



HEBER PUBLIC UTILITY DISTRICT STANDARD DETAILS AND SPECIFICATIONS



PREPARED BY



THE HOLT GROUP

ENGINEERING ■ PLANNING ■ SURVEYING

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GENERAL CONDITIONS

1. UTILITIES

THE LOCATION OF UNDERGROUND UTILITIES ILLUSTRATED ON THE PLANS IS APPROXIMATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT UNDERGROUND SERVICE ALERT TO EXACTLY LOCATE THE UNDERGROUND UTILITIES. UNDERGROUND SERVICE ALERT SHOULD BE CONTACTED 72 HOURS BEFORE ANY EXCAVATION BEGINS.

THE CONTRACTOR SHALL ASSUME COMPLETE RESPONSIBILITY FOR DAMAGED UTILITIES. A LIST OF UTILITY COMPANIES WHICH SERVICE THE HEBER PUBLIC UTILITY DISTRICT APPEARS BELOW:

- A. ADELPHIA
313 N. EIGHTH STREET
EL CENTRO, CA 92243
PHONE: (760) 352-6258
CONTACT: OCTAVIO CARRILLO
- B. SOUTHERN CALIFORNIA GAS COMPANY-PLANNING DEPARTMENT
P. O. BOX 3003
1981 W. LUGONIA AVENUE
REDLANDS, CA 92373
PHONE: (909) 335-7781
CONTACT: MIKE FISHER
- C. SOUTHERN CALIFORNIA GAS COMPANY
970 N. FOURTH STREET
EL CENTRO, CA 92243
PHONE: (760) 352-6100
CONTACT: JIMMIE RODRIGUEZ
- D. IMPERIAL IRRIGATION DISTRICT - POWER DIVISION
1285 BROADWAY
EL CENTRO, CA 92243
PHONE: (760) 482-9630
CONTACT: STAN ARMSTRONG

- E. SBC
1029 S. SECOND STREET
EL CENTRO, CA 92243
PHONE: (760) 337-3325 OR (760) 337-3358
CONTACT: MIKE ORMAND
- F. HEBER PUBLIC UTILITY DISTRICT
1078 DOGWOOD ROAD, SUITE 103
HEBER, CA 92249
PHONE: (760) 482-2440
CONTACT: RAFAELA "FALA" SANCHEZ, OFFICE MANAGER
- G. UNDERGROUND SERVICE ALERT
PHONE: 1-800-422-4133

2. AS-BUILT DRAWINGS

THE DEVELOPER SHALL MAINTAIN A SET OF DRAWINGS ON THE JOB ILLUSTRATING ALL "AS-BUILT" CHANGES MADE TO DATE. A MARKED-UP SET OF DRAWINGS SHALL BE DELIVERED TO THE HEBER PUBLIC UTILITY DISTRICT ENGINEER UPON COMPLETION OF THE WORK, WHICH SHALL REFLECT ALL "AS-BUILT" MODIFICATIONS. THE DEVELOPER SHALL PROVIDE "AS-BUILT" DRAWINGS TO THE HEBER PUBLIC UTILITY DISTRICT AT THE CONCLUSION OF THE PROJECT. THE AS-BUILT DRAWINGS SHALL BE REVIEWED AND APPROVED BY THE DISTRICT ENGINEER. THREE (3) SETS OF APPROVED BLUELINE DRAWINGS AND AN ELECTRONIC FILE (COMPUTER DISK) SHALL BE FORWARDED TO THE HEBER PUBLIC UTILITY DISTRICT AT THE CONCLUSION OF THE PROJECT.

3. DUST CONTROL

THE CONTRACTOR SHALL MAKE A SPECIAL EFFORT TO CONTROL DUST DURING THE EXECUTION OF THE WORK. DUST SHALL BE MAINTAINED TO A MINIMUM BY REGULAR APPLICATIONS OF WATER AS NECESSARY AND AS DIRECTED BY THE DISTRICT ENGINEER.

4. CODES AND REGULATIONS

ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH APPLICABLE CODES, ORDINANCES AND REGULATIONS OF THE HEBER PUBLIC UTILITY DISTRICT, THE STATE OF CALIFORNIA AND ALL OTHER PUBLIC AUTHORITIES HAVING JURISDICTION. CODES

GOVERNING THIS WORK INCLUDE, BUT ARE NOT LIMITED TO, THE LATEST APPROVED EDITION OF THE FOLLOWING: STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, LATEST EDITION; STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK) LATEST EDITION; OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA); AND THE HEBER PUBLIC UTILITY DISTRICT REGULATIONS. REQUIREMENTS OF CODES AND REGULATIONS SHALL BE CONSIDERED AS MINIMUM. WHERE CONTRACT DOCUMENTS EXCEED WITHOUT VIOLATING CODE AND REGULATION REQUIREMENTS, CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE. WHERE CODES CONFLICT, THE MORE STRINGENT SHALL APPLY. THE CONTRACTOR SHALL FURNISH ALL MATERIALS AND LABOR REQUIRED FOR COMPLIANCE WITH CODES AND REGULATIONS, EVEN THOUGH NOT SPECIFICALLY MENTIONED OR ILLUSTRATED, WITHIN THE CONTENTS OF THE PLANS OR SPECIFICATIONS.

5. EXAMINATION OF SITE:

IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND SUBCONTRACTOR(S) TO EXAMINE THE PROJECT SITE PRIOR TO THE OPENING OF PROPOSALS. THE CONTRACTOR SHALL BECOME FAMILIAR AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED. IT IS EXPECTED THAT QUESTIONS RELEVANT TO THE WORK TO BE PERFORMED AT THE PROJECT WILL BE PRESENTED TO THE DISTRICT ENGINEER PRIOR TO THE NEGOTIATION OF A CONTRACT WITH THE DEVELOPER. IF CONFLICTS OR AMBIGUITIES EXIST BETWEEN JOB SITE CONDITIONS AND THE PLANS AND SPECIFICATIONS NO ALLOWANCE WILL BE PROVIDED TO THE CONTRACTOR AND SUBCONTRACTORS FOR THEIR NEGLIGENCE TO PROPERLY EXAMINE THE PROJECT SITE.

6. PERMITS:

THE CONTRACTORS AND SUBCONTRACTORS SHALL OBTAIN ALL NECESSARY PERMITS AND A BUSINESS LICENSE FROM THE HEBER PUBLIC UTILITY DISTRICT. THE CONTRACTOR SHALL NOTIFY THE HEBER PUBLIC UTILITY DISTRICT AND THE HOLT GROUP, INC., AT LEAST 72 HOURS PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL INCLUDE ALL EXPENSES ASSOCIATED WITH THE HEBER PUBLIC UTILITY DISTRICT BUSINESS LICENSE WITH THE PROJECT COSTS.

7. **TRAFFIC CONTROL:**

THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE COUNTY OF IMPERIAL DEPARTMENT OF PUBLIC WORKS FOR REVIEW AND APPROVAL PRIOR TO COMPLETING DEMOLITION OR EXCAVATION WORK IN ROADWAYS WITHIN THE COUNTY RIGHT OF WAY. THE CONTRACTOR SHALL ADVISE ALL RESIDENTS ALONG COUNTY ROADWAYS OF IMPENDING CONSTRUCTION ACTIVITIES AT LEAST TWO (2) WORKING DAYS PRIOR TO THE COMMENCEMENT OF ANY WORK. THE TRAFFIC CONTROL PLAN SHALL BE PREPARED IN CONFORMANCE WITH THE REQUIREMENTS OF THE IMPERIAL COUNTY PUBLIC WORKS DEPARTMENT.

THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL NECESSARY TRAFFIC CONTROL TO PROTECT AND GUIDE TRAFFIC FOR ALL WORK IN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXPENSES RELATIVE TO TRAFFIC CONTROL. ALL TRAFFIC CONTROLS SHALL BE CLEARLY POSTED WITH SIGNS PRIOR TO THE BEGINNING OF ANY WORK. ALL TRAFFIC RESTRICTIONS LISTED HEREIN ARE TO SUPPLEMENT OTHER TRAFFIC REGULATIONS OF THE COUNTY OF IMPERIAL. THE CONTRACTOR SHALL ATTEMPT TO MAINTAIN LOCAL ACCESS TO ALL PROPERTIES ON THE PROJECT AT THE END OF EACH WORKING DAY, WHEN POSSIBLE. **ANY STREET CLOSURE SHALL BE APPROVED BY THE COUNTY OF IMPERIAL PUBLIC WORKS DEPARTMENT.**

8. **BARRICADES.**

DURING THE INSTALLATION OF THE SANITARY SEWER PIPELINE AND WATER PIPELINE, THE CONTRACTOR SHALL MAINTAIN LIGHTED BARRICADES ALONG THE LENGTH OF THE PIPELINE TO PROHIBIT PEDESTRIAN TRAFFIC OR VEHICULAR TRAFFIC FROM ENTERING OPEN EXCAVATIONS. THE CONTRACTOR SHALL SUPPLY THE QUANTITY OF BARRICADES REQUIRED. IF THE LIGHTED BARRICADES BECOME DEFECTIVE OR NON-FUNCTIONAL, THE BARRICADES SHALL BE IMMEDIATELY REPLACED AS DIRECTED BY THE ENGINEER. BARRICADES SHALL BE PLACED ALONG THE EDGES OF THE PIPELINE EXCAVATIONS AT FOUR FEET (4') ON CENTER TO DIVERT VEHICULAR AND PEDESTRIAN TRAFFIC AROUND THE CONSTRUCTION AREAS. ADDITIONAL BARRICADES SHALL BE ADDED IF REQUIRED AS DIRECTED BY THE DISTRICT ENGINEER. THE CONTRACTOR SHALL INCLUDE THE

COST ASSOCIATED WITH BARRICADE SUPPLY AND PLACEMENT IN THE PROPOSAL TO THE DEVELOPER.

10. RESTROOM FACILITIES.

THE DEVELOPER SHALL LOCATE MEN'S AND WOMEN'S PORTABLE RESTROOM FACILITIES AT THE PROJECT SITE DURING THE CONSTRUCTION PERIOD. THE PORTABLE RESTROOMS SHALL BE CLEANED ON A WEEKLY BASIS. THE PORTABLE RESTROOMS SHALL BE POSITIONED IN THE AREA THAT WORK IS OCCURRING.

11. UNDERGROUND SERVICE ALERT.

THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT AT 1-800-227-2600 AT LEAST 72 HOURS PRIOR TO ANY UNDERGROUND EXCAVATION.

12. ACCESS TO PRIVATE PROPERTY.

THE CONTRACTOR SHALL PROVIDE FOR INGRESS AND EGRESS FOR PRIVATE PROPERTY ADJACENT TO THE WORK THROUGHOUT THE PERIOD OF CONSTRUCTION.

13. CLEAN-UP OF EXISTING STREETS.

ANY DIRT, DUST OR MUD, EITHER TRACKED OFF-SITE BY EQUIPMENT OR BLOWN INTO ADJACENT STREETS WITHIN THE HEBER PUBLIC UTILITY DISTRICT WILL BE CLEANED UP DAILY BY THE RESPONSIBLE CONTRACTOR OR SUBCONTRACTOR.

14. UNDERGROUND UTILITIES.

THE LOCATION OF EXISTING UTILITIES IS SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

15. COORDINATION OF INSPECTION SERVICES.

THE CONTRACTOR SHALL ARRANGE FOR INSPECTIONS FOR THIS PROJECT WITH THE HEBER PUBLIC UTILITY DISTRICT ENGINEERING CONSULTANT AT (760) 337-3883 A MINIMUM OF 72 HOURS IN ADVANCE. IN THE EVENT THE CONTRACTOR OR

SUBCONTRACTOR DECLINES THE INSPECTION AT THE PRE-ARRANGED TIME AND DATE OF INSPECTION, THE DEVELOPER SHALL BE CHARGED THE CURRENT HOURLY RATE OF THE HOLT GROUP PERSONNEL FROM THE TIME THE PERSONNEL LEAVES THE HOLT GROUP OFFICE UNTIL THE TIME THE PERSONNEL RETURNS TO THE HOLT GROUP OFFICE.

16. PUMPING OF NATIVE SOIL.

DURING GRADING OPERATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING EQUIPMENT THAT WILL NOT CAUSE "PUMPING" OF THE SOIL DUE TO THE DEPTH OF GROUNDWATER PRIOR TO CONSTRUCTION.

17. REQUIREMENTS OF CONTRACTORS AND SUBCONTRACTORS.

ALL CONTRACTORS AND SUBCONTRACTORS PARTICIPATING ON THIS PROJECT SHALL BE LICENSED BY THE STATE OF CALIFORNIA, HAVE A HEBER PUBLIC UTILITY DISTRICT BUSINESS LICENSE AND SHALL FILE A CERTIFICATE OF WORKMENS' COMPENSATION WITH THE HEBER PUBLIC UTILITY DISTRICT AND COUNTY OF IMPERIAL PUBLIC WORKS DEPARTMENT PRIOR TO THE START OF CONSTRUCTION.

18. LISTING OF GENERAL CONTRACTORS AND SUBCONTRACTORS.

A LIST OF ALL SUBCONTRACTORS AND THE GENERAL CONTRACTOR SHALL BE PROVIDED BY THE DEVELOPER TO THE HEBER PUBLIC UTILITY DISTRICT AND COUNTY OF IMPERIAL PUBLIC WORKS DEPARTMENT PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES AT THE PROJECT SITE.

19. OPEN TRENCHES.

NO OPEN TRENCHES WILL BE PERMITTED OVERNIGHT WITHOUT THE WRITTEN APPROVAL OF THE HEBER PUBLIC UTILITY DISTRICT.

20. PRE-CONSTRUCTION CONFERENCE.

A PRE-CONSTRUCTION CONFERENCE SHALL BE CONDUCTED WITH THE COUNTY OF IMPERIAL DEPARTMENT OF PUBLIC WORKS, DISTRICT ENGINEER, GENERAL MANAGER, CONTRACTOR, SUBCONTRACTOR AND DEVELOPER AT LEAST 7 DAYS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

21. CONTRACTOR, DEVELOPER AND SUBCONTRACTOR RESPONSIBILITY.

THE CONTRACTOR, DEVELOPER AND SUBCONTRACTORS AGREE TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR, DEVELOPER AND SUBCONTRACTORS SHALL DEFEND, INDEMNIFY AND HOLD THE HEBER PUBLIC UTILITY DISTRICT HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT.

22. STENCIL WATER SERVICE ON CURB.

STENCIL EACH WATER SERVICE WITH A "W" 2 INCHES IN HEIGHT ON THE FACE OF THE CURB BORDERING THE WATER METER ENCLOSURE.

23. STENCIL SANITARY SEWER SERVICE ON CURB.

STENCIL EACH SANITARY SEWER SERVICE WITH AN "S" 2 INCHES IN HEIGHT ON THE FACE OF THE CURB UNDER WHICH THE SANITARY SEWER SERVICE CROSSES THE CURB.

24. SEPARATION REQUIREMENTS OF DOMESTIC WATER AND SANITARY SEWER SERVICES.

BASIC SEPARATION REQUIREMENTS FOR WATER AND SEWER MAINS AND LATERALS AND SERVICES SHALL BE OBSERVED AS DIRECTED BY THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES STANDARDS AND THE HEBER PUBLIC UTILITY DISTRICT STANDARDS.

25. CUT SHEET DISTRIBUTION.

THE CONTRACTOR SHALL FURNISH TWO (2) SETS OF "CUT SHEETS" FOR SEWER CONSTRUCTION TO THE HEBER PUBLIC UTILITY DISTRICT AND TWO (2) SETS OF "CUT SHEETS" TO THE HOLT GROUP A MINIMUM OF 24 HOURS PRIOR TO THE COMMENCEMENT OF PIPELINE INSTALLATION.

TECHNICAL CONDITIONS

I. WATER PIPELINE TECHNICAL CONDITIONS

1.1 PIPE INSTALLATION

THIS SECTION COVERS FURNISHING ALL LABOR, SUPERVISION, MATERIALS AND EQUIPMENT AND PERFORMING ALL OPERATIONS NECESSARY TO FURNISH AND INSTALL THE PIPING, FITTINGS, AND VALVES. ALL PIPE, FITTINGS, VALVES AND ACCESSORIES FURNISHED BY THE CONTRACTOR SHALL BE NEW MATERIAL FREE FROM RUST OR CORROSION. ALL PIPING, VALVES AND FITTINGS SHALL BE CLEANED ON THE INSIDE WHEN INSTALLED AND THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO INSURE THAT THE LINES ARE KEPT FREE OF ANY FOREIGN MATTER AND DIRT UNTIL THE WORK IS COMPLETED. ALL PIPE SHALL BE CAREFULLY PLACED AND SUPPORTED AT THE PROPER LINES AND GRADES, AS SHOWN ON THE DRAWINGS. PIPING RUNS SHOWN ON THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE EXCEPT FOR MINOR ADJUSTMENTS TO AVOID OTHER PIPING OR STRUCTURAL FEATURES. IF MAJOR RELOCATIONS ARE REQUIRED, THEY SHALL BE APPROVED BY THE DISTRICT ENGINEER. THE BEDDING SHALL BE DEFINED AS THAT MATERIAL SUPPORTING, SURROUNDING AND EXTENDING TO ONE FOOT ABOVE THE TOP OF THE PIPE. IF SOFT, SPONGY UNSTABLE, OR SIMILAR OTHER MATERIAL IS ENCOUNTERED UPON WHICH THE BEDDING MATERIAL OR PIPE IS TO BE PLACED, THIS UNSUITABLE MATERIAL SHALL BE REMOVED TO A DEPTH ORDERED BY THE DISTRICT ENGINEER AND REPLACED WITH BEDDING MATERIAL SUITABLY DENSIFIED. BEDDING MATERIAL SHALL FIRST BE PLACED SO THAT THE PIPE IS SUPPORTED FOR THE FULL LENGTH OF THE BARREL WITH FULL BEARING ON THE BOTTOM SEGMENT OF THE PIPE. HUNCHING OF THE PIPE SHALL NOT BE ALLOWED. THEN THE REMAINDER OF THE BEDDING SHALL BE PLACED. EXCEPT WHERE OTHERWISE SPECIFIED OR ILLUSTRATED ON THE PLANS, BEDDING MATERIAL SHALL BE GRANULAR SAND MATERIAL. PIPE WILL BE

CAREFULLY INSPECTED IN THE FIELD BEFORE AND AFTER LAYING. IF ANY CAUSE FOR REJECTION IS DISCOVERED IN A PIPE AFTER IT HAS BEEN LAID, IT SHALL BE SUBJECT TO REJECTION. ANY CORRECTIVE WORK SHALL BE APPROVED BY THE DISTRICT ENGINEER AND SHALL BE ACCOMPLISHED BY THE CONTRACTOR. PIPE SHALL BE LAID UPGRADE WITH THE SOCKET ENDS OF THE PIPE UPGRADE UNLESS OTHERWISE AUTHORIZED BY THE DISTRICT ENGINEER. PIPE SHALL BE LAID TRUE TO LINE AND GRADE WITH UNIFORM BEARING UNDER THE FULL LENGTH OF THE BARREL OF THE PIPE. SUITABLE EXCAVATION SHALL BE MADE TO RECEIVE THE BELL OR COLLAR, WHICH SHALL NOT BEAR UPON THE SUBGRADE OR BEDDING. ANY PIPE WHICH IS NOT IN TRUE ALIGNMENT OR SHOWS ANY UNDUE SETTLEMENT AFTER LAYING SHALL BE TAKEN UP AND RELAID AT THE CONTRACTOR'S EXPENSE. PIPE SECTIONS SHALL BE LAID AND JOINED IN SUCH A MANNER THAT THE OFFSET OF THE INSIDE OF THE PIPE AT ANY JOINT WILL BE HELD TO A MINIMUM AT THE INVERT. THE MAXIMUM HORIZONTAL OFFSET AT THE INVERT OF THE PIPE SHALL BE 1% OF THE INSIDE DIAMETER OF THE PIPE OR 0.02 FEET, WHICHEVER IS SMALLER. THE VERTICAL GRADE SHALL BE +/- 0.02 FEET OF THE DESIGN INVERT. IN JOINING SOCKET PIPE, THE SPIGOT OF EACH PIPE SHALL BE SO SEATED IN THE SOCKET OF THE ADJACENT PIPE AS TO GIVE A UNIFORM ANNULAR SPACE ALL AROUND THE PIPE IN THE SOCKET. UNAVOIDABLE OFFSETS SHALL BE DISTRIBUTED AROUND THE CIRCUMFERENCE OF THE PIPE IN SUCH A MANNER THAT THE MINIMUM OFFSET OCCURS AT THE INVERT. AT THE CLOSE OF WORK EACH DAY, OR WHENEVER THE WORK CEASES FOR ANY REASON, THE END OF THE PIPE SHALL BE SECURELY CLOSED.

1.2 PVC PIPE

THIS SPECIFICATION DESIGNATES GENERAL REQUIREMENTS FOR UNPLASTICIZED POLYVINYL CHLORIDE (PVC) PLASTIC CLASS WATER PIPE WITH INTEGRAL BELL AND SPIGOT JOINTS FOR THE CONVEYANCE OF WATER. PIPE SHALL MEET THE REQUIREMENTS OF AWWA C900 "POLYVINYL CHLORIDE (PVC) WATER DISTRIBUTION". ALL CLASS 100 PIPE SHALL MEET THE REQUIREMENTS OF DR 25, CLASS 150 PIPE SHALL MEET THE REQUIREMENTS OF DR 18 AND CLASS 200 THE REQUIREMENTS OF DR 14.

ALL PIPE SHALL BE SUITABLE FOR USE AS PRESSURE CONDUIT. PROVISIONS MUST BE MADE FOR EXPANSION AND CONTRACTION AT EACH JOINT WITH AN ELASTOMERIC RING. THE BELL SHALL CONSIST OF AN INTEGRAL WALL SECTION WITH A FACTORY INSTALLED, SOLID CROSS SECTION ELASTOMERIC RING WHICH MEETS THE

REQUIREMENTS OF ASTM F-477. THE BELL SECTION SHALL BE DESIGNED TO BE AT LEAST AS HYDROSTATICALLY STRONG AS THE PIPE WALL AND MEET THE REQUIREMENTS OF AWWA C900 OR C905. SIZES AND DIMENSIONS SHALL BE AS SHOWN IN THIS SPECIFICATION. JOINT DESIGN MEETS QUALIFICATION REQUIREMENTS OF ASTM F3139. EACH PIPE SHALL BE TESTED TO FOUR TIMES THE PRESSURE CLASS OF THE PIPE FOR A MINIMUM OF 5 SECONDS. THE INTEGRAL BELL SHALL BE TESTED WITH THE PIPE. STANDARD LAYING LENGTHS SHALL BE 20 FEET ($\pm 1''$) FOR ALL SIZES.

THE PIPE STIFFNESS USING $F/\Delta Y$ FOR PVC CLASS WATER PIPE IS CONTAINED IN THE TABLE BELOW:

CLASS	DR	$F\Delta y$ (psi)
100	25	129
150	18	364
200	14	815

PIPE SHALL WITHSTAND, WITHOUT FAILURE AT 73°F, AN IMPACT OF A FALLING MISSILE, TUP C, AT THE FOLLOWING LEVELS. (PER ASTM D-2444.)

PIPE SIZE (IN.)	IMPACT (FT./LBS.)
4	100
6	100
8	100
10	120
12	120

THERE SHALL BE NO VISIBLE EVIDENCE OF SHATTERING OR SPLITTING WHEN THE ENERGY IS IMPOSED.

RANDOMLY SELECTED SAMPLES TESTED IN ACCORDANCE WITH ASTM D 1599 SHALL WITHSTAND, WITHOUT FAILURE, PRESSURES LISTED BELOW WHEN APPLIED IN 60-70 SECONDS.

CLASS	MINIMUM BURST PRESSURE AT 73°F (PSI)
100	535
150	755
200	985

1.3 DUCTILE IRON FITTINGS

FITTINGS FOR THE WATER MAINS SHALL BE COMPOSED OF DUCTILE IRON. THE DUCTILE IRON FITTINGS SHALL CONFORM TO ANSI/AWWA C-110/A21.10-82. THE FITTINGS SHALL BE CEMENT MORTAR LINED IN ACCORDANCE WITH ANSI/AWWA C-104/A21.4, STANDARD FOR CEMENT MORTAR LINING FOR DUCTILE IRON AND GRAY IRON PIPE FITTINGS FOR WATER, LATEST REVISION.

1.4 HARDWARE

ALL NUTS, BOLTS AND MISCELLANEOUS HARDWARE SHALL BE COMPOSED OF 304 STAINLESS STEEL. AN ANTI-SEIZE MATERIAL SHALL BE APPLIED TO THE STAINLESS STEEL HARDWARE.

1.5 RESILIENT SEATED GATE VALVES

RESILIENT SEATED GATE VALVES SHALL CONFORM TO AWWA C509, LATEST EDITION. THE WEDGE SHALL BE FULLY ENCAPSULATED IN THE ELASTOMER, INCLUDING THE GUIDES. THE BRASS STEM NUT SHALL BE RIGIDLY ENCLOSED IN THE WEDGE TO MAINTAIN ALIGNMENT. THE ELASTOMER SHALL BE BONDED TO THE WEDGE. THE VALVE BODY SHALL BE COMPOSED OF DUCTILE IRON.

THE STEM SHALL HAVE TWO O-RINGS AND A WIPER ABOVE THE COLLAR AND ONE O-RING BELOW THE COLLAR. STEM SEALS MUST BE REPLACEABLE WITH THE VALVE UNDER PRESSURE.

THE STEM MATERIAL SHALL BE STANDARD BRONZE. STAINLESS STEEL (ANSI – 420) SHALL ALSO BE ACCEPTABLE FOR USE AS AN ALTERNATIVE.

THE WATERWAY SHALL BE FULL SIZE TO ALLOW FOR TAPPING USE; NO CAVITIES OR DEPRESSIONS SHALL BE PERMITTED IN THE SEAT AREA.

VALVE BODY AND BONNET SHALL BE ELECTROSTATICALLY APPLIED, FUSION BONDED, EPOXY COATED BOTH INSIDE AND OUT BY THE VALVE MANUFACTURER. THE COATING SHALL MEET THE REQUIREMENTS OF AWWA C-550, LATEST EDITION. COATING SHALL BE APPLIED ONLY AT THE VALVE MANUFACTURER'S FACILITIES. EXTERIOR HARDWARE SHALL BE COMPOSED OF 304 STAINLESS STEEL.

THE BONNET BOLTS SHALL NOT BE EXPOSED TO THE ENVIRONMENT.

O-RING STYLE SEALS SHALL BE USED AS GASKETS ON THE BONNET AND ON THE STUFFING BOX. THE BELOW GRADE VALVES SHALL BE SUPPLIED WITH A STANDARD 2" OPERATING NUT.

THE VALVES SHALL BE AFC RESILIENT WEDGE GATE VALVES OR AN APPROVED EQUAL. ALL VALVES FOR THIS PROJECT SHALL BE RESILIENT WEDGE GATE VALVES.

1.6 FLANGED COUPLING ADAPTERS

FLANGED COUPLING ADAPTERS SHALL BE USED TO JOIN PLAIN END PIPE WITH FLANGED DUCTILE IRON FITTINGS AND VALVES. ADAPTERS SHALL CONFORM TO AWWA SPECIFICATION C-100-541. BODIES SHALL BE COMPOSED OF DUCTILE IRON.

1.7 TRANSITION COUPLINGS

TRANSITION COUPLINGS SHALL BE INSTALLED AS NEEDED. THE BODY OF THE COUPLING SHALL BE COMPOSED OF DUCTILE IRON AND BE EPOXY COATED. TRANSITION COUPLINGS SHALL BE A SMITH/BLAIR 441 OR APPROVED EQUAL.

1.8 RESTRAINED JOINT FITTINGS

MECHANICAL JOINT RESTRAINT SHALL BE INCORPORATED INTO THE DESIGN FOR THE FOLLOWER GLAND. THE GRIPPING OR RESTRAINING MECHANISM SHALL TRANSMIT UNIFORM RESTRAINING PRESSURE AROUND THE CIRCUMFERENCE OF THE PIPE, THUS AVOIDING POINT LOADING OR PIPE DISTORTION. THIS RESTRAINING PROCESS SHALL BE KEPT SEPARATE FROM THE MECHANICAL JOINT SEALING PROCESS AND **NOT** A PART OF THE SEALING FUNCTION. ALL COMPONENTS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536-80, GRADE 65-45-12.

THE RESTRAINING TWIST OFF NUT BOLT SYSTEM SHALL HAVE A TORQUE LIMITING FEATURE DESIGNED TO BREAK OFF AT 75 TO 90 FT-LBS. OF TORQUE TO INSURE PROPER ACTUATING OF RESTRAINING DEVICES. BOTH THE TWIST OFF NUT AND THE REMOVAL NUT SHALL

BE THE SAME SIZE AS TEE-BOLT NUT. HARDWARE SHALL BE COMPOSED OF 304 STAINLESS STEEL.

THE GLAND SHALL BE SUCH THAT IT CAN REPLACE THE STANDARDIZED MECHANICAL JOINT GLAND AND CAN BE USED WITH THE STANDARDIZED MECHANICAL JOINT BELL CONFORMING TO ANSI/AWWA C111/A21.11, C110/A21.10 AND C153/A21.53 OF THE LATEST REVISION.

THE DEVICE SHALL RESTRAIN ALL CLASSES OF DUCTILE IRON, C-900 PVC, C905 PVC AND HIGH DENSITY POLYETHYLENE (HDPE) WITH THE USE OF A STANDARD MECHANICAL JOINT GASKET. THE SAME DEVICE WITHOUT ANY FIELD MODIFICATION SHALL ADDITIONALLY, RESTRAIN IPS PVC, IPS STEEL AND IPS HDPE WITH THE USE OF A TRANSITION GASKET.

THE RESTRAINING GLANDS SHALL HAVE A PRESSURE RATING EQUAL TO TWICE (2:1) THAT OF THE PIPE ON WHICH IT IS USED. THE RESTRAINING GLANDS SHALL HAVE BEEN TESTED TO UNI-B-13-92, BE LISTED BY UNDERWRITERS LABORATORIES, AND BE APPROVED BY FACTORY MUTUAL. THE MECHANICAL JOINT RESTRAINT DEVICE SHALL BE STAR PIPE PRODUCTS INC., ALLGRIP SERIES 3600 OR EQUAL UNLESS OTHERWISE NOTED ON THE PLANS.

RESTRAINED JOINT FITTINGS SHALL BE PLACED AT TERMINATION POINTS, TEES, BENDS, ANGLE POINTS AND CONNECTION POINTS TO THE EXISTING WATER PIPELINE AND ALL NEW WATER PIPELINE CONNECTION POINTS.

1.9 PIPE FITTING AND VALVE HANDLING

AT ALL TIMES MATERIALS SHALL BE HANDLED WITH CARE TO AVOID DAMAGE. WHETHER MOVED BY HAND, SKIDWAYS, OR HOISTS, MATERIAL SHALL NOT BE DROPPED, BUMPED, OR ALLOWED TO IMPACT ON ITSELF. IN DISTRIBUTING THE MATERIAL AT THE WORK SITE, IT SHALL BE UNLOADED ADJACENT TO OR NEAR THE LOCATION WHERE IT IS TO BE INSTALLED.

1.10 PIPELINE TESTING

THE AWWA C-900, CLASS 150 PVC PIPELINE OR AWWA C-905, DR18 PIPELINE, FIRE HYDRANT ASSEMBLIES AND WATER SERVICES UP TO THE

ANGLE METER STOP SHALL BE PRESSURE TESTED, LEAK TESTED AND CHLORINATED PRIOR TO THE CONNECTION TO EXISTING FACILITIES. INDIVIDUAL PRESSURE, LEAKAGE, AND CHLORINATION TESTS SHALL BE CONDUCTED ON THE WATERMAIN. THE PIPELINE CONTRACTOR SHALL PROVIDE ALL THE NECESSARY EQUIPMENT AND MATERIALS FOR THE TESTING OF THE WATER PIPELINE FACILITIES. THE PIPELINE CONTRACTOR SHALL MAKE EVERY EFFORT POSSIBLE TO AVOID DAMAGE TO EXISTING IMPROVEMENTS DURING THE COURSE OF THE TESTING AND CHLORINATION. THE PIPELINE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED TO NEW OR EXISTING FACILITIES. THE PIPELINE CONTRACTOR SHALL REPLACE ANY DAMAGED FACILITIES WITH NEW FACILITIES.

1.11 HYDROSTATIC TESTING

THE NEW WATER PIPELINE SHALL BE HYDROSTATICALLY TESTED PRIOR TO THE CHLORINATION AND DISINFECTION OF THE PIPELINE. THE NEW PIPELINE SHALL BE FILLED WITH WATER AND HYDROSTATICALLY PRESSURIZED TO 200 PSI AND HELD FOR A MINIMUM OF FOUR (4) HOURS. ALL JOINTS AND CONNECTIONS SHALL BE CHECKED FOR LEAKS. ALL FIRE HYDRANT ASSEMBLIES UP TO AND INCLUDING THE FIRE HYDRANT SHALL BE TESTED. THE BRANCH PIPELINES SHALL BE TESTED UP TO THE LOCATIONS OF THE NEW VALVES LOCATED ALONG THE BRANCH PIPELINES. THE WATER SERVICE PIPELINES SHALL BE HYDROSTATICALLY TESTED FROM THE NEW PIPELINE TO THE NEW ANGLE METER STOPS. THE ENGINEER SHALL CHECK TO INSURE THAT ALL IN-LINE VALVES AND HYDRANT ASSEMBLY VALVES ARE FULLY OPENED DURING THE TEST. THE HYDROSTATIC PRESSURE TESTING SHALL CONFORM WITH THE REQUIREMENTS OF AWWA STANDARD C504, LATEST EDITION, EXCEPT THAT THE PRESSURE AND DURATION OF THE TEST SHALL BE 200 PSI FOR 4 HOURS. THE CONTRACTOR SHALL SUPPLY ALL PUMPS, HOSES, FUEL, MATERIAL, FITTINGS AND PERSONNEL TO PERFORM THE HYDROSTATIC TESTING. SAMPLING/BLOWOFF ASSEMBLIES ARE TO BE INSTALLED FOR PRESSURE TESTING AND DISINFECTION AS ILLUSTRATED ON THE PLANS. THE CONTRACTOR SHALL BE ALLOWED TO INSTALL ADDITIONAL SAMPLING BLOWOFF ASSEMBLIES FOR THE PRESSURE TESTING AND DISINFECTION OF THE PIPELINE AT THE COST OF THE CONTRACTOR AS THE CONTRACTOR DEEMS APPROPRIATE.

1.12 LEAKAGE TESTING

THE LEAKAGE TEST SHALL BE CONDUCTED AFTER COMPLETION OF THE PRESSURE TEST. THE TEST PRESSURE SHALL BE 150 PSI (UNLESS HIGHER TEST PRESSURES ARE INDICATED ON THE PLANS) AND SHALL BE HELD CONTINUOUSLY FOR AT LEAST 2 HOURS. THE LEAKAGE SHALL THEN BE MEASURED BY DETERMINING THE QUANTITY OF WATER REQUIRED TO REFILL THE PIPELINE. REGARDLESS OF THE RATE OF LEAKAGE, ALL VISIBLE LEAKS SHALL BE STOPPED.

NO PIPE INSTALLATION WILL BE ACCEPTED BY THE DISTRICT UNTIL THE LEAKAGE FOR THE SECTION OF LINE TESTED IS LESS THAN THE RATE OF LEAKAGE SPECIFIED HEREIN. THE MAXIMUM ALLOWABLE LEAKAGE RATE, BASED ON MAINLINE PIPE LENGTH, SHALL NOT EXCEED THAT PER THE FOLLOWING TABLE.

ALLOWABLE LEAKAGE FOR 1000 FEET OF PIPE

GALLONS/HOURS

DIAMETER (INCHES)

TEST PRESSURE (PSI)

4		0.37	0.43
6		0.55	0.64
8		0.74	0.85
10		0.92	1.06
12		1.10	1.28
14		1.29	1.48
16		1.47	1.70
18		1.66	1.91
20		1.84	2.12
24		2.21	2.55

BASED UPON 11.65 GALLONS PER DAY, PER INCH OF DIAMETER, PER MILE AT 150 PSI.

FOR PRESSURES OTHER THAN THOSE LISTED ABOVE, THE FOLLOWING FORMULA SHALL BE USED:

$$L = \frac{SD\sqrt{P}}{133,200}$$

WHERE: L = ALLOWABLE LEAKAGE, IN GALLONS PER HOUR
 S = LENGTH OF PIPE TESTED, IN FEET
 D = NOMINAL DIAMETER OF THE PIPE, IN INCHES
 P = AVERAGE TEST PRESSURE DURING THE
 LEAKAGE TEST, IN POUNDS PER SQUARE INCH
 (GAUGE)

1.13 CHLORINATION AND DISINFECTION OF THE PIPELINE

UPON THE SUCCESSFUL COMPLETION OF THE HYDROSTATIC TEST, THE NEW WATER PIPELINE SHALL BE COMPLETELY FLUSHED AT EACH HYDRANT, BLOWOFF, OR SERVICE PIPELINE. IT SHALL BE NECESSARY TO INSTALL SAMPLING/BLOWOFF ASSEMBLIES AT THE EXTREMITIES OF EACH PIPE SECTION TO ALLOW THE CHLORINATED WATER TO BE DISPERSED THROUGHOUT THE NEW WATERMAIN SECTION UNLESS THERE ARE FIRE HYDRANTS LOCATED AT THE EXTREMITY OF A PARTICULAR PIPE SECTION. SEE THE PLANS FOR THE LOCATION OF THE SAMPLING/BLOWOFF ASSEMBLIES. FLUSHING THROUGH HYDRANTS OR SERVICES SHALL CONTINUE AT FULL FLOW FOR A MINIMUM OF 10 MINUTES. THE PIPELINE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING STRUCTURES AND UTILITIES. AFTER FLUSHING IS COMPLETED, THE PIPELINE SHALL BE CHLORINATED IN ACCORDANCE WITH AWWA C-601. THE CONTINUOUS FEED METHOD OF CHLORINE APPLICATION SHALL BE EMPLOYED. THE USE OF CHLORINE PILLS SHALL NOT BE ALLOWED. THE INITIAL CHLORINE CONTENT SHALL BE 100 PPM. THE CHLORINATED WATER SHALL REMAIN IN THE PIPELINE FOR AT LEAST 24 HOURS AT WHICH TIME THE CHLORINE RESIDUAL SHALL BE AT LEAST 25 PPM. THE PIPELINE SHALL THEN BE FLUSHED, COMPLETELY REFILLED, AND ALLOWED TO STAND FOR 24 HOURS BEFORE BACTERIOLOGICAL SAMPLES ARE TAKEN, TESTED AND APPROVED. IF THE BACTERIOLOGICAL TESTS PROVE POSITIVE, THE CHLORINATION PROCEDURE SHALL BE REPEATED UNTIL SATISFACTORY TEST RESULTS ARE RECEIVED. THE BACTERIOLOGICAL RESULTS SHALL BE FORWARDED TO THE ENGINEER FOR EVALUATION AND APPROVAL PRIOR TO PLACING THE NEW WATERMAIN SECTIONS IN SERVICE. AT THAT TIME, THE WATERMAIN CAN BE PLACED IN SERVICE AND CONNECTED TO THE EXISTING DISTRIBUTION SYSTEM. THE

CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXPENSES RELATIVE TO THE CHLORINATION AND DISINFECTION OF THE PIPELINE. ANY OTHER TESTS REQUIRED TO BE CONDUCTED BY THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES SHALL BE PERFORMED AT THE EXPENSE OF THE CONTRACTOR PRIOR TO PLACING THE NEW PIPELINE IN SERVICE.

THE CONTRACTOR SHALL BE RESPONSIBLE AND INCUR ALL EXPENSES RELATIVE TO THE DISPOSAL OF THE CHLORINATED WATER. THE CONTRACTOR SHALL NOT BE ALLOWED TO DISPOSE OF THE CHLORINATED WATER IN THE HEBER PUBLIC UTILITY DISTRICT WASTEWATER COLLECTION SYSTEM. THE CONTRACTOR SHALL DISPOSE OF THE CHLORINATED WATER IN ACCORDANCE WITH A METHOD ACCEPTABLE TO THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES, REGIONAL WATER QUALITY CONTROL BOARD AND HEBER PUBLIC UTILITY DISTRICT.

TECHNICAL CONDITIONS

II. SANITARY SEWER TECHNICAL CONDITIONS

1. PIPE INSTALLATION

THIS SECTION COVERS FURNISHING ALL LABOR, SUPERVISION, MATERIALS AND EQUIPMENT AND PERFORMING ALL OPERATIONS NECESSARY TO FURNISH AND INSTALL THE PIPING AND FITTINGS. ALL PIPE AND FITTINGS, AND ACCESSORIES FURNISHED BY THE CONTRACTOR SHALL BE NEW MATERIAL FREE FROM RUST OR CORROSION. ALL PIPING AND FITTINGS SHALL BE CLEANED ON THE INSIDE WHEN INSTALLED AND THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO INSURE THAT THE LINES ARE KEPT FREE OF ANY FOREIGN MATTER AND DIRT UNTIL THE WORK IS COMPLETED. ALL PIPE SHALL BE CAREFULLY PLACED AND SUPPORTED AT THE PROPER LINES AND GRADES AS SHOWN ON THE DRAWINGS. PIPING RUNS SHOWN ON THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE EXCEPT FOR MINOR ADJUSTMENTS TO AVOID OTHER PIPING OR STRUCTURAL FEATURES. IF MAJOR RELOCATIONS ARE REQUIRED, THEY SHALL BE APPROVED BY THE DISTRICT ENGINEER. THE BEDDING SHALL BE DEFINED AS THAT MATERIAL SUPPORTING, SURROUNDING AND EXTENDING TO A MINIMUM OF ONE FOOT (1') ABOVE THE TOP OF THE PIPE. IF SOFT, SPONGY, UNSTABLE OR SIMILAR OTHER MATERIAL IS ENCOUNTERED UPON WHICH THE BEDDING MATERIAL OR PIPE IS TO BE PLACED, THIS UNSUITABLE MATERIAL SHALL BE REMOVED TO A DEPTH ORDERED BY THE DISTRICT ENGINEER AND REPLACED WITH BEDDING MATERIAL SUITABLY DENSIFIED. BEDDING MATERIAL SHALL FIRST BE PLACED SO THAT THE PIPE IS SUPPORTED FOR THE FULL LENGTH OF THE BARREL WITH FULL BEARING ON THE BOTTOM SEGMENT OF THE PIPE. IN THE EVENT THE NATIVE MATERIAL BENEATH THE PIPELINE IS OVEREXCAVATED BELOW THE DESIGN FLOWLINE GRADE OF THE PIPELINE, THE OVEREXCAVATED VOLUME SHALL BE FILLED WITH GRANULAR SAND FILL TO THE DESIGN GRADE OF THE BOTTOM OF THE PIPELINE. THE GRANULAR SAND FILL SHALL BE COMPACTED TO 95 PERCENT OF MAXIMUM DENSITY PER ASTM D-1557. IN THE EVENT WATER ENTERS THE PIPE TRENCH FROM THE WATER TABLE OR OTHER SOURCES A MINIMUM OF ONE FOOT (1') OF ROUND ROCK SHALL BE PLACED BENEATH THE PIPE. THE ROUND ROCK SHALL POSSESS A MAXIMUM DIAMETER OF ONE INCH (1").

HUNCHING OF THE PIPE SHALL NOT BE ALLOWED. PIPE WILL BE CAREFULLY INSPECTED IN THE FIELD BEFORE AND AFTER LAYING. IF ANY CAUSE FOR REJECTION IS DISCOVERED IN A PIPE AFTER IT HAS BEEN LAID, IT SHALL BE SUBJECT TO REJECTION. ANY CORRECTIVE WORK SHALL BE APPROVED BY THE ENGINEER. PIPE SHALL BE LAID TRUE TO LINE AND GRADE WITH UNIFORM BEARING UNDER THE FULL LENGTH OF THE BARREL OF THE PIPE. SUITABLE EXCAVATION SHALL BE MADE TO RECEIVE THE BELL OR COLLAR WHICH SHALL NOT BEAR UPON THE SUBGRADE OR BEDDING. ANY PIPE WHICH IS NOT IN TRUE ALIGNMENT OR SHOWS ANY UNDUE SETTLEMENT AFTER LAYING SHALL BE TAKEN UP AND RELAID AT THE CONTRACTOR'S EXPENSE. PIPE SECTIONS SHALL BE LAID AND JOINED IN SUCH A MANNER THAT THE OFFSET OF THE INSIDE OF THE PIPE AT ANY JOINT WILL BE HELD TO A MINIMUM AT THE INVERT. THE MAXIMUM HORIZONTAL OFFSET AT THE INVERT OF THE PIPE SHALL BE 1% OF THE INSIDE DIAMETER OF THE PIPE OR 0.02 FEET, WHICHEVER IS SMALLER. THE VERTICAL GRADE SHALL BE +/- 0.02 FEET OF THE DESIGN INVERT. IN JOINING SOCKET PIPE, THE SPIGOT OF EACH PIPE SHALL BE SO SEATED IN THE SOCKET OF THE ADJACENT PIPE AS TO GIVE A UNIFORM ANNULAR SPACE ALL AROUND THE PIPE IN THE SOCKET. UNAVOIDABLE OFFSETS SHALL BE DISTRIBUTED AROUND THE CIRCUMFERENCE OF THE PIPE IN SUCH A MANNER THAT THE MINIMUM OFFSET OCCURS AT THE INVERT. AT THE CLOSE OF WORK EACH DAY, OR WHENEVER THE WORK CEASES FOR ANY REASON, THE END OF THE PIPE SHALL BE SECURELY CLOSED.

2. SHORING AND SHEETING.

THE CONTRACTOR SHALL DO SUCH TRENCH BRACING, SHEATHING, OR SHORING NECESSARY TO PERFORM AND PROTECT THE EXCAVATION AS REQUIRED FOR SAFETY AND CONFORMANCE TO GOVERNING LAWS. THE BRACING, SHEATHING, OR SHORING SHALL NOT BE REMOVED IN ONE OPERATION BUT SHALL BE DONE IN SUCCESSIVE STAGES TO PREVENT OVERLOADING OF THE PIPE DURING BACKFILLING OPERATIONS. ALL SHORING AND SHEETING DEEMED NECESSARY TO PROTECT THE EXCAVATION AND TO SAFEGUARD EMPLOYEES, SHALL BE INSTALLED.

3. OPEN TRENCH

EXCEPT WHERE OTHERWISE NOTED IN THE SPECIAL PROVISIONS, OR APPROVED IN WRITING BY THE DISTRICT ENGINEER, THE MAXIMUM LENGTH OF OPEN TRENCH, WHERE THE CONSTRUCTION IS IN ANY

STAGE OF COMPLETION (EXCAVATION, PIPE LAYING OR BACKFILLING), SHALL NOT EXCEED 1,320 FEET IN THE AGGREGATE AREA OF A STREET AT ANY ONE LOCATION.

ANY EXCAVATED AREA SHALL BE CONSIDERED OPEN TRENCH UNTIL THE TRENCH BACKFILL HAS BEEN PLACED TO SUBBASE LEVEL, THE LEVEL OF THE BOTTOM OF THE CLASS 2 BASE. WITH THE APPROVAL OF THE DISTRICT ENGINEER, PIPE LAYING MAY BE CARRIED ON AT MORE THAN ONE SEPARATE LOCATION, THE RESTRICTIONS ON OPEN TRENCH APPLYING TO EACH LOCATION. TRENCHES ACROSS STREETS SHALL BE COMPLETELY BACKFILLED AS SOON AS POSSIBLE AFTER PIPE LAYING.

SUBSTANTIAL STEEL PLATES WITH ADEQUATE TRENCH BRACING SHALL BE USED TO BRIDGE ACROSS TRENCHES AT STREET CROSSINGS WHERE TRENCH BACKFILL AND TEMPORARY PATCHES HAVE NOT BEEN COMPLETED DURING REGULAR WORK HOURS. SAFE AND CONVENIENT PASSAGE FOR PEDESTRIANS SHALL BE PROVIDED. THE DISTRICT ENGINEER MAY DESIGNATE A PASSAGE TO BE PROVIDED AT ANY POINT HE DEEMS NECESSARY. ACCESS TO HOSPITALS, FIRE STATIONS, SCHOOLS, POST OFFICES, PUBLIC FACILITIES AND FIRE HYDRANTS MUST BE MAINTAINED AT ALL TIMES.

4. PROTECTION OF EXISTING UTILITIES

- 4.1 **UTILITIES:** UNLESS OTHERWISE SHOWN ON THE PLANS OR STATED IN THE SPECIFICATIONS, ALL UTILITIES, BOTH UNDERGROUND OR OVERHEAD, SHALL BE MAINTAINED IN CONTINUOUS SERVICE THROUGHOUT THE ENTIRE CONTRACT PERIOD. THE CONTRACTOR SHALL BE RESPONSIBLE AND LIABLE FOR ANY DAMAGES TO OR INTERRUPTION OF SERVICE CAUSED BY THE CONSTRUCTION.

IF THE CONTRACTOR DESIRES TO SIMPLIFY HIS OPERATION BY TEMPORARILY OR PERMANENTLY RELOCATING OR SHUTTING DOWN ANY UTILITY OR APPURTENANCE, HE SHALL MAKE THE NECESSARY ARRANGEMENTS AND AGREEMENTS WITH THE UTILITY PURVEYOR AND SHALL BE COMPLETELY RESPONSIBLE FOR ALL COSTS CONCERNED WITH THE RELOCATION OR SHUTDOWN AND RECONSTRUCTION. ALL PROPERTY SHALL BE RECONSTRUCTED IN ITS ORIGINAL OR NEW LOCATION AS SOON AS POSSIBLE AND TO A CONDITION AT LEAST AS GOOD AS ITS PREVIOUS CONDITION. THIS CYCLE OF RELOCATION OR SHUTDOWN AND RECONSTRUCTION SHALL BE SUBJECT TO

INSPECTION AND APPROVAL BY BOTH THE DISTRICT ENGINEER AND THE UTILITY PURVEYOR.

THE CONTRACTOR SHALL BE ENTIRELY RESPONSIBLE FOR SAFEGUARDING AND MAINTAINING ALL CONFLICTING UTILITIES THAT ARE SHOWN ON THE PLANS. THIS INCLUDES OVERHEAD WIRES AND CABLES AND THEIR SUPPORTING POLES WHETHER THEY ARE INSIDE OR OUTSIDE OF THE OPEN TRENCH. IF, IN THE COURSE OF WORK, A CONFLICTING UTILITY LINE THAT WAS NOT SHOWN ON THE PLANS IS DISCOVERED, THE DEVELOPER SHALL EITHER NEGOTIATE WITH THE UTILITY PURVEYOR FOR RELOCATION, RELOCATE THE UTILITY OR CHANGE THE ALIGNMENT AND GRADE OF THE TRENCH.

- 4.2 **BUILDING, FOUNDATIONS AND STRUCTURES:** WHERE TRENCHES ARE LOCATED ADJACENT TO BUILDING, FOUNDATIONS, AND STRUCTURES, THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTION AGAINST DAMAGE TO THEM. THE CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGE CAUSED BY THE CONSTRUCTION. EXCEPT WHERE AUTHORIZED IN THE SPECIAL PROVISIONS OR IN WRITING BY THE DISTRICT ENGINEER, WATER SETTLING OF BACKFILL MATERIAL IN TRENCHES ADJACENT TO STRUCTURES WILL NOT BE PERMITTED.
- 4.3 **ELECTRONIC, TELEPHONIC, TELEGRAPHIC, ELECTRICAL, OIL AND GAS LINES:** THESE UNDERGROUND FACILITIES SHALL BE ADEQUATELY SUPPORTED BY THE CONTRACTOR. SUPPORT FOR PLASTIC PIPE SHALL BE CONTINUOUS ALONG THE BOTTOM OF THE PIPE. SUPPORT FOR METAL PIPE AND ELECTRICAL CONDUIT MAY BE CONTINUOUS OR NYLON WEBBING MAY BE USED FOR SUSPENSION AT NO GREATER THAN TEN FOOT (10') INTERVALS.

THE CONTRACTOR SHALL AVOID DAMAGING THE PLASTIC PIPE, PIPE WAYS OR CONDUITS DURING TRENCH BACKFILLING AND DURING FOUNDATION AND BEDDING PLACEMENT.

5. COMPACTION METHODS:

BACKFILL MATERIAL SHALL BE COMPACTED WITH HAND AND/OR MECHANICAL WORK METHODS USING EQUIPMENT SUCH AS ROLLER, PNEUMATIC TAMPS, AND HYDRO-HAMMERS OR OTHER APPROVED

DEVICES WHICH SECURE UNIFORM AND REQUIRED DENSITY WITHOUT INJURY TO THE PIPE OR RELATED STRUCTURES.

WATER CONSOLIDATION BY JETTING OR FLOODING IS NOT ACCEPTABLE AS A SOIL CONSOLIDATION METHOD UNLESS AUTHORIZED IN THE TECHNICAL SPECIFICATION OR APPROVED BY THE DISTRICT ENGINEER.

6. RIGHTS-OF-WAY BELONGING TO OTHERS:

WHERE THE PERMIT OF A GOVERNING AGENCY SETS FORTH REQUIREMENTS FOR COMPACTION MORE STRINGENT THAN THOSE STATED HEREIN, THE CONTRACTOR SHALL ADHERE TO THE MORE STRINGENT REQUIREMENTS.

7. SANITARY SEWER GRAVITY MAIN

THE SANITARY SEWER GRAVITY PIPE MATERIAL SHALL MEET ALL REQUIREMENTS OF ASTM D-3034. "TYPE P.S.M. P.V.C. SEWER PIPE", SDR 35. THE PIPE SHALL BE JOINED WITH A BELL AND SPIGOT TYPE OF RUBBER GASKETED JOINT. ALL GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F-744. THE PIPE SHALL BE MADE OF P.V.C. PLASTIC HAVING A CELL CLASSIFICATION OF 12454-B OR 12454-C OR 13364-B WITH A MINIMUM TENSILE MODULES OF 500,000 PSI AS DEFINED IN ASTM D-1784. CLEAN REWORK MATERIAL MAY BE USED AS LONG AS THE PIPE PRODUCED MEETS ALL OF THE REQUIREMENTS OF THIS SPECIFICATION. THE PIPELINE DIAMETER SIZE SHALL BE AS INDICATED ON THE PLANS. THE PIPE LENGTHS SHALL MEASURE 20 FEET IN HORIZONTAL LENGTH.

8. DEFLECTION TESTING FOR SANITARY SEWER PIPELINE

THE CONTRACTOR SHALL PERFORM DEFLECTION TESTING FOR 100% OF SEWER LINES TO ENSURE THAT THE INSTALLATION MEETS OR EXCEEDS THE MANUFACTURE'S RECOMMENDATIONS.

THE CONTRACTOR SHALL PERFORM DEFLECTION TESTING ON THE SYSTEM AS DIRECTED BY THE DISTRICT ENGINEER. THE DEFLECTION TESTING SHALL BE ACCOMPLISHED BY MANDRELING THE PIPELINE. ANY PART OF THE INSTALLATION, WHICH SHOWS DEFLECTION IN

EXCESS OF 5% OF THE AVERAGE INSIDE DIAMETER PER ASTM D-3034 FOR PVC PIPE, SHALL BE CORRECTED.

AFTER ACCEPTANCE BUT PRIOR TO THE TERMINATION OF THE WARRANTY PERIOD, THE HEBER PUBLIC UTILITY DISTRICT MAY TEST THE LONG-TERM DEFLECTION OF THE SEWER. IF THE HEBER PUBLIC UTILITY DISTRICT DETERMINES THAT THE DEFLECTION HAS EXCEEDED 7 ½% OF THE AVERAGE INSIDE DIAMETER, THAT PORTION OF THE INSTALLATION SHALL BE CORRECTED BY THE CONTRACTOR AT NO COST TO THE HEBER PUBLIC UTILITY DISTRICT.

9. LEAK TESTING FOR SANITARY SEWER PIPELINE

THE CONTRACTOR SHALL LEAK TEST 100% OF THE SEWER LINE INSTALLED. THE LEAK TESTING SHALL BE ACCOMPLISHED AFTER THE DEFLECTION TESTING OF THE SANITARY SEWER PIPELINE IS ACCOMPLISHED.

SEWER LINES SHALL BE SUBJECT TO ACCEPTANCE TESTING AFTER BACKFILLING HAS BEEN COMPLETED BUT PRIOR TO THE PLACEMENT OF THE FINISHED SURFACE MATERIAL, (CLASS 2 BASE, A.C. PAVEMENT AND P.C.C. CONCRETE).

THE COST OF REPAIRS OR CORRECTIONS NECESSARY TO CONFORM TO THE TESTING REQUIREMENTS WILL BE BORNE BY THE CONTRACTOR AT NO COST TO THE HEBER PUBLIC UTILITY DISTRICT.

(A) LOW PRESSURE AIR TEST:

TESTING WILL BE ACCOMPLISHED BY THE MEANS OF "LOW PRESSURE AIR TESTING." TESTS MAY BE CONDUCTED BY THE CONTRACTOR OR AN INDEPENDENT TESTING FIRM. HOWEVER, ACCEPTANCE TESTS SHALL BE MADE ONLY IN THE PRESENCE OF THE DISTRICT ENGINEER.

TEST PROCEDURE:

1. BEFORE TESTING, THE PIPE SHALL BE THOROUGHLY CLEANED.
2. THE CONTRACTOR SHALL SEAL OFF THE SECTION OF PIPE TO BE TESTED AT EACH MANHOLE CONNECTION. TEST

PLUGS MUST BE SECURELY BRACED WITHIN THE MANHOLES.

3. A MINIMUM OF TWO CONNECTION HOSES TO LINK THE AIR INLET TEST PLUG WITH AN ABOVE GROUND TEST MONITORING PANEL MUST BE PROVIDED.
 - A. ONE HOSE IS TO INDUCE AIR THROUGH THE TEST PLUG AND INTO THE TEST CHAMBER.
 - B. THE SECOND HOSE IS FOR THE PURPOSE OF MONITORING THE TEST PRESSURE FROM WITHIN THE ENCLOSED PIPE.
4. UNDER NO CIRCUMSTANCES ARE WORKERS TO BE ALLOWED IN THE CONNECTING MANHOLES WHILE A PRESSURE TEST IS BEING CONDUCTED.
5. ADD AIR SLOWLY INTO THE TEST SECTION. AFTER AN INTERNAL PRESSURE OF 4.0 PSI IS OBTAINED, ALLOW INTERNAL AIR TEMPERATURE TO STABILIZE.
6. AFTER STABILIZATION PERIOD, ADJUST THE INTERNAL AIR PRESSURE TO 3.5 PSI, DISCONNECT THE AIR SUPPLY AND BEGIN TIMING THE TEST.
7. REFER TO SANITARY SEWER AIR TEST TABLE TO DETERMINE THE LENGTH OF TIME (MINUTES) THE PIPELINE SECTION BEING TESTED MUST SUSTAIN AIR PRESSURE WHILE NOT LOSING IN EXCESS OF 1 PSI AS MONITORED BY THE TEST GAUGE. IF THE SECTION OF PIPELINE TO BE TESTED INCLUDES MORE THAN ONE PIPE SIZE, CALCULATE THE TEST TIME FOR EACH SIZE AND ADD THE TEST TIMES TO ARRIVE AT THE TOTAL TEST TIME FOR THE SECTION.
8. SECTIONS SO DETERMINED TO HAVE LOST 1 PSI OR LESS DURING THE TEST PERIOD WILL HAVE PASSED THE LEAKAGE TEST. THOSE SECTIONS LOSING IN EXCESS OF 1 PSI DURING THE TEST PERIOD WILL HAVE FAILED THE LEAKAGE TEST.
9. APPROPRIATE REPAIRS MUST THEN BE COMPLETED AND THE LINE RE-TESTED FOR ACCEPTANCE.

SANITARY SEWER AIR TEST TABLE			
MINIMUM TEST TIME FOR VARIOUS PIPE SIZES*			
NOMINAL PIPE SIZE, IN.	T (TIME), MIN/100 FT.	NOMINAL PIPE SIZE, IN.	T (TIME), MIN/100 FT.
3	0.2	21	3.0
4	0.3	24	3.6
6	0.7	27	4.2
8	1.2	30	4.8
10	1.5	33	5.4
12	1.8	36	6.0
15	2.1	39	6.6
18	2.4	42	7.3

* THE TIME HAS BEEN ESTABLISHED USING THE FORMULAS CONTAINED IN ASTM C-828, APPENDIX.

(B) HYDROSTATIC TEST:

EXFILTRATION TESTING (WATER):

SANITARY SEWER TESTING BY MEANS OF EXFILTRATION SHOULD ONLY BE CONSIDERED WHEN LOW PRESSURE AIR TESTING CANNOT BE USED AND ONLY WITH THE APPROVAL OF THE DISTRICT ENGINEER.

TESTING PROCEDURE:

1. THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT FOR TESTING.
2. SEAL OFF THE DOWNSTREAM END OF THE LINE AND FILL WITH WATER TO A MINIMUM HEAD OF FOUR FEET (4') IN A STAND PIPE AT THE HIGH END.
3. A PERIOD OF AT LEAST ONE (1) HOUR WILL BE ALLOWED FOR ABSORPTION TIME BEFORE MAKING THE TEST.
4. A SUITABLE METER OR METHOD OF MEASURING THE QUANTITY OF WATER USED IS NECESSARY.
5. THE ALLOWABLE WATER LOSS FOR SANITARY SEWERS SHALL NOT EXCEED 0.158 GALLONS PER HOUR PER 100

FEET OF PIPE PER INCH OF DIAMETER OF PIPE UNDER A MINIMUM TEST HEAD OF FOUR FEET (4') ABOVE THE TOP OF THE PIPE AT THE UPPER END.

10. LEAK TESTING FOR SANITARY MANHOLES

THE CONTRACTOR SHALL LEAK TEST 100 % OF THE SANITARY MANHOLES INSTALLED FOR THIS PROJECT.

THE CONTRACTOR SHALL TEST ALL MANHOLES USING THE FOLLOWING TEST PROTOCOL:

WATER TIGHTNESS TESTING BY SHALL CONSIST OF FILLING THE MANHOLE WITH WATER. THE CONTRACTOR SHALL ENSURE THAT THE DROP IN WATER LEVEL DOES NOT EXCEED 0.001 OF THE TOTAL MANHOLE VOLUME IN ONE (1) HOUR.

11. ADDITIONAL TESTING

THE HEBER PUBLIC UTILITY DISTRICT RESERVES THE RIGHT TO VISUALLY INSPECT THE INTERIOR OF THE SEWER LINE USING A TELEVISION CAMERA. ANY DEFECTS IN THE PIPE OR CONSTRUCTION METHODS REVEALED SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE HEBER PUBLIC UTILITY DISTRICT.

THE CONTRACTOR SHALL NOT PAY FOR T.V. INSPECTIONS COMPLETED BY THE HEBER PUBLIC UTILITY DISTRICT. ANY ADDITIONAL INSPECTION(S) OR CORRECTIVE WORK REQUIRED, DUE TO PIPE DEFICIENCIES IDENTIFIED BY THE T.V. INSPECTION, SHALL BE PAID FOR BY THE CONTRACTOR.

12. SEWER LATERALS

THE CONTRACTOR SHALL INSTALL 4-INCH DIAMETER SDR 35 PVC SANITARY SEWER LATERALS EXTENDING FROM THE SANITARY SEWER MAIN TO THE PROPERTY LINE AS ILLUSTRATED ON THE PLANS. ALL FITTINGS SHALL BE COMPOSED OF SDR 35 PVC MATERIAL WITH O-RING GASKETS. A 2-INCH HIGH LETTER "L" SHALL BE STAMPED IN THE P.C.C. CURB FACE AT THE LOCATION OF EACH SANITARY SEWER LATERAL.

13. CONCRETE

THE PORTLAND CONCRETE CEMENT FOR THE MANHOLE BASES, MANHOLE GRADE RINGS AND ALL OTHER CONCRETE INFRASTRUCTURE SHALL BE TYPE "V" AND CONTAIN A MINIMUM OF 6-1/2 SACKS OF CEMENT PER CUBIC YARD AND ATTAIN 4,500 PSI COMPRESSIVE STRENGTH AFTER 28 DAYS OF CURING. CONCRETE SLUMP SHALL NOT EXCEED 4.5 INCHES. THE DISTRICT ENGINEER SHALL BE PROVIDED WITH A COPY OF THE CONCRETE VENDOR'S DELIVERY SLIP. ONE (1) SLIP SHALL BE PROVIDED FOR EACH CONCRETE DELIVERY TRUCK. TWO (2) SETS OF CONCRETE CYLINDERS SHALL BE OBTAINED FOR THIS PROJECT. A SET OF CYLINDERS SHALL BE DEFINED AS THREE (3) CYLINDERS. ONE (1) CYLINDER SHALL BE TESTED 7 DAYS AFTER CONCRETE PLACEMENT. THE SECOND CYLINDER SHALL BE TESTED 28 DAYS AFTER CONCRETE PLACEMENT. THE THIRD CYLINDER SHALL BE HELD IN RESERVE AND TESTED AT THE DIRECTION OF THE DISTRICT ENGINEER.

14. SANITARY SEWER MANHOLES COATING

INSTALL A LOW TEMPERATURE 100 PERCENT SOLIDS ACRYLATED EPOXY PRIMER SYSTEM DESIGNED TO PROVIDE POSITIVE CURE DOWN TO 20 DEGREES FAHRENHEIT AND EXTREMELY RAPID ROOM TEMPERATURE CURE. THE SOLIDS ACRYLATED EPOXY IS TO BE APPLIED AS A PRIMER MATERIAL TO THE INTERIOR OF THE MANHOLE SURFACES. APPLY THE POLYURETHANE SYSTEM OVER THE PRIMER SYSTEM WITHIN SURFACE INTERIOR OF THE P.C.C. MANHOLE PER THE MANUFACTURER'S RECOMMENDATIONS. THE INTERIOR SURFACE OF THE P.C.C. MANHOLE SHALL BE PRIMED WITH A 1 TO 3 MIL. THICKNESS OF 100 PERCENT SOLIDS ACRYLATED EPOXY PRIMER SYSTEM TO THE ABRASIVE GRIT BLASTED RING AND TO ALL CONCRETE SURFACES, INCLUDING INTO THE INVERT DOWN TO THE LOW FLOW WATER LINE. ALLOW THE PRIMER TO TACK UP (STICK TO THE TOUCH). A 125 MIL THICKNESS POLYURETHANE COATING SYSTEM SHALL BE APPLIED TO THE PRIMER AND ALL INTERIOR SURFACES OF THE P.C.C. MANHOLE AFTER THE PRIMER HAS ATTAINED THE REQUIRED CONSISTENCY.

PRIOR TO THE APPLICATION OF THE 100% SOLIDS ACRYLATED EPOXY PRIMER AND POLYURETHANE PROTECTIVE LINING, THE MANHOLE SHALL BE THOROUGHLY CLEANED BY HIGH WATER PRESSURE BLAST AT PRESSURES OF 34.5 MPA (5,000 PSI) MINIMUM TO 68.9 MPA (10,000 PSI) MAXIMUM. DEBRIS FROM CLEANING SHALL NOT BE ALLOWED TO

ENTER THE SEWER SYSTEM. THE CONTRACTOR SHALL PROVIDE THE NECESSARY DEBRIS CONTAINMENT DEVICES WHILE MAINTAINING SEWER FLOW. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL DEBRIS COLLECTED FROM THE CLEANING OPERATION PER 500-1.4 OF THE GREENBOOK SPECIFICATIONS.

THE CURED POLYURETHANE LINING SHALL BE SPARK TESTED FOR PINHOLES WITH A SPARK TESTER SET AT 15,000 VOLTS MINIMUM. ALL PINHOLES SHALL BE REPAIRED AS SPECIFIED IN THE GREENBOOK SPECIFICATION 500-2.4.9.

ALL PINHOLES IN THE PROTECTIVE LINING SHALL BE MARKED OFF ON SURFACE AREAS CONTAINING PINHOLES TO A POINT 150MM (6 INCHES) BEYOND ALL PINHOLES, PRIMED WITH EPOXY, AND RE-COATED WITH POLYURETHANE TO A MINIMUM ADDITIONAL THICKNESS OF 762NM (30 MILS). BILSTERS, UNCURED LINING AND SURFACE IMPERFECTIONS SHALL BE COMPLETELY REMOVED AND THE AREAS RE-COATED WITH EPOXY PRIMER AND POLYURETHANE LINING TO A POINT 150MM (6 INCHES) BEYOND THE REPAIR AREAS AT A MINIMUM THICKNESS OF 2540NM (100 MILS).

THE EPOXY PRIMER AND POLYURETHANE LINING SHALL MEET OR EXCEED THE REQUIREMENTS SPECIFIED IN GREENBOOK SPECIFICATIONS 303-2 AND GREENBOOK TABLE 500-2.4.10(A) AS FOLLOWS:

TABLE 500-2.4.10(A)

	POLYURETHANE	EPOXY
TENSILE STRENGTH ASTM D 638, TYPE 1V, MPA (PSI)	13.8(2,000)	41.4(6,000)
ELONGATION AT BREAK, % ASTM D 638, TYPE IV	50	5
WEAR RESISTANCE, MG. WT. LOSS TABER ABRASION, S-17	60	100
HARDNESS, SHORE D, DUROMETER ASTM D 2240	55	75
TEAR RESISTANCE, KG/MM (PPI) ASTM D 903	2.7(150)	N/A
PEEL STRENGTH, CONCRETE, G/MM (PLI) ASTM D 903	125 (7)1	125 (7)1
ADHESIVE STRENGTH, KPA (PSI) ASTM C 190 (MODIFIED BRIQUET)	2760 (400)1	2760 (400)1

TEST RESULTS SHALL BE VERIFIED ON A PER JOB BASIS OR AS REQUIRED BY THE DISTRICT ENGINEER.

THE COATING SYSTEM SHALL BE A ZEBRON NUMBER 386 OR AN APPROVED EQUAL. THE COATING SYSTEM SHALL BE APPLIED PER THE MANUFACTURER'S RECOMMENDATIONS.

15. DUCTILE IRON PIPE

ALL DUCTILE IRON WATER PIPE SHALL BE DESIGNED IN ACCORDANCE WITH AWWA C-150 AND SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA C-151. THE CLASS SHALL BE CLASS 52 UNLESS OTHERWISE INDICATED ON THE PLANS OR SPECIAL PROVISIONS.

PIPE SHALL BE CEMENT MORTAR LINED AND SEAL COATED IN ACCORDANCE WITH AWWA C-104.

JOINT REQUIREMENTS:

PUSH-ON JOINTS FOR DUCTILE IRON WATER PIPE SHALL CONFORM TO AWWA C-111 AND SHALL INCLUDE SYNTHETIC RUBBER GASKETS AND LUBRICANT.

FLANGED JOINTS FOR CAST IRON OR DUCTILE IRON WATER PIPE SHALL BE AS DETAILED ON THE PLANS OR AS DESIGNED IN THE SPECIAL PROVISIONS.

MECHANICAL JOINTS SHALL MEET THE REQUIREMENTS OF ANSI/AWWA C110/A21.10 AND ANSI/AWWA C111/A21.11 AND SHALL BE DESIGNATED PER A TYPE III JOINT IN FEDERAL SPECIFICATION WW-P-421D.

THE FOLLOWING IS AN APPROVED JOINT RESTRAINT METHOD FOR USE WITH DUCTILE IRON PIPE: RING RESTRAINED JOINT; AMERICAN FLEX-RING OR AN APPROVED EQUAL.

16. TRANSITION COUPLINGS

CENTER RINGS: DUCTILE IRON PER ASTM A 536, GRADE 65-45-12 FUSION BONDED EPOXY.

END RINGS: DUCTILE IRON PER ASTM A 536, GRADE 65-45-12.

GASKETS: SBR PER ASTM D 2000 MBA 710, COMPOUNDED FOR WATER AND SEWER SERVICE. OTHER COMPOUNDS AVAILABLE ON REQUEST.

BOLTS AND NUTS: TRACKHEAD BOLTS, HEAVY HEX NUTS, UNC 5/8" ROLLED THREAD, 304 S.S.

TECHNICAL CONDITIONS

THE FOLLOWING GEOTECHNICAL TESTS SHALL BE PERFORMED FOR THE PROJECT. THE CONTRACTOR IS TO ABSORB THE COSTS RELATIVE TO THE GEOTECHNICAL TESTING.

1. REGARDING THE CLASS 2 BASE, GRANULAR SAND INSTALLATION AND NATIVE BACKFILL FOR THE SANITARY SEWER AND DOMESTIC WATER SYSTEMS, THE FOLLOWING COMPACTION REQUIREMENTS SHALL BE REQUIRED:
 - A. ONE (1) COMPACTION TEST FOR THE GRANULAR SAND FILL PIPE BEDDING ALONG EACH 200 LINEAL FOOT OF WATER PIPE PLACED FOR EACH 1 FOOT LIFT OF MATERIAL PLACED.
 - B. ONE (1) COMPACTION TEST SHALL BE REQUIRED FOR EACH 1 FOOT OF VERTICAL SAND FILL MATERIAL PLACED ALONG EACH 200 FEET OF SANITARY SEWER PIPELINE INSTALLED.
 - C. ONE (1) COMPACTION TEST SHALL BE OBTAINED FOR EACH 1-FOOT LIFT OF NATIVE MATERIAL ALONG EACH 200-FOOT SECTION OF SANITARY SEWER PIPELINE INSTALLED. A GEOTECHNICAL TESTING REPRESENTATIVE SHALL BE PRESENT AT THE TIME THE SANITARY SEWER PIPELINE AND MANHOLES ARE BACKFILLED TO MONITOR THE PLACEMENT OF BACKFILL MATERIAL AND COMPLETE COMPACTION TESTING.
 - D. ONE (1) COMPACTION TEST SHALL BE OBTAINED FOR EACH 1 VERTICAL FOOT OF NATIVE MATERIAL PLACED AROUND MANHOLES. A GEOTECHNICAL TESTING REPRESENTATIVE SHALL BE PRESENT AT THE TIME THE SANITARY SEWER PIPELINE AND MANHOLES ARE BACKFILLED TO MONITOR THE PLACEMENT OF BACKFILL MATERIAL AND COMPLETE COMPACTION TESTING.
 - E. ONE (1) SET OF CONCRETE CYLINDERS SHALL BE OBTAINED EACH DAY MANHOLE BASES ARE PLACED.
 - F. THE SANITARY SEWER PIPELINES AND SANITARY SEWER LATERALS SHALL BE AIR TESTED. THE PROVISIONS OF THE AIR TESTING OF THE SANITARY SEWER LATERALS ARE INCLUDED IN THE HEBER PUBLIC UTILITY DISTRICT TECHNICAL SPECIFICATIONS.

- G. THE SANITARY SEWER MANHOLES SHALL BE WATER TESTED PER THE REQUIREMENTS OF THE HEBER PUBLIC UTILITY DISTRICT TECHNICAL SPECIFICATIONS.
- H. THE WATER PIPELINE SHALL BE HYDROSTATICALLY TESTED, LEAK TESTED AND DISINFECTED AND TESTED PER STATE OF CALIFORNIA HEALTH DEPARTMENT REQUIREMENTS AND PER THE HEBER PUBLIC UTILITY DISTRICT TECHNICAL SPECIFICATIONS.
- I. COMPACTION TESTING OF THE CLASS 2 BASE IN THE STREET AREAS SHALL BE IN CONFORMANCE WITH THE REQUIREMENTS OF THE COUNTY OF IMPERIAL PUBLIC WORKS DEPARTMENT.

TECHNICAL CONDITIONS

III. SUBMITTALS

THE DEVELOPER SHALL SUBMIT THE FOLLOWING SHOP DRAWINGS TO THE HEBER PUBLIC UTILITY DISTRICT FOR REVIEW AND APPROVAL PRIOR TO COMMENCING CONSTRUCTION WORK AT THE PROJECT SITE. A TOTAL OF SIX (6) SETS OF SUBMITTAL DOCUMENTS SHALL BE FORWARDED TO THE HEBER PUBLIC UTILITY DISTRICT. THE DISTRICT SHALL RETAIN THREE (3) SETS OF SUBMITTAL DOCUMENTS AFTER THE REVIEW PROCESS IS COMPLETE. THE REMAINING THREE (3) SUBMITTAL DOCUMENTS SHALL BE FORWARDED TO THE DEVELOPER. THIS LIST IS NOT INTENDED TO BE ALL INCLUSIVE AND THE DISTRICT RESERVES THE RIGHT TO DEMAND SHOP DRAWINGS ASSOCIATED WITH ANY OTHER ITEMS AT ITS DISCRETION.

1. WATER FACILITIES

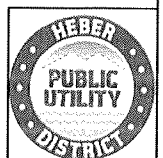
- A. AWWA C-900, CLASS 150 PVC PIPE
- B. AWWA C-905, DR18 PVC PIPE
- C. DUCTILE IRON PIPE
- D. DUCTILE IRON FITTINGS
- E. RESILIENT WEDGE GATE VALVES
- F. VALVE RISERS AND CAPS
- G. TRANSITION COUPLINGS
- H. DUCTILE IRON END CAPS
- I. 6 INCH DUCTILE IRON BURY
- J. 6 INCH DUCTILE IRON SHEAR SPOOL
- K. 6 INCH FIRE HYDRANT
- L. HYDRANT BREAK-OFF CHECK VALVE (IF APPLICABLE)
- M. BRASS SERVICE SADDLES
- N. BRASS CORPORATION STOP
- O. BRASS ANGLE METER STOPS
- P. 1 INCH COPPER PIPELINE
- Q. BLOWOFF/SAMPLING POINT FITTINGS
- R. WATER METER
- S. WATER METER ENCLOSURE
- T. BACKFLOW PREVENTORS



2. SANITARY SEWER FACILITIES

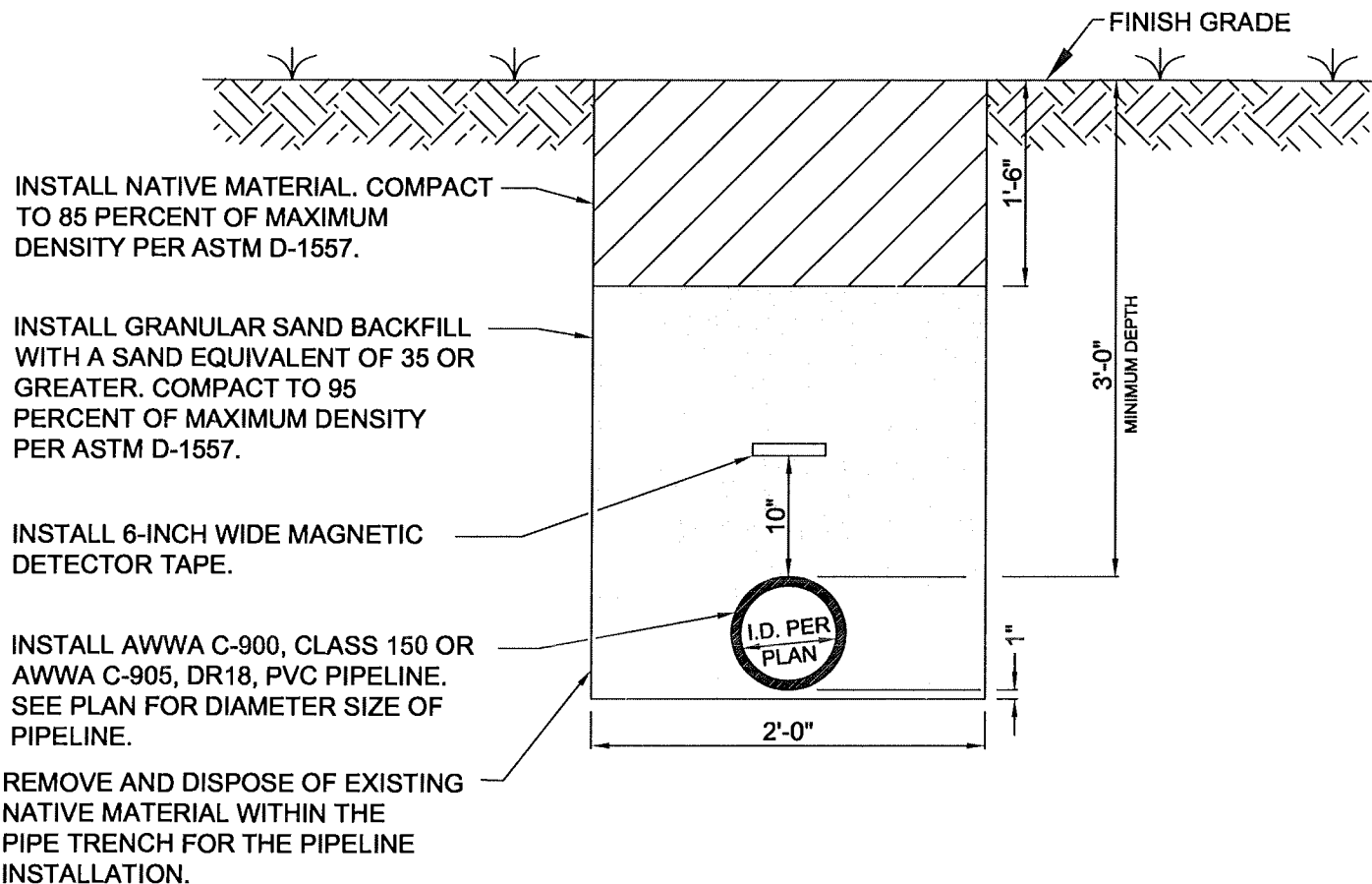
- A. PRECAST MANHOLE SECTIONS
- B. DUCTILE IRON MANHOLE RINGS AND COVERS
- C. SDR 35 PIPE FOR MAIN PIPELINES AND SEWER LATERALS

- D. DUCTILE IRON FRAMES AND COVERS FOR CLEAN-OUTS
 - E. COATING SYSTEM FOR INTERIOR OF MANHOLES
 - F. DUCTILE IRON PIPELINE (IF REQUIRED)
 - G. TRANSITION COUPLINGS
- 3. CONSTRUCTION SCHEDULE
 - 4. P.C.C. CONCRETE FOR DOMESTIC WATER AND SANITARY SEWER SYSTEMS
 - 5. CLASS 2 BASE FOR DOMESTIC WATER AND SANITARY SEWER SYSTEMS
 - 6. GRANULAR SAND FOR DOMESTIC WATER AND SANITARY SEWER SYSTEMS

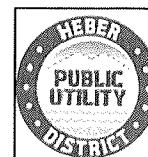
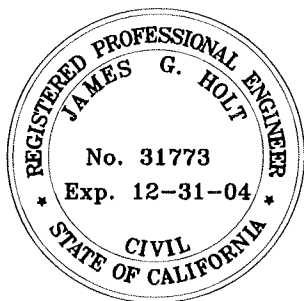
W 100	INDEX
W 101	WATER PIPELINE OUT OF PAVEMENT TRENCH
W 102	TYPICAL WATER PIPELINE TRENCH DETAIL IN PAVED AREAS
W 103	TYPICAL PIPE RISER
W 104	SMALL DIAMETER POTABLE WATER SERVICE PIPELINE IN PAVED AREAS WITHIN RIGHT OF WAY
W 105	SMALL DIAMETER POTABLE WATER SERVICE PIPELINE IN NATIVE AREAS WITHIN RIGHT OF WAY
W 106	RESIDENTIAL/COMMERCIAL FIRE HYDRANT ASSEMBLY
W 107	1 INCH RESIDENTIAL WATER SERVICE CONNECTION
W 108	2 INCH RESIDENTIAL WATER SERVICE CONNECTION
W 109	3 INCH COMMERCIAL WATER SERVICE CONNECTION
W 110	WATER METER ENCLOSURES, 12" X 20"
W 111	TYPICAL BLOWOFF / SAMPLING POINT ASSEMBLY
W 112 A	STANDARD AIR AND VACUUM RELEASE VALVE ASSEMBLY
W 112 B	STANDARD AIR AND VACUUM RELEASE VALVE ASSEMBLY
W 112 C	STANDARD AIR AND VACUUM RELEASE VALVE ASSEMBLY
W 112 D	STANDARD AIR AND VACUUM RELEASE VALVE ASSEMBLY
W 113	WATER PIPELINE TRENCH IN EXISTING A.C. PAVEMENT AREAS WITH 2 SACK CEMENT SLURRY BACKFILL
W 114	REDUCED PRESSURE PRINCIPAL 1/2 INCH - 2 INCH DIAMETER BACKFLOW PREVENTION ASSEMBLY
W 115A	REDUCED PRESSURE PRINCIPAL 2 1/2" INCH - 10 INCH DIAMETER BACKFLOW PREVENTION ASSEMBLY SECTION.
W 115B	REDUCED PRESSURE PRINCIPAL 2 1/2 INCH - 10 INCH DIAMETER BACKFLOW PREVENTION ASSEMBLY NOTES
W 116A	THRUST BLOCKING
W 116B	THRUST BLOCKING
W 116C	THRUST BLOCKING
W 116D	THRUST BLOCKING
W 117	SEWER AND WATER CROSSINGS
W 118	SEPARATION REQUIREMENTS FOR SEWER AND WATER CROSSINGS
W 119	SEPARATION AND CONSTRUCTION REQUIREMENTS FOR SEWER AND WATER LINES (PARALLEL CONSTRUCTION)
W 120	SEPARATION AND CONSTRUCTION REQUIREMENTS FOR SEWER AND WATER LINES (CROSSING)



The Holt Group ENGINEERING · PLANNING · SURVEYING 1581 S. 4th Street El Centro, California 92243 321 W. Hobsonway, Suite A Blythe, California 92225	 (760) 337-3883 (760) 922-4858	SEAL-ENGINEER 	PREPARED BY: JAMES G. "JACK" HOLT R.C.E. NO. 31773 EXP. DATE: 12-31-04	HEBER PUBLIC UTILITY DISTRICT WATER INDEX SCALE: _____ DATE: <u>5-20-2004</u>	SHEET NO. W 100 THG 744.011
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PREPARED BY:

JAMES G. "JACK" HOLT

R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
WATER PIPELINE OUT OF PAVEMENT
TRENCH

SCALE:
NO SCALE

DATE:
5-20-2004

SHEET NO.

W 101

THG 744.011

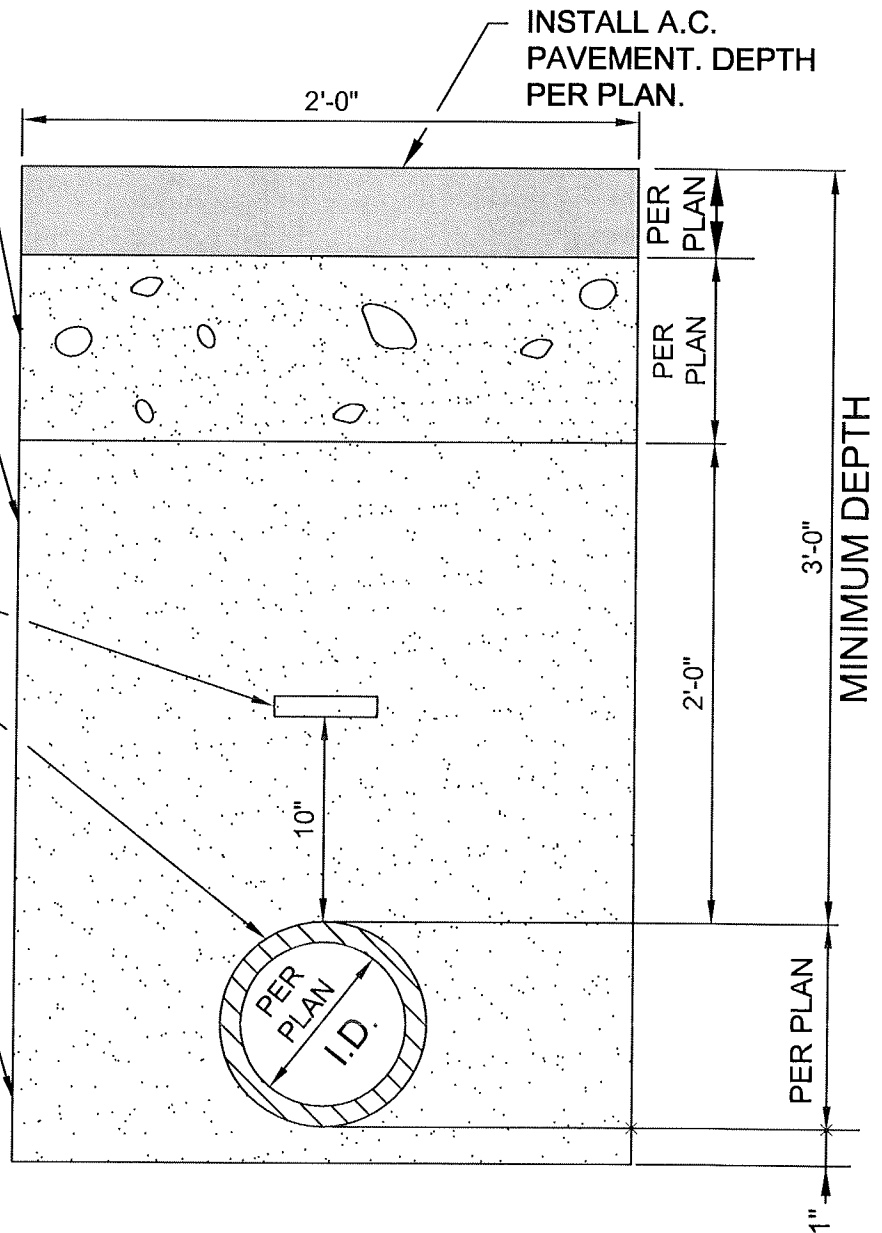
INSTALL 3/4" MAXIMUM
CLASS 2 BASE DEPTH PER
PLAN. COMPACT TO 95
PERCENT OF MAXIMUM
DENSITY PER ASTM D-1557.

INSTALL GRANULAR SAND FILL
WITH A SAND EQUIVALENT OF
35 OR GREATER. COMPACT TO
95 PERCENT OF MAXIMUM
DENSITY PER ASTM D-1557.

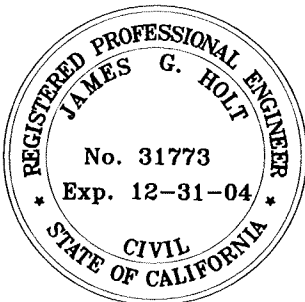
INSTALL 6-INCH WIDE
MAGNETIC DETECTOR TAPE

INSTALL AWWA C-900, CLASS
150 OR AWWA C-905, DR 18
PVC PIPELINE. SEE PLAN FOR
DIAMETER SIZE OF PIPELINE

REMOVE AND DISPOSE OF
EXISTING NATIVE MATERIAL
WITHIN THE PIPE TRENCH
FOR THE PIPELINE
INSTALLATION.



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JAMES G. "JACK" HOLT

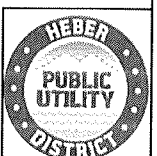
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
TYPICAL WATER PIPELINE TRENCH
DETAIL IN PAVED AREAS

SCALE:
NO SCALE

DATE:
5-20-2004

THG. 744.011



SHEET NO.

W 102

INSTALL 8 INCH WIDE, 8 INCH DEEP
P.C.C. CONCRETE RING CONCENTRIC
WITH THE EXTERIOR OF THE VALVE
RISER.

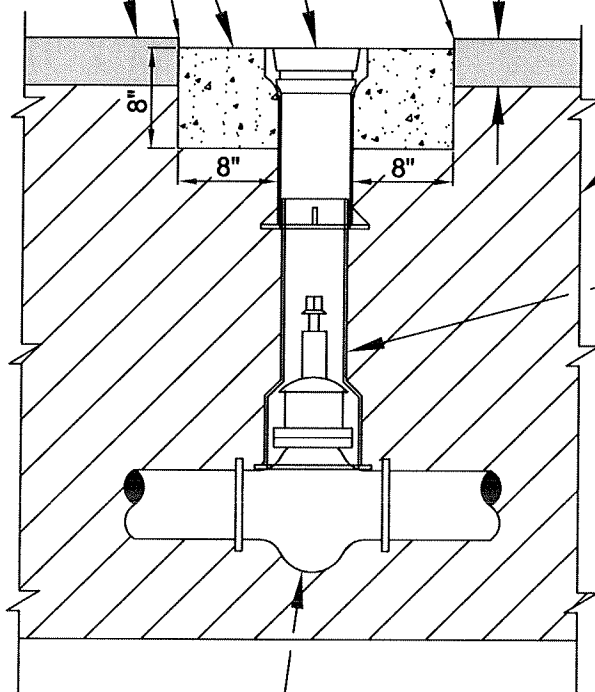
NEW A.C. PAVEMENT

T=3/8"

INSTALL NEW VALVE EXTENSION RISER AND COVER
FLUSH WITH NEW PAVEMENT SURFACE.

T=3/8"

DEPTH PER PLAN

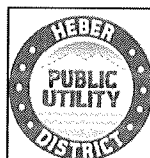
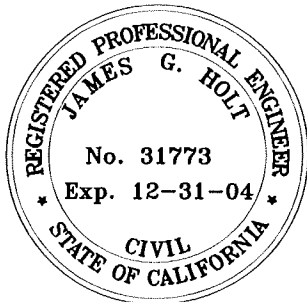


BACKFILL PER PIPE
TRENCH DETAILS AND
TECHNICAL SPECIFICATION.

INSTALL CAST IRON STAR PIPE
PRODUCTS VALVE EXTENSION
RISER No. 562-A, No. 564-A or
No. 664-A (AS APPLICABLE) AND
CAST IRON COVER STAMPED
"WATER". APPLY TWO (2)
COATS OF BLUE METALLIC
PAINT TO CAST IRON COVER.

D.I. EPOXY COATED
RESILIENT WEDGE
GATE VALVE.

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EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
TYPICAL PIPE RISER

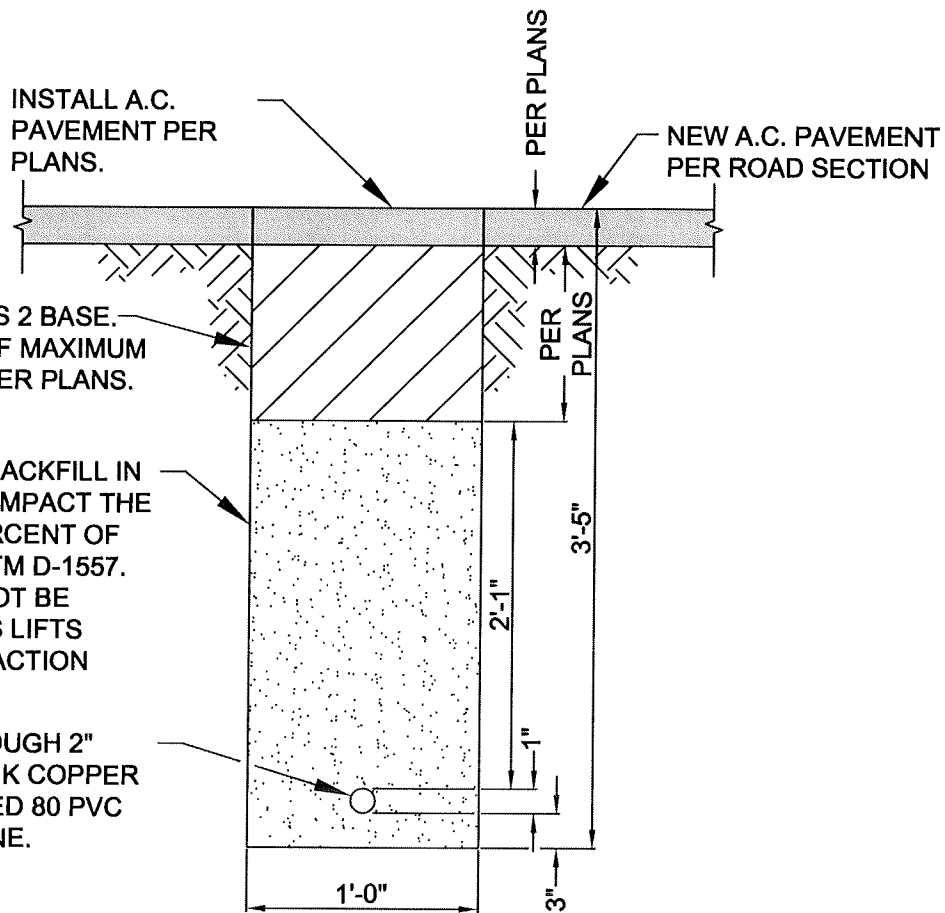
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DATE:
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W 103

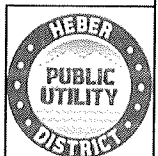
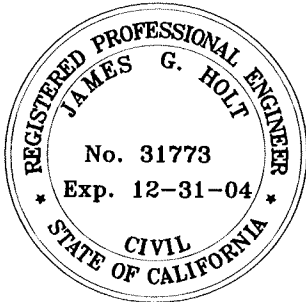


INSTALL 3/4" MAXIMUM CLASS 2 BASE. COMPACT TO 95 PERCENT OF MAXIMUM DENSITY PER ASTM D-1557 PER PLANS.

INSTALL GRANULAR SAND BACKFILL IN MAXIMUM 1-FOOT LIFTS. COMPACT THE GRANULAR SAND TO 95 PERCENT OF MAXIMUM DENSITY PER ASTM D-1557. ADDITIONAL LIFTS SHALL NOT BE INSTALLED UNTIL PREVIOUS LIFTS HAVE ATTAINED THE COMPACTION PERCENTAGE SPECIFIED.

INSTALL 1" THROUGH 2" DIAMETER TYPE K COPPER OR 3" SCHEDULED 80 PVC SERVICE PIPELINE.

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R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
SMALL DIAMETER POTABLE WATER
SERVICE PIPELINE IN PAVED
AREAS WITHIN RIGHT OF WAY

SCALE:
NO SCALE

DATE: 5-20-2004

THG 744.011

SHEET NO.

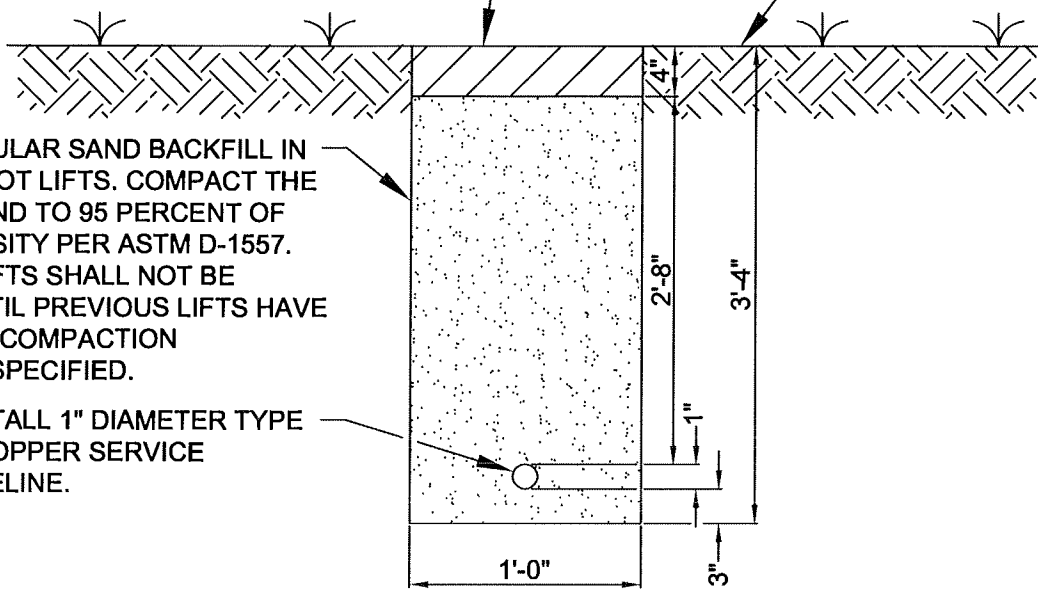
W 104

INSTALL NATIVE MATERIAL TO THE SURFACE OF THE FINISH GRADE. COMPACT THE NATIVE MATERIAL TO 85 PERCENT OF MAXIMUM DENSITY PER ASTM D - 1557.

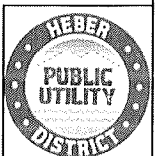
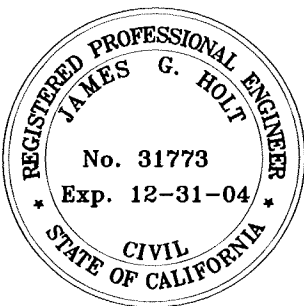
FINISH GRADE

INSTALL GRANULAR SAND BACKFILL IN MAXIMUM 1-FOOT LIFTS. COMPACT THE GRANULAR SAND TO 95 PERCENT OF MAXIMUM DENSITY PER ASTM D-1557. ADDITIONAL LIFTS SHALL NOT BE INSTALLED UNTIL PREVIOUS LIFTS HAVE ATTAINED THE COMPACTION PERCENTAGE SPECIFIED.

INSTALL 1" DIAMETER TYPE K COPPER SERVICE PIPELINE.



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R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
SMALL DIAMETER POTABLE WATER
SERVICE PIPELINE IN NATIVE AREAS
WITHIN RIGHT OF WAY

SCALE:
NO SCALE

DATE:
5-20-2004

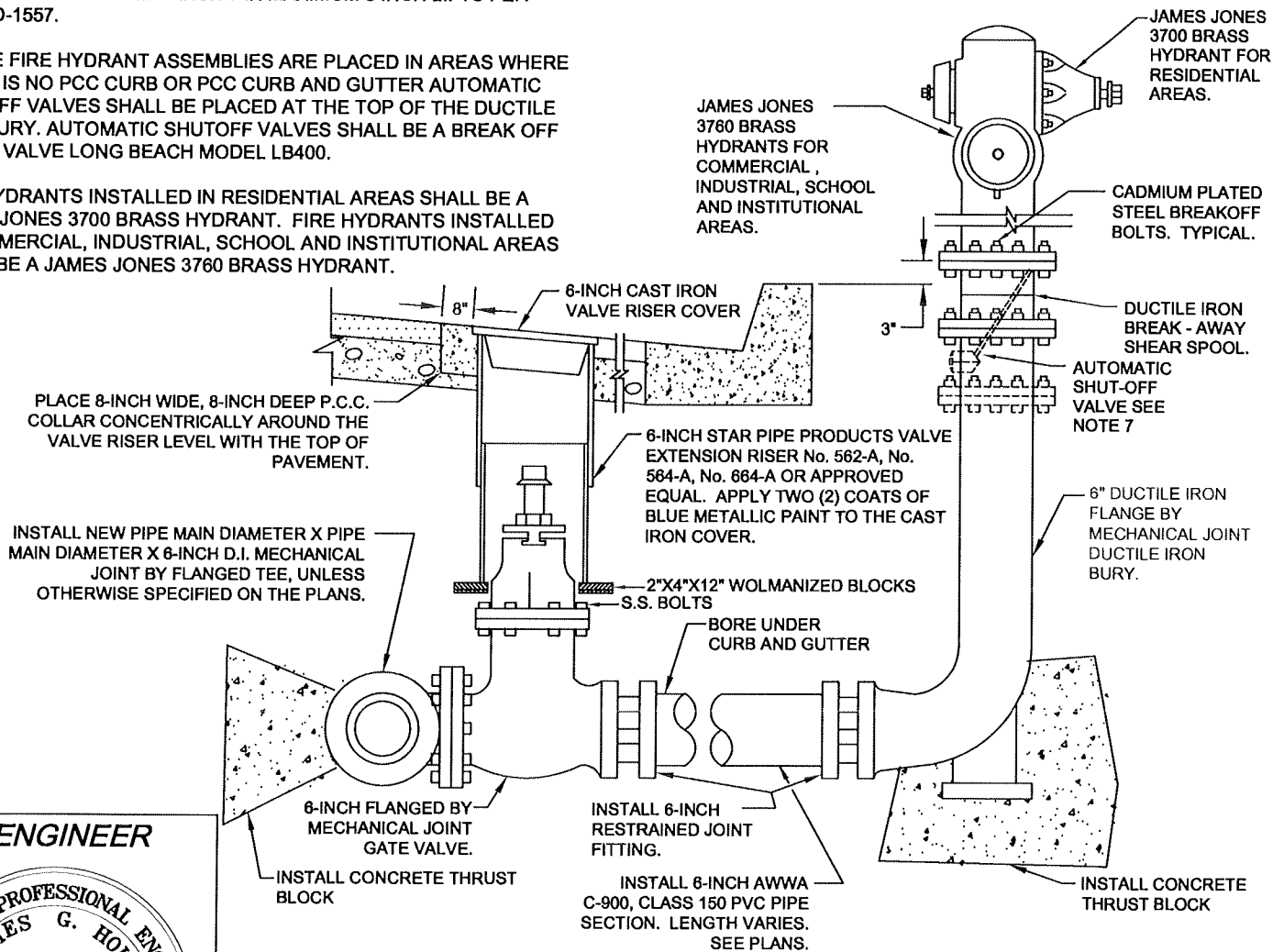
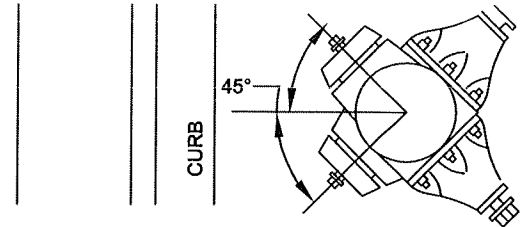
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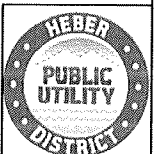
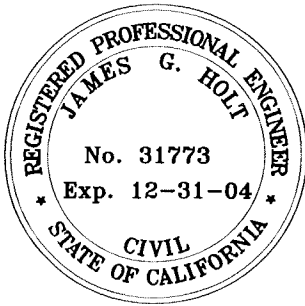
W 105

NOTES

1. HYDRANT LOCATION IS TO BE COORDINATED WITH ALL OTHER UTILITY COMPANIES WITHIN THE HEBER PUBLIC UTILITY DISTRICT.
2. APPLY 2 COATS OF SAFETY YELLOW AMERON AMERLOCK 400 HIGH SOLIDS EPOXY TO HYDRANT SURFACES. PLACE A BLUE REFLECTIVE RAISED PAVEMENT MARKER 1 FOOT INSIDE CENTERLINE ALONG ADJOINING PAVED ROADWAYS.
3. JAMES JONES HYDRANTS ARE STANDARD EQUIPMENT WITHIN THE DISTRICT. APPROVED EQUALS MUST BE APPROVED BY THE DISTRICT ENGINEER AND GENERAL MANAGER AND MATCH EXACTLY IN PERFORMANCE AND PARTS.
4. INSTALL HYDRANTS AFTER P.C.C. CURB AND GUTTER IS INSTALLED.
5. ALL BELOW GRADE HARDWARE SHALL CONSIST OF 304 STAINLESS STEEL. PLACE ANTI-SEIZE COMPOUND ON ALL STAINLESS STEEL HARDWARE.
6. BACKFILL FOR FIRE HYDRANT ASSEMBLIES SHALL CONSIST OF A CLEAN GRANULAR MATERIAL WITH A SAND EQUIVALENT OF 35 OR GREATER. COMPACT THE GRANULAR MATERIAL BACKFILL TO 95 PERCENT OF MAXIMUM DENSITY IN MAXIMUM 8 INCH LIFTS PER ASTM D-1557.
7. WHERE FIRE HYDRANT ASSEMBLIES ARE PLACED IN AREAS WHERE THERE IS NO PCC CURB OR PCC CURB AND GUTTER AUTOMATIC SHUTOFF VALVES SHALL BE PLACED AT THE TOP OF THE DUCTILE IRON BURY. AUTOMATIC SHUTOFF VALVES SHALL BE A BREAK OFF CHECK VALVE LONG BEACH MODEL LB400.
8. FIRE HYDRANTS INSTALLED IN RESIDENTIAL AREAS SHALL BE A JAMES JONES 3700 BRASS HYDRANT. FIRE HYDRANTS INSTALLED IN COMMERCIAL, INDUSTRIAL, SCHOOL AND INSTITUTIONAL AREAS SHALL BE A JAMES JONES 3760 BRASS HYDRANT.



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PREPARED BY:

JAMES G. "JACK" HOLT
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
RESIDENTIAL/COMMERCIAL FIRE
HYDRANT ASSEMBLY

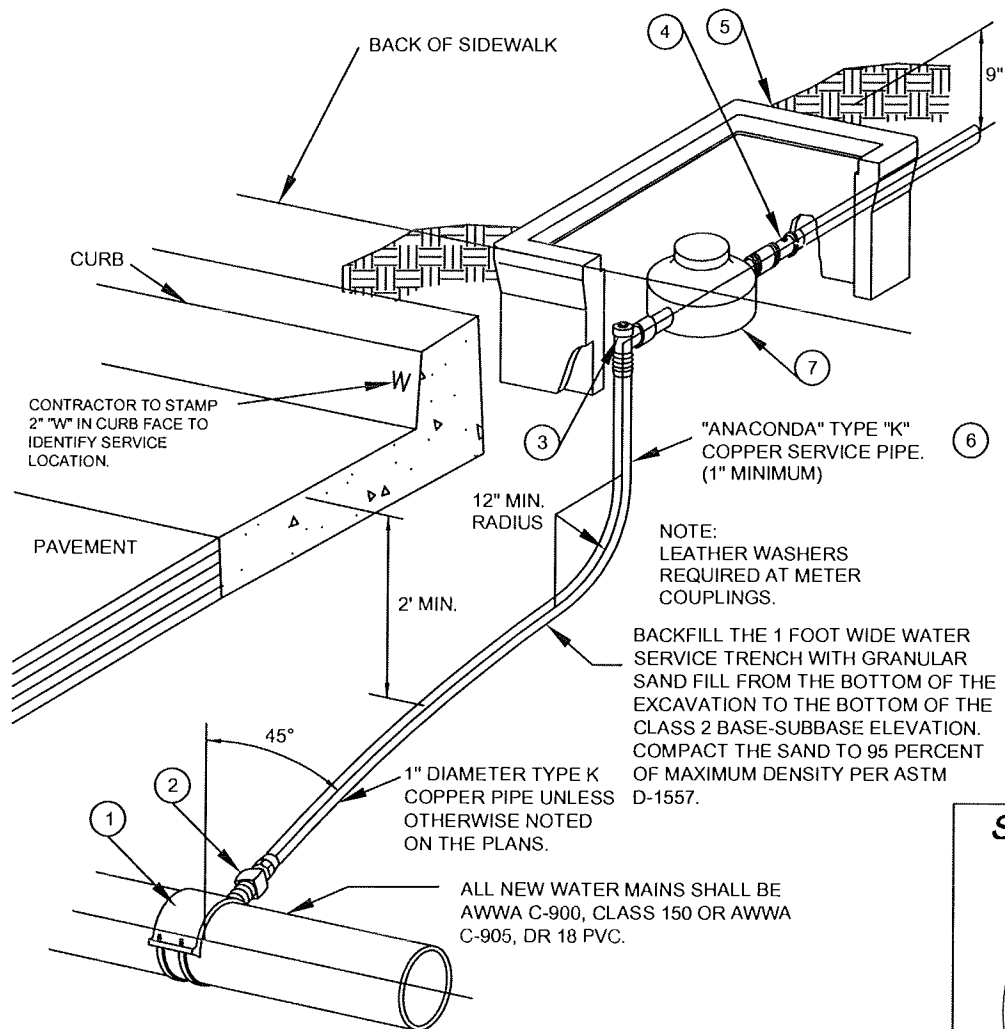
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W 106

SCALE:
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DATE:
5-20-2004

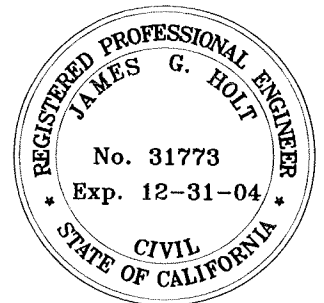
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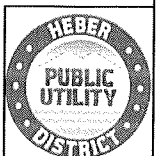
NOTES:

- 1 JAMES JONES MODEL NUMBER J-996 BRONZE DOUBLE STRAP SERVICE SADDLE WITH BRASS HARDWARE TO ACCOMMODATE A 1 INCH DIAMETER PIPELINE.
- 2 1 INCH DIAMETER JAMES JONES MODEL NUMBER J-3403SG CORPORATION STOP WITH BRASS COMPRESSION CONNECTION FITTING AND STAINLESS STEEL OR BRASS HARDWARE.
- 3 1 INCH DIAMETER JAMES JONES MODEL NUMBER J-4201SG ANGLE METER STOP WITH LOCK WING. PROVIDE A 1 INCH J-2623 BRASS COMPRESSION COUPLING ON THE UPSTREAM SIDE OF THE ANGLE METER STOP WITH STAINLESS STEEL OR BRASS HARDWARE.
- 4 INSTALL STRAIGHT MALE IRON PIPE SWIVEL SECTION WITH METER COUPLING NUT WASHER AND OCTAGON BARREL IN CONFORMANCE WITH JAMES JONES J-130.
- 5 INSTALL A SAN DIEGO PRECAST CONCRETE PART NUMBER P 4/2 -12" X 20" PCC CONCRETE WATER METER BOX. INSTALL A 4-1/2 C WITH 4-1/2 I CONCRETE LID ADAPTABLE TO A TOUCH READ METER FOR RESIDENTIAL SERVICES. THE CONCRETE LID SHALL BE EQUIPPED WITH A 1-3/4 INCH DIAMETER HOLE TO ACOMODATE A TOUCH READ DEVICE. WATER SERVICES LOCATED IN TRAFFIC AREAS SHALL BE FURNISHED WITH A 4-1/2 CCI CAST IRON LID WITH A 1-3/4" HOLE TO ACOMODATE A TOUCH READ DEVICE. SEE W110.
- 6 TYPE "K" SEAMLESS SOFT COPPER 1" SIZE. CONTINUOUS SERVICE (NO COUPLINGS, CORP. STOP TO CURB STOPS). PLASTIC APPROVED ONLY ON CUSTOMER'S SIDE. 1 1/2" & 2"= TYPE K SEAMLESS SOFT COPPER WELDED COUPLINGS WITH 95/5 SILVER SOLDER.
- 7 SENSUS TR/PL TOUCH READ SR II 5/8" X 3/4" METER. DEVELOPER TO SUPPLY METER. METER TO READ SEVEN DIGITS. METER TO READ IN GALLON INCREMENTS.
- 8 THE REQUIRED SIZE OF THE SERVICE MUST BE APPROVED BY THE HEBER PUBLIC UTILITY DISTRICT (1" MIN., 2" OR 3").
- 9 THE WATER SERVICE SHALL EXTEND PERPENDICULAR TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP, WHERE EVER POSSIBLE.
- 10 THE METER LOCATION SHALL BE AS ILLUSTRATED ON PLANS UNLESS OTHERWISE SPECIFIED BY THE HEBER PUBLIC UTILITY DISTRICT

SEAL-ENGINEER



PUBLIC UTILITY DISTRICT



SHEET NO.

W 107

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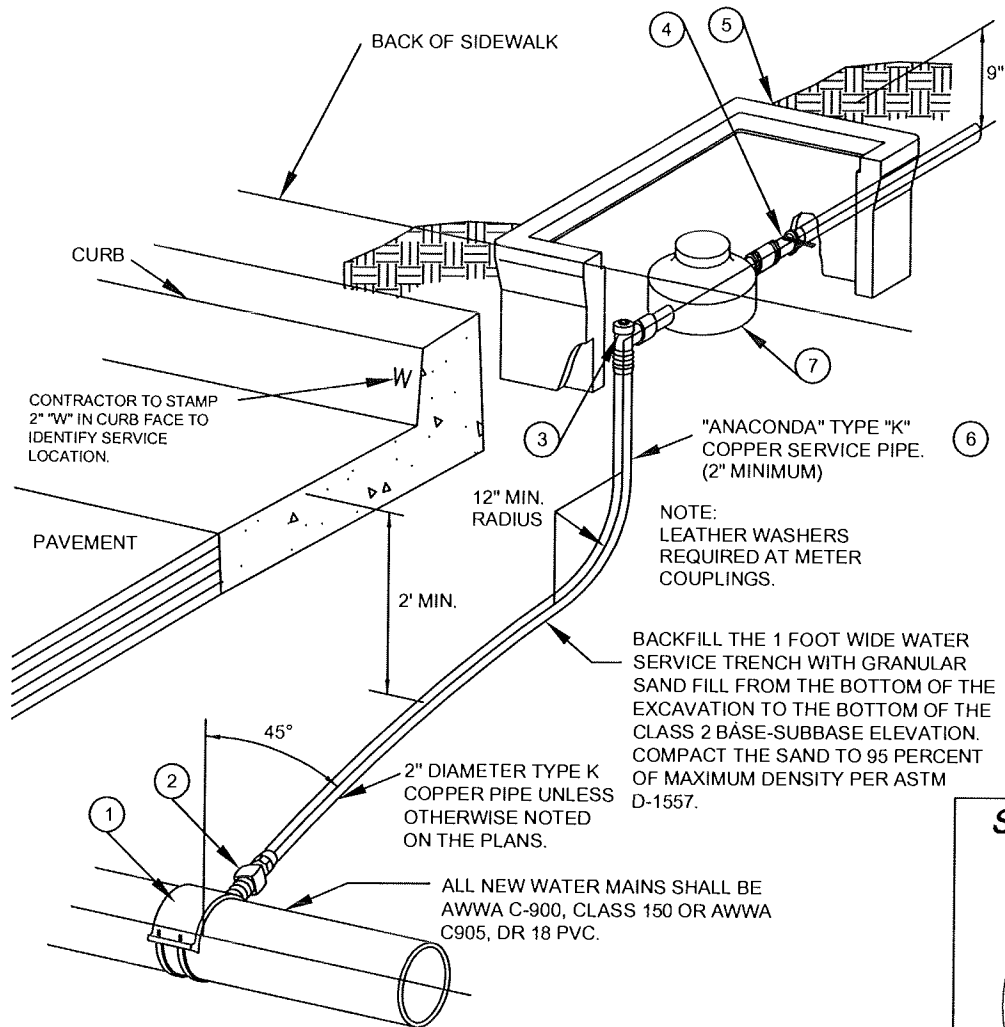
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
1-INCH RESIDENTIAL WATER SERVICE
CONNECTION

SCALE:
NO SCALE

DATE:
5-20-2004

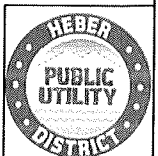
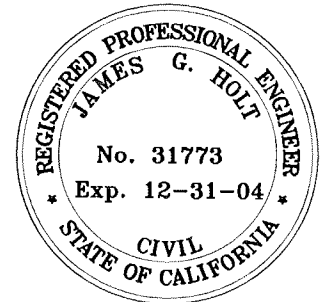
THG 744.011



NOTES:

- 1 JAMES JONES MODEL NUMBER J-996 BRONZE DOUBLE STRAP SERVICE SADDLE WITH BRASS HARDWARE TO ACCOMMODATE A 2 INCH DIAMETER PIPELINE.
- 2 2 INCH DIAMETER JAMES JONES MODEL NUMBER J-1930 CORPORATION STOP WITH BRASS COMPRESSION CONNECTION FITTING AND STAINLESS STEEL OR BRASS HARDWARE.
- 3 2 INCH DIAMETER JAMES JONES MODEL NUMBER J-4205 ANGLE METER STOP WITH OUTLET METER FLANGE AND LOCK WING.
- 4 INSTALL JAMES JONES MODEL NO. J-1941 CONNECTION FOR TUBE SIZE PLASTIC OR COPPER TUBING METER OUTLET SHALL BE FLANGED.
- 5 INSTALL A SAN DIEGO PRECAST CONCRETE PART NUMBER P 4/2 -12" X 20" PCC CONCRETE WATER METER BOX. INSTALL A 4-1/2 C WITH 4-1/2 I CONCRETE LID ADAPTABLE TO A TOUCH READ METER FOR RESIDENTIAL SERVICES. THE CONCRETE LID SHALL BE EQUIPPED WITH A 1-3/4 INCH DIAMETER HOLE TO ACOMODATE A TOUCH READ DEVICE. WATER SERVICES LOCATED IN TRAFFIC AREAS SHALL BE FURNISHED WITH A 4-1/2 CCI CAST IRON LID WITH A 1-3/4" HOLE TO ACOMODATE A TOUCH READ DEVICE. SEE W110.
- 6 TYPE "K" SEAMLESS SOFT COPPER 2" SIZE. CONTINUOUS SERVICE (NO COUPLINGS, CORP. STOP TO CURB STOPS). PLASTIC APPROVED ONLY ON CUSTOMER'S SIDE. 1 1/2" & 2"= TYPE K SEAMLESS SOFT COPPER WELDED COUPLINGS WITH 95/5 SILVER SOLDER.
- 7 SENSUS TR/PL TOUCH READ SR II 2-INCH FLANGED METER. DEVELOPER TO SUPPLY METER. METER TO READ SEVEN DIGITS. METER TO READ IN GALLON INCREMENTS.
- 8 THE REQUIRED SIZE OF THE SERVICE MUST BE APPROVED BY THE HEBER PUBLIC UTILITY DISTRICT (1" MIN., 2" MAX.).
- 9 THE WATER SERVICE SHALL EXTEND PERPENDICULAR TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP, WHERE EVER POSSIBLE.
- 10 THE METER LOCATION SHALL BE AS ILLUSTRATED ON PLANS UNLESS OTHERWISE SPECIFIED BY THE HEBER PUBLIC UTILITY DISTRICT

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SEAL-ENGINEER



PREPARED BY:

JAMES G. "JACK" HOLT

R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
2-INCH RESIDENTIAL WATER SERVICE
CONNECTION

SHEET NO.

W 108

SCALE:
NO SCALE

DATE: 5-20-2004

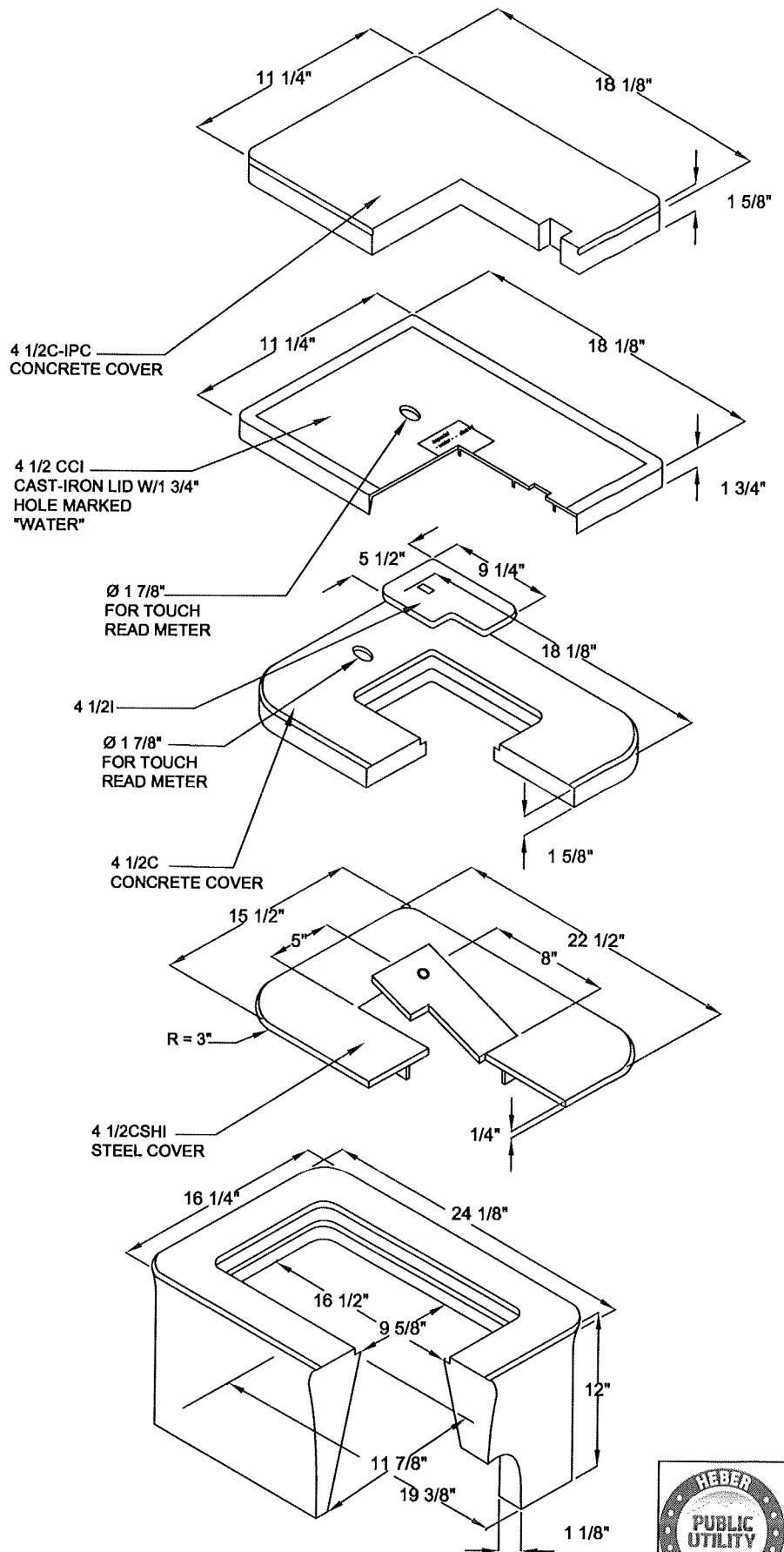
THG 744.011

CONFIGURATION BLOCK

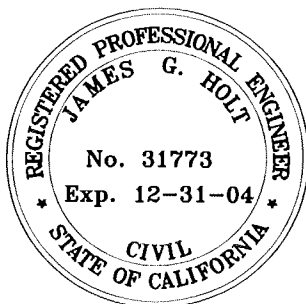
PART NO.	DESCRIPTION	HEIGHT	WEIGHT
4 1/2BOX	BOX	12"	142 LBS
4 1/2OSHI	COVER STEEL	1/4"	30 LBS
4 1/2C	COVER CONCRETE	1 5/8"	30 LBS
4 1/2I	COVER INSERT	1 1/8"	5 LBS
4 1/2CCI	COVER CAST IRON	1 3/4"	30 LBS
4 1/2C-IPC	COVER CONCRETE	1 5/8"	30 LBS

NOTES:

1. THE PCC WATER METER ENCLOSURE SHALL BE MANUFACTURED BY SAN DIEGO PRECAST CONCRETE OR AN APPROVED EQUAL. THE ADDRESS OF SAN DIEGO PRECAST CONCRETE IS: 9702 PROSPECT AVENUE, SANTEE, CALIFORNIA 92071. THE TELEPHONE NUMBER IS (619) 449-6810.
2. RESIDENTIAL WATER METER ENCLOSURES SHALL BE CONSTRUCTED WITH A CONCRETE BOX AND CONCRETE LID. THE COVER SHALL BE A SAN DIEGO PRECAST CONCRETE 4-1/2 C OR AN APPROVED EQUAL. THE CONCRETE LID SHALL BE CONSTRUCTED WITH A 1-7/8" OPENING FOR A SENSUS TOUCH READ METER. SEE DETAIL W 107 AND W 108 REGARDING RESIDENTIAL WATER SERVICES.
3. INDUSTRIAL, INSTITUTIONAL AND COMMERCIAL WATER METER ENCLOSURES SHALL BE CONSTRUCTED WITH A CONCRETE BOX AND CAST-IRON LID. WATER METER ENCLOSURES PLACED IN TRAFFIC AREAS SHALL BE SUPPLIED WITH A CAST-IRON LID. THE COVER SHALL BE A SAN DIEGO PRECAST CONCRETE 4-1/2 CCI CAST-IRON LID OR AN APPROVED EQUAL. THE CAST-IRON LID SHALL BE CONSTRUCTED WITH A 1-7/8" OPENING FOR A SENSUS TOUCH READ METER. SEE DETAIL W 107 AND W 108 REGARDING RESIDENTIAL WATER SERVICES..



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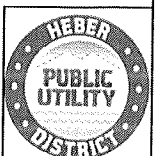
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
WATER METER ENCLOSURES,
12" X 20"

SCALE:
NO SCALE

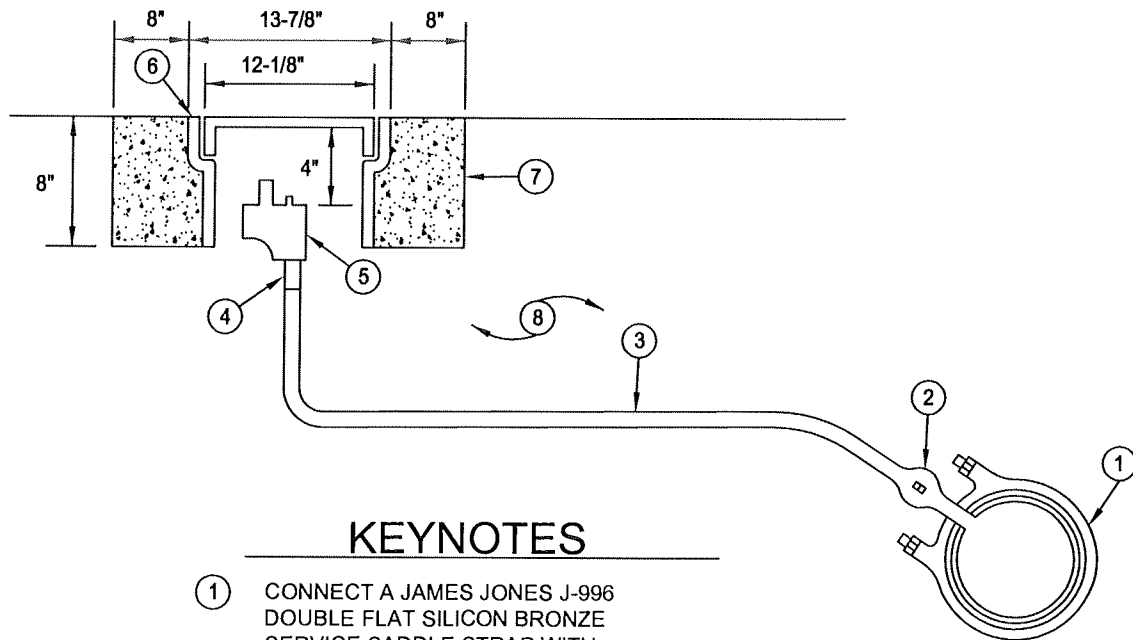
DATE:
5-20-2004

THG 744.011



SHEET NO.

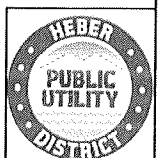
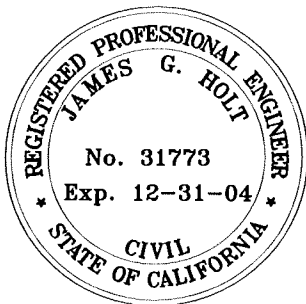
W 110



KEYNOTES

- ① CONNECT A JAMES JONES J-996 DOUBLE FLAT SILICON BRONZE SERVICE SADDLE STRAP WITH BRONZE NUTS TO THE WATER MAIN.
- ② INSTALL A 2 INCH JAMES JONES J-1930 BRONZE CORPORATION STOP.
- ③ INSTALL A 2 INCH DIAMETER TYPE K COPPER WATER SERVICE PIPELINE.
- ④ INSTALL A BRASS TRANSITION FITTING FROM THE FLAIED 2 INCH TYPE K COPPER PIPELINE TO THE BLOWOFF FITTING.
- ⑤ INSTALL A 2 INCH TRUFLO MODEL TF550 BLOWOFF FITTING AS MANUFACTURED BY THE KUPFERLE FOUNDRY COMPANY.
- ⑥ INSTALL A SOUTH BAY FOUNDRY MODEL NUMBER SBF 1240 DUCTILE IRON FRAME AND COVER TO THE FINISH SURFACE GRADE.
- ⑦ INSTALL AN 8 INCH WIDE, 8 INCH DEEP PCC CONCENTRIC RING AROUND THE DUCTILE IRON FRAME AND COVER.
- ⑧ BACKFILL THE PIPELINE WITH GRANULAR SAND BACKFILL WITH A SAND EQUIVALENT OF 35 OR GREATER. COMPACT THE GRANULAR SAND BACKFILL TO 95 PERCENT OF MAXIMUM DENSITY PER ASTM D 1557.

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PREPARED BY:

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R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
TYPICAL BLOWOFF / SAMPLING POINT
ASSEMBLY

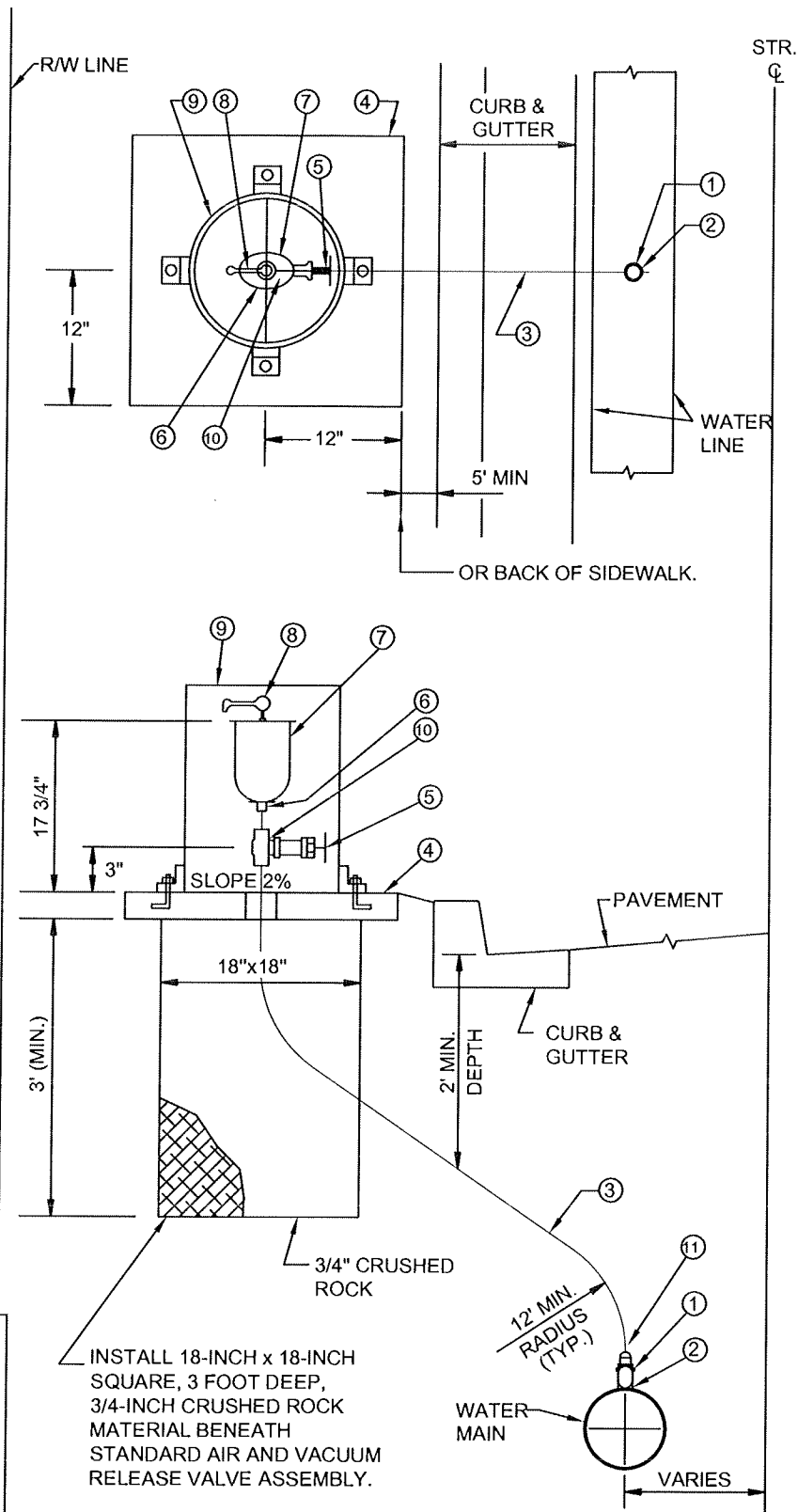
SCALE:
NO SCALE

DATE:
5-20-2004

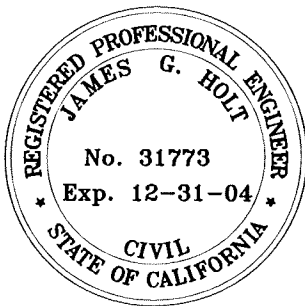
THG 744.011

SHEET NO.

W 111



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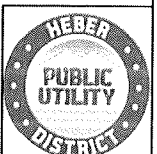
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
STANDARD AIR AND VACUUM RELEASE
VALVE ASSEMBLY

SCALE:
NO SCALE

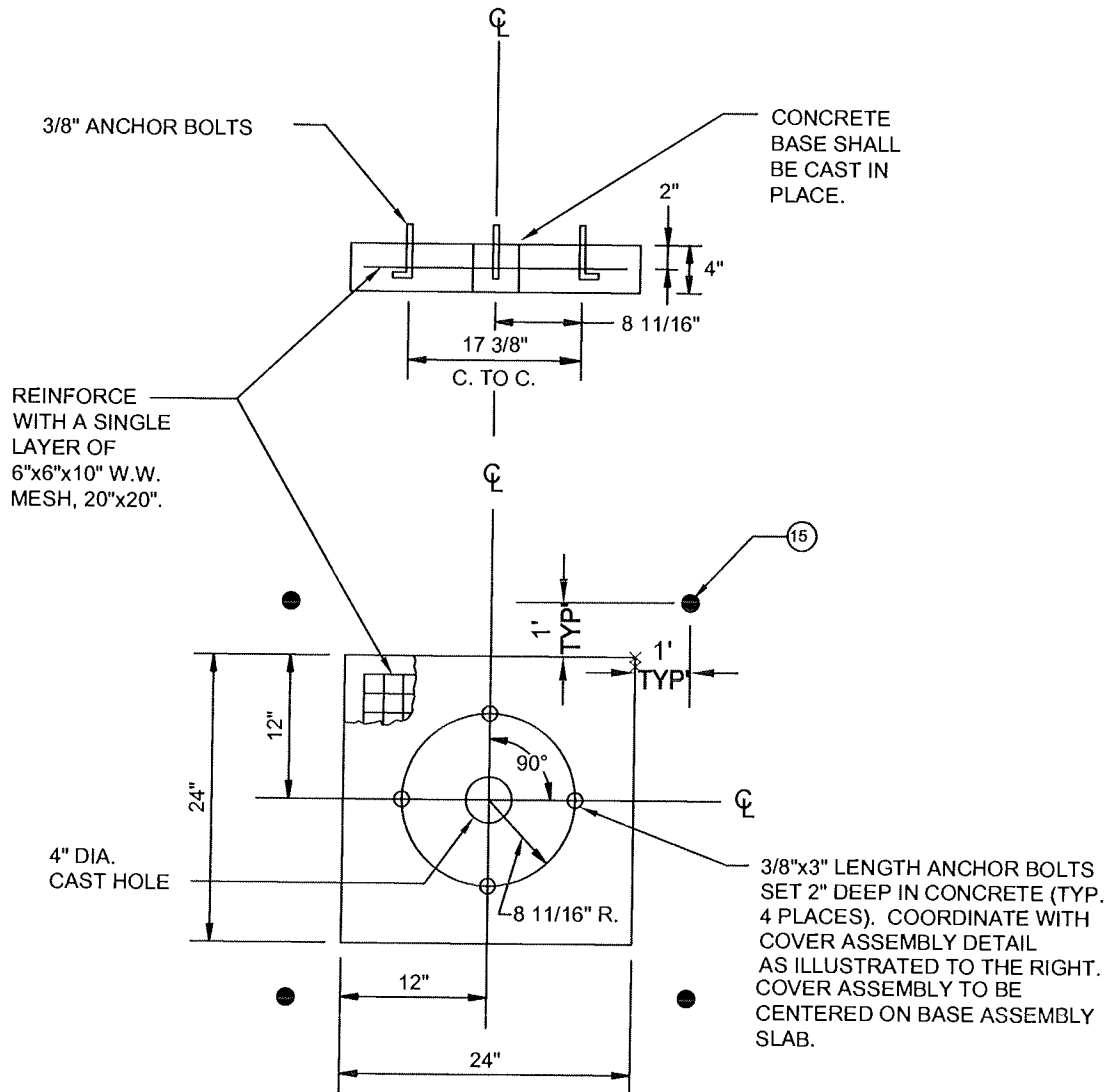
DATE:
5-20-2004

THG 744.011

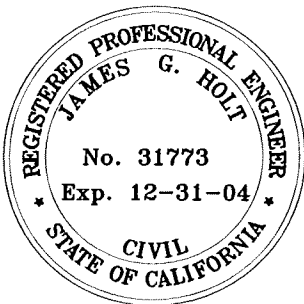


SHEET NO.

W 112 A



SEAL-ENGINEER



BASE ASSEMBLY DETAIL

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PREPARED BY:

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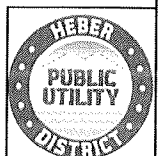
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
STANDARD AIR AND VACUUM RELEASE
VALVE ASSEMBLY

SCALE:
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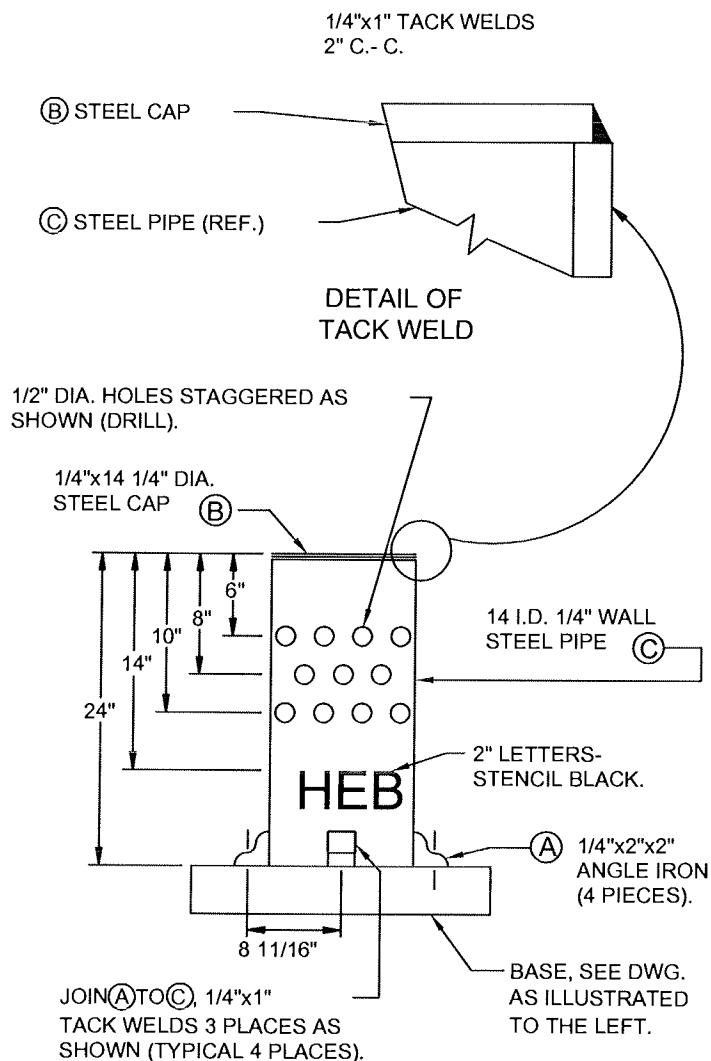
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THG 744.011



SHEET NO.

W 112 B

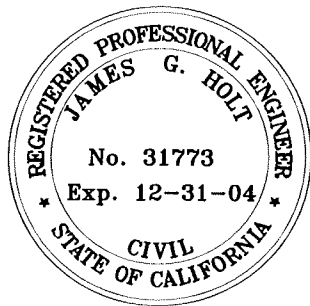


COVER ASSEMBLY DETAIL

NOTES:

1. FABRICATION BY CEBE CO., PARAMOUNT, CA; PIPELINE PRODUCTS, SAN MARCOS, CA, O.A.E.
2. HOT DIP GALVANIZE.
3. PRIMER (2 COATS) - ZINC CHROMATE OR RED OXIDE METAL PRIMER.
4. PAINT WITH TWO (2) COATS OF BLUE EPOXY PAINT. (BRUSH OR SPRAY).
5. STENCIL "HEBER" IDENTIFICATION (BLACK ENAMEL) MARINE TYPE MOISTURE RESISTANT.

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R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
STANDARD AIR AND VACUUM RELEASE
VALVE ASSEMBLY

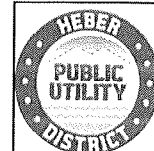
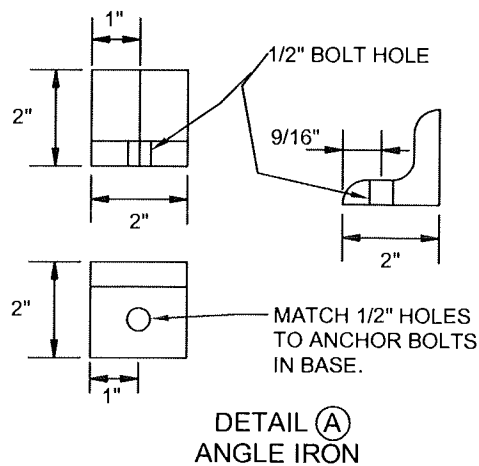
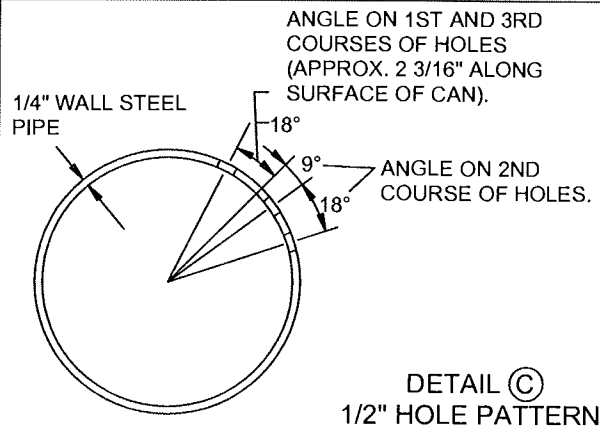
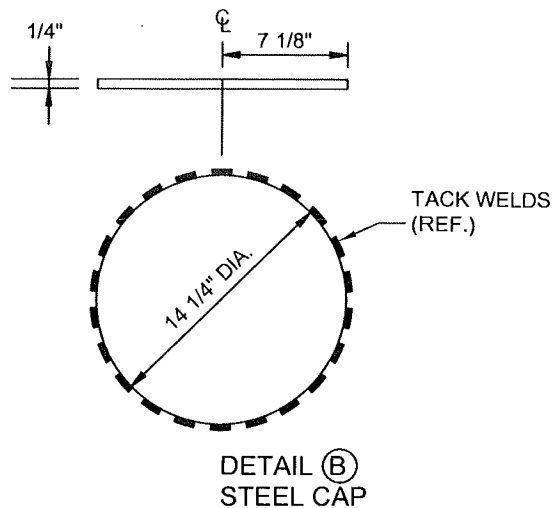
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DATE:
5-20-2004

THG 744.011

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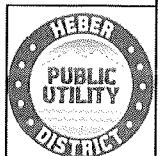
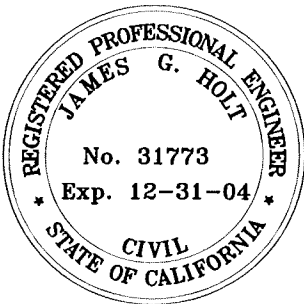
W 112 C



NOTES:

- ① INSTALL BRONZE JAMES JONES CORPORATION
STOP 1"=J-1929, 2" = J-1931
- ② BRONZE CAST BODY, DOUBLE STAINLESS
STEEL STRAPS WITH WELDED BOLT,
PASSIVATED STAINLESS STEEL NUT, BNNA-N
O'RING. (JAMES JONES - J-969 FOR PVC,
C-900 PIPE.
- ③ LATERAL PIPE= ANACONDA TYPE "K"
COPPER. (SIZE 1" AND 2")
- ④ BASE ASSEMBLY. SEE DETAIL
- ⑤ GATE VALVE 1"= MILWAUKEE NO. 105.
- ⑥ BRASS NIPPLE SIZE x CLOSE.
- ⑦ AIR VACUUM RELEASE VALVE ASSEMBLY
1"= CRISPIN UNIVERSAL UL-10 AIR
VACUUM RELEASE VALVE SCREWED
BODY WITH 1-S TOP; 2" REQUIRED
FOR 12" PIPE AND LARGER, UL-20.
- ⑧ OVERFLOW ASSEMBLY 1" (GALVANIZED
NIPPLE 1"x4" LENGTH, 1" GALVANIZED
ELBOW).
- ⑨ COVER ASSEMBLY. SEE DETAIL
- ⑩ MALE X FLARE COUPLING JAMES JONES J-1531
- ⑪ 2" ONLY= FLARE COPPER X MALE IRON PIPE,
90° BEND (JAMES JONES J-1550)
- ⑫ ALL CONCRETE SHALL CONTAIN 6 SACKS
OF CEMENT PER CUBIC YARD AND ATTAIN
4,000 PSI COMPRESSIVE STRENGTH AFTER
28 DAYS CURING.
- ⑬ ALL MANUFACTURED ITEMS INDICATED
SHALL BE AS NOTED OR AN APPROVED
EQUAL AUTHORIZED BY THE DISTRICT
ENGINEER IN WRITING.
- ⑭ ALL FITTINGS SHALL BE SWEAT FITTINGS
EXCEPT AS NOTED. ALL SOLDERED
JOINTS TO BE POLISHED WITH NO. 00
STEEL WOOL OR FINE GRADE SANDCLOTH
TO OBTAIN A BRIGHT AND CLEAN
SURFACE.
- ⑮ INSTALL GUARD POSTS (BOLLARD'S) TO
PROTECT THE AIR VACUUM RELEASE VALVE
ASSEMBLY. INSTALL 4 INCH O.D. X 8 GAUGE
STEEL POSTS (TYP.) COAT POSTS WITH RED
OXIDE PRIMER AND TWO (2) COATS OF A YELLOW
EPOXY PAINT. CENTER GUARD POSTS IN A 1 FOOT
DIAMETER FOOTING. THE FOOTING SHALL EXTEND 3
FEET BELOW GRADE. THE GUARD POSTS SHALL
EXTEND 2.5 FEET ABOVE GRADE. THE POSTS SHALL
BE FILLED WITH P.C.C. CONCRETE. A PCC CONVEX CAP
SHALL BE PLACED AT THE TOP OF THE BOLLARD POST.

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SEAL-ENGINEER



PREPARED BY:

JAMES G. "JACK" HOLT

R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
STANDARD AIR AND VACUUM RELEASE
VALVE ASSEMBLY

SCALE:
NO SCALE

DATE:
5-20-2004

SHEET NO.
W 112 D

THG 744.011

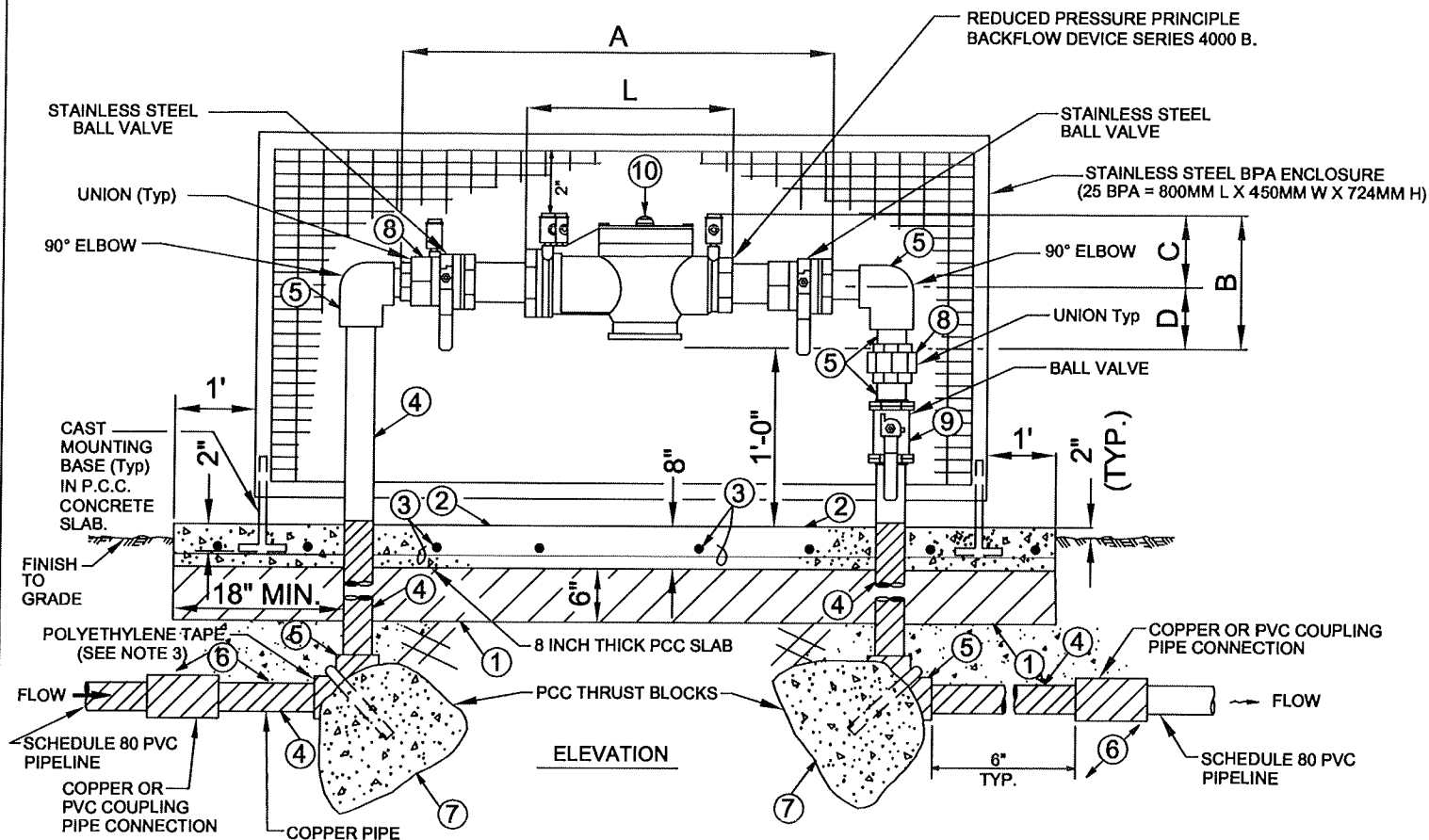
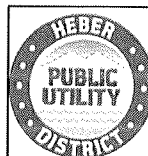


TABLE OF DIMENSIONS FOR BACKFLOW ASSEMBLY

SIZE (DN)		DIMENSIONS (APPROX.)										WEIGHT	
in.	mm.	A		B		C		D		L		lbs.	kg.
1/2	15	10	250	4-3/8	117	3-3/8	86	1-1/4	32	5-1/2	140	4.50	2.0
3/4	20	10-3/4	273	5	127	3-1/2	89	1-1/2	38	6-3/4	171	5.75	2.6
1	25	16-3/4	425	5-1/2	140	3	76	2-1/2	64	9-1/2	241	12.25	5.6
1-1/4	32	17-3/8	441	8	150	3-1/2	89	2-1/2	64	11-3/8	289	14.62	6.6
1-1/2	40	17-7/8	454	6	150	3-1/2	89	2-1/2	64	11-1/8	283	16.32	7.4
2	50	21-3/8	543	7-3/4	197	4-1/2	114	3-1/4	83	13-1/2	343	30.00	13.6

- NOTES:
1. INSTALL 6 INCHES OF CLASS 2 BASE. COMPACT THE CLASS 2 BASE TO 95 PERCENT OF MAXIMUM DENSITY PER ASTM D-1557.
 2. INSTALL A 4 FOOT WIDE, 8 INCH DEEP P.C.C. CONCRETE SLAB. THE LENGTH OF THE CONCRETE SLAB SHALL BE DETERMINED BY THE DIAMETER SIZE OF THE PIPELINE AND LENGTH OF THE BACKFLOW PREVENTER ASSEMBLY. THE SURFACE OF THE CONCRETE SLAB SHALL RECEIVE A DOUBLE TROWEL FINISH. THE CONCRETE SHALL CONTAIN 6-1/2 SACKS OF CEMENT PER CUBIC YARD AND ATTAIN A COMPRESSIVE STRENGTH OF 4,500 PSI AFTER 28 DAYS CURING. THE CEMENT SHALL BE TYPE V.
 3. INSTALL NUMBER 4 REINFORCING BARS 12 INCHES ON CENTER EACH WAY.
 4. INSTALL COPPER PIPELINE PER THE DIAMETER REQUIRED BY THE PLANS.
 5. INSTALL COPPER 90 DEGREE ELBOWS.
 6. BACKFILL THE BELOW GRADE COPPER PIPELINES AND 90 DEGREE ELBOW WITH A 1 FOOT ENVELOPE OF GRANULAR SAND BACKFILL. COMPACT THE GRANULAR SAND BACKFILL TO 95 PERCENT OF MAXIMUM DENSITY PER ASTM D-1557.
 7. INSTALL P.C.C. THRUST BLOCKS WITH SECUREMENT HOOK.
 8. INSTALL A BRASS UNION FITTING. THE DIAMETER SIZE SHALL BE AS INDICATED ON THE PLANS.
 9. INSTALL A BRASS BALL VALVE WITH OPERATOR HANDLE. THE DIAMETER SIZE SHALL BE AS INDICATED ON THE PLANS.
 10. INSTALL A BRONZE BODY REDUCED PRESSURE PRINCIPAL BACKFLOW DEVICE ASSEMBLY WITH STAINLESS STEEL BALL VALVE HANDLES. CLEAN AND CHECK STRAINER AND UNION CONNECTIONS. THE BRONZE BODY REDUCED PRESSURE PRINCIPAL BACKFLOW DEVICE SHALL BE AN AMES FIRE & WATERWORKS SERIES 4000B.

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EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
REDUCED PRESSURE PRINCIPAL
1/2 INCH - 2 INCH DIAMETER
BACKFLOW PREVENTION
ASSEMBLY

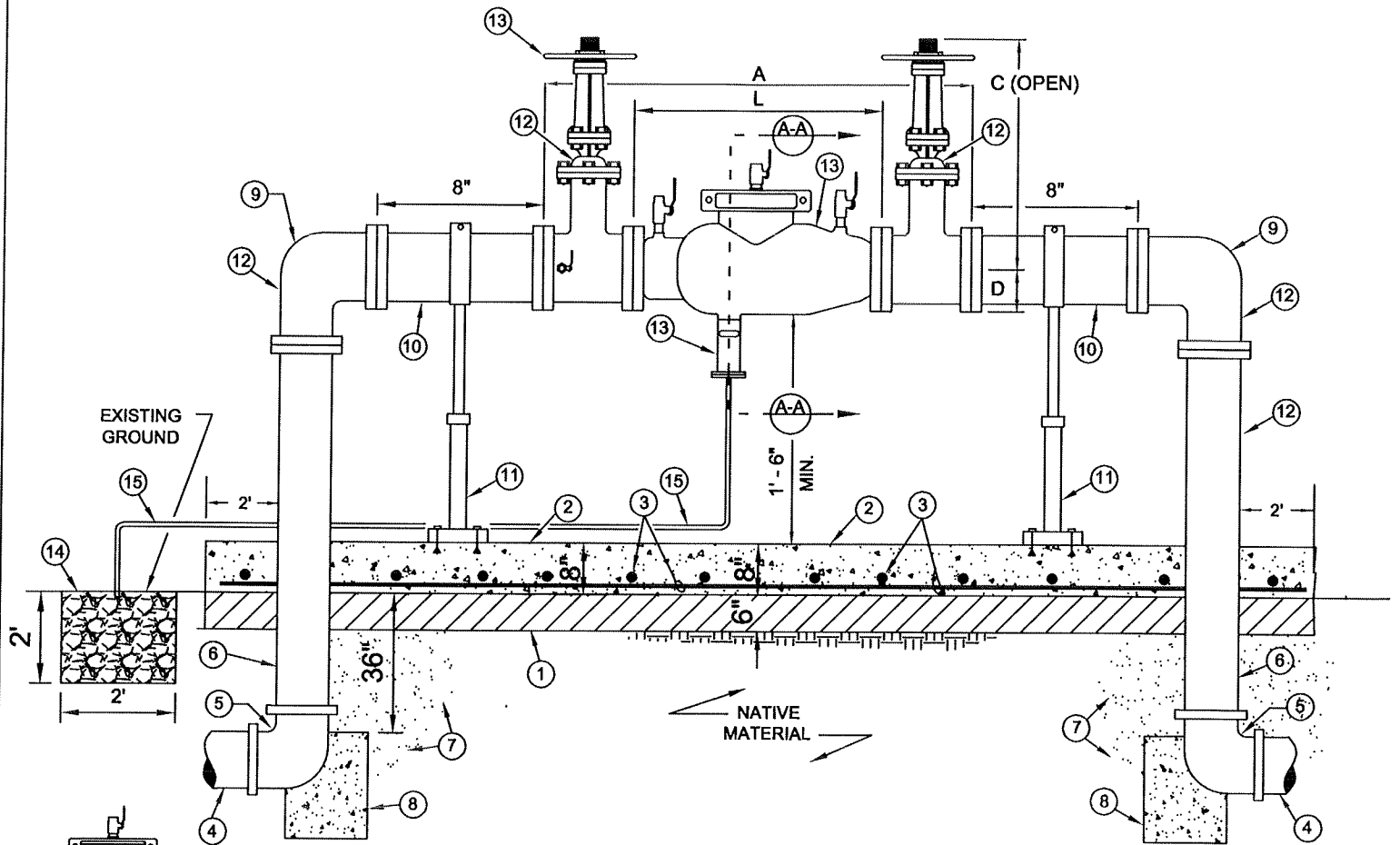
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DATE:
5-20-2004

SHEET NO.

W 114

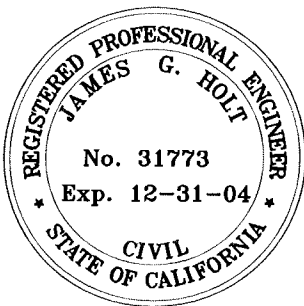
THG 744.011



TABLES OF DIMENSIONS FOR BACKFLOW ASSEMBLY

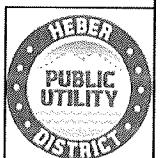
SIZE (DN)				DIMENSIONS (APPROX.)										WEIGHT			
		A		C				D		F		L		w/Gates		w/o Gates	
				OSY		NRS											
in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lb.	kg.	lb.	kg.
2-1/2	65	37	940	16-3/4	416	9-3/8	238	10-1/2	267	7	178	22	559	148	67	60	27
3	80	38	965	18-7/8	479	10-1/4	260	10-1/2	267	7-1/2	191	22	559	226	103	62	28
4	100	40	1016	22-3/4	578	12-3/16	310	10-1/2	267	9	229	22	559	235	107	65	30
6	150	48-1/2	1232	30-1/8	765	16	406	11-1/2	292	11	279	27-1/2	699	380	172	110	50
8	200	52-1/2	1334	37-3/4	959	19-15/16	506	12-1/2	318	13-1/2	343	29-1/2	749	571	259	179	81
10	250	55-1/2	1410	45-3/4	1162	23-13/16	605	12-1/2	318	16	406	29-1/2	749	773	351	189	86

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NOTES:

THE INSTALLATION OF A DRAIN LINE IS RECOMMENDED. WHEN INSTALLING A DRAIN LINE, AN AIR GAP IS NECESSARY. THE 4000SS SHOULD BE INSTALLED WITH A MINIMUM CLEARANCE OF 12" BETWEEN LOWEST POINT OF THE ASSEMBLY AND THE FLOOR DRAIN OR GRADE.



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EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
REDUCED PRESSURE PRINCIPAL
2-1/2 INCH - 10 INCH DIAMETER
BACKFLOW PREVENTION ASSEMBLY
SECTION

SCALE:
NO SCALE

DATE:
5-20-2004

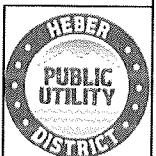
SHEET NO.

W 115A

THG 744.011

NOTES:

- ① INSTALL 6 INCHES OF CLASS 2 BASE. COMPACT THE CLASS 2 BASE TO 95 PERCENT OF MAXIMUM DENSITY PER ASTM D-1557.
- ② INSTALL A 6 FOOT WIDE, 8 INCH DEEP P.C.C. CONCRETE SLAB. THE LENGTH OF THE SLAB SHALL BE DETERMINED BY THE DIAMETER SIZE OF THE PIPELINE. THE SURFACE OF THE P.C.C. CONCRETE SLAB SHALL RECEIVE A DOUBLE TROWEL FINISH. THE CONCRETE SHALL CONTAIN 6-1/2 SACKS OF CEMENT PER CUBIC YARD AND ATTAIN A COMPRESSIVE STRENGTH OF 4,500 PSI AFTER 28 DAYS CURING TIME. THE CEMENT SHALL BE TYPE V.
- ③ INSTALL NUMBER 4 REINFORCING BARS 12 INCHES ON CENTER EACH WAY.
- ④ INSTALL PIPELINE PER THE DIAMETER AND MATERIAL TYPE REQUIRED BY THE PLANS.
- ⑤ INSTALL A DUCTILE IRON 90 DEGREE FITTING WITH 304 STAINLESS STEEL HARDWARE. FOR DIAMETER SIZES 4 INCHES AND GREATER PLACE DUCTILE IRON RESTRAINED JOINT FITTINGS WITH STAINLESS STEEL HARDWARE ON EACH SIDE OF THE DUCTILE IRON FITTINGS.
- ⑥ INSTALL A CLASS 52 DUCTILE IRON PIPE SECTION.
- ⑦ BACKFILL THE BELOW GRADE VERTICAL PIPELINE AND 90 DEGREE DUCTILE IRON ELBOW WITH A 1 FOOT ENVELOPE OF GRANULAR SAND BACKFILL. COMPACT THE GRANULAR SAND BACKFILL TO 95 PERCENT OF MAXIMUM DENSITY PER ASTM D-1557.
- ⑧ INSTALL P.C.C. THRUST BLOCK FOR PIPE SIZES EQUAL TO OR GREATER THAN 4 INCHES IN DIAMETER. DO NOT ALLOW THE CONCRETE TO COVER THE HARDWARE OF THE 90 DEGREE ELBOWS.
- ⑨ INSTALL A 90 DEGREE DUCTILE IRON ELBOW. THE DIAMETER SIZE SHALL BE AS INDICATED ON THE PLANS.
- ⑩ INSTALL AN 8 INCH LONG CLASS 52 DUCTILE IRON PIPE SPOOL SECTION. THE DIAMETER SIZE SHALL BE AS INDICATED ON THE PLANS.
- ⑪ INSTALL A THREADED ADJUSTABLE STEEL PIPE SUPPORT ASSEMBLY. SECURE THE THREADED ADJUSTABLE STEEL PIPE SUPPORT ASSEMBLY TO THE CONCRETE SUPPORT SLAB WITH FOUR (4) 1/2 INCH DIAMETER, 4 INCH LONG EXPANSION BOLTS.
- ⑫ PAINT ALL ABOVE GRADE STEEL OR DUCTILE IRON FITTINGS WITH TWO (2) COATS OF AN AMERON AMERLOCK 400 HIGH SOLIDS EPOXY SAFETY YELLOW COATING SYSTEM. DO NOT COAT THE STAINLESS STEEL BACKFLOW DEVICE ASSEMBLY WITH THE COATING SYSTEM. COAT THE DUCTILE IRON VALVES WITH THE COATING SYSTEM.
- ⑬ INSTALL A SILVER BULLET SERIES 4000SS STAINLESS STEEL REDUCED PRESSURE PRINCIPAL BACKFLOW ASSEMBLY. THE ASSEMBLY SHALL BE SUPPLIED WITH NON-RISING STEM RESILIENT SEATED GATE VALVES WITH HAND WHEEL OPERATORS. A DRAIN LINE SHALL BE CONSTRUCTED FROM THE BACKFLOW ASSEMBLY TO A GRAVEL SUMP PLACED NEAR THE BACKFLOW ASSEMBLY.
- ⑭ INSTALL A 2 FOOT WIDE x 2 FOOT LONG x 2 FOOT DEEP GRAVEL SUMP. PLACE 1 INCH MAXIMUM CRUSHED OR ROUND ROCK IN THE GRAVEL SUMP.
- ⑮ INSTALL A SCHEDULE 80 PVC DRAIN PIPELINE FROM THE BACKFLOW DEVICE TO THE 2' x 2' x 2' GRAVEL SUMP. THE DIAMETER SIZE OF THE PVC PIPELINE SHALL BE PER THE MANUFACTURES REQUIREMENTS. PAINT THE ABOVE GRADE PVC PIPELINE WITH A WHITE LATEX PAINT.



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SEAL-ENGINEER



PREPARED BY:

JAMES G. "JACK" HOLT

R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
REDUCED PRESSURE PRINCIPAL
2-1/2 INCH - 10 INCH DIAMETER
BACKFLOW PREVENTION ASSEMBLY
NOTES

SCALE:
NO SCALE

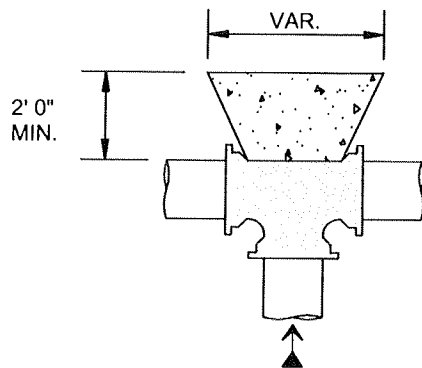
DATE:
5-20-2004

THG 744.011

SHEET NO.

W 115B

FIG. 1

90° TEE

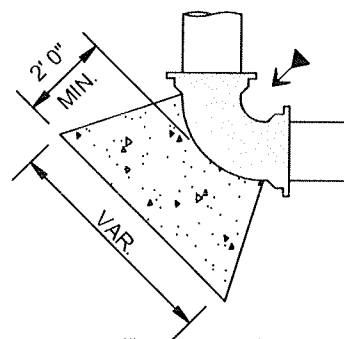
4"	4.0 S.F.
6"	8.0 S.F.
8"	13.0 S.F.
10"	22.0 S.F.
12"	31.0 S.F.
* 14"	42.0 S.F.
* 16"	54.0 S.F.

FIG. 2

90° BEND

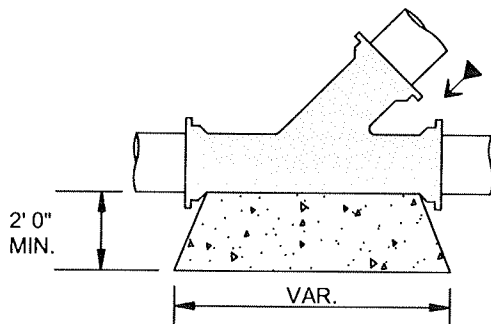
* - DESIGN ENGINEER
TO DETERMINE
CONFIGURATION

▲ - DIRECTION OF
THRUST



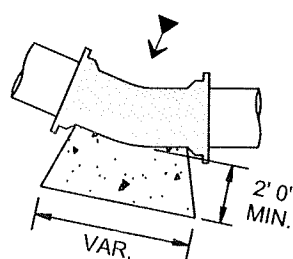
4"	5.0 S.F.
6"	11.0 S.F.
8"	19.0 S.F.
10"	30.0 S.F.
12"	43.0 S.F.
* 14"	59.0 S.F.
* 16"	76.0 S.F.

FIG. 3

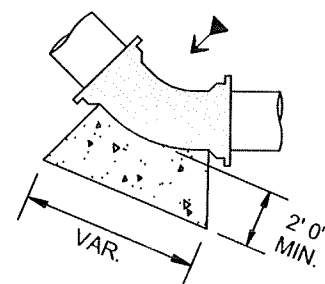
90° TEE

4"	3.0 S.F.
6"	6.0 S.F.
8"	10.0 S.F.
10"	16.0 S.F.
12"	23.0 S.F.
* 14"	32.0 S.F.
* 16"	41.0 S.F.

FIG. 4

22 1/2° BEND

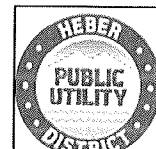
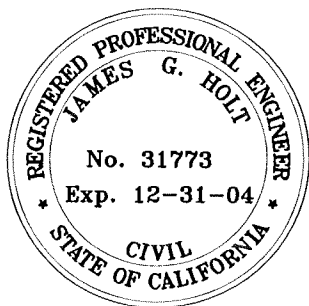
4"	1.0 S.F.
6"	3.0 S.F.
8"	5.0 S.F.
10"	8.0 S.F.
12"	12.0 S.F.
* 14"	16.0 S.F.
* 16"	21.0 S.F.

45° BEND

4"	3.0 S.F.
6"	6.0 S.F.
8"	10.0 S.F.
10"	16.0 S.F.
12"	23.0 S.F.
* 14"	32.0 S.F.
* 16"	41.0 S.F.

SEE STD. DWG. W-112D FOR GENERAL NOTES.

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HEBER PUBLIC UTILITY DISTRICT
THRUST BLOCKING

SHEET NO.

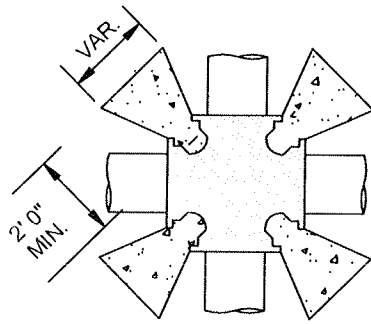
W 116A

SCALE:
NO SCALE

DATE:
5-20-2004

THG 744.011

FIG. 5

CROSS

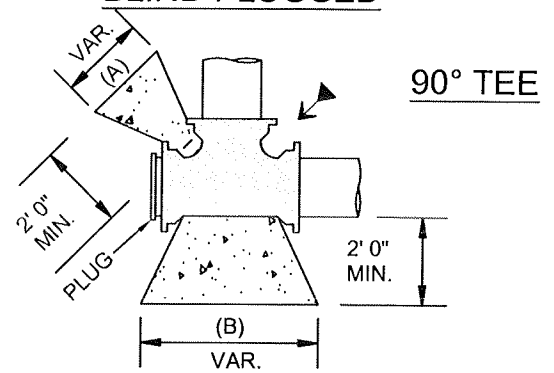
4"	2.0 S.F./EA.
6"	4.0 S.F./EA.
8"	7.0 S.F./EA.
10"	11.0 S.F./EA.
12"	18.0 S.F./EA.
* 14"	21.0 S.F./EA.
* 16"	27.0 S.F./EA.

FIG. 6

BLIND PLUGGED

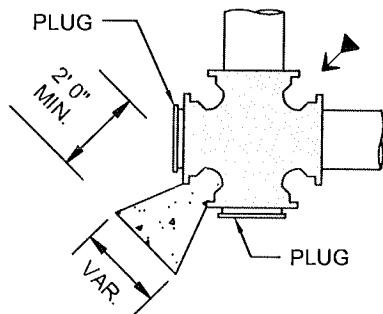
* - DESIGN ENGINEER
TO DETERMINE
CONFIGURATION

▲ - DIRECTION OF
THRUST



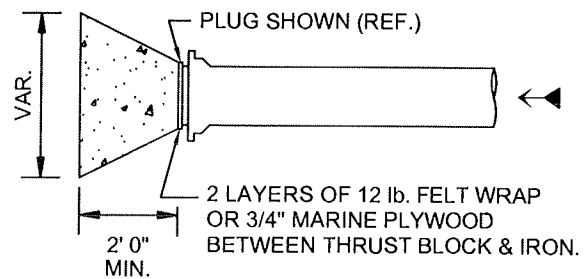
	(A)	(B)
4"	3.0 S.F.	3.0 S.F.
6"	5.0 S.F.	5.0 S.F.
8"	9.0 S.F.	9.0 S.F.
10"	15.0 S.F.	15.0 S.F.
12"	21.0 S.F.	21.0 S.F.
* 14"	29.0 S.F.	29.0 S.F.
* 16"	38.0 S.F.	38.0 S.F.

FIG. 7

BLIND DOUBLE PLUGGEDCROSS

4"	5.0 S.F.
6"	11.0 S.F.
8"	19.0 S.F.
10"	30.0 S.F.
12"	43.0 S.F.
* 14"	59.0 S.F.
* 16"	76.0 S.F.

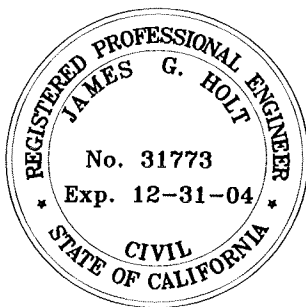
FIG. 8

LIVE CAP or PLUG

4"	4.0 S.F.
6"	8.0 S.F.
8"	14.0 S.F.
10"	22.0 S.F.
12"	30.0 S.F.
* 14"	42.0 S.F.
* 16"	55.0 S.F.

SEE STD. DWG. W-112D FOR GENERAL NOTES.

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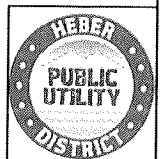
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
THRUST BLOCKING

SCALE:
NO SCALE

DATE:
5-20-2004

THG 744.011



SHEET NO.

W 116B

FIG. 9

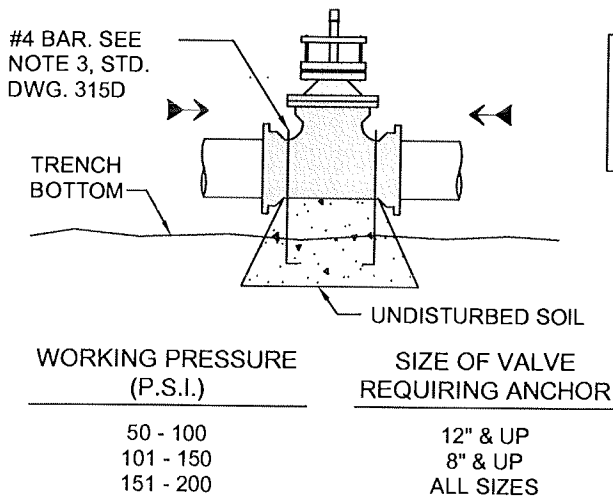
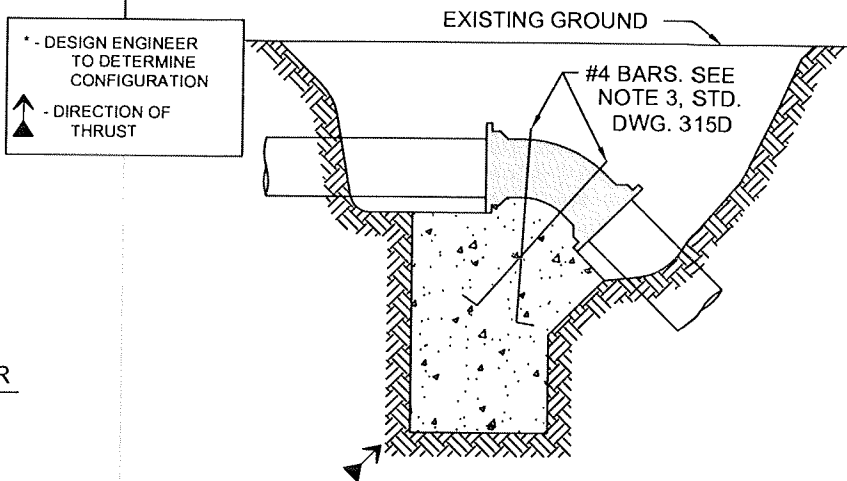
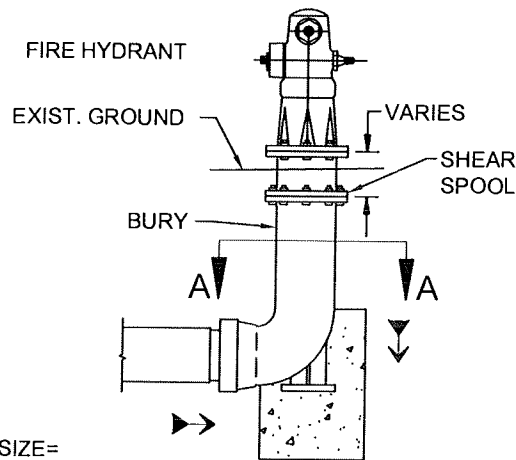
VALVE ANCHOR BLOCK

FIG. 10

VERTICAL BEND

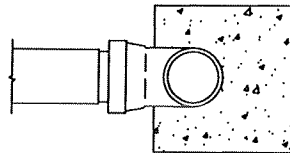
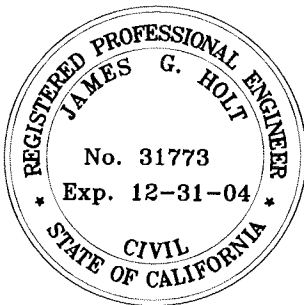
SHAPE AND DIMENSIONS OF FIG. 9 & 10 ANCHOR BLOCKS TO BE DETERMINED BY DESIGN ENGINEER.

FIG. 11

FIRE HYDRANT BURY THRUST BLOCK

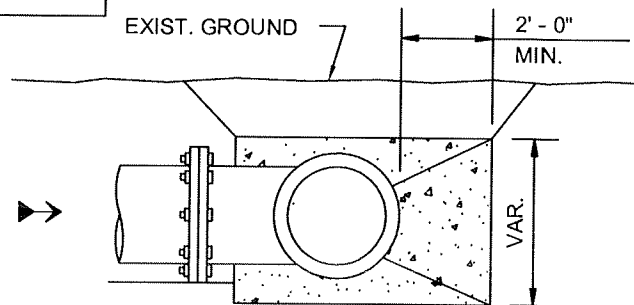
BLOCK SIZE=
3' x 3' x 3'

SEAL-ENGINEER

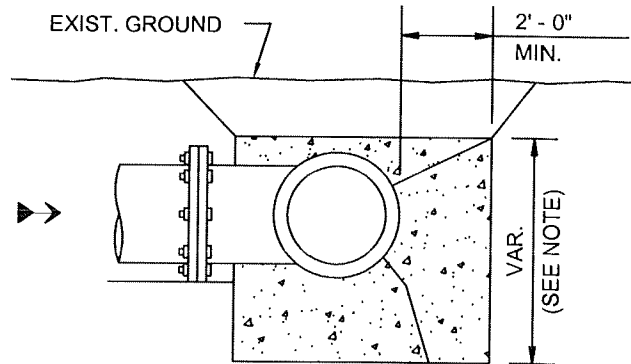


SECTION A - A

FIG. 12

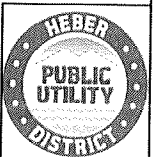


THE THRUST BLOCK SHOULD HAVE A PYRAMIDAL SHAPE IN ORDER TO DEVELOP MAX. BEARING AREA.



FOR HIGH PRESSURE AND/OR LARGE DIAMETER PIPE, THE BEARING AREA MAY BE INCREASED, AS SHOWN IN THE ABOVE SKETCH.

SEE STD. DWG. W-112D FOR GENERAL NOTES.



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SEAL-ENGINEER



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R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
THRUST BLOCKING

SHEET NO.

W 116C

SCALE:
NO SCALE

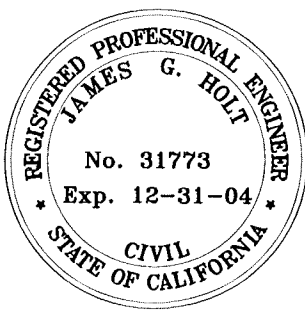
DATE:
5-20-2004

THG 744.011

GENERAL NOTES:

1. BEARING AREAS MAY BE INCREASED AT THE OPTION OF THE DISTRICT IF SOIL BEARING PRESSURE IS LESS THAN 1,000 P.S.F.
2. APPROVED COMPACTED BACKFILL MAY BE REQUIRED BY THE DISTRICT TO IMPROVE THRUST BLOCK BEARING AREA.
3. ANY METAL COMPONENT WHICH IS NOT STAINLESS STEEL OR BRONZE SHALL BE WRAPPED WITH 4 PLY OF 10 MIL. PLASTIC SHEETING BEFORE CONCRETE PLACEMENT OR BURIAL.
4. UNLESS OTHERWISE NOTED, THRUST BLOCK BEARING FORCES SHALL BE POURED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL.
5. AFTER THE TRENCH HAS BEEN BACKFILLED TO THE TOP OF THE PIPE, AREAS TO BE OCCUPIED BY THRUST BLOCKS SHALL BE RE-EXCAVATED AND SHAPED. AFTER SHAPING, SIMPLE PLYWOOD OR BOX WOOD FORMS SHALL BE INSERTED ADJACENT TO THE VERTICAL NON-PRESSURE BEARING SIDES OF THE MOLD. DISTRICT INSPECTION OF THE MOLD FORM MUST BE OBTAINED PRIOR TO CASTING THE THRUST BLOCK.
6. THE THRUST BLOCK IS TO BE CAST IN SUCH A MANNER AS TO CRADLE THE FITTING. CONCRETE ENCASEMENT SHALL BE PERPENDICULAR TO THE LINE OF THRUST. CONCRETE SHALL NOT CONTACT THE PIPE.
7. ALL BOLTS ON FITTINGS SHALL BE EXPOSED AND CONCRETE SHALL NOT INTERFERE WITH REMOVAL AND REPLACEMENT AFTER THRUST BLOCK INSTALLATION IS COMPLETE.

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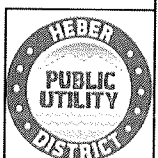
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
THRUST BLOCKING

SCALE:
NO SCALE

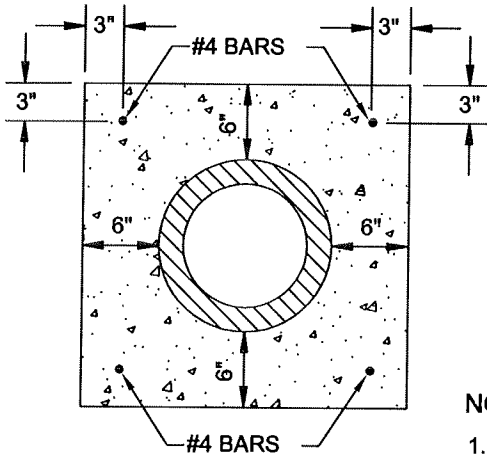
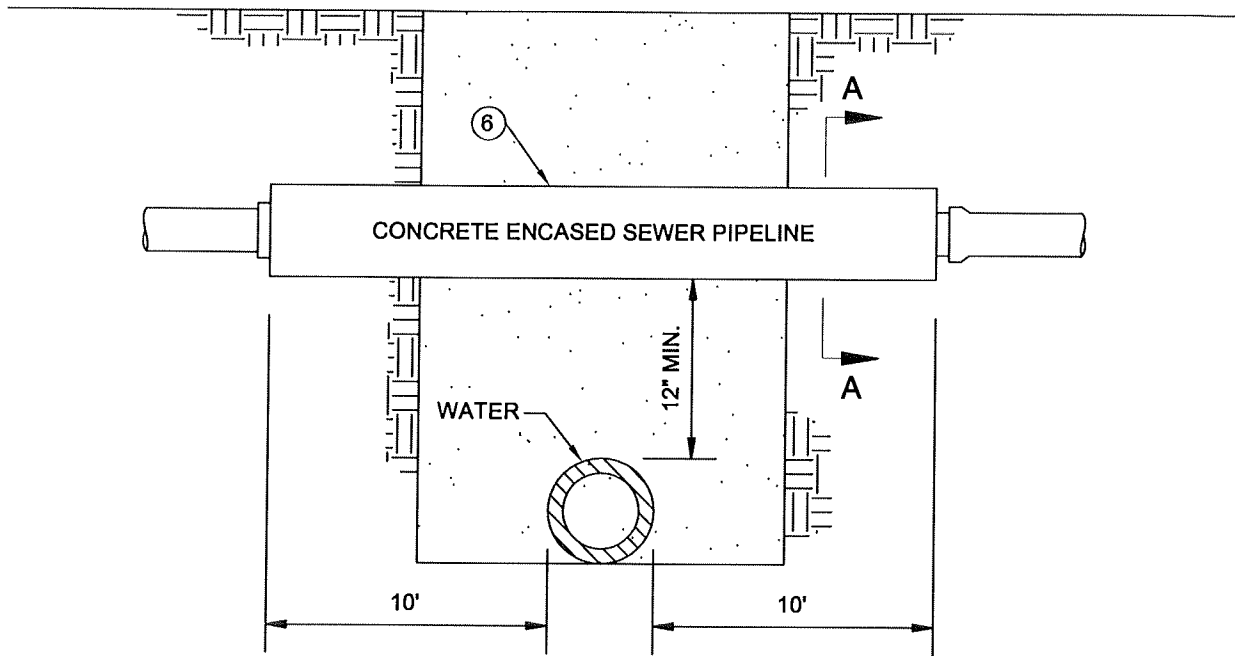
DATE:
5-20-2004

THG 744.011

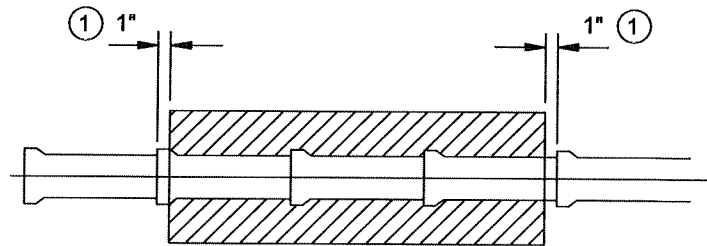


SHEET NO.

W 116D



SECTION A-A

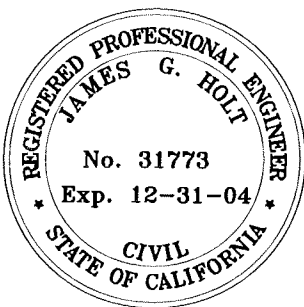


PLAN

NOTES:

1. EXTEND BOTH ENDS OF CRADLE OR ENCASEMENT TO A POINT ONE INCH SHORT OF FIRST PIPE JOINT BEYOND LOCATIONS SPECIFIED ON PLAN.
2. APPLY FORM OIL, THIN PLASTIC SHEET, OR OTHER ACCEPTABLE MATERIAL TO PIPE TO PREVENT BOND BETWEEN PIPE AND CONCRETE.
3. ALL CONCRETE SHALL BE CLASS "3" CONCRETE WHICH SHALL ATTAIN A 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI IN ACCORDANCE WITH ASTM C39/C39M-99.
4. SEE SS-118 & SS-119 FOR WATER AND SEWER CROSSING REQUIREMENTS.
5. EXPANSION JOINTS MUST BE PLACED AT 20' INTERVALS, AT THE PIPE JOINT ON CONTINUOUS ENCASEMENT OR CRADLE.
6. CLASS 200 PVC C-900, 12" AND SMALLER; DR-14 PVC C-905, 14" OR LARGER MAY BE USED IN LIEU OF CONCRETE ENCASEMENT.

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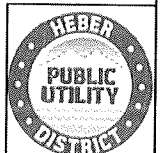
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
SEWER AND WATER CROSSINGS

SCALE:
NO SCALE

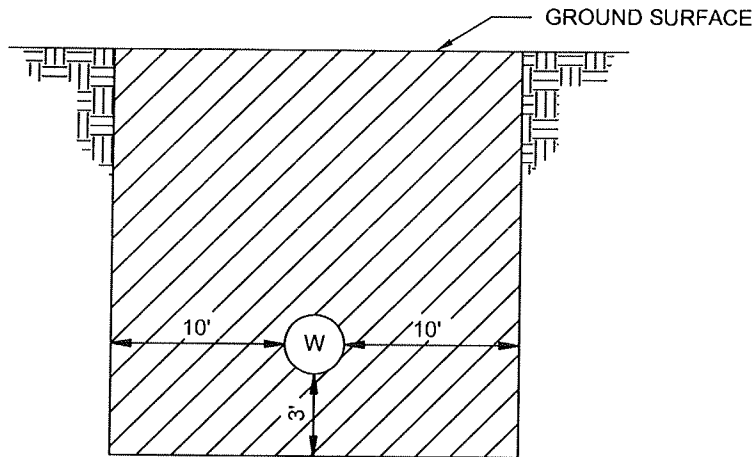
DATE: 5-20-2004

THG 744.011



SHEET NO.

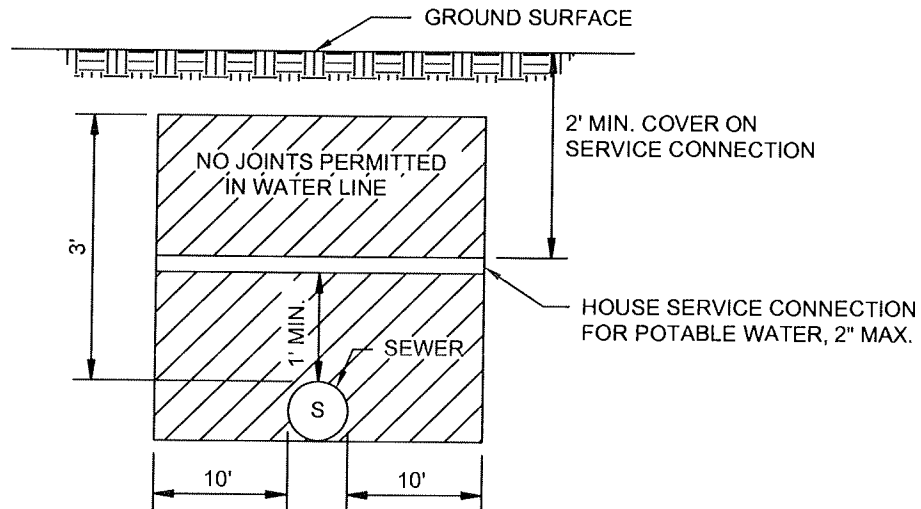
W 117



CROSSING
SANITARY SEWER
AND WATER LINE

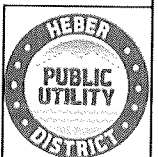
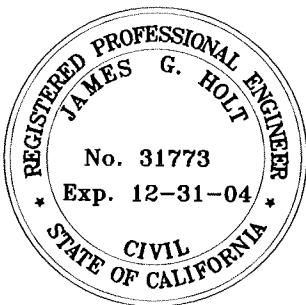
(W) INDICATES PRESSURE WATERMAIN FOR POTABLE WATER

NOTE:
DIMENSIONS ARE FROM OUTSIDE
OF PIPE TO OUTSIDE OF PIPE.



CROSSING
HOUSE SERVICE CONNECTION
FOR POTABLE WATER

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EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
SEPARATION REQUIREMENTS FOR
SEWER AND WATER CROSSINGS

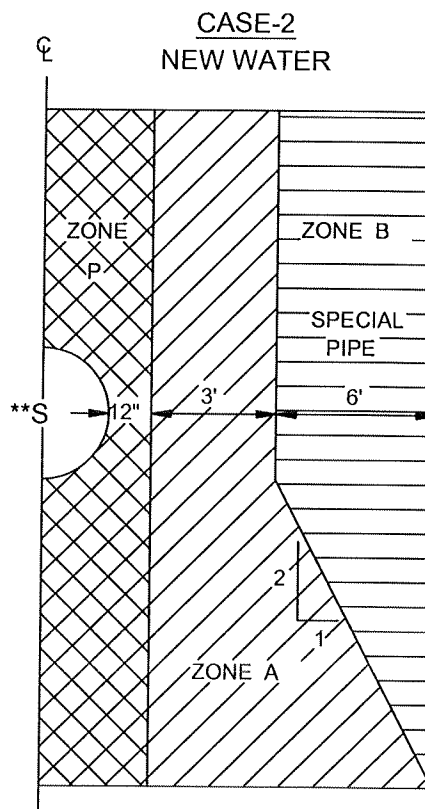
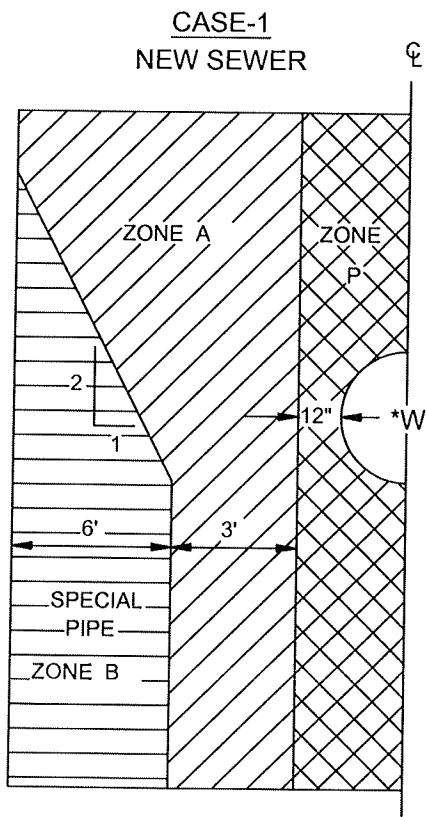
SHEET NO.

W 118

SCALE:
NO SCALE

DATE:
5-20-2004

THG 744.011



*W = EXISTING WATER LINE

**S = EXISTING SEWER LINE

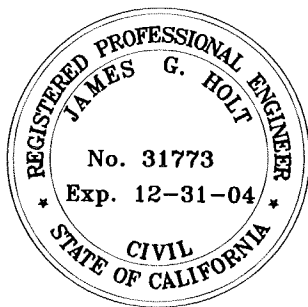
CASE 1 - NEW SEWER

ZONE	SPECIAL CONSTRUCTION
P	CONSTRUCTION PROHIBITED
A	CONSTRUCTION PROHIBITED
B	1. VCP, TYPE "G" JOINT 2. PVC-AWWA C-900, CL 200 OR AWWA C-905 DR-14

CASE 2 - NEW WATER

ZONE	SPECIAL CONSTRUCTION
P	CONSTRUCTION PROHIBITED
A	CONSTRUCTION PROHIBITED
B	CLASS 52, DUCTILE IRON PIPE, (CEMENT MORTAR LINED)

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EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
SEPARATION AND CONSTRUCTION
REQUIREMENTS FOR SEWER AND
WATER LINES (PARALLEL
CONSTRUCTION)

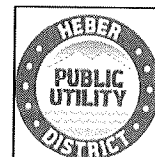
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DATE: **5-20-2004**

SHEET NO.

W 119

THG 744.011

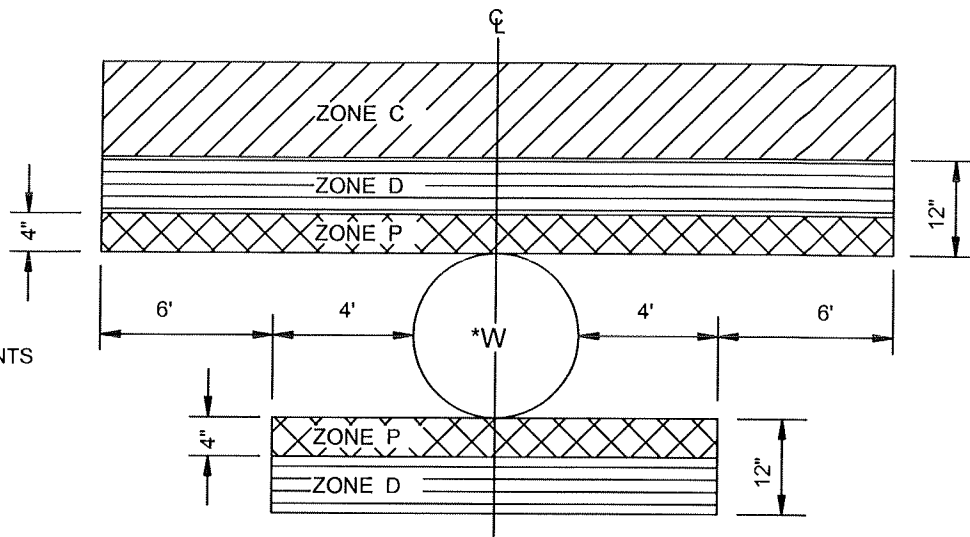


CASE 1 - NEW SEWER

ZONE SPECIAL CONSTRUCTION

- P CONSTRUCTION PROHIBITED
- D CONSTRUCTION PROHIBITED
- C 1. PVC-AWWA C-900, CL 200
OR AWWA C-905 DR-14
2. CLASS 52 DUCTILE IRON PIPE,
IN 1/4" STEEL SLEEVE, WELDED JOINTS

- NEW PIPE TO BE CENTERED
OVER PIPE BEING INSTALLED



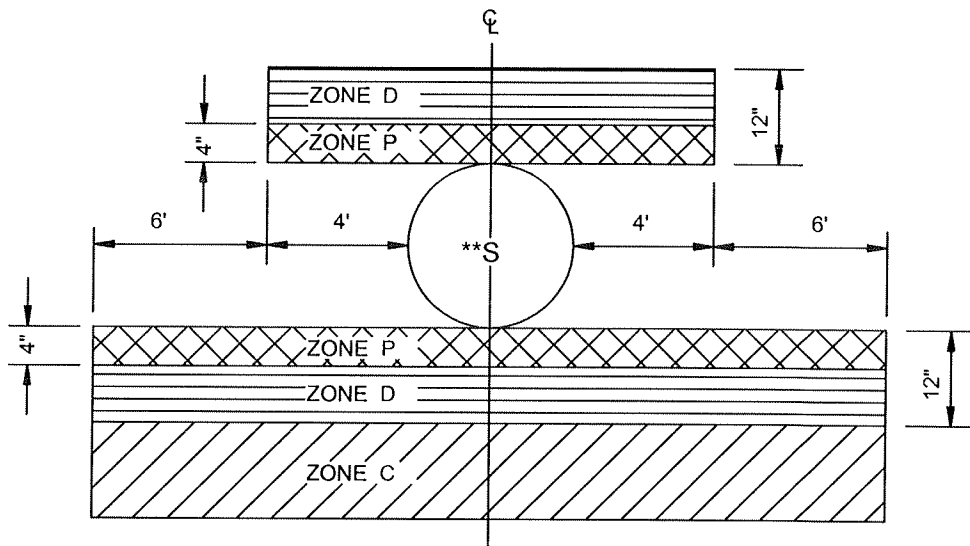
CASE-1
NEW SEWER
*W= EXISTING WATER

CASE 2 - NEW WATER

ZONE SPECIAL CONSTRUCTION

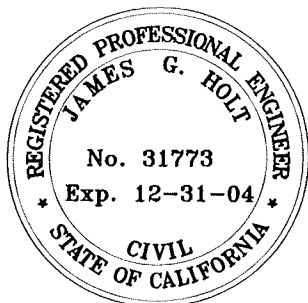
- P CONSTRUCTION PROHIBITED
- D CONSTRUCTION PROHIBITED
- C CLASS 52 DUCTILE IRON PIPE
(CEMENT MORTAR LINED)

- NEW PIPE TO BE CENTERED
OVER PIPE BEING INSTALLED



CASE-2&3
NEW WATER/WATER SERVICE
**S= EXISTING SEWER

SEAL-ENGINEER



CASE 3 - NEW WATER SERVICE

ZONE SPECIAL CONSTRUCTION

- C COPPER - NO JOINTS

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SEAL-ENGINEER



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EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
SEPARATION AND CONSTRUCTION
REQUIREMENTS FOR SEWER AND
WATER LINES (CROSSING)

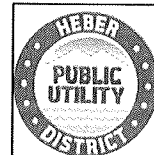
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DATE:
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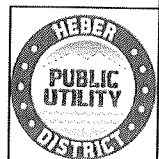
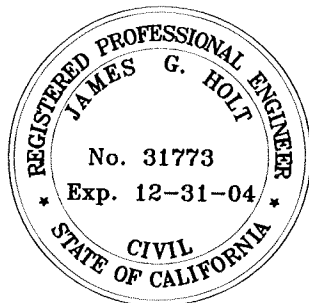
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W 120



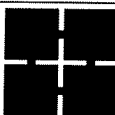
- SS 100 SANITARY SEWER INDEX
- SS 101 TYPICAL SANITARY SEWER MAIN TRENCH IN PAVED AREAS
- SS 102 TYPICAL SANITARY SEWER MAIN TRENCH IN UNPAVED AREAS
- SS 103 WASTEWATER SEWER MANHOLE
- SS 104 TYPICAL SANITARY SEWER LATERAL
- SS 105 TYPICAL SANITARY SEWER CLEANOUT IN PAVED OR NATIVE AREAS
FOR GRAVITY SANITARY SEWER PIPELINES
- SS 106 TYPICAL SANITARY SEWER FORCEMAIN TRENCH IN PAVED AREAS
- SS 107 TYPICAL SANITARY SEWER FORCEMAIN TRENCH IN AREAS OUTSIDE OF
THE PAVEMENT
- SS 108 TYPICAL SANITARY SEWER FORCEMAIN GATE VALVE AND RISER
- SS 109 A PRECAST DROP MANHOLE
- SS 109 B PRECAST DROP MANHOLE
- SS 110 SEWER AND WATER CROSSINGS
- SS 111 SEPARATION REQUIREMENTS FOR SEWER AND WATER CROSSINGS
- SS 112 SEPARATION AND CONSTRUCTION REQUIREMENTS FOR SEWER AND
WATER LINES (PARALLEL CONSTRUCTION)
- SS 113 SEPARATION AND CONSTRUCTION REQUIREMENTS FOR SEWER AND
WATER LINES (CROSSING)
- SS 114 TYPICAL SANITARY SEWER CLEANOUT IN PAVED OR NATIVE AREAS FOR
SANITARY SEWER FORCEMAIN PIPELINES
- SS 115 TYPICAL SANITARY SEWER CLEANOUT IN PAVED OR NATIVE AREAS FOR
SANITARY SEWER FORCEMAIN PIPELINES FOR 90° BENDS

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HEBER PUBLIC UTILITY DISTRICT
SANITARY SEWER INDEX

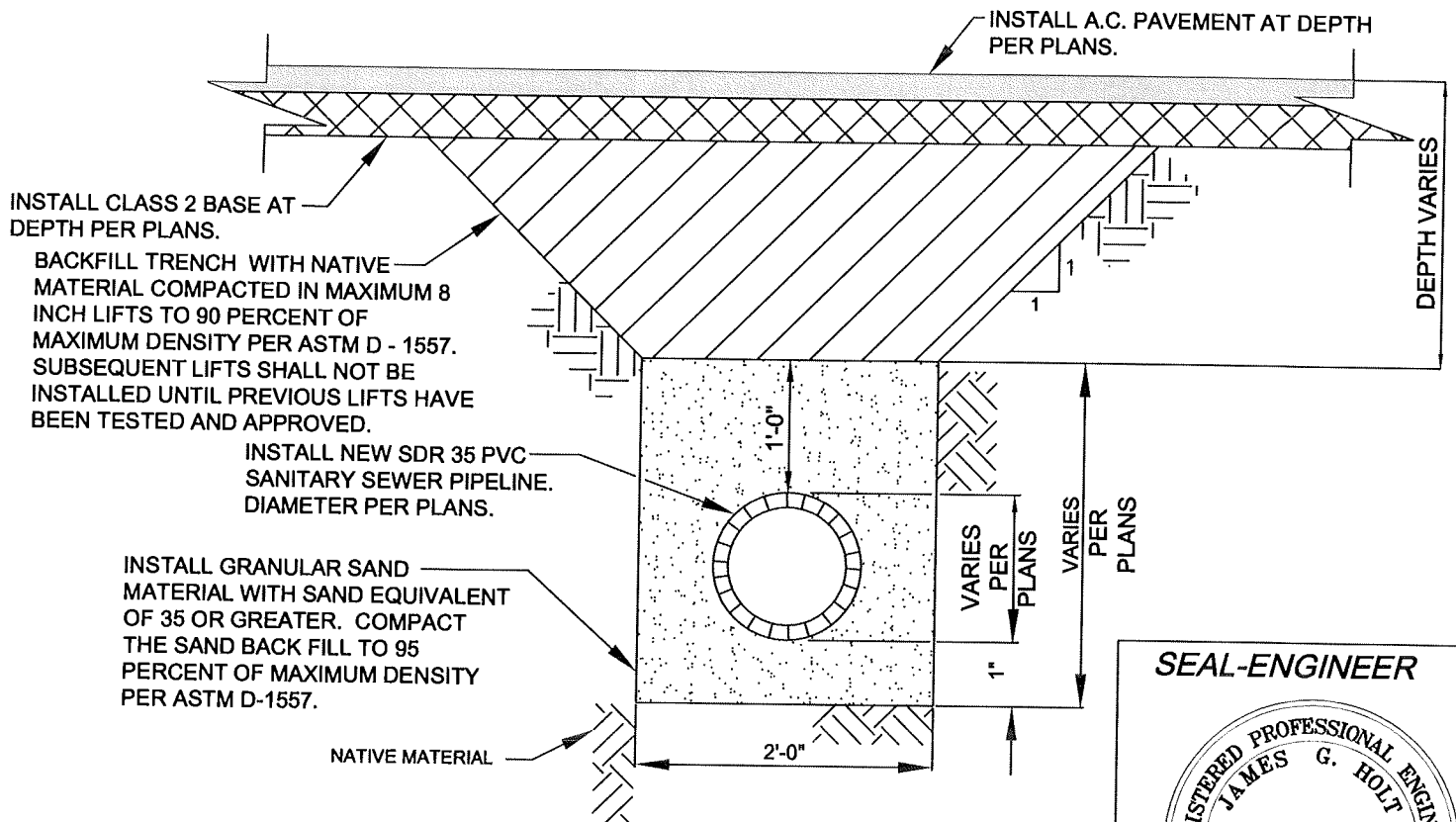
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SS 100

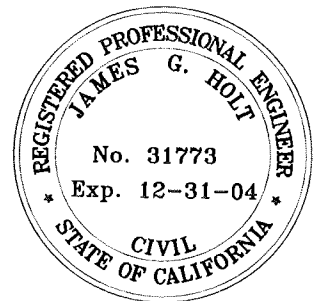
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DATE:
5-20-2004

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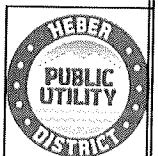


SEAL-ENGINEER



NOTES:

1. WHERE THE TRENCH DEPTH EXCEEDS 3', THE PIPELINE SUBCONTRACTOR SHALL UTILIZE ANY OF THE FOLLOWING METHODS FOR EXCAVATION AND TRENCH STABILIZATION. THE METHOD OF EXCAVATION AND TRENCH STABILIZATION SHALL BE APPROVED BY CAL OSHA.
 - A) SHORING AS APPROVED BY THE ENGINEER.
 - B) SLOPING BOTH TRENCH SIDES AT A 1:1 MAXIMUM ABOVE THE BOTTOM 3 FEET.
 - C) "STEPPING OR BENCHING" BOTH TRENCH SIDES AT 3 FOOT VERTICAL INCREMENTS, THE WIDTH OF EACH BENCH SHALL BE THE SAME AS THE BOTTOM 3 FEET.
 - D) USE OF A STEEL SHIELD.
 - E) USE OF TRENCH JACKS.
2. WHEN THE PIPE TRENCH IS UNSTABLE DUE TO GROUND WATER INFILTRATION PLACE 8 INCHES OF 3/4-INCH DIAMETER ROUND ROCK BENEATH THE SANITARY SEWER PIPELINE.



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HEBER PUBLIC UTILITY DISTRICT
TYPICAL SANITARY SEWER MAIN
TRENCH IN PAVED AREAS

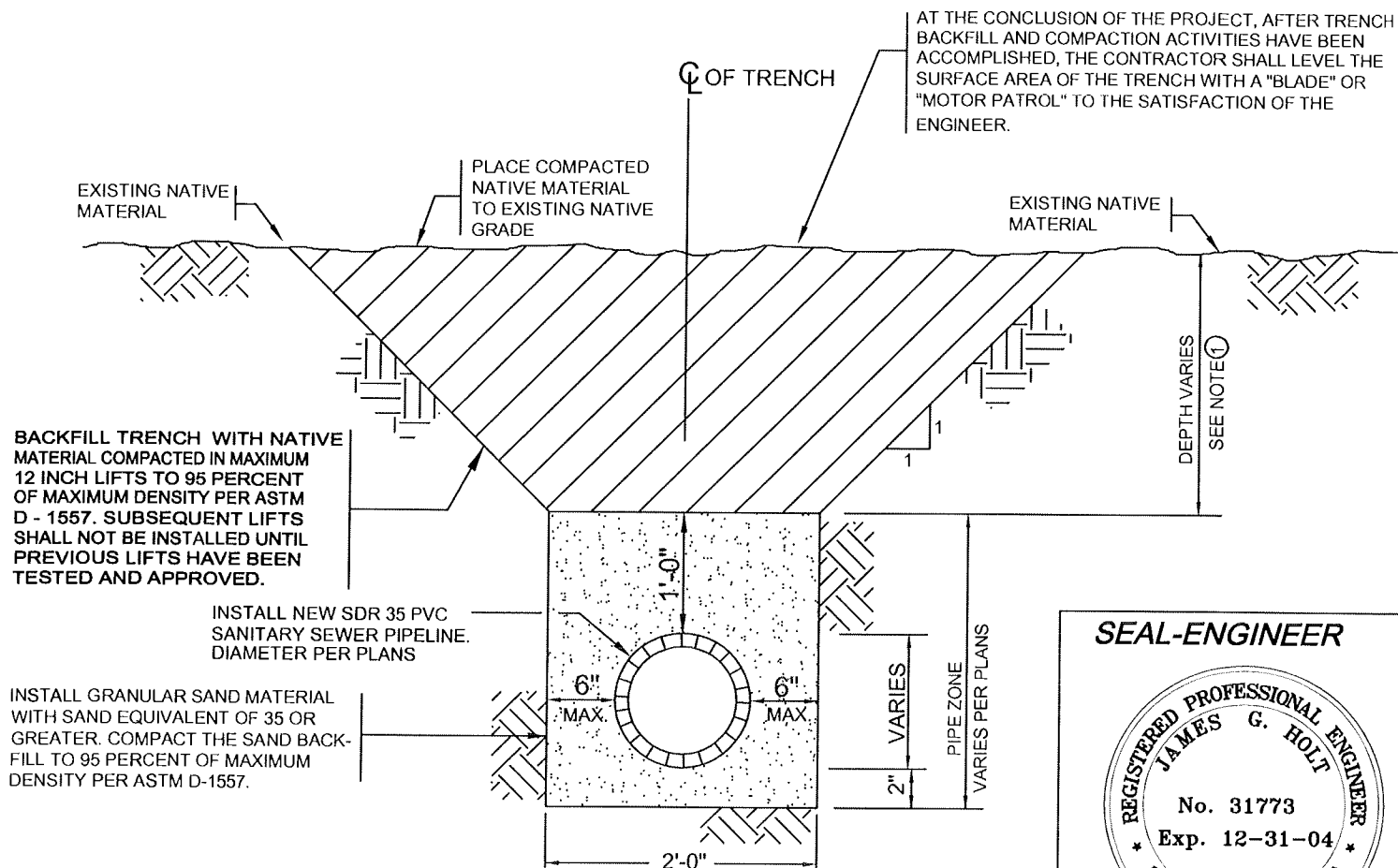
SCALE:
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DATE:
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SHEET NO.

SS 101

THG 744.011

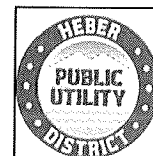


SEAL-ENGINEER



NOTES:

1. TRENCH DEPTH SHALL HAVE A MINIMUM OF 3'-6".
2. WHERE THE PERMIT OF A GOVERNING AGENCY SETS FOURTH REQUIREMENTS MORE STRINGENT THAN THOSE STATED HEREIN, THE CONTRACTOR SHALL ADHERE TO THE AGENCY REQUIREMENTS.
3. WHERE THE TRENCH DEPTH EXCEEDS 3', THE PIPELINE CONTRACTOR SHALL UTILIZE ANY OF THE FOLLOWING METHODS FOR EXCAVATION AND TRENCH STABILIZATION. THE METHOD OF EXCAVATION AND TRENCH STABILIZATION SHALL BE APPROVED BY CAL OSHA
 - A) SHORING AS APPROVED BY THE ENGINEER.
 - B) SLOPING BOTH TRENCH SIDES AT A 1:1 MAXIMUM ABOVE THE BOTTOM 3 FEET.
 - C) "STEPPING OR BENCHING" BOTH TRENCH SIDES AT 3 FOOT VERTICAL INCREMENTS, THE WIDTH OF EACH BENCH SHALL BE THE SAME AS THE BOTTOM 3 FEET.
 - D) USE OF A STEEL SHIELD.
 - E) USE OF TRENCH JACKS.



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HEBER PUBLIC UTILITY DISTRICT
TYPICAL SANITARY SEWER MAIN
TRENCH IN UNPAVED AREAS

SHEET NO.

SS 102

SCALE:
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DATE:
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MANHOLE FRAME AND COVER SHALL BE ALHAMBRA FOUNDRY A-1170 OR AN APPROVED EQUAL.

INSTALL A 1'-0" WIDE, 1'-0" DEEP CONCRETE RING CIRCUMFERENTIALLY AROUND THE MANHOLE FRAME. PLACE THE CONCRETE RING FLUSH WITH THE EXISTING PAVEMENT OR 0.10 FEET ABOVE NATIVE SURFACES.

GROUT PRECAST CONCRETE JOINTS INSIDE AND OUTSIDE (TYPICAL).

PLACE GRADE RINGS AS REQUIRED TO ADJUST THE MANHOLE COVER TO GRADE.

PRECAST CONCRETE CONES AND SHAFTS.

INSTALL A ZEBRON 388 COATING SYSTEM

4'-0"

GROUT ANNULAR SPACE CREATED FOR SEWER PIPELINE

P.C.C. SHELF

1/4" / FT.

1'-1/2"

4"

1/4" / FT.

1'-9"

1'-0"

1'-0"

1'-0"

1'-0"

1'-0"

1'-0"

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1'-0"

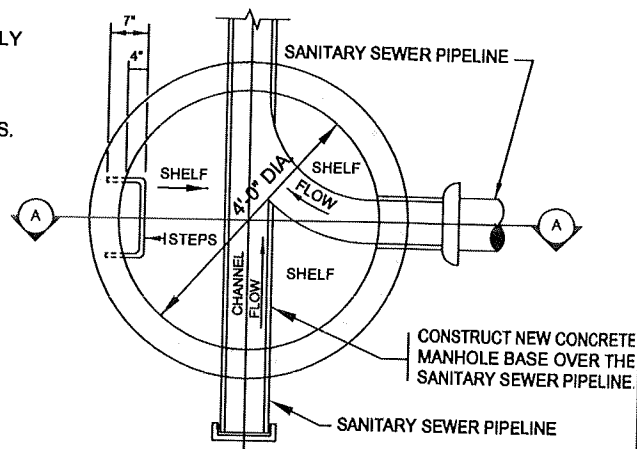
1'-0"

1'-0"

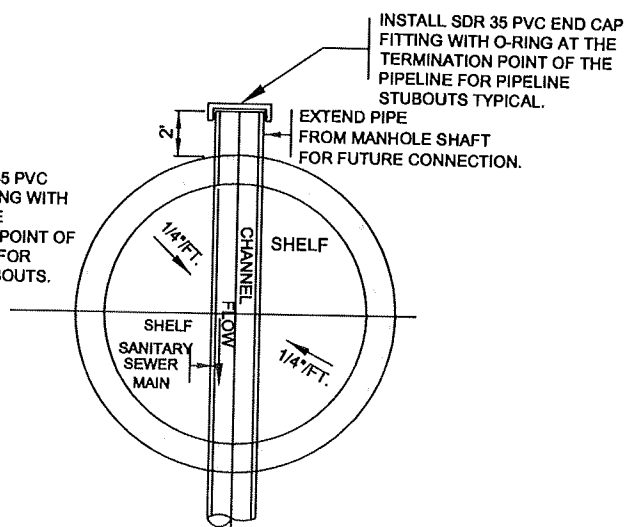
1'-0"

1'-0"

PLACE 1" ROUND ROCK BELOW THE P.C.C. MANHOLE BASE.



PLAN VIEW "A"



DEAD END MANHOLE

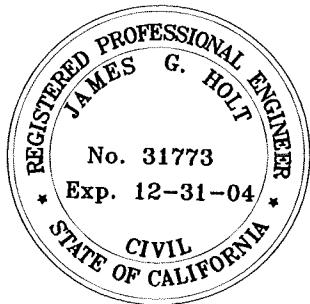
PLAN VIEW "B"

SECTION A-A

NOTES:

- EXCEPT AS NOTED HEREON, THE PRECAST UNITS SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH ASTM C-478. THE CURING OF THE PRECAST UNITS SHALL CONFORM TO SECTION 207-2.7 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
- THE CONCRETE SHELF OF THE MANHOLE SHALL BE SLOPED AT 1/4 INCH PER FOOT. THE SHELF SHALL RECEIVE A DOUBLE TROWEL FINISH. THE CONCRETE UTILIZED FOR THE CONCRETE BASE SHALL CONTAIN 6 SACKS OF CONCRETE PER CUBIC YARD AND ATTAIN A COMPRESSIVE STRENGTH OF 4,000 P.S.I. AFTER 28 DAYS CURING.
- WHENEVER PRACTICABLE, THE FRAME AND COVER SHALL BE PLACED DIRECTLY OVER THE INLET OF THE STRUCTURE EXCEPT AS OTHERWISE NOTED ON THE PLANS.
- MANHOLE SHAFTS, CONES AND GRADE RINGS SHALL BE SET PLUMB.
- PLACE CEMENT SLURRY IN THE OPENINGS BETWEEN PRECAST MANHOLE UNITS AND GRADE RINGS FLUSH WITH THE INTERIOR AND EXTERIOR SURFACES PRIOR TO APPLYING THE ZEBRON COATING OR COMPLETING BACKFILL WORK AROUND THE EXTERIOR OF THE MANHOLE.

SEAL-ENGINEER

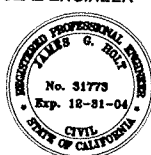


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HEBER PUBLIC UTILITY DISTRICT
WASTEWATER SEWER MANHOLE

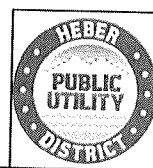
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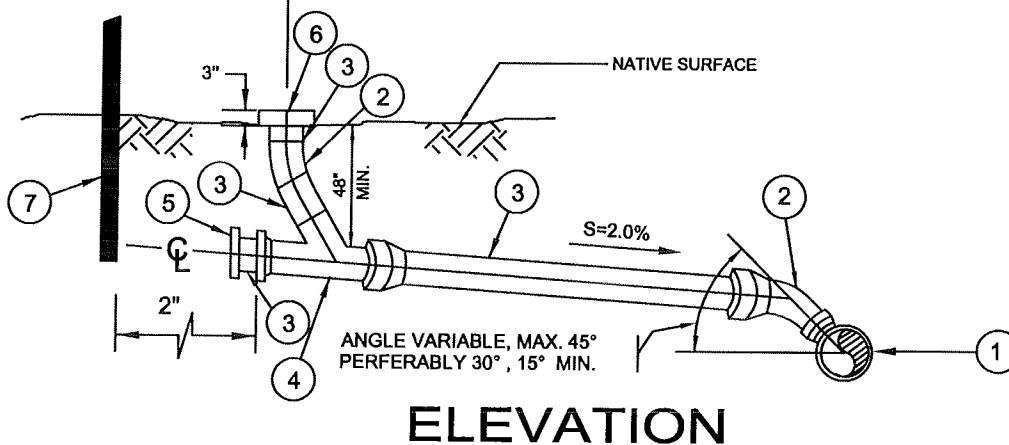
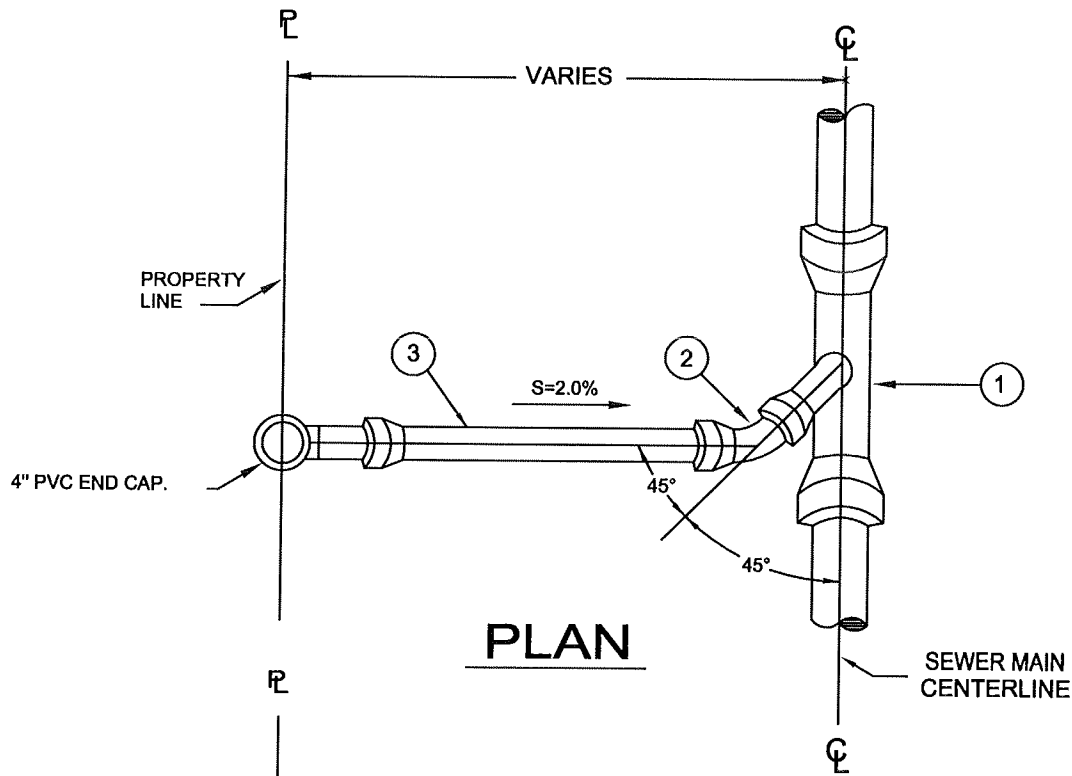
SS 103

SCALE:
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DATE:
5-20-2004

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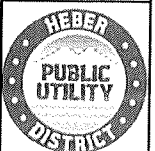
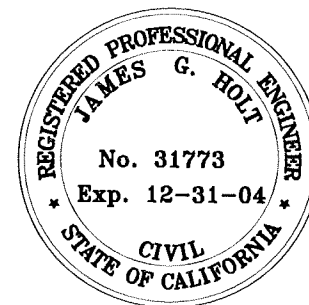
KEYNOTES

- ① PIPE MAIN SIZE x 4-INCH SDR 35 PVC WYE FITTING.
- ② INSTALL 4 INCH 45 DEGREE SDR 35 PVC FITTING.
- ③ INSTALL 4" SDR 35 PVC SANITARY SEWER PIPE SECTION.
- ④ INSTALL 4 INCH SDR 35 PVC WYE FITTING.
- ⑤ INSTALL 4 INCH SDR 35 PVC END CAP.
- ⑥ PLACE A CLEAN-OUT AT THE PROPERTY LINE. PLACE A 4 INCH SDR 35 PVC END CAP AT THE CLEAN-OUT TERMINATION POINT.
- ⑦ INSTALL A 2X4 AT THE END OF EACH LATERAL EXTENDING FROM THE INVERT OF THE LATERAL TERMINATION POINT TO 2-FEET ABOVE THE EXISTING NATIVE SURFACE.

NOTES:

- A. SEWER LATERALS SHALL HAVE A MINIMUM SLOPE OF 2 PERCENT SLOPE EXCEPT AS OTHERWISE SPECIFICALLY NOTED ON THE PLANS.
- B. END CAPS SHALL BE COMPOSED OF SDR 35 PVC WITH O-RING GASKETS.
- C. IN NO CASE SHALL A LATERAL CONNECT TO THE SEWER MAIN DIRECTLY ON TOP OF THE PIPE.

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HEBER PUBLIC UTILITY DISTRICT
TYPICAL SANITARY SEWER LATERAL

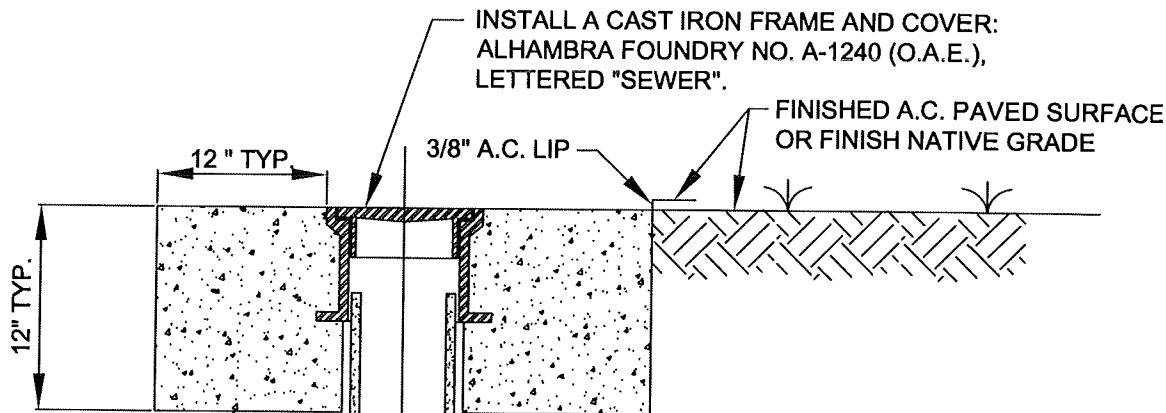
SHEET NO.

SS 104

SCALE:
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DATE:
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CONCRETE SHALL ATTAIN A MINIMUM OF 6 SACKS OF CEMENT PER CUBIC YARD AND A COMPRESSIVE STRENGTH OF 4000 PSI AFTER 28 DAYS IN ACCORDANCE WITH ASTM C39/C39M-99.

INSTALL A 6 INCH SDR 35 PVC PIPE SECTION.

INSTALL 6 INCH SDR 35 PVC 45° DEGREE ELBOW.

INSTALL 6 INCH SDR 35 PVC PIPE SECTION.

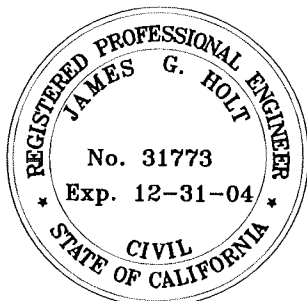
INSTALL SDR 35 PVC PIPE SECTION. SEE PLANS FOR DIAMETER SIZE OF PIPE MAIN.

INSTALL SDR 35 PVC END CAP. SEE PLANS FOR DIAMETER SIZE OF PIPE MAIN.

INSTALL A MAIN SIZE X MAIN SIZE X 6" SDR 35 PVC WYE FITTING.

NOTE: CLEANOUT RING AND COVER SHALL BE RAISED TO FINISHED GRADE AND SUPPORT COLLAR INSTALLED AFTER PAVING OR FINISH GRADING IS COMPLETED.

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EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
TYPICAL SANITARY SEWER
CLEANOUT IN PAVED OR NATIVE
AREAS FOR GRAVITY SANITARY
SEWER PIPELINES

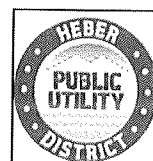
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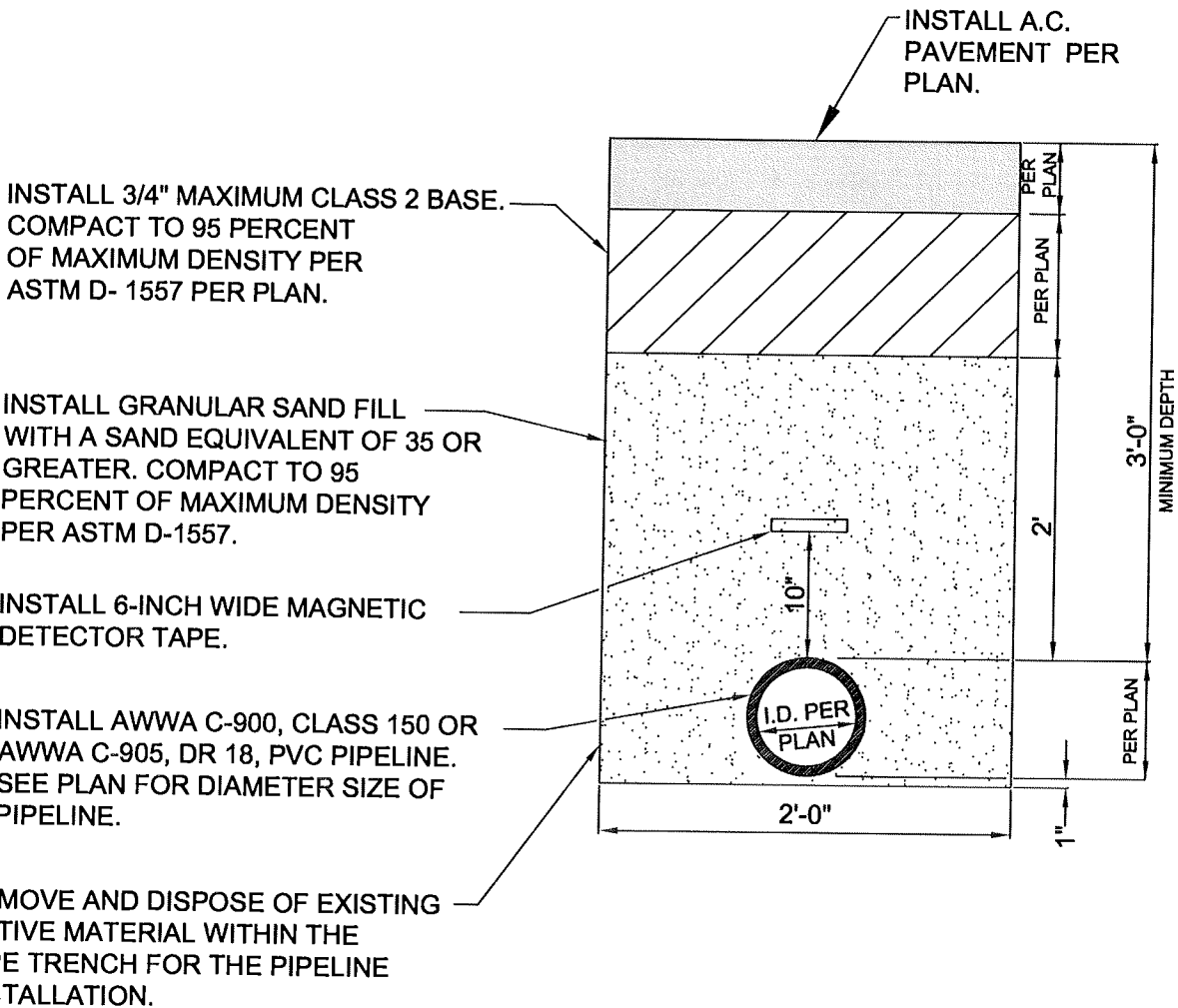
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5-20-2004

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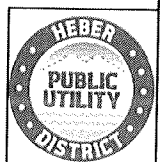
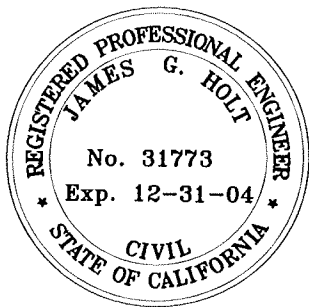
SHEET NO.

SS 105





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EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
TYPICAL SANITARY SEWER
FORCEMAIN TRENCH IN PAVED
AREAS

SCALE:
NO SCALE

DATE:
5-20-2004

SHEET NO.

SS 106

THG 744.011

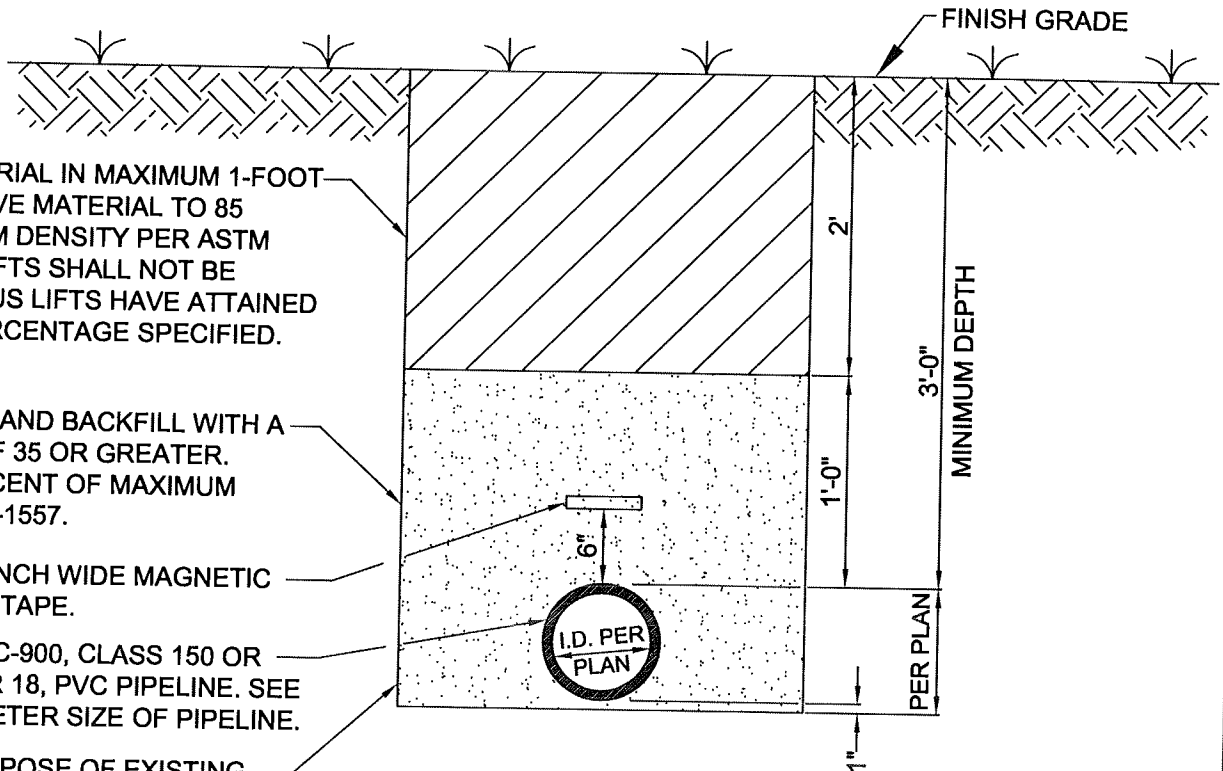
INSTALL NATIVE MATERIAL IN MAXIMUM 1-FOOT LIFTS. COMPACT NATIVE MATERIAL TO 85 PERCENT OF MAXIMUM DENSITY PER ASTM D-1557. ADDITIONAL LIFTS SHALL NOT BE ADDED UNTIL PREVIOUS LIFTS HAVE ATTAINED THE COMPACTION PERCENTAGE SPECIFIED.

INSTALL GRANULAR SAND BACKFILL WITH A SAND EQUIVALENT OF 35 OR GREATER. COMPACT TO 95 PERCENT OF MAXIMUM DENSITY PER ASTM D-1557.

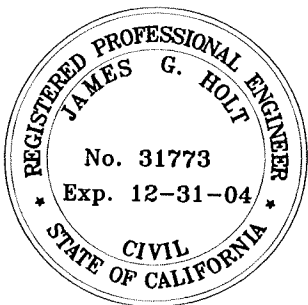
INSTALL 6-INCH WIDE MAGNETIC DETECTOR TAPE.

INSTALL AWWA C-900, CLASS 150 OR AWWA C-905, DR 18, PVC PIPELINE. SEE PLAN FOR DIAMETER SIZE OF PIPELINE.

REMOVE AND DISPOSE OF EXISTING NATIVE MATERIAL WITHIN THE PIPE TRENCH FOR THE PIPELINE INSTALLATION.



SEAL-ENGINEER



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EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
TYPICAL SANITARY SEWER
FORCEMAIN TRENCH IN AREAS
OUTSIDE OF THE PAVEMENT

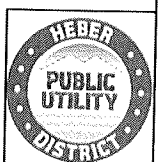
SCALE:
NO SCALE

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SHEET NO.

SS 107



INSTALL 8 INCH WIDE, 8 INCH DEEP
P.C.C. CONCRETE RING CONCENTRIC
WITH THE EXTERIOR OF THE VALVE
RISER.

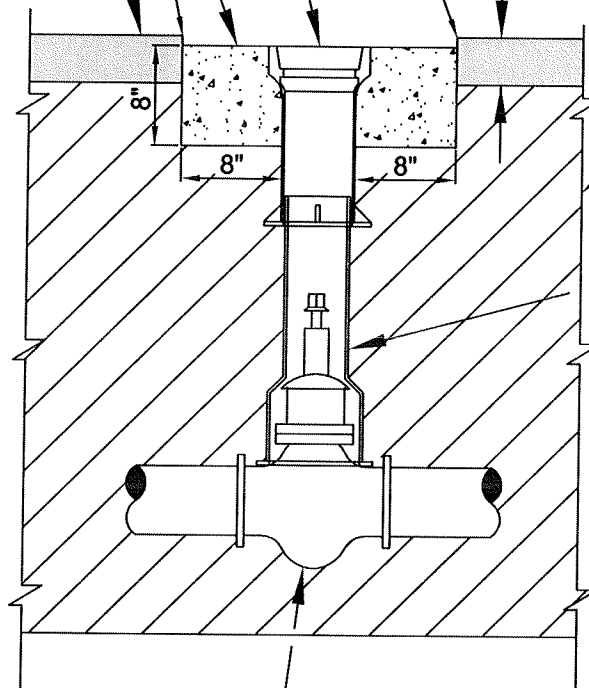
NEW A.C. PAVEMENT

T=3/8"

INSTALL NEW VALVE EXTENSION RISER AND COVER
STAMPED SEWER FLUSH WITH NEW PAVEMENT SURFACE.

T=3/8"

DEPTH PER PLAN

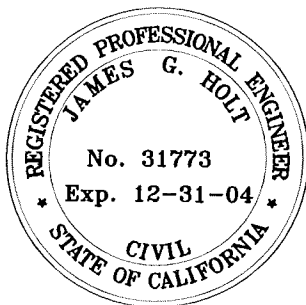


BACKFILL PER PIPE
TRENCH DETAILS AND
TECHNICAL SPECIFICATION.

INSTALL CAST IRON STAR PIPE
PRODUCTS VALVE EXTENSION
RISER No. 562-A, No. 564-A or
No. 664-A (AS APPLICABLE) AND
CAST IRON COVER STAMPED
"WATER". APPLY TWO (2)
COATS OF BLUE METALLIC
PAINT TO CAST IRON COVER.

D.I. EPOXY COATED
RESILIENT WEDGE
GATE VALVE.

SEAL-ENGINEER



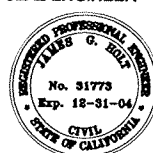
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HEBER PUBLIC UTILITY DISTRICT
TYPICAL SANITARY SEWER
FORCEMAIN GATE VALVE AND RISER

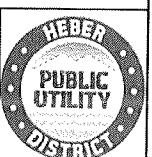
SHEET NO.

SS 108

SCALE:
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SEAL-ENGINEER



EXFILTRATION RING (TYP.)

OUTLET

4" MIN.

4" MIN.

INLET
PLAN

NON-SHRINK GROUT
ANNUAL SPACE.

DROP MANHOLE TEE

SEE STD. DWG.
SS-103 FOR
MANHOLE
DETAILS

INVERT ELEV.
SHOWN ON
PLANS

SEWER PIPE

4" MIN.

4" MIN.

VARIABLE

SLOPE 1":12"

2" MIN.

EXFILTRATION RING

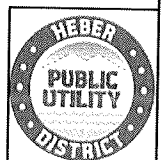
CONSTRUCTION
JOINT

DROP MANHOLE
1/4 BEND

INVERT ELEV.
SHOWN ON
PLANS

SECTION A-A

NOTE:
FOUNDATION FOR DROP SECTION
SHALL BE POURED MONOLITHIC
WITH MANHOLE BASE.



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1551 S. 4th Street El Centro, California 92243
321 W. Hobbesway, Suite A Blythe, California 92225

(760) 337-3883
(760) 922-4658

SEAL-ENGINEER



PREPARED BY:

JAMES G. "JACK" HOLT
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
PRECAST DROP MANHOLE

SHEET NO.

SS 109A

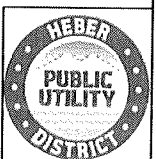
SCALE:
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DATE:
5-20-2004

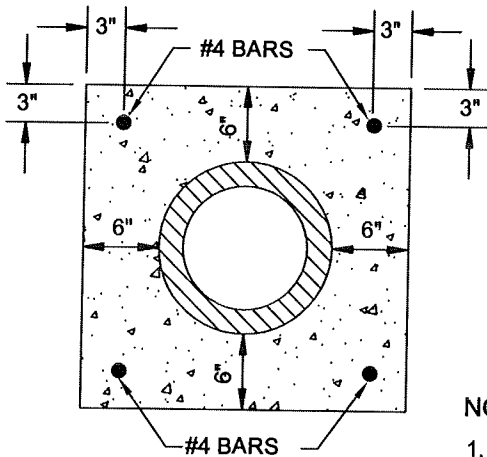
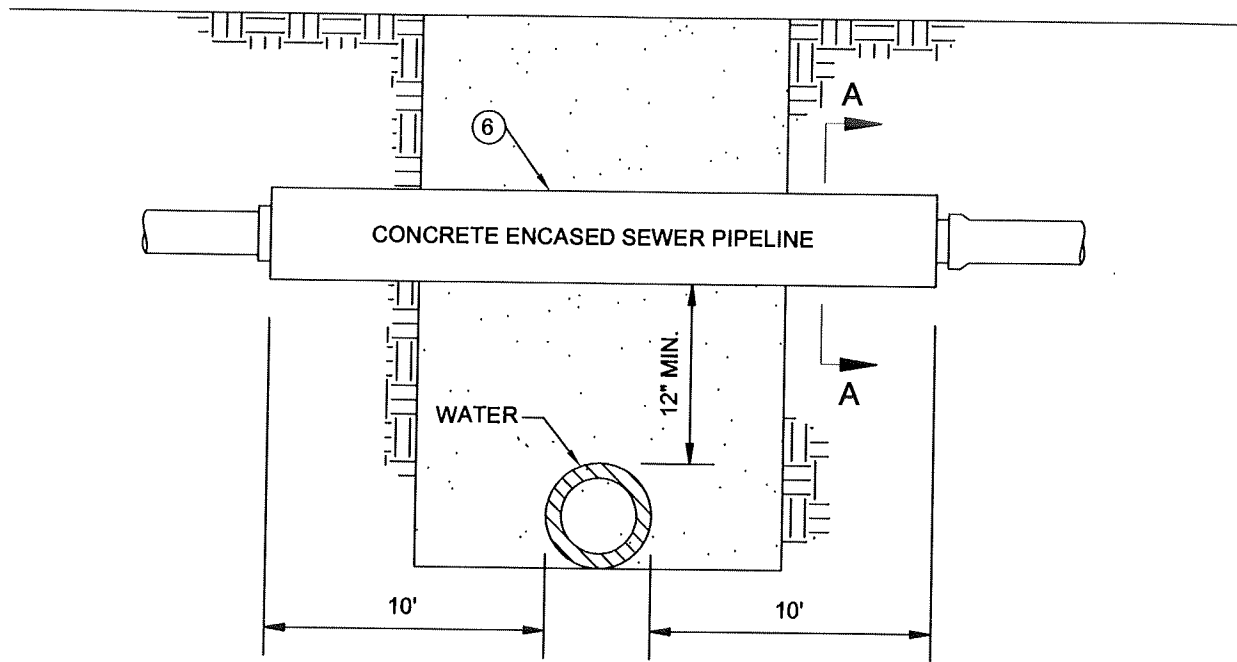
THG 744.011

GENERAL NOTES:

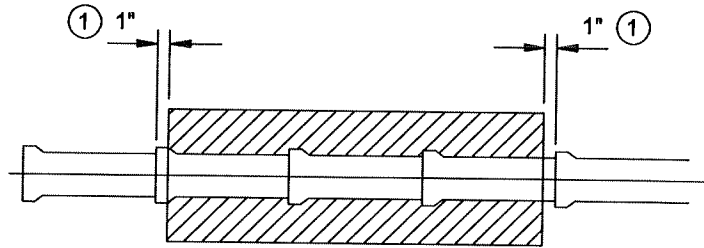
1. MANHOLE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE HAVING A MINIMUM THICKNESS OF SIX INCHES AND CONFORMING TO ASTM C-478 REQUIREMENTS FOR MATERIALS AND MANUFACTURE AND ASTM REQUIREMENTS FOR REINFORCEMENT.
2. VERTICAL WALL OF CONE SHALL BE OPPOSITE OUTLET SIDE OF MANHOLE.
3. CONE SHALL BE RAISED WHEN GRADE RINGS EXCEED 11".
4. SUPPORT COLLAR SHALL CONSIST OF CLASS "3" CONCRETE.
5. JOINTS SHALL CONSIST OF 1-2 CEMENT MORTAR, NEATLY STRUCK AND POINTED, 3/8" MIN. THICKNESS, OR RAM-NECK, EXCEPT FOR GRADE ADJUSTING RINGS WHICH SHALL BE 1-2 CEMENT MORTAR ONLY.
6. CONCRETE FOR SUPPORT COLLAR SHALL BE CLASS "3" CONCRETE WHICH SHALL ATTAIN A COMPRESSIVE STRENGTH OF 4000 PSI IN ACCORDANCE WITH ASTM C39/C39-99.
7. SHELF SHALL BE DOUBLE TROWELED AND RECEIVE A FINE BROOM FINISH.
8. THE MINIMUM DROP BETWEEN THE UPPER AND LOWER INLETS OF THIS STRUCTURE IS 2.20'.
9. THIS MANHOLE IS FOR DEPTHS GREATER THAN 3'-0" AND LESS THAN 20'. MAXIMUM PIPE INTERNAL DIAMETER IS 24".
10. ALL PIPE AND FITTINGS IN DROP CONNECTION SHALL BE SDR-35, ASTM 3034 AND OF THE SAME SIZE AS THE SEWER MAIN, UNLESS SHOWN OTHERWISE ON THE PLANS.
11. TROUGH:
 - A. SHALL NOT HAVE A FLAT BOTTOM.
 - B. SHALL HAVE A STEEL TROWELED FINISH.
 - C. DIAMETER OF FEEDLINE SHALL NOT "FLARE OUT" WHERE IT JOINS THE MAINLINE TROUGH.
12. "JIFFY RINGS" SHALL NOT BE ALLOWED.
13. FOR STRAIGHT THROUGH FLOW THE "Y" SHALL NOT BE CONSTRUCTED UNLESS A STUB OR LATERAL IS SHOWN ON THE PLANS AS BEING REQUIRED.
14. ZEBRON 386 SHALL BE REQUIRED TO BE APPLIED TO ALL INTERIOR SURFACES OF THE MANHOLE.
15. MANHOLE RING AND COVER SHALL BE RAISED TO FINISHED GRADE AND SUPPORT COLLAR INSTALLED AFTER PAVING OR FINE GRADING.
16. EXFILTRATION RINGS SHALL BE CONSISTENT WITH PIPE MANUFACTURER'S RECOMMENDATIONS.



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SECTION A-A

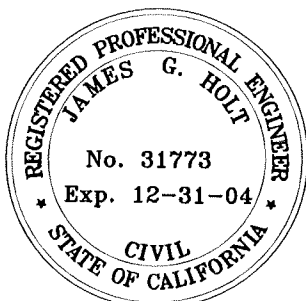


PLAN

NOTES:

1. EXTEND BOTH ENDS OF CRADLE OR ENCASEMENT TO A POINT ONE INCH SHORT OF FIRST PIPE JOINT BEYOND LOCATIONS SPECIFIED ON PLAN.
2. APPLY FORM OIL, THIN PLASTIC SHEET, OR OTHER ACCEPTABLE MATERIAL TO PIPE TO PREVENT BOND BETWEEN PIPE AND CONCRETE.
3. ALL CONCRETE SHALL BE CLASS "3" CONCRETE WHICH SHALL ATTAIN A 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI IN ACCORDANCE WITH ASTM C39/C39M-99.
4. SEE SS-111 & SS-112 FOR WATER AND SEWER CROSSING REQUIREMENTS.
5. EXPANSION JOINTS MUST BE PLACED AT 20' INTERVALS, AT THE PIPE JOINT ON CONTINUOUS ENCASEMENT OR CRADLE.
6. CLASS 200 PVC C-900, 12" AND SMALLER; DR-14 PVC C-905, 14" OR LARGER MAY BE USED IN LIEU OF CONCRETE ENCASEMENT.

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PREPARED BY:

JAMES G. "JACK" HOLT

R.C.E. NO. 31773
EXP. DATE: 12-31-04

**HEBER PUBLIC UTILITY DISTRICT
SEWER AND WATER CROSSINGS**

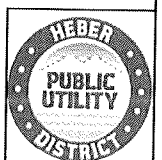
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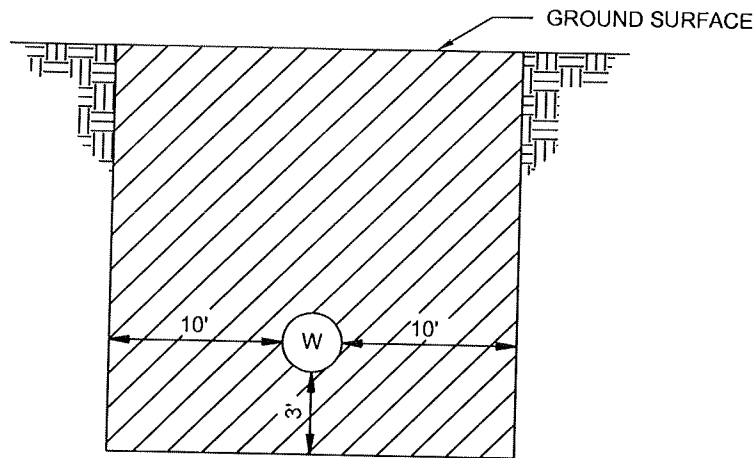
SS 110

SCALE:
NO SCALE

DATE:
5-20-2004

THG 744.011





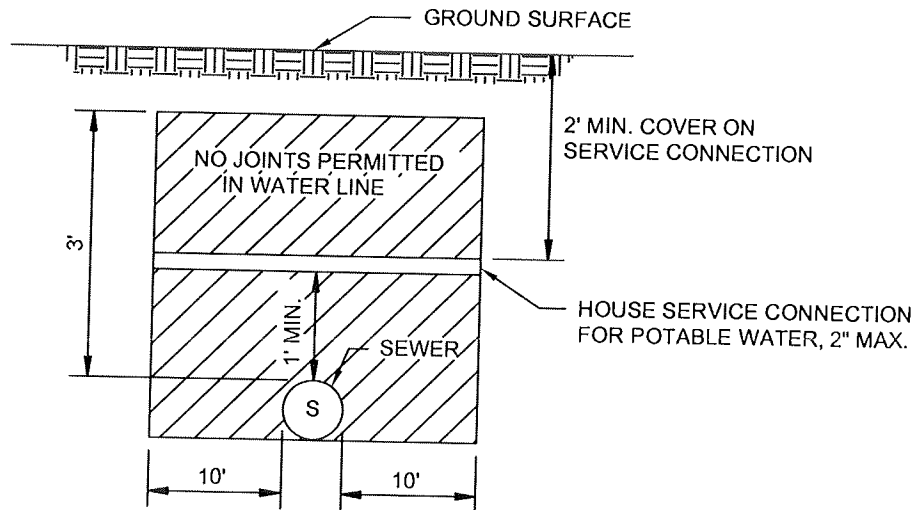
CROSSING SANITARY SEWER AND WATER LINE



INDICATES PRESSURE WATERMAIN FOR POTABLE WATER

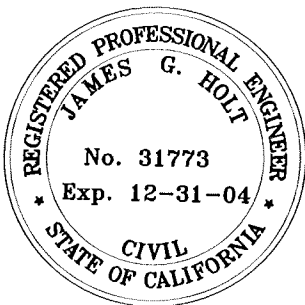
NOTE:

DIMENSIONS ARE FROM OUTSIDE
OF PIPE TO OUTSIDE OF PIPE.



CROSSING HOUSE SERVICE CONNECTION FOR POTABLE WATER

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SEAL-ENGINEER



PREPARED BY:

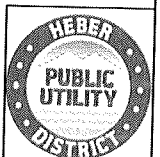
JAMES G. "JACK" HOLT
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
SEPARATION REQUIREMENTS FOR
SEWER AND WATER CROSSINGS

SCALE:
NO SCALE

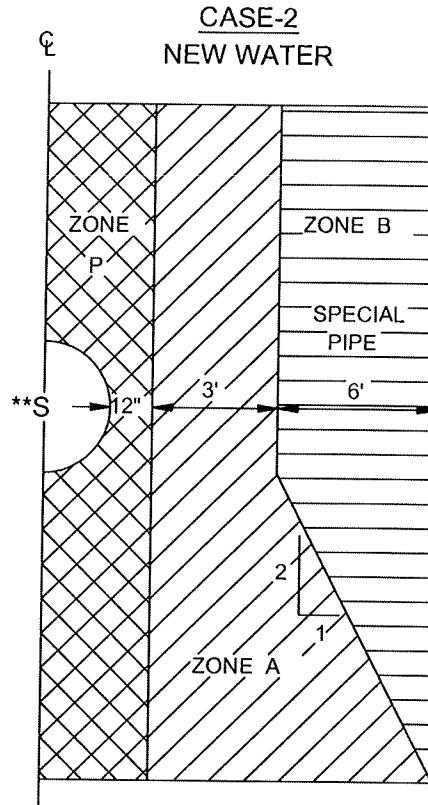
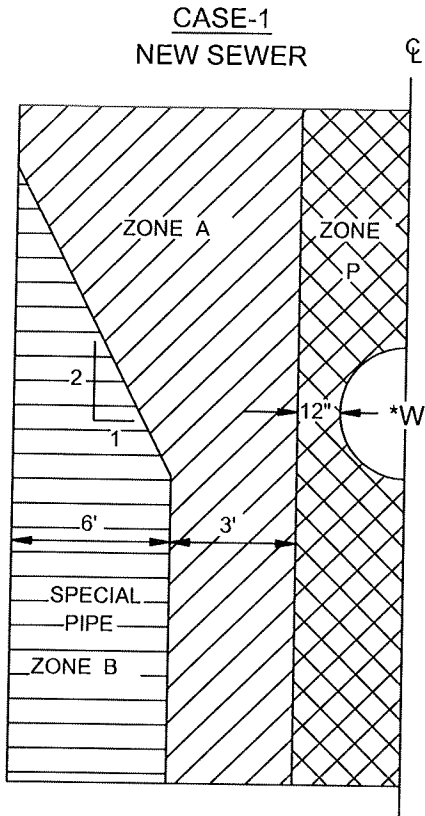
DATE:
5-20-2004

THG 744.011



SHEET NO.

SS 111



*W = EXISTING WATER LINE

**S = EXISTING SEWER LINE

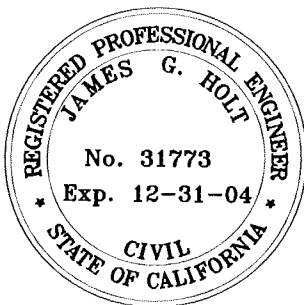
CASE 1 - NEW SEWER

ZONE	SPECIAL CONSTRUCTION
P	CONSTRUCTION PROHIBITED
A	CONSTRUCTION PROHIBITED
B	1. VCP, TYPE "G" JOINT 2. PVC-AWWA C-900, CL 200 OR AWWA C-905 DR-14

CASE 2 - NEW WATER

ZONE	SPECIAL CONSTRUCTION
P	CONSTRUCTION PROHIBITED
A	CONSTRUCTION PROHIBITED
B	CLASS 52 DUCTILE IRON PIPE (CEMENT MORTAR LINED)

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PREPARED BY:

JAMES G. "JACK" HOLT
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
SEPARATION AND CONSTRUCTION
REQUIREMENTS FOR SEWER AND
WATER LINES (PARALLEL
CONSTRUCTION)

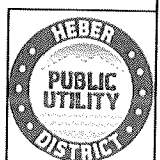
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DATE:
5-20-2004

THG 744.011

SHEET NO.

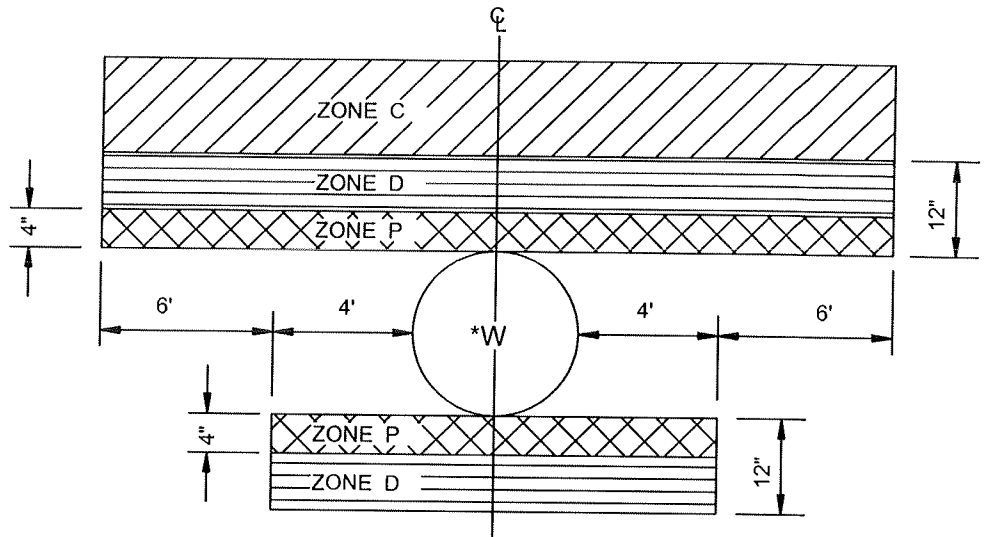
SS 112



CASE 1 - NEW SEWER

ZONE SPECIAL CONSTRUCTION

- P CONSTRUCTION PROHIBITED
D CONSTRUCTION PROHIBITED
C 1. PVC-AWWA C-900, CL 200
OR AWWA C-905 DR-14
2. DUCTILE IRON PIPE IN 1/4" STEEL
SLEEVE, WELDED JOINTS

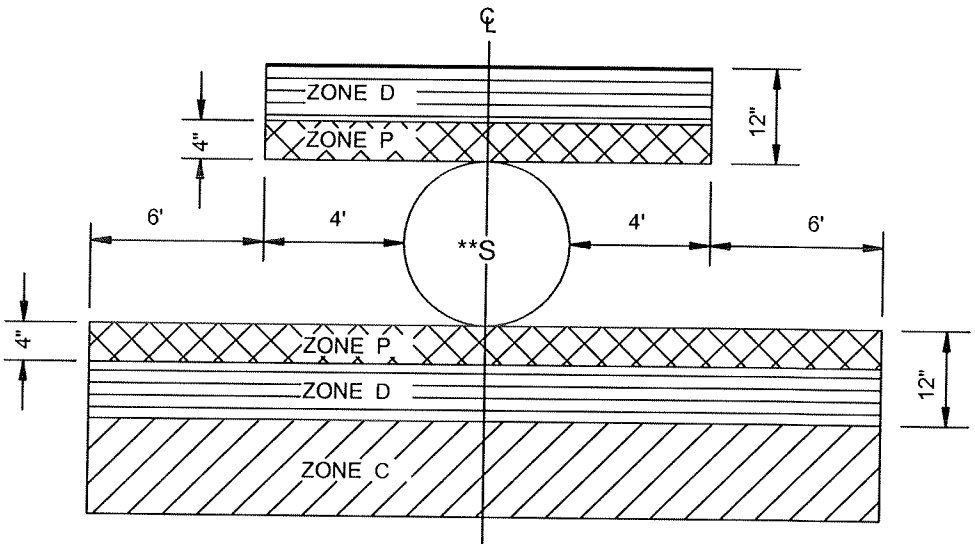


CASE-1
NEW SEWER
*W= EXISTING WATER

CASE 2 - NEW WATER

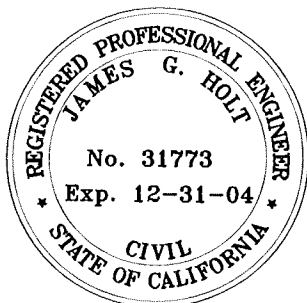
ZONE SPECIAL CONSTRUCTION

- P CONSTRUCTION PROHIBITED
D CONSTRUCTION PROHIBITED
C CLASS 52 DUCTILE IRON PIPE
(CEMENT MORTAR LINED)



CASE-2&3
NEW WATER/WATER SERVICE
**S= EXISTING SEWER

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CASE 3 - NEW WATER SERVICE

ZONE SPECIAL CONSTRUCTION

- C COPPER - NO JOINTS

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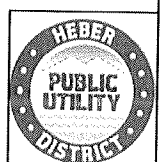
R.C.E. NO. 31773
EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
SEPARATION AND CONSTRUCTION
REQUIREMENTS FOR SEWER AND
WATER LINES (CROSSING)

SCALE:
NO SCALE

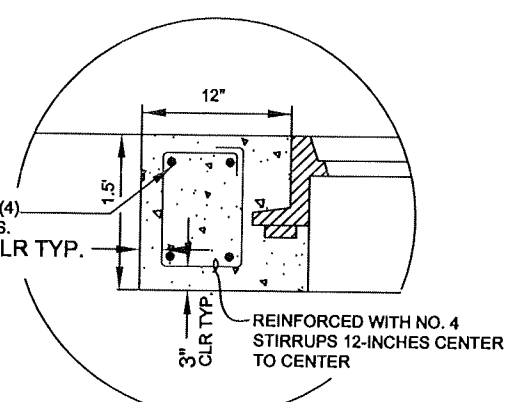
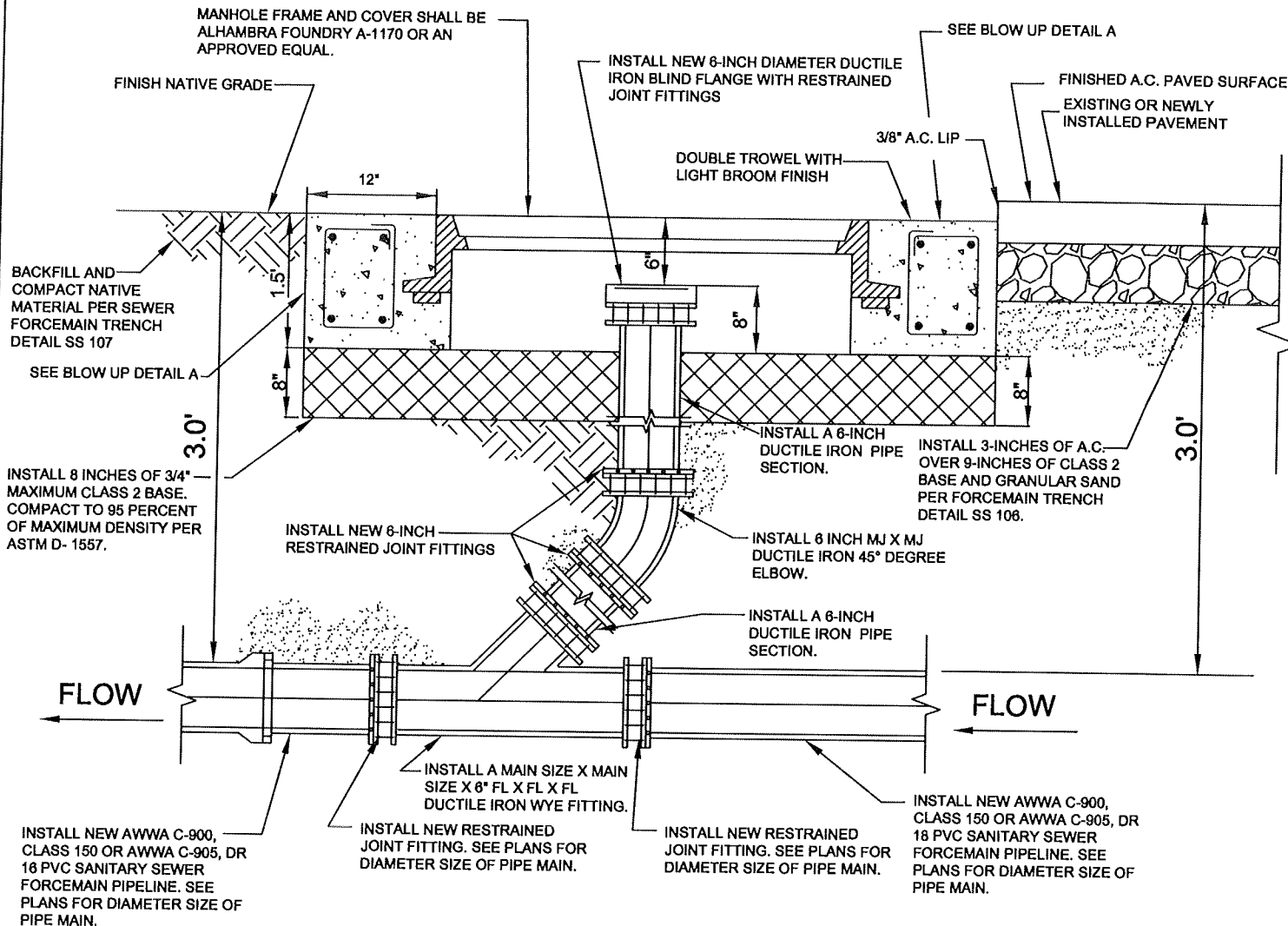
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5-20-2004

THG 744.011



SHEET NO.

SS 113

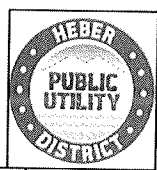


DETAIL A

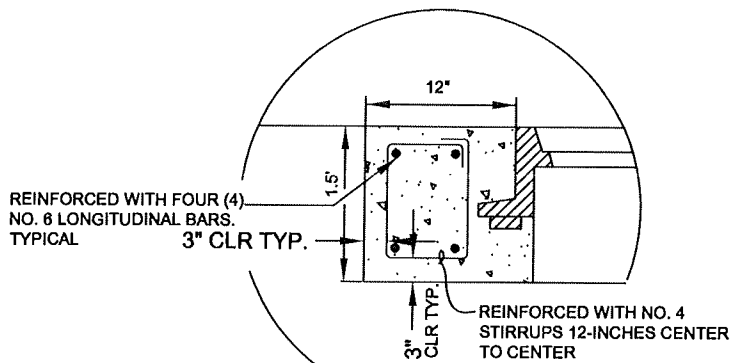
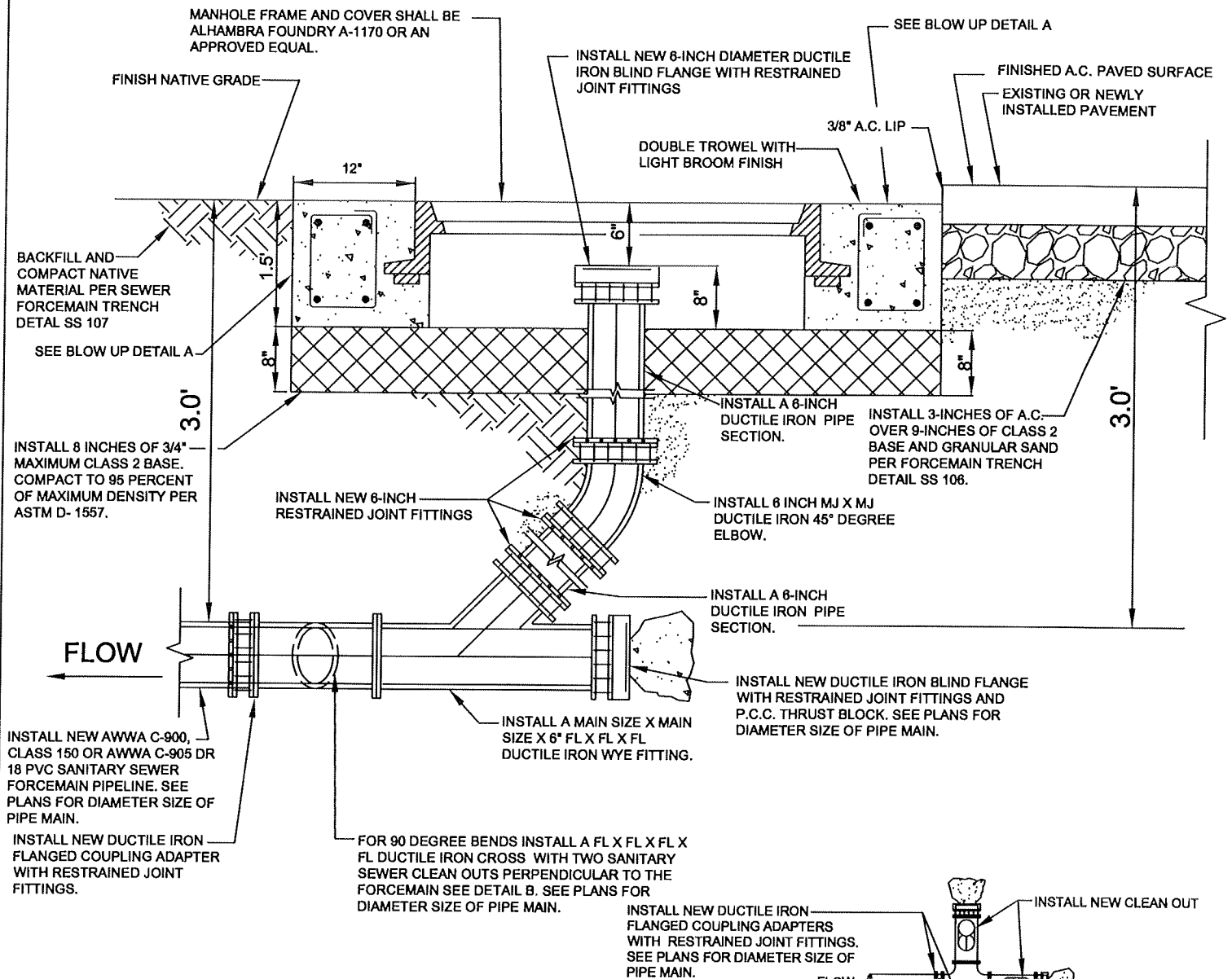
SEAL-ENGINEER



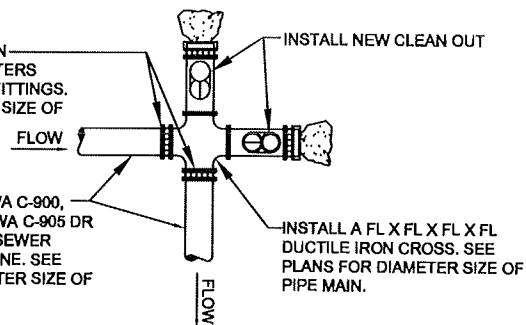
NOTE: MANHOLE FRAME AND COVER SHALL BE RAISED TO FINISHED GRADE AND SUPPORT COLLAR INSTALLED AFTER PAVING OR FINISH GRADING IS COMPLETED.



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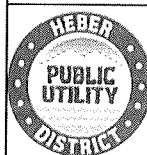
DETAIL A



DETAIL B

NOTE: MANHOLE FRAME AND COVER SHALL BE RAISED TO FINISHED GRADE AND SUPPORT COLLAR INSTALLED AFTER PAVING OR FINISH GRADING IS COMPLETED.

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EXP. DATE: 12-31-04

HEBER PUBLIC UTILITY DISTRICT
TYPICAL SANITARY SEWER CLEANOUT
IN PAVED OR NATIVE AREAS FOR
SANITARY SEWER FORCEMAIN
PIPELINES FOR 90° BENDS

SHEET NO.

SS 115

SCALE:
NO SCALE

DATE:
5-20-2004

THG 744.011