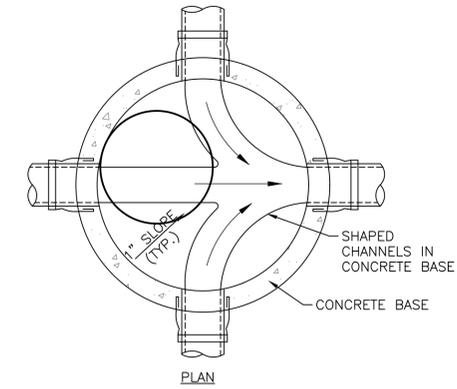
- A. SECONDARY WATER PIPE SHALL BE DUCTILE IRON PIPE PC250. REFER TO SPECIFICATION SECTION 33 05 05.
- B. ALL FITTING, VALVES AND APPURTENANCES SHALL BE MECHANICALLY RESTRAINED AS PER DETAIL F8 ON SHEET C-620. RESTRAINED JOINT PIPE (MCWANE TR FLEX OR APPROVED EQUAL) MAY BE USED IN LIEU OF MECHANICAL RESTRAINTS (E.G. MEGA-LUGS).
- C. PROVIDE JOINT BONDS AT ALL JOINTS AS PER DETAIL F10 ON SHEET C-621.
- D. PROVIDE TEST STATIONS AT EACH END OF SECONDARY WATER LINE AS PER DETAIL F2 ON SHEET C-621. DESIGN BUILD CONTRACTOR TO FIELD LOCATE TEST STATION AND VERIFY WITH CITY OF WEST JORDAN.
- E. DESIGN BUILD CONTRACTOR SHALL CONDUCT HYDROSTATIC PRESSURE TESTING OF 24" SECONDARY WATERLINE AFTER CONCRETE PAVEMENT IS INSTALLED. PROVIDE 2" GALVANIZED PIPING AND APPURTENANCES NECESSARY TO FACILITATE HYDROSTATIC PRESSURE TESTING THAT TERMINATE OUTSIDE THE ROADWAY. 2" GALVANIZED PIPING AND APPURTENANCES SHALL BE REMOVED AND TERMINATED WITH CAP 2' BELOW GRADE OUTSIDE ROADWAY AND ABANDONED WITHIN THE ROADWAY.



B	ISSUED FOR FRP	AKF	GST	DWJ	09/08/16
A	ISSUED FOR REVIEW	AKF	GST	DWJ	07/07/16
NO.	REVISIONS	DSGN	CHKD	APVD	DATE
		PRELIMINARY NOT FOR CONSTRUCTION			
CITY OF WEST JORDAN 7000 SOUTH UTILITY BETTERMENTS					
PLAN AND PROFILE SECONDARY WATER SHEET 2					
DESIGNED	AKF	SCALE:		AS SHOWN	
DRAWN	AKF	NO.	REV.		
CHECKED	GST	C-201		B	
APPROVED	GST				
APPROVED	DWJ				
DATE	7/5/16				

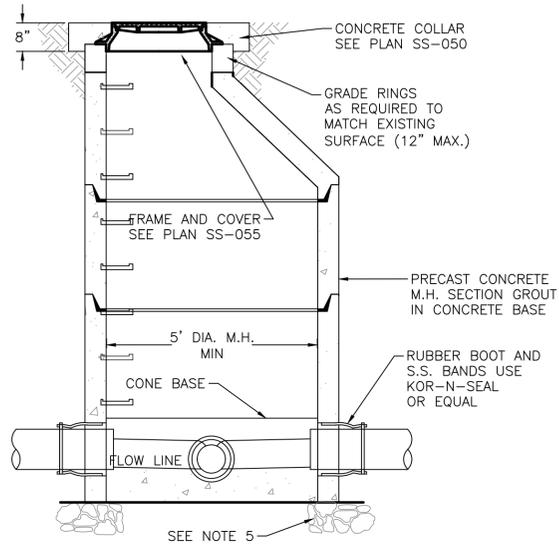
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CADD D3-R4

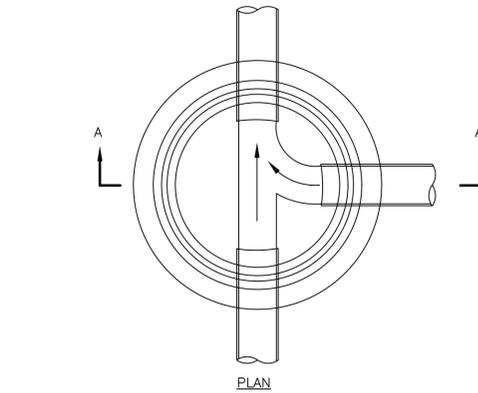


**NOTES:**

1. SELECT FILL: USE OF UNTREATED BASE COURSE AS PER UDOT STANDARD SPECIFICATION 02721 UNTREATED BASE COURSE (UTBC).
2. BACKFILL: INSTALL AND COMPACT ALL BACKFILL MATERIAL PER UDOT STANDARD SPECIFICATION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL.
3. CONCRETE: CLASS 4,000 PER CAST IN PLACE APPLICATIONS AND 5,000 PSI FOR PRECAST APPLICATIONS. APPLY A SEALING/CURING COMPOUND UDOT STANDARD SPECIFICATION 03390 CONCRETE CURING AND UDOT SUPPLEMENTAL SPECIFICATION 03390 CONCRETE CURING.
4. REDUCING RISER: WHEN A DEPTH OF MANHOLE FROM PIPE INVERT TO FINISH GRADE EXCEEDS 6'-7", USE A REDUCING RISER SECTION.
5. FOUNDATION: FOUNDATION TO REST ON 6" OF FREE DRAINING GRANULAR BACKFILL AS PER UDOT STANDARD SPECIFICATION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL.
6. JOINTS: PLACE FLEXIBLE GASKET TYPE SEALANT IN MANHOLE JOINTS.
7. BASE OF MANHOLE: POUR IN ONE CONTINUOUS OPERATION. FINISH: PROVIDE SMOOTH AND NEAT FINISHES ON THE INTERIOR OF CONES, SHAFTS, AND RINGS. IMPERFECT MOLDING OR HONEYCOMBS WILL NOT BE ACCEPTED.

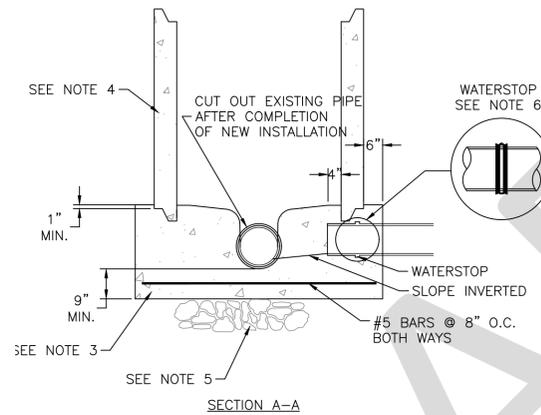


**F** JUNCTION MANHOLE  
2 NTS CITY OF WEST JORDAN STD. PLAN SS-035 REVISED

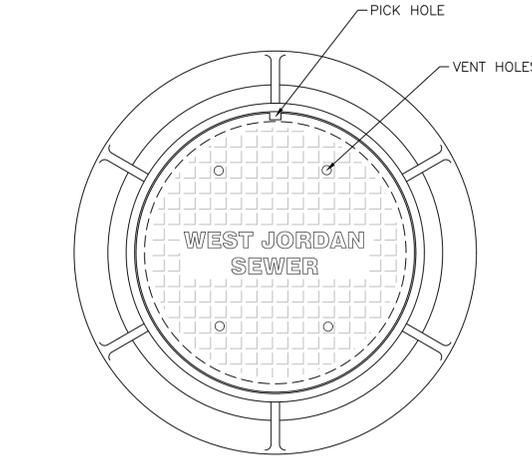


**NOTES:**

1. SELECT FILL: USE OF UNTREATED BASE COURSE AS PER UDOT STANDARD SPECIFICATION 02721 UNTREATED BASE COURSE (UTBC).
2. BACKFILL: INSTALL AND COMPACT ALL BACKFILL MATERIAL PER UDOT STANDARD SPECIFICATION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL.
3. CONCRETE: CLASS 4,000 PER CAST IN PLACE APPLICATIONS AND 5,000 PSI FOR PRECAST APPLICATIONS. APPLY A SEALING/CURING COMPOUND UDOT STANDARD SPECIFICATION 03390 CONCRETE CURING AND UDOT SUPPLEMENTAL SPECIFICATION 03390 CONCRETE CURING.
4. REDUCING RISER: WHEN A DEPTH OF MANHOLE FROM PIPE INVERT TO FINISH GRADE EXCEEDS 6'-7", USE A REDUCING RISER SECTION.
5. FOUNDATION: FOUNDATION TO REST ON 6" OF FREE DRAINING GRANULAR BACKFILL AS PER UDOT STANDARD SPECIFICATION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL.
6. WATERSTOP: SHALL BE 1/2" 300 SERIES NONMAGNETIC STAINLESS STEEL CONFORMING TO ASTM A167 AND RUBBER GASKET MEETING ASTM C-443.
7. JOINTS: PLACE FLEXIBLE GASKET TYPE SEALANT IN MANHOLE JOINTS.
8. BASE OF MANHOLE:
  - A. THIS MANHOLE BASE IS TO BE USED FOR A CONNECTION TO AN EXISTING LINE OR AS AN ALTERNATE TO A PRECAST MANHOLE BASE.
  - B. INVERT SHALL BE SMOOTH AND "U" SHAPED AND MATCH THE SPRING LINE OF THE PIPE.
  - C. THE FIRST PRECAST MANHOLE SECTION SHALL BE CAST INTO THE BASE. THE REMAINDER OF THE MANHOLE CONSTRUCTION SHALL CONFORM TO PLAN SS-030.

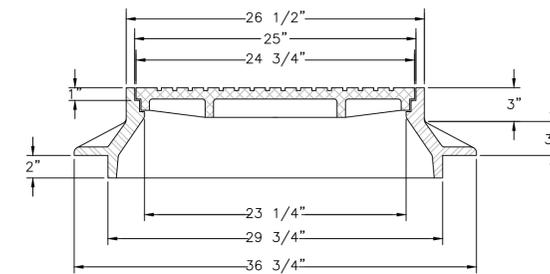


**F** CAST IN PLACE MANHOLE BASE  
6 NTS CITY OF WEST JORDAN STD. PLAN SS-040 (REVISED)

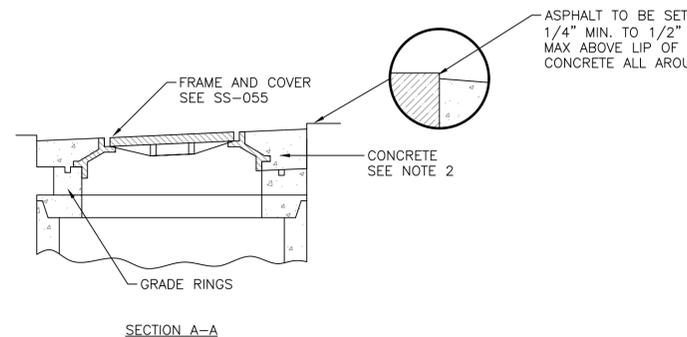
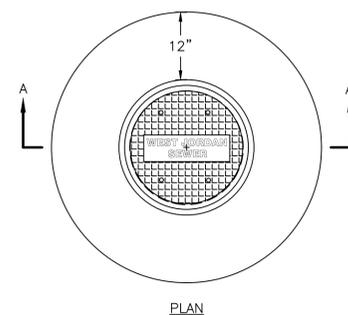


**NOTES:**

1. CASTINGS: GRAY IRON CLASS 30 MINIMUM PER ASTM A48.
2. COATING: EXCEPT MACHINED SURFACES, COAT ALL METAL PARTS WITH ASPHALTUM PAINT.
3. INSCRIPTIONS: CAST THE WORDS "WEST JORDAN" AND "SEWER" ON THE COVER FLUSH WITH THE SURFACE FINISH.
4. HEAT NUMBER: PLACE FOUNDRY AND HEAT NUMBER ON THE INSIDE OF THE FRAME AND ON THE BOTTOM OF THE COVER.
5. FIT: GIVE THE FRAME AND COVER A MACHINE FINISH SO THE COVER WILL NOT ROCK.
6. LOCKING: PROVIDE COVERS FOR MANHOLES LOCATED IN EASEMENTS, RIGHTS OF WAY, ALLEYS PARKING LOTS, AND ALL OTHER PLACES EXCEPT PAVED STREETS, WITH ALLEN SOCKET SET SCREW LOCKING DEVICES. DRILL AND TAP TWO HOLES TO A DEPTH OF 1 INCH AT 90 DEGREES TO PRY AND INSTALL 3/4" X 3/4" INCH ALLEN SOCKET SET SCREWS.
7. MANHOLE STRUCTURES: SEE PLAN SS-030, SS-035, SS-045, SS-060, SS-065.
8. VENTILATION: STANDARD IS FOR VENTED MANHOLE EXCEPT AS NEEDED FOR PROBLEMS.



**F** FRAME AND COVER  
9 NTS CITY OF WEST JORDAN STD. PLAN SS-055



**NOTES:**

1. ADJUST TO GRADE: ADJUST INCIDENTAL STRUCTURE TO GRADE PER APWA SECTION 33 05 14
2. BACKFILL: INSTALL AND COMPACT ALL BACKFILL MATERIAL PER UDOT STANDARD SPECIFICATION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL.
3. JOINTS: PROVIDE A NEAT STRAIGHT JOINT BETWEEN EXISTING AND NEW ASPHALT CONCRETE SURFACES. PROVIDE CONCENTRIC CIRCLE OR STRAIGHT EDGE CUT. CLEAN EDGES OF ALL DIRT, OIL AND LOOSE DEBRIS.

**B** CONCRETE COVER COLLAR  
4 NTS CITY OF WEST JORDAN STD. PLAN SS-050

B	ISSUED FOR RFP	AKF	GST	DWJ	09/08/16
A	ISSUED FOR REVIEW	AKF	GST	DWJ	07/07/16
NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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385 West Vine Street, Suite 400, Murray, Utah 84123  
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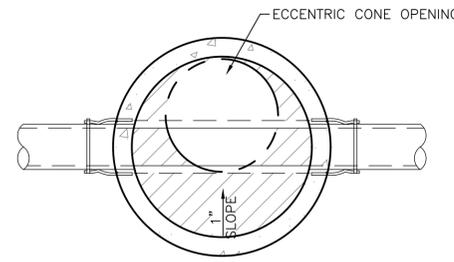
**PRELIMINARY NOT FOR CONSTRUCTION**

CITY OF WEST JORDAN  
7000 SOUTH UTILITY BETTERMENTS

SANITARY SEWER  
DETAIL SHEET 1

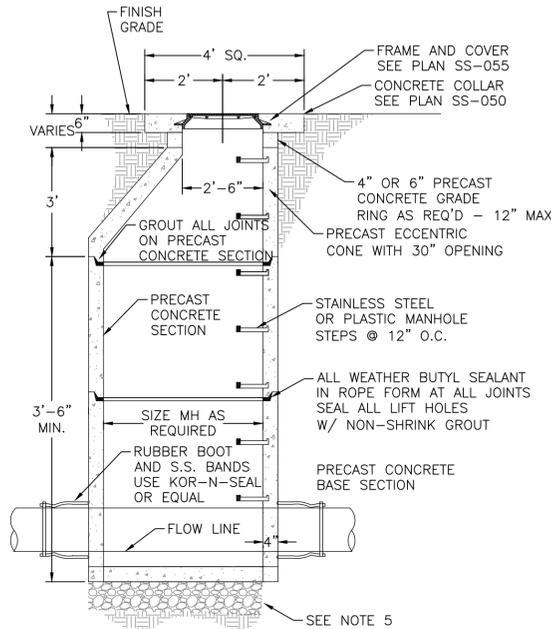
DESIGNED	AKF	SCALE:	AS SHOWN
DRAWN	IL	NO.	C-610
CHECKED	GST	REV.	B
APPROVED	GST		
APPROVED	DWJ		
DATE	7/5/16		

# EXHIBIT D-1



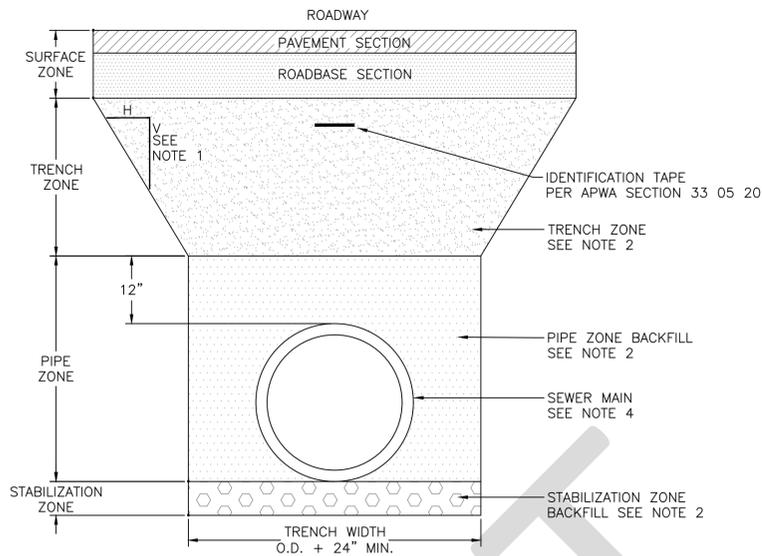
**NOTES:**

1. SELECT FILL: USE OF UNTREATED BASE COURSE AS PER UDOT STANDARD SPECIFICATION 02721 UNTREATED BASE COURSE (UTBC).
2. BACKFILL: INSTALL AND COMPACT ALL BACKFILL MATERIAL PER UDOT STANDARD SPECIFICATION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL.
3. CONCRETE: CLASS 4,000 PER UDOT STANDARD SPECIFICATION 03055 PORTLAND CEMENT CONCRETE AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 03055M PORTLAND CEMENT CONCRETE CAST IN PLACE APPLICATIONS AND 5,000 PSI FOR PRECAST APPLICATIONS. APPLY A SEALING/CURING COMPOUND UDOT STANDARD SPECIFICATION 03390 CONCRETE CURING AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 03390 CONCRETE CURING.
4. REDUCING RISER: WHEN A DEPTH OF MANHOLE FROM PIPE INVERT TO FINISH GRADE EXCEEDS 6'-7", USE A REDUCING RISER SECTION. FOUNDATION: FOUNDATION TO REST ON 6" OF FREE DRAINING GRANULAR BACKFILL AS PER UDOT STANDARD SPECIFICATION 02056 EMBANKMENT, BORROW, AND BACKFILL.
5. JOINTS: PLACE FLEXIBLE GASKET TYPE SEALANT IN MANHOLE JOINTS.
6. BASE OF MANHOLE: POUR IN ONE CONTINUOUS OPERATION.
7. FINISH: PROVIDE SMOOTH AND NEAT FINISHES ON THE INTERIOR OF CONES, SHAFTS, AND RINGS. IMPERFECT MOLDING OR HONEYCOMBS WILL NOT BE ACCEPTED.



**F** IN-LINE MANHOLE

2 NTS CITY OF WEST JORDAN STD. PLAN SS-030 (REVISED)



**NOTES:**

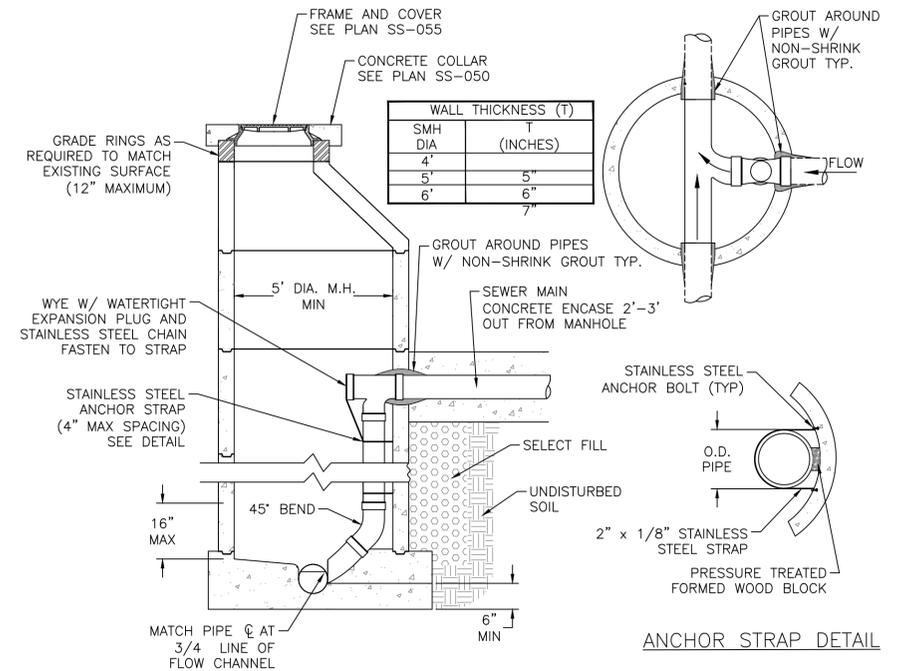
1. EXCAVATION: TRENCH EXCAVATION AND SIDE SLOPES SHALL BE PROVIDED IN ACCORDANCE WITH OSHA AND UOSH SAFETY STANDARDS AND WITH UDOT STANDARD SPECIFICATION SECTION 02317 STRUCTURAL EXCAVATION AND UDOT SUPPLEMENTAL SPECIFICATION 02317M STRUCTURAL EXCAVATION AND ALL STATE AND FEDERAL LAWS FOR TRENCH SAFETY.
2. BACKFILL: BACKFILL OPERATIONS SHALL COMPLY WITH UDOT STANDARD SPECIFICATION SECTION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL WITH MATERIAL SELECTION AS FOLLOWS:

	UNIMPROVED AREAS	PAVEMENT AREAS
STABILIZATION ZONE	2" MINUS SEWER ROCK	GRANULAR BACKFILL BORROW
PIPE ZONE	UNTREATED BASE COURSE GRADE 3/4"	UNTREATED BASE COURSE GRADE 3/4"
TRENCH ZONE	GRANULAR BACKFILL BORROW	GRANULAR BACKFILL BORROW
SURFACE ZONE	NATIVE TOP SOIL REPLACE VEGETATION TO PRECONSTRUCTION CONDITION	UDOT ROAD SECTION

3. COMPACTION: COMPACTION OF BACKFILL MATERIALS SHALL COMPLY WITH UDOT STANDARD SPECIFICATION SECTION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL. SUBMISSION OF QUALITY ASSURANCE COMPACTION TEST RESULT DATA MAY BE REQUIRED BY ENGINEER AT ANY TIME. CONTRACTOR IS TO PROVIDE RESULTS OF TEST IMMEDIATELY UPON REQUEST.
4. INSTALLATION OF PIPE: INSTALL PIPE PER APWA SECTION 33 31 00 "SANITARY SEWERAGE SYSTEMS". INSTALL PIPE ON STABLE FOUNDATION WITH UNIFORM BEARING.
5. PAVEMENT RESTORATION: DO NOT INSTALL PAVEMENT OR ROADBASE SELECTION UNTIL TRENCH COMPACTION IS ACCEPTED BY ENGINEER.

**F** SANITARY SEWER TRENCH

6 NTS CITY OF WEST JORDAN STD. PLAN SS-020 (REVISED)



**NOTES:**

1. SELECT FILL: USE CLASS A UNTREATED BASE COURSE GRADE 1 OR GRADE 3/4 PER UDOT STANDARD SPECIFICATION 02721. USE OF SEWER ROCK OR RECYCLED AGGREGATE REQUIRES ENGINEER'S WRITTEN APPROVAL.
2. BACKFILL: INSTALL AND COMPACT ALL BACKFILL MATERIAL PER UDOT STANDARD SPECIFICATION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL.
3. CONCRETE: CLASS 4,000 PER UDOT STANDARD SPECIFICATION 03055 PORTLAND CEMENT CONCRETE AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 03055M PORTLAND CEMENT CONCRETE CAST IN PLACE APPLICATIONS AND 5,000 PSI FOR PRECAST APPLICATIONS. APPLY A SEALING/CURING COMPOUND UDOT STANDARD SPECIFICATION 03390 CONCRETE CURING AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 03390 CONCRETE CURING.
4. FOUNDATION: FOUNDATION TO REST ON 6" OF FREE DRAINING GRANULAR BACKFILL AS PER UDOT STANDARD SPECIFICATION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL.
5. JOINTS: PLACE FLEXIBLE GASKET TYPE SEALANT IN MANHOLE JOINTS.
6. FINISH: PROVIDE SMOOTH AND NEAT FINISHES ON THE INTERIOR OF CONES, SHAFTS, AND RINGS. IMPERFECT MOLDING OR HONEYCOMBS WILL NOT BE ACCEPTED.

**F** DROP MANHOLE

10 NTS CITY OF WEST JORDAN STD. PLAN SS-045 (REVISED)

S:\25931 - 7000 South Utility Design\25931.05 - Secondary Water Transmission Pipeline\11-CAD\C-601 through C-623.dwg  
CADD D3-R4

B	ISSUED FOR RFP	AKF	GST	DWJ	09/08/16
A	ISSUED FOR REVIEW	AKF	GST	DWJ	07/07/16
NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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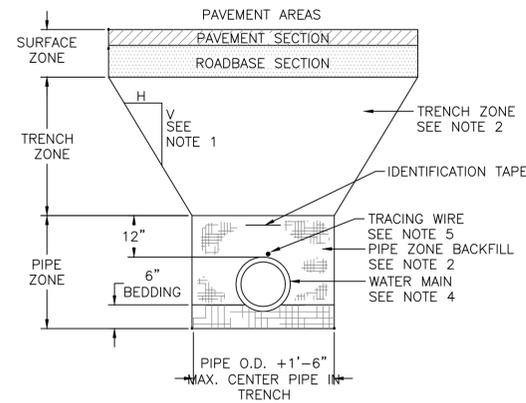
**PRELIMINARY NOT FOR CONSTRUCTION**

CITY OF WEST JORDAN  
7000 SOUTH UTILITY BETTERMENTS

SANITARY SEWER  
DETAIL SHEET 2

DESIGNED	AKF	SCALE:	AS SHOWN
DRAWN	IL	NO.	
CHECKED	GST	REV.	
APPROVED	GST		
APPROVED	DWJ	C-611	B
DATE	7/5/16		

# EXHIBIT D-1



- NOTES:**
- EXCAVATION: TRENCH EXCAVATION AND SIDE SLOPES SHALL BE IN ACCORDANCE WITH OSHA AND UOSH SAFETY STANDARDS AND WITH UDOT STANDARD SPECIFICATION SECTION 02317 STRUCTURAL EXCAVATION AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02317M STRUCTURAL EXCAVATION AND ALL STATE AND FEDERAL LAWS FOR TRENCH SAFETY.
  - BACKFILL: BACKFILL OPERATIONS SHALL COMPLY WITH UDOT STANDARD SPECIFICATION SECTION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL WITH MATERIAL SELECTION AS FOLLOWS:

	UNIMPROVED AREAS	PAVEMENT AREAS
BEDDING	SAND	SAND
PIPE ZONE	SAND	SAND
TRENCH ZONE	GRANULAR BACKFILL BORROW. SAND NATIVE (FREE OF ROCK OVER 2")	GRANULAR BACKFILL BORROW
SURFACE ZONE	NATIVE TOP SOIL	UDOT ROAD SECTION

SEWER ROCK, PEA GRAVEL, RECYCLE AGGREGATE NOT ALLOWED AS BACKFILL

- COMPACTION: COMPACTION OF BACKFILL MATERIALS SHALL COMPLY WITH UDOT STANDARD SPECIFICATION SECTION 02056 EMBANKMENT, BORROW, AND BACKFILL; AND UDOT SUPPLEMENTAL SPECIFICATION SECTION 02056M EMBANKMENT, BORROW, AND BACKFILL AND THE FOLLOWING:

	UNIMPROVED AREAS	PAVEMENT AREAS
PIPE ZONE	PER PIPE MANUFACTURE RECOMMENDATION	PER PIPE MANUFACTURE RECOMMENDATION
TRENCH ZONE	92% OF ASTM D 698	95% OF ASTM D 1557
SURFACE ZONE	80% OF ASTM D 698	UDOT ROAD SECTION

WATER SETTLING OR "JETTING" OF TRENCHES BACKFILL NOT ALLOWED

- INSTALLATION OF PIPE: INSTALL PIPE PER SPECIFICATION SECTION 33 11 00 WATER DISTRIBUTION AND TRANSMISSION (CITY SPECIFICATION) AND APWA SPECIFICATION SECTION 33 11 00 WATER DISTRIBUTION AND TRANSMISSION. INSTALL PIPE ON STABLE FOUNDATION WITH UNIFORM BEARING. SHAPE TRENCH BY HAND TO FIT BOTTOM QUADRANT OF PIPE ALLOWING SPACE FOR PIPE BELLS.
- TRACING WIRE: ALL PIPES SHALL HAVE 12 GA. INSULATED TRACING WIRE INSTALLED W/THE PIPE.
- DEWATERING: CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE TRENCHES FREE FROM SURFACE AND GROUNDWATER.

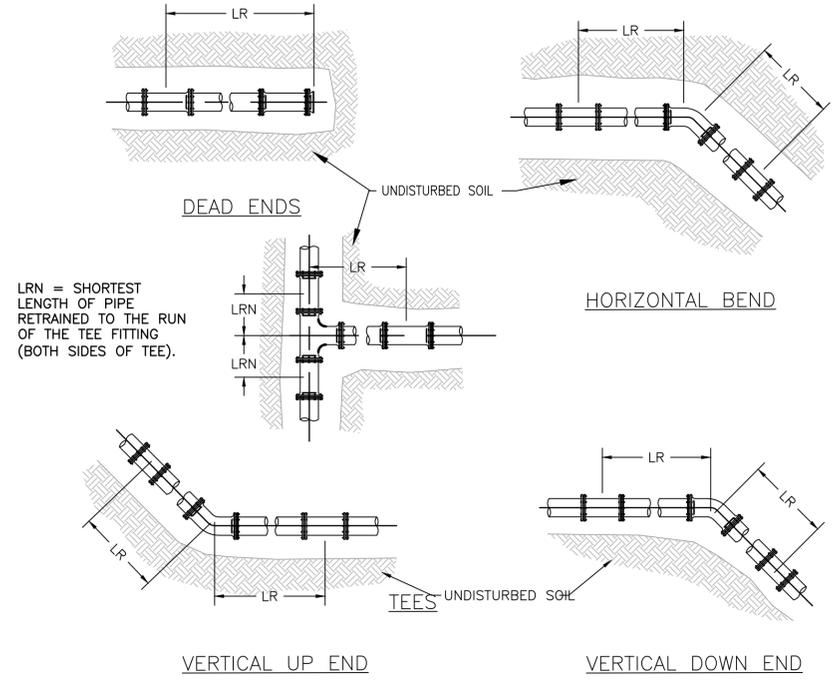
**F** **2** SECONDARY WATER PIPE TRENCH  
NTS CITY OF WEST JORDAN STD. PLAN CW-035 (REVISED)

RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE

NOMINAL PIPE SIZE INCHES	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS						DEAD ENDS
	90°	45°	22-1/2°	LRN=0'	LRN=10'	90° BEND FITTINGS		45° BEND FITTINGS		22-1/2° BEND FITTINGS		
						DOWN BEND	UP BEND	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
46	25	10	5	43	20	44	25	18	10	9	5	44
8	32	13	6	56	34	58	32	24	13	11	6	58
10	38	16	8	68	45	69	38	29	16	14	8	69
12	45	19	9	80	57	81	45	34	19	16	9	81
14	51	21	10	91	68	92	51	38	21	18	10	92
16	57	24	11	103	79	104	57	43	24	21	11	104
18	62	26	12	113	90	115	62	48	26	23	12	115
20	68	28	14	125	100	126	68	52	28	25	14	126
24	79	33	16	145	121	147	79	61	33	29	16	147

RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE WITH POLYETHYLENE WRAP

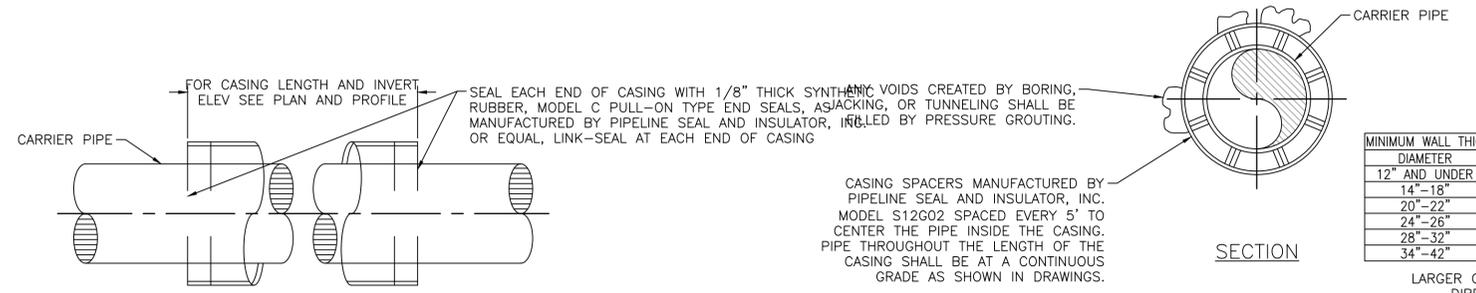
NOMINAL PIPE SIZE INCHES	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS						DEAD ENDS
	90°	45°	22-1/2°	LRN=0'	LRN=10'	90° BEND FITTINGS		45° BEND FITTINGS		22-1/2° BEND FITTINGS		
						DOWN BEND	UP BEND	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
46	26	11	5	69	18	72	26	30	11	14	5	72
8	36	15	7	99	47	102	36	42	15	20	7	102
10	47	19	9	130	78	133	47	55	19	26	9	133
12	56	23	11	157	103	159	56	66	23	32	11	159
14	65	27	13	185	131	187	65	77	27	37	13	187
16	74	31	15	211	156	214	74	89	31	42	15	214
18	82	34	16	238	183	241	82	100	34	48	16	241
20	90	37	18	263	207	266	90	110	38	53	18	266
24	98	41	20	289	233	292	98	121	41	58	20	292
24	113	47	22	337	280	340	113	141	47	68	22	340



- NOTES:**
- ALL JOINTS WITHIN THE SPECIFIED LENGTH LR MUST BE RESTRAINED. ALL LENGTHS ARE GIVEN IN FEET.
  - THE MAXIMUM TEST PRESSURE SHALL NOT EXCEED 200 PSI.
  - THE MINIMUM DEPTH OF BURY SHALL BE 3' TO TOP OF PIPE.
  - RESTRAINED LENGTHS MAY BE REDUCED WHEN SUPPORTED BY ENGINEERING CALCULATIONS.

**F** **8** JOINT RESTRAINT - DUCTILE IRON  
NTS CITY OF WEST JORDAN STD. PLAN CW-90&95

- NOTES:**
- CASING PIPES SHALL BE REQUIRED AS INDICATED ON THE DRAWINGS AND/OR WHERE REQUIRED BY THE DISTRICT INSPECTOR OR ENGINEER.
  - SEE PLANS FOR CASING SIZE
  - CARRIER PIPE SHALL BE TESTED BEFORE SEALING THE ENDS OF THE CASING.
  - SPACERS SHALL BE SECURELY ATTACHED TO CARRIER PIPE PER MANUFACTURER'S REQUIREMENTS.
  - CASING PIPE SHALL BE WELDED STEEL, ASTM A53, GRADE B OR APPROVED EQUIVALENT.
  - ALL CARRIER PIPE JOINTS WITHIN CASING TO BE MECHANICALLY RESTRAINED. THRUST LOCK BOLTLESS RESTRAINED JOINT OR APPROVED EQUAL.



MINIMUM WALL THICKNESS OF CASINGS

DIAMETER	WALL THICKNESS
12" AND UNDER	0.188"
14"-18"	0.312"
20"-22"	0.375"
24"-26"	0.438"
28"-32"	0.500"
34"-42"	0.562"

LARGER CASINGS AS DIRECTED BY THE CITY ENGINEER.

**A** **5** STEEL CASING  
NTS CITY OF WEST JORDAN STD. PLAN SS-100 (REVISED)

B	ISSUED FOR RFP	AKF	GST	DWJ	09/08/16
A	ISSUED FOR REVIEW	AKF	GST	DWJ	07/07/16
NO.	REVISIONS	DSGN	CHKD	APVD	DATE

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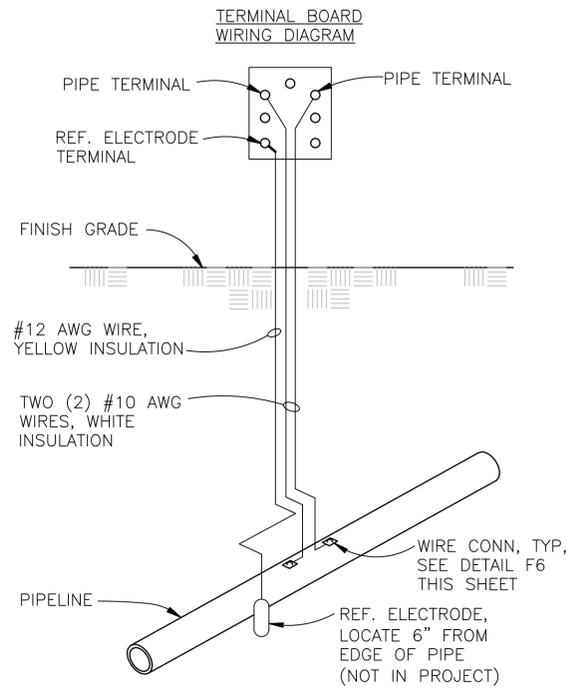
CITY OF WEST JORDAN  
7000 SOUTH UTILITY BETTERTMENTS

SECONDARY WATER  
DETAIL SHEET 1

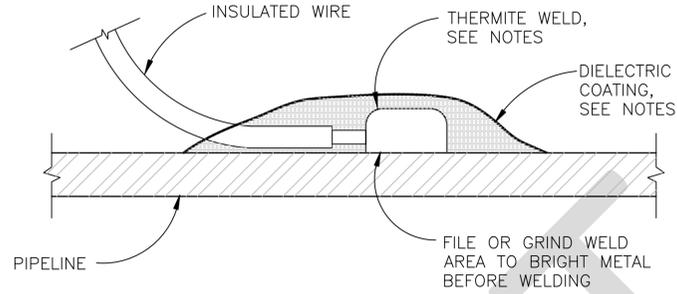
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CHECKED	GST	REV.	B
APPROVED	GST		
APPROVED	DWJ		
DATE	7/5/16		

S:\25931 - 7000 South Utility Design\25931.05 - Secondary Water Transmission Pipeline\11-CAD\C-601 through C-623.dwg  
CADD D3-R4

# EXHIBIT D-1



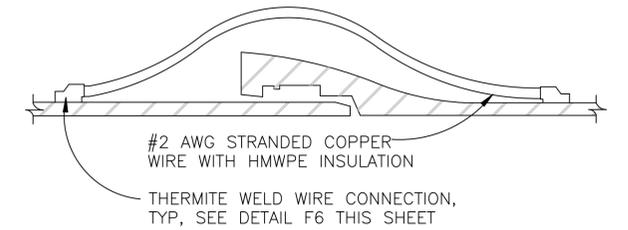
F  
2 TYPE T TEST STATION  
NTS



**NOTES:**

1. MAINTAIN SEPARATION BETWEEN MULTIPLE TEST WIRE CONNECTIONS OF ONE PIPE DIA OR 24", WHICHEVER IS LESS.
2. COPPER SLEEVE REQUIRED FOR #2 AWG JOINT BONDS OR FOR #12 AWG OR SMALLER TEST WIRES.
3. THERMITE WELDER AND CARTRIDGE SIZE VARIES ACCORDING TO PIPE SIZE AND PIPE MATERIAL, CONSULT WELDER MANUFACTURER FOR RECOMMENDED WELDER AND CARTRIDGE
4. COAT COMPLETED CONNECTIONS WITH DENSO PROTAL 7200 EPOXY.

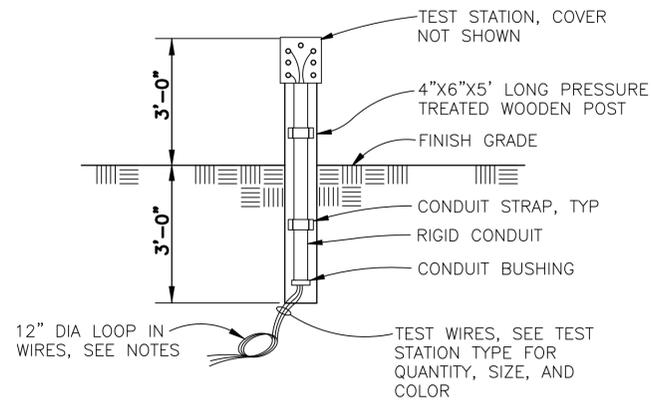
F  
6 STEEL AND DUCTILE IRON  
PIPE WIRE CONNECTION  
NTS



**NOTES:**

1. PUSH ON DUCTILE IRON BOND SHOWN, SIMILAR FOR DUCTILE MECHANICAL AND RESTRAINED JOINTS, AND STEEL CARNEGIE JOINTS.
2. INSTALL 2 BOND WIRES AT EACH PIPE JOINT, UNLESS SPECIFIED OTHERWISE.
3. COAT THERMITE WELDS WITH DENSO PROTAL 7200 EPOXY.

F  
10 DUCTILE IRON JOINT BOND  
NTS



**NOTES:**

1. TEST STATION TO BE ALUMINUM BODY AND LID WITH THREADED CONNECTION FOR CONDUIT.
2. QUANTITY OF TERMINALS AND WIRING CONNECTIONS VARIES, SEE APPLICABLE TEST STATION DETAILS FOR TYPE OF TEST STATION
3. PROVIDE WIRE LOOP AT BASE OF POST MOUNTED TEST STATION TO MINIMIZE SETTLEMENT STRESSES ON WIRE
4. PROVIDE 3"X3" IDENTIFICATION PLATE TO EACH POST ON THE OPPOSITE SIDE OF TEST STATION. SECONDARY WATER IDENTIFICATION PLATE SHALL READ "CITY OF WEST JORDAN 24" DIP SECONDARY WATER LINE". SANITARY SEWER CASING IDENTIFICATION PLATE SHALL READ "CITY OF WEST JORDAN SANITARY SEWER 36" STEEL CASING".

B  
2 POST MOUNTED, WOOD POST  
NTS

B	ISSUED FOR RFP	AKF	GST	DWJ	09/08/16
A	ISSUED FOR REVIEW	AKF	GST	DWJ	07/07/16
NO.	REVISIONS	DSGN	CHKD	APVD	DATE

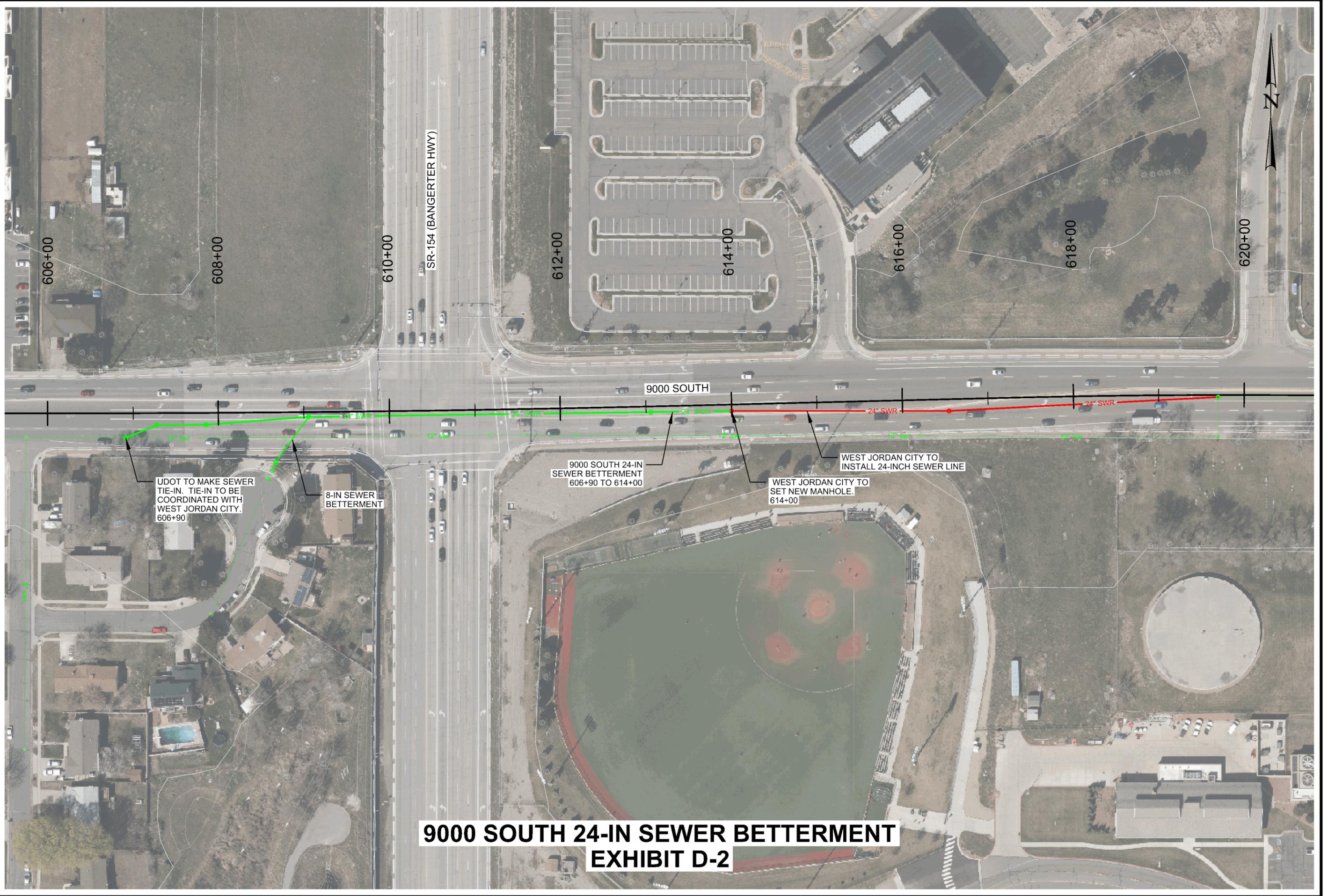


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CONSTRUCTION

CITY OF WEST JORDAN  
7000 SOUTH UTILITY BETTERMENTS

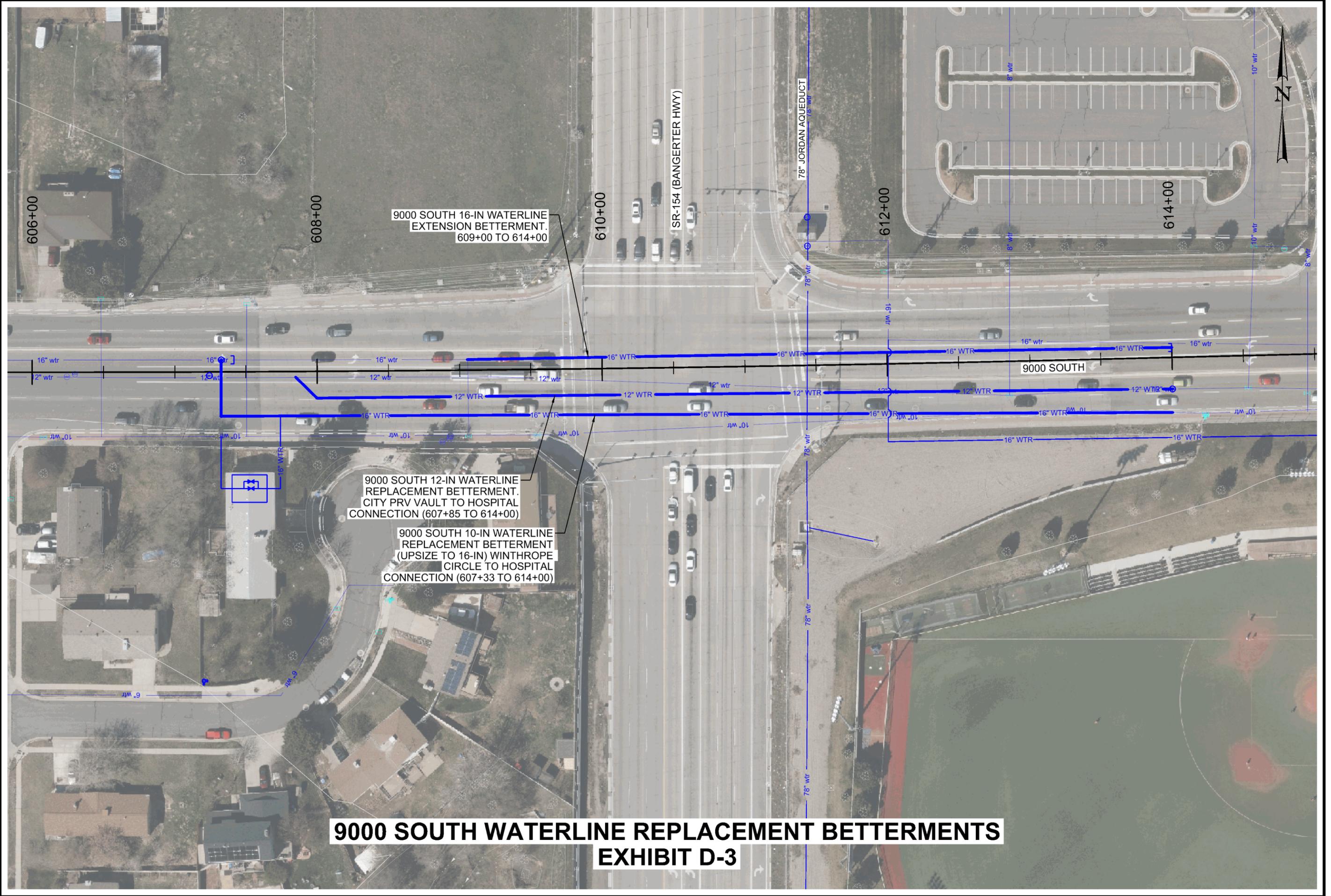
SECONDARY WATER  
DETAIL SHEET 2

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APPROVED	GST		
APPROVED	DWJ	C-621	B
DATE	7/5/16		

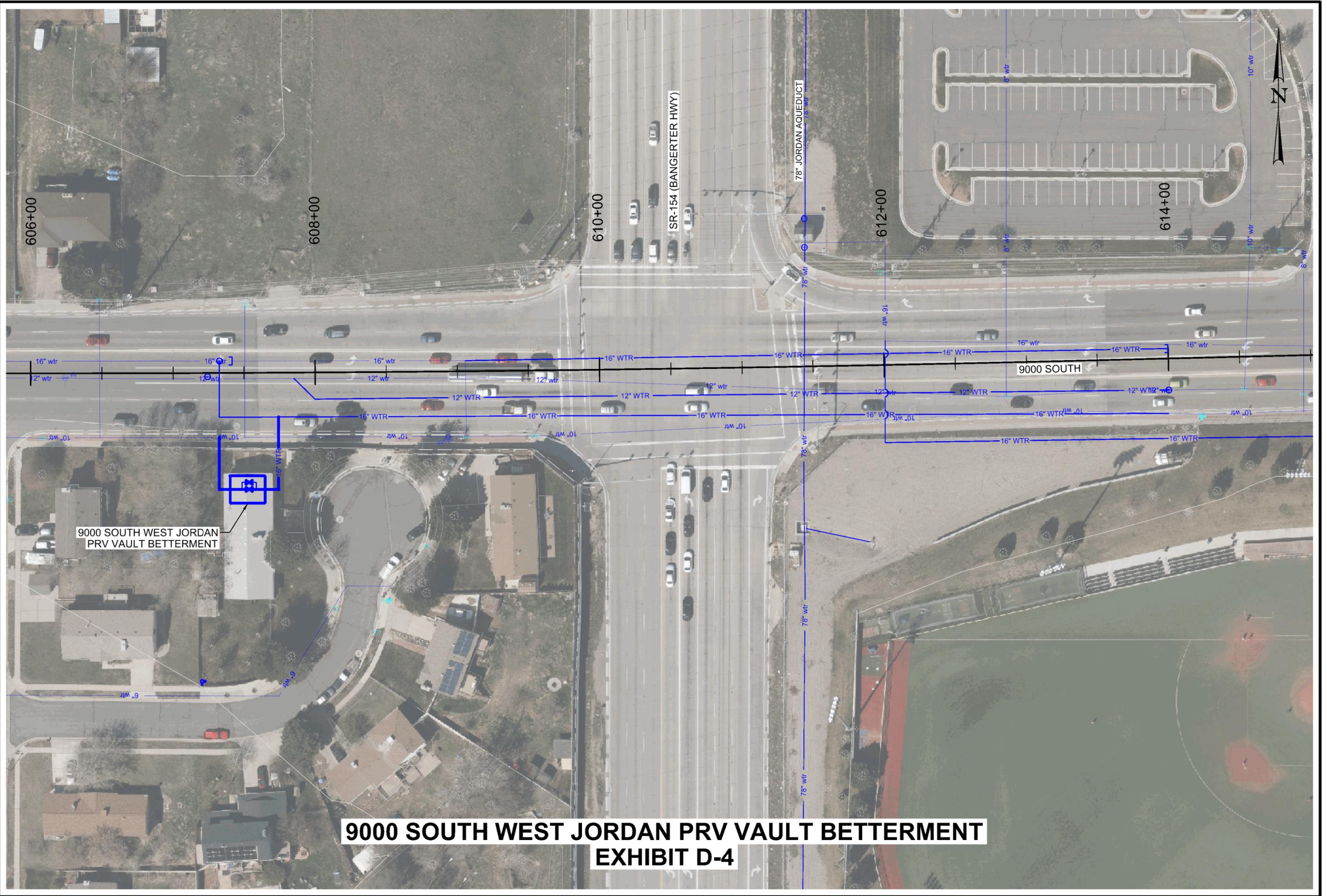


**9000 SOUTH 24-IN SEWER BETTERMENT  
EXHIBIT D-2**

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**9000 SOUTH WATERLINE REPLACEMENT BETTERMENTS  
EXHIBIT D-3**



**9000 SOUTH WEST JORDAN PRV VAULT BETTERMENT  
EXHIBIT D-4**