

JACKSON SPRINGS WATER TRANSMISSION MAINS

CITY OF RAPID CITY PROJECT NO. WTP09-1836

CIP #50780



NOT FOR CONSTRUCTION

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PROJECT LOCATION



PROJECT LOCATION MAP NOT TO SCALE



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I, DAVID M. MUCK, CERTIFY THAT I HAVE READ AND UNDERSTAND THE PROVISIONS CONTAINED IN THE CITY OF RAPID CITY STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, CURRENT EDITION AND THE CITY OF RAPID CITY'S ADOPTED DESIGN CRITERIA MANUALS. THE DRAWINGS AND SPECIFICATIONS CONTAINED HEREIN, TO THE BEST OF MY KNOWLEDGE, WERE PREPARED IN ACCORDANCE WITH THESE DOCUMENTS OR A PROPERLY EXCITED EXCEPTION TO THE STANDARD SPECIFICATIONS AND INFRASTRUCTURE DESIGN CRITERIA MANUAL HAS BEEN SECURED.

DAVID M. MUCK, PE/LS

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OCT 1 2009

Rapid City Growth Management Department

ONE CALL BEFORE DIGGING
1-800-781-7474

JACKSON SPRINGS WATER TRANSMISSION MAINS

Sheet Title: COVER SHEET

Sheet: 1 of 43

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EXISTING LEGEND

ESTIMATE OF QUANTITIES

GENERAL NOTES

SUBMITTALS

STAGING AREAS

RECOMMENDED STAGING AREAS HAVE BEEN PROVIDED IN THESE PLANS AND COINCIDE WITH THE PROJECT PHASING. IF THE CONTRACTOR WISHES TO STAGE MATERIALS IN OTHER LOCATIONS, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING WRITTEN PERMISSION FROM THE OWNER OF THE PROPOSED LOCATION AND THE ENGINEER. COPIES OF ANY WRITTEN PERMISSION SHALL BE DELIVERED TO THE ENGINEER.

CONTRACTOR IS RESPONSIBLE FOR REPAIRS NECESSARY TO ANY DISTURBANCE OR DAMAGE TO AREAS OUTSIDE OF THE DESIGNATED STAGING AREAS.

PIPE DEFLECTION

STEEL PIPE HORIZONTAL AND VERTICAL DEFLECTION ANGLES ARE PROVIDED ON THEIR RESPECTIVE INSTALLATION PLAN SHEET.

PIPE DEFLECTION IN RESTRAINED JOINT PVC PIPE SHALL NOT EXCEED THE MINIMUM ALLOWABLE RADIUS OF CURVATURE AS RECOMMENDED BY THE PIPE MANUFACTURER.

PIPE DEFLECTION AT FITTINGS SHALL BE WITHIN TOLERANCES RECOMMENDED BY THE PIPE AND/OR FITTING MANUFACTURER. ALLOWABLE DEFLECTION PARAMETERS SHALL BE INCLUDED IN THE PIPE SUBMITTAL AND SHALL BE CLEARLY MARKED AS SUCH.

PIPE ENCASUREMENT

WHERE INDICATED ON PLANS OR REQUIRED BY STANDARD SPECIFICATIONS PIPE SHALL BE ENCASED WITH CONTROLLED LOW STRENGTH MATERIAL IN ACCORDANCE WITH SECTION 8.3 OF THE STANDARD SPECIFICATIONS. THE PIPE ENCASUREMENT, ALL MATERIAL AND LABOR SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE PER LF FOR "WATER MAIN ENCASUREMENT." STEEL PIPE IS NOT TO BE ENCASED; EXISTING SANITARY OR STORM PIPE WILL BE ENCASED.

WATER MAIN ABANDONMENT

EXISTING WATER DISTRIBUTION MAINS SHALL BE ABANDONED ALONG THE PROJECT ACCORDING TO THE STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL REMOVE THE EXISTING MAIN AND/OR ANY ASSOCIATED VALVES AND FITTINGS NECESSARY TO COMPLETE THE PROJECT. WATER DISTRIBUTION MAIN ABANDONMENT/REMOVAL SHALL BE INCIDENTAL TO THE PROJECT.

THE EXISTING 18-, 20- AND 24-INCH CAST IRON WATER MAIN SHALL BE ABANDONED BY REMOVAL OF ALL VALVES, HYDRANTS AND OTHER ASSOCIATED FITTINGS. THE ABANDONMENT PLANS PROVIDE DETAIL REGARDING WATER MAIN ABANDONMENTS. PAYMENT FOR WATER TRANSMISSION MAIN ABANDONMENT/REMOVAL SHALL BE AT THE CONTRACT LUMP SUM PRICES FOR "ABANDON EXISTING WATER TRANSMISSION MAIN - FILLED" AND "ABANDON EXISTING WATER TRANSMISSION MAIN - CAPPED." BOTH ITEMS INCLUDE REMOVAL OF THE VALVES AND FITTINGS.

WATER SERVICE CONNECTIONS

ALL WATER SERVICE CONNECTIONS SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 8 OF THE STANDARD SPECIFICATIONS. RAPID CITY UTILITY MAINTENANCE SHALL PROVIDE CORP STOPS FOR ALL 1-INCH WATER SERVICE CONNECTIONS. THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND PAY FEES ASSOCIATED WITH NEW WATER SERVICE CONNECTIONS. ALL COSTS FOR PERMITS AND FEES REQUIRED FOR NEW WATER SERVICE CONNECTIONS SHALL BE INCIDENTAL TO THE PROJECT.

WORK LIMITS

THE WORK LIMITS ARE DEFINED BY THE TYPICAL SECTION(S) PROVIDED WITHIN THESE PLANS. THE CONTRACTOR SHALL DEMARCATHE THE WORK LIMITS UTILIZING CONSTRUCTION FENCE AND/OR JERSEY BARRIERS, TRAFFIC BARRELS OR CONES, ETC., DEPENDING UPON THE ACTIVITIES ADJACENT TO THE PROJECT WORK AREA. ADJUSTMENTS TO THE WORK LIMITS MAY BE APPROVED BY THE ENGINEER.

THE INSTALLATION OF THE WORK LIMIT BARRIERS IS INCIDENTAL TO THE CONSTRUCTION OF THE PROJECT. NO SEPARATE PAYMENT WILL BE MADE.

CLEARING

CLEARING SHALL BE IN ACCORDANCE WITH SECTION 10 OF THE STANDARD SPECIFICATIONS. EXTREME CARE SHALL BE USED BY THE CONTRACTOR TO PRESERVE ALL TREES AND OTHER VEGETATION THAT LIE OUTSIDE THE ACTUAL CONSTRUCTION LIMITS. ANY MATERIALS SUCH AS TREES, STUMPS, TIMBERS AND OTHER DEBRIS ENCOUNTERED DURING CLEARING OPERATIONS SHALL BE DISPOSED OF AT THE DIRECTION OF THE ENGINEER. REMOVAL OF ALL TREES 6" DIAMETER AND LARGER DESIGNATED FOR REMOVAL BY THE ENGINEER WILL BE PAID FOR AT THE CONTRACT PRICE PER EACH FOR "CLEAR & GRUB TREE". THE COSTS FOR ALL TREES SMALLER THAN 6" IN DIAMETER, SHRUBS OR OTHER VEGETATION REMOVED SHALL BE INCLUDED IN THE LUMP SUM FOR "CLEARING & GRUBBING."

THE CONTRACTOR SHALL REPLACE ANY EXISTING TREE NOT IDENTIFIED FOR REMOVAL THAT IS DAMAGED OR DYING AS A RESULT OF HIS OPERATIONS. THE TREE SHALL BE REPLACED WITH A TREE OF EQUIVALENT SPECIES AND SIZE AT THE EXPENSE OF THE CONTRACTOR.

PROTECTION OF EXISTING FEATURES

EXISTING FEATURES, INCLUDING TREES, MONUMENTS, PIONIC TABLES, BENCHES, ETC., NOT CALLED OUT AS REMOVALS OR REMOVALS AND RESET, SHALL BE PROTECTED BY THE CONTRACTOR. METHODS OF PROTECTION SHALL BE SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.

AT NO TIME IS THE CONTRACTOR ALLOWED TO CROSS THE ROCK WALLS, CANALS OR OTHER FEATURES WITH EQUIPMENT WITHIN THE WORK LIMITS.

Table with columns: ITEM NO., DESCRIPTION OF ITEM, QUANTITY, UNIT. Lists various construction items like mobilization, clearing, pipe, valves, and manholes.

ALL UTILITY WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF RAPID CITY STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION 2007 (STANDARD SPECIFICATIONS) EDITION WITH ALL CURRENT UPDATES, EXCEPT AS MODIFIED IN THE BID DOCUMENTS. THE SOUTH DAKOTA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES (SDDOT STANDARD SPECIFICATIONS), SHALL APPLY FOR PAVEMENT RESTORATION AND PAVEMENT MARKINGS WHILE WORKING IN THE HIGHWAY 44 RIGHT-OF-WAY.

PROJECT NOTE

THIS PROJECT IS THE CONSTRUCTION OF TWO 20-INCH POLYURETHANE-COATED, CEMENT MORTAR-LINED WATER MAINS THAT WILL CONNECT THE FUTURE JACKSON SPRINGS WATER TREATMENT PLANT LOCATED ON CLEGHORN PARK ROAD TO THE CITY DISTRIBUTION SYSTEM AT CANYON LAKE DRIVE AND AT PARK DRIVE. ONE 20-INCH MAIN WILL SERVE THE RAPID CITY LOW LEVEL SERVICE ZONE (OVERFLOW ELEVATION 3406 FT-MSL). THE OTHER MAIN WILL SERVE THE CANYON LAKE HIGH LEVEL SYSTEM (OVERFLOW ELEVATION 3562 FT-MSL). THE OPERATING PRESSURE OF THE SYSTEM WHEN COMPLETE IS 125 PSI FOR THE HIGH LEVEL SYSTEM AND 95 PSI FOR THE LOW LEVEL SYSTEM. ANTICIPATED SURGE PRESSURES ARE 175 PSI AND 95 PSI, RESPECTIVELY.

THE PROJECT INCLUDES MODIFICATIONS TO THE CHAPEL VALLEY WATER DISTRICT CONNECTION TO THE CITY SYSTEM; RECONSTRUCTION OF 20-INCH LOW LEVEL WATER MAIN NORTH ON CANYON LAKE DRIVE TO LAKEVIEW DRIVE; RECONSTRUCTION OF HIGH LEVEL 12-INCH MAIN NORTH ON CANYON LAKE DRIVE TO LAKEVIEW DRIVE; AND, CONSTRUCTION OF 20-INCH MAIN NORTH ON PARK DRIVE FROM THE CANYON LAKE PARK EAST ENTRANCE TO JACKSON BOULEVARD.

AN EXISTING 24-INCH MAIN PROVIDES SERVICE TO THE PROPERTIES ALONG THE ROUTE OF THE NEW MAINS. THIS 24-INCH MAIN MUST REMAIN IN SERVICE UNTIL THE END OF THE PROJECT.

UTILITIES

THE INFORMATION ON THESE DRAWINGS CONCERNING THE TYPE, SIZE, AND LOCATION OF UTILITIES HAS BEEN SHOWN BASED UPON THE BEST INFORMATION AVAILABLE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES IN PLACE. CONTRACTOR SHALL COORDINATE ALL RELOCATION S WITH THE UTILITY COMPANIES.

ELECTRICAL, TELEPHONE, TELEVISION, FIBER AND GAS UTILITIES MAY BE ADJUSTED AND/OR RELOCATED BY THE RESPECTIVE UTILITY COMPANIES.

THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES PRIOR TO BIDDING THIS PROJECT SO THEY ARE AWARE OF THEIR RELOCATION / ADJUSTMENT / OR INSTALLATION REGARDING THIS PROJECT; AND INCLUDE ANY NECESSARY IMPACT TO THE SCHEDULE THE CONTRACTOR INTENDS TO FOLLOW. ANY CONFLICTS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND UTILITY TO RESOLVE AT NO COST IN TIME OR MONEY TO THE CITY.

UTILITIES: SOUTH DAKOTA ONE CALL 1-800-781-7474

- (ELECTRIC) (SIGNAL, STREET LIGHTS) BLACK HILLS POWER AND LIGHT COMPANY CITY OF RAPID CITY TRAFFIC OPERATIONS 405 DEADWOOD AVENUE 706 STEELE AVENUE (605) 721-3230 (605) 394-4118

- (TELEPHONE) (GAS) MONTANA-DAKOTA UTILITIES 718 STEELE AVENUE (605) 342-0160
- (TELEPHONE-TELEVISION) (SEWER, WATER) MIDCONTINENT COMMUNICATIONS 1301 OMAHA STREET SUITE 106 (605) 888-1300
- (TELEPHONE-TELEVISION) (KNOWLEDGE COMMUNICATIONS) 809 DEADWOOD AVENUE (605) 721-2056
- (SEWER) RAPID CANYON SANITARY DISTRICT (605) 381-1280

PIPE SCHOOL

THE ENGINEER WILL SCHEDULE A MEETING PRIOR TO BEGINNING OF CONSTRUCTION. THE COST OF THE SCHOOL SHALL BE INCIDENTAL TO THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ATTENDANCE BY PRODUCT MANUFACTURERS.

- ATTENDANCE IS REQUIRED BY: REPRESENTATIVE(S) FROM THE PVC PIPE MANUFACTURER REPRESENTATIVE(S) FROM THE STEEL PIPE MANUFACTURER CONTRACTOR'S JOB SUPERINTENDENT CONTRACTOR'S PIPE INSTALLATION CREW(S) CONTRACTOR'S WELDER(S) CONTRACTOR'S TESTING FIRM OWNER ENGINEER CATHODIC PROTECTION SPECIALIST

- AGENDA: THE PURPOSE OF PIPE SCHOOL IS TO INSTRUCT ATTENDEES ON THE PROPER INSTALLATION OF: PVC RESTRAINED JOINT PIPE POLYURETHANE-COATED, CEMENT-MORTAR LINED STEEL PIPE INSTALLATION FIELD MODIFICATION INTERNAL GROUTING COATING INSPECTION/TESTING FIELD COATING REPAIR ELEMENTS OF THE CATHODIC PROTECTION SYSTEM INSTALLATION TESTING REQUIREMENTS

ANSWER QUESTIONS AND CONCERNS OF THOSE IN ATTENDANCE.

PROJECT COORDINATION

CONTRACTOR IS RESPONSIBLE FOR COORDINATING WORK WITH RAPID CITY PARKS DIVISION, THE SOUTH DAKOTA GAME, FISH AND PARKS AND OTHER ADJACENT PROPERTY OWNERS THAT WILL BE TEMPORARILY IMPACTED BY CONSTRUCTION OF THIS PROJECT.

SUBMITTALS ARE REQUIRED FOR ALL ITEMS LISTED BELOW AND AS REQUIRED IN THE STANDARD SPECIFICATIONS. A DETAILED TABLE OF SUBMITTALS WILL BE PROVIDED TO THE CONTRACTOR AT TIME OF "NOTICE-TO-PROCEED WITH SUBMITTALS". THIS TABLE OF SUBMITTALS WILL BE UTILIZED THROUGHOUT CONSTRUCTION BY THE CONTRACTOR, ENGINEER AND CITY FOR TRACKING OF MATERIALS.

SUBMITTALS SHALL INCLUDE ALL DRAWINGS, DIAGRAMS, DESCRIPTIVE LITERATURE, ILLUSTRATIONS, INSTRUCTION, SCHEDULES, SAFETY PLANS, OPERATING PLANS, PERFORMANCE AND TEST DATA, PRODUCT DATA SHEETS, MATERIAL SAFETY DATA SHEETS, AND SIMILAR MATERIALS PREPARED BY THE CONTRACTOR OR A SUPPLIER TO ILLUSTRATE MATERIAL, EQUIPMENT OR SOME PORTION OF THE WORK. SAMPLES MAY BE REQUIRED PER THE STANDARD SPECIFICATIONS.

AT LEAST TEN (10) WORKING DAYS, UNLESS OTHERWISE SPECIFIED, PRIOR TO INCORPORATING INTO WORK, THE CONTRACTOR SHALL TRANSMIT TO THE ENGINEER COPIES OF SUBMITTALS FOR ALL CONTRACTOR FURNISHED PRODUCTS. A SUFFICIENT QUANTITY OF COPIES SHALL BE FURNISHED TO ALLOW THE ENGINEER TO RETAIN THREE (3) COPIES AND RETURN THE REMAINDER FOR CONTRACTOR AND SUPPLIER USE. THE ENGINEER WILL NORMALLY REVIEW FOR GENERAL CONFORMANCE TO REQUIREMENTS OF THE CONTRACT DOCUMENTS AND RETURN THE SUBMITTALS WITHIN SEVEN (7) WORKING DAYS FROM RECEIPT. SUBMITTALS WILL BE ACCEPTED ONLY FROM THE CONTRACTOR. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE SCHEDULE OF SUBMITTALS AND MATERIAL ORDERING AND DELIVERY. THE CONTRACTOR IS ADVISED TO RECEIVE REVIEWED SUBMITTALS FROM THE ENGINEER PRIOR TO DELIVERY OF MATERIALS. DELAYS CAUSED BY INCOMPLETE OR INCORRECT SUBMITTALS ARE THE RESPONSIBILITY OF THE CONTRACTOR.

SUBMITTALS SHALL BE CLEARLY MARKED/HIGHLIGHTED TO IDENTIFY SPECIFIC PRODUCT DETAILS AND INFORMATION DEMONSTRATING CONFORMANCE WITH OR EXCEEDING SPECIFIED REQUIREMENTS. ANY DEVIATIONS FROM THE SPECIFICATIONS SHALL ALSO BE CLEARLY MARKED.

SUBMITTALS SHALL BE TRANSMITTED TO THE ENGINEER WITH A COVER FORM SEQUENTIALLY NUMBERED. REVISED SUBMITTALS SHALL BE TRANSMITTED WITH THE ORIGINAL NUMBER AND A SEQUENTIAL ALPHABETIC SUFFIX. THE FORM SHALL IDENTIFY THE PROJECT INFORMATION, CONTRACTOR, SUPPLIER, PERTINENT DRAWING OR SPECIFICATION REFERENCES, AND ITEM DESCRIPTION. THE FORM SHALL CONTAIN A CONTRACTOR SIGNED STATEMENT CERTIFYING THE INFORMATION CONTAINED THEREIN IS IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING ITEMS TO THE ENGINEER A MINIMUM OF FOURTEEN (14) DAYS PRIOR TO THE PRECONSTRUCTION CONFERENCE:

- CONSTRUCTION SCHEDULE; - TRAFFIC CONTROL PLAN FOR THE ENTIRE PROJECT. - DETAILED WORK PLAN FOR THE CHAPEL LAKE CROSSING. - AIR QUALITY CONSTRUCTION PERMIT FROM THE CITY OF RAPID CITY; - A COPY OF THE NOTICE OF INTENT TO THE SDOENR (FILED BY THE CONTRACTOR); - A COPY OF THE CONTRACTOR'S SDOENR TEMPORARY DISCHARGE PERMIT; - A COPY OF THE CONTRACTOR'S STORMWATER POLLUTION PREVENTION PLAN; - A COPY OF THE UTILITY WORK PERMIT FROM THE SDOOT FOR WORK WITHIN THE JACKSON BOULEVARD R.O.W.; - BORING CONTRACTOR'S EXPERIENCE AND CREDENTIALS; - BORING PLAN; SHORING METHOD, PIT FLOOR STABILIZATION; EQUIPMENT, METHOD OF INSURING AGAINST OVERBELLING, HORIZ. AND VERT. CONTROL METHOD, ETC.; - SLEEVE, SLEEVE END SEALS, CASING SPACERS, CARRIER PIPE RESTRAINTS; - 18-, 20- AND 24-INCH WATER MAIN ABANDONMENT PLAN - WATER MAIN DECHLORINATION AND SUPERCHLORINATED WATER DISPOSAL PLAN - WELDER CERTIFICATION.

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING ITEMS TO THE ENGINEER ACCORDING TO THE REQUIREMENTS ABOVE:

- ALL MATERIALS FURNISHED, INCLUDING BUT NOT LIMITED TO: - AGGREGATE MATERIALS; - ASPHALT MIX DESIGN --- CITY OF RAPID CITY TYPE G ASPHALT --- SDOOT TYPE E ASPHALT MIX --- SDOOT TYPE S ASPHALT MIX - PIPE, FITTINGS, APPURTENANCES, ETC.; - SEED CERTIFICATIONS; - MIX DESIGNS; - PAVING FABRIC; - PAVING FABRIC TACK COAT; - EROSION CONTROL MATERIALS;

THE CONTRACTOR SHALL SUBMIT TEST REPORTS TO THE ENGINEER IMMEDIATELY UPON RECEIPT FROM TESTING AGENCY.

FIELD OFFICE REQUIREMENTS

CONTRACTOR IS RESPONSIBLE FOR PROVIDING WORKSPACE WITHIN THEIR JOB TRAILER OR A SEPARATE JOB TRAILER FOR THE CONSTRUCTION OBSERVER. IN EITHER CASE, CONTRACTOR SHALL SUPPLY A TABLE/DESK AND CHAIRS FOR THE CONSTRUCTION OBSERVER.

THE CLEGHORN SCHOOL BUILDING AND SITE MAY BE AVAILABLE DURING AT LEAST A PORTION OF THE CONSTRUCTION. CONTRACTOR SHALL OBTAIN APPROPRIATE PERMISSIONS FROM THE CITY PUBLIC WORKS DIRECTOR FOR TEMPORARY USE OF THE BUILDING AND SITE. DOCUMENTATION OF TEMPORARY USE MUST BE PROVIDED TO THE ENGINEER OR HIS REPRESENTATIVE. IF PERMISSION IS RECEIVED, THE CONTRACTOR MAY USE THE BUILDING AND SITE AS A PROJECT OFFICE AND MATERIALS STAGING AREA.

THE CLEGHORN SCHOOL BUILDING WILL BE DEMOLISHED UNDER THE JACKSON SPRINGS WATER TREATMENT PLANT CONSTRUCTION PROJECT BY OTHERS. THE TIMING OF THE DEMOLITION AND THE USE OF THE BUILDING WILL BE COORDINATED WITH THE CONTRACTOR AS MORE INFORMATION BECOMES AVAILABLE. CONTRACTOR SHALL BE PREPARED TO RELOCATE OFFICE SPACE, WORK TRAILERS, MATERIALS, ETC., AS NECESSARY.

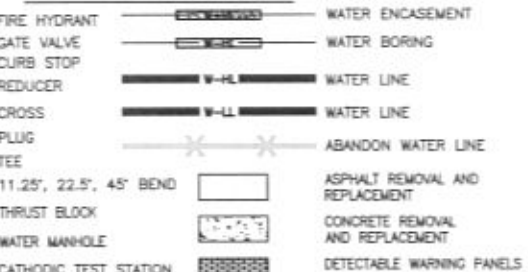
PROGRESS MEETINGS

PROGRESS MEETINGS WILL BE HELD AT LEAST WEEKLY, AND MORE FREQUENTLY IN CRITICAL AREAS SUCH AS WHEN WORK IS OCCURRING IN AND AROUND THE FISH HATCHERY. THE WEEKLY MEETING SCHEDULE WILL BE ESTABLISHED AT THE PRE-CONSTRUCTION CONFERENCE.

ENGINEER WILL PREPARE THE MEETING AGENDAS AND MEETING MINUTES. THE CONTRACTOR SHALL MAKE AVAILABLE APPROPRIATE SPACE FOR PROGRESS MEETINGS. CONTRACTOR SHALL SUPPLY SUFFICIENT TABLES AND CHAIRS TO ACCOMMODATE THE CONTRACTOR/SUBCONTRACTOR ATTENDEES AS WELL AS 12 ADDITIONAL PEOPLE, WHICH MAY INCLUDE ADJACENT LANDOWNERS, ENGINEER'S REPRESENTATIVES, CITY PERSONNEL, SDOOT PERSONNEL, ETC.

RECEIVED OCT 12 2009 City of Rapid City Department of Public Works

PROPOSED LEGEND



Project Information: Public Works Department, Burns & McDonnell, FEC Ferber Engineering Company, Inc., Scale: AS SHOWN, Design By: DRM, Drawn By: DWS, Design Date: SEPT 2008, Print Date: 10-8-09, Internal Job No: J08-133, Survey Date: FEB 2009, Project Name: JACKSON SPRINGS WATER TRANSMISSION MAINS, Sheet Title: LEGEND ESTIMATE OF QUANTITIES AND GENERAL NOTES, Sheet No: 2 of 43.

GENERAL NOTES

COMBINATION AIR VALVE

COMBINATION AIR VALVES SHALL BE AUTOMATIC FLOAT OPERATED VALVES DESIGNED TO EXHAUST LARGE QUANTITIES OF AIR DURING THE FILLING OF THE PIPING SYSTEM AND CLOSE UPON LIQUID ENTRY. THE VALVES SHALL OPEN DURING DRAINING OR IF A NEGATIVE PRESSURE OCCURS. THE VALVES SHALL ALSO RELEASE ACCUMULATED AIR FROM A PIPING SYSTEM WHILE THE SYSTEM IS IN OPERATION AND UNDER PRESSURE. THE VALVES SHALL PERFORM THE FUNCTIONS OF BOTH AIR RELEASE AND AIR/VACUUM VALVES AND FURNISHED AS A SINGLE BODY TYPE.

VALVES SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH ANNA C512 AND CERTIFIED TO ANSI/NSF 61 DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS.

SINGLE BODY COMBINATION VALVES SHALL HAVE AN EXPANDED OUTLET TO PROVIDE FULL FLOW AREA AROUND THE GUIDE MECHANISM. THE VALVE SHALL HAVE A DOUBLE-GUIDED PLUG AND AN ADJUSTABLE THREADED ORIFICE BUTTON. THE PLUG SHALL BE PROTECTED AGAINST DIRECT WATER IMPACT BY AN INTERNAL BAFFLE.

THE VALVE BODY AND COVER SHALL BE CONSTRUCTED OF ASTM A126 CLASS B CAST IRON FOR CLASS 125 VALVES. THE FLOAT, GUIDE SHAFTS, AND BUSHINGS SHALL BE CONSTRUCTED OF TYPE 316 STAINLESS STEEL. NON-METALLIC FLOATS, LINKAGE, OR BUSHINGS ARE NOT ACCEPTABLE. RESILIENT SEALS SHALL BE Buna-N.

THE VALVE BODY SHALL BE THREADED WITH NPT INLETS AND OUTLETS. THE BODY INLET CONNECTION SHALL BE HEXAGONAL FOR A WRENCH CONNECTION. THE VALVE SHALL HAVE TWO ADDITIONAL NPT CONNECTIONS FOR ADDITIONAL GAUGES, TESTING AND DRAINING. THE COVER SHALL BE BOLTED TO THE VALVE BODY AND SEALED WITH A FLAT GASKET. RESILIENT SEALS SHALL BE REPLACEABLE AND PROVIDE DROP TIGHT SHUT OFF TO THE FULL VALVE PRESSURE RATING. FLOATS SHALL BE UNCONDITIONALLY GUARANTEED AGAINST FAILURE INCLUDING PRESSURE SURGES. MECHANICAL LINKAGE SHALL PROVIDE SUFFICIENT MECHANICAL ADVANTAGE SO THAT THE VALVE WILL OPEN UNDER FULL OPERATING PRESSURE. SIMPLE LEVER DESIGNS SHALL CONSIST OF A SINGLE PIVOT ARM AND A RESILIENT ORIFICE BUTTON. COMPOUND LEVER DESIGNS SHALL CONSIST OF TWO LEVERS AND AN ADJUSTABLE THREADED RESILIENT ORIFICE BUTTON.

THE EXTERIOR OF THE VALVE SHALL BE COATED WITH A UNIVERSAL ALKYL PRIMER.

ALL AIR VALVES INSTALLED IN VAULTS SHALL INCLUDE AN INFLOW PREVENTER TO PREVENT THE INTRODUCTION OF CONTAMINATED WATER THROUGH THE AIR VALVE OUTLET. THE INFLOW PREVENTER SHALL ALLOW THE ADMITTANCE AND EXHAUSTING OF AIR WHILE PREVENTING CONTAMINATED WATER FROM ENTERING DURING NORMAL OPERATING CONDITIONS. THE INFLOW PREVENTER SHALL BE TESTED BY A THIRD PARTY TO CERTIFY PERFORMANCE. THE THIRD PARTY SHALL BE AN APPROVED TESTING LAB OF THE AMERICAN SOCIETY OF SANITARY ENGINEERS.

THE 20" STEEL WATER MAIN SHALL HAVE A SHOP-FABRICATED 4" FLANGED OUTLET FOR RECEIVING THE AIR VALVE.

COMBINATION AIR VALVES SHALL BE VAL-MATIC MODEL VM-1204S/104/38, SINGLE BODY TYPE, FLANGED INLET, OR APPROVED EQUAL.

PAYMENT FOR COMBINATION AIR VALVES, AS DEFINED IN THE PLANS, SHALL INCLUDE ALL VAULTS, FITTINGS, VALVES, AND OTHER MATERIALS AS NECESSARY TO CONSTRUCT AND MAKE FULLY OPERATIONAL AND WILL BE PAID FOR UNDER THE ITEM "COMBINATION AIR VALVE". THE 20" STEEL WATER MAIN AND 4" FLANGED STEEL OUTLET ARE SEPARATE PAY ITEMS.

BEDDING, FOUNDATION MATERIAL AND IMPORTED BACKFILL (TRENCH)

QUANTITIES OF TYPE I GRANULAR MATERIAL AND TYPE II FOUNDATION MATERIAL HAVE BEEN INCLUDED IN THE ESTIMATE OF QUANTITIES FOR USE WHERE UNSTABLE TRENCH BOTTOM IS ENCOUNTERED. A QUANTITY OF IMPORTED BACKFILL (TRENCH) HAS BEEN INCLUDED IN THE ESTIMATE OF QUANTITIES FOR USE IF A SHORTAGE OF SUITABLE BACKFILL MATERIAL IS ENCOUNTERED. THE USE OF THESE MATERIALS SHALL BE AUTHORIZED BY THE ENGINEER PRIOR TO PLACEMENT. MEASUREMENT AND PAYMENT WILL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. ALL OTHER BEDDING MATERIAL IS INCIDENTAL TO THE WATER MAIN INSTALLED PER THE STANDARD SPECIFICATIONS.

TRENCH CHECK DAM

CONTRACTOR SHALL PLACE WITHIN THE TRENCH A COMPACTED COHESIVE CLAY CHECK DAM. CHECK DAM LOCATIONS SHALL BE AS INDICATED ON THE PROFILE. DURING CONSTRUCTION CHECK DAM LOCATIONS MAY BE MOVED DUE TO FIELD CONDITIONS. THE CHECK DAM SHALL EXTEND FROM THE BOTTOM OF THE EXCAVATION THROUGH THE BEDDING MATERIAL TO THE BACKFILL AND SHALL EXTEND COMPLETELY TO EACH TRENCH SIDEWALL. THE CHECK DAM IS USED AS A MEANS TO PREVENT THE CONVEYANCE OF WATER THROUGH THE TRENCH BEDDING. COMPACTED COHESIVE CLAY SHALL CONSIST OF MATERIAL THAT CONTAINS A MINIMUM OF 25% FINUS NO. 200 SIEVE MATERIAL WITH 70% PASSING A 3/4 INCH SIEVE AND A PI OF 10%. THE MATERIAL SHALL CONSIST OF CLAY, SILTY SAND OR SILTY CLAY. IF THE NORMAL EXCAVATED MATERIAL IS NOT SUITABLE FOR CONSTRUCTION OF THE CHECK DAM THEN THE CONTRACTOR SHALL OBTAIN MATERIAL FROM OUTSIDE SOURCES. CHECK DAM INSTALLATION AND MATERIAL SHALL BE CONSIDERED AS INCIDENTAL TO THE WATER INSTALLATION.

REMOVAL OF CONCRETE SIDEWALK, CURB AND GUTTER, GUTTER AND DRIVEWAY PAVEMENT

ALL CONCRETE SIDEWALK, CURB AND/OR GUTTER, PAVEMENT OR OTHER SUCH STRUCTURES DESIGNATED ON THE PLANS SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED CONTRACTOR FURNISHED DISPOSAL SITE. COSTS FOR ALL LABOR, MATERIALS, MACHINERY, TRANSPORT AND DISPOSAL SHALL BE A PART OF THE RESPECTIVE CONCRETE AND ASPHALT CONCRETE REMOVAL BID ITEMS.

PLANS QUANTITY WILL BE THE BASIS FOR PAYMENT FOR REMOVAL ITEMS UNLESS CHANGES ARE DIRECTED BY THE ENGINEER DURING CONSTRUCTION. IF CHANGES ARE DIRECTED BY THE ENGINEER ACTUAL QUANTITIES REMOVED WILL BE MEASURED BY THE ENGINEER AND WILL BE PAID FOR AT THE UNIT PRICES FOR THE ITEMS REMOVED.

ADDITIONAL QUANTITIES HAVE BEEN ADDED FOR ASPHALT CONCRETE, CONCRETE CURB AND GUTTER AND CONCRETE SIDEWALK IN ANTICIPATION OF REMOVAL AND REPLACEMENT OF THESE ITEMS AT VARIOUS LOCATIONS AS DIRECTED BY THE ENGINEER.

ROCK EXCAVATION

A QUANTITY OF ROCK EXCAVATION IS INCLUDED IN THE BID TAB FOR USE IF ROCK IS ENCOUNTERED WHILE INSTALLING THE WATER MAIN INFRASTRUCTURE ON THIS PROJECT. ROCK EXCAVATION DETERMINATION, MEASUREMENT AND PAYMENT IF NECESSARY SHALL BE IN ACCORDANCE WITH SECTION 11 OF THE CITY OF RAPID CITY STANDARD SPECIFICATIONS.

SUBSURFACE BORE LOGS ARE INCLUDED IN THE PLAN SET FOR INFORMATIONAL PURPOSES. AS STATED IN THE CITY OF RAPID CITY STANDARD SPECIFICATIONS SHALL REGARDLESS OF THE NATURE OF THE DEPOSIT WILL NOT BE CONSIDERED ROCK EXCAVATION.

TEMPORARY 6" GATE VALVE

DURING CONSTRUCTION OF THE CANYON LAKE DRIVE PORTION OF THE PROJECT, A TEMPORARY 6" GATE VALVE SHALL BE INSTALLED IN JACKSON BOULEVARD AT THE LOCATION SHOWN IN THE PLANS. RAPID CITY UTILITY MAINTENANCE HAS A 6" VALVE AVAILABLE FOR USE. CONTRACTOR WILL BE RESPONSIBLE FOR RETRIEVING AND INSTALLING THE VALVE.

WASTE DISPOSAL SITE

THE CONTRACTOR WILL BE REQUIRED TO FURNISH A SITE FOR THE DISPOSAL OF CONSTRUCTION/DEMOLITION DEBRIS GENERATED BY THIS PROJECT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

CONSTRUCTION DEBRIS MAY NOT BE DISPOSED OF WITHIN THE RIGHT-OF-WAY.

MATERIAL STOCKPILE IDENTIFICATION

THE CONTRACTOR SHALL CLEARLY IDENTIFY MATERIAL STOCKFILES SO THAT MATERIAL TYPES AND USES ARE CLEARLY IDENTIFIED, FOR EXAMPLE - BEDDING, BASE COURSE AND GRAVEL CUSHION FOR SIDEWALK, ETC.

INCIDENTAL WORK

THIS WORK INCLUDES ALL MISCELLANEOUS ITEMS NOT INCLUDED UNDER THE REGULAR ITEMS COVERED BY UNIT PRICES AS LISTED IN THE PROPOSAL, BUT WHICH MUST BE PERFORMED IN ORDER TO COMPLETE THE CONTRACT. SPECIFIC INCIDENTAL ITEMS ARE SHOWN ON THE DRAWINGS AND WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "INCIDENTAL WORK." INCIDENTAL WORK INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

- 1. RELOCATION OF LIGHT POLES
2. WORK LIMIT BARRIERS
3. WATER DISTRIBUTION MAIN ABANDONMENT
4. ADJUSTMENT TO PRIVATE UTILITIES
5. IRRIGATION LINE REPAIR

BASE COURSE

AGGREGATES FOR BASE COURSE SHALL BE LIMESTONE LEDGE ROCK AND SHALL CONFORM TO THE REQUIREMENTS OF 3/4" AGGREGATE BASE COURSE IN SECTION 117 OF THE STANDARD SPECIFICATIONS.

ESTIMATED QUANTITIES WERE BASED UPON AN ASSUMED IN PLACE DENSITY OF 150 LB/CU FT.

WATER FOR COMPACTION OF GRANULAR MATERIAL

WATER FOR COMPACTION OF GRANULAR MATERIAL SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE FOR THE VARIOUS GRANULAR MATERIALS. THE MOISTURE CONTENT OF THE GRANULAR MATERIALS SHALL BE WITHIN 6% +/- OF OPTIMUM MOISTURE UNLESS OTHERWISE REQUIRED BY THE ENGINEER.

ASPHALT CONCRETE

IN AREAS OUTSIDE OF THE JACKSON BOULEVARD RIGHT-OF-WAY, MINERAL REQUIREMENTS FOR ASPHALT CONCRETE COMPOSITE SHALL CONFORM TO THE REQUIREMENTS FOR CLASS G, TYPE 1, AS DEFINED IN SECTION 33 OF THE STANDARD SPECIFICATIONS.

WITHIN THE JACKSON BOULEVARD RIGHT-OF-WAY, MINERAL REQUIREMENTS WILL CONFORM TO THE SOOFT SPECIFICATION FOR CLASS E, TYPE 1 AND CLASS S, TYPE 1, AS DEFINED IN SECTIONS 320, 321 AND 325 OF SOOFT STANDARD SPECIFICATIONS.

THE ASPHALT BINDER USED IN THE MIXTURES SHALL BE A PG 64-28 ASPHALT BINDER. THE ASPHALT BINDER CONTENT MAY BE ADJUSTED BY THE ENGINEER. BINDER SHALL BE INCIDENTAL TO THE ASPHALT CONCRETE COMPOSITE.

THE CONTRACTOR SHALL PROVIDE A JOB-MIX FORMULA EACH ASPHALT CONCRETE MIX TO THE ENGINEER WITH SUPPORTING MIX DESIGN DATA PRIOR TO PRODUCTION.

ASPHALT THICKNESS SHALL MATCH EXISTING BUT NOT BE LESS THAN 5" OF AC ON 6" OF AGGREGATE BASE COURSE IN AREAS OUTSIDE OF THE JACKSON BOULEVARD RIGHT-OF-WAY. WITHIN THE JACKSON BOULEVARD RIGHT-OF-WAY, THE ASPHALT THICKNESS SHALL MATCH EXISTING BUT NOT BE LESS THAN 5" OF AC (1-1/4" CLASS 5 AC AND 4" CLASS E, TYPE 1 AC) OR 11" OF AGGREGATE BASE COURSE. QUANTITIES IN THE PLANS FOR THESE ITEMS WERE CALCULATED BASED ON THESE PLACEMENT THICKNESSES AND DENSITY OF 150 POUNDS PER CUBIC FOOT.

REPLACEMENT OF ASPHALT CURB IN CANYON LAKE PARK IS INCIDENTAL TO THE ASPHALT CONCRETE PAVEMENT REPLACEMENT.

THE PORTION OF THE JACKSON BOULEVARD ASPHALT PAVEMENT NOT REMOVED WITH THE WATER MAIN TRENCH SHALL BE MILLED TO A DEPTH OF 1" PRIOR TO PLACEMENT OF THE 1-1/4" TYPE 5 WEARING COURSE.

CURING OF CONCRETE

PORTLAND CEMENT CONCRETE PAVEMENT AND CONCRETE CURB AND GUTTER SHALL BE CURED WITH WHITE PIGMENTED LINSEED OIL BASE EMULSION COMPOUND PER THE STANDARD SPECIFICATIONS.

HANDICAP RAMPS

HANDICAP RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DETAIL 61-5. THE DETECTABLE WARNING PANELS SHALL BE CAST-IN-PLACE TYPE, MANUFACTURED BY ARBOR TILE TACTILE SYSTEMS OR APPROVED EQUAL. THE DETECTABLE WARNING PANELS SHALL BE CAREFULLY SET TO MATCH THE TOP OF THE SIDEWALK TO ENSURE THAT NO TRIP SPOTS EXIST AT THE EDGES OF THE PANELS.

THE DETECTABLE WARNING PANELS SHALL BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR "DETECTABLE WARNING PANEL."

THERE WILL BE NO SEPARATE PAYMENT FOR HANDICAP RAMPS. THE RAMP SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER SQUARE FOOT FOR THE CORRESPONDING CONCRETE SIDEWALK BID ITEM. THE CURB TRANSITION AND RAMP OPENING SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER FOOT FOR THE CORRESPONDING CURB AND GUTTER BID ITEM WHEN CURB AND GUTTER IS USED. THE CURB TRANSITION AND RAMP OPENING SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER SQUARE YARD FOR THE CORRESPONDING CONCRETE FILLET BID ITEM WHEN A CONCRETE FILLET SECTION IS USED.

COMPOST

PRIOR TO SEEDING AND AS PART OF THE SEEDBED PREPARATION, THE CONTRACTOR SHALL BLEND COMPOST MATERIAL WITH THE NATIVE TOPSOIL OVER THE DISTURBED AREAS CALLED FOR IN THE PLANS. THE COMPOST SHALL BE APPLIED AND INCORPORATED WITH THE NATIVE SOIL AS SPECIFIED IN SECTION 76 OF THE STANDARD SPECIFICATIONS. THE QUANTITY LISTED IN THE BID PROPOSAL IS BASED ON A THICKNESS OF 1 INCH OVER THE DISTURBED AREA. PAYMENT FOR HAULING AND PLACING OF THE COMPOST MATERIAL WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR "HAULING AND PLACING COMPOST."

PERMANENT SEEDING, FERTILIZING AND MULCHING

ALL DISTURBED AREAS WEST OF CHAPEL LANE THAT WILL NOT BE PAVED OR GRAVELED SHALL BE PERMANENTLY SEEDED ACCORDING TO THE STANDARD SPECIFICATIONS. SEED MIXTURE SHALL BE A NON-IRRIGATED LAWN MIX:

- 20% BLUE FESCUE
20% CHEWINGS FESCUE
20% CREEPING RED FESCUE

- 20% HARD FESCUE
10% PERENNIAL RYEGRASS

ALL DISTURBED AREAS THROUGH CANYON LAKE PARK THAT WILL NOT BE PAVED OR GRAVELED SHALL BE PERMANENTLY SEEDED ACCORDING TO THE STANDARD SPECIFICATIONS. SEED MIXTURE SHALL BE SPORTS PARK OS MIX:

- 25% ODYSSEY KENTUCKY BLUEGRASS
25% SR2100 KENTUCKY BLUEGRASS
25% SR4600 PERENNIAL RYEGRASS
25% MANHATTAN PERENNIAL RYEGRASS

APPLICATION RATE FOR BOTH MIXES IS 200 LBS PER ACRE.

FERTILIZER SHALL BE 18-46-0 AND SHALL BE APPLIED AT A RATE OF 200 LBS PER ACRE.

FIBER MULCHING SHALL BE COMPLETED IN ACCORDANCE WITH SECTION 72 OF THE STANDARD SPECIFICATIONS.

PLANS QUANTITY WILL BE PAID WITHOUT FURTHER MEASUREMENT.

WATERING WILL BE REQUIRED ACCORDING TO SECTION 70 OF THE STANDARD SPECIFICATIONS.

PLANTING OF TREES

TREES CALLED OUT FOR REMOVAL DURING CONSTRUCTION SHALL BE REPLACED WITH SIMILAR SPECIES OF MINIMUM CALIPER OF 2". ALL TREE PLANTING SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

CONTRACTOR SHALL SUPPLY THE ENGINEER WITH A TREE REPLACEMENT SCHEDULE. CITY PARKS URBAN FORESTER SHALL APPROVE OF THE REPLACEMENT SCHEDULE PRIOR TO PLANTING.

NUMBER AND LOCATION OF TREES TO BE DETERMINED BY ENGINEER DURING CONSTRUCTION. BID ITEMS AND QUANTITIES HAVE BEEN PROVIDED IN THE BID TAB FOR BOTH DECIDUOUS AND CONIFEROUS TREES.

PAVEMENT MARKING PAINT

ALL PAVEMENT MARKINGS OUTSIDE OF THE JACKSON BOULEVARD RIGHT-OF-WAY THAT ARE REMOVED OR OTHERWISE DETERIORATED FROM ORIGINAL CONDITION AS A RESULT OF WORK ON THIS PROJECT SHALL BE RESTORED BY PAINTING IN ACCORDANCE WITH SECTION 93 OF THE STANDARD SPECIFICATIONS.

ALL PAVEMENT MARKINGS WITHIN THE JACKSON BOULEVARD RIGHT-OF-WAY THAT ARE REMOVED OR OTHERWISE DETERIORATED FROM ORIGINAL CONDITION AS A RESULT OF WORK ON THIS PROJECT SHALL BE RESTORED BY PAINTING IN ACCORDANCE WITH SECTION 633 OF THE SOOFT STANDARD SPECIFICATIONS AND THE SPECIAL PROVISION FOR EPOXY PAVEMENT MARKING PAINT PROVIDED IN APPENDIX A OF THE DETAILED SPECIFICATIONS.

MARKING AREA SHALL BE DRY AND FREE OF DUST, DIRT AND OIL SUBSTANCE DURING THE APPLICATION OF THE PAVEMENT MARKING PAINT AND BEADS.

APPLY PAVEMENT MARKING PAINT PER MANUFACTURER'S INSTRUCTIONS.

PAVEMENT MARKING MATERIAL OUTSIDE OF THE JACKSON BOULEVARD RIGHT-OF-WAY SHALL BE TRAFFIC PAINT (ALKYD) SPECIFIED FOR PAVEMENT MARKING. PAYMENT FOR PAVEMENT MARKINGS OUTSIDE OF THE JACKSON BOULEVARD RIGHT-OF-WAY SHALL BE AS FOLLOWS:

- PAVEMENT MARKING PAINT, 4" (LF)
PAVEMENT MARKING PAINT, 12" (LF)
PAVEMENT MARKING PAINT, 24" (LF)
PAINTED ARROW, WHITE (EA)
PAINTED HANDICAP MARKING (EA)

PAVEMENT MARKING MATERIAL WITHIN THE JACKSON BOULEVARD RIGHT-OF-WAY SHALL BE EPOXY TRAFFIC PAINT SPECIFIED FOR PAVEMENT MARKING. PAYMENT FOR PAVEMENT MARKINGS INSIDE OF THE JACKSON BOULEVARD RIGHT-OF-WAY SHALL BE AS FOLLOWS:

- EPOXY PAVEMENT MARKING PAINT, 4" (LF)

GROOVING WILL BE REQUIRED FOR PAVEMENT MARKINGS ON JACKSON BOULEVARD. GROOVING WILL BE CONSIDERED INCIDENTAL TO THE PAVEMENT MARKING. NO SEPARATE PAYMENT WILL BE MADE FOR PAVEMENT MARKING GROOVING.

CONTROLLED LOW STRENGTH BACKFILL MATERIAL

UNDER SOME CIRCUMSTANCES, LOW STRENGTH BACKFILL MATERIAL MAY BE REQUIRED FOR SUPPORT AND OTHER STRUCTURAL REASONS. UNDER THESE SITUATIONS, THE LOW STRENGTH BACKFILL MATERIAL SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE PER CY FOR "CONTROLLED LOW STRENGTH BACKFILL MATERIAL." THE USE OF LOW STRENGTH BACKFILL MATERIAL SHALL BE AUTHORIZED BY THE ENGINEER PRIOR TO PLACEMENT.

CHAIN LINK FENCING

A PORTION OF THE CHAIN LINK FENCE ALONG THE CLEGHORN STATE FISH HATCHERY WILL BE REMOVED AND REPLACED DURING THIS PROJECT. MATERIALS FROM THE FENCE REMOVAL SHALL BE REUSED TO THE GREATEST EXTENT PRACTICABLE. IN-KIND REPLACEMENT OF THE FENCE SHALL BE IN THE LOCATION SHOWN IN THE PLANS.

MEASUREMENT OF FENCE REMOVAL WILL BE MADE IN LINEAL FEET AND WILL BE PAID UNDER "REMOVE CHAIN LINK FENCE W/ CONCRETE BASE". MEASUREMENT FOR FENCE REPLACEMENT WILL BE MADE IN LINEAL FEET AND WILL BE PAID UNDER THE BID ITEM "CHAIN LINK FENCE W/ CONCRETE BASE". CHAIN LINK FENCE SHALL BE INSTALLED PER DETAILS LOCATED ON SHEET 40

SINCE THE FENCE WILL BE LOCATED WITHIN THE 100-YEAR FLOODPLAIN, PROVISIONS SHALL BE MADE TO MAKE THE CHAIN LINK BREAK AWAY FROM THE POSTS WHEN FLOODWATERS AND ASSOCIATED DEBRIS BUILD UP ON THE FENCE. SUBMITTALS FOR LIGHTER DUTY TIES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

SAWING IN EXISTING PAVEMENT

PAVEMENT AREAS TO BE REMOVED ARE SHOWN ON THE DRAWINGS. THESE AREAS REPRESENT THE FINAL PAVEMENT SAWCUT AND REMOVAL LIMITS. THE FIRST PAVEMENT SAWCUT FOR ASPHALT SHALL BE MADE AT LEAST 1 FOOT INSIDE OF THE LINES SHOWN. PAVEMENT TO BE REMOVED NEXT TO THE CONCRETE CURB AND GUTTER, SHALL HAVE THE FIRST PAVEMENT SAWCUT AT LEAST 1 FOOT INSIDE THE LIP OF THE CURB AND GUTTER. SAWCUTTING OF THE PAVEMENT AREAS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. ITEMS TO BE SAWCUT WILL INCLUDE AC PAVEMENT, PANS, SIDEWALKS, CURB AND GUTTERS, AND MISCELLANEOUS CONCRETE AND ASPHALT ITEMS AS SHOWN ON THE PLANS. NO SEPARATE PAYMENT WILL BE MADE FOR SAWING.

CANYON LAKE PARK IRRIGATION SYSTEM

THE IRRIGATION MAINS WITHIN CANYON LAKE PARK HAVE BEEN SHOWN IN THE PLANS. THE LOCATIONS SHOWN, BOTH HORIZONTAL AND VERTICAL, ARE APPROXIMATE ONLY. ADDITIONALLY, NONE OF THE SMALLER IRRIGATION LINES ARE SHOWN DUE TO INABILITY TO LOCATE THE LINES. IRRIGATION HEADS, WHERE FOUND DURING SURVEY, ARE SHOWN. CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL IRRIGATION SYSTEM COMPONENTS THAT ARE WITHIN THE DESIGNATED WORK LIMITS.

IF IRRIGATION MAINS AND LATERALS ARE DAMAGED DURING CONSTRUCTION OF THIS PROJECT, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR THE LINES AS SOON AS PRACTICABLE. IRRIGATION LINE REPAIR IS CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE PROJECT.

BORING AND CASING

APPENDIX B "BORING SPECIFICATIONS" IS PROVIDED IN THE DETAILED SPECIFICATIONS.

SPRING BOX ABANDONMENT

THE ABANDONMENT OF THE CLEGHORN WATER USERS SPRING BOX IS A PART OF THIS PROJECT. A DETAIL OF THE PROPOSED ABANDONMENT IS PROVIDED WITHIN THE ABANDONMENT PLANS. THE DETAIL PROVIDES INFORMATION REGARDING THE DEPTH OF AND TYPE OF MATERIAL AND THE LAYER REQUIRED TO COMPLETE THE ABANDONMENT.

PAYMENT FOR THE SPRING BOX ABANDONMENT WILL BE LUMP SUM AND WILL BE PAID UNDER THE BID ITEM "SPRING BOX ABANDONMENT".

UTILITY ADJUSTMENT

RELOCATION OF SEVERAL LIGHT POLES ARE CALLED OUT WITHIN THE PLANS AND INDIVIDUAL BID ITEMS ARE PROVIDED. THERE MAY BE OTHER ADDITIONAL PRIVATE UTILITIES WITHIN THE WORK LIMITS THAT REQUIRE RELOCATION. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION WITH AND PAYMENT OF ANY RELOCATION FEES TO THE PRIVATE UTILITY COMPANIES. COMPENSATION WILL BE MADE TO THE CONTRACTOR AT THE CONTRACT LUMP SUM PRICE FOR "UTILITY ADJUSTMENT" AND SHALL INCLUDE RELOCATION FEES AND ANY OTHER COSTS ASSOCIATED WITH THE ADJUSTMENTS, IF NECESSARY.

CONTRACTOR FURNISHED STAKING

ALL STAKING ON THE PROJECT WILL BE BY THE CONTRACTOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. PAYMENT FOR CONTRACTOR FURNISHED STAKING SHALL BE AT THE CONTRACT UNIT PRICE FOR "CONSTRUCTION STAKING".

CATHODIC PROTECTION

CATHODIC PROTECTION IS OUTLINED IN SECTION 13900 OF THE DETAILED SPECIFICATIONS. TIGHTLY-BONDED COATINGS AND LININGS ARE OUTLINED IN SECTION 9950 OF THE DETAILED SPECIFICATIONS.

ZINC GALVANIC ANODES (18#) ARE REQUIRED AT A MAXIMUM SPACING OF 150 FEET ALONG THE ENTIRE LENGTH OF BOTH METALLIC PIPELINES. ADDITIONAL ANODES ARE REQUIRED AT METALLIC FITTINGS, VALVES AND HYDRANTS ON NONMETALLIC PIPE ACCORDING TO THE DETAILED SPECIFICATIONS. A TABLE OF TEST STATION LOCATIONS AND TYPES IS PROVIDED BELOW.

Table with columns: ALIGNMENT, APPROXIMATE PIPELINE STATION, TEST STATION TYPE, DETAIL No., and REMARKS. It lists various test station locations along the pipeline with specific details for each.

CATHODIC PROTECTION DETAIL NOTES

- 1. TRACER WIRE SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND NOT NECESSARILY AS SHOWN IN THESE DETAILS.
2. PIPE MARKING SIGNS SHALL NOT BE REQUIRED.
3. CATHODIC PROTECTION SHALL NOT BE REQUIRED ON WATER SERVICE LINES.

Vertical sidebar containing logos for Burns & McDonnell, FEC Engineering Company, Inc., and project title 'JACKSON SPRINGS WATER TRANSMISSION MAINS'. It also includes a 'NOT FOR CONSTRUCTION' watermark and a 'GENERAL NOTES AND QUANTITY TABLES' header.

PROJECT PHASING AND SEQUENCING

THIS PROJECT PHASING AND SEQUENCING SECTION PROVIDES DETAIL REGARDING HOW THE PROJECT SHOULD PROGRESS TO PROVIDE A NEARLY UNINTERRUPTED WATER SOURCE TO ALL CURRENT WATER USERS. ALTHOUGH THIS GUIDANCE IS PROVIDED, THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING A DETAILED CONSTRUCTION SCHEDULE AND SEQUENCING PLAN.

THE PROJECT PLANS CONTAIN THREE (3) CONSTRUCTION ALIGNMENTS. THESE ARE LISTED BELOW WITH THE ABBREVIATIONS USED IN THE FOLLOWING PHASE DESCRIPTIONS:

- CL - CANYON LAKE DRIVE
- JB - JACKSON BOULEVARD
- PD - PARK DRIVE

THIS PROJECT CONSISTS OF FOUR (4) PHASES OF WORK WITH MULTIPLE PARTS TO EACH PHASE. MULTIPLE CREWS ARE ASSUMED TO BE WORKING ON THE PROJECT. COMPLETION DATES ASSUME COMMENCEMENT OF CONSTRUCTION ACTIVITIES ON OR BEFORE APRIL 1, 2010. EACH PHASE OF WORK DISCUSSED BELOW PROVIDES A LIST OF THE MINIMUM ITEMS THAT MUST BE COMPLETED PRIOR TO CONTINUING TO THE NEXT PHASE OF WORK.

THE PHASING PROVIDED BELOW ALLOWS OVERLAP BETWEEN THE START OF ONE SUBPHASE AND THE ANTICIPATED SUBSTANTIAL COMPLETION OF THE PREVIOUS. THE ANTICIPATED COMPLETION DATES PROVIDED FOR THE SUBPHASES ARE TO DEMONSTRATE THE NECESSITY OF MULTIPLE CREWS. IF THE CONTRACTOR NEGLECTS TO COMPLETE THE ITEMS NECESSARY TO REOPEN ROADS OR PEDESTRIAN ROUTES, A STOP WORK ORDER WILL BE ISSUED BY THE CITY. AUTHORIZATION TO RESTART WORK WILL NOT BE GIVEN UNTIL NECESSARY ITEMS WITHIN EACH SUBPHASE ARE COMPLETED TO THE SATISFACTION OF THE OWNER.

THE COMPLETION DATE PROVIDED FOR EACH COMPLETE PHASE WILL BE THE BASIS IN THE ASSESSMENT OF LIQUIDATED DAMAGES.

STAGING AREAS HAVE BEEN PROVIDED FOR THIS PROJECT AND ARE SHOWN ON THE PROJECT PHASING SHEETS. THE STAGING AREAS ARE GENERALLY LIMITED TO EXISTING PARKING LOTS OR PROPERTY THAT WILL BE DISTURBED IN THE NEAR FUTURE FOR CONSTRUCTION OF THE JACKSON SPRINGS WATER TREATMENT PLANT (WTP). IF THE CONTRACTOR DETERMINES THAT MORE STAGING AREA IS NECESSARY, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING WRITTEN PERMISSION FROM THE OWNER PRIOR TO USE. THE CONTRACTOR IS RESPONSIBLE FOR ALL SURFACE RESTORATION OF ADDITIONAL SITES AT NO ADDITIONAL COST TO THE PROJECT.

STAGING AREAS 4 AND 5 ARE LOCATED AT THE WEST END OF THE PROJECT. WORK TRAILERS SHALL BE PLACED AT ONE OF THESE TWO STAGING AREAS.

STAGING AREA 4 IS LOCATED OUTSIDE OF THE 100-YEAR FLOODPLAIN. NO MATERIALS OR EQUIPMENT SHALL BE STORED IN THE RAPID CREEK FLOODWAY AND LIMITED STORAGE SHALL TAKE PLACE IN THE 100-YEAR FLOODPLAIN. THE ENGINEER WILL MARK THE APPROXIMATE STAGING AREA BOUNDARY. THE CONTRACTOR IS RESPONSIBLE FOR STORING ALL MATERIALS OUTSIDE OF THE FLOODWAY.

STAGING AREA 5 IS THE SITE OF THE WTP. IT IS ANTICIPATED THAT THE WTP PROJECT WILL BE BID IN LATE MAY 2010 WITH AN ANTICIPATED CONSTRUCTION START DATE OF AUGUST 15, 2010. THEREFORE, STAGING AREA 5 MAY BE USED FOR EQUIPMENT AND MATERIALS STORAGE UNTIL THAT TIME WITH PRIOR WRITTEN APPROVAL FROM THE PUBLIC WORKS DIRECTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR SECURING STORAGE SITES.

PHASE 1 - PD 1-37.2 TO PD 4-92.9 AND JB 44-41.4 TO JB 58-05.4 - COMPLETION DATE: JUNE 15, 2010

STAGING AREA 1 (SHOWN) SHALL BE USED DURING CONSTRUCTION OF PHASE 1A AND PHASE 1B (UP TO JB 50-50) NEAR CASING BORE FOR CANAL. THE VERY EAST END OF STAGING AREA 2 MAY BE USED DURING COMPLETION OF PHASE 1B. PRIOR TO FULLY CLOSING WEST PARKING LOT, CONTRACTOR SHALL HAVE THE EAST PARKING LOT OPEN TO FULL USE, INCLUDING STRIPING. FULL USE OF STAGING AREA 2 WILL NOT BE ALLOWED UNTIL STAGING AREA 1 IS CLEAR.

PHASE 1A: PD 1-37.2 TO PD 4-92.9 AND JB 58-05.4 TO JB 55-79.5 - SUBSTANTIAL COMPLETION -- MAY 1, 2010

BORE 30" STEEL CASING ACROSS PARK DRIVE FROM JB 57+04 TO JB 58+00 TO ESTABLISH FINAL ELEVATION OF 20"x20"x20" TEE AT JB 58-05. CONSTRUCT 20" STEEL WATER MAIN ALONG PARK DRIVE TO TIE-IN WITH 12" CI AT INTERSECTION OF PARK DRIVE AND JACKSON BOULEVARD AT PD 4-92.9. CONSTRUCT 10-INCH TIE-IN AT PD 1-37.2. COMPLETE CONSTRUCTION OF 20" STEEL WATER MAIN TO JB 55-79.5.

CANYON LAKE PARK DRIVE ACCESS IS CLOSED. TWO-WAY INTERNAL TRAFFIC MUST BE ESTABLISHED WITHIN PARK WITH ACCESS FROM CANYON LAKE DRIVE. TEMPORARY PEDESTRIAN ACCESS MUST BE PROVIDED AT INTERSECTION OF PARK DRIVE AND JACKSON BOULEVARD. PEDESTRIAN CROSSINGS TO OCCUR AT INTERSECTION AND ON NORTH SIDE OF PARK DRIVE BRIDGE. BIKE PATH TO BE CLOSED THROUGH CONSTRUCTION ZONE.

SUBSTANTIAL COMPLETION OF PHASE 1A INCLUDES:

- 20" STEEL WATER MAIN AND APPURTENANCES CONSTRUCTED, DISINFECTED AND IN SERVICE TO JB 55-79.5
- ALL SURFACE RESTORATION OF PARK DRIVE, INCLUDING, CONCRETE SIDEWALK/BIKEPATH AND SEEDING AND MULCHING OF AREAS ON EAST SIDE OF STREET
- THROUGH-ACCESS REESTABLISHED FOR CANYON LAKE PARK.
- NORMAL PARK DRIVE VEHICULAR AND PEDESTRIAN TRAFFIC ROUTES RESTORED

PHASE 1B: JB 55-79.5 TO JB 48-60.9 - SUBSTANTIAL COMPLETION - JUNE 1, 2010

CONSTRUCT 20" STEEL WATER MAIN UP TO JB 48-60.9. BORE 30" STEEL CASING UNDER HISTORIC CANAL.

SUBSTANTIAL COMPLETION OF PHASE 1B INCLUDES:

- 20" STEEL WATER MAIN CONSTRUCTED, DISINFECTED AND IN SERVICE TO JB 48-60.9
- EAST PARKING LOT IS FULLY RESTORED AND ACCESS TO PARKING LOT IS OPEN
- ALL SEEDING AND MULCHING AS WELL AS TREE REPLACEMENT IS COMPLETE
- BIKE PATH IS RESTORED AND IN SERVICE

BIKE PATH CLOSED AND PEDESTRIAN TRAFFIC DIVERTED TO SIDEWALK ON THE SOUTH SIDE OF JACKSON BOULEVARD.

PHASE 1C: JB 48-60.9 TO JB 44-41.4 - SUBSTANTIAL COMPLETION - JUNE 15, 2010

CONSTRUCT 20" STEEL WATER MAIN TO JB 44-41.4 INCLUDING 20"x20"x12"x8" CROSS AND HIGH LEVEL - LOW LEVEL WATER MAIN INTERCONNECTION. INSTALL 18" AND 30" CASINGS UNDER HISTORIC RETAINING WALL. BORING SHOULD NOT BE NECESSARY. INTENT OF CASINGS IS TO MAINTAIN INTEGRITY OF SHORT ROCK WALLS. CASINGS SHOULD BE PUSHED THROUGH THIN WALL OF SOIL. CONSTRUCT 8" HL TIE-IN TO CANYON LAKE PARK WATER SERVICE.

CANYON LAKE DRIVE ENTRANCE TO CANYON LAKE PARK IS CLOSED. ESTABLISH TWO-WAY ACCESS WITHIN CANYON LAKE PARK WITH ACCESS FROM PARK DRIVE. BEACH STREET CLOSED ON WEST SIDE OF FOREST PRODUCTS EAST ENTRANCE.

PEDESTRIAN TRAFFIC CAN BE DIVERTED TO THE CURB SIDE SIDEWALK ON THE WEST SIDE OF CANYON LAKE DRIVE.

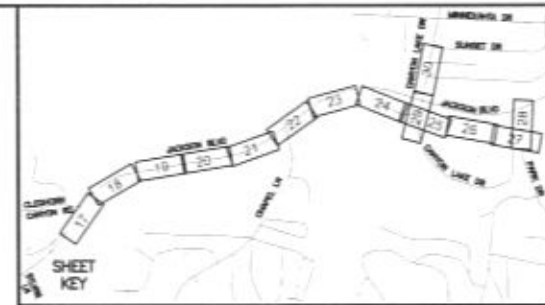
SUBSTANTIAL COMPLETION OF PHASE 1C INCLUDES:

- 20" STEEL WATER MAIN AND APPURTENANCES CONSTRUCTED, DISINFECTED AND IN SERVICE TO JB 44-41.4
- 8" PVC WATER MAIN TIE-IN TO CANYON LAKE PARK WATER SERVICE
- SURFACE RESTORATION OF CANYON LAKE DRIVE PARK ACCESS AND WEST PARKING LOT
- CANYON LAKE DRIVE PARK DRIVE ACCESS REOPENED
- WEST PARKING LOT (STAGING AREA 2) SWEEPED AND REOPENED UNTIL START OF PHASE 2D

RECEIVED

OCT 17 2009

Rapid City Growth Management Department



NOT FOR CONSTRUCTION

Scale:	AS SHOWN
Designed By:	RLM
Drawn By:	DRS
Design Date:	SEPT 2009
Print Date:	10-8-09
Internal Job No.:	J08-133
Surveyed By:	BLAUB
Survey Date:	FEB 2009

Remarks:

JACKSON SPRINGS WATER TRANSMISSION MAINS

Sheet Title: PROJECT PHASING WEST

P:\08-133\AutoCAD\PlanSheets\1472PHASING.DWG

PHASE 2 - JB 44+41.4 TO JB 22+87.5 - COMPLETION DATE: JULY 31, 2010

STAGING AREA 3 (JACKSON BOULEVARD PARKING LOT) SHALL BE USED DURING CONSTRUCTION OF PHASES 2A THROUGH 2C.

PHASE 2A - JB 44+41.4 TO JB 35+94 - ANTICIPATED COMPLETION: JULY 1, 2010

CONSTRUCT 20" WATER MAIN FROM JB 44+41.4 TO JB 35+94. CONSTRUCT 6" HL SERVICE CONNECTION FOR FOREST PRODUCTS AT JB 42+09 AND RECONNECT 1-1/4" WATER SERVICE TO RESIDENCE AT JB 40+35. CONSTRUCT 20" MAIN INTERCONNECTION AT JB 36+00.

BEACH STREET ACCESS FROM CANYON LAKE DRIVE IS CLOSED ON WEST SIDE OF FOREST PRODUCTS EAST ENTRANCE. BEACH STREET IS CLOSED TO THROUGH TRAFFIC ON THE SOUTH SIDE OF THE JACKSON BOULEVARD PARKING LOT DURING CONSTRUCTION IN THE BEACH STREET FOOTPRINT. LOCAL ACCESS MUST BE PROVIDED THROUGHOUT CONSTRUCTION.

SUBSTANTIAL COMPLETION OF PHASE 2A INCLUDES:

- 20" STEEL WATER MAIN AND APPURTENANCES CONSTRUCTED, DISINFECTED AND IN SERVICE TO JB 35+94.
- 6" PVC SERVICE TIE-IN TO FOREST PRODUCTS SERVICE LINE
- 1-1/4" WATER SERVICE TO RESIDENCE
- BEACH STREET RESTORED AND OPEN TO THROUGH TRAFFIC FROM JACKSON BOULEVARD TO CANYON LAKE DRIVE.

PHASE 2B - JB 35+94 TO JB 28+52.3 - ANTICIPATED COMPLETION: JULY 15, 2010

CONSTRUCT 20" WATER MAIN FROM JB 35+94 TO JB 28+52.3. CONSTRUCT 6" PVC TIE-IN TO WATER MAIN AT JB 34+06. CONSTRUCT 20" GATE VALVES AT JB 28+22.3. INSTALL 20" INTERCONNECTION AT JB 28+79.3. INSTALL 20"x20"x16"x16" CROSS AT JB 28+63.3. TIE TO 6-INCH PVC CHAPEL LANE INTER-TIE MAIN.

JACKSON BOULEVARD PARKING LOT IS CLOSED. OUTSIDE EAST BOUND LANE OF JACKSON BOULEVARD WILL REQUIRE TRAFFIC CONTROL.

TEMPORARY PEDESTRIAN ACCESS MUST BE CONSTRUCTED TO CONNECT BIKEPATH AROUND TO CHAPEL LANE SIDEWALK. CURB SIDE SIDEWALK ALONG JACKSON BOULEVARD CAN BE CLOSED TO PEDESTRIAN TRAFFIC.

SUBSTANTIAL COMPLETION OF PHASE 2B INCLUDES:

- 20" WATER MAIN AND APPURTENANCES CONSTRUCTED, DISINFECTED AND IN SERVICE TO JB 28+52.3
- 8" WATER MAIN TIE-IN FOR CHAPEL VALLEY WATER SYSTEM
- 6" WATER MAIN TIE-IN NEAR RESTROOMS.

PHASE 2C - JB 28+52.3 TO JB 22+87.5 - ANTICIPATED COMPLETION: AUGUST 1, 2010

CHAPEL LANE TO MAINTAIN TWO-WAY TRAFFIC DURING CONSTRUCTION. CLOSE NORTH BOUND RIGHT-TURN LANE OF CHAPEL LANE. CONSTRUCT 20" WATER MAINS TO INSIDE JOINT OF RIGHT-TURN LANE AT JB 26+25. CONSTRUCT TEMPORARY ROAD DETOUR BY REMOVING CURB AND GUTTER AND SIDEWALK ALONG EAST SIDE OF CHAPEL LANE TO APPROXIMATELY 50 FEET SOUTH OF CONSTRUCTION CENTERLINE. REMOVE APPROXIMATELY 25 FEET OF CURB AND GUTTER ALONG JACKSON BOULEVARD. CREATE AGGREGATE BASE COURSE TEMPORARY SURFACING.

WITH APPROPRIATE TRAFFIC ROUTING IN PLACE, CONSTRUCT 20" WATER MAINS TO WEST SIDE OF CHAPEL LANE. CONTRACTOR SHALL COMPLETE CHAPEL LANE SURFACE RECONSTRUCTION AND RESTORE NORMAL TRAFFIC CONDITIONS WITHIN SEVEN (7) WORKING DAYS OF COMPLETION OF THE STREET CROSSING.

NIGHT WORK MAY BE NECESSARY FOR COMPLETION OF THE CHAPEL LANE CROSSING. CONTRACTOR

SHALL PREPARE A DETAILED CONSTRUCTION PLAN AND SCHEDULE SHALL BE SUBMITTED TO THE ENGINEER A MINIMUM OF 14 DAYS PRIOR TO CONSTRUCTION.

CONSTRUCTION OF 20" WATER MAIN TO CONTINUE THROUGH COMBINATION AIR VALVES TO 20" GATE VALVES AT JB 22+87.5.

OUTSIDE EAST BOUND LANE OF JACKSON BOULEVARD WILL REQUIRE TRAFFIC CONTROL.

SUBSTANTIAL COMPLETION OF PHASE 2C INCLUDES:

- 20" STEEL WATER MAINS CONSTRUCTED, DISINFECTED AND IN SERVICE THROUGH JB 22+87.5
- COMBINATION AIR VALVES ARE CONSTRUCTED
- CHAPEL LANE IS RESTORED
- JACKSON BOULEVARD PARKING LOT IS RESTORED AND IN SERVICE
- ALL SIDEWALK AND BIKE PATH EAST OF CHAPEL LANE IS RESTORED AND IN SERVICE
- CURB AND GUTTER AND BIKE PATH FROM JB 25+00 TO JB 28+00 IS RESTORED WHERE POSSIBLE

NO WORK IS ALLOWED WITHIN JACKSON BOULEVARD BETWEEN JULY 31, 2010, AND AUGUST 9, 2010.

PHASE 2D - CL 1+04.6 TO CL 6+59.0 - ANTICIPATED COMPLETION: AUGUST 15, 2010

THIS PHASE CAN ONLY BEGIN ONCE SURFACE RESTORATION FOR BEACH STREET IS COMPLETED IN PHASE 2A.

STAGING AREA 2 CAN BE UTILIZED FOR PHASE 2D.

BEACH STREET CLOSED AT CANYON LAKE DRIVE. LOCAL TRAFFIC TO ENTER AT BEACH STREET AND JACKSON BOULEVARD. CANYON LAKE DRIVE ENTRANCE TO PARK IS CLOSED. CANYON LAKE PARK ACCESS VIA PARK DRIVE ENTRANCE.

CONSTRUCT 20" LL STEEL MAIN AND 12" HL RJ PVC MAIN TO JACKSON BOULEVARD. CONSTRUCT 6" PVC WELL NO. 1 CONNECTION TO LL MAIN AND HL MAIN. HL VALVE IS NORMALLY CLOSED.

JACKSON BOULEVARD TRAFFIC RESTRICTED TO HEAD-TO-HEAD TRAFFIC ON WEST BOUND LANES. NO EAST BOUND LEFT TURN ONTO CANYON LAKE DRIVE. DIVERT TRAFFIC TO 32ND STREET.

CONSTRUCT 20" LL STEEL MAIN AND 12" HL RJ PVC MAIN TO APPROXIMATELY 3+70. REPLACE EAST BOUND AND CENTER TURN LANE CONCRETE PAVEMENT IN JACKSON BOULEVARD.

HEAD-TO-HEAD TRAFFIC TO JACKSON BOULEVARD EAST BOUND LANES. MAINTAIN NO LEFT TURN ONTO CANYON LAKE DRIVE. MAINTAIN TRAFFIC DIVERSION AT 32ND STREET. CANYON LAKE DRIVE TRAFFIC HEAD-TO-HEAD IN NORTH BOUND LANES. ACCESS TO ADJACENT PROPERTIES TO BE ACCOMMODATED THROUGH COMPLETION OF PHASE 2D.

CONSTRUCT 20" LL STEEL MAIN AND 12" HL RJ PVC MAIN TO CL 6+59.0. CONCURRENT CONSTRUCTION OF 12" RJ PVC MAIN IN JACKSON BOULEVARD REQUIRED. NORMAL TRAFFIC IN JACKSON BOULEVARD IS REQUIRED BEFORE JULY 31, 2010. CANYON LAKE DRIVE PARK ACCESS TO BE RESTORED BY SAME DATE.

SUBSTANTIAL COMPLETION OF PHASE 2D INCLUDES:

- 20" LL STEEL MAIN AND APPURTENANCES CONSTRUCTED, DISINFECTED AND IN SERVICE
- 12" HL RJ PVC MAIN AND APPURTENANCES CONSTRUCTED, DISINFECTED AND IN SERVICE
- 6" PVC WELL NO. 1 CONNECTIONS TO HL AND LL MAINS IN SERVICE
- WATER SERVICE RESTORED, WHERE APPLICABLE, TO IMPACTED, ADJACENT PROPERTIES
- JACKSON BOULEVARD PAVEMENT RESTORED
- CANYON LAKE DRIVE PAVEMENT RESTORED
- SURFACE RESTORATION OF BIKE PATH, CURB AND GUTTER AND TOPSOIL PLACEMENT AND PREPARATION IN ALL AREAS EAST OF CHAPEL LANE NOT PREVIOUSLY RESTORED.
- WEST PARKING LOT (STAGING AREA 2) FULLY RESTORED AND PARKING LOT IS OPEN

PHASE 3 - JB 22+87.5 TO JB 2+23.8 - COMPLETION DATE: NOVEMBER 1, 2010

STAGING AREA 4, AND IF AVAILABLE, STAGING AREA 5, CAN BE USED FOR THIS PHASE OF CONSTRUCTION.

PHASE 3A - JB 22+87.5 TO JB 9+29.5 - ANTICIPATED COMPLETION: OCTOBER 1, 2010

CONSTRUCTION OF THIS PHASE CANNOT BEGIN UNTIL AUGUST 9, 2010.

CONSTRUCT PARALLEL 20" STEEL MAINS FROM JB 22+87.5 TO JB 9+29.5. CONSTRUCT 6" PVC WATER SERVICE FOR CLEGHORN STATE FISH HATCHERY AT JB 17+63.5.

COORDINATION WITH SOGFP HATCHERY PERSONNEL DURING THIS PHASE OF PROJECT IS NECESSARY. WITH THE PROXIMITY OF THE CONSTRUCTION DISTURBANCE OF GROUNDWATER ALONG THE HATCHERY FRONTAGE, THE POTENTIAL EXISTS THAT SEDIMENTS COULD BE RESUSPENDED AND INADVERTENTLY TAKEN INTO THE HATCHERY GALLERY SYSTEM. CONTRACTOR SHALL CONTACT WILL SAYLER, CLEGHORN SPRINGS STATE FISH HATCHERY MANAGER AT 394-2397.

A TEMPORARY DETOUR OF HATCHERY ACCESS TO JB 5+40 WILL BE NECESSARY. UTILIZE EXISTING 18" RCP FOR GRAVEL CROSSING.

SUBSTANTIAL COMPLETION OF PHASE 3A INCLUDES:

- 20" STEEL MAINS AND APPURTENANCES CONSTRUCTED, DISINFECTED AND IN SERVICE.
- 6" PVC WATER SERVICE TO HATCHERY IN SERVICE
- JACKSON BOULEVARD CURB AND GUTTER AND PAVEMENT RESTORED
- JACKSON BOULEVARD STRIPING COMPLETED

PHASE 3B: JB 9+29.5 TO JB 2+23.8 - ANTICIPATED COMPLETION: NOVEMBER 1, 2010

REMOVE FENCE ALONG JACKSON BOULEVARD FROM HATCHERY VISITOR'S CENTER GATE TO FENCE CORNER NEAR CLEGHORN CANYON. CONCURRENTLY REPLACE FENCE IN-KIND ALONG ALIGNMENT PROVIDED IN PLANS. ACCESS TO HATCHERY MUST BE CONTROLLED DURING FENCE REMOVAL AND RECONSTRUCTION.

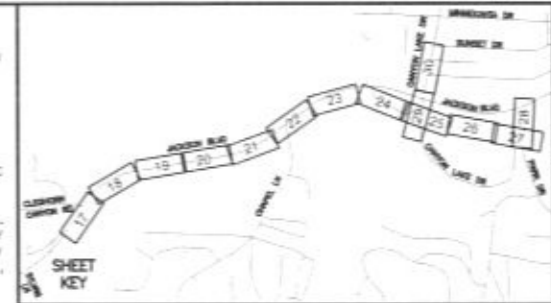
CONSTRUCT 2" WATER SERVICE TO HATCHERY VISITOR CENTER. SURFACE DISTURBANCE OF HATCHERY ENTRANCE FROM JACKSON BOULEVARD AND ENTRANCE TO HATCHERY OFFICE IS TO BE LIMITED. SERVICE TO BE CONSTRUCTED ACROSS THESE ACCESS POINTS USING TRENCHLESS METHODS.

CONSTRUCT PARALLEL 20" STEEL MAINS TO JB 3+03.1. CONSTRUCT 10" RJ PVC WATER MAIN TO STATION 2+23.8. CONSTRUCT TEMPORARY 2" BYPASS SHOWN IN DETAILS.

SUBSTANTIAL COMPLETION OF PHASE 3B INCLUDES:

- 20" STEEL MAIN AND APPURTENANCES CONSTRUCTED, DISINFECTED AND IN SERVICE.
- 10" RJ PVC MAIN AND APPURTENANCES CONSTRUCTED, DISINFECTED AND IN SERVICE.
- 2" COPPER SERVICE TO VISITOR'S CENTER CONSTRUCTED, DISINFECTED AND IN SERVICE.
- 2" COPPER BYPASS.
- CLEGHORN SPRING BOX ABANDONED
- CHAIN LINK FENCE REMOVED AND RECONSTRUCTED.
- REMAINING SURFACE RESTORATION COMPLETE FOR PROJECT

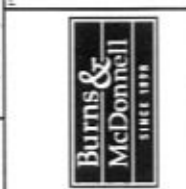
PHASE 4 - ABANDONMENT - COMPLETION DATE: NOVEMBER 15, 2010



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Scale:	AS SHOWN
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Drawn By:	DRS
Design Date:	SEPT 2009
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Internal Job No.:	J09-133
Surveyed By:	SLA/LJS
Survey Date:	FEB 2009
Revisions:	

JACKSON SPRINGS WATER TRANSMISSION MAINS

PROJECT PHASING

EAST

Sheet: 5 of 43

WTP09-1036

CONSTRUCTION SIGNING AND TRAFFIC CONTROL

CONSTRUCTION SIGNING AND TRAFFIC CONTROL SHALL CONFORM TO SECTIONS 90 AND 91 OF THE STANDARD SPECIFICATIONS, TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND AS DIRECTED BY THE ENGINEER. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE TO THE ENGINEER, TWO COPIES OF HIS DETAILED TRAFFIC CONTROL PLAN COORDINATED WITH THE PROJECT SCHEDULE. THE ENGINEER WILL TRANSMIT ONE COPY TO THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION FOR APPROVAL OF PROPOSED WORK IN THE JACKSON BOULEVARD RIGHT-OF-WAY.

THE TRAFFIC CONTROL PLAN, ALONG WITH THE NOTES, ARE INTENDED TO SERVE AS A GUIDE FOR THE CONTRACTOR IN DEVELOPING HIS DETAILED TRAFFIC CONTROL PLAN. DEVIATIONS FROM THE REQUIREMENTS PRESENTED ON THIS PLAN MAY BE APPROVED IF TECHNIQUES AND METHODS KNOWN TO THE CONTRACTOR WILL RESULT IN IMPROVED PROJECT EFFICIENCY, LESS TRAFFIC DISRUPTION, IMPROVED ACCESS TO LOCAL PROPERTIES OR REDUCED CONSTRUCTION TIME.

PEDESTRIAN TRAFFIC SHALL BE PROTECTED FROM HAZARDS ASSOCIATED WITH THE PROJECT BY THE USE OF SAFFR FENCE OR AN ALTERNATIVE APPROVED BY THE ENGINEER.

PAYMENT FOR DEVELOPMENT AND IMPLEMENTATION OF THE TRAFFIC CONTROL PLAN SHALL BE PAID AT THE CONTRACT LUMP SUM PRICE FOR "TRAFFIC CONTROL PLAN".

CONSTRUCTION SIGNING AND TRAFFIC CONTROL (CONTINUED)

PAYMENT FOR ALL OTHER TRAFFIC CONTROL OBLIGATIONS DURING THE PROJECT INCLUDING BUT NOT LIMITED TO SIGNS, BARRELS, DELINEATORS, TEMPORARY STRIPING AND RESOLUTION OF CONFLICTS BETWEEN EXISTING SIGNS, SIGNALS, PAVEMENT MARKINGS ETC. AND THE CONSTRUCTION TRAFFIC CONTROL ITEMS SHALL BE MADE AT THE CONTRACT LUMP SUM PRICE FOR "TRAFFIC CONTROL, MISCELLANEOUS".

A QUANTITY OF JERSEY BARRIERS WILL BE MADE AVAILABLE TO THE CONTRACTOR AT NO COST, BY THE SDOOT. BARRIERS WILL BE AVAILABLE AT THE SDOOT YARD ON EGLIN ST. THE CONTRACTOR WILL BE RESPONSIBLE FOR PICK UP, INSTALLATION, AND RETURN OF ALL BARRIERS.

IMPACT ATTENUATORS SHALL BE USED AT THE ENDS OF ALL JERSEY BARRIERS.

TRAFFIC CONTROL PLANS SHALL BE DEVELOPED AND IMPLEMENTED FOR ALL WORK IN STREET OR HIGHWAY RIGHT OF WAY, REGARDLESS OF THE NEED FOR LANE CLOSURES OR DETOURS.

CONTRACTOR IS RESPONSIBLE TO PREPARE THE PSA AND COORDINATE WITH THE ENGINEER 72 HOURS IN ADVANCE OF PROPOSED CLOSURE OR OUTAGE.

CONTRACTOR SHALL MAINTAIN ACCESS TO ALL BUSINESSES AND PRIVATE RESIDENCES DURING CONSTRUCTION.

CONSTRUCTION SIGNING AND TRAFFIC CONTROL (CONTINUED)

CONTRACTOR SHALL REDUCE THE SPEED LIMIT ON JACKSON BOULEVARD TO BE NO GREATER THAN 35 MILES PER HOUR WHEN USING JERSEY BARRIERS.

CONTRACTOR SHALL COORDINATE WITH THE CITY OF RAPID CITY PARKS DEPARTMENT TO ALLOW FOR THE USE OF THE CANYON LAKE PARK LOOP TO BE USED AS A TWO WAY STREET DURING CONSTRUCTION.

CONTRACTOR SHALL MAINTAIN TWO-BAY TRAFFIC ON CHAPEL LANE DURING CONSTRUCTION. CONTRACTOR SHALL REMOVE THE CURB AND SIDEWALK AND TEMPORARILY WIDEN THE EXISTING ROADWAY TO THE EAST AS SHOWN ON THIS SHEET. ALL WORK TO CONSTRUCT THE DETOUR, INCLUDING THE REQUIRED EXCAVATION, GRAVEL SURFACING, AND THE REMOVAL OF THE DETOUR WILL BE PAID FOR UNDER THE BID ITEM FOR "TRAFFIC CONTROL, MISCELLANEOUS." THE REMOVAL AND REPLACEMENT OF THE CONCRETE CURB AND GUTTER AND CONCRETE BIKE PATH WILL BE PAID FOR UNDER THEIR RESPECTIVE BID ITEMS.

CONTRACTOR SHALL MAINTAIN PEDESTRIAN AND BICYCLE TRAFFIC ON THE BIKE PATH THROUGHOUT CONSTRUCTION.

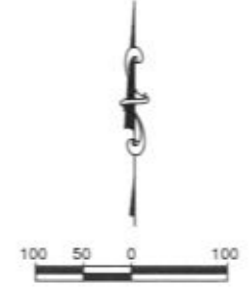
CONSTRUCTION SIGNING AND TRAFFIC CONTROL (CONTINUED)

CONTRACTOR SHALL TEMPORARILY REALIGN THE BIKE PATH AT THE INTERSECTION WITH CHAPEL LANE WITH AN ALL WEATHER GRAVEL SURFACE AS SHOWN ON THIS SHEET. ALL WORK TO CONSTRUCT THE BIKEPATH DETOUR, INCLUDING THE REQUIRED EXCAVATION, GRAVEL SURFACING, AND THE REMOVAL OF THE DETOUR WILL BE PAID FOR UNDER THE BID ITEM FOR "TRAFFIC CONTROL, MISCELLANEOUS."

CONTRACTOR SHALL CONSTRUCT A TEMPORARY ACCESS TO THE SDG&P PROPERTY AS SHOWN ON THIS SHEET. ALL COSTS ASSOCIATED WITH THE CONSTRUCTION AND REMOVAL OF THE TEMPORARY ACCESS INCLUDING REMOVAL OF THE EXISTING 18" RCP AND REGRADING OF THE DITCH SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.

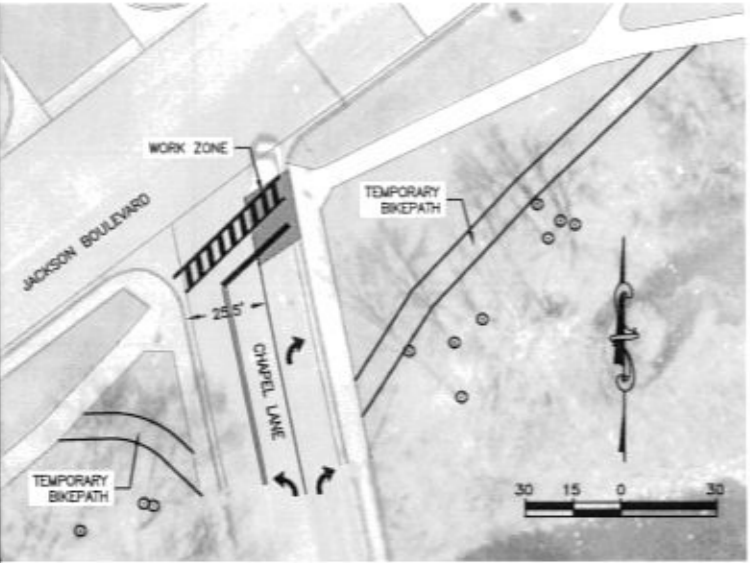
ADVANCED NOTICE SIGNS FOR CANYON LAKE PARK ACCESS SHALL READ "CANYON LAKE DRIVE" DURING PHASE 1A. THEY SHALL READ "PARK DRIVE" DURING PHASES 1C AND 2D. ADDITIONAL SIGNS DENOTING THE ACCESS POINT SHALL BE PLACED AT THE APPROPRIATE ENTRANCE.

REFER TO THE PROJECT PHASING PLAN FOR ADDITIONAL TRAFFIC AND PEDESTRIAN CONTROL TYPING INFORMATION.

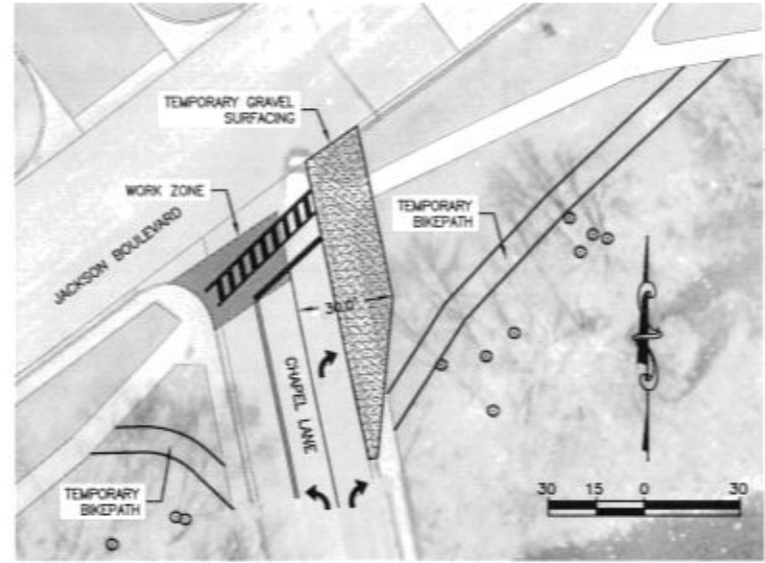


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CHAPEL LANE PHASE 1



CHAPEL LANE PHASE 2



PLACE SIGN AT THE INTERSECTION OF HIGHWAY 44 AND HIGHWAY 385:
WIDTH RESTRICTION-11 FEET
13.5 MILES AHEAD. CONSIDER ALTERNATE ROUTE.



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Scale:	AS SHOWN
Designed By:	RLM
Drawn By:	DRS
Design Date:	SEPT 2008
Print Date:	10-8-08
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Surveyed By:	SLAUBJ
Survey Date:	FEB 2008
Revisions:	

JACKSON SPRINGS WATER TRANSMISSION MAINS

Sheet Title: TRAFFIC CONTROL WEST

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 Design Date: SEPT 2009
 Internal Job No: J08-133
 Drawn By: DRS
 Print Date: 10-8-09
 Survey Date: FEB 2009

JACKSON SPRINGS WATER TRANSMISSION MAINS

WTP09-1036

Sheet Title: TRAFFIC CONTROL EAST





Burns & McDonnell
SINCE 1898

FEC
Farber Engineering
Company, Inc.

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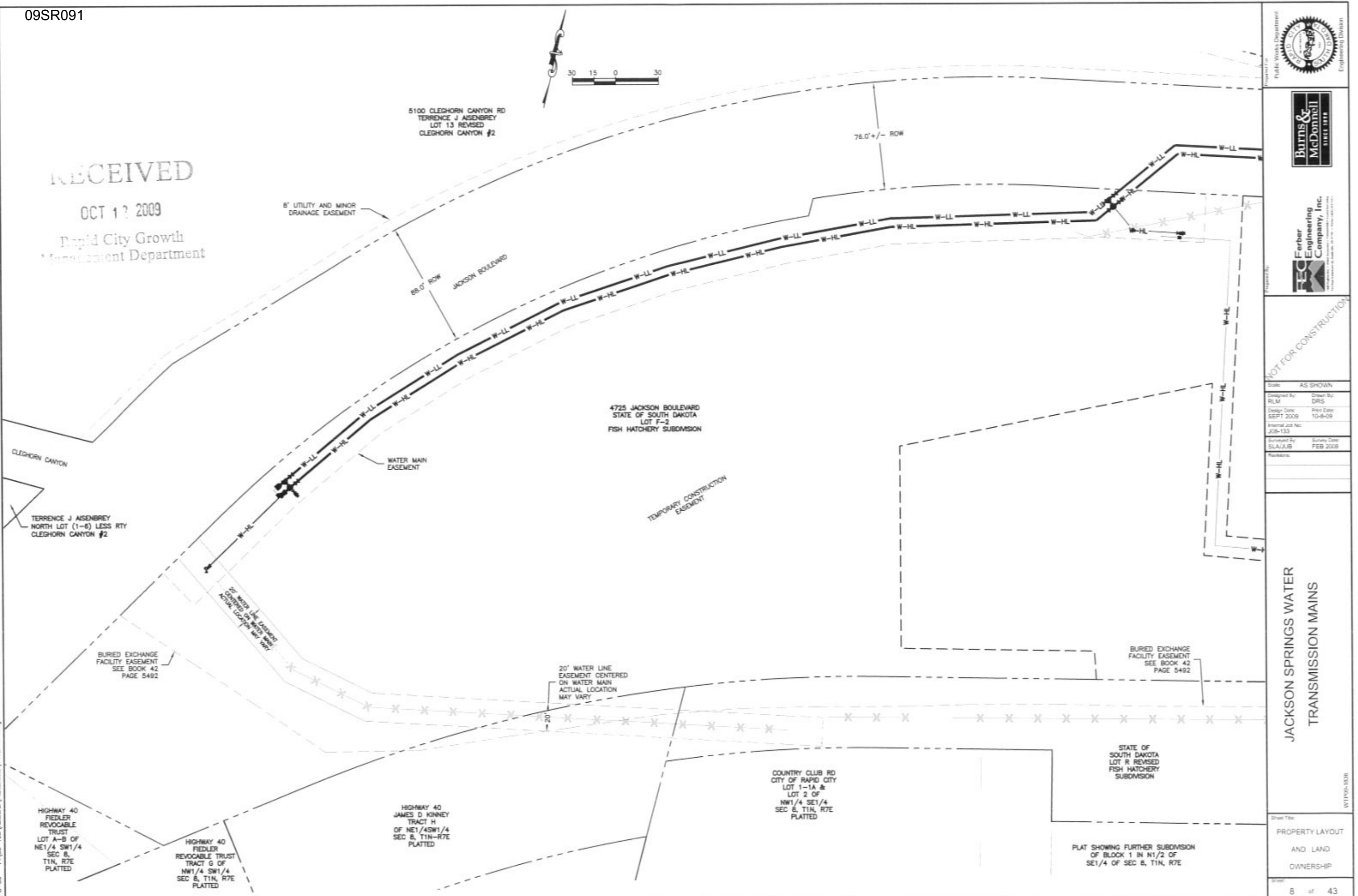
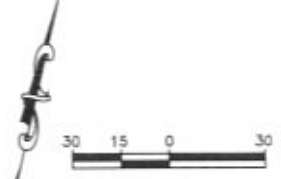
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Designed By:	RLM	Drawn By:	DRS		
Design Date:	SEPT 2009	Plan Date:	10-8-09		
Internal Job No.:	J08-133	Surveyed By:	BLAUB	Survey Date:	FEB 2008
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JACKSON SPRINGS WATER
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Sheet Title:	PROPERTY LAYOUT AND LAND OWNERSHIP
Scale:	8 of 43

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8' UTILITY AND MINOR DRAINAGE EASEMENT

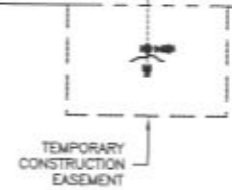
5100 CLEGHORN CANYON RD
TERRENCE J AISENBREY
LOT 13 REVISED
CLEGHORN CANYON #2

ROBIN L PATTERSON
LOT 3 (INCLUDING FEATHER RIDGE CT
A PRIVATE EASEMENT)
VISTA LAKE SUB #2



JACKSON BOULEVARD

75.5' +/- ROW



TEMPORARY CONSTRUCTION EASEMENT



4725 JACKSON BOULEVARD
STATE OF SOUTH DAKOTA
LOT F-2
FISH HATCHERY SUBDIVISION



TEMPORARY CONSTRUCTION EASEMENT

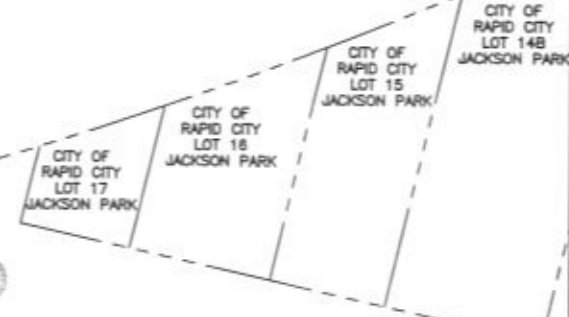
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JACKSON SPRINGS WATER
TRANSMISSION MAINS



STATE OF SOUTH DAKOTA
LOT R REVISED
FISH HATCHERY
SUBDIVISION



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PLAT SHOWING FURTHER SUBDIVISION
OF BLOCK 1 IN N1/2 OF
SE1/4 OF SEC 8, T1N, R7E

4802 GUEST
RODARD M LUTZ
W50' OF LOT 9
JACKSON PARK

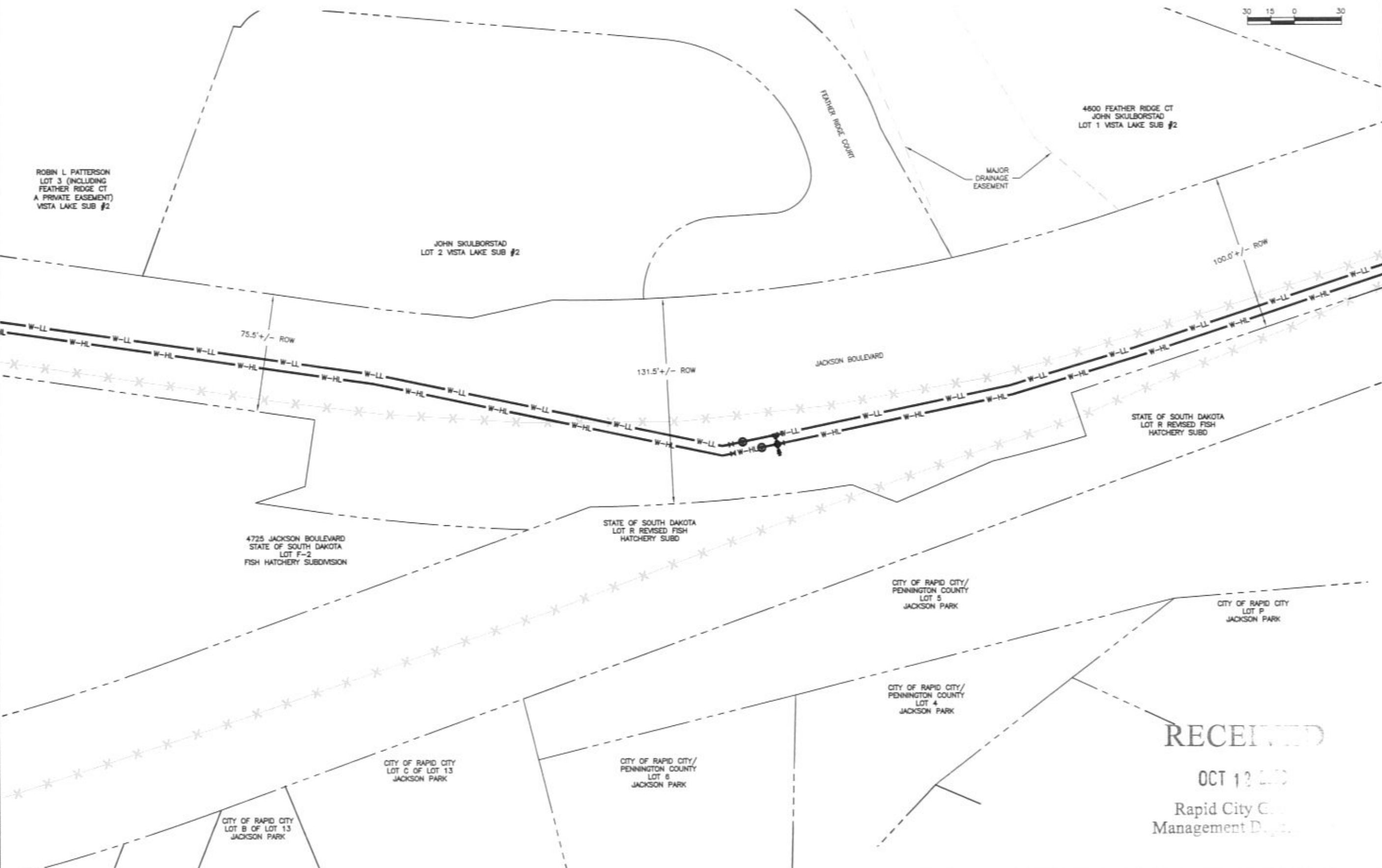
4720 GUEST RD
BONNIE
HOOD-WEAVER
TRUSTEE
E50' OF LOT 9
JACKSON PARK

SHORE DRIVE 40.0' ROW

Sheet Title:	PROPERTY LAYOUT AND LAND OWNERSHIP
Sheet:	9 of 43

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10-8-09

WTP09-1036



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Sheet:	10 of 43
Drawn Title:	PROPERTY LAYOUT AND LAND OWNERSHIP

F:\08-133\AutoCAD\PlanSheets\14729909.dwg

4500 JACKSON BLVD
CHURCH OF THE BLESSED SACRAMENT RC
TRACT A LESS LOT 1 OF TRACT A OF
SEC 9, T1N, R7E,
PLATTED



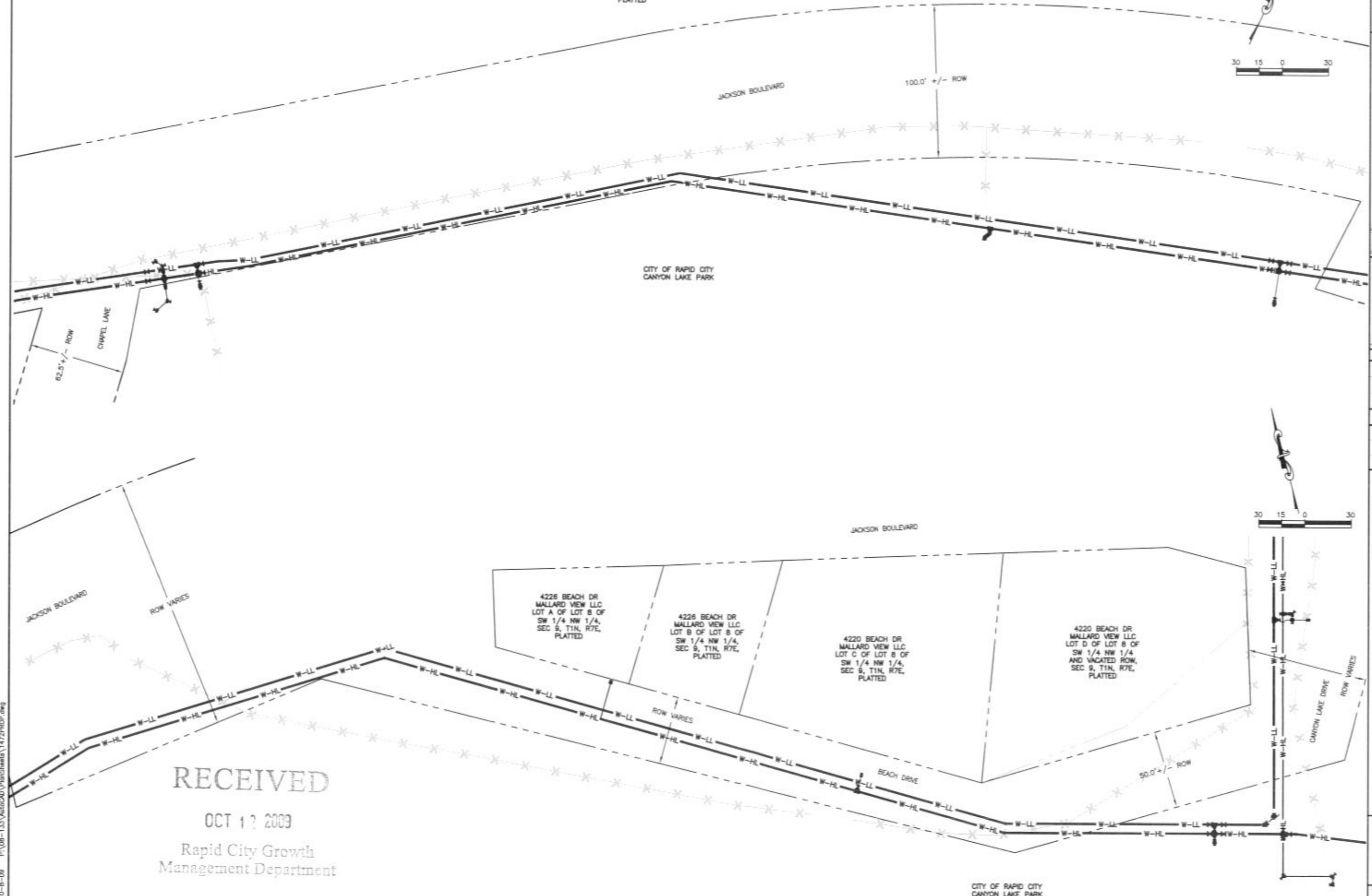
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TRANSMISSION MAINS

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CITY OF RAPID CITY
CANYON LAKE PARK

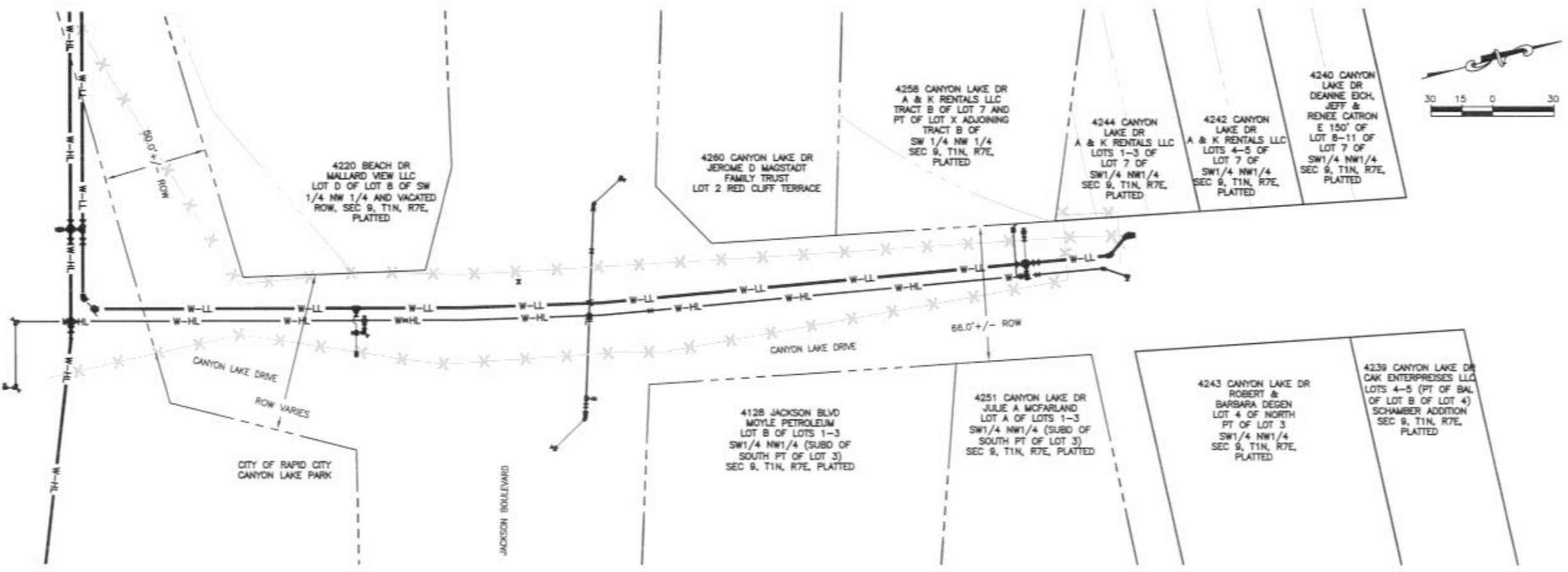
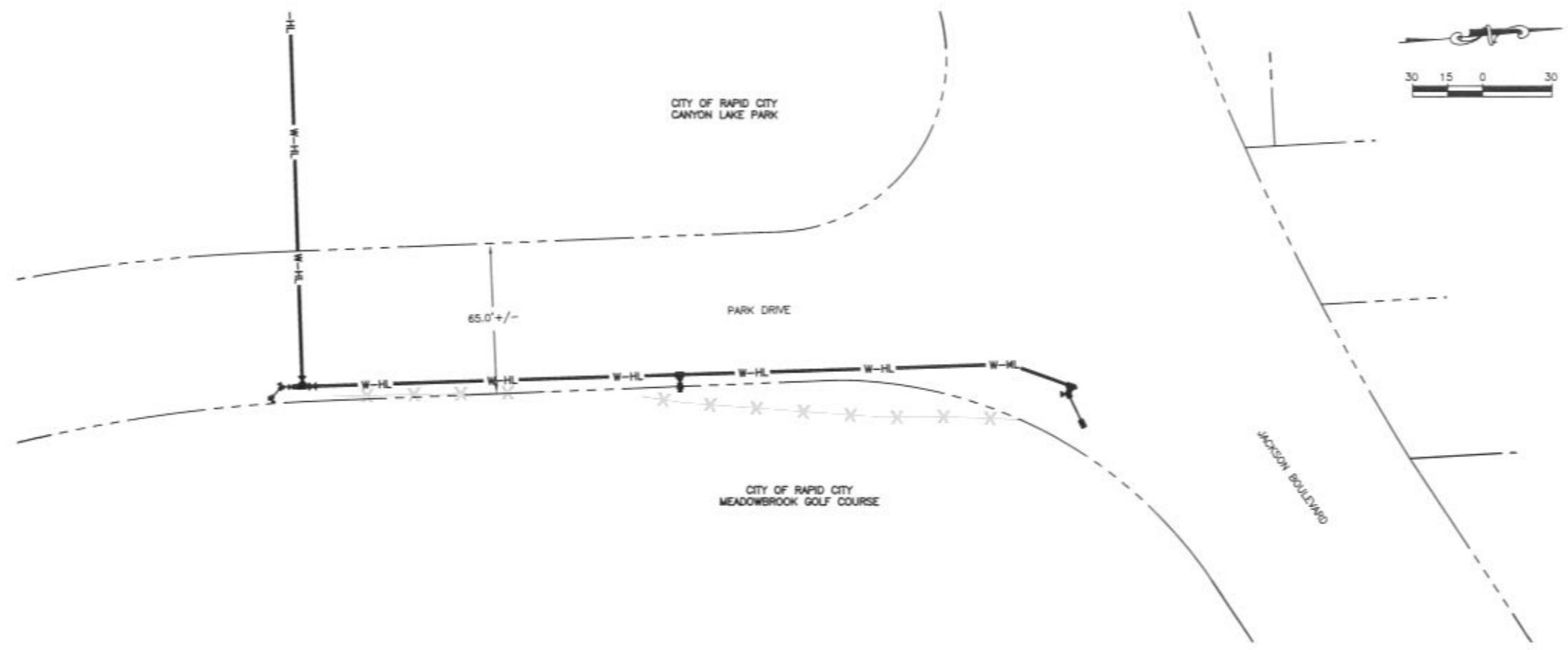
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Design Date:	10-6-09
Issue Date:	SEPT 2009
Internal Job No.:	J08-133
Reviewed By:	SLA/LJS
Review Date:	FEB 2009
Revisions:	

JACKSON SPRINGS WATER
TRANSMISSION MAINS

VT0905-1030

Sheet Title:
PROPERTY LAYOUT
AND LAND
OWNERSHIP



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JACKSON BOULEVARD ALIGNMENT

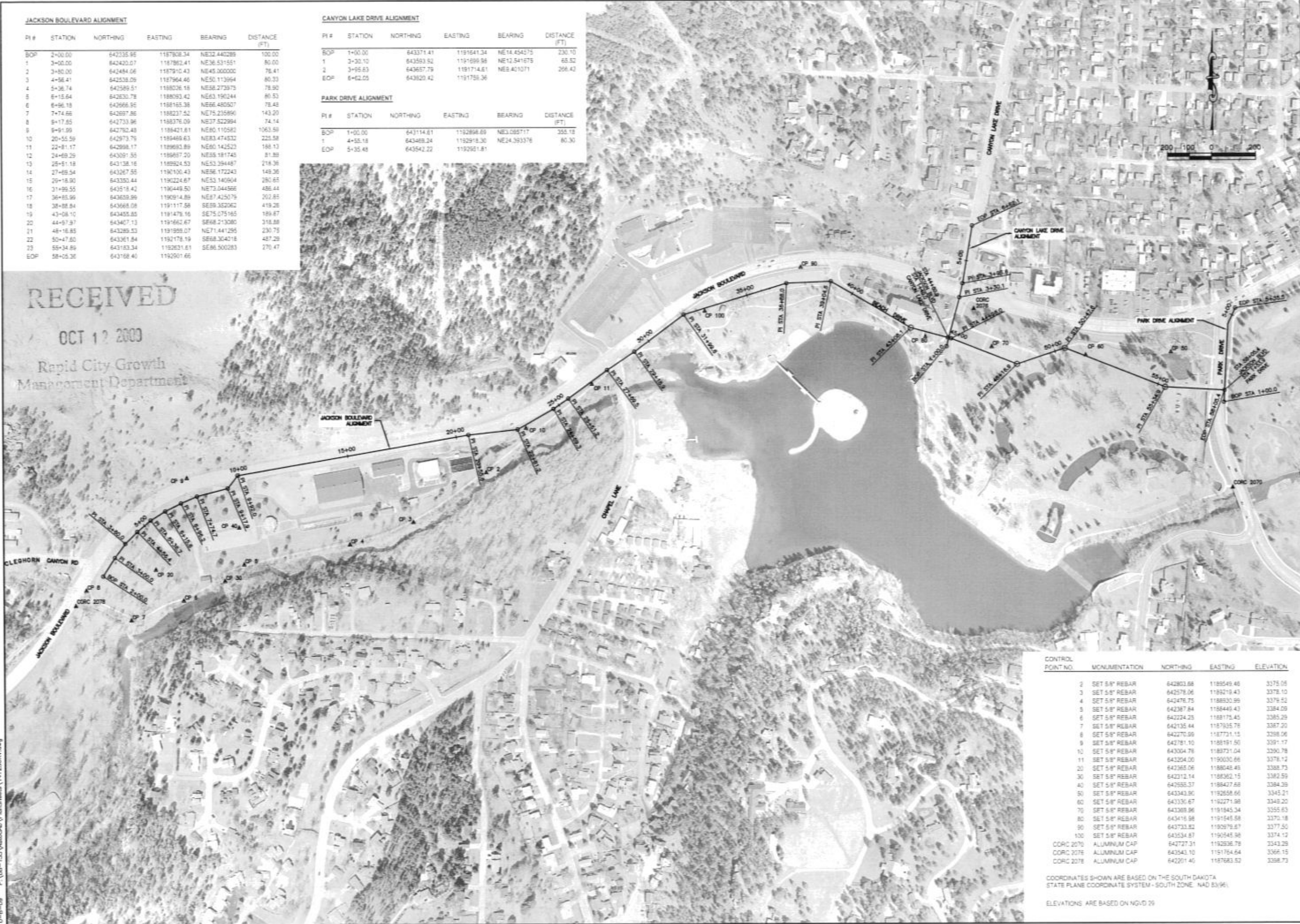
PI #	STATION	NORTHING	EASTING	BEARING	DISTANCE (FT)
BOP	2+00.00	642335.95	1187808.34	NE32.440289	100.00
1	3+00.00	642420.07	1187862.41	NE36.531551	80.00
2	3+80.00	642484.06	1187910.43	NE45.000000	78.41
3	4+58.41	642538.09	1187964.46	NE50.113964	80.33
4	5+38.74	642599.51	1188026.18	NE58.273973	78.90
5	6+15.64	642630.78	1188093.42	NE63.190244	80.53
6	6+96.18	642666.95	1188165.38	NE66.480507	78.48
7	7+74.66	642697.86	1188237.52	NE75.235890	143.20
8	8+17.85	642733.96	1188376.09	NE37.522984	74.14
9	8+91.99	642792.48	1188421.81	NE80.110582	1063.59
10	20+55.59	642973.79	1188469.63	NE83.474532	225.58
11	22+81.17	642998.17	1188693.89	NE80.142523	188.13
12	24+69.29	643091.55	1188987.20	NE85.181748	81.88
13	25+51.18	643128.16	1188924.52	NE52.394487	218.36
14	27+69.54	643267.55	1190100.43	NE86.172243	149.26
15	29+18.90	643393.44	1190224.67	NE53.140904	280.65
16	31+99.55	643518.42	1190449.50	NE73.044566	486.44
17	36+85.99	643639.96	1190914.89	NE87.425079	202.85
18	38+88.84	643688.08	1191117.58	SE89.352062	419.26
19	43+08.10	643455.85	1191476.16	SE75.075165	189.87
20	44+57.97	643407.13	1191662.67	SE68.213080	318.86
21	46+16.85	643285.53	1191995.07	NE71.441295	230.75
22	50+47.60	643361.84	1192178.19	SE68.304018	487.29
23	55+34.89	643183.34	1192631.81	SE86.500283	270.47
EOP	58+05.36	643168.40	1192901.66		

CANYON LAKE DRIVE ALIGNMENT

PI #	STATION	NORTHING	EASTING	BEARING	DISTANCE (FT)
BOP	1+00.00	643371.41	1191641.34	NE14.454575	230.10
1	3+30.10	643593.52	1191699.98	NE12.541675	68.52
2	3+95.63	643657.79	1191714.61	NE8.401071	266.42
EOP	6+62.05	643820.42	1191758.36		

PARK DRIVE ALIGNMENT

PI #	STATION	NORTHING	EASTING	BEARING	DISTANCE (FT)
BOP	1+00.00	643114.61	1192898.69	NE3.085717	358.18
1	4+55.18	643488.24	1192918.30	NE34.393376	80.30
EOP	5+35.48	643542.22	1192951.81		



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CONTROL POINT NO.	MONUMENTATION	NORTHING	EASTING	ELEVATION
2	SET 5" REBAR	642803.88	1188549.46	3375.05
3	SET 5" REBAR	642578.06	1188219.43	3378.10
4	SET 5" REBAR	642476.75	1188530.99	3379.52
5	SET 5" REBAR	642387.84	1188449.43	3384.09
6	SET 5" REBAR	642224.25	1188175.45	3385.29
7	SET 5" REBAR	642135.44	1187935.78	3387.20
8	SET 5" REBAR	642270.99	1187731.15	3398.06
9	SET 5" REBAR	642181.10	1188181.50	3391.17
10	SET 5" REBAR	643004.78	1189731.04	3390.78
11	SET 5" REBAR	643204.00	1190030.66	3378.12
20	SET 5" REBAR	642365.06	1188048.48	3388.73
30	SET 5" REBAR	642312.14	1188362.15	3382.59
40	SET 5" REBAR	642655.37	1188427.68	3384.39
50	SET 5" REBAR	643343.90	1192558.66	3345.21
60	SET 5" REBAR	643330.67	1192271.98	3348.20
70	SET 5" REBAR	643389.96	1191845.34	3355.83
80	SET 5" REBAR	643416.98	1191545.58	3370.18
90	SET 5" REBAR	643733.82	1192979.67	3377.50
100	SET 5" REBAR	643534.87	1192545.98	3374.12
CORC 2070	ALUMINUM CAP	642727.31	1192936.78	3343.29
CORC 2076	ALUMINUM CAP	642543.10	1191764.64	3366.15
CORC 2078	ALUMINUM CAP	642201.40	1187683.52	3398.73

COORDINATES SHOWN ARE BASED ON THE SOUTH DAKOTA STATE PLANE COORDINATE SYSTEM - SOUTH ZONE, NAD 83 (96).
 ELEVATIONS ARE BASED ON NGVD 29

Project No: 09SR091

Drawn By: WJPH/10/26

Scale: AS SHOWN

Designed By: RLM Drawn By: DRS

Design Date: SEPT 2009 Field Date: 10-8-09

Internal Job No: J08-133

Surveyed By: SLA/AB Survey Date: FEB 2008

Revisions:

JACKSON SPRINGS WATER TRANSMISSION MAINS

HORIZONTAL ALIGNMENT AND SURVEY CONTROL SHEET

14 of 43

- 1) PROJECT DESCRIPTION:
THIS PROJECT CONSISTS OF THE CONSTRUCTION OF APPROXIMATELY 11,000 FEET OF 20" STEEL AND 500 FEET OF RESTRAINED JOINT PVC WATER MAIN AND APPURTENANCES. EXISTING WATER INFRASTRUCTURE TO BE ABANDONED INCLUDES A SPRING BOX AND 18", 20", AND 24" WATER MAINS.
- 2) EXISTING SITE CONDITIONS:
SITE CONDITIONS VARY BETWEEN PARK LAND, PAVED STREETS, AND PARKING LOTS. EXISTING TOPOGRAPHY SLOPES VARY FROM 50%:1V TO 4%:1V. PROJECT IS CONTAINED ENTIRELY WITHIN THE RAPID CREEK WATERSHED.
- 3) WETLANDS:
ARE WETLANDS AN ISSUE? NO. DO ANY OTHER JURISDICTIONAL AUTHORITIES (SHPO OR OFP) NEED TO REVIEW THESE PLANS? NO.
- 4) ADJACENT AREAS:
THE PROJECT IS PRIMARILY ADJACENT TO JACKSON BOULEVARD. WORK WILL TAKE PLACE NEAR RAPID CREEK IN SEVERAL LOCATIONS AS INDICATED IN THIS PLAN.
- 5) SOILS:
PREDOMINANT SOILS ARE ALLUVIUM AND LEAN CLAY.
- 6) AREA AND VOLUME:
DISTURBED AREA IS APPROXIMATELY 9.6 ACRES.
- 7) EROSION AND SEDIMENT CONTROL MEASURES:
THE EROSION CONTROL PLAN SHOWS THE TYPE AND LOCATION OF THE EROSION AND SEDIMENT CONTROL MEASURES FOR THE PROJECT.
- 8) AREA FOR STOCKPILES AND STORAGE:
TOPSOIL STOCKPILES/BERMS SHALL BE PLACED AS SHOWN ON THIS EROSION CONTROL PLAN. EROSION CONTROL MEASURES SHALL BE IMPLEMENTED AROUND THE TOPSOIL STOCKPILES/BERMS.
- 9) SOIL SURFACE STABILIZATION PRACTICES:
AFTER CONSTRUCTION BEGINS, SOIL SURFACE STABILIZATION SHALL BE APPLIED WITHIN 14 DAYS TO ALL DISTURBED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR PERIODS LONGER THAN AN ADDITIONAL 21 CALENDAR DAYS. WITHIN 14 DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE, PERMANENT OR TEMPORARY SOIL SURFACE STABILIZATION SHALL BE APPLIED TO DISTURBED AREAS AND SOIL STOCKPILES.
- 10) PERMANENT STABILIZATION MEASURES:
SEDIMENT CONTROL WATTLES OR HIGH FLOW SILT FENCE WILL BE UTILIZED TO PREVENT RUN-OFF STORMWATER FROM LEAVING THE CONSTRUCTION SITE. ALL EXISTING AND CONSTRUCTED DRAINAGE FACILITIES WILL BE PROPERLY PROTECTED DURING CONSTRUCTION.

SILT FENCE SHALL NOT BE USED IN THE 100-YEAR FLOODWAY.

- 11) STORM WATER MANAGEMENT CONSIDERATIONS:
STORM WATER COMING OFF THE SITE WILL BE DIRECTED TO EXISTING DRAINAGES AND WILL BE FILTERED THROUGH SEDIMENT CONTROL TUBES OR SILT FENCE PRIOR TO LEAVING THE SITE.
- 12) MAINTENANCE:
INSPECTION OF EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE SCHEDULED WEEKLY AND FOLLOWING ANY STORM EVENT OF 1/2 INCH OR GREATER. ALL MEASURES SHALL BE MAINTAINED IN GOOD WORKING ORDER. INSPECTION AND MAINTENANCE PROCEDURES SHALL CONTINUE UNTIL THE DISTURBED AREAS ACHIEVE FINAL STABILIZATION. ANY ACCUMULATED SEDIMENT SHALL BE REMOVED TO MAINTAIN STORAGE CAPACITY.
- 13) SPILL CONTROL PRACTICES:
CHEMICAL AND PETROLEUM PRODUCT SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY.
- 14) SPILL PREVENTION:
 - A) REGULARLY PICKUP AND DISPOSE OF GARBAGE AND WASTE MATERIAL.
 - B) ONSITE CONSTRUCTION EQUIPMENT SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE.
 - C) ROUTINELY INSPECT EQUIPMENT AND PROCESSES FOR LEAKS OR CONDITIONS THAT COULD LEAD TO DISCHARGES OF CHEMICALS OR CONTACT OF STORM WATER WITH RAW MATERIALS, INTERMEDIATE MATERIALS, WASTE MATERIALS, OR PRODUCTS USED ON SITE.
 - D) ASSURE ALL SPILL CLEAN UP PROCEDURES ARE UNDERSTOOD BY EMPLOYEES. TRAINING EMPLOYEES ON PROPER CLEAN UP PROCEDURES SHALL BE IMPLEMENTED.
 - E) DESIGNATE SEPARATE AREAS OF THE SITE FOR AUTO PARKING, VEHICLE REFUELING, AND ROUTINE MAINTENANCE.
 - F) CLEAN UP LEAKS, DRIPS, AND OTHER SPILLS IMMEDIATELY.
 - G) COVER AND MAINTAIN DUMPSTERS AND WASTE RECEPTACLES.
 - H) STORE CONTAINERS, DRUMS, AND BAGS AWAY FROM DIRECT TRAFFIC ROUTES TO PREVENT ACCIDENTAL SPILLS.
 - I) STACK CONTAINERS ACCORDING TO MANUFACTURER'S INSTRUCTIONS TO AVOID DAMAGING THE CONTAINERS FROM IMPROPER WEIGHT DISTRIBUTION.
 - J) STORE CONTAINERS ON PALLETS OR SIMILAR DEVICES TO PREVENT CORROSION OF CONTAINERS THAT RESULTS FROM CONTAINERS COMING IN CONTACT WITH MOISTURE ON THE GROUND.
 - K) STORE TOXIC OR HAZARDOUS LIQUIDS WITHIN CURBED AREAS OR SECONDARY CONTAINERS.
 - L) ASSIGN RESPONSIBILITY OF HAZARDOUS MATERIAL INVENTORY TO A LIMITED NUMBER OF PEOPLE WHO ARE TRAINED TO HANDLE SUCH MATERIALS. IN THE EVENT OF SPILLS OF ANY DANGEROUS OR HAZARDOUS MATERIAL, NOTIFY THE CITY OF RAPID CITY PUBLIC WORKS DEPARTMENT.
- 16) THE FOLLOWING PREVENTATIVE STRATEGIES ARE RECOMMENDED WHERE TOXIC OR HAZARDOUS FLUIDS ARE COMMONLY PRESENT:

- A) IDENTIFY ALL EQUIPMENT THAT MAY BE EXPOSED TO STORM WATER, POLLUTANTS THAT MAY BE GENERATED AND POSSIBLE SOURCES OF LEAKS OR DISCHARGES
 - B) PERFORM REGULAR MAINTENANCE OF EACH PIECE OF EQUIPMENT TO CHECK FOR PROPER OPERATION, LEAKS, MALFUNCTIONS, AND EVIDENCE OF LEAKS OR DISCHARGE (STAINS). DEVELOP A PROCEDURE FOR SPILL REPORTING, CLEAN UP AND REPAIR.
 - C) DRAIN OR REPLACE MOTOR OIL OR OTHER AUTOMOTIVE FLUIDS IN AN AREA AWAY FROM STREAMS, STORM, OR SANITARY SEWER INLETS. COLLECT SPENT FLUIDS AND RECYCLE OR DISPOSE OF THEM PROPERLY.
 - D) IN FUELING AREAS, CLEAN UP SPILLS WITH DRY CLEAN UP METHODS (ABSORBENTS).
 - E) MAKE SURE EMPLOYEES ARE TRAINED IN SPILL PREVENTION PRACTICES AND ADHERE TO THEM.
- 17) SITE PLAN:
THE EROSION CONTROL PLAN SHOWS THE EROSION CONTROL DEVICES TO BE INSTALLED. THESE ITEMS SHALL BE INSTALLED AS PER CITY OF RAPID CITY STANDARD DETAILS AND SPECIFICATIONS.
 - 18) NOTICE OF INTENT (PERMIT NO. _____):
CONTRACTOR IS RESPONSIBLE FOR FILING A NOTICE OF INTENT (NOI) WITH THE SURFACE WATER DISCHARGE PROGRAM OF THE SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (DENR). THE PRIMARY RESPONSIBLE PARTY IS REQUIRED TO FILE A NOTICE OF TERMINATION WITH DENR WHEN THE SITE HAS REACHED FINAL STABILIZATION.

OWNER'S CERTIFICATION

THIS EROSION AND SEDIMENT CONTROL PLAN NARRATIVE AND EROSION AND SEDIMENT CONTROL PLAN APPEARS TO FULFILL THE TECHNICAL CRITERIA AND THE CRITERIA FOR EROSION CONTROL AND THE REQUIREMENTS FOR THE CITY OF RAPID CITY. I UNDERSTAND THAT ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES MAY BE NEEDED IF UNFORESEEN EROSION PROBLEMS OCCUR OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS PLAN SHALL RUN WITH THE LAND AND BE THE OBLIGATION OF THE RESPONSIBLE PARTY UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED.

CITY OF RAPID CITY (OWNER) _____ DATE _____

(GENERAL CONTRACTOR) _____ DATE _____

EROSION AND SEDIMENT CONTROL NOTES:

SEDIMENT CONTROL LOG IS DEFINED AS ANY TUBULAR SEDIMENT CONTROL DEVICE, INCLUDING BUT NOT LIMITED TO, WATTLES, MULCH-FILLED FILTER SOCK, ETC.

THE MINIMUM LOCATIONS FOR POLLUTION CONTROL DEVICES ARE SPECIFIED ON THIS PLAN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN EROSION AND POLLUTION CONTROL THROUGHOUT THE PROJECT. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE ANY ADDITIONAL DEVICES AND LOCATIONS NECESSARY FOR POLLUTION CONTROL IN ACCORDANCE WITH THE SDOENR REGULATIONS.

STANDARD DETAILS FOR EROSION CONTROL ITEMS ARE INCLUDED FOR INFORMATIONAL PURPOSES.

WORK WILL TAKE PLACE IN SEVERAL LOCATIONS NEAR RAPID CREEK AND CANYON LAKE. ALLUVIUM DEPOSITS AND GROUNDWATER SURFACE ELEVATIONS ARE EXPECTED TO GENERATE SIGNIFICANT VOLUMES OF GROUNDWATER INFILTRATION. ALL PUMPED GROUNDWATER SHALL BE FILTERED THROUGH EROSION AND SEDIMENT CONTROL WATTLES AS SHOWN IN THE DETAILS. IF THE ENGINEER DETERMINES ADDITIONAL GROUNDWATER TREATMENT IS NECESSARY, THE CONTRACTOR SHALL CAPTURE, TREAT (CLARIFICATION, FLOCCULATION, ETC.), AND DISCHARGE GROUNDWATER. ADDITIONAL TREATMENT WILL BE PAID FOR UNDER THE LINE ITEM "ENHANCED GROUNDWATER TREATMENT".

FLUSHING AND DISINFECTION OF NEW MAINS SHALL BE PERFORMED IN A MANNER TO ENSURE ALL SEDIMENT IS CAPTURED AND ALL CHLORINE IS NEUTRALIZED. SEE SPECIAL DETAILS FOR ADDITIONAL FLUSHING AND DECHLORINATION INFORMATION.

EXISTING WATER MAIN ABANDONMENT LOCATIONS ARE SHOWN ON THIS PLAN. WORK IN THESE AREAS VARIES AND SPECIFIC EROSION AND SEDIMENT CONTROL MEASURES ARE NOT SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH THE INTENT OF THIS PLAN IN THESE TEMPORARY WORK AREAS. APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL SURFACES ARE RESTORED TO THEIR ORIGINAL CONDITION.

A STABILIZED CONSTRUCTION ENTRANCE SHALL BE INSTALLED IF DEMOLITION AND GRADING SEQUENCING WILL RESULT IN THE POTENTIAL FOR MATERIAL TO BE "TRACKED" ON TO THE SURROUNDING STREETS.

THE EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL THE SITE IS SURFACED AND VEGETATION IS ESTABLISHED.

THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AN "EROSION & SEDIMENT CONTROL PERMIT" FROM THE CITY OF RAPID CITY AS REQUIRED BY THE CITY ORDINANCE.

THE CONTRACTOR IS ADVISED THAT SEVERAL AGENCIES HAVE THE AUTHORITY TO "STOP WORK" IF THE POLLUTION AND SEDIMENT PREVENTION CONTROL IS NOT IMPLEMENTED OR IS NOT EFFECTIVE IN THE PREVENTION OF ENVIRONMENTAL DAMAGE FROM CONSTRUCTION ACTIVITIES. NO COMPENSATION WILL BE FORTHCOMING FOR "TIME LOST" DUE TO A "STOP WORK" ORDER.

LEGEND

- SEDIMENT CONTROL LOG
- ~ TRIANGULAR SILT DIKE
- ABANDONMENT LOCATION
- INLET PROTECTION
- STOCKPILE WITH SILT FENCE



NOT FOR CONSTRUCTION

Scale:	AS SHOWN
Designed By:	RLM
Drawn By:	DRS
Design Date:	SEPT 2008
Print Date:	10-8-08
Internal Job No.:	J08-133
Submitted By:	SLAJUB
Survey Date:	FEB 2008

RECEIVED
OCT 12 2008
City Growth
Department

JACKSON SPRINGS WATER
TRANSMISSION MAINS

Sheet Title
EROSION AND SEDIMENT
CONTROL PLAN WEST



Prepared For:
 Public Works Department

 Engineering Division

Burns & McDonnell
 SINCE 1918

Engineered By:

FEC Ferber Engineering Company, Inc.
 1000 W. 10th Street, Suite 200, Rapid City, SD 57701
 Phone: 605.261.1111

NOT FOR CONSTRUCTION

Scale:	AS SHOWN		
Designed By:	RJM	Drawn By:	DRS
Design Date:	SEPT 2009	Print Date:	10-8-09
Internal Job No.:	J08-133		
Surveyed By:	SLA/JUB	Survey Date:	FEB 2009
Revisions:			

**JACKSON SPRINGS WATER
 TRANSMISSION MAINS**

Sheet Title:
**EROSION AND SEDIMENT
 CONTROL PLAN EAST**

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 Rapid City Growth
 Management Department

HIGH LEVEL WATER MAIN NOTES

STA 2+23.8 - 2.0' RT INSTALL 8" 90 DEG BEND, TIE TO EXISTING 8" AC WATER MAIN.

STA 2+26.2 - 2.0' RT INSTALL 10" X 8" REDUCER.

STA 2+26.2 - 2.0' RT TO STA 2+99.8 - 3.0' RT INSTALL 76 LF - 10" PVC WATER MAIN.

STA 3+00.0 - 3.0' RT INSTALL 20" X 10" REDUCER AND FLANGED COUPLING ADAPTER.

STA 3+00.0 - 3.0' RT TO STA 3+03.1 - 3.0' RT INSTALL 3.0 LF - 20" STEEL WATER MAIN.

STA 3+03.1 - 3.0' RT INSTALL 20" GATE VALVE.

STA 3+03.1 - 3.0' RT TO STA 3+06.1 - 3.0' RT INSTALL 3.0 LF - 20" STEEL WATER MAIN.

STA 3+06.1 - 3.0' LT TO STA 3+06.1 - 0.0' LT INSTALL 3.0 LF - 16" STEEL WATER MAIN.

STA 3+06.1 - 3.0' RT INSTALL 20" X 20" X 16" X 6" CROSS.

STA 3+06.1 - 0.0' LT INSTALL 16" GATE VALVE.

STA 3+06.1 - 0.0' LT TO STA 3+06.1 - 3.0' RT INSTALL 3.0 LF - 16" STEEL WATER MAIN.

STA 3+06.1 - 3.0' RT TO STA 3+06.2 - 9.0' RT INSTALL 6 LF - 6" PVC WATER MAIN.

STA 3+06.2 - 9.0' RT INSTALL FIRE HYDRANT WITH AUXILIARY VALVE.

STA 3+06.1 - 3.0' RT TO STA 3+12.1 - 3.0' RT INSTALL 6.0 LF - 20" STEEL WATER MAIN.

STA 3+12.1 - 3.0' RT INSTALL 20" GATE VALVE.

STA 3+12.1 - 3.0' RT TO STA 3+80.0 - 3.0' RT INSTALL 67.7 LF - 20" STEEL WATER MAIN.

STA 3+80.0 - 3.0' RT 20" STEEL DEFLECTION.

LOW LEVEL WATER MAIN NOTES

STA 3+00.0 - 3.1' LT INSTALL TEMPORARY BYPASS.

STA 3+00.0 - 3.1' LT TO STA 3+03.1 - 3.0' LT INSTALL 3.2 LF - 20" STEEL WATER MAIN.

STA 3+03.1 - 3.0' LT INSTALL 20" GATE VALVE.

STA 3+03.1 - 3.0' LT TO STA 3+06.1 - 3.0' LT INSTALL 3.0 LF - 20" STEEL WATER MAIN.

STA 3+06.1 - 3.0' LT INSTALL 20" X 20" X 16" TEE.

STA 3+06.1 - 3.0' LT TO STA 3+12.1 - 3.0' LT INSTALL 6.0 LF - 20" STEEL WATER MAIN.

STA 3+12.1 - 3.0' LT INSTALL 20" GATE VALVE.

STA 3+12.1 - 3.0' LT TO STA 3+80.0 - 3.0' LT INSTALL 68.1 LF - 20" STEEL WATER MAIN.

STA 3+80.0 - 3.0' LT 20" STEEL DEFLECTION.

REMOVE AND REPLACE FENCE WITH CONCRETE BASE

STA 1+06.7 - 0.0' RT TO STA 9+87.2 - 135.4' RBM LF

REMOVE AND REPLACE FENCE TOTALS: 896 LF

CLEAR AND GRUB 8" CONIFEROUS TREE

STA 2+74.4 - 17.2 RT 1 EA

CLEAR AND GRUB TREE TOTALS: 1 EA

TABLE OF THRUST BLOCKS

STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SQ FT)	MINIMUM CONCRETE VOL (CY)
2+23.8	R	8" 90 DEG BEND	17.4	0.49
3+06.1	R	6" FIRE HYDRANT	10.2	0.29

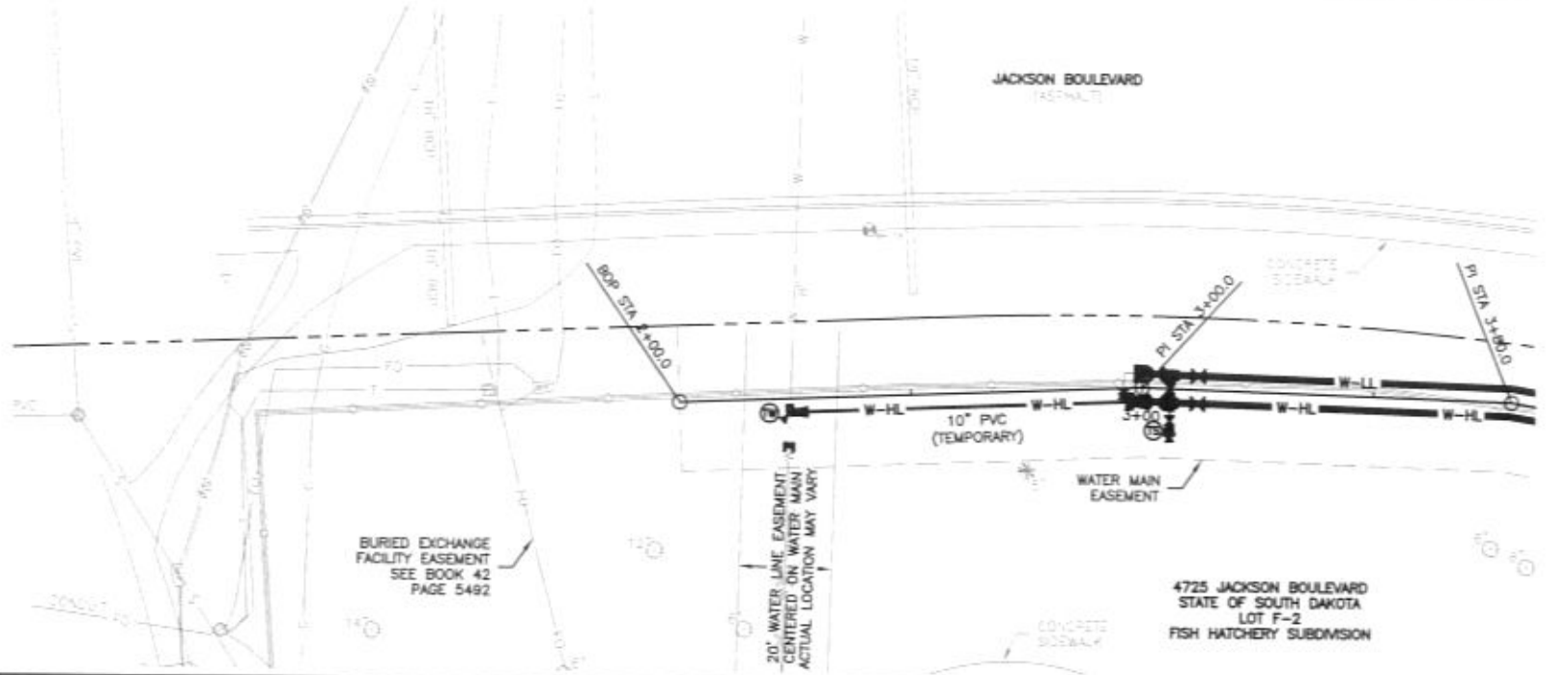
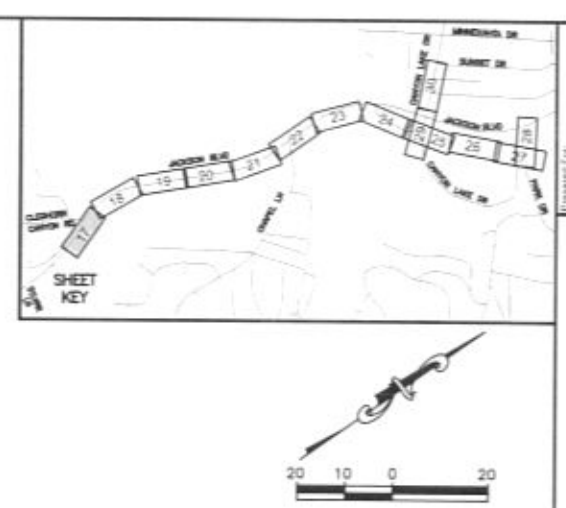
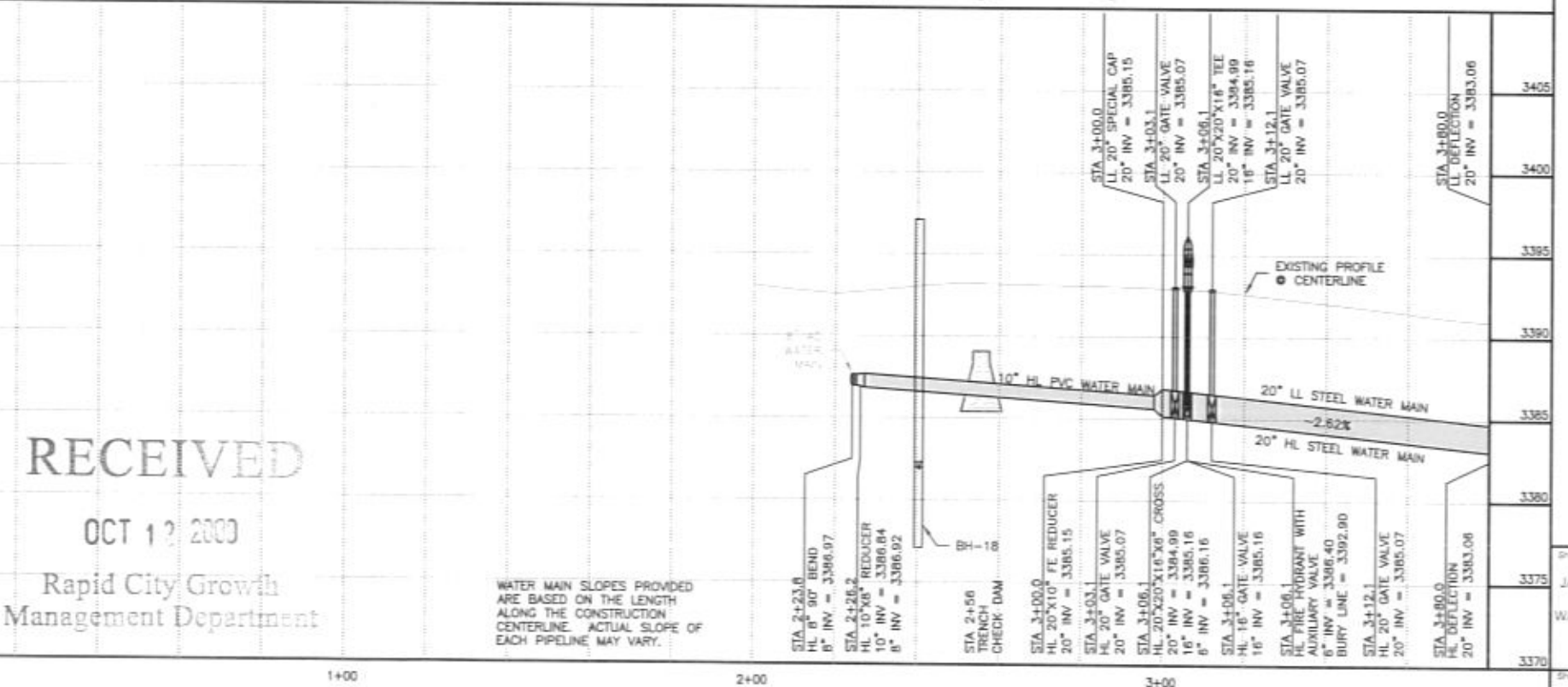


TABLE OF 20" STEEL DEFLECTIONS - LOW LEVEL

STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
3+00.0	L	642421.78	1187958.89	0	0
3+80.0	L	642486.03	1187908.15	8.112	0

TABLE OF 20" STEEL DEFLECTIONS - HIGH LEVEL

STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
3+00.0	R	642418.36	1187954.89	0	0
3+80.0	R	642482.09	1187912.79	8.112	0



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WATER MAIN SLOPES PROVIDED ARE BASED ON THE LENGTH ALONG THE CONSTRUCTION CENTERLINE. ACTUAL SLOPE OF EACH PIPELINE MAY VARY.

Public Works Department
Engineering Division

Burns & McDonnell
SINCE 1899

Ferber Engineering Company, Inc.
SINCE 1919

NOT FOR CONSTRUCTION

Scale: AS SHOWN

Designed By: RLM
Drawn By: DRB

Design Date: SEPT 2008
Print Date: 10-8-09

Internal Job No: J08-133

Surveyed By: SLAUB
Survey Date: FEB 2008

Revisions:

JACKSON SPRINGS WATER TRANSMISSION MAINS

WTP08-103H

Draw Title: JACKSON BOULEVARD WATER PLAN & PROFILE

Sheet: 17 of 43

HIGH LEVEL WATER MAIN NOTES

- STA 3+80.0 - 3.0' RT TO STA 4+56.3 - 3.0' RT INSTALL 76.1 LF - 20" STEEL WATER MAIN.
- STA 4+56.4 - 3.0' RT 20" STEEL DEFLECTION.
- STA 4+56.4 - 3.0' RT TO STA 5+37.0 - 3.0' RT INSTALL 80.0 LF - 20" STEEL WATER MAIN.
- STA 5+36.7 - 3.0' RT 20" STEEL DEFLECTION.
- STA 5+36.7 3.0' RT TO STA 6+15.6 - 3.0' RT INSTALL 78.6 LF - 20" STEEL WATER MAIN.
- STA 6+15.6 - 3.0' RT 20" STEEL DEFLECTION.
- STA 6+15.6 - 3.0' RT TO STA 6+96.2 - 3.0' RT INSTALL 80.3 LF - 20" STEEL WATER MAIN.
- STA 6+96.2 - 3.0' RT 20" STEEL DEFLECTION.
- STA 6+96.2 - 3.0' RT TO STA 7+74.9 - 3.0' RT INSTALL 78.2 LF - 20" STEEL WATER MAIN.
- STA 7+74.7 - 3.0' RT 20" STEEL DEFLECTION.

HIGH LEVEL WATER MAIN NOTES

- STA 7+74.7 - 3.0' RT TO STA 9+17.7 - 3.0' RT INSTALL 144.0 LF - 20" STEEL WATER MAIN.
- STA 9+17.9 - 3.0' RT 20" STEEL DEFLECTION.
- STA 9+17.9 - 3.0' RT TO STA 9+29.5 - 3.0' RT INSTALL 12.7 LF - 20" STEEL WATER MAIN.
- STA 9+29.5 - 3.0' RT INSTALL 20" GATE VALVE.
- STA 9+29.5 - 3.0' RT TO STA 9+32.5 - 3.0' RT INSTALL 2.9 LF - 20" STEEL WATER MAIN.
- STA 9+32.5 - 0.0' LT INSTALL 16" GATE VALVE.
- STA 9+32.5 - 3.0' RT INSTALL 20" X 20" X 16" X 6" CROSS.
- STA 9+32.5 - 3.0' RT TO STA 9+32.5 - 24.8' RT INSTALL 22 LF - 6" PVC WATER MAIN.

HIGH LEVEL WATER MAIN NOTES

- STA 9+32.5 - 24.8' RT INSTALL 6" 45 DEG BEND.
- STA 9+32.5 - 24.8' RT TO STA 9+57.4 - 47.9' RT INSTALL 34 LF - 6" PVC WATER MAIN.
- STA 9+32.5 - 3.0' RT TO STA 9+38.5 - 3.0' RT INSTALL 6.1 LF - 20" STEEL WATER MAIN.
- STA 9+38.5 - 3.0' RT INSTALL 20" GATE VALVE.
- STA 9+38.5 - 3.0' RT TO STA 9+93.2 - 3.0' RT INSTALL 52.3 LF - 20" STEEL WATER MAIN.

LOW LEVEL WATER MAIN NOTES

- STA 6+15.6 - 3.0' LT 20" STEEL DEFLECTION.
- STA 6+15.6 - 3.0' LT TO STA 6+96.2 - 3.0' LT INSTALL 80.8 LF - 20" STEEL WATER MAIN.
- STA 6+96.2 - 3.0' LT 20" STEEL DEFLECTION.
- STA 6+96.2 - 3.0' LT TO STA 7+74.7 - 3.0' LT INSTALL 78.8 LF - 20" STEEL WATER MAIN.
- STA 7+74.7 - 3.0' LT 20" STEEL DEFLECTION.
- STA 7+74.7 - 3.0' LT TO STA 9+17.9 - 3.0' LT INSTALL 142.4 LF 20" STEEL WATER MAIN.
- STA 9+17.9 - 3.0' LT 20" STEEL DEFLECTION.
- STA 9+17.9 - 3.0' LT TO STA 9+29.5 - 3.0' LT INSTALL 10.6 LF - 20" STEEL WATER MAIN.
- STA 9+29.5 - 3.0' LT 20" GATE VALVE.
- STA 9+29.5 - 3.0' LT TO STA 9+32.5 - 3.0' LT INSTALL 3.1 LF - 20" STEEL WATER MAIN.
- STA 9+32.5 - 3.0' LT INSTALL 20" X 20" X 16" TEE.

LOW LEVEL WATER MAIN NOTES

- STA 9+32.5 - 3.0' LT TO STA 9+38.5 - 3.0' LT INSTALL 5.9 LF - 20" STEEL WATER MAIN.
- STA 9+38.5 - 3.0' LT INSTALL 20" GATE VALVE.
- STA 9+38.5 - 3.0' LT TO STA 9+92.0 - 3.0' LT INSTALL 54.6 LF - 20" STEEL WATER MAIN.

CLEAR AND GRUB 8" DECIDUOUS TREE

STA 4+96.0 - 12.5 RT	1	EA
CLEAR AND GRUB TREE TOTALS	1	EA
CLEAR AND GRUB 12" CONIFEROUS TREE		
STA 8+00.4 - 17.7 RT	1	EA
CLEAR AND GRUB TREE TOTALS	1	EA

REMOVE 18" RCP AND REGRADE DITCH (INCIDENTAL)

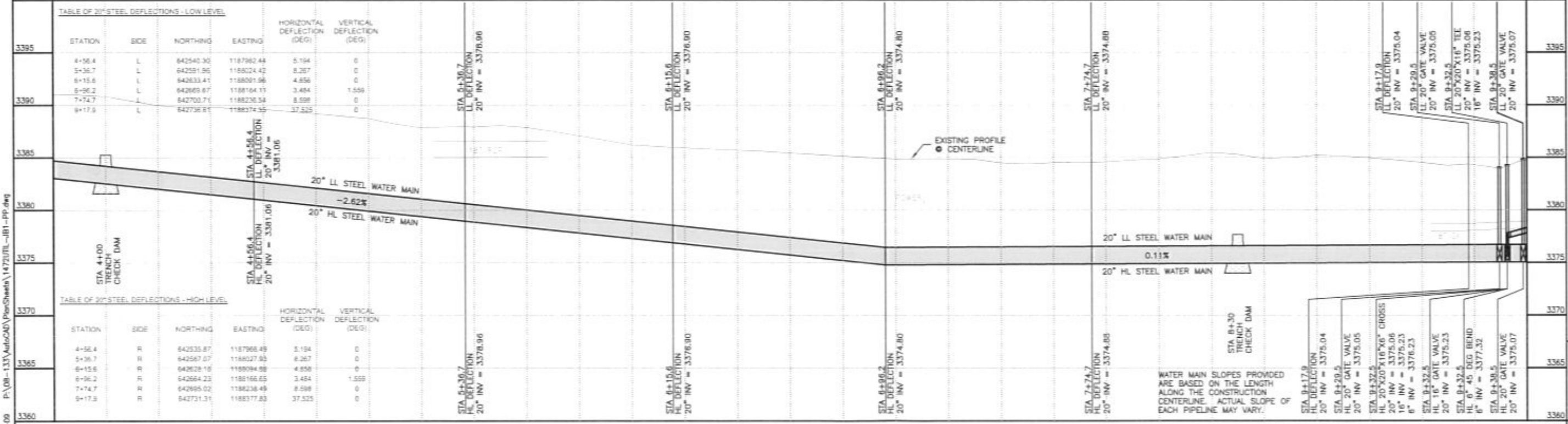
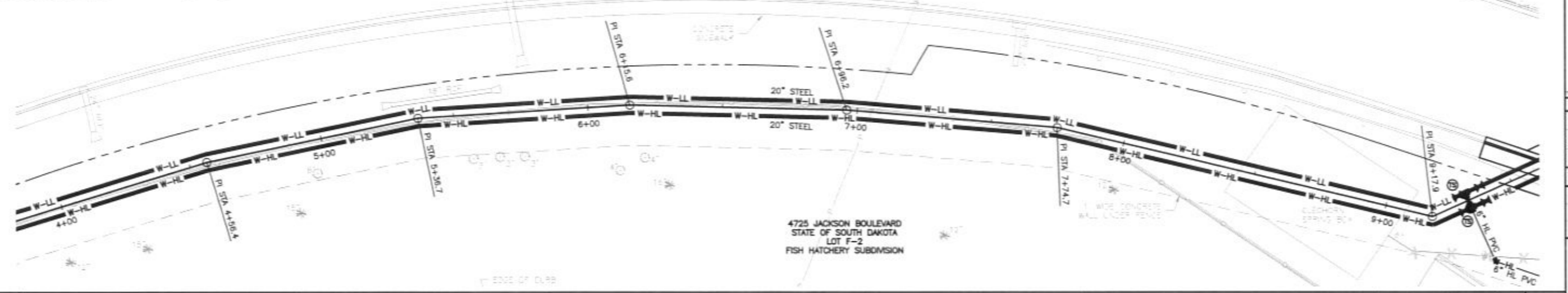
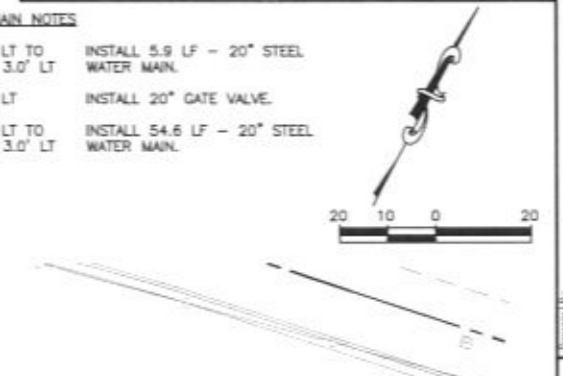
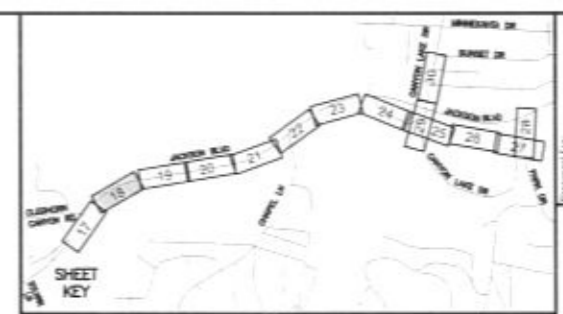
STA 5+24.7 - 7.1 LT TO STA 5+68.0 - 8.9 LT	45	LF
REMOVE RCP AND REGRADE DITCH TOTALS	45	LF
REMOVE AND RESET GUYWIRE / STABILIZE POWER POLE (INCIDENTAL)		
STA 7+65.5 - 1.3 LT	1	EA
REMOVE AND RESET GUYWIRE / STABILIZE POWER POLE TOTAL	1	EA

LOW LEVEL WATER MAIN NOTES

STA 3+80.0 - 3.0' LT TO STA 4+56.4 - 3.0' LT	INSTALL 76.8 LF - 20" STEEL WATER MAIN.
STA 4+56.4 - 3.0' LT	20" STEEL DEFLECTION.
STA 4+56.4 - 3.0' LT TO STA 5+36.7 - 3.0' LT	INSTALL 80.6 LF - 20" STEEL WATER MAIN.
STA 5+36.7 - 3.0' LT	20" STEEL DEFLECTION.
STA 5+36.7 - 3.0' LT TO STA 6+15.6 - 3.0' LT	INSTALL 79.2 LF - 20" STEEL WATER MAIN.

TABLE OF THRUST BLOCKS

STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SF)	MINIMUM CONCRETE VOL (CY)
9+32.5	R	6" 45 DEG BEND	7.2	0.28



Project for: Public Works Department
 Engineering Division
 Burns & McDonnell
 1882 1918
 FEC Ferber Engineering Company, Inc.
 NOT FOR CONSTRUCTION
 Scale: AS SHOWN
 Designed By: RLM
 Drawn By: DRS
 Design Date: SEPT 2006
 Print Date: 10-8-09
 Internal Job No: J08-133
 Surveyed By: SLAUJB
 Survey Date: FEB 2006
 Revision:

JACKSON SPRINGS WATER TRANSMISSION MAINS
 WATER PLAN & PROFILE
 STA 3+80 - 9+40
 18 of 43

HIGH LEVEL WATER MAIN NOTES

STA 9+57.4 - 47.9' RT INSTALL FIRE HYDRANT WITH AUXILIARY VALVE.

STA 9+92.0 - 3.0' RT 20" STEEL DEFLECTION.

STA 9+92.0 - 3.0' RT TO STA 17+63.5 - 3.8' RT INSTALL 770.3 LF - 20" STEEL WATER MAIN.

LOW LEVEL WATER MAIN NOTES

STA 9+92.0 - 3.0' LT 20" STEEL DEFLECTION.

STA 9+92.0 - 3.0' LT TO STA 17+84.7 - 3.0' LT INSTALL 793.9 LF - 20" STEEL WATER MAIN.

REMOVE AND REPLACE CONCRETE SIDEWALK

STA 9+46.6 - 17.0' LT TO STA 9+77.0 - 18.3' RT

REMOVE AND REPLACE CONCRETE SIDEWALK TOTALS 227 SF

REMOVE AND REPLACE CONCRETE CURB AND GUTTER

STA 9+46.6 - 17.0' LT TO STA 9+55.3 - 4.0' RT

REMOVE AND REPLACE CONCRETE CURB AND GUTTER TOTALS 31 LF

REMOVE AND REPLACE CONCRETE FILLET

STA 9+63.3 - 4.0' RT TO STA 9+70.3 - 38.4' RT

REMOVE AND REPLACE CONCRETE FILLET TOTALS 29 SF

REMOVE AND REPLACE ASPHALT PAVEMENT

STA 9+80.1 - 8.0' LT TO STA 22+34.8 - 13.8' LT

REMOVE AND REPLACE ASPHALT PAVEMENT TOTALS 2196 SF

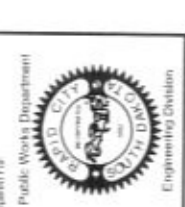
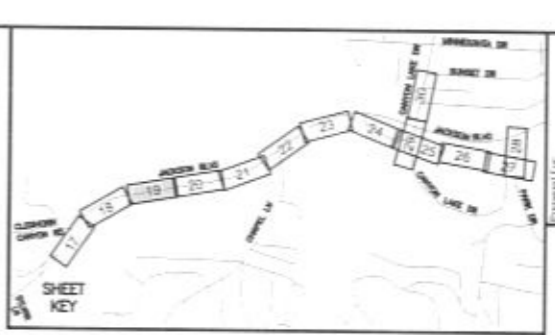
REMOVE AND RESET 18" RCP

STA 10+00.1 - 8.0' LT TO 10+03.1 - 8.0' RT
STA 13+27.9 - 8.0' LT TO 13+27.9 - 8.0' RT

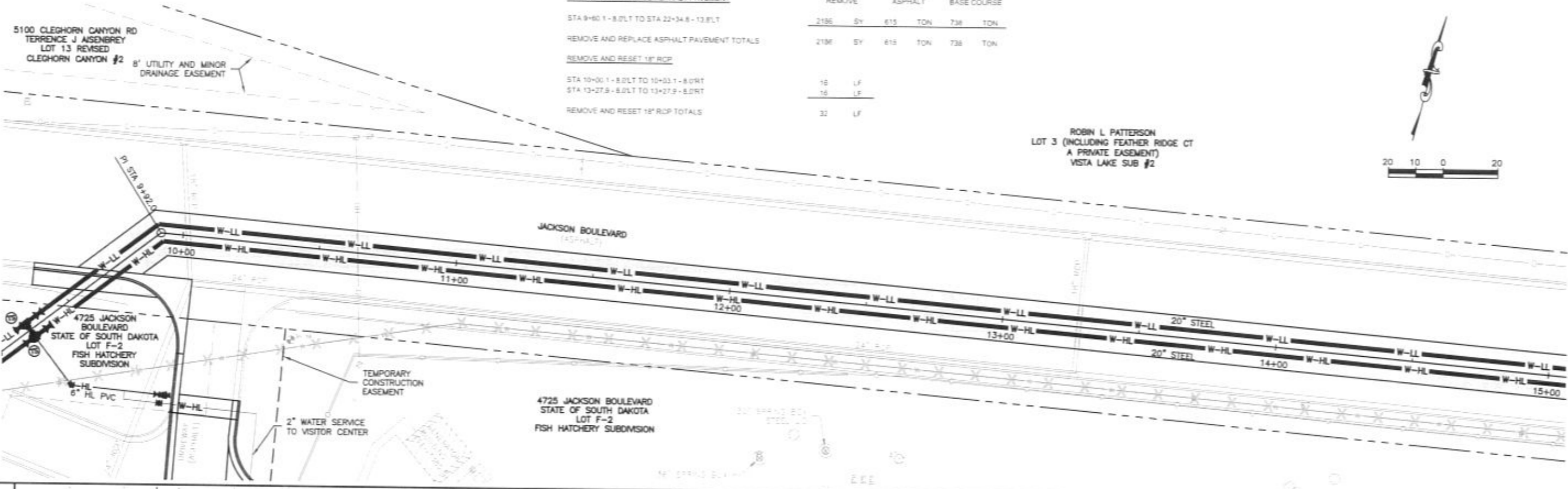
REMOVE AND RESET 18" RCP TOTALS 32 LF

TABLE OF THRUST BLOCKS

STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SQ FT)	MINIMUM CONCRETE VOL (CY)
9+57.4	R	6" FIRE HYDRANT	10.2	0.29



ΕΙΣΘΕΝ



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Scale: AS SHOWN

Designed By: RLM
Drawn By: DRS

Design Date: SEPT 2009
Print Date: 10-8-09

Internal Job No: J08-133

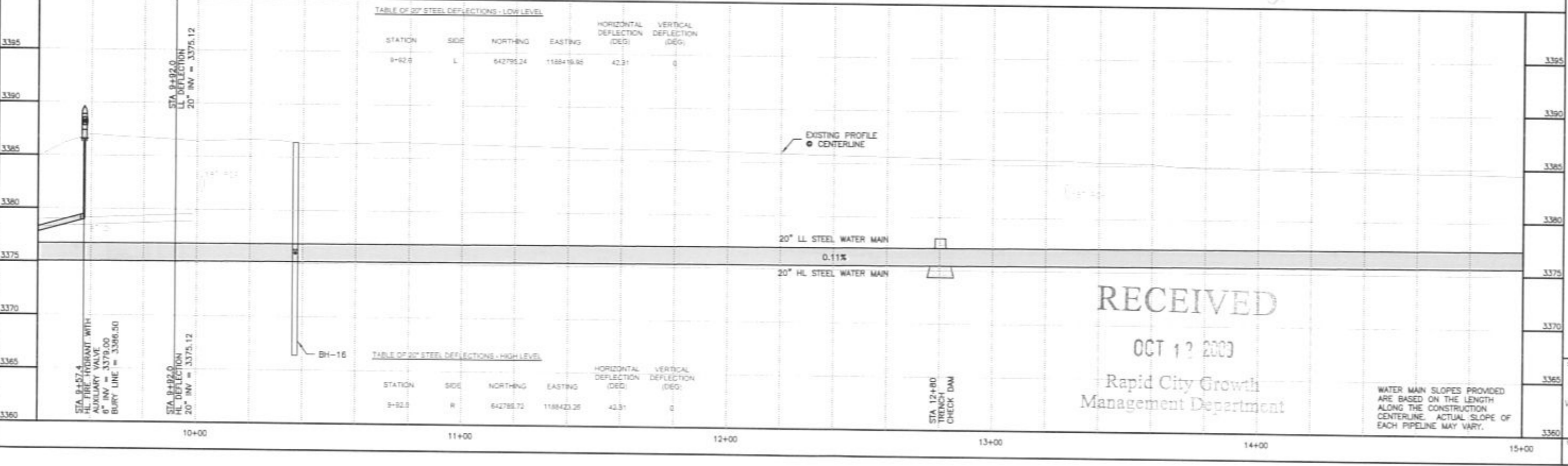
Surveyed By: SLA/JUB
Survey Date: FEB 2005

TABLE OF 20" STEEL DEFLECTIONS - LOW LEVEL

STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
9+92.0	L	642795.24	1188416.85	42.31	0

TABLE OF 20" STEEL DEFLECTIONS - HIGH LEVEL

STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
9+57.4	R	642795.72	1188423.25	42.31	0



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Management Department

WATER MAIN SLOPES PROVIDED ARE BASED ON THE LENGTH ALONG THE CONSTRUCTION CENTERLINE. ACTUAL SLOPE OF EACH PIPELINE MAY VARY.

JACKSON SPRINGS WATER
TRANSMISSION MAINS

Sheet Title: JACKSON BOULEVARD WATER PLAN & PROFILE
Sta: STA 9+40 - 15+00
Print: 19 of 43

HIGH LEVEL WATER MAIN NOTES
 STA 17+63.5 - 3.8' RT INSTALL 20" X 20" X 6" TEE.
 STA 17+63.5 - 3.8' RT TO STA 17+84.7 - 3.0' RT INSTALL 21.2 LF - 20" STEEL WATER MAIN.
 STA 17+84.7 - 3.0' RT 20" STEEL DEFLECTION.
 STA 17+84.7 - 3.0' RT TO STA 20+55.6 - 3.0' RT INSTALL 270.8 LF - 20" STEEL WATER MAIN.
 STA 20+55.6 - 3.0' RT 20" STEEL DEFLECTION.
 STA 20+55.6 - 3.0' RT TO STA 22+81.2 - 3.0' RT INSTALL 226.1 LF - 20" STEEL WATER MAIN.

LOW LEVEL WATER MAIN NOTES
 STA 17+84.7 - 3.0' LT 20" STEEL DEFLECTION.
 STA 17+84.7 - 3.0' LT TO STA 20+55.6 - 3.0' LT INSTALL 270.9 LF - 20" STEEL WATER MAIN.
 STA 20+55.6 - 3.0' LT 20" STEEL DEFLECTION.
 STA 20+55.6 - 3.0' LT TO STA 22+81.2 - 3.0' LT INSTALL 225.0 LF - 20" STEEL WATER MAIN.

REMOVE AND REPLACE CONCRETE SIDEWALK
 STA 17+51.5 - 18.5 RT TO STA 17+75.5 - 24.6 RT 121 SF
 REMOVE AND REPLACE CONCRETE SIDEWALK TOTALS 121 SF
REMOVE AND REPLACE CONCRETE CURB AND GUTTER
 STA 17+51.5 - 18.5 RT TO STA 17+75 - 19.6 RT 24 LF
 REMOVE AND REPLACE CONCRETE CURB AND GUTTER TOTALS 24 LF
REMOVE AND RESET 18" RCP
 STA 16+43.7 - 8.0' LT TO STA 16+43.7 - 8.0' RT 16 LF
 STA 18+77.9 - 8.0' LT TO STA 18+77.7 - 8.0' RT 16 LF
 REMOVE AND RESET 18" RCP TOTAL 32 LF



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 Engineering Department

ROBIN L PATTERSON
 LOT 3 (INCLUDING
 FEATHER RIDGE CT
 A PRIVATE EASEMENT)
 VISTA LAKE SUB #2

JOHN SKULBORSTAD
 LOT 2 VISTA LAKE SUB #2

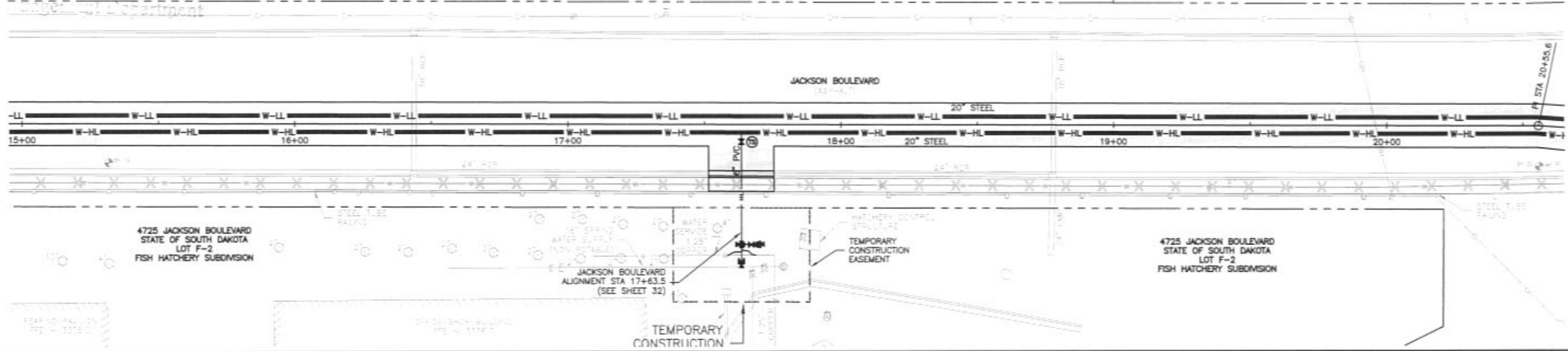
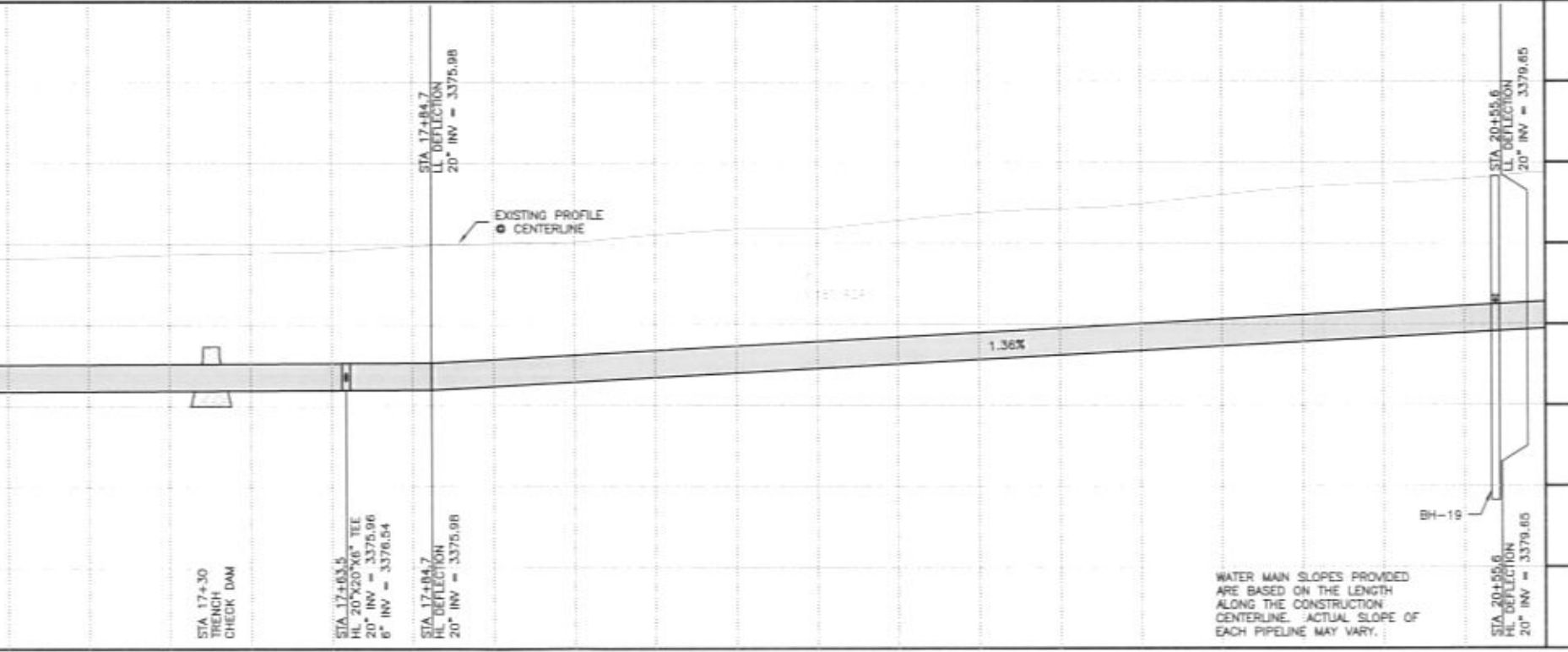


TABLE OF 20" STEEL DEFLECTIONS - LOW LEVEL

STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
17+84.7	L	842930.57	1188203.20	0	0.714
20+55.6	L	842978.75	1188489.21	3.611	0

TABLE OF 20" STEEL DEFLECTIONS - HIGH LEVEL

STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
17+84.7	R	842924.66	1188203.22	0	0.714
20+55.6	R	842970.82	1188470.05	3.611	0



WATER MAIN SLOPES PROVIDED ARE BASED ON THE LENGTH ALONG THE CONSTRUCTION CENTERLINE. ACTUAL SLOPE OF EACH PIPELINE MAY VARY.



NOT FOR CONSTRUCTION

Scale: AS SHOWN
 Designed By: RLM Drawn By: DRS
 Design Date: SEPT 2009 Print Date: 10-8-09
 Internal Job No: J08-133
 Surveyed By: BLAUB Survey Date: FEB 2008
 Revisions:

JACKSON SPRINGS WATER
 TRANSMISSION MAINS

Sheet Title: JACKSON BOULEVARD
 WATER PLAN & PROFILE
 STA 15+00 - 20+60

HIGH LEVEL WATER MAIN NOTES

- STA 22+81.2 - 3.0' RT 20" STEEL DEFLECTION.
- STA 22+81.2 - 3.1' RT TO STA 22+87.5 - 3.0' RT INSTALL 6.9 LF - 20" STEEL WATER MAIN.
- STA 22+87.5 - 3.0' RT INSTALL 20" GATE VALVE.
- STA 22+87.5 - 3.0' RT TO STA 23+06.0 - 3.0' RT INSTALL 18.5 LF - 20" STEEL WATER MAIN.
- STA 23+06.0 - 3.0' RT INSTALL COMBINATION AIR VALVE.
- STA 23+06.0 - 3.0' RT TO STA 23+16.6 - 3.0' RT INSTALL 10.0 LF - 20" STEEL WATER MAIN.
- STA 23+16.6 - 0.0' LT INSTALL 16" GATE VALVE.
- STA 23+16.6 - 3.0' RT INSTALL 20" X 20" X 16" X 6" CROSS.

HIGH LEVEL WATER MAIN NOTES

- STA 23+16.6 - 3.0' RT TO STA 23+16.6 - 8.0' RT INSTALL 5 LF - 6" PVC WATER MAIN.
- STA 23+16.6 - 8.0' RT INSTALL FIRE HYDRANT WITH AUXILIARY VALVE.
- STA 23+16.6 - 3.0' RT TO STA 23+19.0 - 3.0' RT INSTALL 2.4 LF - 20" STEEL WATER MAIN.
- STA 23+19.0 - 3.0' RT INSTALL 20" GATE VALVE.
- STA 23+19.0 - 3.0' RT TO STA 23+21.4 - 3.0' RT INSTALL 2.4 LF - 20" STEEL WATER MAIN.
- STA 23+21.4 - 3.0' RT 20" STEEL DEFLECTION.
- STA 23+21.4 - 3.0' RT TO STA 24+69.3 - 3.0' RT INSTALL 148.1 LF - 20" STEEL WATER MAIN.
- STA 24+69.3 - 3.0' RT 20" STEEL DEFLECTION.
- STA 24+69.3 - 3.0' RT TO STA 25+51.2 - 3.0' RT INSTALL 82.1 LF - 20" STEEL WATER MAIN.
- STA 25+51.2 - 3.0' RT 20" STEEL DEFLECTION.

HIGH LEVEL WATER MAIN NOTES

- STA 25+51.2 - 3.0' RT TO STA 26+73.2 - 3.0' RT INSTALL 122.0 LF 20" STEEL WATER MAIN.
- STA 22+81.2 - 3.0' LT 20" STEEL DEFLECTION.
- STA 22+81.2 - 3.0' LT TO STA 22+87.5 - 3.0' LT INSTALL 5.7 LF - 20" STEEL WATER MAIN.
- STA 22+87.5 - 3.0' LT INSTALL 20" GATE VALVE.
- STA 22+87.5 - 3.0' LT TO STA 22+95.0 - 3.0' LT INSTALL 7.5 LF - 20" STEEL WATER MAIN.
- STA 22+95.0 - 3.0' LT INSTALL COMBINATION AIR VALVE.
- STA 22+95.0 - 3.0' LT TO STA 23+16.6 - 3.0' LT INSTALL 21.0 LF - 20" STEEL WATER MAIN.
- STA 23+16.6 - 3.0' LT INSTALL 20" X 20" X 16" TEE.
- STA 23+16.6 - 3.0' LT TO STA 23+19.0 - 3.0' LT INSTALL 3.0 LF 20" STEEL WATER MAIN.

LOW LEVEL WATER MAIN NOTES

- STA 23+19.0 - 3.0' LT INSTALL 20" GATE VALVE.
- STA 23+19.0 - 3.0' LT TO STA 23+21.4 - 3.0' LT INSTALL 2.4 LF - 20" STEEL WATER MAIN.
- STA 23+21.4 - 3.0' LT 20" STEEL DEFLECTION.
- STA 23+21.4 - 3.0' LT TO STA 24+69.3 - 3.0' LT INSTALL 147.8 LF - 20" STEEL WATER MAIN.
- STA 24+69.3 - 3.0' LT 20" STEEL DEFLECTION.
- STA 24+69.3 - 3.0' LT TO STA 25+51.2 - 3.0' LT INSTALL 81.7 LF - 20" STEEL WATER MAIN.
- STA 25+51.2 - 3.0' LT 20" STEEL DEFLECTION.
- STA 25+51.2 - 3.0' LT TO STA 26+73.2 - 3.0' LT INSTALL 122.1 LF - 20" STEEL WATER MAIN.

REMOVE AND REPLACE CONCRETE CURB AND GUTTER

STA 21+14.0 - 12.8 RT TO STA 22+53.7 - 15.9 LT	142	LF
REMOVE AND REPLACE CONCRETE CURB AND GUTTER TOTALS	142	LF

REMOVE AND REPLACE CONCRETE SIDEWALK

STA 21+14.7 - 17.7 RT TO STA 27+76.0 - 12.5 RT	3905	SF
REMOVE AND REPLACE CONCRETE SIDEWALK TOTALS	3905	SF

REMOVE AND REPLACE SIGN

STA 23+64.0 - 7.8 LT	1	EA
STA 25+03.7 - 2.7 LT	1	EA
REMOVE AND REPLACE SIGN TOTALS	2	EA

INSTALL CONCRETE APPROACH PAVEMENT (6" CONCRETE ON 4" BASE COURSE)

STA 22+52.8 - 18.5 LT TO STA 22+90.1 - 21.8 LT	20	SY
INSTALL CONCRETE APPROACH PAVEMENT TOTALS	20	SY

REMOVE AND RESET 24" RCP

STA 24+62.4 - 8.0 LT TO STA 24+62.4 - 8.0 RT	16	LF
STA 24+82.9 - 8.0 LT TO STA 24+81.7 - 8.0 RT	16	LF
REMOVE AND RESET 24" RCP TOTAL	32	LF

INSTALL ASPHALT PAVEMENT

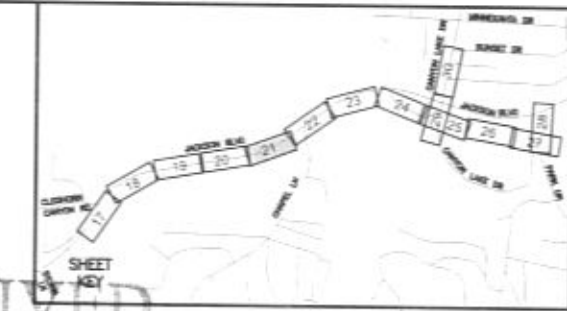
STA 22+60.8 - 13.0 LT TO STA 23+12.2 - 8.8 RT	26	ASPHALT TONS	30	BASE COURSE TONS
ASPHALT CONCRETE TOTALS	26	TONS	30	TONS

REMOVE AND RESET INSTALL GUARDRAIL

STA 21+14.8 - 18.3 RT TO STA 24+43.7 - 3.0 LT	327	LF	20	LF
REMOVE AND RESET INSTALL GUARDRAIL TOTALS	327	LF	20	LF

TABLE OF THRUST BLOCKS

STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SQ)	MINIMUM CONCRETE VOL (CY)
23+156	R	6" FIRE HYDRANT	10.2	0.5



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 Rapid City Growth Management Department

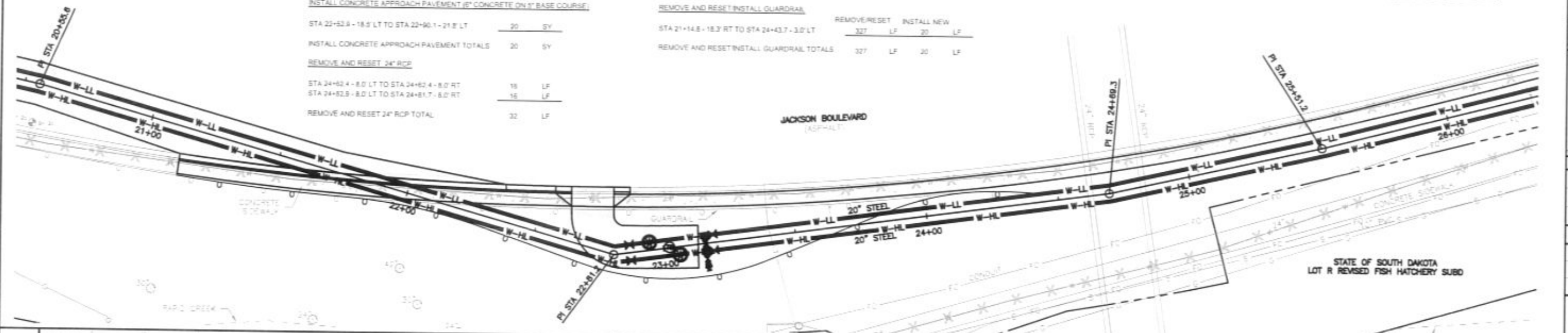
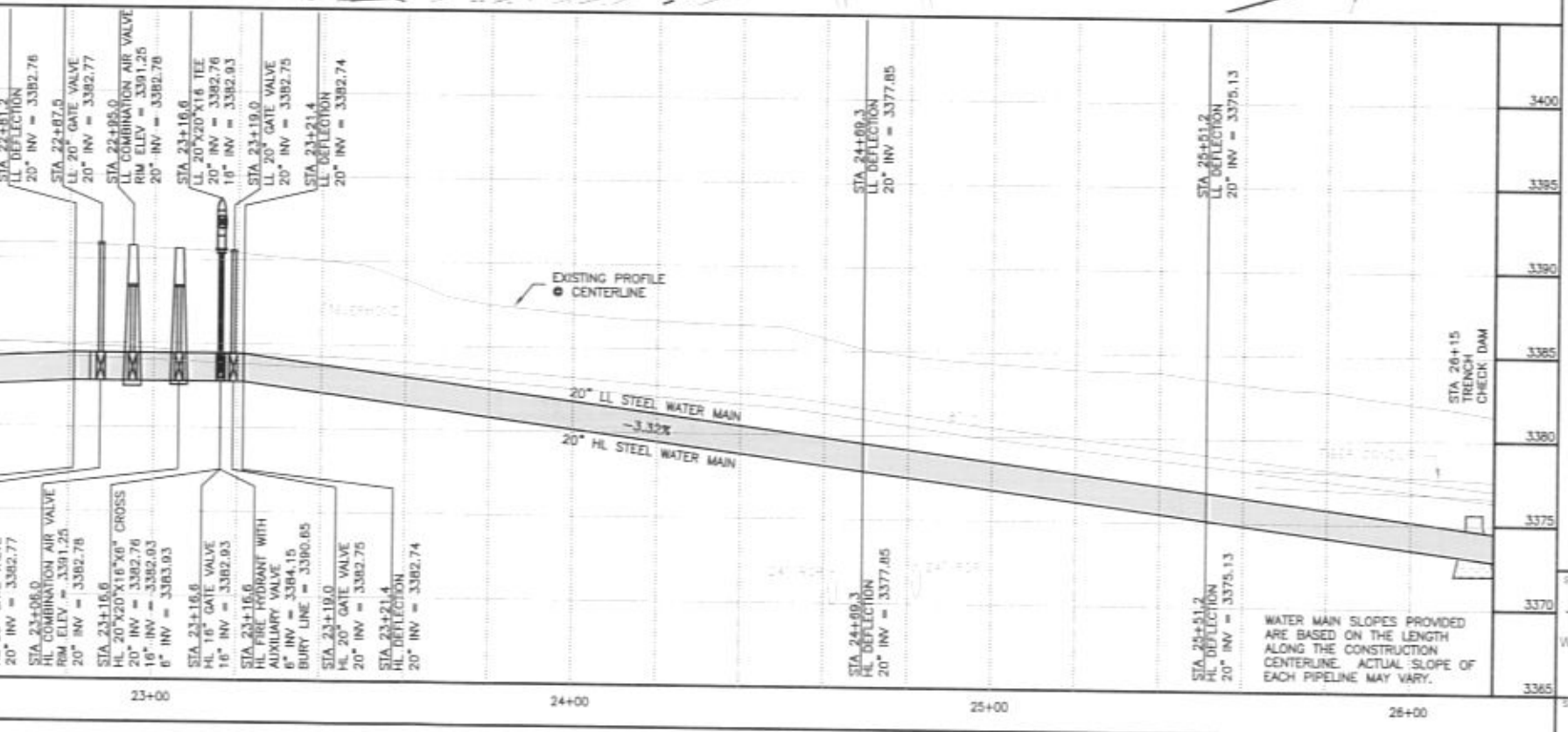


TABLE OF 20" STEEL DEFLECTIONS - LOW LEVEL

STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
22+81.2	L	643001.08	1189612.84	23.567	0.792
23+21.4	L	643020.79	1189727.42	0	1.8
24+69.3	L	643094.09	1189855.66	4.95	0
25+51.2	L	643140.80	1189922.79	1.542	0

TABLE OF 20" STEEL DEFLECTIONS - HIGH LEVEL

STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
22+81.2	R	642998.26	1189694.83	23.567	0.792
23+21.4	R	643015.58	1189730.28	0	1.8
24+69.3	R	643089.01	1189858.80	4.95	0
25+51.2	R	643135.72	1189926.28	1.542	0



Public Works Department
 Engineering Division

Burns & McDonnell
 SINCE 1878

FEC Ferber Engineering Company, Inc.
 1000 North 17th Street, Suite 100, Rapid City, SD 57701-1808

Project No: AS SHOWN
 Designed By: DRS
 Drawn By: DRS
 Design Date: SEPT 2009
 Print Date: 10-8-09
 Internal Job No: J08-133
 Checked By: SLA/JUB
 Safety Date: FEB 2009

JACKSON SPRINGS WATER TRANSMISSION MAINS

Sheet Title: JACKSON BOULEVARD WATER PLAN & PROFILE
 STA 20+60 - 26+20

21 of 43

HIGH LEVEL WATER MAIN NOTES

STA 26+73.2 - 3.0' RT 20" STEEL DEFLECTION.

STA 26+73.2 - 3.0' RT TO STA 27+69.5 - 3.0' RT INSTALL 96.3 LF - 20" STEEL WATER MAIN.

STA 27+69.5 - 3.0' RT 20" STEEL DEFLECTION.

STA 27+69.5 - 3.0' RT TO STA 28+20.4 - 3.0' RT INSTALL 50.9 LF - 20" STEEL WATER MAIN.

STA 28+20.7 - 3.0' RT 20" STEEL DEFLECTION.

STA 28+20.7 - 3.0' RT TO STA 28+40.7 - 3.0' RT INSTALL 20.3 LF - 20" STEEL WATER MAIN.

STA 28+40.7 - 3.0' RT 20" STEEL DEFLECTION.

STA 28+40.7 - 3.0' RT TO STA 28+52.3 - 3.0' RT INSTALL 11.6 LF - 20" STEEL WATER MAIN.

STA 28+52.3 - 3.0' RT 20" STEEL DEFLECTION.

STA 28+52.3 - 3.0' RT TO STA 28+63.0 - 3.0' RT INSTALL 10.7 LF - 20" STEEL WATER MAIN.

REMOVE AND REPLACE SIGN

STA 26+32.8 - 1.0LT 1 EA

STA 28+48.7 - 8.5RT 1 EA

STA 28+54.8 - 5.8LT 1 EA

REMOVE AND REPLACE SIGN TOTALS 3 EA

REMOVE AND REPLACE CONCRETE FILLET

STA 27+80.5 - 12.2LT TO STA 27+92.6 - 8.9RT 28 SF

REMOVE AND REPLACE CONCRETE FILLET TOTALS 28 SF

INSTALL DECTABLE WARNING PANEL

STA 27+92.8 - 0.9 LT 1 EA

STA 28+42.6 - 2.8 LT 1 EA

INSTALL DECTABLE WARNING PANEL TOTAL 2 EA

HIGH LEVEL WATER MAIN NOTES

STA 28+63.0 - 3.0' RT INSTALL 20" X 20" X 16" X 16" CROSS

STA 28+63.0 - 3.0' RT TO STA 28+68.0 - 3.0' RT INSTALL 5 LF - 20" STEEL WATER MAIN.

STA 28+68.0 - 3.0' RT 20" STEEL DEFLECTION.

STA 28+68.0 - 3.0' RT TO STA 28+83.2 - 3.0' RT INSTALL 15.2 LF - 20" STEEL WATER MAIN.

STA 28+83.2 - 3.0' RT 20" STEEL DEFLECTION.

STA 28+83.2 - 3.0' RT TO STA 28+85.2 - 3.0' RT INSTALL 2.0 LF - 20" STEEL WATER MAIN.

STA 28+85.2 - 3.0' RT 20" STEEL DEFLECTION.

STA 28+85.2 - 0.0' LT INSTALL 16" GATE VALVE.

REMOVE AND REPLACE CONCRETE PAVEMENT

STA 27+95.0 - 9.9RT TO STA 28+45.2 - 18.2LT 146 SF

REMOVE AND REPLACE CONCRETE PAVEMENT TOTALS 146 SF

REMOVE AND REPLACE CONCRETE CURB AND GUTTER

STA 28+25.5 - 13.1RT TO STA 28+44.2 - 8.0LT 102 LF

REMOVE AND REPLACE CONCRETE CURB AND GUTTER TOTALS 102 LF

REMOVE AND RESET 24" RCP

STA 27+73.9 - 8.0 LT TO STA 27+71.8 - 8.0 RT 16 LF

REMOVE AND RESET 24" RCP TOTAL 16 LF

HIGH LEVEL WATER MAIN NOTES

STA 28+85.2 - 3.0' RT TO STA 28+85.4 - 11.0' RT INSTALL 8 LF - 6" PVC WATER MAIN.

STA 28+85.4 - 11.0' RT INSTALL FIRE HYDRANT WITH AUXILIARY VALVE.

STA 28+85.2 - 3.0' RT TO STA 28+88.2 - 3.0' RT INSTALL 3.0 LF - 20" STEEL WATER MAIN.

STA 28+88.2 - 3.0' RT INSTALL 20" GATE VALVE.

STA 28+88.2 - 3.0' RT TO STA 29+18.9 - 3.0' RT INSTALL 30.8 LF - 20" STEEL WATER MAIN.

STA 29+18.9 - 3.0' RT 20" STEEL DEFLECTION.

STA 29+18.9 - 3.0' RT TO STA 31+99.0 - 3.0' RT INSTALL 280.2 LF - 20" STEEL WATER MAIN.

STA 26+73.2 - 3.0' LT 20" STEEL DEFLECTION.

STA 26+73.2 - 3.0' LT TO STA 27+69.5 - 3.0' LT INSTALL 96.3 LF - 20" STEEL WATER MAIN.

REMOVE AND REPLACE CONCRETE SIDEWALK

STA 28+42.8 - 15.7RT TO STA 32+06.9 - 11.9LT 2643 SF

REMOVE AND REPLACE CONCRETE SIDEWALK TOTALS 2643 SF

REMOVE AND RESET 12" RCP

STA 28+42.8 - 6.1RT TO STA 28+56.6 - 7.5RT 15 LF

REMOVE AND RESET 12" RCP TOTALS 15 LF

REMOVE AND RESET 18" RCP

STA 28+57.0 - 14.4LT TO STA 29+56.6 - 15.9RT 31 LF

REMOVE AND RESET 18" RCP TOTALS 31 LF

REMOVE AND RELOCATE LIGHT POLE

STA 31+38.3 - 1.0RT 1 EA

REMOVE AND RELOCATE LIGHT POLE TOTALS 1 EA

RELOCATE LIGHT POLE TO STA 31+38.3 - 10.0' LT

LOW LEVEL WATER MAIN NOTES

STA 27+69.5 - 3.0' LT 20" STEEL DEFLECTION.

STA 27+69.5 - 3.0' LT TO STA 28+52.3 - 3.0' LT INSTALL 82.8 LF - 20" STEEL WATER MAIN.

STA 28+52.3 - 3.0' LT 20" STEEL DEFLECTION.

STA 28+52.3 - 3.0' LT TO STA 28+85.2 - 3.0' LT INSTALL 32.9 LF - 20" STEEL WATER MAIN.

STA 28+85.2 - 3.0' LT 20" STEEL DEFLECTION.

STA 28+85.2 - 3.0' LT TO STA 28+88.2 - 3.0' LT INSTALL 3.0 LF - 20" STEEL WATER MAIN.

STA 28+88.2 - 3.0' LT 20" STEEL DEFLECTION.

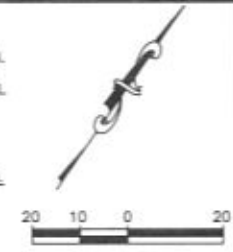
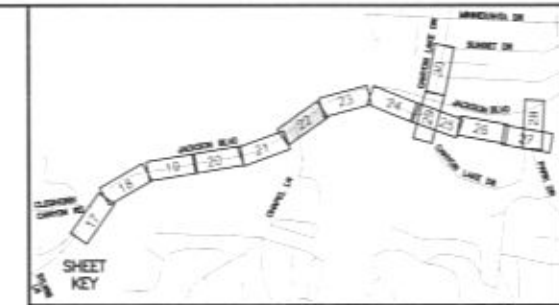
STA 28+88.2 - 3.0' LT TO STA 28+99.0 - 3.0' LT INSTALL 10.8 LF - 20" STEEL WATER MAIN.

STA 28+99.0 - 3.0' LT 20" STEEL DEFLECTION.

STA 28+99.0 - 3.0' LT TO STA 29+18.9 - 1.0' LT INSTALL 20.0 LF - 20" STEEL WATER MAIN.

TABLE OF THRUST BLOCKS

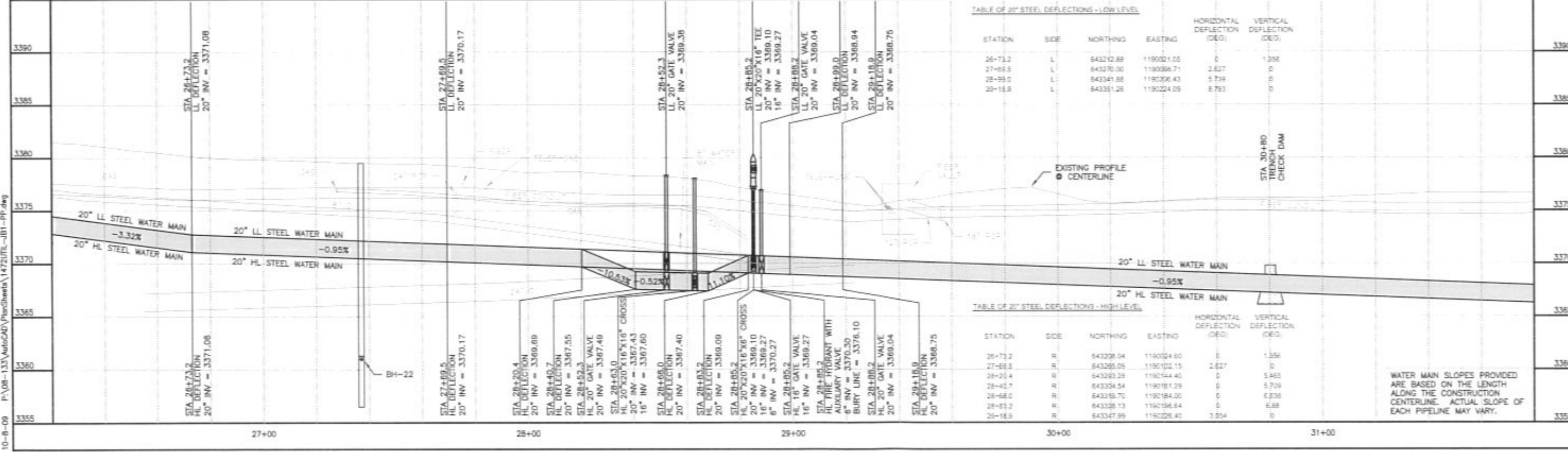
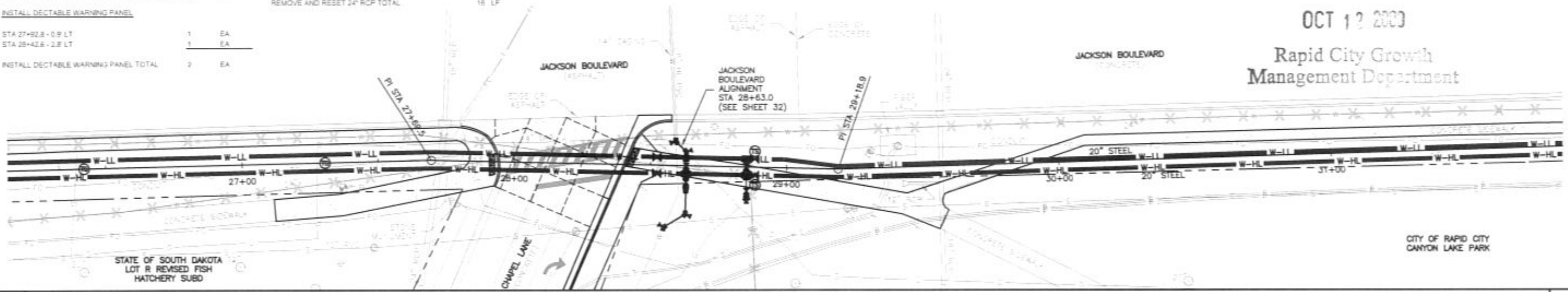
STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SF)	MINIMUM CONCRETE VOL (CY)
28+85.2	R	6" FIRE HYDRANT	10.2	0.28



RECEIVED

OCT 12 2003

Rapid City Growth Management Department



Project For: Public Works Department

Engineer: J. Dobbins

Burns & McDonnell SINCE 1818

FEC Ferber Engineering Company, Inc.

Scale: AS SHOWN

Designed By: RLM Drawn By: DRS

Design Date: SEPT 2008 Print Date: 10-8-09

Project Job No: J08-133

Submitted By: SLAJUB Survey Date: FEB 2009

Project: JACKSON SPRINGS WATER TRANSMISSION MAINS

Sheet: 22 of 43

HIGH LEVEL WATER MAIN NOTES

- STA 32+00.0 - 3.0' RT 20" STEEL DEFLECTION.
- STA 32+00.0 - 3.0' RT TO STA 34+10.0 - 3.0' RT INSTALL 209.9 LF - 20" STEEL WATER MAIN.
- STA 34+10.0 - 3.0' RT INSTALL 20" X 6" TEE.
- STA 34+10.0 - 3.0' RT TO STA 34+10.0 - 6.5' INSTALL 4 LF - 6" PVC WATER MAIN.
- STA 3+10.0 - 6.5' RT INSTALL 6" 45' BEND.
- STA 34+10.0 - 6.5' RT TO STA 34+07.2 - 9.2' RT INSTALL 4 LF - 6" PVC WATER MAIN.
- STA 34+07.2 - 9.2' RT INSTALL 6" 45' BEND AND CONNECT TO EXISTING.
- STA 34+10.0 - 3.0' RT TO STA 35+94.0 - 3.0' RT INSTALL 184.0 LF - 20" STEEL WATER MAIN.
- STA 35+94.0 - 3.0' RT INSTALL 20" GATE VALVE.
- STA 35+94.0 - 3.0' RT TO STA 36+00.0 - 3.0' RT INSTALL 6.0 LF - 20" STEEL WATER MAIN.

HIGH LEVEL WATER MAIN NOTES

- STA 36+00.0 - 3.0' RT INSTALL 20" X 20" X 16" X 6" CROSS.
- STA 36+00.0 - 0.0' LT INSTALL 16" GATE VALVE.
- STA 36+00.0 - 3.0' RT TO STA 36+00.0 - 23.7' RT INSTALL 20.7 LF - 6" PVC WATER MAIN.
- STA 36+00.0 - 23.7' RT INSTALL FIRE HYDRANT WITH AUXILIARY VALVE.
- STA 36+00.0 - 3.0' RT TO STA 36+06.0 - 3.0' RT INSTALL 6.0 LF - 20" STEEL WATER MAIN.
- STA 36+06.0 - 3.0' RT INSTALL 20" GATE VALVE.
- STA 36+06.0 - 3.0' RT TO STA 36+86.0 - 3.0' RT INSTALL 79.7 LF - 20" STEEL WATER MAIN.
- STA 36+86.0 - 3.0' RT 20" STEEL DEFLECTION.
- STA 36+86.0 - 3.0' RT TO STA 37+79.4 - 3.0' RT INSTALL 93.0 LF - 20" STEEL WATER MAIN.

LOW LEVEL WATER MAIN NOTES

- STA 32+04.9 - 3.0' LT 20" STEEL DEFLECTION.
- STA 32+04.9 - 3.0' LT TO STA 35+94.0 - 3.1' LT INSTALL 389.1 LF - 20" STEEL WATER MAIN.
- STA 35+94.0 - 3.0' LT INSTALL 20" GATE VALVE.
- STA 35+94.0 - 3.0' LT TO STA 36+00.0 - 3.0' LT INSTALL 6 LF - 20" STEEL WATER MAIN.
- STA 36+00.0 - 3.0' LT INSTALL 20" X 20" X 16" TEE.
- STA 36+00.0 - 3.0' LT TO STA 36+06.0 - 2.9' LT INSTALL 6 LF - 20" STEEL WATER MAIN.
- STA 36+06.0 - 2.9' LT INSTALL 20" GATE VALVE.
- STA 36+06.0 - 2.9' LT TO STA 36+86.0 - 3.0' LT INSTALL 80.3 LF - 20" STEEL WATER MAIN.
- STA 36+86.0 - 3.0' LT 20" STEEL DEFLECTION.
- STA 36+86.0 - 3.0' LT TO STA 37+79.4 - 3.0' LT INSTALL 93.6 LF - 20" STEEL WATER MAIN.

REMOVE AND REPLACE CONCRETE CURBS AND GUTTER

- STA 33+54.9 - 8.0' LT TO STA 34+06.9 - 12.2' RT 58 LF
- REMOVE AND REPLACE CONCRETE CURBS AND GUTTER 58 LF
- REMOVE AND REPLACE ASPHALT PAVEMENT
- STA 33+61.9 - 9.7' LT TO STA 36+86.9 - 6.3' LT REMOVE ASPHALT BASE COURSE 1186 SY 334 TON 401 TON
- REMOVE AND REPLACE ASPHALT PAVEMENT TOTALS 1186 SY 334 TON 401 TON
- REMOVE AND RESET 24" RCP
- STA 36+92.0 - 8.0' LT TO STA 36+90.9 - 8.0' RT 16 LF
- REMOVE AND RESET 24" RCP TOTALS 16 LF

ENCASEMENT NOTES

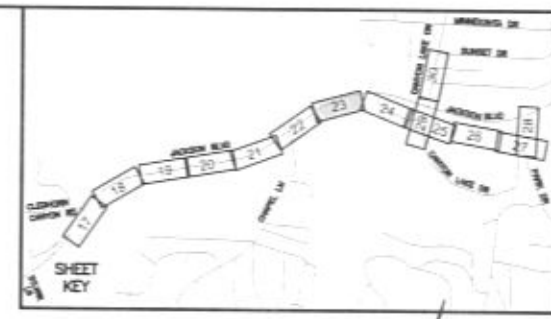
- STA 33+46.6 - 13.0' LT TO STA 33+62.4 - 13.0' RT ENCASE 31 LF - 4" SANITARY SEWER SERVICE.

CLEAR AND GRUB 6" CONIFEROUS TREE

- STA 32+51.7 - 15.4' RT 1 EA
- CLEAR AND GRUB 6" CONIFEROUS TREE TOTALS 1 EA

CLEAR AND GRUB 8" CONIFEROUS TREE

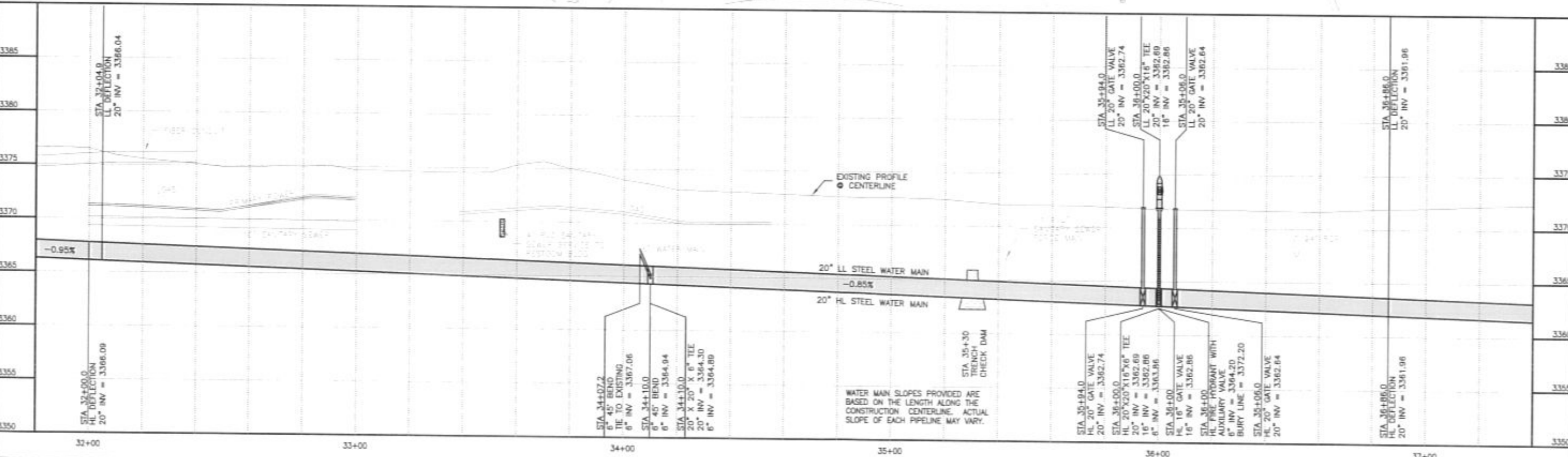
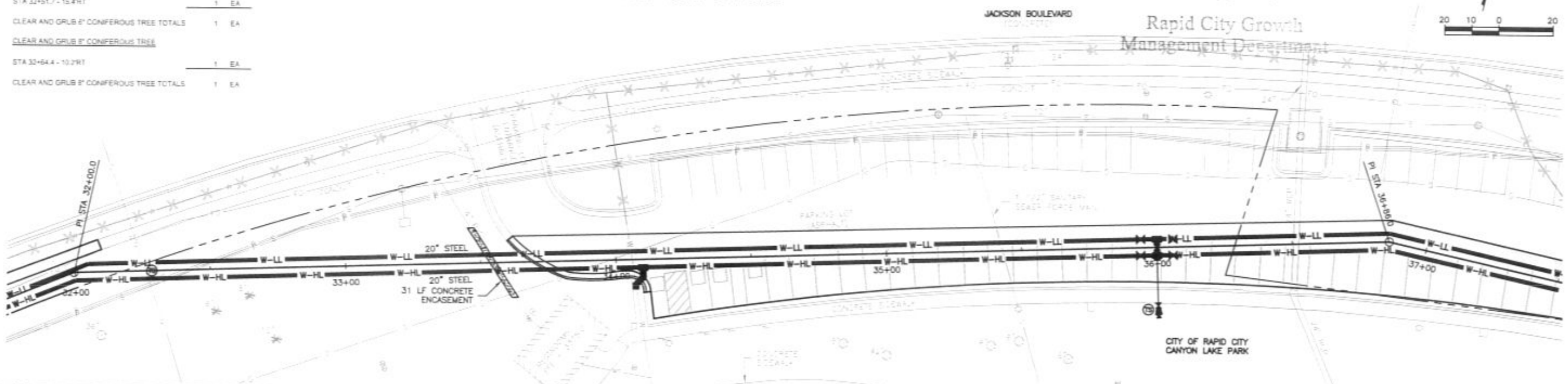
- STA 32+64.4 - 10.2' RT 1 EA
- CLEAR AND GRUB 8" CONIFEROUS TREE TOTALS 1 EA



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OCT 12 2003

Rapid City Growth Management Department



NOT FOR CONSTRUCTION

Scale	AS SHOWN
Designed By	RLM
Drawn By	DBS
Design Date	SEPT 2003
Check Date	10-6-03
Internal Job No.	JOB-133
Submitted By	SLA:JJB
Review Date	FEB 2003
Revisions	

JACKSON SPRINGS WATER TRANSMISSION MAINS

JACKSON BOULEVARD WATER PLAN & PROFILE STA 31+80 - 37+40

HIGH LEVEL WATER MAIN NOTES

STA 37+79.4 - 3.0' RT 20" STEEL DEFLECTION.

STA 37+79.4 - 3.0' RT TO STA 38+88.8 - 3.0' RT INSTALL 108.6 LF - 20" STEEL WATER MAIN.

STA 38+88.8 - 3.0' RT 20" STEEL DEFLECTION.

STA 38+88.8 - 3.0' RT TO STA 42+08.9 - 3.0' RT INSTALL 319.1 LF - 20" STEEL WATER MAIN.

STA 40+35.4 - 3.0' RT INSTALL 1" SERVICE TAP.

STA 40+35.4 - 3.0' RT TO STA 40+35.4 - 20.0' LT INSTALL 23 LF - 1" COPPER SERVICE LINE AND CURB STOP, RECONNECT WATER SERVICE.

STA 42+08.9 - 3.0' RT INSTALL 20" X 20" X 6" TEE

STA 42+08.9 - 0.0' LT INSTALL 6" GATE VALVE.

STA 42+08.9 - 0.0' LT TO STA 42+08.9 - 7.9' LT INSTALL 8 LF - 6" PVC WATER MAIN.

HIGH LEVEL WATER MAIN NOTES

STA 42+08.9 - 7.9' LT INSTALL 6" DEFLECTION COUPLING, TIE TO EXISTING WATER MAIN.

STA 42+08.9 - 3.0' RT TO STA 43+08.1 - 3.0' RT INSTALL 99.7 LF - 20" STEEL WATER MAIN.

LOW LEVEL WATER MAIN NOTES

STA 37+79.4 - 3.0' LT 20" STEEL DEFLECTION.

STA 37+79.4 - 3.0' LT TO STA 38+88.8 - 3.0' LT INSTALL 110.3 LF - 20" STEEL WATER MAIN.

STA 38+88.8 - 3.0' LT 20" STEEL DEFLECTION.

STA 38+88.8 - 3.0' LT TO STA 43+07.7 - 3.0' LT INSTALL 419.7 LF - 20" STEEL WATER MAIN.

REMOVE AND REPLACE CONCRETE PAV

STA 38+88.8 - 6.3' LT TO STA 38+90.2 - 8.5' LT 8 SY

STA 42+62.0 - 12.6' LT TO STA 42+69.3 - 3.0' RT 14 SY

REMOVE AND REPLACE CONCRETE PAV TOTALS 22 SY

REMOVE AND REPLACE ASPHALT PAVEMENT

REMOVE	ASPHALT	BASE COURSE
777 SY	215 TON	263 TON
264 SY	75 TON	90 TON
1041 SY	294 TON	353 TON

REMOVE ASPHALT PAVEMENT TOTALS 1041 SY 294 TON 353 TON

REMOVE AND REPLACE CONCRETE CURB AND GUTTER

STA 38+52.7 - 14.0' RT TO STA 38+40.3 - 9.8' RT 106 LF

STA 40+64.7 - 13.9' RT TO STA 44+15.5 - 13.8' RT 377 LF

REMOVE AND REPLACE CONCRETE CURB AND GUTTER 483 LF

CLEAR AND GRUB 16" DECIDUOUS TREE

STA 38+76.4 - 1.8' RT 1 EA

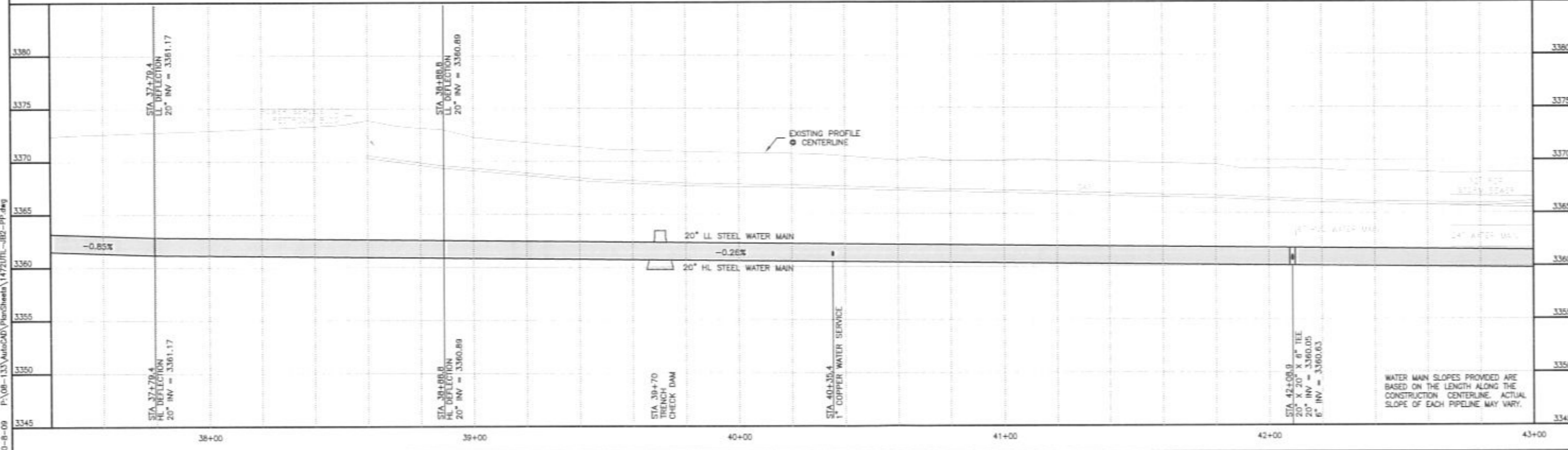
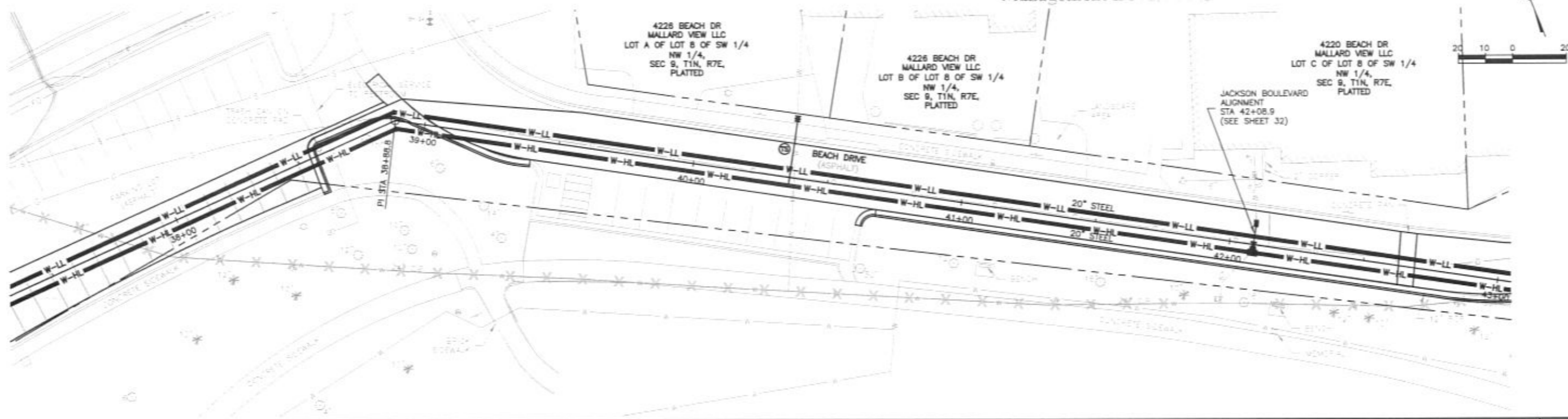
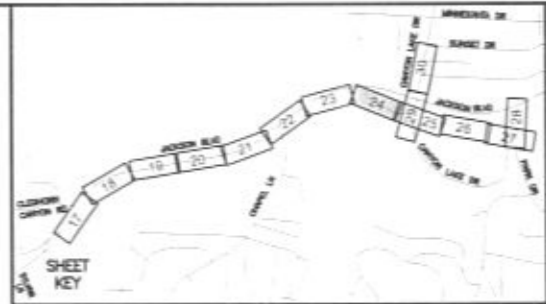
CLEAR AND GRUB 16" DECIDUOUS TREE TOTALS 1 EA

CLEAR AND GRUB 12" CONIFEROUS TREE

STA 42+94.2 - 19.3' RT 1 EA

CLEAR AND GRUB 12" CONIFEROUS TREE TOTALS 1 EA

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Rapid City Growth Management Department



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Scale: AS SHOWN

Designed By: RLM Drawn By: DRS

Design Date: SEPT 2009 Print Date: 10-9-09

Internal Job No: J08-133

Surveyed By: SLAJUB Survey Date: FEB 2009

Revisions:

JACKSON SPRINGS WATER TRANSMISSION MAINS

JACKSON BOULEVARD WATER PLAN & PROFILE

STA 37+40 - 43+00

24 of 43

HIGH LEVEL WATER MAIN NOTES

- STA 43+08.1 - 3.0' RT 20" STEEL DEFLECTION.
- STA 43+08.1 - 3.0' RT TO STA 44+41.4 - 3.0' RT INSTALL 133.7 LF - 20" STEEL WATER MAIN.
- STA 44+41.4 - 3.0' RT INSTALL 20" GATE VALVE.
- STA 44+44.4 - 3.0' RT INSTALL 20" X 20" X 16" X 6" CROSS.
- STA 44+44.4 - 0.0' LT INSTALL 16" GATE VALVE.
- STA 44+44.4 - 3.0' RT TO STA 44+44.5 - 8.0' RT INSTALL 5 LF - 6" PVC WATER MAIN.
- STA 44+44.5 - 8.0' RT INSTALL FIRE HYDRANT WITH AUXILIARY VALVE.
- STA 44+44.4 - 3.0' RT TO STA 44+50.4 - 3.0' RT INSTALL 6.0 LF - 20" STEEL WATER MAIN.
- STA 44+50.4 - 3.0' RT INSTALL 20" GATE VALVE.
- STA 44+50.4 - 3.0' RT TO STA 44+52.9 - 3.0' RT INSTALL 2.5 LF - 20" STEEL WATER MAIN.
- STA 44+52.9 - 3.0' RT 20" STEEL DEFLECTION.
- STA 44+52.9 - 3.0' RT TO STA 44+89.5 - 3.0' RT INSTALL 39.1 LF - 20" STEEL WATER MAIN.

HIGH LEVEL WATER MAIN NOTES

- STA 44+89.5 - 3.0' RT INSTALL 20" X 20" X 12" X 8" CROSS.
- STA 44+89.5 - 3.0' RT TO STA 44+93.3 - 3.0' RT INSTALL 3.8 LF - 20" STEEL WATER MAIN.
- STA 44+93.3 - 3.0' RT INSTALL 20" GATE VALVE.
- STA 44+93.3 - 3.0' RT TO STA 44+98.0 - 3.0' RT INSTALL 4.5 LF - 20" STEEL WATER MAIN.
- STA 44+98.0 - 3.0' RT 20" STEEL DEFLECTION.
- STA 44+98.0 - 3.0' RT TO STA 45+06.6 - 3.0' RT INSTALL 10 LF - 33" STEEL CASING.
- STA 44+98.0 - 3.0' RT TO STA 46+33.7 - 3.0' RT INSTALL 135.9 LF - 20" STEEL WATER MAIN.
- STA 46+33.7 - 3.0' RT 20" STEEL DEFLECTION.
- STA 46+33.7 - 3.0' RT TO STA 48+16.9 - 3.0' RT INSTALL 184.2 LF - 20" STEEL WATER MAIN.
- STA 48+16.9 - 3.0' RT 20" STEEL DEFLECTION.
- STA 48+16.9 - 3.0' RT TO STA 48+56.9 - 3.0' RT INSTALL 41.1 LF - 20" STEEL WATER MAIN.

HIGH LEVEL WATER MAIN NOTES

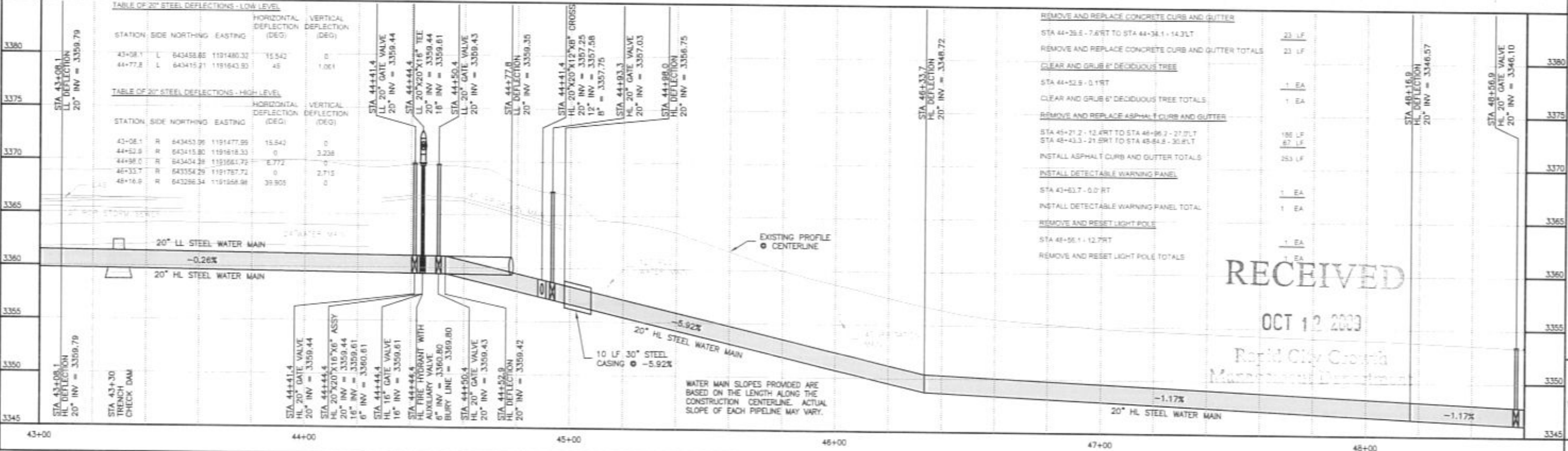
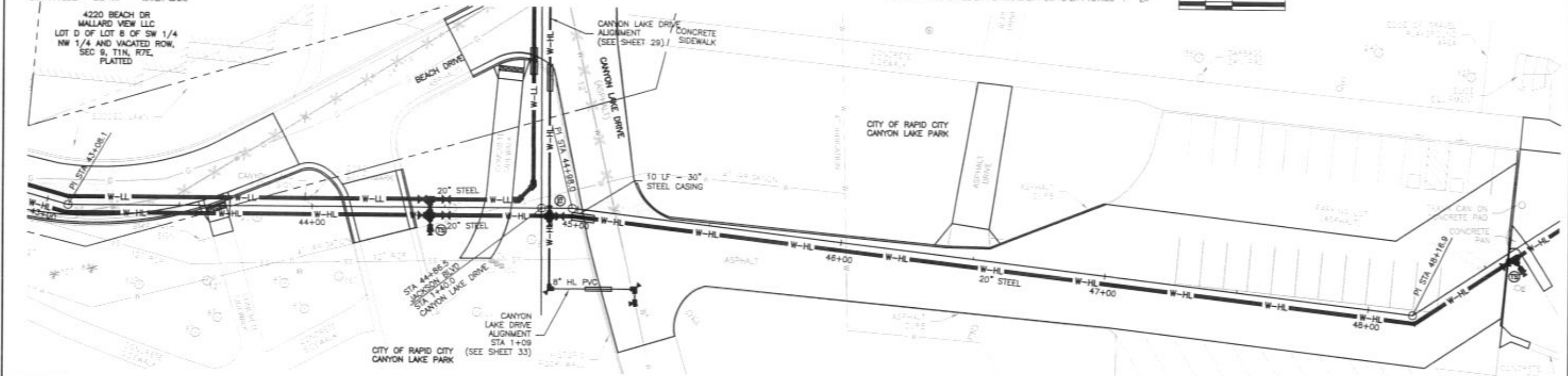
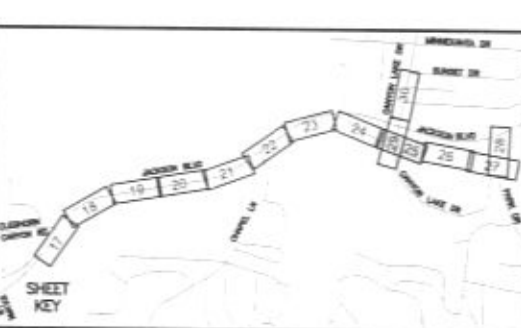
- STA 48+56.9 - 3.0' RT INSTALL 20" GATE VALVE.
 - STA 48+56.9 - 3.0' RT TO STA 48+60.8 - 3.0' RT INSTALL 3.9 LF - 20" STEEL WATER MAIN.
- LOW LEVEL WATER MAIN NOTES
- STA 43+08.1 - 3.0' LT INSTALL 20" STEEL DEFLECTION.
 - STA 43+08.1 - 3.0' LT TO STA 44+41.4 - 3.0' LT INSTALL 132.9 LF - 20" STEEL WATER MAIN.
 - STA 44+41.4 - 3.0' LT INSTALL 20" GATE VALVE.
 - STA 44+44.4 - 3.0' LT INSTALL 20" X 20" X 16" TEE.
 - STA 44+44.4 - 3.0' LT TO STA 44+50.4 - 3.0' LT INSTALL 6.0 LF - 20" STEEL WATER MAIN.
 - STA 44+50.4 - 3.0' LT INSTALL 20" GATE VALVE.
 - STA 44+50.4 - 3.0' LT TO STA 44+77.8 - 3.0' LT INSTALL 27.4 LF - 20" STEEL WATER MAIN.
 - STA 44+77.8 - 3.0' LT INSTALL 20" STEEL DEFLECTION.

REMOVE ASPHALT PAVEMENT

- STA 44+18.1 - 13.2RT TO STA 44+31.5 - 13.6LT
 - STA 44+35.4 - 51.4LT TO STA 48+44.8 - 19.0RT
 - STA 48+43.5 - 66.4LT TO STA 48+54.6 - 11.9LT
- REMOVE ASPHALT PAVEMENT TOTALS
- | | | | |
|------|----|-----|-----|
| 50 | SY | 15 | TON |
| 2112 | SY | 894 | TON |
| 95 | SY | 11 | TON |
| 2257 | SY | 920 | TON |
- REMOVE AND RESET SIGN
- | | |
|---|----|
| 1 | EA |
| 1 | EA |
| 1 | EA |
| 3 | EA |
- REMOVE AND REPLACE CONCRETE SIDEWALK
- | | |
|-----|----|
| 102 | SF |
| 102 | SF |
- REMOVE AND REPLACE CONCRETE SIDEWALK TOTALS
- | | |
|---|----|
| 1 | EA |
| 1 | EA |
| 1 | EA |
| 1 | EA |
- CLEAR AND GRUB 20" DECIDUOUS TREE
- | | |
|---|----|
| 1 | EA |
| 1 | EA |
| 1 | EA |
| 1 | EA |
- REMOVE AND SALVAGE CITY OF RAPID CITY BM TO CITY
- | | |
|---|----|
| 1 | EA |
| 1 | EA |
- REMOVE AND SALVAGE CITY OF RAPID CITY BM TO CITY TOTALS
- | | |
|---|----|
| 1 | EA |
| 1 | EA |

TABLE OF THRUST BLOCKS

STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SQ FT)	MINIMUM CONCRETE VOL (CY)
36+00.0	R	6" FIRE HYDRANT	13.3	0.5



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OCT 12 2009
Rapid City Growth
Management Department

Public Works Department
Engineering Division

Burns & McDonnell
SINCE 1918

FEC Ferber Engineering Company, Inc.

Scale: AS SHOWN

Designed By: RLM
Drawn By: DRB

Design Date: SEPT 2009
Print Date: 10-6-09

Internal Job No: J08-133

Reviewed By: SLAUB
Survey Date: FEB 2009

NOT FOR CONSTRUCTION

JACKSON SPRINGS WATER
TRANSMISSION MAINS

Sheet Title: JACKSON BOULEVARD WATER PLAN & PROFILE
STA 43+00 - 48+60

25 of 43

HIGH LEVEL WATER MAIN NOTES

STA 48+60.9 - 3.0' RT	INSTALL 20" X 20" X 6" TEE
STA 48+60.9 - 3.0' RT TO STA 48+60.9 - 8.0' RT	INSTALL 5.0 LF - 6" PVC WATER MAIN
STA 48+60.9 - 8.0' RT	INSTALL FIRE HYDRANT WITH AUXILIARY VALVE
STA 48+60.9 - 3.0' RT TO STA 50+48.7 - 3.0' RT	INSTALL 185.7 LF - 20" STEEL WATER MAIN
STA 50+01.0 - 3.0' RT TO STA 50+25.0 - 3.0' RT	INSTALL 24 LF - 33" STEEL CASING
STA 50+47.6 - 3.0' RT	20" STEEL DEFLECTION
STA 50+47.6 - 3.0' RT TO STA 55+34.9 - 3.0' RT	INSTALL 486.7 LF - 20" STEEL WATER MAIN
STA 54+19.8 - 7.8' LT TO STA 54+23.7 - 13.8' RT	ENCASE 22 LF - 8" SANITARY SEWER MAIN

REMOVE AND REPLACE CONCRETE PAN

STA 48+61.4 - 1.0' LT TO STA 48+67.2 - 18.0' RT	12 SY
REMOVE AND REPLACE CONCRETE PAN TOTALS	12 SY

CLEAR AND GRUB 10" DECIDUOUS TREE

STA 48+91.2 - 8.3' RT	1 EA
CLEAR AND GRUB 10" DECIDUOUS TREE TOTALS	1 EA

REMOVE AND REPLACE CONCRETE SIDEWALK

STA 48+84.8 - 30.8' LT TO STA 50+80.7 - 31.8' LT	2205 SF
REMOVE AND REPLACE CONCRETE SIDEWALK TOTALS	2205 SF

REMOVE AND RESET TRASH CAN ON CONCRETE PAD

STA 48+74.1 - 12.5' LT	1 EA
REMOVE AND RESET TRASH CAN ON CONCRETE PAD TOTAL	1 EA

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Rapid City Growth Management Department

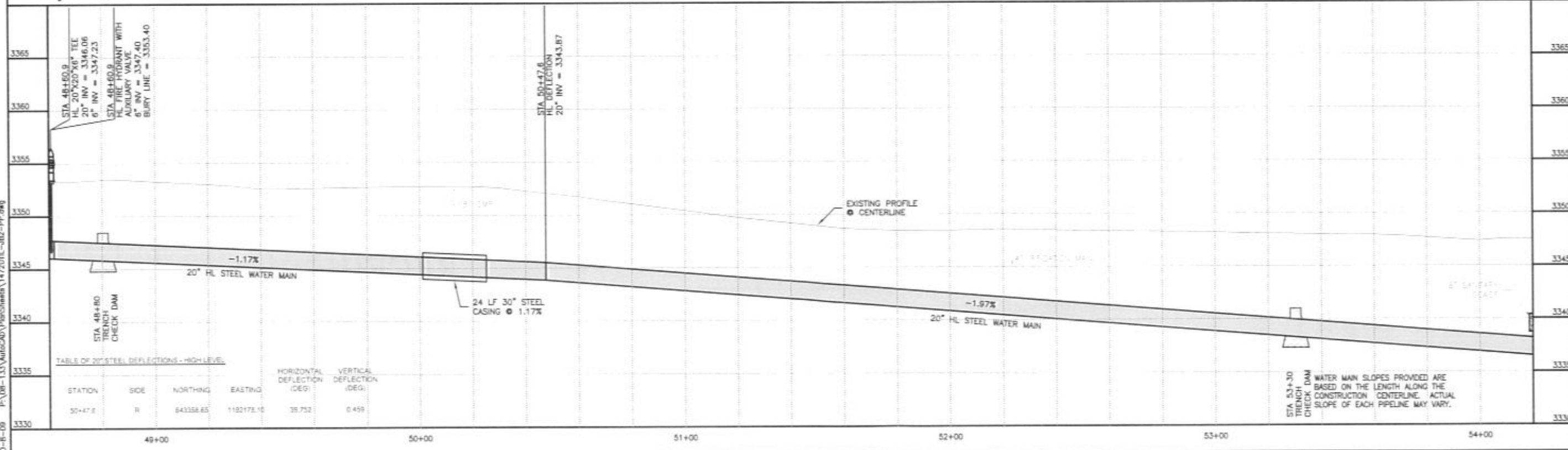
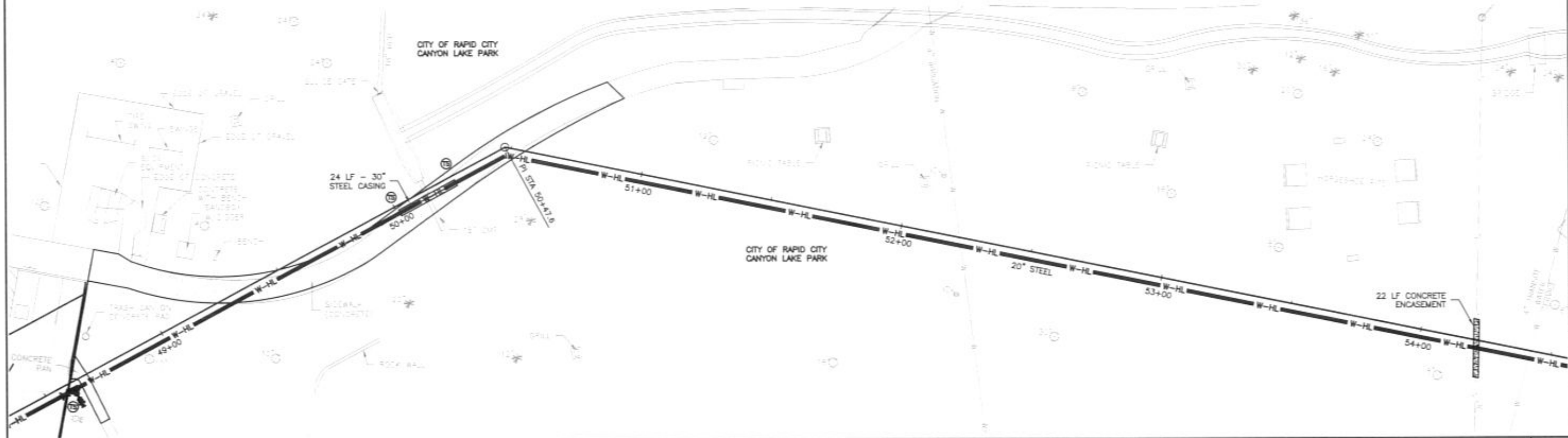
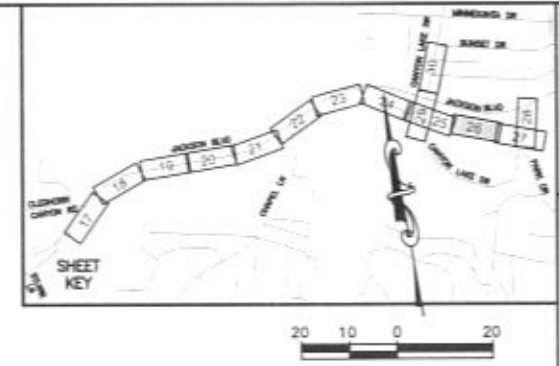


TABLE OF 20" STEEL DEFLECTIONS - HIGH LEVEL

STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
50+47.6	R	643358.65	1182178.10	35.752	0.459

WATER MAIN SLOPES PROVIDED ARE BASED ON THE LENGTH ALONG THE CONSTRUCTION CENTERLINE. ACTUAL SLOPE OF EACH PIPELINE MAY VARY.

JACKSON SPRINGS WATER TRANSMISSION MAINS

JACKSON BOULEVARD
WATER PLAN & PROFILE
STA 48+60 - 54+20
26 of 43

HIGH LEVEL WATER MAIN NOTES

STA 55+34.9 - 3.0' RT	20" STEEL DEFLECTION.
STA 55+34.9 - 3.0' RT TO STA 55+79.5 - 3.0' RT	INSTALL 45.1 LF - 20" STEEL WATER MAIN.
STA 55+79.5 - 3.0' RT	INSTALL 20" GATE VALVE.
STA 55+81.9 - 3.0' RT	INSTALL 20" X 20" X 6" TEE.
STA 55+81.9 - 3.0' RT TO STA 55+81.9 - 8.0' RT	INSTALL 5.0 LF - 6" PVC WATER MAIN.
STA 55+81.9 - 8.0' RT	INSTALL FIRE HYDRANT WITH AUXILIARY VALVE.
STA 55+81.9 - 3.0' RT TO STA 56+99.6 - 3.0' RT	INSTALL 117.7 LF - 20" STEEL WATER MAIN.
STA 56+99.6 - 3.0' RT	20" STEEL DEFLECTION.
STA 56+99.6 - 3.0' RT TO STA 56+02.5 - 3.0' RT	INSTALL 102.9 LF - 20" STEEL WATER MAIN.
STA 57+04.4 - 3.0' RT TO STA 56+00.4 - 3.0' RT	INSTALL 96.0 LF - 30" STEEL CASING.
STA 58+02.5 - 3.0' RT	INSTALL 20" GATE VALVE.
STA 58+05.4 - 3.0' RT	INSTALL 20" X 20" X 20" TEE.

REMOVE AND REPLACE CONCRETE SIDEWALK

STA 55+24.0 - 27.0 LT TO STA 55+90.5 - 0.1 LT	456	SF
REMOVE AND REPLACE CONCRETE SIDEWALK TOTALS	456	SF

REMOVE AND RELOCATE LIGHT POLE WITH CONCRETE FOUNDATION

STA 55+86.6 - 7.5 RT	1	EA
REMOVE LIGHT POLE WITH CONCRETE FOUNDATION TOTALS	1	EA

REMOVE AND RESET TRASH CAN ON CONCRETE PAD

STA 56+44.7 - 9.0' RT	1	EA
REMOVE AND RESET TRASH CAN ON CONCRETE PAD TOTAL	1	EA

INSTALL DETECTABLE WARNING PANEL

STA 55+90.1 - 4.8 LT	1	EA
INSTALL DETECTABLE WARNING PANEL TOTAL	1	EA

REMOVE AND RESET SIGN

STA 55+87.3 - 3.9 RT	1	EA
REMOVE AND RESET SIGN TOTALS	1	EA

REMOVE AND REPLACE ASPHALT CURB AND GUTTER

STA 55+88.8 - 19.0 RT TO STA 57+13.9 - 21.3 LT	164	LF
STA 56+55.9 - 19.0 RT TO STA 56+77.0 - 19.0 RT	70	LF
REMOVE AND REPLACE ASPHALT CURB AND GUTTER TOTALS	234	LF

REMOVE AND REPLACE ASPHALT PAVEMENT

STA 55+89.3 - 19.0 RT TO STA 57+13.9 - 21.3 LT	REMOVE 503	ASPHALT 142	BASE COURSE 170
REMOVE AND REPLACE ASPHALT PAVEMENT TOTALS	503	142 TON	170 TON

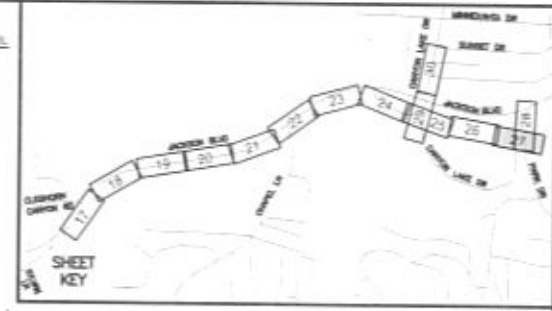
REMOVE AND REPLACE CONCRETE CURB AND GUTTER

STA 58+00.4 - 8.0 LT TO STA 58+00.4 - 8.0 RT	16	LF
REMOVE AND REPLACE CONCRETE CURB AND GUTTER TOTALS	16	LF

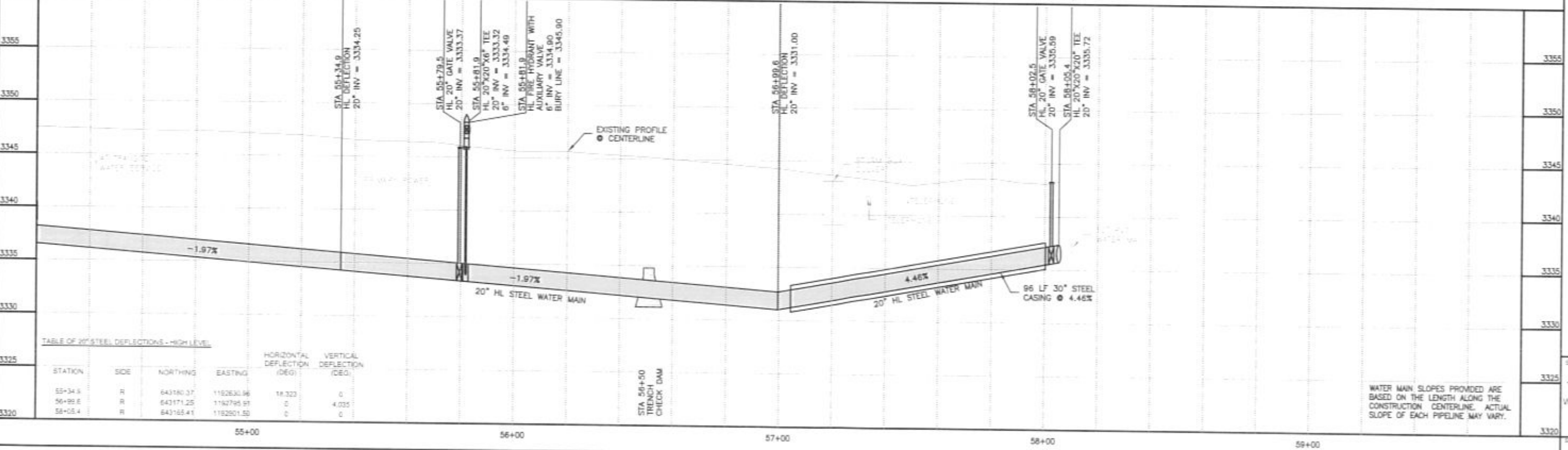
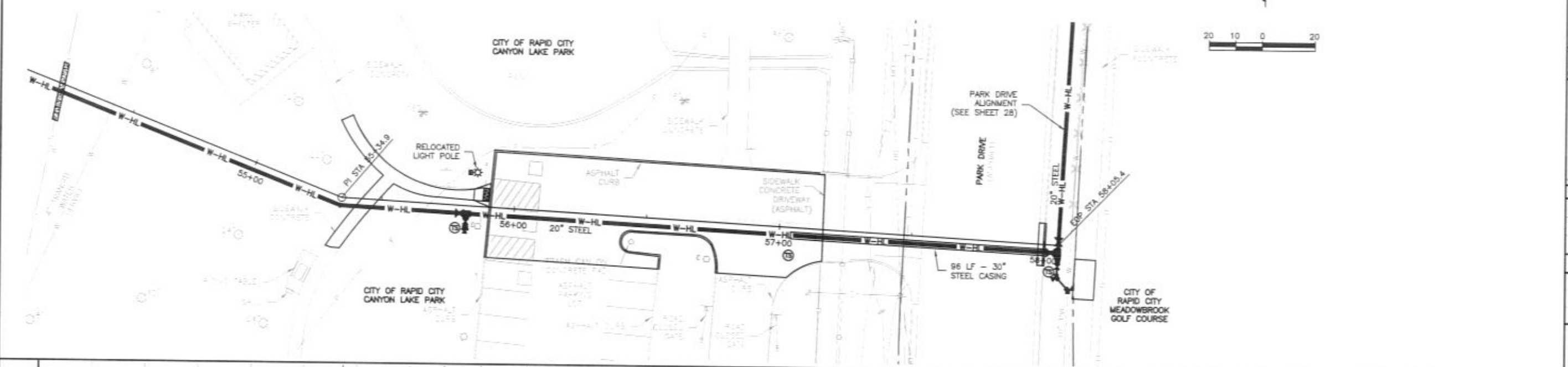
TABLE OF THRUST BLOCKS

STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SQ FT)	MINIMUM CONCRETE VOL (CY)
48+80.8	R	6" FIRE HYDRANT	13.3	0.5

RECEIVED
 OCT 17 2009
 Rapid City Growth Management Department



Prepared For: Public Works Department
 Burns & McDonnell SINCE 1991
 Prepared By: Ferber Engineering Company, Inc.
 F&E CONSULTING ENGINEERS SINCE 1971



JACKSON SPRINGS WATER TRANSMISSION MAINS

Scale: AS SHOWN
 Designed By: RLM
 Drawn By: DRS
 Design Date: SEPT 2008
 Plot Date: 10-6-09
 Internal Job No: J08-133
 Surveyed By: SLAUB
 Survey Date: FEB 2009

Sheet Title: JACKSON BOULEVARD WATER PLAN & PROFILE
 STA 54+20 - 59+00

27 of 43

HIGH LEVEL WATER MAIN NOTES

STA 1+37.2 - 4.6' RT	INSTALL 10" 45 DEG BEND. TIE TO EXISTING.
STA 1+37.2 - 4.6' RT TO STA 1+41.8 - 0.0' RT	INSTALL 7 LF - 10" PVC WATER MAIN.
STA 1+41.8 - 0.0' RT	INSTALL 10" 45 DEG BEND.
STA 1+41.8 - 0.0' RT TO STA 1+45.9 - 0.0' RT	INSTALL 4 LF - 10" PVC WATER MAIN.
STA 1+45.9 - 0.0' RT	INSTALL 10" GATE VALVE
STA 1+49.2 - 0.0' RT	INSTALL 20" X 10" REDUCER.
STA 1+55.2 - 0.0' RT	INSTALL 20" GATE VALVE.
STA 1+55.2 - 0.0' RT TO STA 3+13.0 - 0.0' RT	INSTALL 157.8 LF - 20" STEEL WATER MAIN.
STA 3+13.0 - 0.0' RT	INSTALL 20" X 20" X 6" TEE.
STA 3+13.0 - 0.0' RT TO STA 3+13.0 - 5.0' RT	INSTALL 5 LF - 6" PVC WATER MAIN.
STA 3+13.0 - 5.0' RT	INSTALL FIRE HYDRANT WITH AUXILIARY VALVE.

HIGH LEVEL WATER MAIN NOTES

STA 3+13.0 - 0.0' RT TO STA 4+55.2 - 0.0' RT	INSTALL 142.2 LF - 20" STEEL WATER MAIN.
STA 4+55.2 - 0.0' RT	20" STEEL DEFLECTION.
STA 4+55.2 - 0.0' RT TO STA 4+82.8 - 0.0' RT	INSTALL 27.6 LF - 20" STEEL WATER MAIN.
STA 4+82.8 - 0.0' RT	INSTALL 20" X 20" X 12" TEE.
STA 4+82.8 - 0.0' RT TO STA 4+82.8 - 3.5' RT	INSTALL 4 LF - 12" PVC WATER MAIN.
STA 4+82.8 - 3.5' RT	INSTALL 12" 45 DEG BEND.
STA 4+82.8 - 3.0' RT TO STA 4+92.9 - 13.5' RT	INSTALL 14 LF - 12" PVC WATER MAIN.
STA 4+92.9 - 13.5' RT	INSTALL 12" DEFLECTION COUPLING. TIE TO EXISTING.
STA 4+85.5 - 0.0' RT	INSTALL 20" CAP.

REMOVE AND REPLACE CONCRETE SIDEWALKS

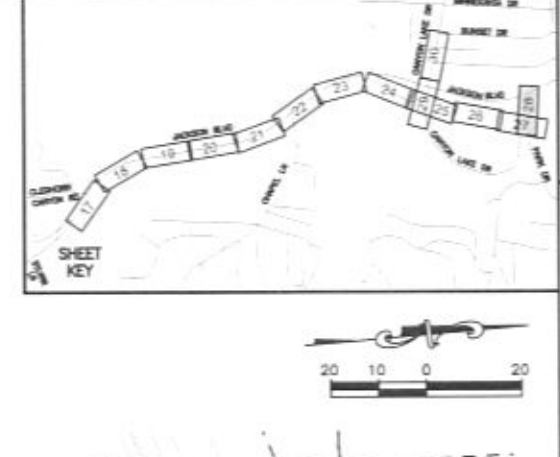
STA 1+34.2 - 14.5' RT TO STA 1+49.2 - 6.7' RT	119 SF
STA 2+83.3 - 15.7' RT TO STA 3+07.9 - 5.2' LT	272 SF
STA 4+67.8 - 11.5' RT TO STA 5+08.3 - 23.1' RT	362 SF
REMOVE AND REPLACE CONCRETE SIDEWALK TOTALS	753 SF

INSTALL DETECTABLE WARNING PANEL

STA 3+01.8 - 4.8' LT	1 EA
INSTALL DETECTABLE WARNING PANEL TOTAL	1 EA

TABLE OF THRUST BLOCKS

STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SF)	MINIMUM CONCRETE VOL (CY)
1+37.2	R	10" 45 DEG BEND	0	0
1+41.8	L	10" 45 DEG BEND	0	0
3+13.0	R	6" FIRE HYDRANT	10.2	0.25



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Rapid City Growth Management Department

Project for: Public Works Department

City of Rapid City

Engineering Division

Burns & McDonnell SINCE 1898

FEC Ferber Engineering Company, Inc.

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Scale: AS SHOWN

Designed By: RLM Drawn By: DRS

Design Date: SEPT 2008 Print Date: 10-8-09

Internal Job No: J08-133

Submitted By: SLAJUB Review Date: FEB 2009

Revisions:

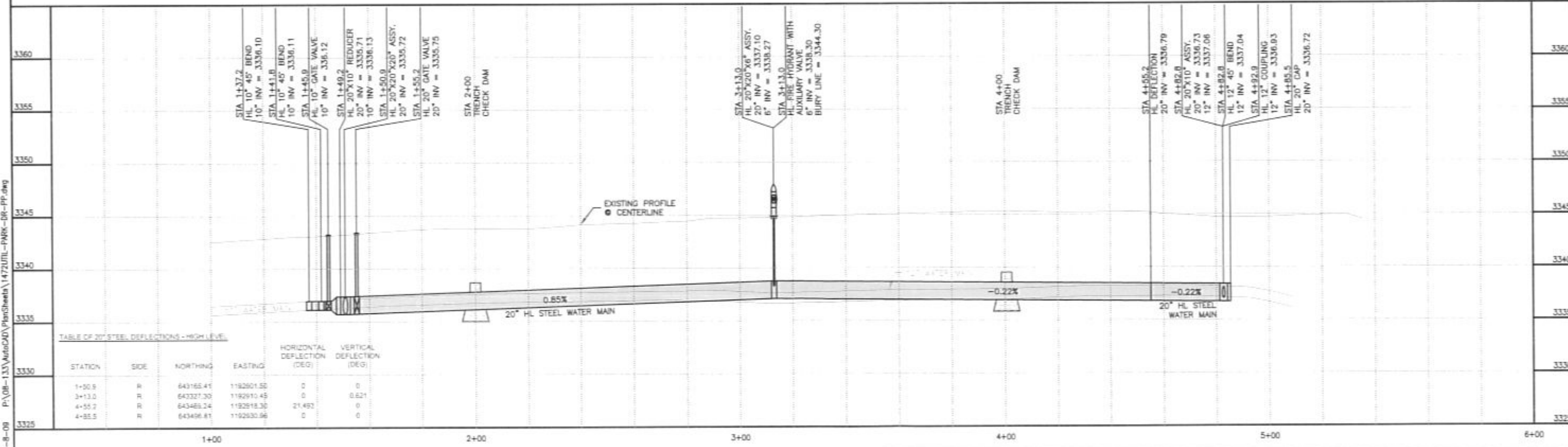
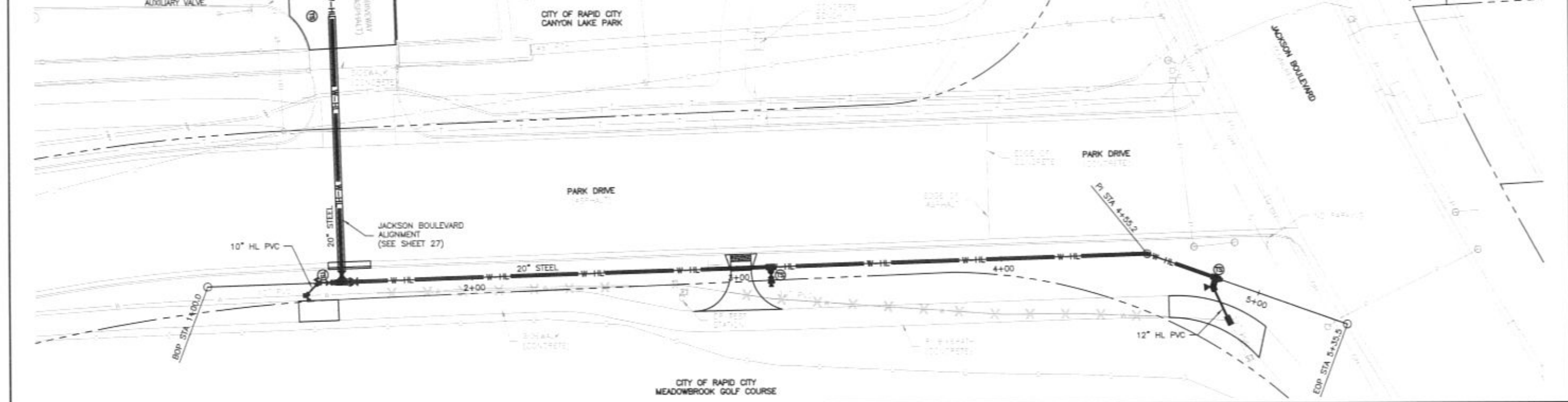


TABLE OF 20" STEEL DEFLECTIONS - HIGH LEVEL

STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
1+00.9	R	643165.41	1192901.50	0	0
3+13.0	R	643327.30	1192910.45	0	0.621
4+55.2	R	643489.24	1192918.30	21.492	0
4+85.5	R	643496.81	1192930.96	0	0

JACKSON SPRINGS WATER TRANSMISSION MAINS

Sheet Title: PARK DRIVE WATER PLAN & PROFILE STA 1+00 - 5+35.5

Sheet: 28 of 43

HIGH LEVEL WATER MAIN NOTES

- STA 1+09.7 - 3.0' RT
- STA 1+09.7 - 3.0' RT TO STA 1+37.0 - 3.0' RT
- STA 1+34.2 - 3.0' RT
- STA 1+41.9 - 3.0' RT
- STA 1+41.9 - 3.0' RT TO STA 2+80.3 - 3.0' RT
- STA 1+84.1 - 3.0' RT TO STA 1+94.1 - 3.0' RT
- STA 2+80.3 - 3.0' RT
- STA 2+80.3 - 3.0' RT TO STA 3+00.1 - 3.0' RT
- STA 3+00.1 - 3.0' RT
- STA 3+00.1 - 3.0' RT TO STA 3+89.8 - 3.0' RT
- STA 3+25.0 - 3.0' RT TO STA 3+45.0 - 3.0' RT
- STA 3+89.8 - 3.0' RT
- STA 3+89.8 - 3.0' RT TO STA 4+19.8 - 3.0' RT
- STA 4+19.8 - 3.0' RT
- STA 4+19.8 - 3.0' RT TO STA 6+01.3 - 3.0' RT

LOW LEVEL WATER MAIN NOTES

- INSTALL 8" 90 DEG BEND.
- INSTALL 24 LF - 8" PVC WATER MAIN.
- INSTALL 8" GATE VALVE.
- INSTALL 12" GATE VALVE.
- INSTALL 140 LF - 12" PVC WATER MAIN.
- INSTALL 10 LF - 24" STEEL CASING.
- INSTALL 12" X 12" X 6" TEE.
- INSTALL 20 LF - 12" PVC WATER MAIN.
- INSTALL 12" GATE VALVE.
- INSTALL 90 LF - 12" PVC WATER MAIN.
- INSTALL 12" X 12" CROSS.
- INSTALL 30 LF - 12" PVC WATER MAIN.
- INSTALL 12" GATE VALVE.
- INSTALL 182 LF - 12" PVC WATER MAIN.

LOW LEVEL WATER MAIN NOTES

- INSTALL 8.0 LF - 20" STEEL WATER MAIN.
- INSTALL 20" STEEL DEFLECTION.
- INSTALL 127.6 LF - 20" STEEL WATER MAIN.
- INSTALL 10 LF - 33" STEEL CASING.
- INSTALL 20" X 20" X 6" TEE.
- INSTALL 53.8 LF - 20" STEEL WATER MAIN.
- INSTALL 65.4 LF - 20" STEEL WATER MAIN.
- INSTALL 20" STEEL DEFLECTION.
- INSTALL 14.9 LF - 20" STEEL WATER MAIN.

REMOVE AND REPLACE CONCRETE CURB AND GUTTER

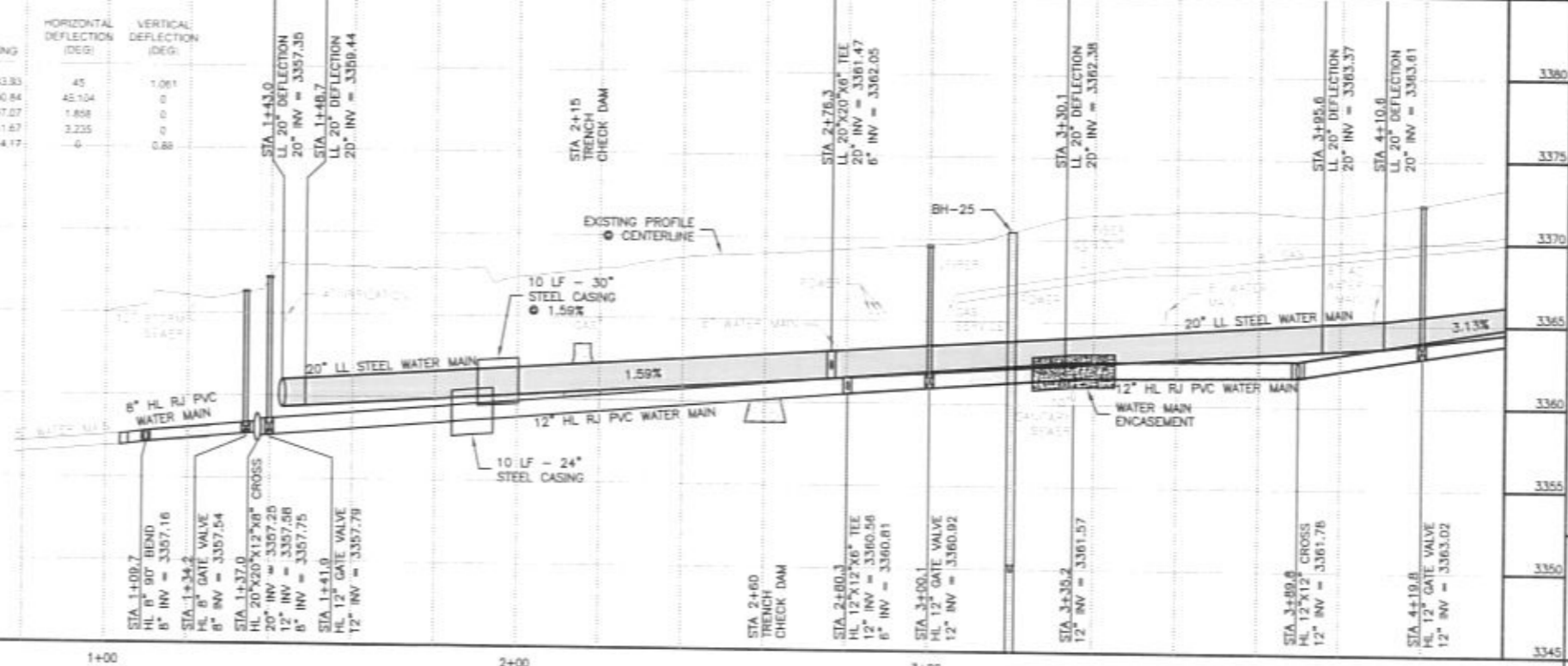
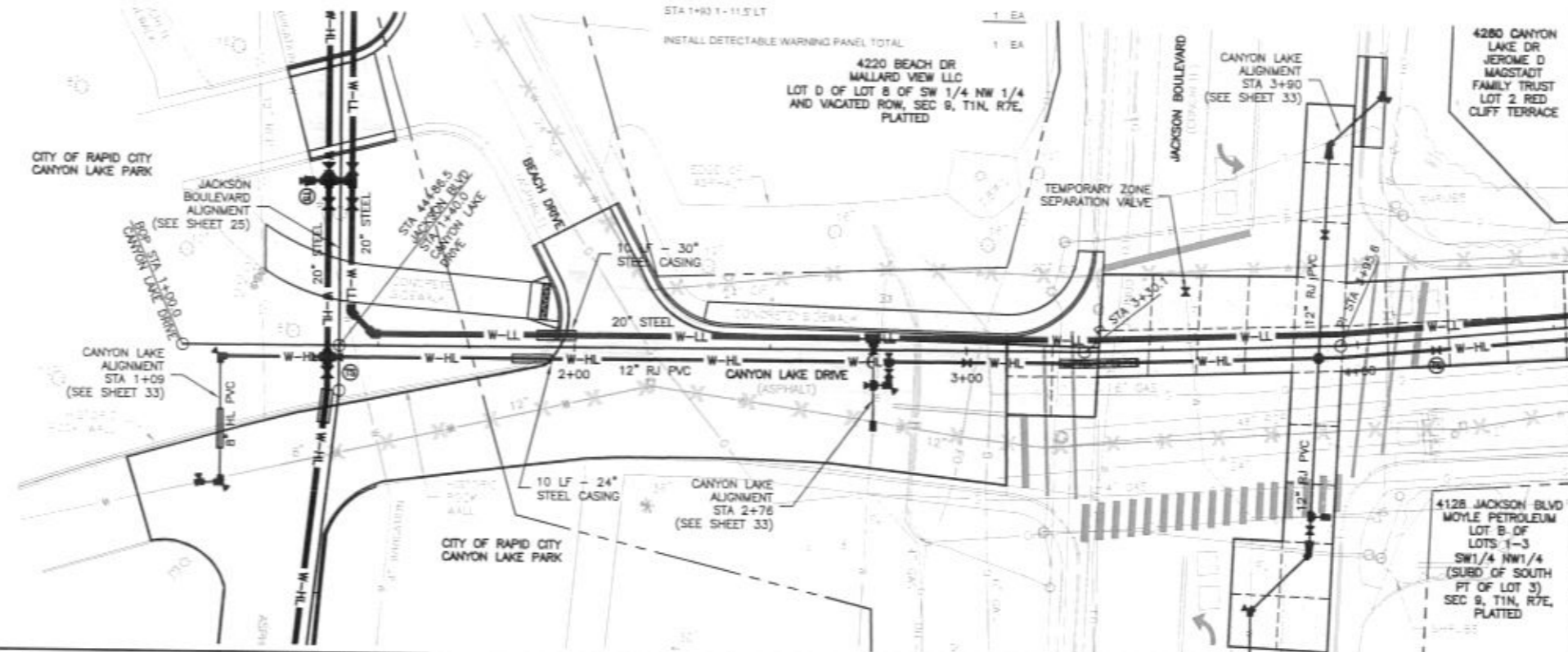
- STA 1+89.1 - 25.8' LT TO STA 1+94.9 2.4' LT 25 LF
- STA 2+11.1 - 37.1' LT TO STA 3+10.4 - 4.4' LT 117 LF
- STA 4+05.6 - 80.2' LT TO STA 4+08.8 - 73.1' LT 24 LF
- REMOVE AND REPLACE CONCRETE CURB AND GUTTER TOTAL 166 LF
- REMOVE AND REPLACE CONCRETE FILLET
- STA 3+10.4 - 4.4' LT TO STA 3+35.8 - 25.5' LT 25 SF
- REMOVE AND REPLACE CONCRETE FILLET TOTAL 25 SF
- REMOVE AND REPLACE CONCRETE PAVEMENT
- STA 3+10.4 - 1.9' LT TO STA 4+63.3 - 13.5' RT 1083 SY
- REMOVE AND REPLACE CONCRETE PAVEMENT 1083 SY
- INSTALL DETECTABLE WARNING PANEL
- STA 1+93.1 - 11.5' LT 1 EA
- INSTALL DETECTABLE WARNING PANEL TOTAL 1 EA

TABLE OF THRUST BLOCKS

STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SF)	MINIMUM CONCRETE VOL (CY)
1+09.7	R	8" 90 DEG BEND	17.4	0.48
2+80.3	R	12" X 12" X 6" TEE	5.1	0.15

TABLE OF 20" STEEL DEFLECTIONS - LOW LEVEL

STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
1+43.0	L	643415.21	1191643.33	45	1.061
1+48.7	L	643419.23	1191650.84	45.104	0
3+30.2	L	643594.63	1191657.07	1.888	0
3+95.5	L	643656.37	1191711.67	2.235	0
4+10.6	L	643673.05	1191714.17	6	0.88



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Public Works Department
City of Rapid City
Burns & McDonnell
Ferber Engineering Company, Inc.
Scale: AS SHOWN
Designed By: RLM
Checked By: DRG
Design Date: SEPT 2009
Issue Date: 10-8-09
Internal Job No: J05-133
Submitted By: SLAUB
Survey Date: FEB 2009
Revisions:
JACKSON SPRINGS WATER TRANSMISSION MAINS
CANYON LAKE DRIVE WATER PLAN & PROFILE
Sheet 29 of 43

HIGH LEVEL WATER MAIN NOTES

STA 5+99.4 - 3.0' RT
 STA 5+99.4 - 3.0' RT TO STA 5+99.4 - 20.0' LT
 STA 5+99.4 - 20.0' LT TO STA 6+01.0 - 25.0' LT
 STA 6+01.3 - 3.0' RT
 STA 6+01.3 - 3.0' RT TO STA 6+04.6 - 3.0' RT
 STA 6+04.6 - 3.0' RT
 STA 6+04.6 - 0.0' LT
 STA 6+04.6 - 3.0' RT TO STA 6+04.6 - 0.0' LT
 STA 6+04.6 - 3.0' RT TO STA 6+09.7 - 3.0' RT

INSTALL 2" TAPPING SADDLE AND CORP STOP.
 INSTALL 23 LF - 2" COPPER WATER SERVICE AND CURB STOP.
 INSTALL 7 LF - 2" COPPER WATER SERVICE AND RECONNECT.
 INSTALL 12" GATE VALVE.
 INSTALL 3 LF - 12" PVC WATER MAIN.
 INSTALL 12" X 12" X 12" TEE.
 INSTALL 12" GATE VALVE.
 INSTALL 3 LF - 12" PVC WATER MAIN.
 INSTALL 5 LF - 12" PVC WATER MAIN.

HIGH LEVEL WATER MAIN NOTES

STA 6+09.7 - 3.0' RT
 STA 6+09.7 - 3.0' RT TO STA 6+28.6 - 3.0' RT
 STA 6+42.0 - 3.0' RT
 STA 6+42.0 - 3.0' RT TO STA 6+46.1 - 4.8' RT
 STA 6+46.1 - 4.8' RT TO STA 6+53.1 - 7.9' RT
 STA 6+53.1 - 7.9' RT

INSTALL 12" GATE VALVE.
 INSTALL 32 LF 12" PVC WATER MAIN.
 INSTALL 12" 22.5" BEND.
 INSTALL 13 LF - 12" PVC WATER MAIN.
 INSTALL 8 LF - 12" PVC WATER MAIN.
 INSTALL 12" 22.5" BEND. TIE TO EXISTING.

LOW LEVEL WATER MAIN NOTES

STA 5+41.2 - 3.0' LT
 STA 5+41.2 - 3.0' LT TO STA 6+01.3 - 3.0' LT
 STA 6+01.3 - 3.0' LT
 STA 6+01.3 - 3.0' LT TO STA 6+04.6 - 3.0' LT
 STA 6+04.6 - 3.0' LT
 STA 6+04.6 - 0.0' LT TO STA 6+04.6 - 3.0' LT
 STA 6+04.6 - 3.0' LT TO STA 6+05.0 - 17.8' LT
 STA 6+05.0 - 17.8' LT
 STA 6+04.4 - 3.0' LT TO STA 6+09.4 - 3.0' LT

INSTALL 20" STEEL VERTICAL DEFLECTION.
 INSTALL 60.1 LF - 20" STEEL WATER MAIN.
 INSTALL 20" GATE VALVE.
 INSTALL 3.3 LF - 20" STEEL WATER MAIN.
 INSTALL 20" X 20" X 12" X 6" CROSS.
 INSTALL 3.0 LF - 12" PVC WATER MAIN.
 INSTALL 15 LF - 6" PVC WATER MAIN.
 INSTALL FIRE HYDRANT WITH AUXILIARY VALVE.
 INSTALL 4.9 LF - 20" STEEL WATER MAIN.

LOW LEVEL WATER MAIN NOTES

STA 6+09.4 - 3.0' LT
 STA 6+09.4 - 3.0' LT TO STA 6+45.7 - 3.0' LT
 STA 6+45.7 - 3.0' LT
 STA 6+45.7 - 3.0' LT TO STA 6+54.3 - 11.9' LT
 STA 6+54.3 - 11.9' LT
 STA 6+57.0 - 11.9' LT

INSTALL 20" GATE VALVE.
 INSTALL 36.2 LF - 20" STEEL WATER MAIN.
 INSTALL 20" STEEL DEFLECTION.
 INSTALL 12.4 LF - 20" STEEL WATER MAIN.
 INSTALL 20" STEEL DEFLECTION.
 INSTALL 20" X 18" REDUCER AND FLANGED COUPLING ADAPTER. TIE TO EXISTING.

REMOVE AND REPLACE CONCRETE CURB AND GUTTER

STA 5+94.8 - 12.9' LT TO STA 6+14.8 - 12.3' LT	25	LF
STA 6+44.2 - 11.4' LT TO STA 6+83.3 - 13.5' RT	117	LF
REMOVE AND REPLACE CONCRETE CURB AND GUTTER TOTAL	142	LF

REMOVE AND REPLACE CONCRETE SIDEWALK

STA 5+96.7 - 12.8' LT TO STA 6+08.0 - 18.9' T	87	SF
REMOVE AND REPLACE CONCRETE SIDEWALK TOTAL	87	SF

REMOVE AND REPLACE ASPHALT PAVEMENT

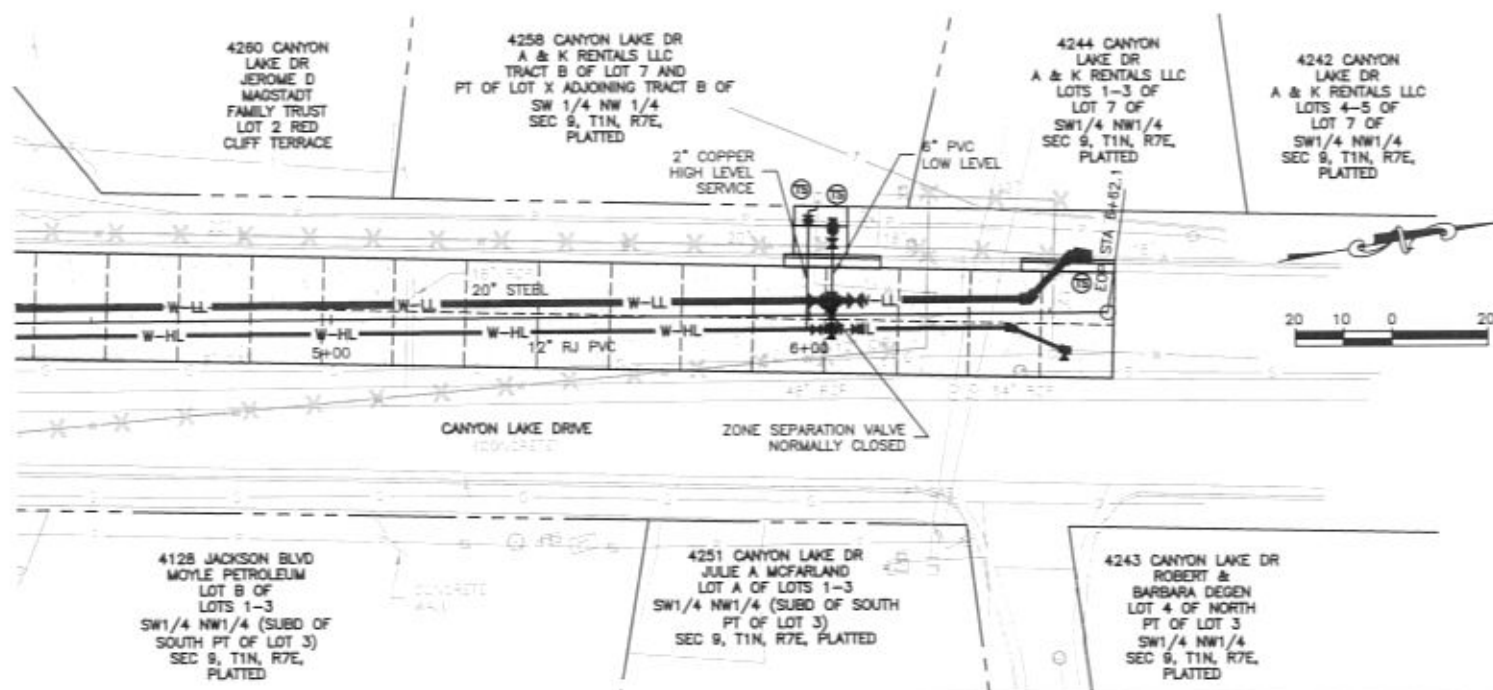
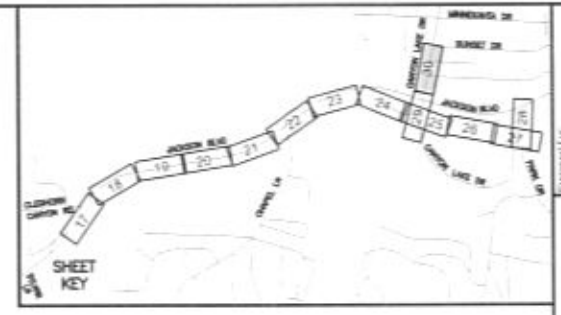
STA 5+96.9 - 18.8' LT TO STA 6+08.1 - 22.8' LT	REMOVE	ASPHALT	BASE COURSE
	5	2 TONS	2 TONS
REMOVE AND REPLACE ASPHALT PAVEMENT TOTALS	5	2 TONS	2 TONS

REMOVE AND RESET 18" RCP

STA 5+16.8 - 8.0' LT TO STA 5+16.5 - 8.0' RT	16	LF
REMOVE AND RESET 18" RCP TOTAL	16	LF

TABLE OF THRUST BLOCKS

STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SF)	MINIMUM CONCRETE VOL (CY)
6+04.4	R	12"x12"x12" TEE	0	0
6+05.0	L	6" FIRE HYDRANT	10.2	0.26
6+53.1	R	12" 22.5 DEG BEND	13.4	0.53



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Public Works Department
 Rapid City, South Dakota
 Engineering Division

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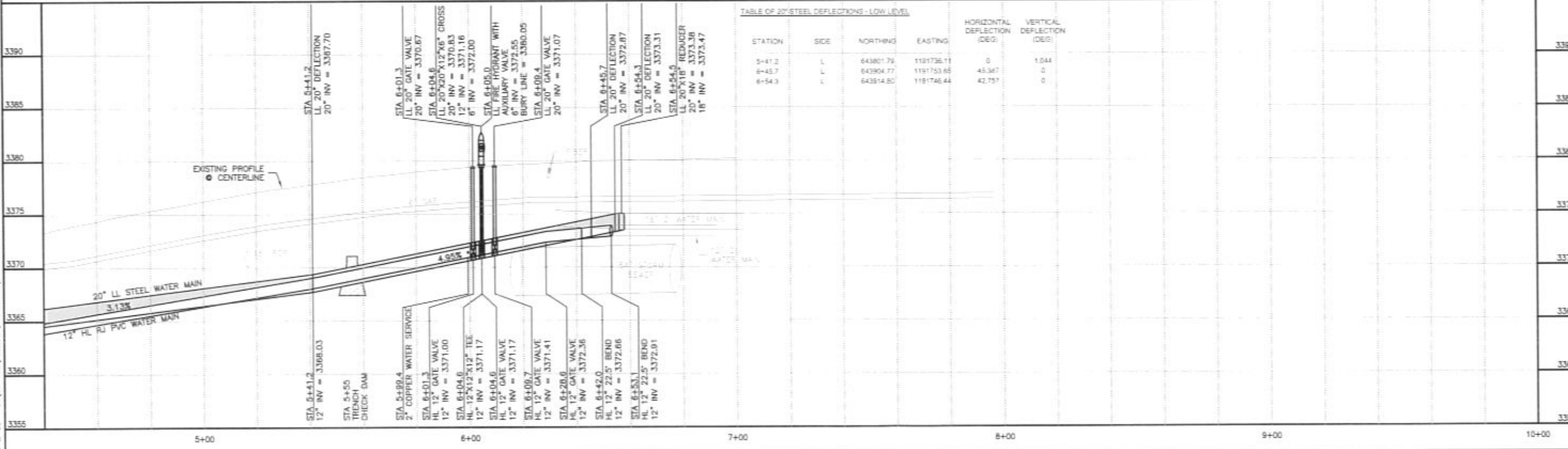
Ferber Engineering Company, Inc.

Scale: AS SHOWN
 Designed By: RLM
 Drawn By: DRS
 Design Date: SEPT 2009
 Print Date: 10-8-09
 Internal Job No: J08-133
 Surveyed By: SLA/JAB
 Survey Date: FEB 2008

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TABLE OF 20" STEEL DEFLECTIONS - LOW LEVEL

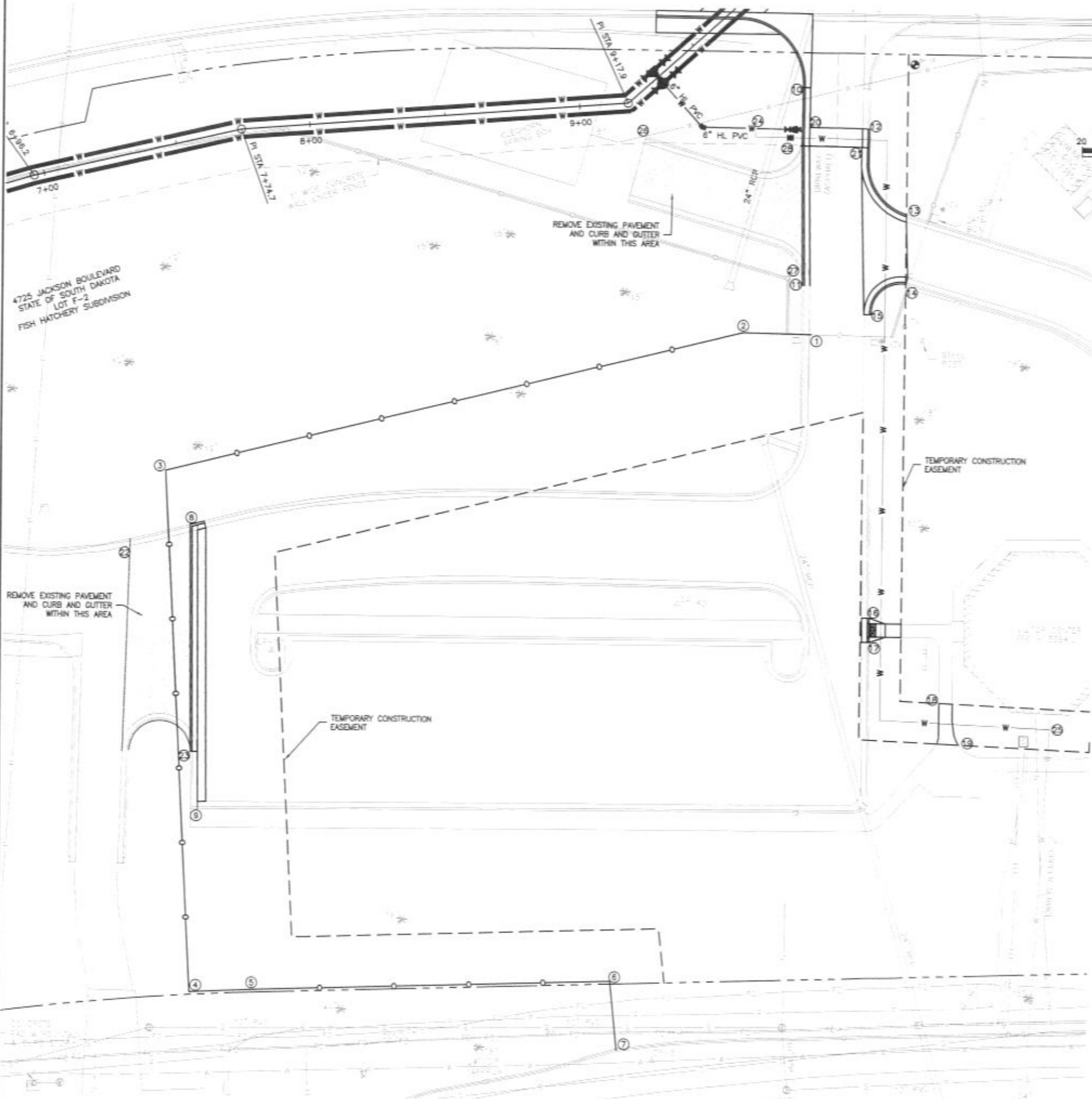
STATION	SIDE	NORTHING	EASTING	HORIZONTAL DEFLECTION (DEG)	VERTICAL DEFLECTION (DEG)
5+41.2	L	643801.79	1191735.11	0	1.044
6+45.7	F	643904.77	1191753.65	45.367	0
6+54.3	F	643914.80	1191746.44	42.757	0



JACKSON SPRINGS WATER TRANSMISSION MAINS

Sheet Title: CANYON LAKE DRIVE WATER PLAN & PROFILE
 STA 4+40 - 6+62.1

30 of 43



- | | |
|--|---|
| <p>1. N = 642662.22
E = 1188458.15
INSTALL 16 LF - FENCE.
TIE TO EXISTING.</p> <p>2. N = 642658.24
E = 1188433.31
INSTALL 220 LF - FENCE.</p> <p>3. N = 642568.63
E = 1188233.14
INSTALL 193 LF - FENCE.</p> <p>4. N = 642380.77
E = 1188276.44
INSTALL 24 LF - FENCE.</p> <p>5. N = 642386.00
E = 1188299.74
INSTALL 132 LF - FENCE.</p> <p>6. N = 642413.36
E = 1188428.85
INSTALL 26 LF - FENCE.</p> <p>7. N = 642388.96
E = 1188435.79
TIE TO EXISTING FENCE.</p> <p>8. N = 642550.54
E = 1188245.68
INSTALL 90 LF - CONCRETE C & G
T.C. ELEV. = 3385.49 +/-
MATCH EXISTING</p> <p>9. N = 642447.33
E = 1188264.68
END STR C & G
T.C. ELEV. = 3384.91
MATCH EXISTING</p> <p>10. N = 642751.72
E = 1188438.59
T.C. ELEV. = 3385.86
INSTALL 74 LF - CONCRETE C & G</p> <p>11. N = 642679.56
E = 1188451.73
T.C. ELEV. = 3384.02</p> <p>12. N = 642741.19
E = 1188465.54
T.C. ELEV. = 3386.20
REMOVE AND REPLACE 39 LF - CONCRETE C & G</p> <p>13. N = 642712.40
E = 1188485.34
T.C. ELEV. = 3384.03</p> <p>14. N = 642666.98
E = 1188489.11
REMOVE AND REPLACE 20 LF - CONCRETE C & G
T.C. ELEV. = 3383.84</p> | <p>15. N = 642673.67
E = 1188478.66
T.C. ELEV. = 3384.02</p> <p>16. N = 642563.15
E = 1188498.53
REMOVE AND REPLACE 9 LF - CONCRETE C & G
REMOVE AND REPLACE 70 SF - CONCRETE SIDEWALK
WITH DETACHABLE WARNING PANEL
T.C. ELEV. = 3383.42</p> <p>17. N = 642554.34
E = 1188500.09
T.C. ELEV. = 3383.36</p> <p>18. N = 642536.99
E = 1188529.67
REMOVE AND REPLACE 82 SF - CONCRETE SIDEWALK</p> <p>19. N = 642523.18
E = 1188539.60</p> <p>20. N = 642536.99
E = 1188529.67
REMOVE 16 SY - ASPHALT PAVEMENT
INSTALL 5 TONS - ASPHALT PAVEMENT
INSTALL 6 TONS - AGGREGATE BASE COURSE</p> <p>21. N = 642733.94
E = 1188464.08</p> <p>22. N = 642541.29
E = 1188224.85
REMOVE 59 LF - CONCRETE C & G.
REMOVE 244 SY - ASPHALT CONCRETE.</p> <p>23. N = 642468.07
E = 1188260.86</p> <p>24. N = 642733.47
E = 1188424.04
INSTALL 350 LF - 2" WATER SERVICE LINE WITH
SERVICE SADDLE AND CORP STOP</p> <p>25. N = 642535.02
E = 1188571.69
TIE TO EXISTING WATER SERVICE LINE.</p> <p>26. N = 642722.83
E = 1188384.81
REMOVE 140 LF - CONCRETE C & G
REMOVE 134 SY - ASPHALT CONCRETE</p> <p>27. N = 642679.56
E = 1188451.73</p> <p>28. N = 642732.52
E = 1188437.33
INSTALL 2" CURB STOP</p> |
|--|---|

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OCT 12 2006

Rapid City Growth
Management Department



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Scale:	AS SHOWN
Designed By:	RLM
Drawn By:	DRS
Design Date:	SEPT 2006
Plot Date:	10-8-06
Internal Job No:	J06-133
Surveyed By:	SLAJUB
Survey Date:	FEB 2006
Revised:	

JACKSON SPRINGS WATER
TRANSMISSION MAINS



NOT FOR CONSTRUCTION

Scale:	AS SHOWN
Designed By:	DRM
Drawn By:	DRS
Design Date:	SEPT 2009
Print Date:	10-8-09
Project Job No.:	209-133
Surveyed By:	SLA/JLB
Survey Date:	FEB 2008
Revised:	

HIGH LEVEL WATER MAIN NOTES

STA 17+63.5 - 6.4' RT	INSTALL 6" GATE VALVE.
STA 17+63.5 - 8.0' RT	INSTALL 6" 45° VERTICAL BEND.
STA 17+63.5 - 8.0' RT TO STA 17+63.5 - 13.9' RT	INSTALL 6 LF - 6" PVC WATER MAIN.
STA 17+63.5 - 13.9' RT	INSTALL 6" 45° VERTICAL BEND.
STA 17+63.5 - 13.9' RT TO STA 17+63.5 - 29.4' RT	INSTALL 16 LF - 6" PVC WATER MAIN.
STA 17+63.5 - 29.4' RT	INSTALL 6" 11.25° VERTICAL BEND.
STA 17+63.5 - 29.4' RT TO STA 17+63.5 - 44.0' RT	INSTALL 15 LF - 6" PVC WATER MAIN.

HIGH LEVEL WATER MAIN NOTES

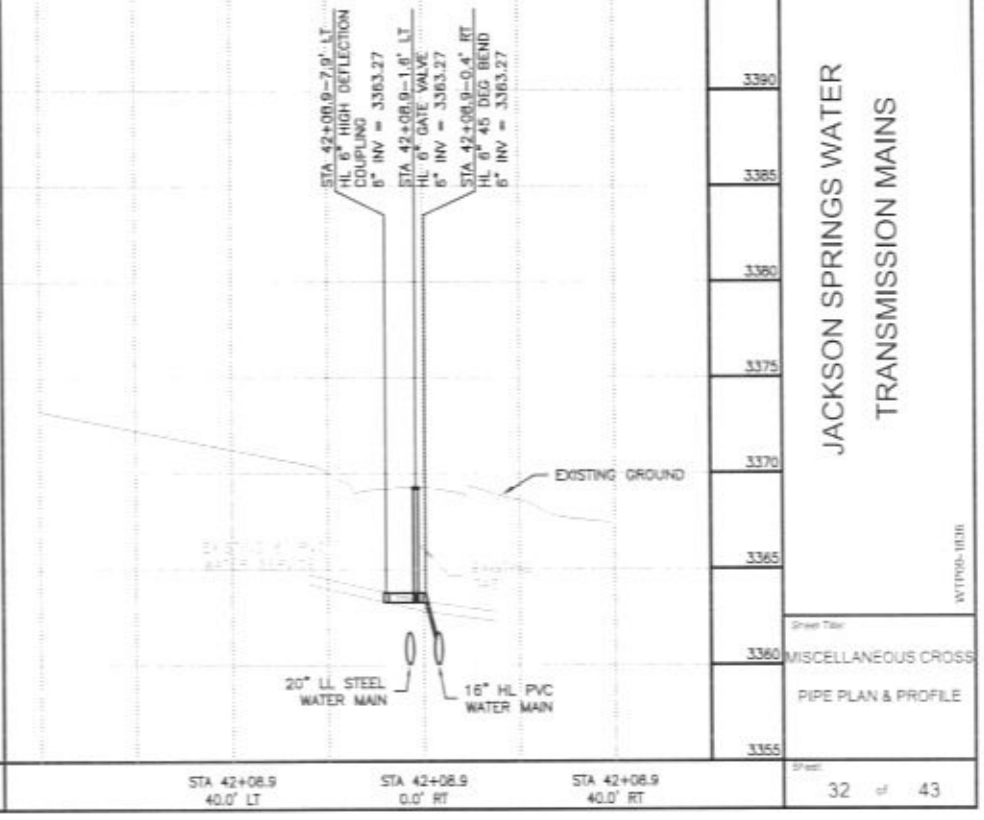
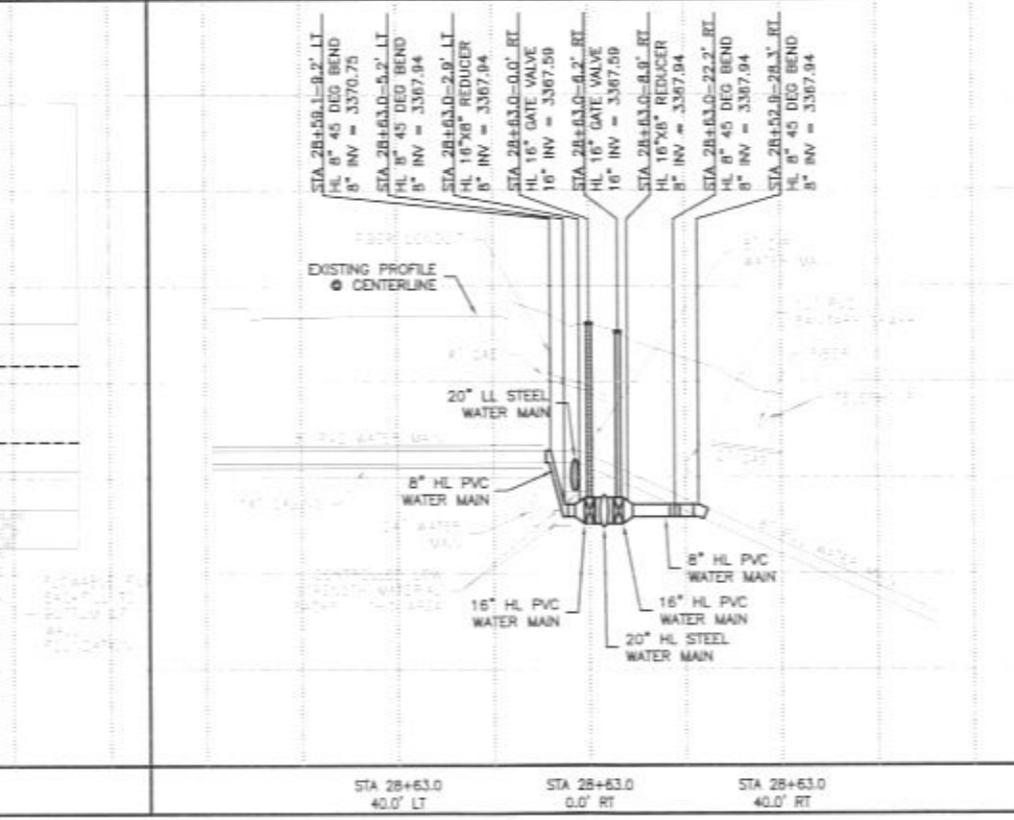
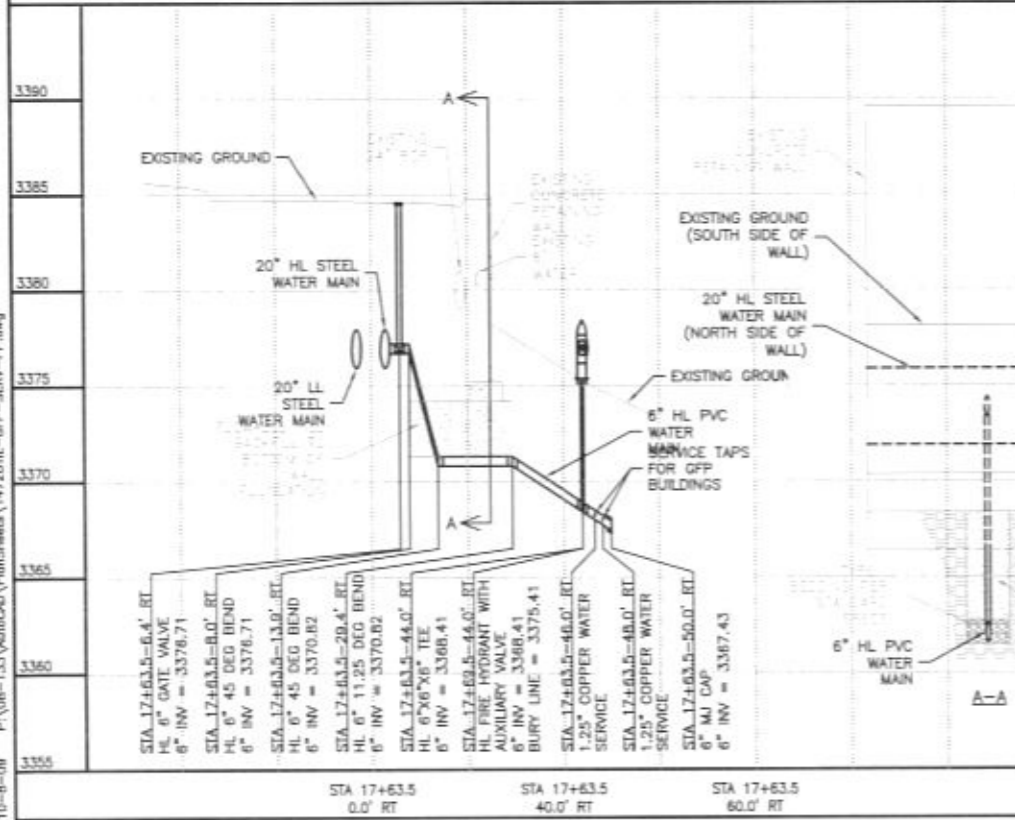
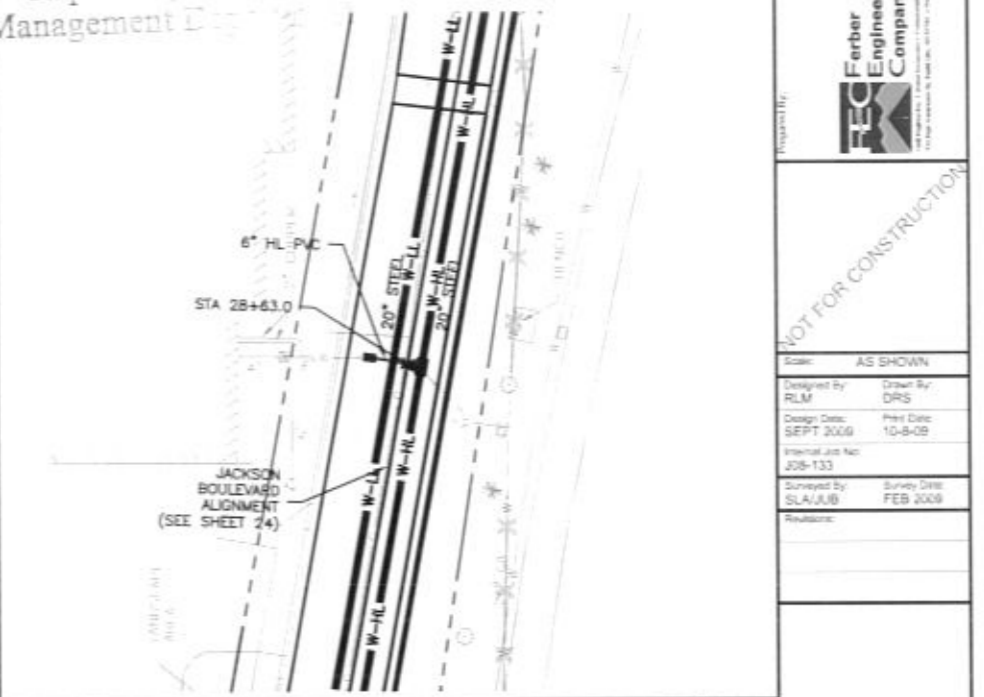
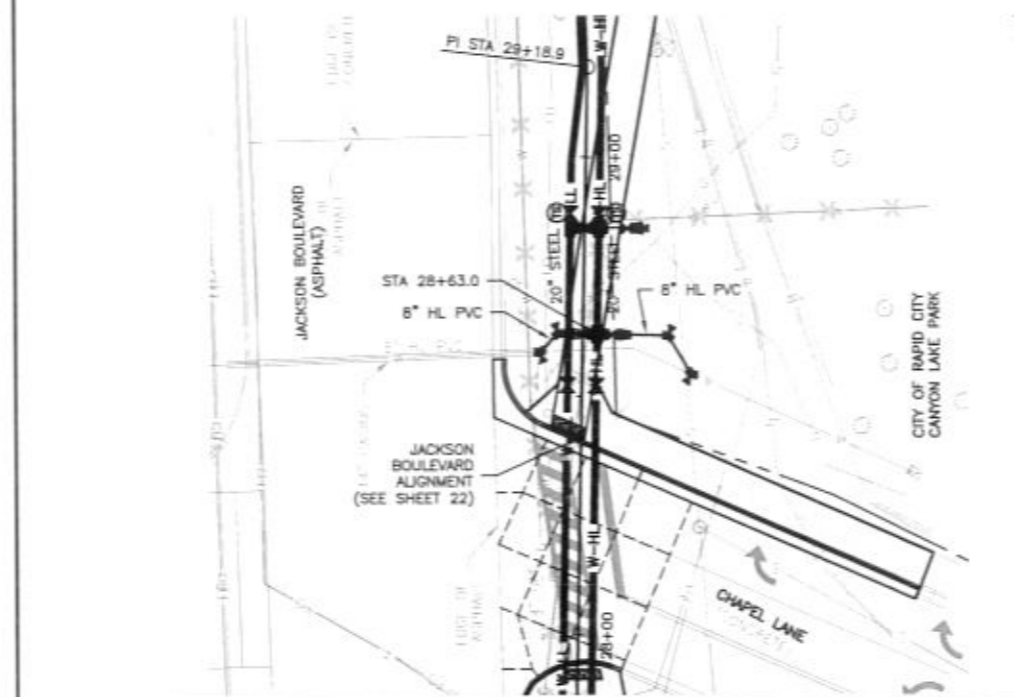
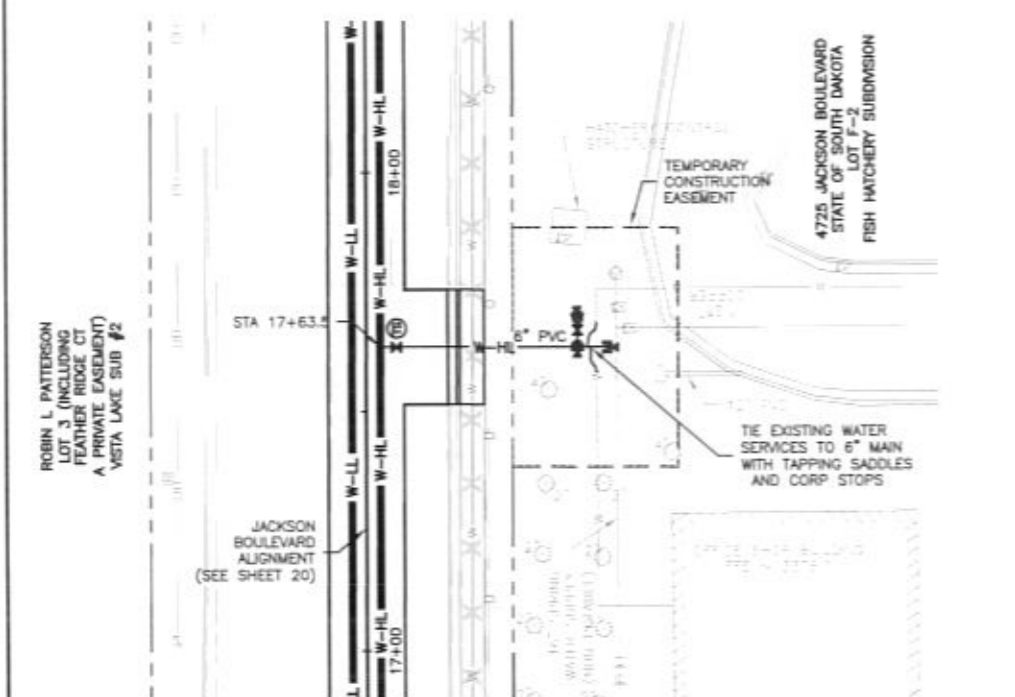
STA 17+63.5 - 44.0' RT	INSTALL 6"x6"x6" TEE.
STA 17+63.5 - 44.0' RT TO STA 17+63.5 - 50.0' RT	INSTALL 6 LF - 6" PVC WATER MAIN WITH PLUG.
STA 17+63.5 - 50.0' RT	INSTALL 6" MJ CAP.
STA 17+63.5 - 44.0' RT TO STA 17+69.5 - 44.0' RT	INSTALL 6 LF - 6" PVC WATER MAIN.
STA 17+69.5 - 44.0' RT	INSTALL FIRE HYDRANT WITH AUXILIARY VALVE.

TABLE OF THRUST BLOCKS

STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SQ FT)	MINIMUM CONCRETE VOL (CY)
17+63.5	R	6" CAP	9.4	0.36
17+63.5	R	6"x6"x6" TEE	9.4	0.36
17+65.5	R	6" FIRE HYDRANT	10.2	0.5

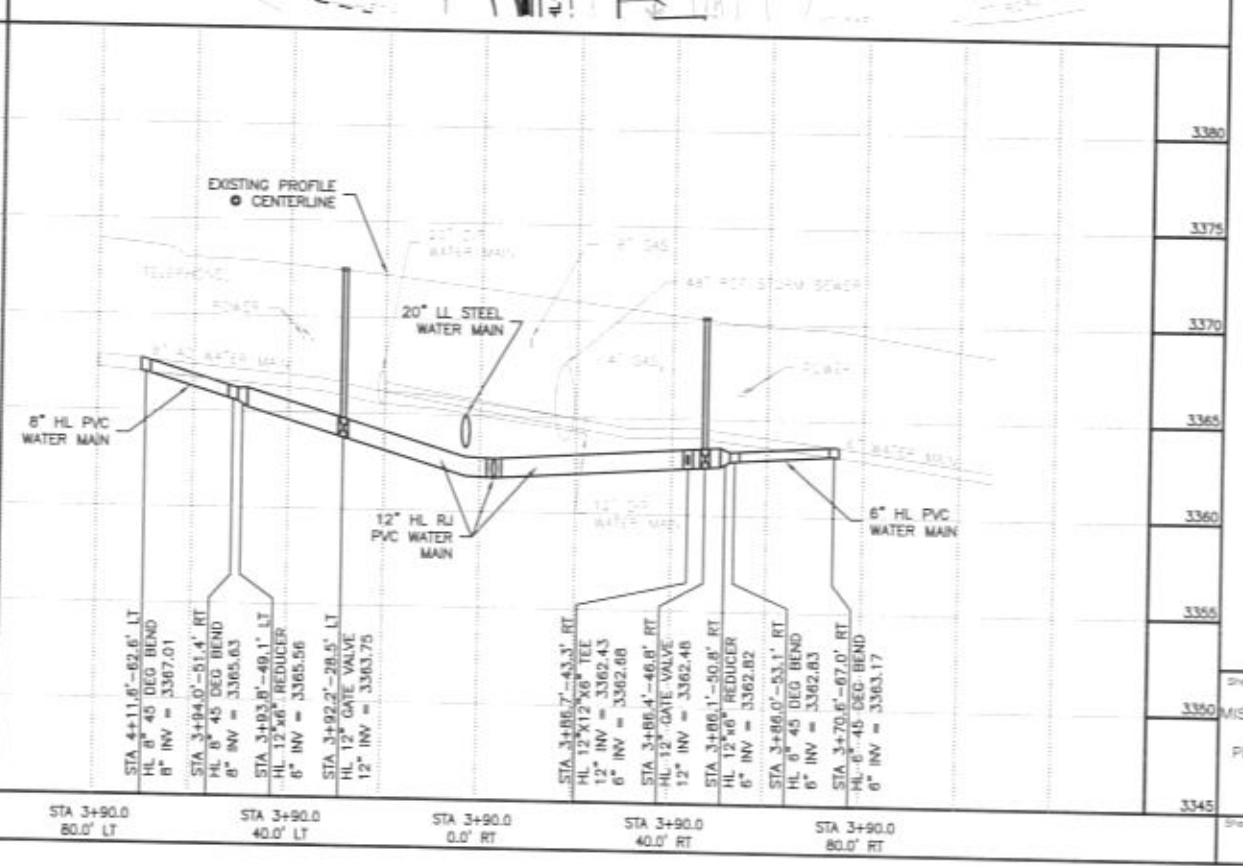
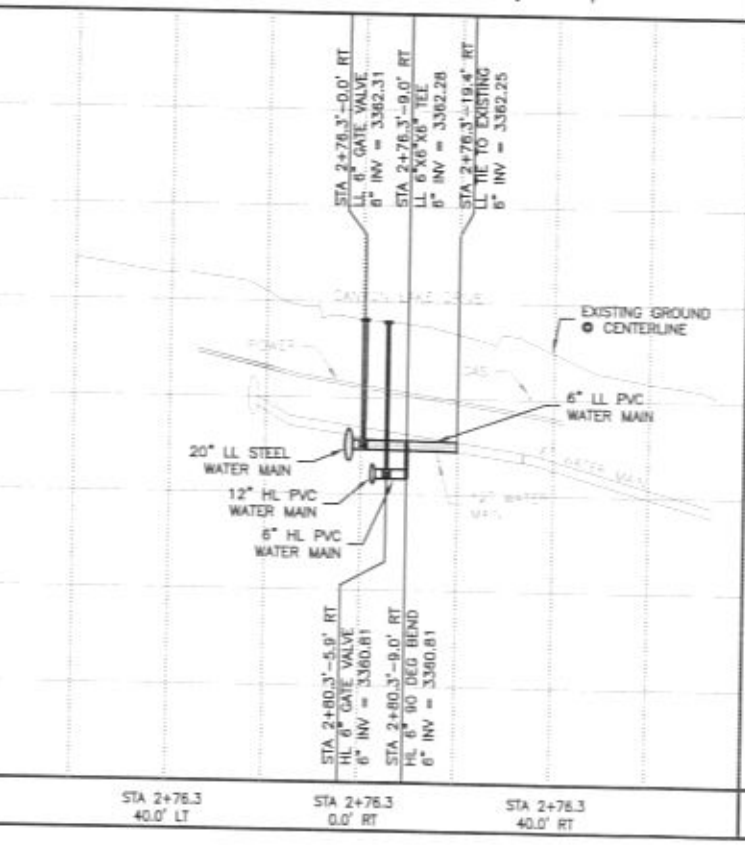
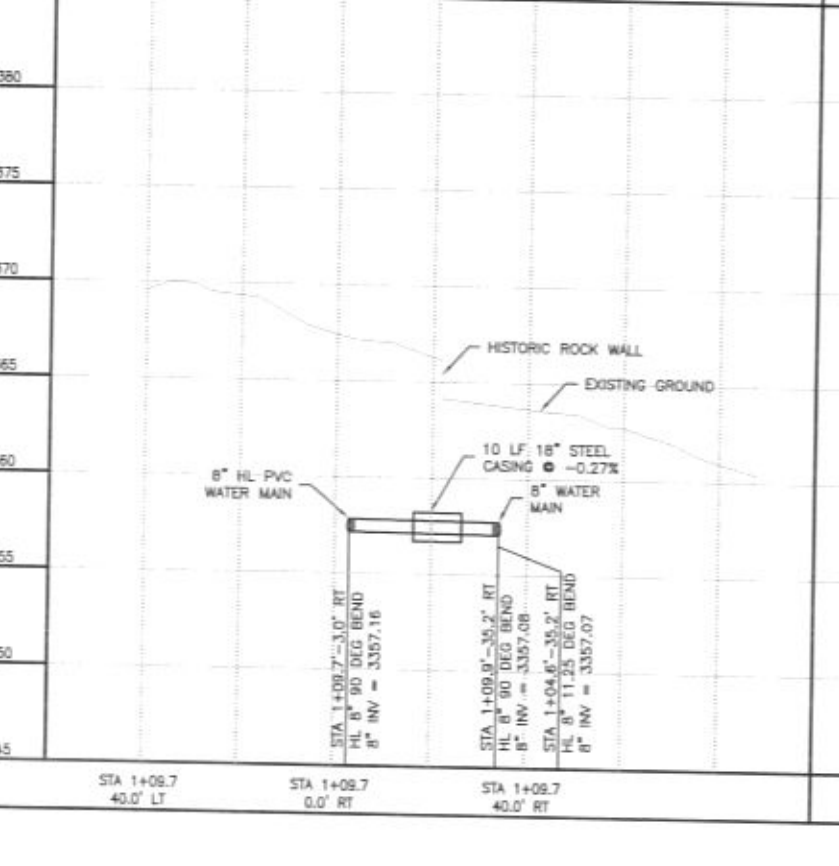
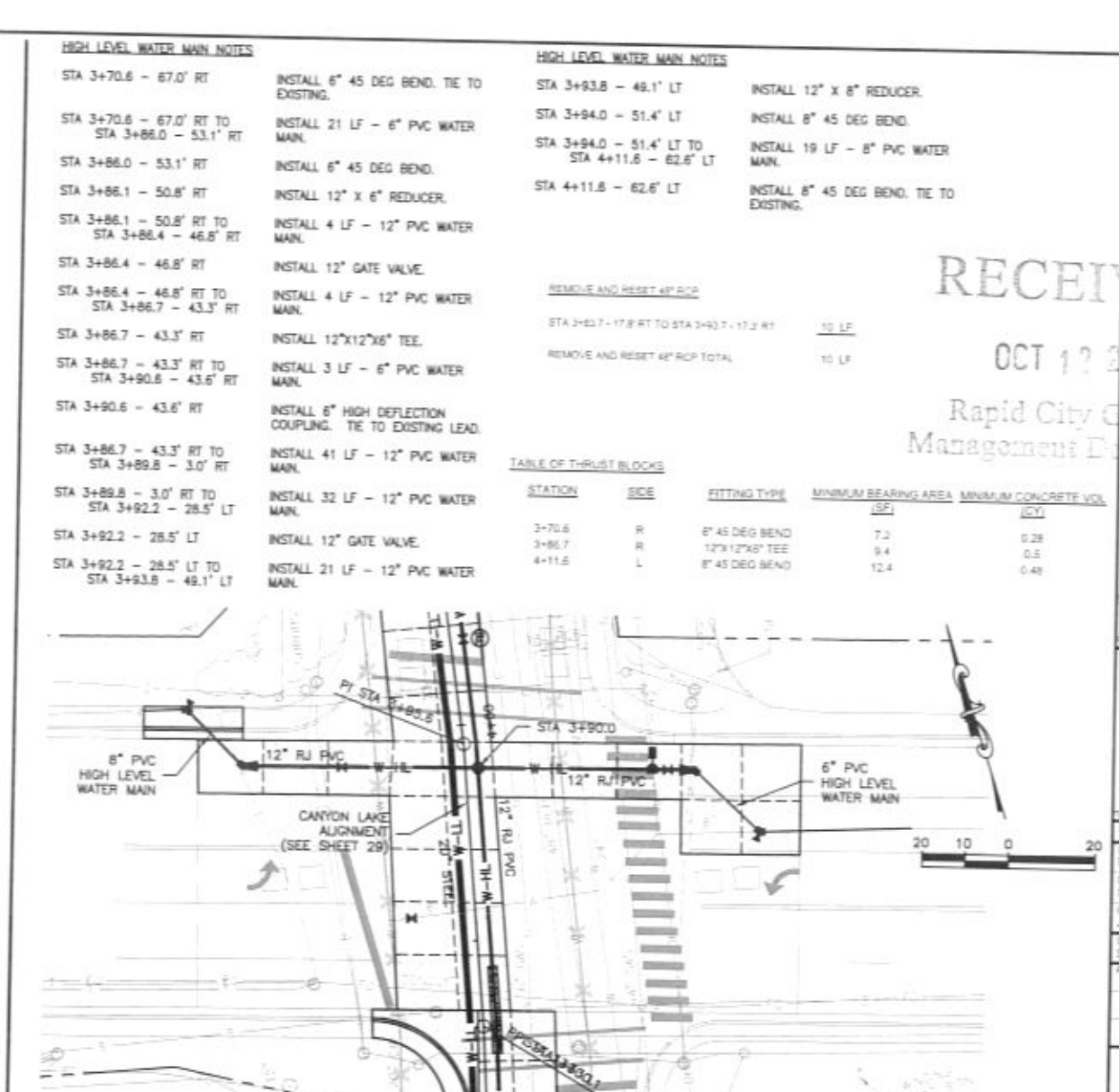
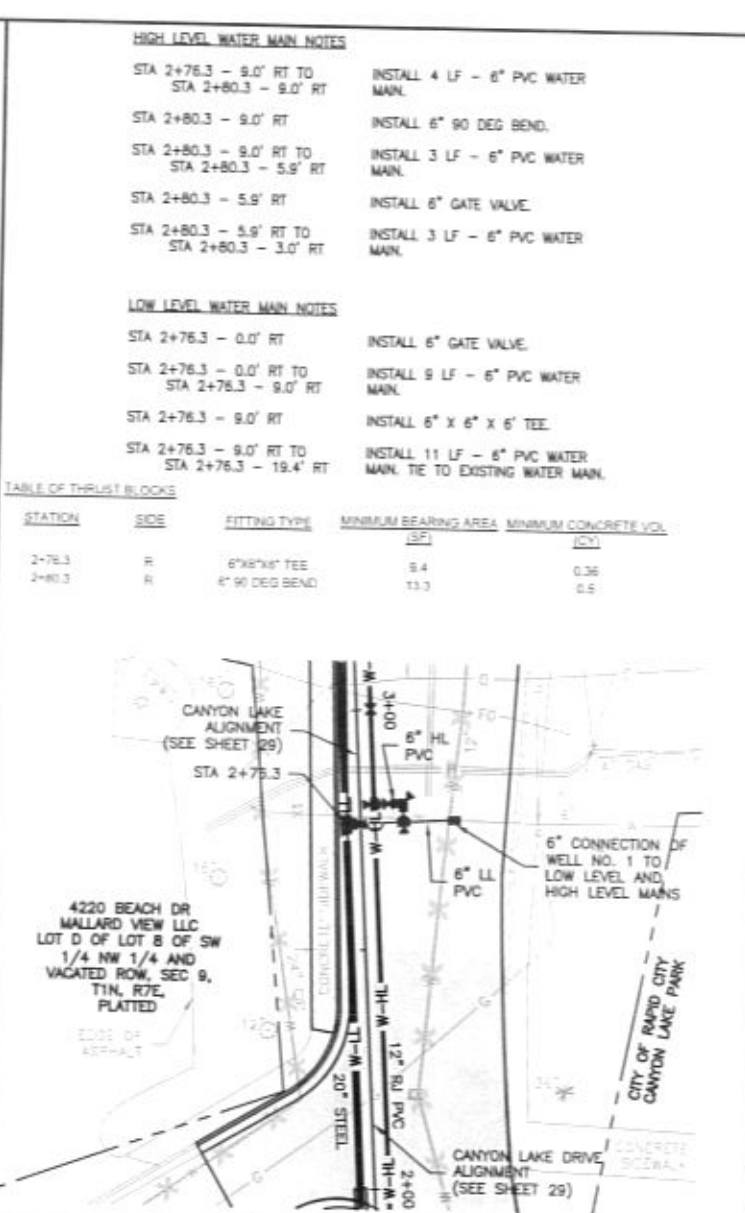
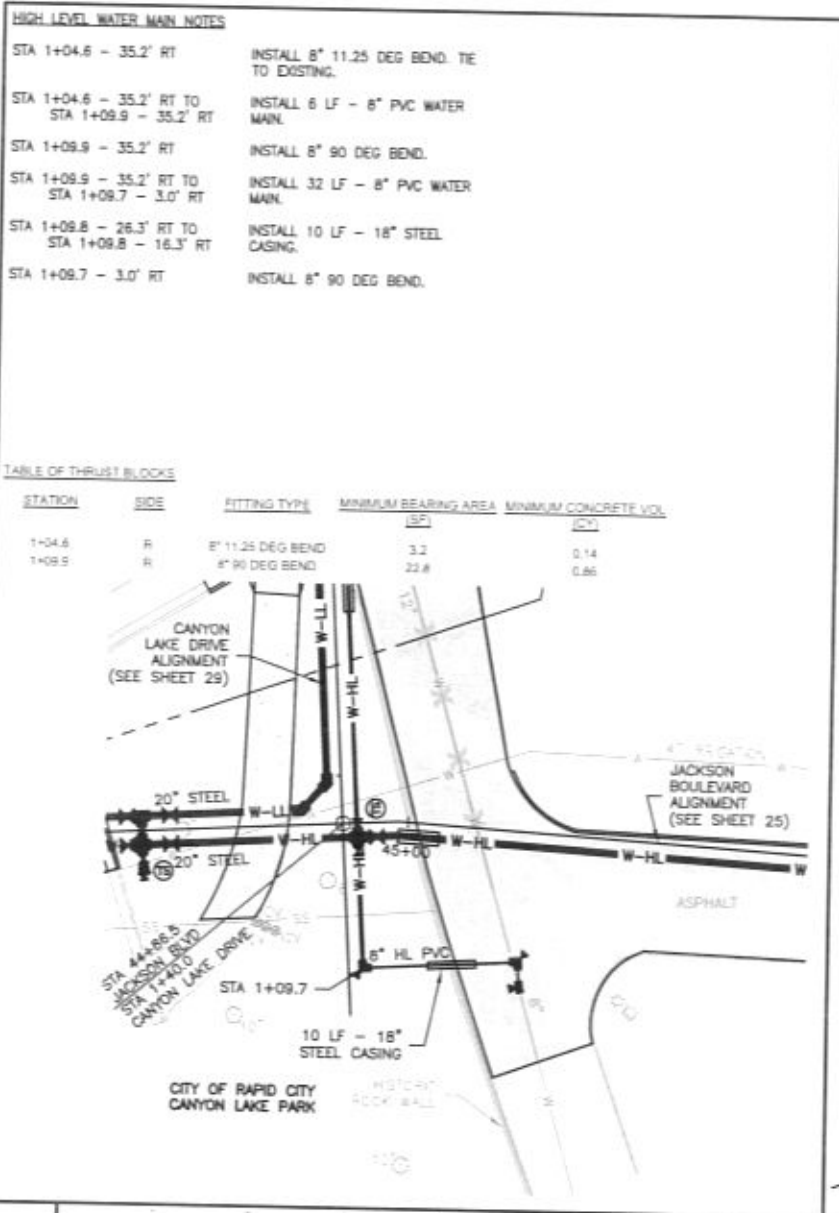
TABLE OF THRUST BLOCKS

STATION	SIDE	FITTING TYPE	MINIMUM BEARING AREA (SQ FT)	MINIMUM CONCRETE VOL (CY)
28+52.9	R	8" 45 DEG BEND	12.4	0.48
28+59.1	L	8" 45 DEG BEND	12.4	0.48
28+63.0	L	8" 45 DEG BEND	12.4	0.48
28+63.0	R	8" 45 DEG BEND	12.4	0.48



JACKSON SPRINGS WATER TRANSMISSION MAINS

MISCELLANEOUS CROSS PIPE PLAN & PROFILE



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Project for: Public Works Department
City of Rapid City, South Dakota
Engineering Division

Burns & McDonnell
1911 1919

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Designed by: RLM
Drawn by: DRS
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Safety Date: FEB 2009

JACKSON SPRINGS WATER TRANSMISSION MAINS

Draw Title: MISCELLANEOUS CROSS PIPE PLAN & PROFILE

Sheet 33 of 43

18-, 20- AND 24-INCH PIPELINE ABANDONMENT IN PLACE

THE EXISTING 18-, 20- AND 24-INCH WATER TRANSMISSION MAIN FROM THE JACKSON SPRINGS PUMP HOUSE TO CANYON LAKE DRIVE SHALL BE ABANDONED IN PLACE. THE CONTRACTOR SHALL EMPTY THE LINE OF ALL WATER, REMOVE OR ABANDON ALL VALVES AND FIRE HYDRANTS AS NOTED.

ALL EXCAVATION, SHORING, DEWATERING, DISPOSAL OF UNSUITABLE MATERIAL, BACKFILLING, AND COMPACTION REQUIRED FOR COMPLETION OF THIS WORK SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL RESTORE THE WORK AREA TO PRECONSTRUCTION CONDITIONS AS REQUIRED BY THE APPLICABLE SECTIONS OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR SHALL NOTIFY THE ENGINEER TWENTY-FOUR (24) HOURS IN ADVANCE OF ABANDONING THE MAIN AND SHALL PROVIDE SAFE ACCESS FOR INSPECTION OF THE PROCESS.

THE CONTRACTOR SHALL SUBMIT THE FOLLOWING INFORMATION AFTER CONTRACT AWARD, PRIOR TO START OF WORK:

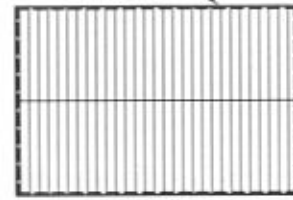
1. WRITTEN PLAN FOR ABANDONMENT OF EXISTING 18-, 20- AND 24-INCH PIPELINE
2. CONTROLLED LOW STRENGTH MATERIAL MIXTURE DESIGN.

FIELD MEASUREMENT FOR THIS WORK ITEM WILL NOT BE REQUIRED. PAYMENT FOR THIS WORK WILL BE MADE AT THE CONTRACT UNIT PRICE FOR "ABANDON EXISTING WATER TRANSMISSION MAIN" AND SHALL BE CONSIDERED AS FULL COMPENSATION FOR COSTS INCIDENTAL THERETO. ANY EXCAVATION, SHORING, DEWATERING, DISPOSAL OF UNSUITABLE MATERIAL, BACKFILLING, COMPACTION EFFORT, MAINTENANCE OF VEHICULAR TRAFFIC AND/OR PEDESTRIAN ACCESS, PAVING, LANDSCAPING, AND RESTORATION OF EXISTING PRECONSTRUCTION CONDITIONS NECESSARY TO COMPLETE THE "18-, 20- AND 24-INCH PIPELINE ABANDONMENT IN PLACE" SCOPE OF WORK IDENTIFIED IN THIS SECTION AND SHALL BE CONSIDERED INCIDENTAL TO THE WORK COMPLETED UNDER THIS SECTION. COSTS INCURRED FOR COMPLETION OF THESE INCIDENTAL WORK ITEMS ARE CONSIDERED INCLUDED IN THE UNIT COST BID FOR COMPLETION OF THE WORK IN THIS SECTION.

KEY NOTES:

1. REMOVE AND SALVAGE FIRE HYDRANT. REMOVE AND DISPOSE AUXILIARY VALVE, LEAD AND TEST STATION. PLUG AND ABANDON ADJACENT WATER LINES.
2. PLUG AND ABANDON WATER LINE.
3. REMOVE AND DISPOSE VALVE. PLUG AND ABANDON ADJACENT WATER LINES.
4. ABANDON VALVE BOX AND ADJACENT WATER LINES PER STANDARD SPECIFICATIONS.
5. REMOVE SECTION OF WATER LINE. PLUG AND ABANDON WATER LINE.
6. ABANDON WATER LINE PER "18-, 20- AND 24-INCH PIPELINE ABANDONMENT IN PLACE" SPECIFICATIONS.
7. REMOVE CURB STOP BOX AND REPAIR PAVEMENT.
8. ABANDON WATER SERVICE AT MAIN. PLUG AND ABANDON ADJACENT WATER LINES.
9. REMOVE DRINKING FOUNTAIN AND ASSOCIATED PIPING AND VALVES. PLUG AND ABANDON ADJACENT WATER LINE.
10. REMOVE 8" WATER LINE FROM OUTFALL TO NORTH SIDE OF PROPOSED 20" LL WATER MAIN AS NECESSARY. PLUG AND ABANDON WATER LINE.
11. REMOVE AND SALVAGE FIRE HYDRANT. REMOVE AND DISPOSE AUXILIARY VALVE AND LEAD. PLUG AND ABANDON ADJACENT WATER LINES.

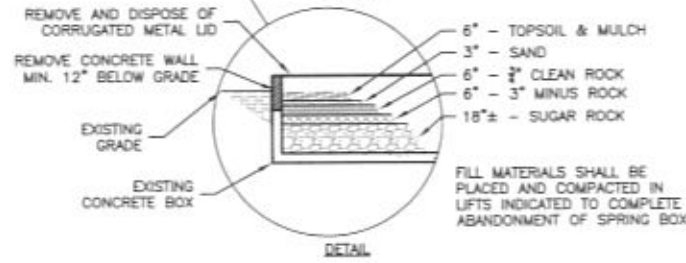
CLEGHORN WATER USERS SPRING BOX



PLAN



SECTION



DETAIL

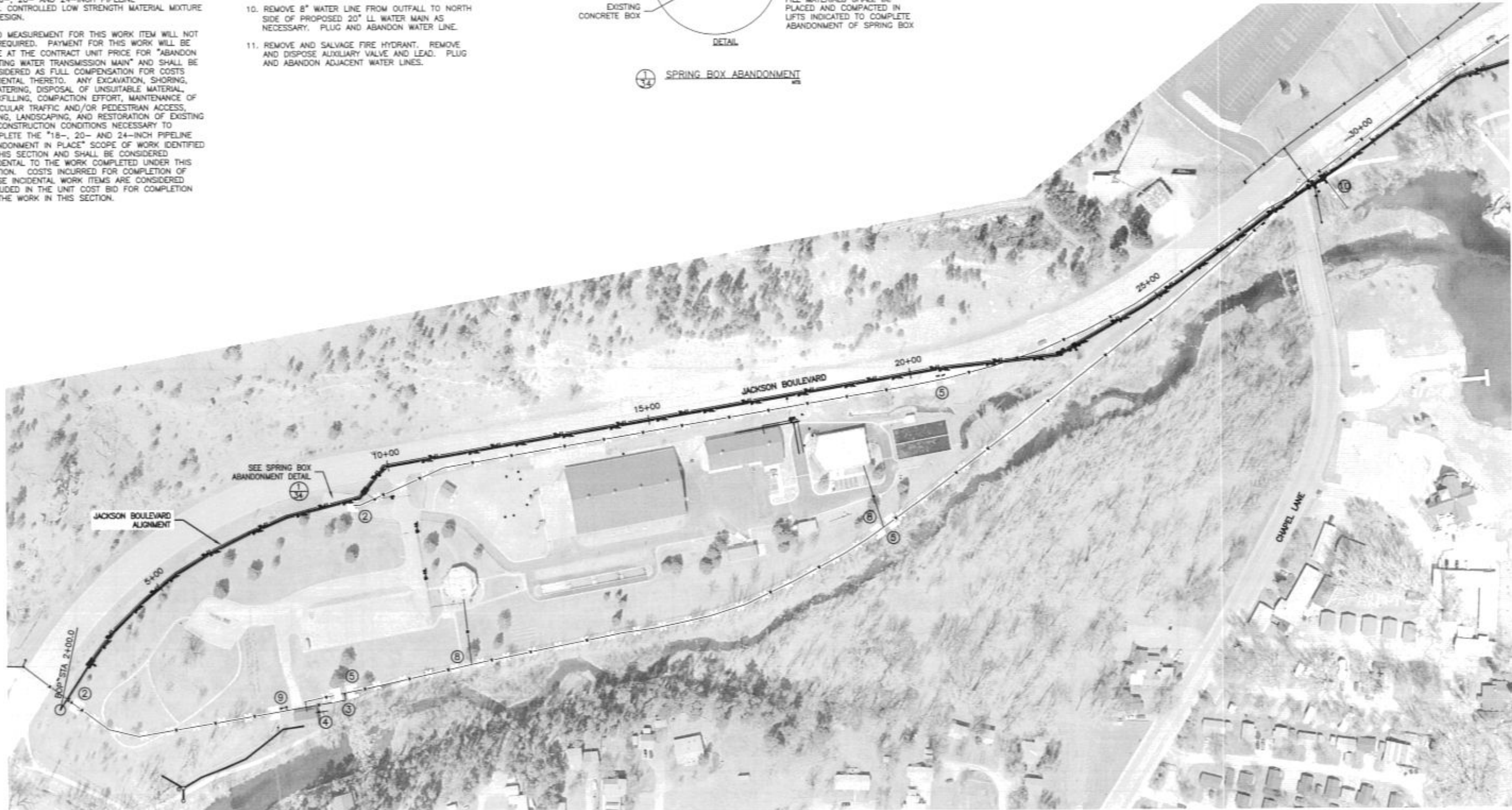


SPRING BOX ABANDONMENT

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Survey Date:	FEB 09
Revisions:	

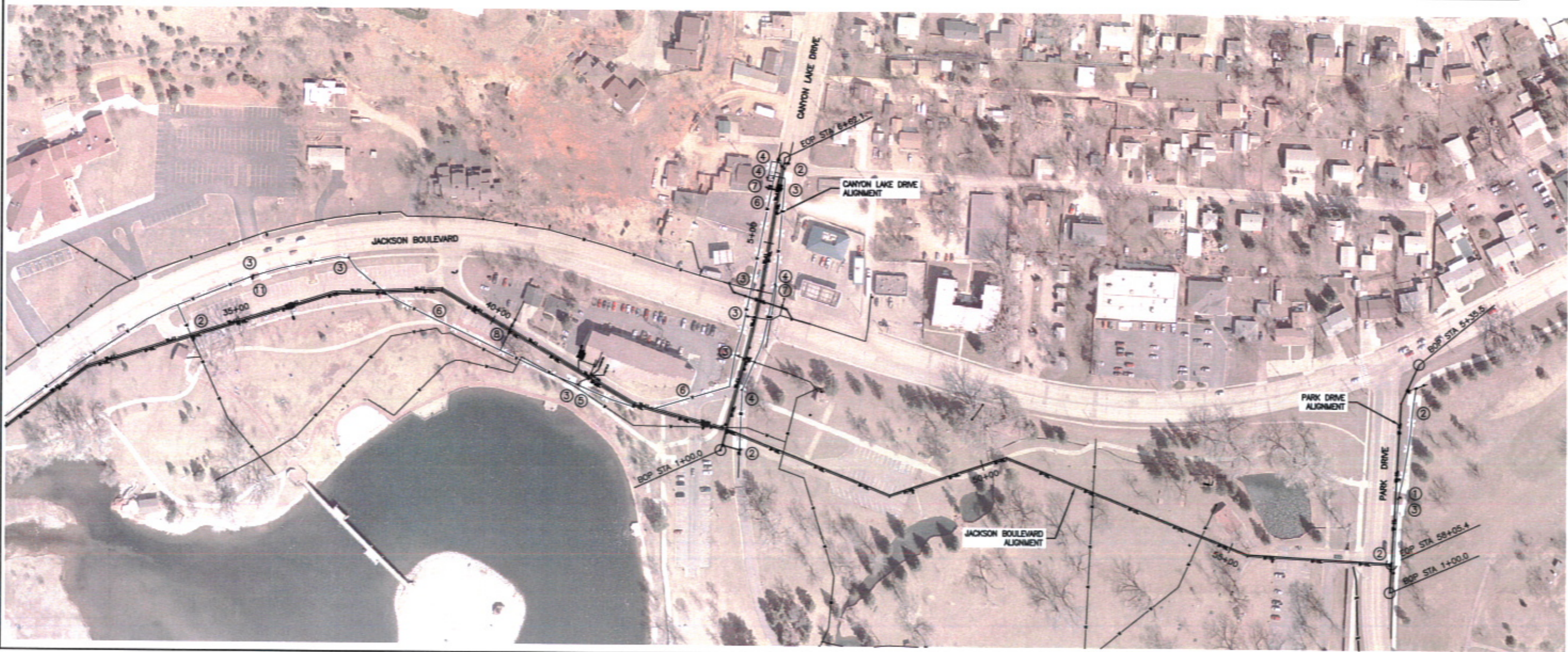
JACKSON SPRINGS WATER
 TRANSMISSION MAINS

ABANDONMENT PLAN
 WEST

KEY NOTES:

1. REMOVE AND SALVAGE FIRE HYDRANT. REMOVE AND DISPOSE AUXILIARY VALVE, LEAD AND TEST STATION. PLUG AND ABANDON ADJACENT WATER LINES.
2. PLUG AND ABANDON WATER LINE.
3. REMOVE AND DISPOSE VALVE. PLUG AND ABANDON ADJACENT WATER LINES.
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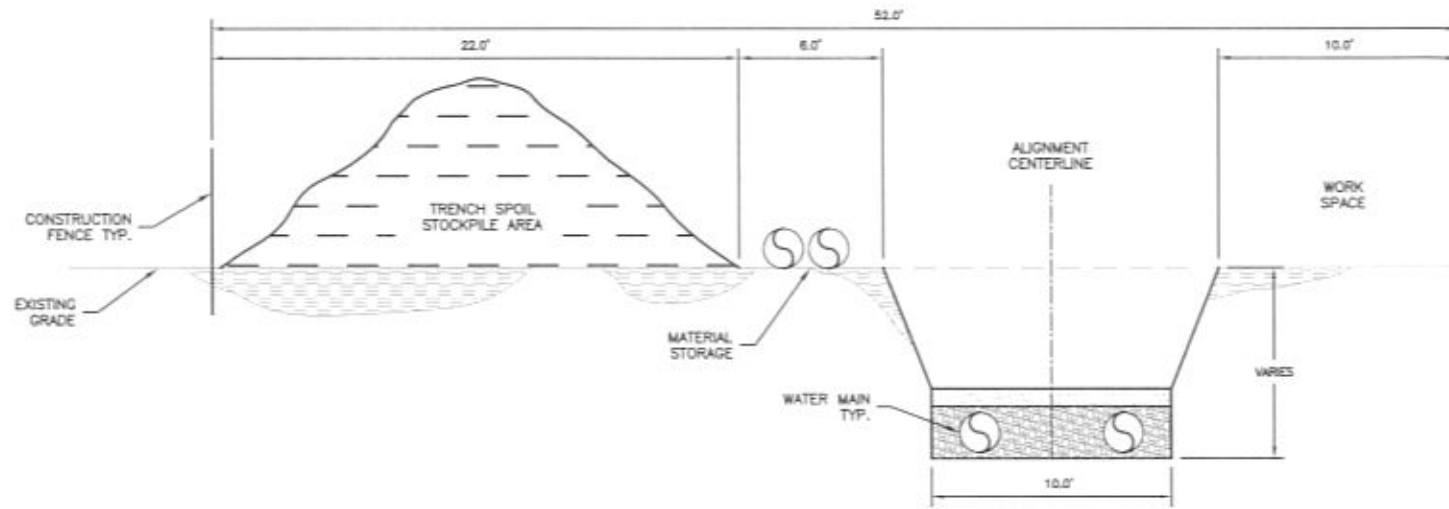


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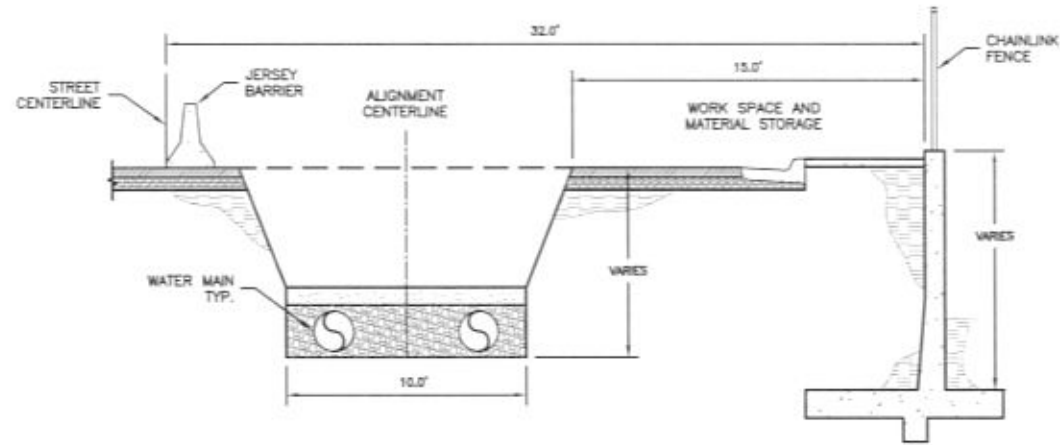
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Issue Date:	10-8-09
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Surveyed By:	SLAULIS
Survey Date:	FEB 09
Revisions:	

JACKSON SPRINGS WATER
 TRANSMISSION MAINS

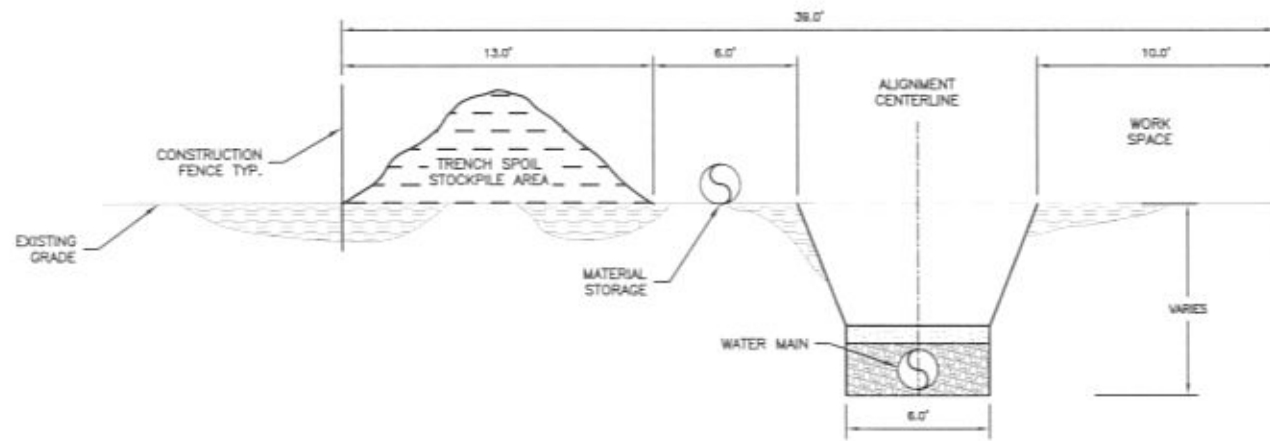
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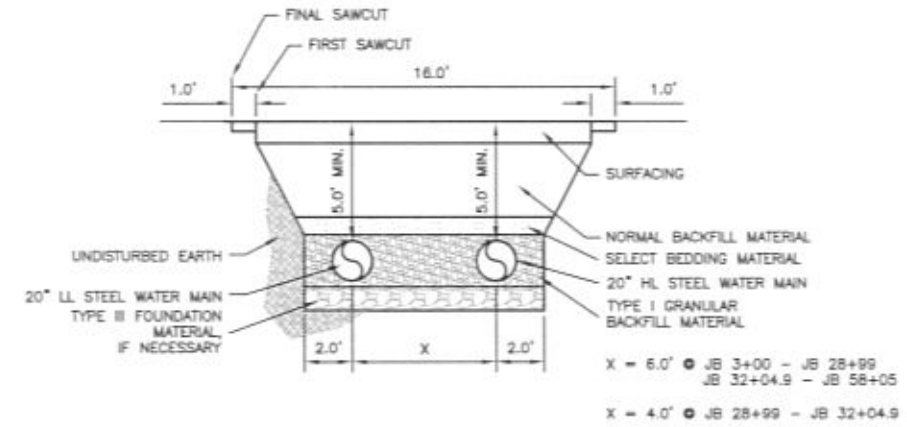
1 TYPICAL PARALLEL MAIN WORK LIMITS DETAIL



2 WORK LIMITS DETAIL JACKSON BOULEVARD

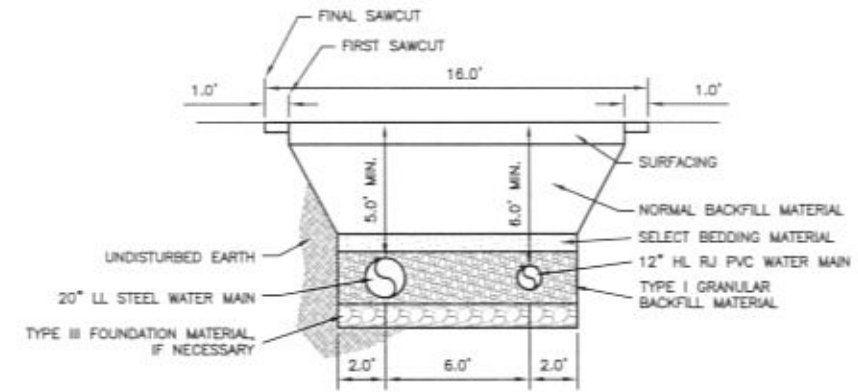


3 TYPICAL SINGLE MAIN WORK LIMITS DETAIL



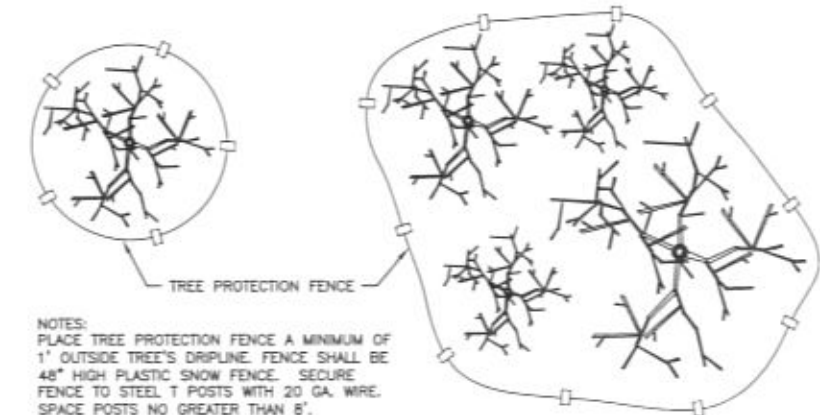
NOTES:
 ALL FOUNDATION, BEDDING, BACKFILL MATERIAL AND RESURFACING SHALL COMPLY WITH STANDARD SPECIFICATIONS AND DETAILS EXCEPT WHERE NOTED.
 ALL TYPE 1 GRANULAR BACKFILL MATERIAL SHALL BE INCIDENTAL TO THE INSTALLATION OF THE PARALLEL WATER MAINS.
 DETAIL SHOWS TYPICAL ROAD SURFACING. ACTUAL SURFACING WILL VARY ALONG THE ALIGNMENT.

4 TYPICAL PARALLEL MAIN TRENCHING DETAIL (JACKSON BOULEVARD ALIGNMENT)



NOTES:
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 ALL TYPE 1 GRANULAR BACKFILL MATERIAL SHALL BE INCIDENTAL TO THE INSTALLATION OF THE PARALLEL WATER MAINS.
 DETAIL SHOWS TYPICAL ROAD SURFACING. ACTUAL SURFACING WILL VARY ALONG THE ALIGNMENT.

5 TYPICAL PARALLEL MAIN TRENCHING DETAIL (CANYON LAKE DRIVE ALIGNMENT)



NOTES:
 PLACE TREE PROTECTION FENCE A MINIMUM OF 1' OUTSIDE TREE'S DRIPLINE. FENCE SHALL BE 48\"/>

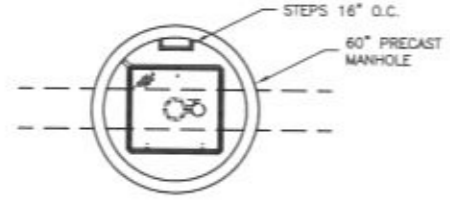
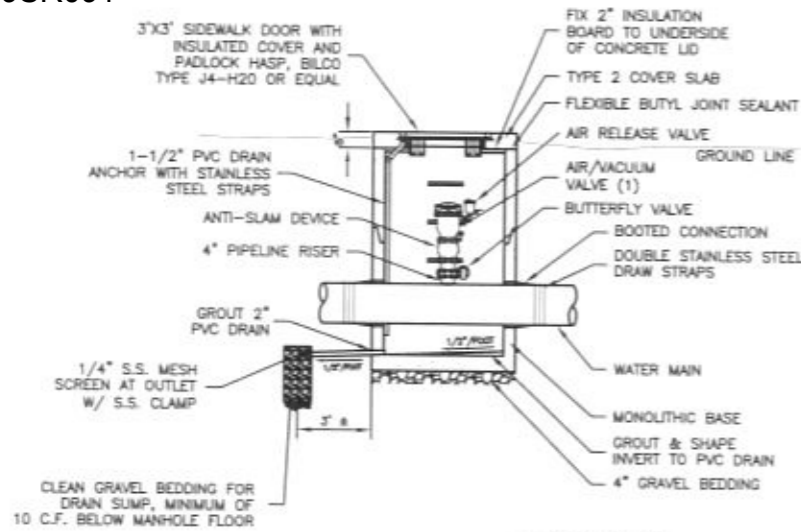
6 TREE PROTECTION DETAIL

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Scale	AS SHOWN
Designed By	DRM
Drawn By	DRS
Design Date	SEPT 2009
Plot Date	10-6-09
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Revisions	

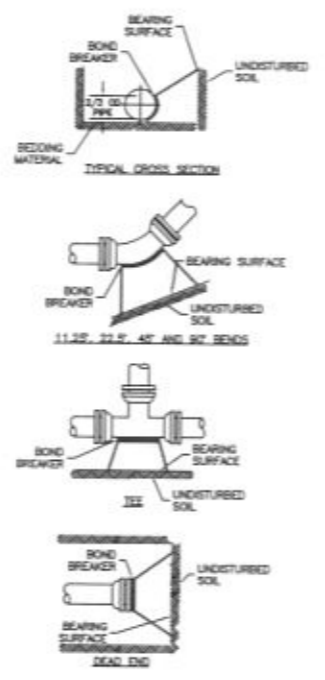
JACKSON SPRINGS WATER
 TRANSMISSION MAINS



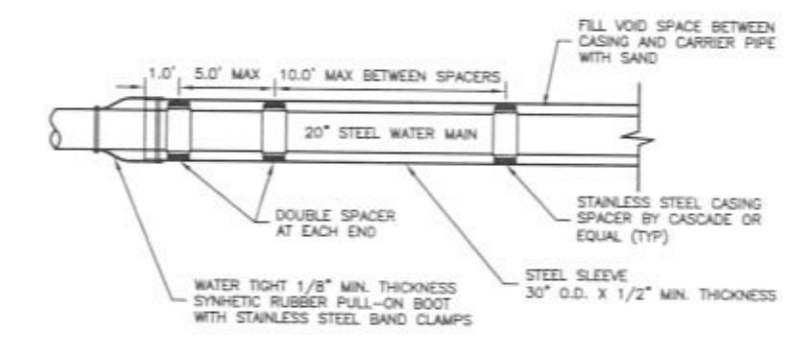
PLAN VIEW

- NOTES:**
- 4" COMBINATION AIR RELEASE/VACUUM VALVE WITH SURGE-SUPPRESSION VAL-MATIC 12045/104/38 OR EQUAL.
 - PAYMENT FOR COMBINATION AIR VALVE SHALL BE MADE ON A PER EACH BASIS FOR ALL FITTINGS, VALVES, MANHOLES, HATCHES, AND ALL INCIDENTALS NECESSARY FOR A COMPLETE COMBINATION AIR RELEASE VALVE STRUCTURE.
 - 20" STEEL PIPE AND 4" FLANGED OUTLET ARE SEPARATE PAY ITEMS.

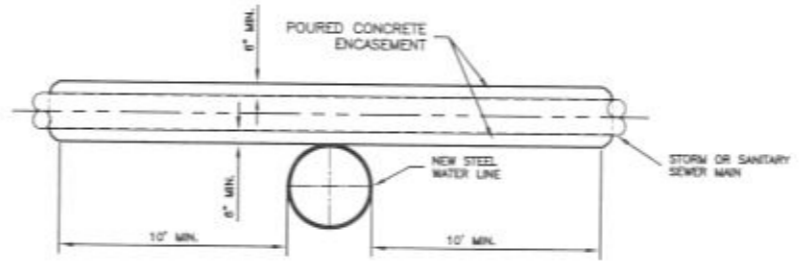
AIR RELEASE VALVE



THRUST BLOCK INSTALLATION DETAILS

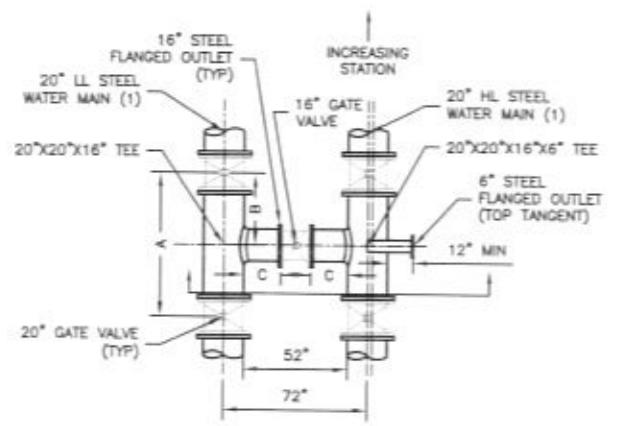


STEEL CASING PIPE - WATER MAIN

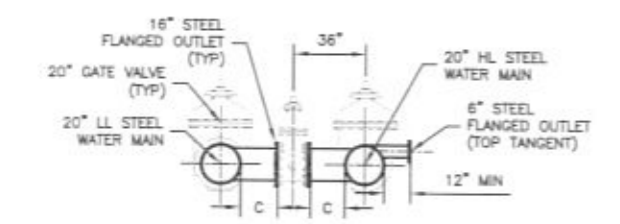


- NOTES:**
- NEW WATER LINE MAY ALSO CROSS OVER STORM AND SANITARY SEWER MAIN LINE.
 - ENCASEMENT IS NOT REQUIRED IF WATER MAIN IS 18" OR MORE ABOVE SANITARY OR STORM SEWER.

TYPICAL STORM AND SANITARY SEWER ENCASEMENT



PLAN



SECTION

20" INTERCONNECTION STATIONS AND DIMENSIONS

STATION	A. (FT)	B. (FT)	COMMENT
3+06.1	9.00	4.50	
9+32.6	9.00	4.50	
23+16.0	31.50	3.00	LOCATION OF CAV
28+63.0	35.90	3.00	CHAPEL LN CONNECTION
36+00.0	12.00	6.00	
44+44.4	9.00	6.00	

- MINIMUM STEEL THICKNESS SHALL BE 0.188 INCHES.
- DIMENSION C DEPENDENT UPON VALVE MANUFACTURER. 16" GATE VALVE SHALL BE CENTERED BETWEEN THE 20" MAINS.
- THE 20"x20"x16" AND 20"x20"x16"x6" TEES THAT FORM THE INTERCONNECTION SHALL BE MANUFACTURED SEPARATELY. ALL FABRICATION, COATING, AND LINING SHALL BE PER SPECIFICATIONS. FABRICATION SHALL INCLUDE ACCOMMODATION FOR INSTALLING ASSEMBLED INTERCONNECTION. IF ADDITIONAL PIPE LENGTH IS REQUIRED TO ATTAIN PROPER HORIZONTAL VALVE SPACING, THE PIPE MANUFACTURER SHALL SUPPLY APPROPRIATE ADDITIONAL PIPE LENGTH AND STIPULATE IN THE PIPE LAYOUT IF BUTT-STRAP OR LAP-WELDED JOINT IS TO BE USED (FLANGES AT VALVES ONLY).
- ALL FLANGES SHALL BE INSTALLED DURING FABRICATION OF THE ASSEMBLIES.
- PAYMENT SHALL BE MADE PER THE BID ITEMS "20-INCH COATED STEEL WATER MAIN", "16-INCH STEEL FLANGED OUTLET", AND "6-INCH STEEL FLANGED OUTLET".
- THE TWO ASSEMBLIES SHALL BE JOINED IN THE FIELD WITH 16" VALVE AND INSTALLED AS ONE UNIT.

WATER MAIN INTERCONNECTION DETAIL



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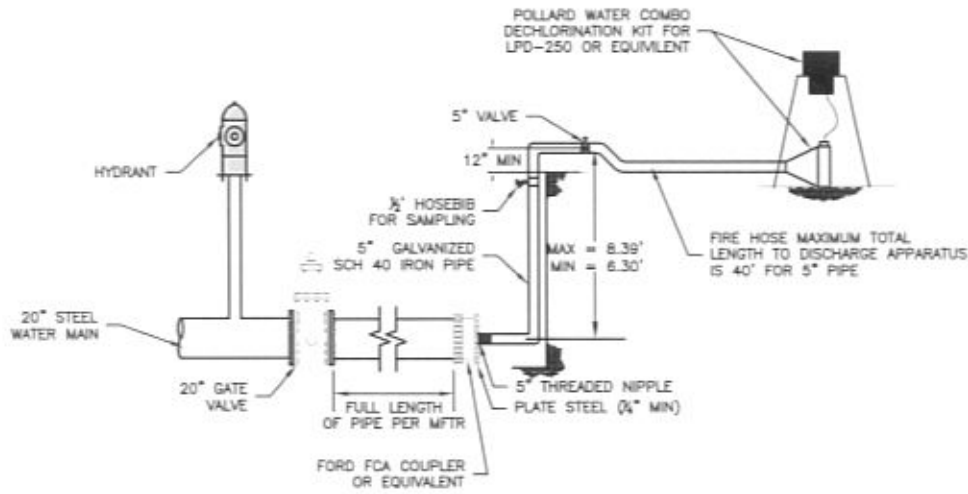
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Designed By: RLM	Drawn By: DRS
Design Date: SEPT 2009	Plot Date: 10-8-09
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Supervised By: SLAUB	Issue Date: FEB 2009
Revisions:	

JACKSON SPRINGS WATER TRANSMISSION MAINS

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SPECIAL DETAILS 2



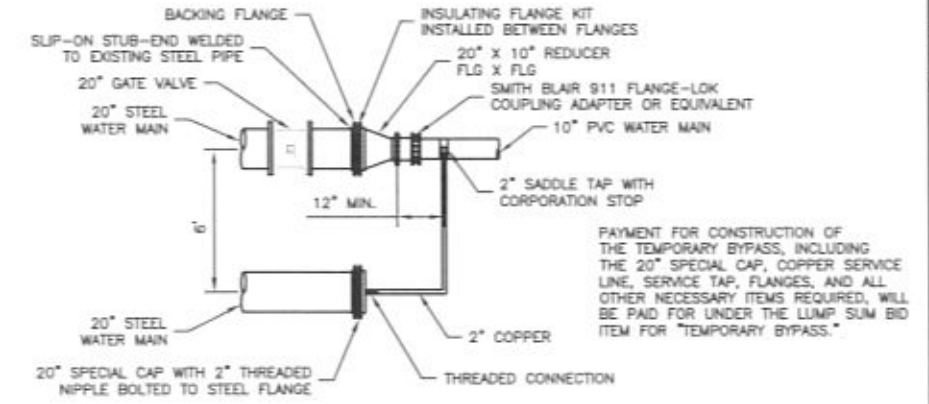
1 38 FLUSHING AND DECHLORINATION DETAILS

TABLE OF APPROXIMATE 20" MAIN FIRST FLUSH WATER QUANTITIES (PIPE AREA = 2.18 SF
Q @ 2.5 FPS = 2450 GPM)

ALIGNMENT	BEGIN STA	END STA	ONE PIPE VOL (GAL)	# MIN TO DISCHARGE (1)
PARK DR	0+47	4+88	7200	3 MIN
JACKSON BLVD	58+03	55+79	3700	2 MIN
JACKSON BLVD	55+79	48+55	12000	5 MIN
JACKSON BLVD (2)	48+55	44+41	6800	3 MIN
JACKSON BLVD (2)	44+41	35+94	14000	6 MIN
JACKSON BLVD (2)	35+94	28+50	12100	5 MIN
JACKSON BLVD (2)	28+50	22+85	9200	4 MIN
JACKSON BLVD (2)	22+85	9+25	22500	9 MIN
JACKSON BLVD (2)	9+25	3+00	10200	4 MIN
CANYON LAKE DR 20"	1+00	6+60	9100	4 MIN

NOTES:

1. NUMBER OF MINUTES TO HYDRAULICALLY DISCHARGE ONE PIPE VOLUME AT 2.5 FPS. ADDITIONAL TIME WILL BE REQUIRED TO REDUCE CHLORINE LEVEL TO ACCEPTABLE RESIDUAL LEVEL. CONTRACTOR IS RESPONSIBLE FOR DETERMINING FULL FLUSH TIME.
2. VOLUME PRESENTED IS FOR A SINGLE PIPE ONLY. DOUBLE THE QUANTITY PROVIDED TO DETERMINE TOTAL VOLUME OF SUPERCHLORINATED WATER IN THE FIRST FLUSH.
3. THE INFORMATION PROVIDED IN THE TABLE IS INFORMATIONAL IN NATURE. IT IS CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE QUANTITY OF WATER TO BE FLUSHED, FINAL CHLORINE LEVELS, ETC.
4. MINIMUM VELOCITY OF FLOW IN WATER MAIN IS 2.5 FPS.
5. MULTIPLE POLLARD WATER DECHLORINATION KITS WILL BE REQUIRED TO TREAT THE FLOW RATES SPECIFIED. PROVIDE EQUIPMENT CAPABLE OF DECHLORINATING 50 PPM CHLORINE CONCENTRATIONS.
6. CONTRACTOR IS REQUIRED TO VERIFY COMPLETE DECHLORINATION PRIOR TO DISCHARGING FLUSHING WATER BEYOND EROSION AND SEDIMENT CONTROLS.
7. ALL DECHLORINATION & FLUSHING TO BE COMPLETED PER AWWA C651-05 OR CURRENT VERSION.
8. 20" COUPLER, 5" GALVANIZED PIPE, 5" VALVES, FIRE HOSE & DECHLORINATOR IS CONSIDERED REUSEABLE FOR ALL FLUSHING ACTIVITIES REQ'D FOR THIS PROJECT.
9. FLUSHING AND DECHLORINATION IS INCIDENTAL TO THE CONSTRUCTION OF THE PROJECT.



2 39 TEMPORARY BYPASS DETAIL

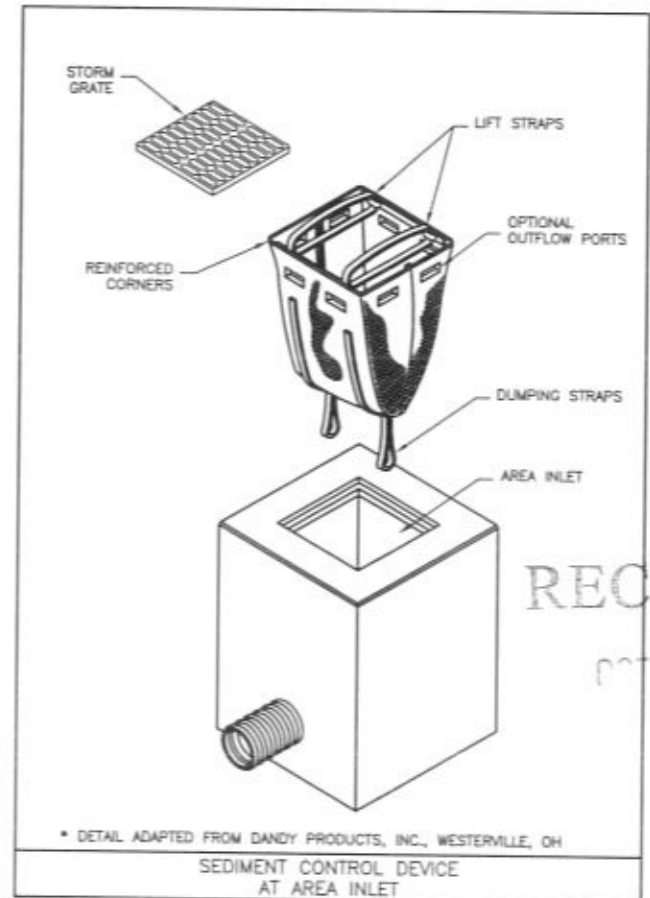
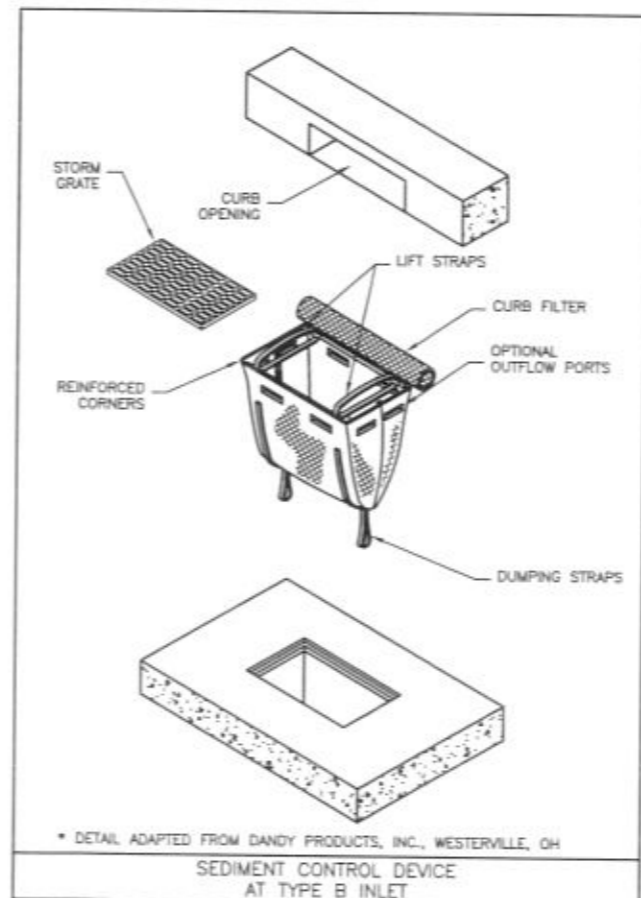
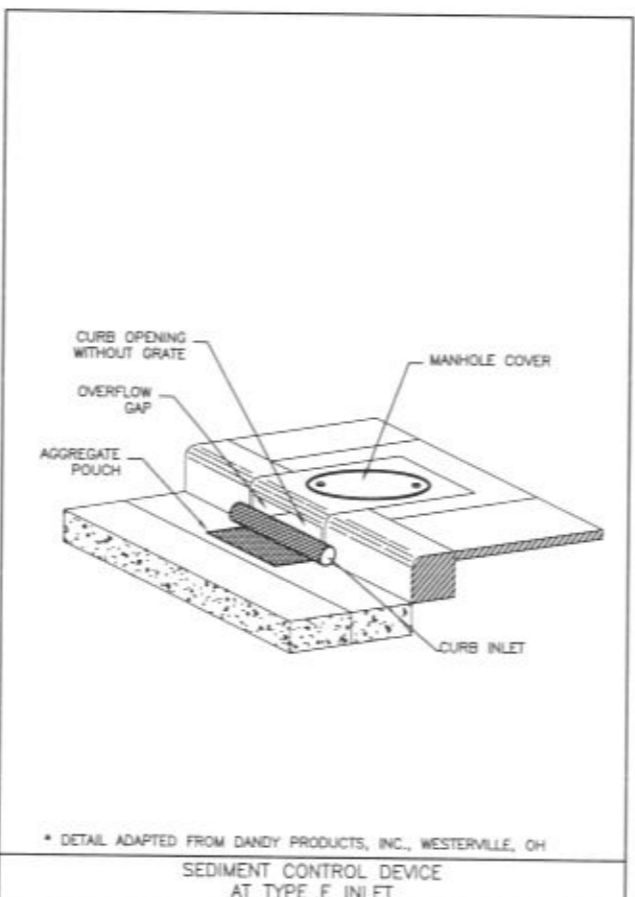
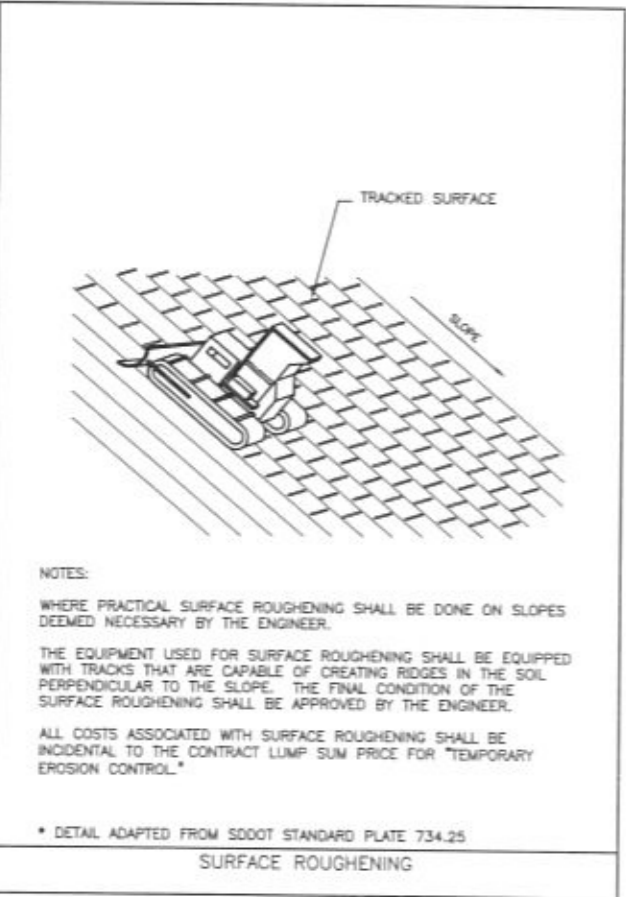
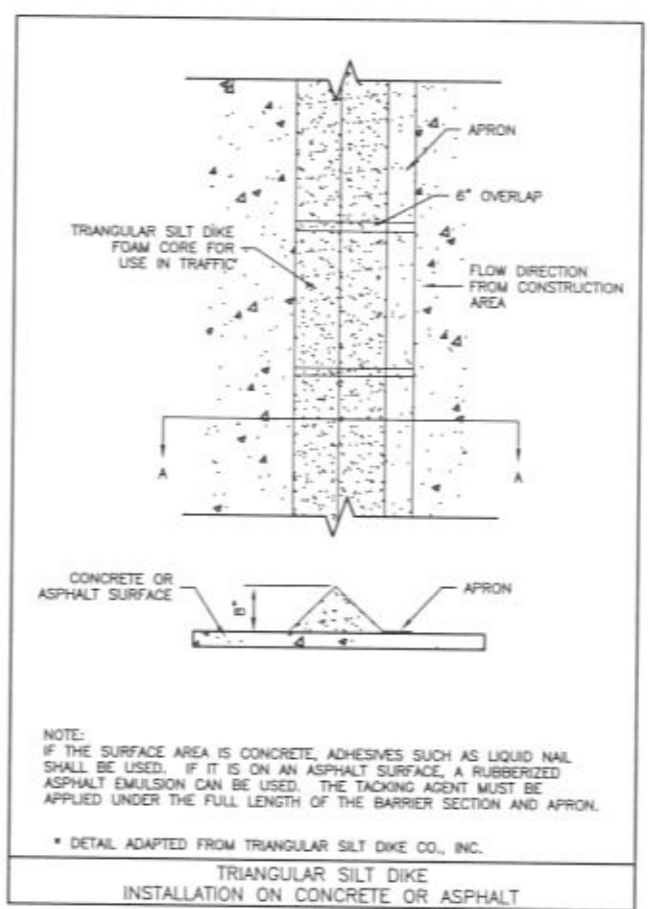
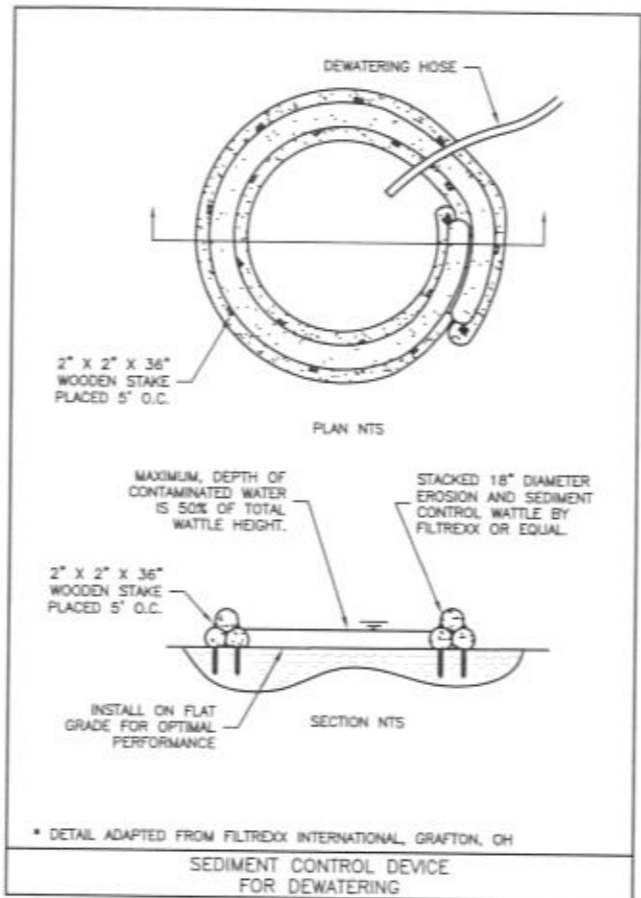
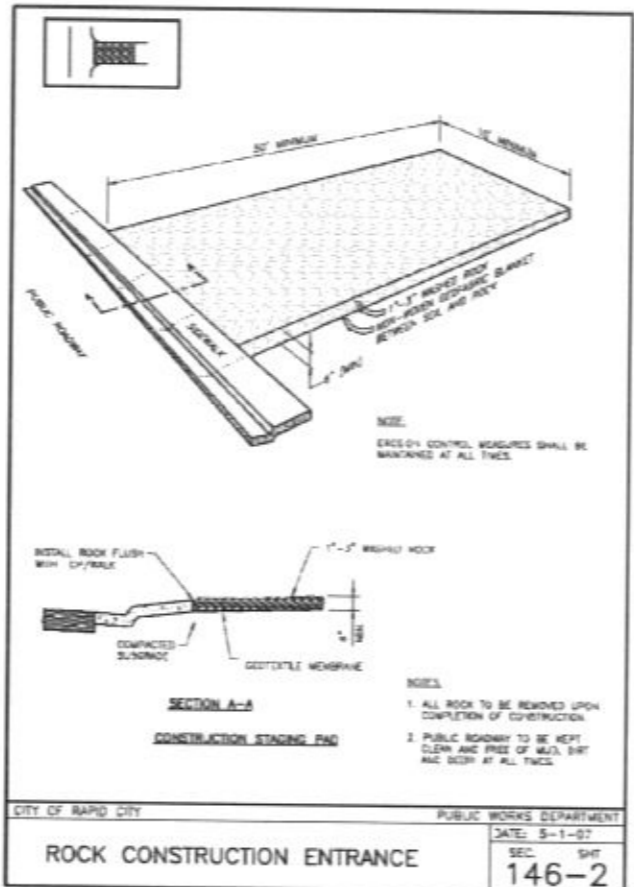
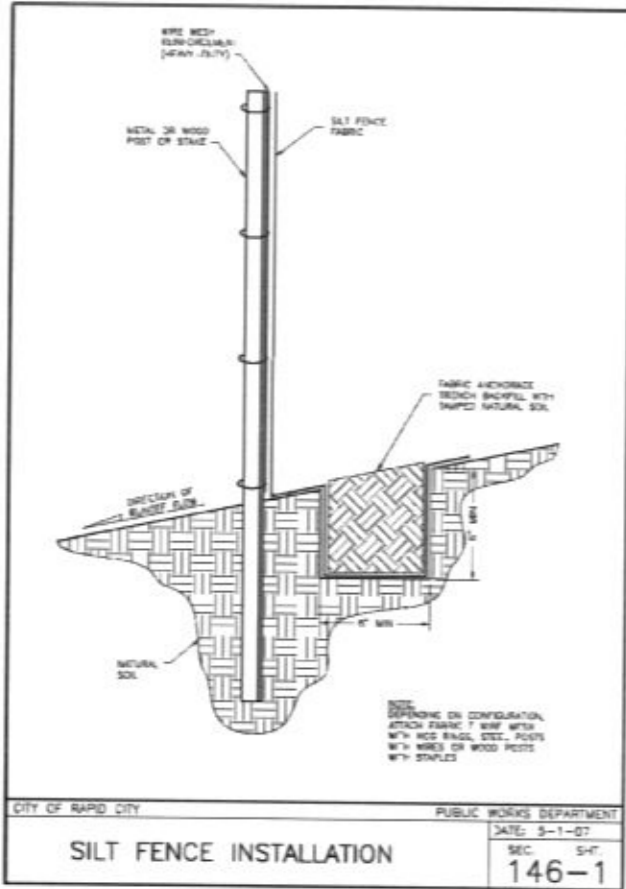


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JACKSON SPRINGS WATER TRANSMISSION MAINS

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 Prepared For: Public Works Department



 Burnes & McDonnell

 1888 1918



 Prepared By: FEC Engineering Company, Inc.

 10000 15th Street, Suite 100, Rapid City, SD 57701

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 Designed By: RLM

 Drawn By: DRS

 Design Date: SEPT 2009

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 Survey Date: FEB 2009

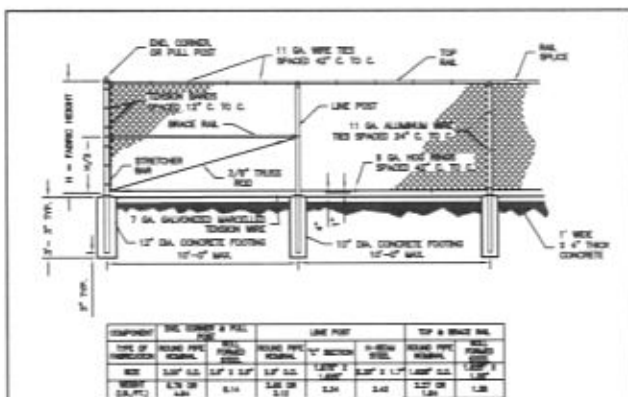
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 JACKSON SPRINGS WATER TRANSMISSION MAINS

 WTP09-15W

 Sheet Title: EROSION AND SEDIMENT CONTROL DETAILS

 Sheet: 39 of 43



COMPONENT	END CORNER & RAIL POST	LINE POST	TOP & BRACE RAIL
TYPE OF FABRICATION	ROUND PIPE	ROUND PIPE	ROUND PIPE
SIZE	2.00" O.D. x 0.187" WALL	2.00" O.D. x 0.187" WALL	2.00" O.D. x 0.187" WALL
FINISH	1.50" DIA. GALV. ZINC	1.50" DIA. GALV. ZINC	1.50" DIA. GALV. ZINC

NOTE:
3/8" TRUSS ROD AND BRACE RAIL ARE NOT REQUIRED FOR 3' THRU 5' FENCES.

GENERAL NOTES:
SPECIFIC DETAILS OF MANUFACTURE OF COMPONENT PARTS OF THE COMPLETE FENCE CONSTRUCTION SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. COMMERCIALY AVAILABLE ITEMS PRODUCED SPECIFICALLY FOR THE USE INTENDED SHALL BE USED WHEREVER POSSIBLE IN THE CONSTRUCTION OF THE FENCE.

"H" (HEIGHT OF FABRIC) SHALL BE AS SHOWN ON THE PLANS. FABRIC IS AVAILABLE IN THE FOLLOWING HEIGHTS: 36", 42", 48", 60", 72", 84", 96", 108", 120", & 144". FABRIC HEIGHTS 80 INCHES AND UNDER SHALL BE KNUCKLED AT BOTH SELVAGES. FABRIC HEIGHTS 72 INCHES AND OVER SHALL BE KNUCKLED AT ONE SELVAGE AND TWISTED AT THE OTHER SELVAGE.

CHAIN LINK FABRIC SHALL BE 2" MESH, NO. 9 GAGE GALVANIZED WIRE SECURELY FASTENED TO TENSION WIRE, LINE POST, RAILS, BRACES AND STRETCHER BARS SPACED AS SHOWN HEREON.

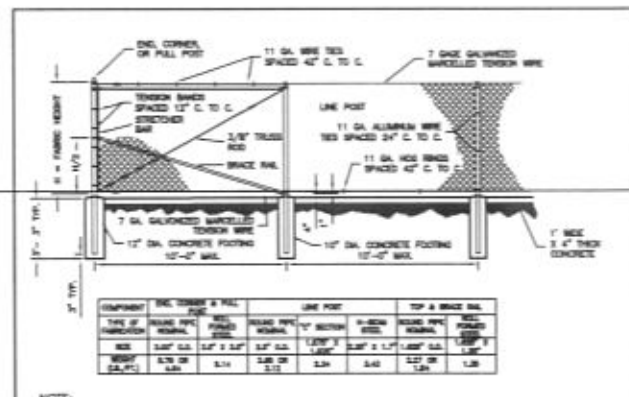
FENCE MAY BE CONSTRUCTED WITH EITHER ROUND PIPE, "C" SECTION, "H" BEAM, OR ROLL FORMED STEEL COMPONENTS AS SHOWN IN THE TABLE BELOW. LINE POST MAY BE ROUND PIPE, "C" SECTION, OR "H" BEAM. THE CORNER POST AND RAILS SHALL BE EITHER ROUND PIPE OR ROLL FORMED STEEL. THE TYPE OF COMPONENTS USED SHALL HAVE PRIOR APPROVAL BY THE ENGINEER BEFORE CONSTRUCTION.

WHERE FENCE IS LOCATED WITHIN RAPID CREEK FLOODPLAIN, USE 11 GAGE HOG RINGS. PROVIDE ONLY TWO TIES PER TENSION WIRE AND TOP RAIL BETWEEN LINE POSTS.

A SUITABLE METHOD OF RAIL SPlicing SHALL BE USED TO ALLOW FOR EXPANSION AND CONTRACTION WHILE MAINTAINING PROPER POSITION OF THE TOP RAIL.

* DETAIL ADAPTED FROM SDDOT STANDARD PLATE 621.01

CHAIN LINK FENCE WITH RAILED TOP



COMPONENT	END CORNER & RAIL POST	LINE POST	TOP & BRACE RAIL
TYPE OF FABRICATION	ROUND PIPE	ROUND PIPE	ROUND PIPE
SIZE	2.00" O.D. x 0.187" WALL	2.00" O.D. x 0.187" WALL	2.00" O.D. x 0.187" WALL
FINISH	1.50" DIA. GALV. ZINC	1.50" DIA. GALV. ZINC	1.50" DIA. GALV. ZINC

NOTE:
3/8" TRUSS ROD AND BRACE RAIL ARE NOT REQUIRED FOR 3' THRU 5' FENCES.

GENERAL NOTES:
SPECIFIC DETAILS OF MANUFACTURE OF COMPONENT PARTS OF THE COMPLETE FENCE CONSTRUCTION SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. COMMERCIALY AVAILABLE ITEMS PRODUCED SPECIFICALLY FOR THE USE INTENDED SHALL BE USED WHEREVER POSSIBLE IN THE CONSTRUCTION OF THE FENCE.

"H" (HEIGHT OF FABRIC) SHALL BE AS SHOWN ON THE PLANS. FABRIC IS AVAILABLE IN THE FOLLOWING HEIGHTS: 36", 42", 48", 60", 72", 84", 96", 108", 120", & 144". FABRIC HEIGHTS 80 INCHES AND UNDER SHALL BE KNUCKLED AT BOTH SELVAGES. FABRIC HEIGHTS 72 INCHES AND OVER SHALL BE KNUCKLED AT ONE SELVAGE AND TWISTED AT THE OTHER SELVAGE.

CHAIN LINK FABRIC SHALL BE 2" MESH, NO. 9 GAGE GALVANIZED WIRE SECURELY FASTENED TO TENSION WIRE, LINE POST, RAILS, BRACES AND STRETCHER BARS SPACED AS SHOWN HEREON.

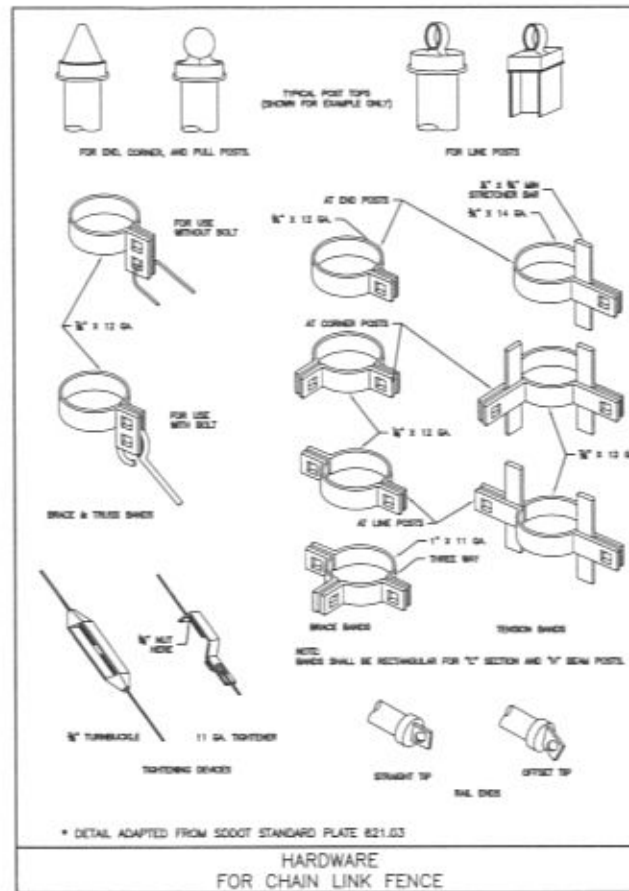
FENCE MAY BE CONSTRUCTED WITH EITHER ROUND PIPE, "C" SECTION, "H" BEAM, OR ROLL FORMED STEEL COMPONENTS AS SHOWN IN THE TABLE BELOW. LINE POST MAY BE ROUND PIPE, "C" SECTION, OR "H" BEAM. THE CORNER POST AND RAILS SHALL BE EITHER ROUND PIPE OR ROLL FORMED STEEL. THE TYPE OF COMPONENTS USED SHALL HAVE PRIOR APPROVAL BY THE ENGINEER BEFORE CONSTRUCTION.

ALL POST SHALL HAVE A MEANS TO SECURELY HOLD THE TOP TENSION WIRE IN POSITION AND ALLOW FOR THE REMOVAL AND REPLACEMENT OF A POST WITHOUT DAMAGING THE TOP TENSION WIRE.

WHERE FENCE IS LOCATED WITHIN THE RAPID CREEK FLOODPLAIN, USE 11 GAGE HOG RINGS. PROVIDE ONLY TWO TIES PER TENSION WIRE AND TOP RAIL BETWEEN LINE POSTS.

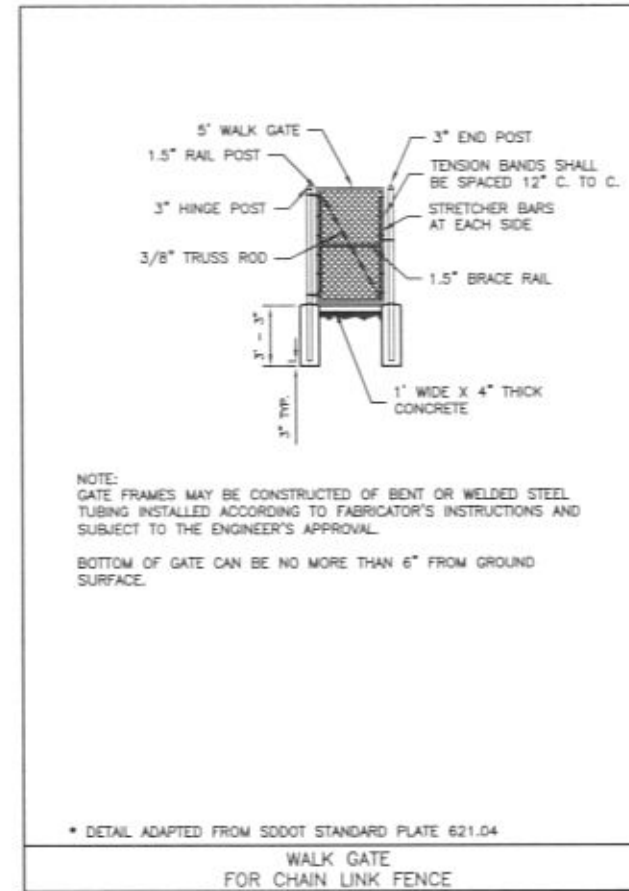
* DETAIL ADAPTED FROM SDDOT STANDARD PLATE 621.02

CHAIN LINK FENCE WITH TENSION WIRED TOP



* DETAIL ADAPTED FROM SDDOT STANDARD PLATE 621.03

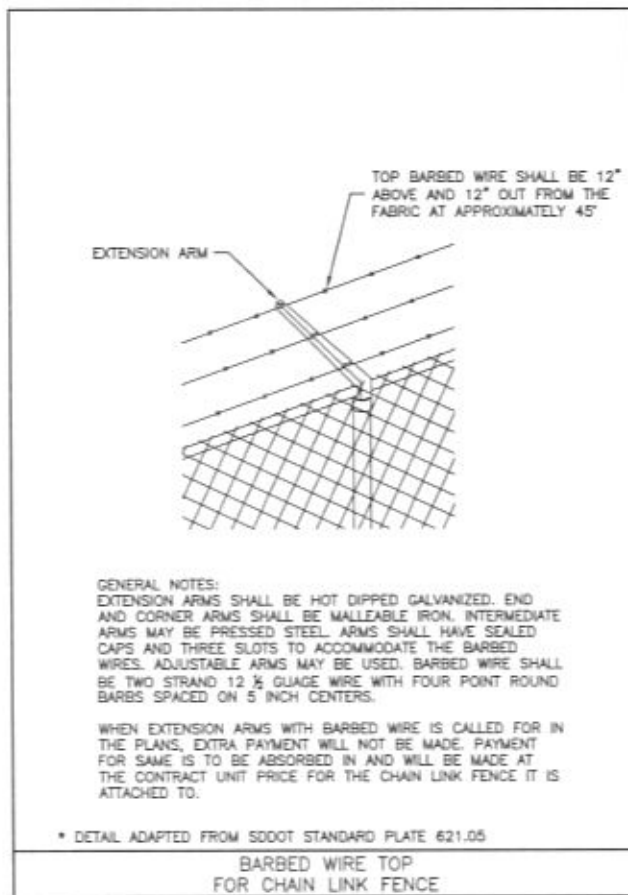
HARDWARE FOR CHAIN LINK FENCE



NOTE:
GATE FRAMES MAY BE CONSTRUCTED OF BENT OR WELDED STEEL TUBING INSTALLED ACCORDING TO FABRICATOR'S INSTRUCTIONS AND SUBJECT TO THE ENGINEER'S APPROVAL.
BOTTOM OF GATE CAN BE NO MORE THAN 6" FROM GROUND SURFACE.

* DETAIL ADAPTED FROM SDDOT STANDARD PLATE 621.04

WALK GATE FOR CHAIN LINK FENCE



GENERAL NOTES:
EXTENSION ARMS SHALL BE HOT DIPPED GALVANIZED. END AND CORNER ARMS SHALL BE MALLEABLE IRON. INTERMEDIATE ARMS MAY BE PRESSED STEEL. ARMS SHALL HAVE SEALED CAPS AND THREE SLOTS TO ACCOMMODATE THE BARBED WIRES. ADJUSTABLE ARMS MAY BE USED. BARBED WIRE SHALL BE TWO STRAND 12 1/2 GAUGE WIRE WITH FOUR POINT ROUND BARBS SPACED ON 5 INCH CENTERS.

WHEN EXTENSION ARMS WITH BARBED WIRE IS CALLED FOR IN THE PLANS, EXTRA PAYMENT WILL NOT BE MADE. PAYMENT FOR SAME IS TO BE ABSORBED IN AND WILL BE MADE AT THE CONTRACT UNIT PRICE FOR THE CHAIN LINK FENCE IT IS ATTACHED TO.

* DETAIL ADAPTED FROM SDDOT STANDARD PLATE 621.05

BARBED WIRE TOP FOR CHAIN LINK FENCE



NOT FOR CONSTRUCTION

Scale	AS SHOWN
Designed By	DRM
Drawn By	DRS
Design Date	SEPT 2009
Print Date	10-8-09
Project Job No.	J08-133
Reviewed By	SLA/JJB
Security Date	FEB 2008
Revisions	

JACKSON SPRINGS WATER TRANSMISSION MAINS

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MURKIN

W BEAM TERMINAL CONNECTOR

GENERAL NOTES:
 W Beam Terminal Connectors shall be 10 gage.
 When the W beam terminal connector is used to connect the rail to the bridge, 1\"/>

Revised: 11/20/09
 Plate Number: 630.35
 Sheet 1 of 1

W BEAM GUARDRAIL TRAILING END TERMINAL

GENERAL NOTES:
 All hardware shall be galvanized in accordance with ASTM A153.
 The cable shall be 3/4\"/>

Revised: 11/20/09
 Plate Number: 630.80
 Sheet 1 of 2

W BEAM GUARDRAIL TRAILING END TERMINAL

Revised: 11/20/09
 Plate Number: 630.80
 Sheet 2 of 2

W BEAM GUARDRAIL POST INSTALLATION

GENERAL NOTES:
 Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the SD Standard Specifications for "Asphalt Concrete Composite." For informational purposes, the type of materials for the 25\"/>

Revised: 11/20/09
 Plate Number: 630.31
 Sheet 1 of 1

W BEAM GUARDRAIL INSTALLATION

GENERAL NOTES:
 All W beam rail shall be Type 1.
 There will be no separate payment for furnishing and installing W beam end sections (flared and W beam terminal connectors). All costs for the W beam end sections (flared and W beam terminal connectors) shall be incidental to the contract unit price per foot for the respective W beam guardrail bid item.
 W beam rail section lengths may be 12'-0\"/>

Revised: 11/20/09
 Plate Number: 630.32
 Sheet 1 of 1

W BEAM RAIL, RAIL SPLICE, AND HARDWARE

Revised: 11/20/09
 Plate Number: 630.33
 Sheet 1 of 1

Project For: Public Works Department
 Rapid City, South Dakota
 Engineering Division

Prepared By: Burns & McDonnell
 SILE 1019

Project By: Ferber Engineering Company, Inc.
 1100 North 17th Street, Suite 100, Rapid City, SD 57701-1001
 (605) 343-1100

Scale: AS SHOWN

Designed By: RLM
 Drawn By: DRS

Design Date: SEPT 2009
 Print Date: 10-8-09

Job No: JOB-133

Surveyed By: SLAJUB
 Survey Date: FEB 2009

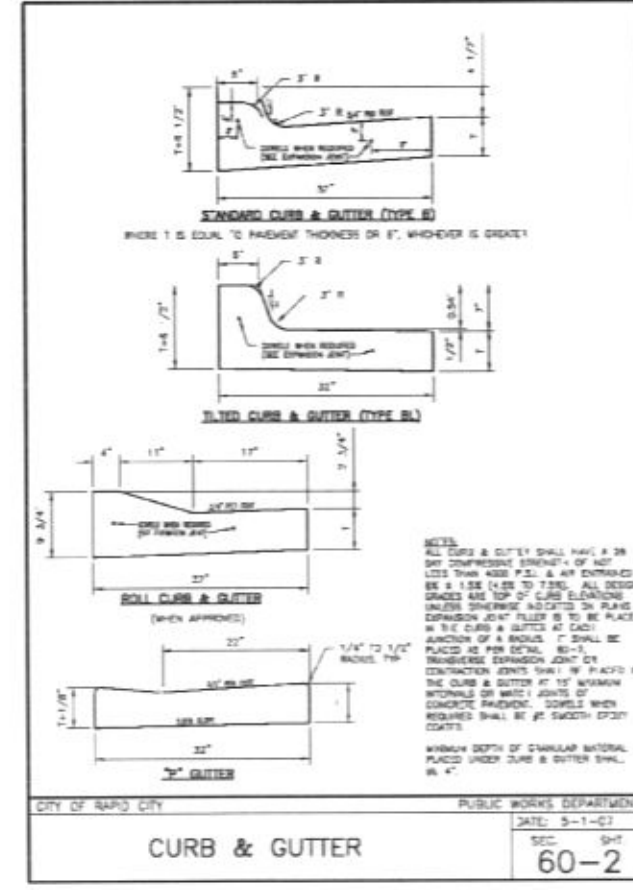
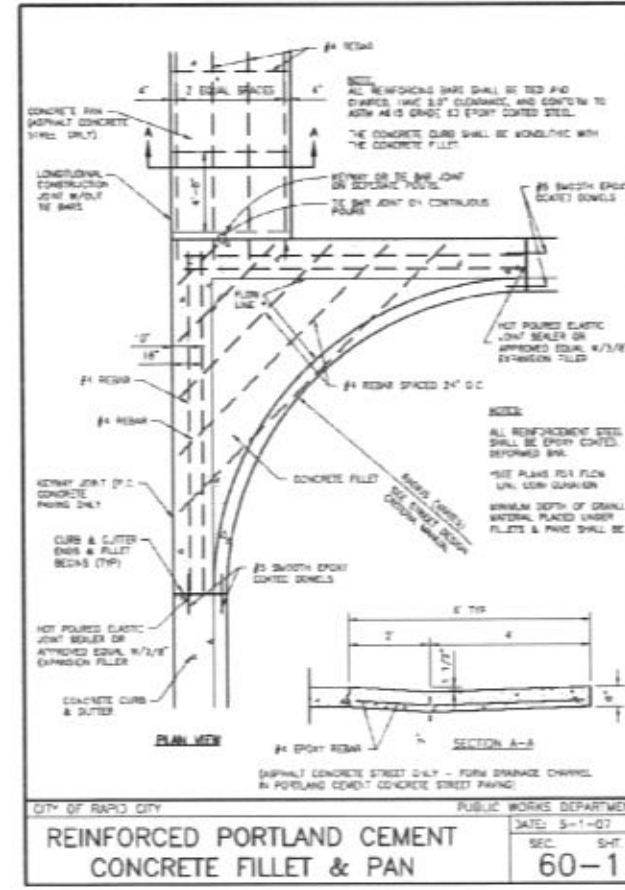
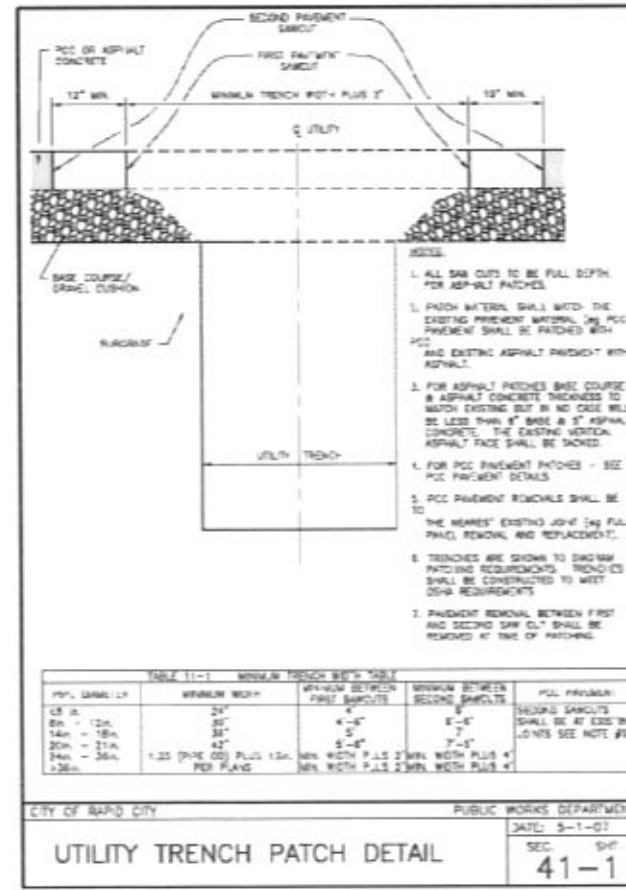
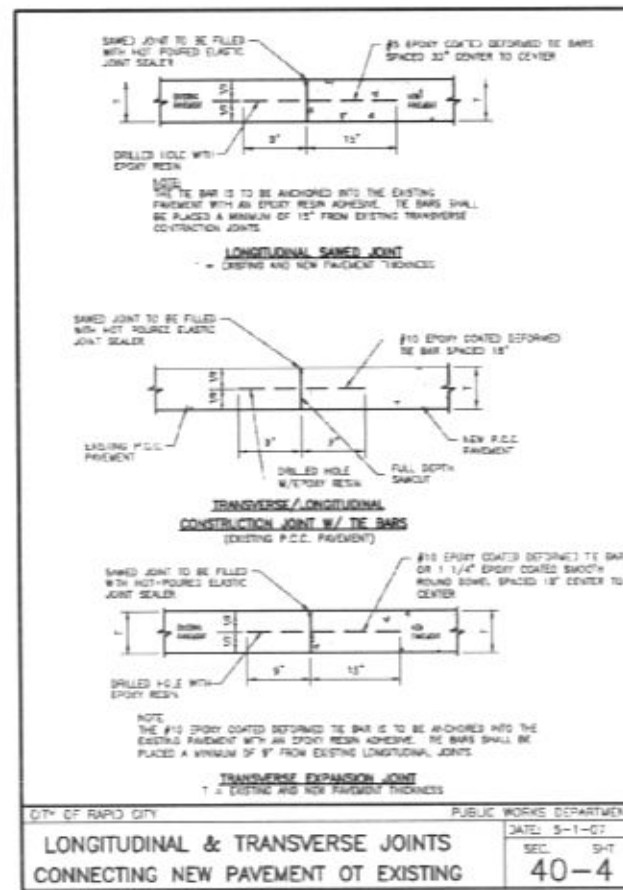
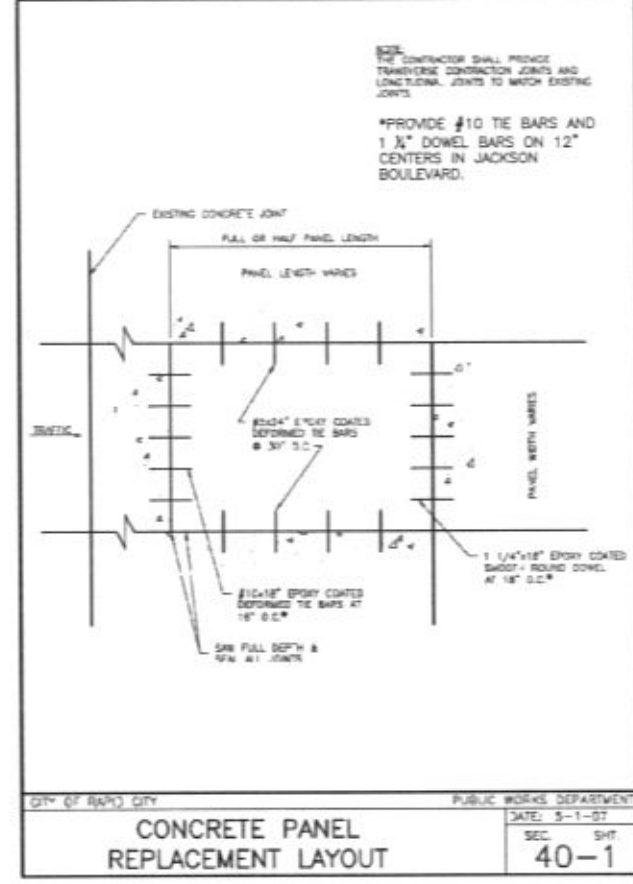
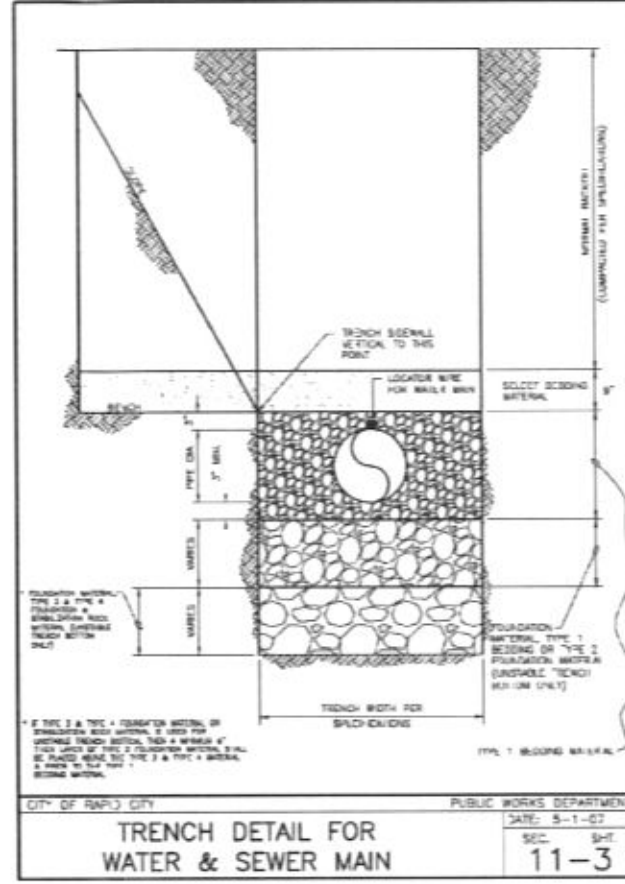
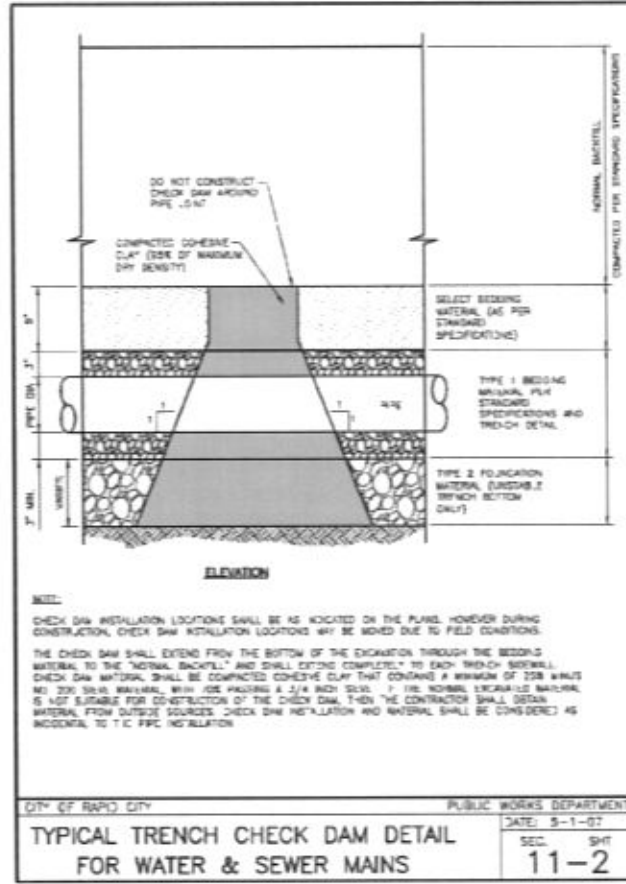
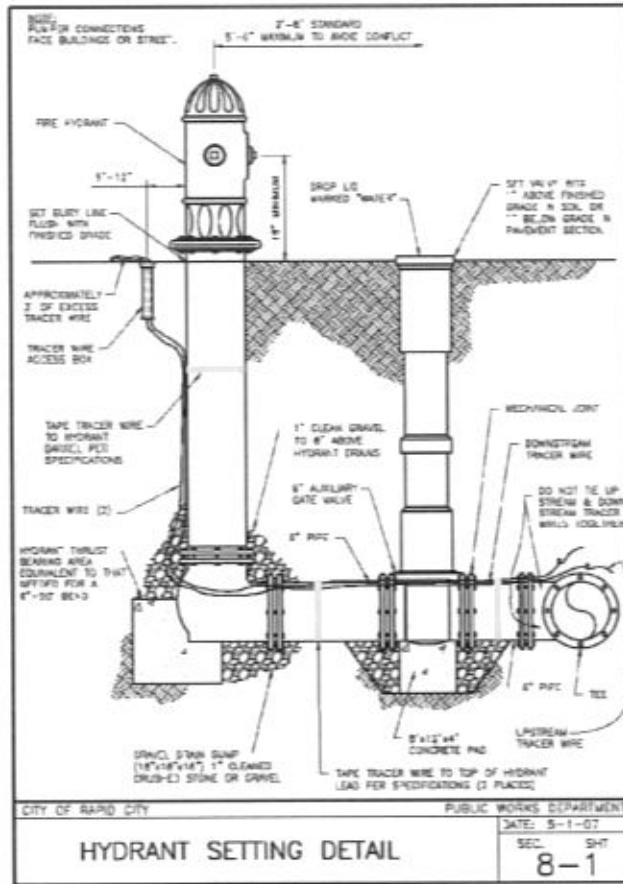
Revisions:

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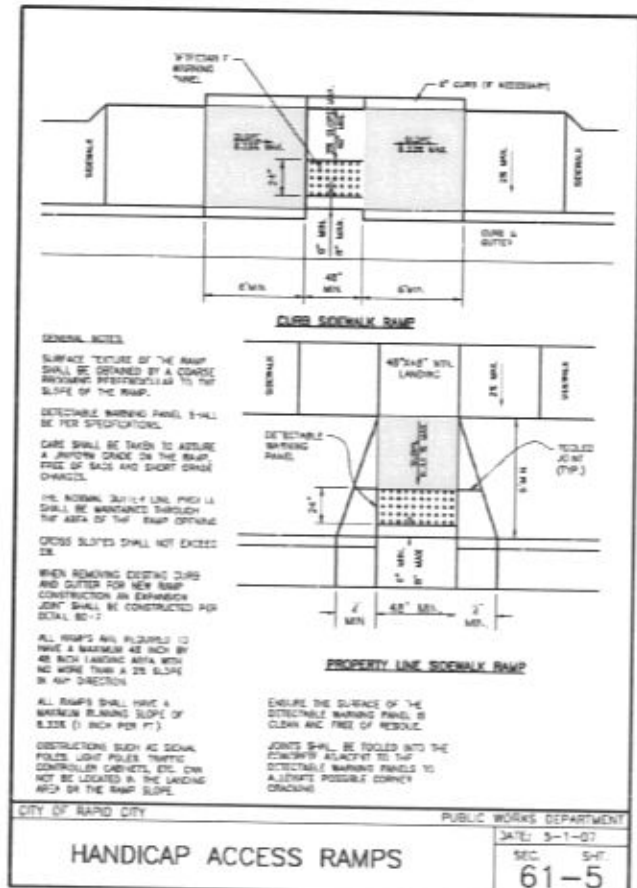
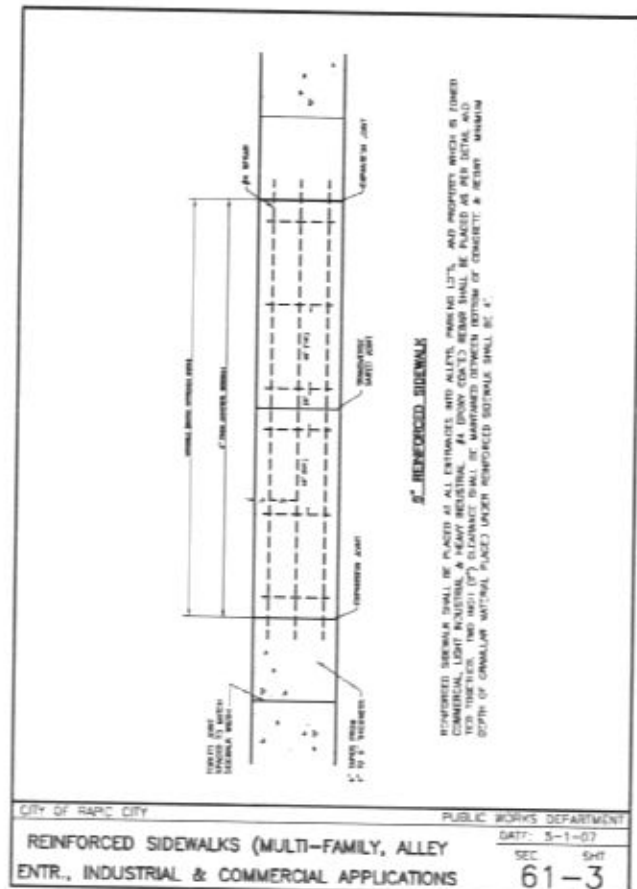
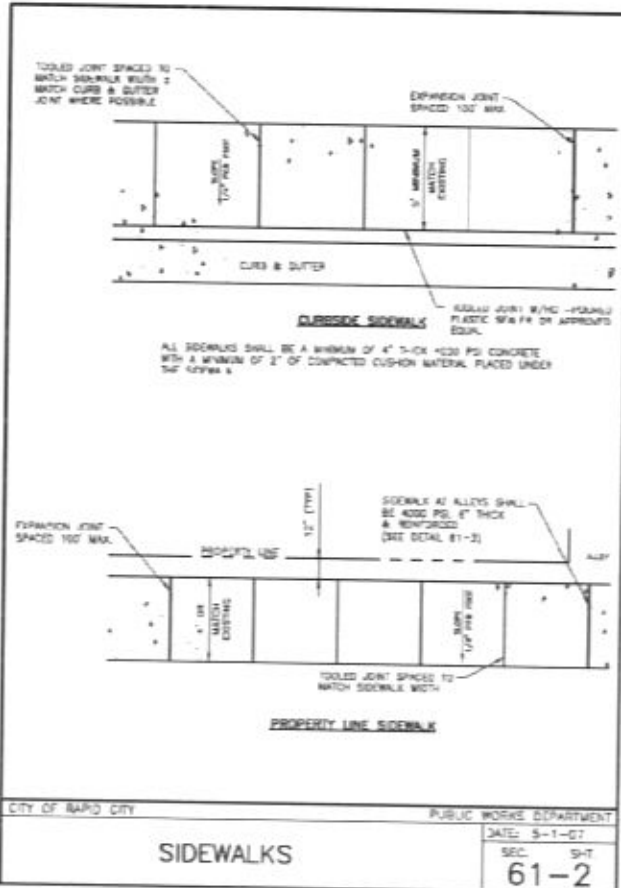
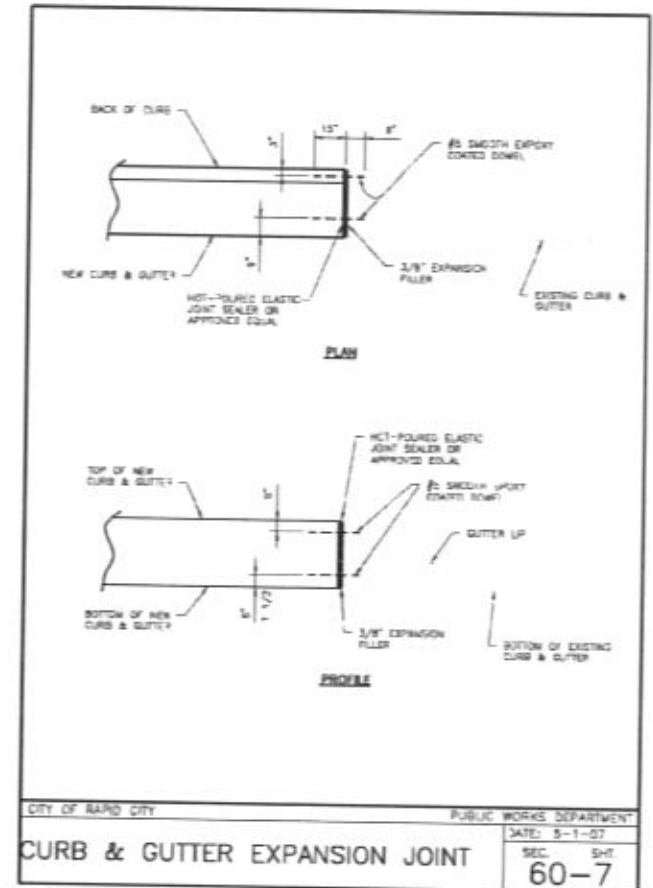
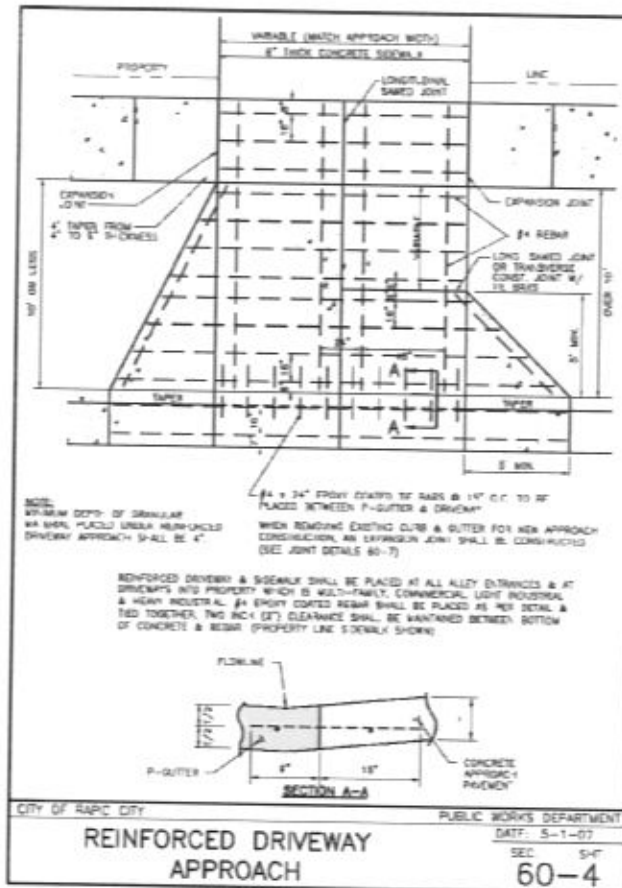
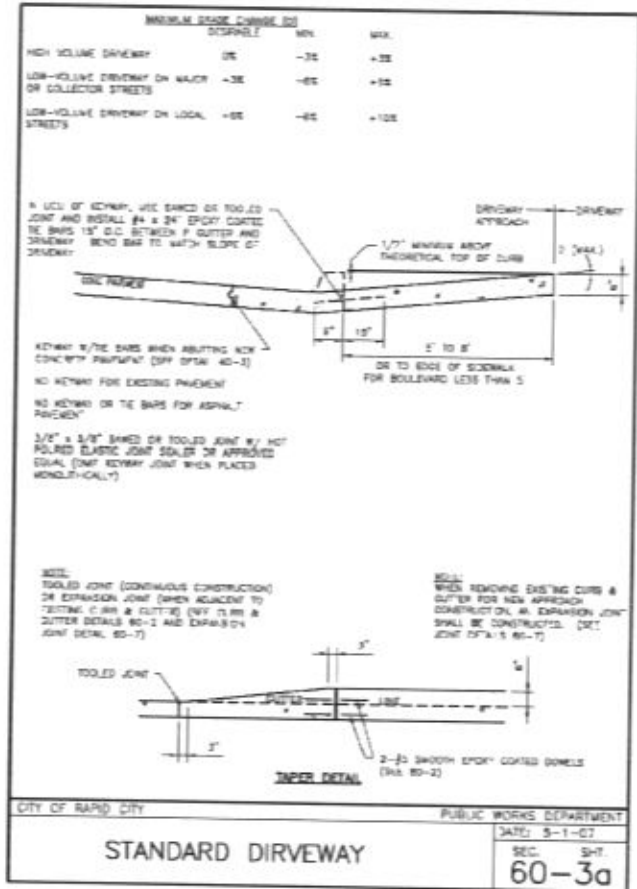
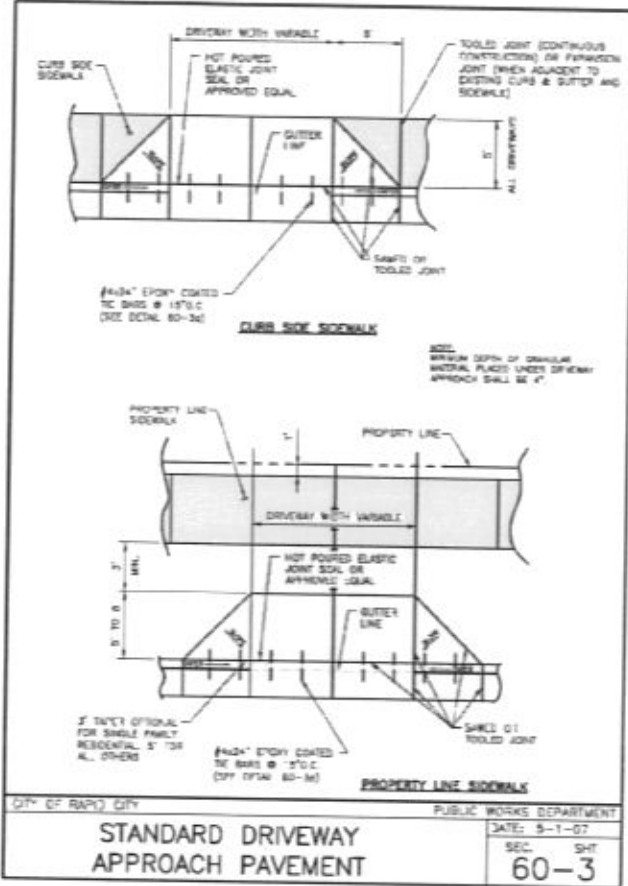
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 Rapid City Growth Management Department

Sheet Title: GUARDRAIL DETAILS

Sheet: 41 of 43



Project For: **CITY OF RAPID CITY** Engineering Division
 Prepared By: **Burns & McDonnell** since 1888
Ferber Engineering Company, Inc.
 Scale: AS SHOWN
 Designed By: RLM
 Drawn By: DRS
 Design Date: SEPT 2008
 Print Date: 10-8-09
 Internal Job No: 108-133
 Submitted By: SLA/JUB
 Safety Date: FEB 2005
JACKSON SPRINGS WATER TRANSMISSION MAINS
 CITY OF RAPID CITY
 STANDARD DETAILS
 42 of 43



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OCT 17 2007
Rapid City
City of Rapid City
Public Works Department

Presented by
Public Works Department
Engineering Division

Burns & McDonnell
SINCE 1858

Prepared by
Ferber
Engineering
Company, Inc.

Scale: AS SHOWN

Designed By: RLM
Drawn By: DRS
Design Date: SEPT 2005
Plot Date: 10-8-09
Internal Job No: 408-133
Surveyed By: SLA/JLB
Survey Date: FEB 2005

JACKSON SPRINGS WATER
TRANSMISSION MAINS

Sheet No: CITY OF RAPID CITY
STANDARD DETAILS
Date: 43 of 43