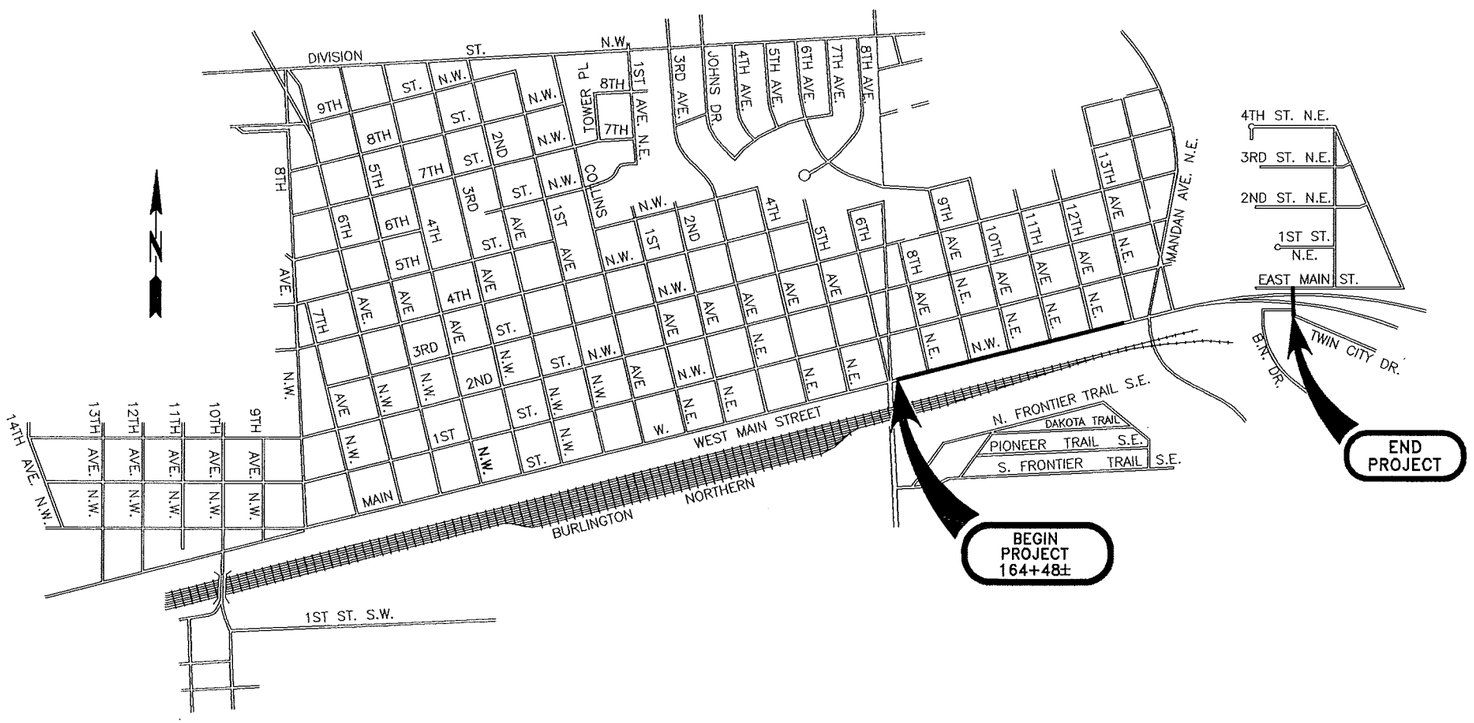
SHEET NO. 1

CITY OF MANDAN, NORTH DAKOTA
MAIN STREET WATER IMPROVEMENTS
DISTRICT #39, WATER IMPROVEMENT PROJECT 96-2, PHASE III

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota Department of Transportaion September 1992, Standard Drawings currently in effect, and other Contract Provisions submitted herein.



Record Drawing

DATE: 2-14-97

ULTEIG ENGINEERS, INC.
BISMARCK • FARGO • MINNEAPOLIS
UEI #95834

TABLE OF CONTENTS

Record Drawing

GENERAL NOTES

100 P01 QUESTIONS: ALL TECHNICAL QUESTIONS PRIOR TO BIDDING OR AFTER BID AWARD IN REGARDS TO DISTRICT #39, WATER AND SEWER IMPROVEMENT PROJECT 96-2, PHASE III ARE TO BE DIRECTED TO ULTEIG ENGINEERS, INC., 1701 SOUTH 12TH STREET, BOX 2041, BISMARCK, ND. TELEPHONE 701-258-6507. FAX 701-224-1163.

100 P02 PROJECT OVERVIEW AND SPECIAL COORDINATION REQUIREMENTS: DISTRICT #39, WATER IMPROVEMENT PROJECT 96-2, PHASE III SHALL BE BID AND CONSTRUCTED IN CONJUNCTION WITH NDDOT PROJECT NHU-1-094(035)916. NDDOT'S PROJECT WILL BE CONSTRUCTED IN PHASES WITH THE NORTH HALF OF MAIN STREET BEING RECONSTRUCTED FIRST. CONSTRUCTION OF WATER IMPROVEMENTS WILL REQUIRE SPECIAL COORDINATION AND PLANNING DUE TO THE PHASED RECONSTRUCTION OF MAIN STREET AND THE NEED TO MAINTAIN WATER SERVICE TO USERS ON BOTH SIDES OF THE STREET. SPECIAL REQUIREMENTS ARE AS FOLLOWS:

1. EXISTING 4" & 6" WATERMAINS WITHIN CONSTRUCTION SEGMENTS TO REMAIN IN SERVICE UNTIL SERVICES AND FIRE HYDRANTS CAN BE SWITCHED OVER TO NEW 12" WATERMAIN OR CONTRACTOR MAY SUBMIT FOR APPROVAL A DETAIL PLAN TO PROVIDE TOTAL BYPASSING OF WATER TO USERS ON THE NORTH AND SOUTH SIDE OF MAIN STREET INSTEAD OF KEEPING OLD MAINS IN SERVICE. BYPASSING PLAN MUST BE CAREFULLY THOUGHT OUT AND PROVIDE FIRE PROTECTION COMPARABLE TO EXISTING. ANY ADDITIONAL COSTS SHALL BE INCIDENTAL. NEW 12" WATERMAIN WILL NEED TO BE INSTALLED IN SEGMENTS.

2. CONTRACTOR MAY BE REQUIRED TO INSTALL TEMPROARY PLUGS IN EXISTING WATERMAINS TO ALLOW SYSTEMATIC WATERMAIN CONST-RUCTION TO OCCUR. LOCATIONS REQUIRE ENGINEER'S APPROVAL. COSTS INCIDENTAL.

3. ADEQUATE NOTICE TO BE GIVEN TO ALL USERS PRIOR TO DISRUPTING WATER SERVICE. WATER SERVICE CANNOT BE DISRUPTED MORE THAN 8 HOURS. CONTRACTOR WILL DISTRIBUTE NOTICES TO AFFECTED USERS 24 HOURS IN ADVANCE OF ANY WATER SHUT DOWNS. NOTICES MUST BE GIVEN NOT ONLY TO USERS WITHIN THE CONSTRUCTION AREA BUT TO ANY USER AFFECTED BY DISRUPTIONS. CONTRACTOR MUST COORDINATE CLOSELY WITH OWNER TO DETERMINE WHO THE AFFECTED USERS ARE.

4. SERVICE LINE WORK WILL INCLUDE INSTALLING NEW COPPER SERVICE LINES FROM NEW 12" MAIN TO EXISTING CURB STOP, REPLACING EXISTING CURB STOPS AND CONNECTING TO EXISTING SERVICE LINE.

5. ONCE THE NEW WATERMAIN IS INSTALLED, TESTED, ETC., SERVICES NEED TO BE CONNECTED TO NEW MAIN. IF ALL SERVICES WITHIN A VALVED SEGMENT CANNOT BE CONNECTED WITHIN 8 HOURS, THE CONTRACTOR MUST PROVIDE TEMPORARY SERVICE OR SHUT OFF, CRIMP, CAP, OR PLUG THE EXISTING SERVICE LINES WHERE THE NEW ONES CONNECT. THE COST OF PROVIDING TEMPORARY WATER SERVICE SHALL BE INCIDENTAL TO TO THE PRICE BID FOR OTHER ITEMS. SCHEDULING OF WORK REQUIRING CLOSURE OF ANY WATERMAINS SHALL BE COORDINATED WITH THE CITY. ANY OPERATIONS OF WATERMAIN VALVES WILL BE DONE BY THE CITY OF MANDAN. METHOD OF PROVIDING TEMPORARY WATER SERVICE REQUIRES THE ENGINEERS APPROVAL. THE CITY OF MANDAN WILL FURNISH WATER FOR TEMPORARY SERVICES AT NO CHARGE. CONTRACTOR WILL BE REQUIRED TO FURNISH ALL PIPING, CONNECTIONS TO USERS FACILITIES, CONNECTIONS TO EXISTING HYDRANTS AND OTHER INCIDENTALS.

6. CONTRACTOR MUST PREPARE AND SUBMIT A WRITTEN PLAN FOR COMPLETING THE WORK TO THE ENGINEER FOR APPROVAL. PLAN WILL BE PREPARED AFTER CONTRACTOR HAS MET WITH OWNER AND ENGINEER TO DISCUSS PROJECT.

7. CONTRACTOR WILL BE REQUIRED TO ASSURE THAT ALL EXISTING USERS ARE RECONNECTED TO THE NEW 12" WATERMAIN.

722 P01 ABANDON EXISTING SANITARY MANHOLES AND EXISTING VALVE BOXES: WHERE CALLED FOR ON THE PLANS OR AS DIRECTED BY THE ENGINEER IN THE FIELD, THE ABANDONMENT OF EXISTING SANITARY MANHOLES SHALL INCLUDE REMOVING AND DISPOSING OF ALL CASTINGS, ADJUSTMENT RINGS AND TOP MANHOLE SECTION, PLUGGING ALL PIPE OPENINGS WITH CONCRETE AND FILLING REMAINDER OF MANHOLE WITH COMPACTED GRANULAR MATERIAL (CLASS 5). THE AMOUNT TO BE PAID SHALL BE AT THE UNIT PRICE BID PER EACH ABANDON EXISTING MANHOLE. ALL EXISTING VALVE BOXES THAT ARE NO LONGER NEEDED ONCE EXISTING MAINS ARE ABANDONED SHALL BE ABANDONED AS FOLLOWS: REMOVE TOP SECTION OF VALVE BOX AND FILL REMAINING VALVE BOX WITH PEA ROCK THAT IS SLICED, TAMPED AND CONSOLIDATED TO THE ENGINEER'S SATISFACTION. THE AMOUNT TO BE PAID SHALL BE AT THE UNIT PRICE BID PER EACH ABANDON EXISTING VALVE BOX.

Record Drawing

GENERAL NOTES

724 P01 WATERMAIN, VALVES, FITTINGS AND HYDRANTS: GATE VALVES SHALL BE REQUIRED WITH A GATE HAVING A RESILIENT (VULCANIZED SYNTHETIC RUBBER COATING) SEAT ATTACHED TO THE WEDGE, MANUFACTURED AND DESIGNED IN ACCORDANCE WITH THE LATEST REVISIONS OF AWWA STANDARD C-509. RESILIENT-SEATED GATE VALVE BODY AND BONNET SHALL BE COATED, INSIDE AND OUT, WITH A FUSION BONDED EPOXY IN ACCORDANCE WITH AWWA C-550. THE RESILIENT RUBBER SEAT SHALL BE MOLDED AND BONDED TO THE WEDGE. THE WATERWAY SHALL HAVE A FULL UNOBSTRUCTED FLOW WITHOUT RECESSES IN THE BOTTOM.

THE MINIMUM BARREL LENGTH OF HYDRANTS SHALL BE 18 INCHES FROM LOWEST NOZZLE TO FUTURE GROUND LINE WITH 8 FEET OF COVER OVER THE TOP OF THE HYDRANT LEAD.

ALL BOLTS CONNECTING THE BARREL TO THE FOOT ELBOW SHALL BE STAINLESS STEEL.

BOLTS FOR MECHANICAL JOINT FITTINGS SHALL BE ALTERNATED WITH ONE-HALF STAINLESS STEEL AND ONE-HALF LOW ALLOY STEEL. LOW ALLOY STEEL BOLTS SHALL CONTAIN A MAXIMUM CONTENT OF CARBON AT 0.2 PERCENT, MANGANESE AT 1.25 PERCENT AND SULFUR AT 0.05 PERCENT AND A MINIMUM CONTENT OF NICKEL AT 0.25 PERCENT, COPPER AT 0.20 PERCENT, AND A COMBINED CONTENT OF NICKEL, COPPER, AND CHROMIUM AT 1.25 PERCENT.

WEIGHTS SHOWN FOR FITTINGS ARE FOR DUCTILE IRON MECHANICAL JOINT FITTINGS. DUCTILE IRON SHALL BE MANUFACTURED IN ACCORDANCE WITH ANSI C153/A21.53 WITH A WORKING PRESSURE OF 350 PSI. THE WEIGHT TO BE PAID FOR SHALL NOT INCLUDE THE POUNDAGE FOR FITTING ACCESSORIES, ie., BOLTS, FLANGES, ETC. THE COST FOR THESE ITEMS SHALL BE INCIDENTAL TO OTHER ITEMS.

WATERMAIN PIPE SHALL BE POLYVINYL CHLORIDE PIPE AND SHALL MEET THE REQUIREMENTS OF AWWA C-900 OR THE LATEST REVISION THEREOF AND SHALL BE FURNISHED IN CAST IRON PIPE EQUIVALENT OUTSIDE DIAMETERS WITH ELASTOMERIC JOINTS. THE PRESSURE CLASS OF THE PVC PIPE SHALL BE CLASS 150 WITH A SDR OF 18.

ANY ADAPTORS NECESSARY TO ADAPT FROM AN EXISTING WATERMAIN PIPE TO THE SPECIFIED WATERMAIN PIPE OR TO THE WATERMAIN PIPE SELECTED SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID FOR WATERMAIN PIPE.

ALL FITTINGS, VALVES, AND HYDRANT SHOES SHALL BE INSTALLED WITH A POLYETHYLENE ENCASEMENT CONFORMING TO AWWA C-150, ANSI A21.5 WITH AN 8 MIL NOMINAL FILM THICKNESS. NOT A SEPARATE PAY ITEM. COST TO BE INCLUDED IN PRICE BID FOR WATERMAIN PIPE.

ALL PIPE JOINTS WITHIN THREE FULL PIPE LENGTHS OF ANY FITTING, VALVE, COUPLING, PLUG OR OTHER SUCH ELEMENT SHALL BE MECHANICALLY RESTRAINED BY USE OF RESTRAINT DEVICES. ALL FITTING JOINTS, COUPLINGS, VALVES, AND PLUGS SHALL ALSO BE RESTRAINED. ALL PIPE JOINTS AND HYDRANTS ON HYDRANT LEADS SHALL ALSO BE RESTRAINED. RESTRAINT DEVICES SHALL BE AS MANUFACTURED BY EBAA IRON, UNI-FLANGE, CERTA-LOK, OR OTHER ENGINEER APPROVED DEVICES. ALL COSTS FOR RESTRAINING DEVICES SHALL BE INCIDENTAL TO OTHER BID ITEMS.

724 P02 PRESSURE TESTING OF NEW WATERMAIN: INSPECTION AND TESTS MUST BE MADE BY THE MANUFACTURER ON ALL PIPE AND COMPONENT PARTS BEFORE SHIPMENT. SUCH TESTS SHALL BE MADE BY A TESTING LABORATORY SATISFACTORY TO THE ENGINEER AND SUCH TESTS SHALL BE MADE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AMERICAN SOCIETY FOR TESTING MATERIALS. TESTS AND DOCUMENTARY EVIDENCE THAT THE MATERIALS HAVE PASSED SUCH INSPECTIONS MUST BE FURNISHED TO THE ENGINEER BEFORE THE DELIVERY OF THE MATERIALS ON THE JOB. ANY MATERIALS WHICH DO NOT PROVE SATISFACTORY AFTER BEING PLACED IN THE WORK MUST BE REMOVED FROM THE PREMISES AND REPLACED WITH SATISFACTORY MATERIAL. THE COST OF FOUNDRY INSPECTION SHALL BE PAID BY THE CONTRACTOR. AFTER THE PIPE HAS BEEN LAID AND THE TRENCH PARTIALLY BACKFILLED, OR COMPLETELY BACKFILLED AT CONTRACTOR'S OPTION, ALL NEW PIPE OR ANY VALVED SECTION THEREOF SHALL BE SUBJECT TO HYDROSTATIC PRESSURE TEST UNDER THE SUPERVISION OF THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL MATERIALS AND DOING ALL TAPPING. THE TEST SECTION SHALL BE FILLED WITH WATER AND SUBJECTED TO EXAMINATION. AFTER THE EXAMINATION THE PRESSURE SHALL BE GRADUALLY INCREASED. IF DEFECTS ARE FOUND, THE CONTRACTOR SHALL IMMEDIATELY MAKE THE NECESSARY REPAIRS AT HIS OWN EXPENSE. THE FINAL PRESSURE TEST SHALL BE 150 POUNDS PER SQUARE INCH AND SHALL BE HELD AT LEAST TWO HOURS. IN ADDITION THE CONTRACTOR MUST COMPLY WITH ALL OF THE HYDROSTATIC TESTINGS OF AWWA C600-87. THE CONTRACTOR SHALL FURNISH ALL TOOLS, EQUIPMENT AND MATERIAL NECESSARY TO MAKE THE PRESSURE TEST.

724 P03 CHLORINATION OF NEW MAINS: AFTER THE NEW MAINS AND VALVED EXTENSIONS HAVE BEEN TESTED THEY SHALL BE FLUSHED UNTIL ALL FOREIGN MATERIAL HAS BEEN REMOVED. CHLORINATION APPLICATIONS SHALL BE MADE UNDER THE SUPERVISION OF THE ENGINEER. WATER SHALL BE FED INTO THE NEW LINE WITH CHLORINE APPLIED IN AMOUNTS TO MAINTAIN A CHLORINE SOLUTION WITH A CHLORINE RESIDUAL OF 50 MILLIGRAMS PER LITER FOR 24 HOURS OR CHLORINE RESIDUAL OF 200 MILLIGRAMS PER LITER FOR 3 HOURS. ALL VALVES AND HYDRANTS IN THE SECTION TREATED SHALL BE OPERATED DURING THIS TIME IN ORDER TO DISINFECT THE APPURTENANCE. THE CHLORINE SHALL BE FLUSHED FROM THE MAIN THROUGH HYDRANTS UNTIL ALL EXCESS CHLORINE HAS BEEN REMOVED. NO CHLORINATION WATER WILL BE PERMITTED IN THE WATERMAIN TRENCH. THE CONTRACTOR SHALL FURNISH ALL TOOLS, EQUIPMENT AND MATERIAL TO CHLORINATE.

AFTER THE CHLORINATED WATER HAS BEEN FLUSHED FROM THE WATERMAIN, THE WATERMAIN SHALL BE TESTED FOR BACTERIOLOGICAL QUALITY IN ACCORDANCE WITH AWWA C651 LATEST REVISION THEREOF. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 24 HOURS PRIOR TO THE TIME THAT COLLECTION OF THE SAMPLES IS TO OCCUR. AT LEAST THREE SAMPLES SHALL BE COLLECTED FROM EACH SEGMENT OF THE PIPELINE BEING TESTED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THANSPORTING ALL SAMPLES TO THE NORTH DAKOTA STATE DEPARTMENT OF HEALTH AND CONSOLIDATED LABRATORIES AND PAYING THE APPROPRIATE FEE. A CORPORATION COCK COMPLETE WITH A COPPER TUBE GOOSENECK ASSEMBLY SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. IF THE INITIAL DISINFECTION FAILS TO PRODUCE SATISFACTORY BACTERIOLOGICAL RESULTS, THE WATERMAIN MUST BE REFLUSHED AND RESAMPLED. IF CHECK SAMPLES SHOW THE PRESENCE OF COLIFORM ORGANISMS, THE MAIN SHALL THEN BE RECHLORINATED AND PROCEDURES REPEATED UNTIL SATISFACTORY RESULTS ARE OBTAINED. THE GOOSENECK ASSEMBLY SHALL BE REMOVED AND REUSED AT EACH SAMPLING LOCATION.

GENERAL NOTES

724 P04 WATER SERVICE CONNECTIONS: CURB STOPS SHALL BE MUELLER NO. H-15164, WITHOUT DRAIN, OR APPROVED EQUAL. CURB BOXES SHALL BE MEULLER NO. H-10300 (1 1/4" DIAMETER UPPER SECTION) FOR ONE (1) INCH CURB STOPS AND MUELLER NO. H-10340 (2" DIAMETER UPPER SECTION) FOR ONE AND ONE-QUARTER (1 1/4) INCH THROUGH TWO (2) INCH CURB STOPS, OR AN APPROVED EQUAL. THE LENGTH OF THE CURB BOXES SHALL VARY OR BE MODIFIED AT NO ADDITIONAL COST TO ACCOMODATE EXISTING CONDITIONS. THERE WILL BE NO SEPERATE PAYMENT FOR ADJUSTING CURB BOXES TO FINAL GRADE, ALL COSTS FOR ADJUSTING CURB BOXES TO FINAL GRADE ARE INCIDENTAL.

COPPER WATER PIPE SHALL CONFORM TO A.S.T.M. B88, TYPE K.

CORPORATION STOPS SHALL BE MUELLER NO. H-15000 FOR COPPER WATER PIPE OR APPROVED EQUAL.

ALL CORPORATION TAPS MADE INTO ALL SIZES AND CLASSES OF PVC FOR TESTING OR PERMANENT CONNECTIONS SHALL BE REINFORCED WITH A TAPPING SADDLE. TAPPING SADDLES USED ON PVC WATERMAIN SHALL PROVIDE FULL SUPPORT AROUND THE CIRCUMFERENCE OF THE PIPE AND PROVIDE A BEARING AREA OF SUFFICIENT WIDTH ALONG THE AXIS OF THE PIPE, 2 INCHES MINIMUM, ENSURING THAT THE PIPE WILL NOT BE DISTORTED WHEN A SADDLE IS TIGHTENED. TAPPING SADDLES SHALL BE ONE OF THE FOLLOWING: A DOUBLE STRAP BRONZE (NOT TO BE USED WITH PVC), A STAINLESS STEEL OR AN EPOXY COATED MALLEABLE IRON. ACCEPTABLE MANUFACTURER'S FOR THESE SADDLES ARE MUELLER, ROCKWELL, SUPERIOR, FORD, ROMAC AND CASCADE OR AN APPROVED EQUAL. THE MAXIMUM SIZE TAP INTO A SIX (6) INCH IN DIAMETER WATERMAIN IS 1 1/2 INCHES, HOWEVER A STAINLESS STEEL SLEEVE MAY BE USED FOR A 2 INCH TAP INTO A 6 INCH MAIN.

CONTRACTOR WILL BE REQUIRED TO TAP WATERMAINS FOR ALL WATER SERVICE CONNECTIONS. TAPS WILL NOT BE MADE BY THE CITY OF MANDAN.

ALL WATER SERVICE LINE STUBOUTS SHALL BE THOROUGHLY FLUSHED PRIOR TO TESTING OF MAINS OR STUBOUTS. CURB STOPS SHALL BE INSTALLED ON A 1/2 SQUARE FOOT BY 4 INCH THICK CONCRETE OR BRICK PAD.

ON WATERMAIN REPLACEMENT CONSTRUCTION ALL TAPS TO THE NEW WATERMAINS SHALL BE 1-1/2 INCH UNLESS OTHERWISE SPECIFIED ON THE PLANS. CONNECTION TO THE EXISTING WATER SERVICE LINES MAY REQUIRE A REDUCER AND SHALL BE CONSIDERED INCIDENTAL TO OTHER BID ITEMS. ALL CONNECTIONS AND FITTINGS REQUIRED TO CONNECT THE NEW COPPER WATER SERVICE LINES TO THE EXISTING WATER SERVICE LINES SHALL BE CONSIDERED INCIDENTAL. EXISTING SERVICE LINES SHALL BE REPLACED UP TO AND INCLUDING THE CURB STOP. ALL CONNECTIONS AND FITTINGS REQUIRED TO CONNECT THE NEW CURB STOP TO THE EXISTING WATER SERVICE LINE SHALL BE CONSIDERED INCIDENTAL.

724 P05 ANY COSTS FOR THE DISPOSAL OF EXCESS EXCAVATION FROM THE TRENCHES OF WATERMAINS, SEWERMAINS OR OTHER UNDERGROUND PIPING ASSOCIATED WITH THESE PLANS SHALL BE INCLUDED IN THE PRICE BID FOR THE RESPECTIVE ITEM.

724 P06 THE UNIT PRICE BID FOR TAPPING SLEEVES OR TAPPING CROSSES SHALL INCLUDE ALL COSTS FOR FURNISHING AND INSTALLING THE FL X MJ VALVE AND BOX.

724 P07 WHEN THE 8" VALVE IS CUT IN AT 184+05 - 150' RT A 12" VALVE SHALL BE CUT IN AT ±201+50 - 400' RT. CONTRACTOR WILL BE REQUIRED TO VERIFY TYPE OF 12" PIPE AND LOCATION PRIOR TO INSTALLING 12" VALVE, ALL COSTS INCIDENTAL. INSTALLING THE 8" AND 12" VALVES AT THE SAME TIME WILL ASSURE THAT WATER SERVICE TO THE STRIP AREA WILL ONLY NEED TO BE SHUT DOWN ONCE.

724 P08 GATE VALVES: PAYMENT FOR GATE VALVES SHALL BE FULL COMPENSATION FOR INSTALLING GATE VALVES AND INCIDENTALS INCLUDING BUT NOT LIMITED TO THE VALVE BOX. ADJUSTMENT OF THE VALVE BOX TO FINAL GRADE SHALL ALSO BE INCLUDED IN THE PRICE BID FOR "GATE VALVE".

Record Drawing

GENERAL NOTES

724 P09 THE CITY OF MANDAN WILL SECURE A PERMIT FROM BURLINGTON NORTHERN RAILROAD (BNRR) TO INSTALL THE WATERMAIN FROM STA 184+00 – 40' RT TO STA 184+00 – 150' RT. CONTRACTOR MUST ABIDE BY THE FOLLOWING BNRR REQUIREMENTS IN ORDER TO COMPLETE THE WORK WITHIN THE PERMIT AREA:

1. CONTRACTOR AND/OR SUBCONTRACTORS MUST PROVIDE EVIDENCE OF GENERAL LIABILITY, VEHICLE, AND WORKERS COMPENSATION INSURANCE. BNRR MUST BE LISTED AS A CERTIFICATE HOLDER. LIMITS OF INSURANCE COVERAGES SHALL BE AS FOLLOWS:

   A. COMMERCIAL GENERAL LIABILITY INSURANCE, INCLUDING CONTRACTUAL LIABILITY AND PRODUCTS COMPLETED/OPERATIONS, AGAINST CLAIMS ARISING OUT OF BODILY INJURY, ILLNESS AND DEATH FROM DAMAGE TO OR DESTRUCTION OF PROPERTY OF OTHERS, INCLUDING LOSS OR USE THEREOF, AND INCLUDING LIABILITY OF BURLINGTON NORTHERN RAILROAD COMPANY, WITH MINIMUM LIMITS FOR BODILY INJURY AND PROPERTY DAMAGE OF $1,000,000 FOR EACH OCCURRENCE, WITH AN AGGREGATE OF $2,000,000. THIS POLICY SHALL CONTAIN A "WAIVER OF TRANSFER RIGHTS" ENDORSEMENT TO WAIVE ANY RIGHT OF RECOVERY THAT THE INSURANCE COMPANY MAY HAVE AGAINST BURLINGTON NORTHERN RAILROAD COMPANY BECAUSE OF PAYMENTS MADE FOR BODILY INJURIES AND PROPERTY DAMAGE.

   B. BUSINESS AUTOMOBILE POLICY INSURANCE, INCLUDING OWNED, NON-OWNED, AND HIRED VEHICLES WITH MINIMUM LIMITS FOR BODILY INJURY AND PROPERTY DAMAGE OF $1,000,000 PER OCCURRENCE, ON ALL VEHICLES THAT THE PERMITTEE OR ANY OF ITS AGENTS OR EMPLOYEES MAY USE AT ANY TIME IN CONNECTION WITH THE PERFORMANCE OF THE AGREEMENT.

   C. WORKER'S COMPENSATION INSURANCE OR COVERAGE AS REQUIRED UNDER THE WORKER'S COMPENSATION ACT OF THE APPLICABLE STATE. THE POLICY SHOULD INCLUDE OCCUPATIONAL DISEASE TO REQUIRED STATUTORY LIMITS, EMPLOYER'S LIABILITY OF $1,000,000 TO INCLUDE FELA, IF APPROPRIATE, AND AN "ALL STATES" ENDORSEMENT.

2. CONTRACTOR MUST PROVIDE A RAILROAD PROTECTION LIABILITY INSURANCE POLICY ISSUED IN THE NAME OF BURLINGTON NORTHERN RAILROAD COMPANY WITH LIMITS OF $2,000,000 FOR BODILY INJURY AND PROPERTY DAMAGE PER OCCURRENCE, WITH AN AGGREGATE OF $6,000,000 MUST BE PROVIDED WHEN CONSTRUCTION WORK WILL BE WITHIN 50 (FIFTY) FEET OF THE TRACKS. POLICY WILL REMAIN IN FORCE DURING THE CONSTRUCTION PHASE OF THIS PROJECT OR CONTRACTOR CAN PURCHASE PARTICIPATION IN BNRR'S BLANKET RAILROAD PROTECTIVE LIABILITY INSURANCE POLICY FOR A FEE. FEE IS ESTIMATED TO BE $300.00.

3. CONTRACTOR AND/OR SUBCONTRACTORS MUST ACKNOWLEDGE THE REQUIREMENTS FOR CONTRACTORS AND SUBCONTRACTORS WORKING ON BNRR RIGHT-OF-WAY DOCUMENT.

4. CONTRACTOR CANNOT BEGIN WORK IN THIS AREA UNTIL OWNER PROVIDES NOTICE THAT PERMIT IS IN EFFECT.

ALL COSTS FOR PROVIDING THE NECESSARY INSURANCE CERTIFICATES AND OTHER RELATED ITEMS SHALL BE INCIDENTAL TO THER ITEMS BID.

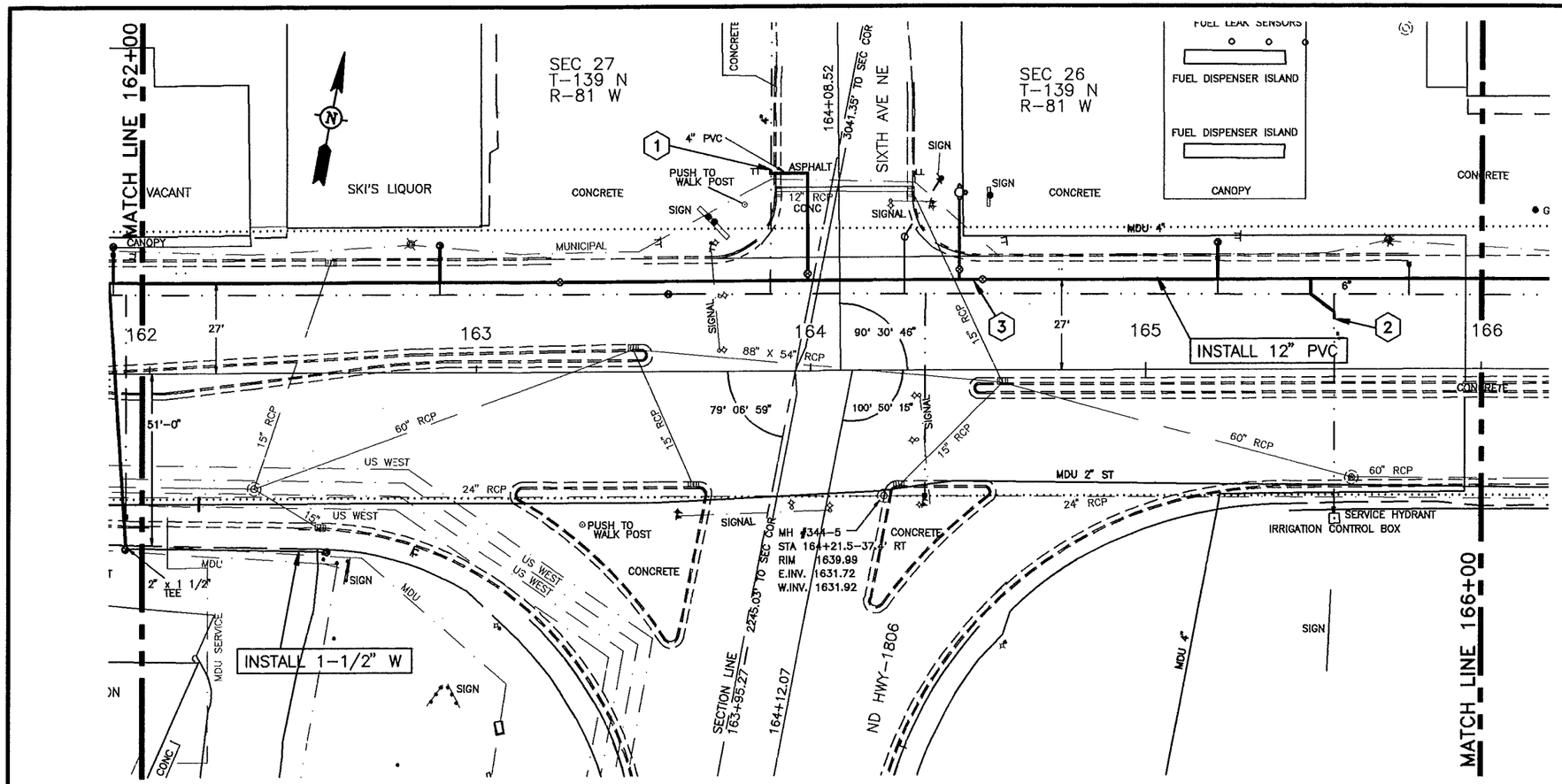
744 P01 POLYSTYRENE INSLUATION: A QUANTITY OF POLYSTYRENE INSULATION HAS BEEN PROVIDED TO ALLOW INSULATION OF WATERMAIN OR WATER SERVICE CROSSINGS WITHIN THREE (3) FEET OF ANY STORM SEWER LINE OR STRUCTURE. THE INSULATION SHALL BE IN TWO (2) INCH THICK THICK SHEETS. ONE LAYER SHALL BE USED FOR A THREE FOOT SEPERATION BETWEEN LINES. ADDITIONAL LAYERS SHALL BE PLACED FOR SEPERATIONS LESS THAN THREE FEET, AS DIRECTED BY THE ENGINEER. INSULATION SHALL CONFORM TO ASTM C578-85, TYPE VII AND SHALL BE VERY HIGH DENSITY RIGID EXTRUDED POLYSTYRENE WITH A COMPRESSIVE STRENGTH OF 60 PSI (NOTE- MATERIAL COMES IN 2' WIDTHS).

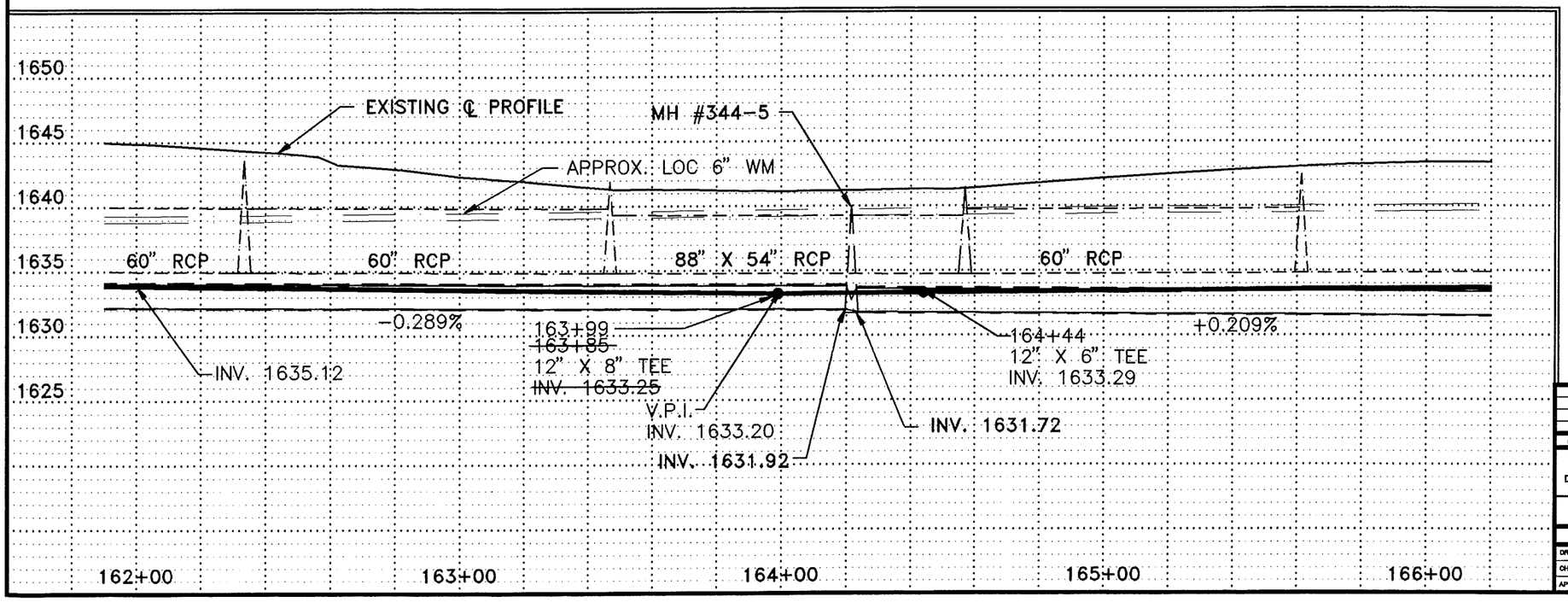
Record Drawing

QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	NHU FUNDS	CITY FUNDS	TOTAL
202	0112	REMOVAL OF CONCRETE, SIDEWALK	SY		~~8~~ 8.56	~~8~~ 8.56
202	0114	REMOVAL OF CONCRETE, PAVEMENT	SY		~~808~~ 725.33	~~808~~ 725.33
202	0130	REMOVAL OF CURB AND GUTTER	LF		~~13~~ 19.30	~~13~~ 19.30
550	0710	10 INCH CONCRETE PAVEMENT REPAIR	SY		~~808~~ 725.33	~~808~~ 725.33
722	6695	AIR RELIEF VALVE AND MANHOLE	EA		1	1
724	0210	FITTINGS, DUCTILE IRON	LBS		~~5650~~ 4504	~~5650~~ 4504
724	0300	GATE VALVE & BOX, 6 INCH	EA		~~10~~ 9	~~10~~ 9
724	0310	GATE VALVE & BOX, 8 INCH	EA		~~9~~ 8	~~9~~ 8
724	0320	GATE VALVE & BOX, 12 INCH	EA		~~11~~ 12	~~11~~ 12
724	0400	HYDRANT, INSTALL 6 INCH	EA		7	7
724	0430	REMOVE HYDRANT	EA		~~6~~ 5	~~6~~ 5
724	0605	WATER SERVICE PIPE, 1 1/2 INCH COPPER	LF		~~419~~ 588	~~419~~ 588
724	0607	WATER SERVICE PIPE, 2 INCH COPPER	LF		~~23~~ 85	~~23~~ 85
724	0810	WATERMAIN, 6 INCH PVC	LF		~~481~~ 394	~~481~~ 394
724	0830	WATERMAIN, 8 INCH PVC	LF		~~334~~ 326	~~334~~ 326
724	0850	WATERMAIN, 12 INCH PVC	LF		~~2599~~ 2612	~~2599~~ 2612
724	0852	WATERMAIN, 16 INCH PVC	LF		176	176
724	0907	CURB STOP & BOX, 1 1/2 INCH	EA		~~20~~ 22	~~20~~ 22
724	0910	CURB STOP & BOX, 2 INCH	EA		~~2~~ 3	~~2~~ 3
724	0958	WATER SERVICE CONNECTION, 1-1/2 INCH	EA		~~20~~ 22	~~20~~ 22
724	0960	WATER SERVICE CONNECTION, 2 INCH	EA		~~2~~ 4	~~2~~ 4
724	6013	ABANDON EXISTING VALVE BOX	EA		~~16~~ 6	~~16~~ 6
724	0426	HYDRANT EXTENSION	LF		~~10~~ 6.5	~~10~~ 6.5
744	0100	POLYSTYRENE INSULATION	BDFT		~~256~~ 320	~~256~~ 320
748	0140	CURB AND GUTTER TYPE I	LF		~~13~~ 19	~~13~~ 19
750	0100	SIDEWALK, CONCRETE	SY		~~8~~ 8.56	~~8~~ 8.56

Record Drawing





GATE VALVE AND BOX, 12"
+51 164+~~48~~ – 27' LT 1 EA

WATERMAIN, 12" PVC
+51 164+~~48~~ – 27' LT TO 166+00 – 27' LT 149 ~~152~~ LF

FITTINGS, DUCTILE IRON
+51 164+~~48~~ – 27' LT 12" PLUG 46 ~~49~~ LBS

WATER SERVICE LINE 1-1/2" COPPER
165+21 – 27' LT TO 165+21 – 38' LT 11 LF
+49 165+~~52~~ – 27' LT TO 165+~~52~~ +56 – 15' ~~22'~~ LT 12 ~~5~~ LF

WATER SERVICE CONNECTION
165+21 – 27' LT 1 EA
+49 165+~~52~~ – 27' LT 1 EA

CURB STOP AND BOX 1-1/2"
165+21– 38' LT 1 EA

CONSTRUCTION NOTES

1. CONNECTED ~~CONNECT~~ EXISTING 4" W.M. TO NEW 8" W.M.
2. CONNECTED ~~CONNECT~~ NEW 1-1/2" COPPER TO EXISTING 1" COPPER
3. QUANTITIES FOR THIS PROJECT BEGIN AT 164+~~48~~+51 INSTALL 12" VALVE AND BOX AND PLUG IF PHASE II CONTRACTOR HAS NOT COMPLETED WORK IN THIS AREA. IF PHASE III CONTRACTOR HAS COMPLETED WORK IN THIS AREA, REMOVE PLUG AND CONNECT TO 12" WATERMAIN.

Record Drawing

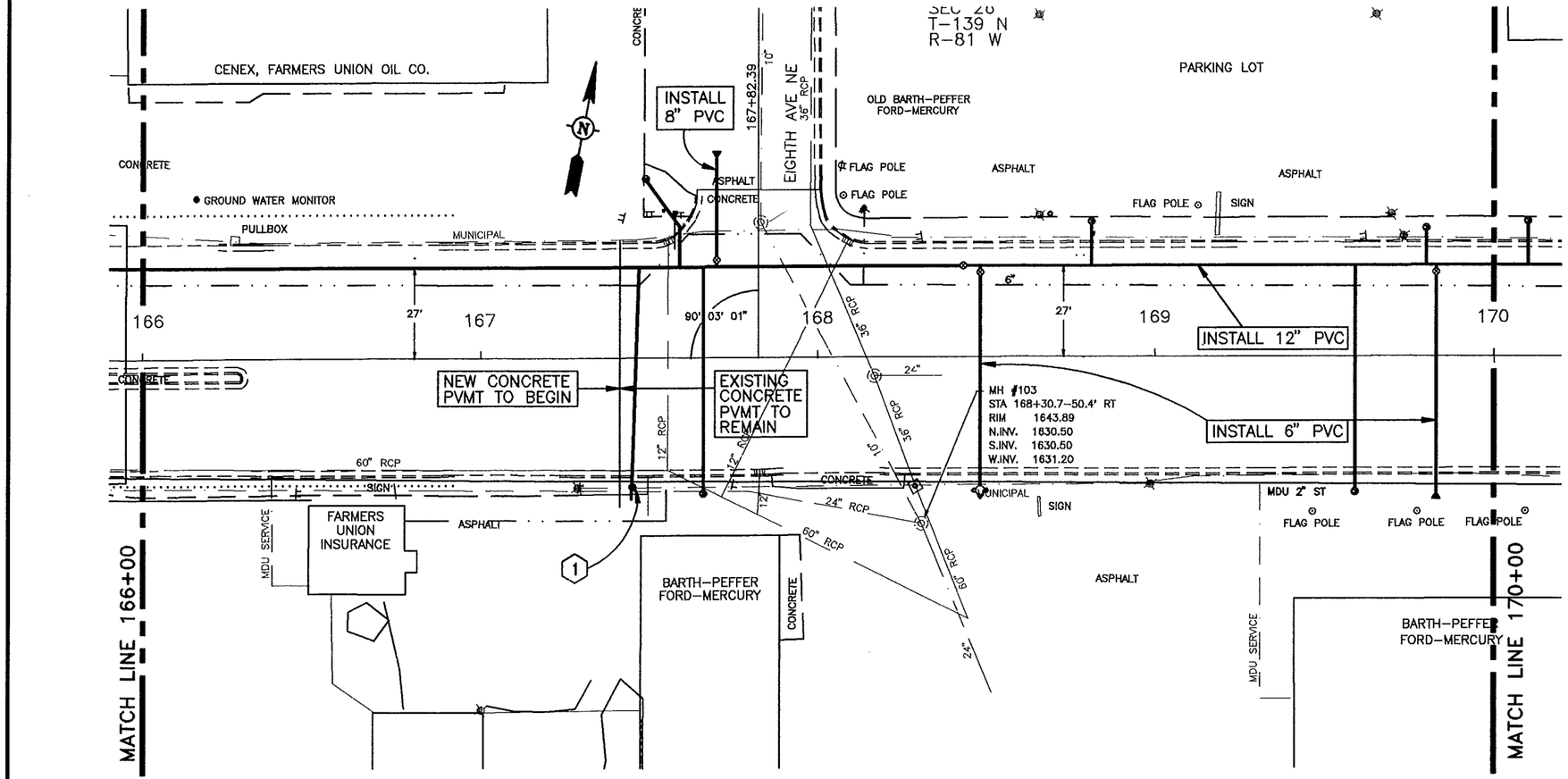
REV.	DATE	DESCRIPTION	BY
3			
2			
1			
0	2/14/97	RECORD DRAWING	DMS

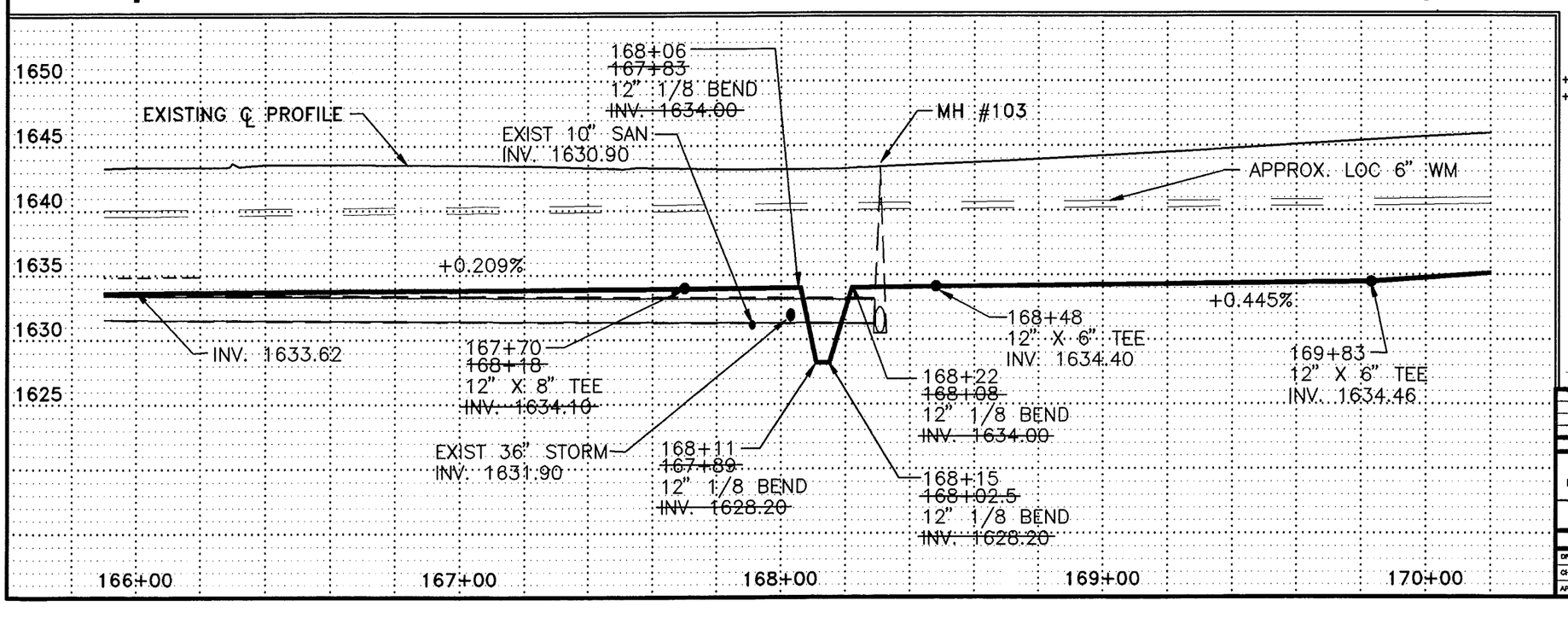
CITY OF MANDAN
DISTRICT #39, WATER IMPROVEMENT PROJECT 96-2, PHASE III

STA 164+48 TO STA 166+00

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS BISMARCK • FARGO • MINNEAPOLIS

DRAWN BY: MJH	SCALE: 1" = 40'	PROJECT NO. 95834
CHECKED BY: BPM	DATE: MAY 17, 1995	SHEET 8 of 20
APPROVED BY: BPM		





6" HYDRANT

+48	168+~~45~~ – 39.5' RT	1	EA

GATE VALVE AND BOX, 6"

+48	168+~~45~~ ~~25'~~24'	LT	1	EA
	169+83 ~~25'~~24'	LT	1	EA

GATE VALVE AND BOX, 8"

167+70	~~168+18~~ ~~29'~~30'	LT	1	EA

GATE VALVE AND BOX, 12"

+48	168+~~42~~ – 27'	LT	1	EA

WATERMAIN, 6" PVC

+48	168+~~45~~ – 27' LT TO 168+~~45~~ – 39.5' RT	66.5	LF
	169+83 – 27' LT TO 169+83 – 40' RT	67	LF

WATERMAIN, 8" PVC

167+70	~~168+18~~ – 27' LT TO ~~168+18~~ 167+70	~~59'60'~~ LT	32 ~~33~~	LF

WATERMAIN, 12" PVC

	166+00 – 27' LT TO 170+00 – 27' LT	400	LF

FITTINGS, DUCTILE IRON

168+06	~~167+83~~ – 27' LT	12" 1/8 BEND	111 ~~92~~	LBS
168+11	~~167+89~~ – 27' LT	12" 1/8 BEND	111 ~~92~~	LBS
+19	168+~~02~~.5 – 27' LT	12" 1/8 BEND	111 ~~92~~	LBS
+22	168+~~08~~ – 27' LT	12" 1/8 BEND	111 ~~92~~	LBS
167+70	~~168+18~~ – 27' LT	12" X 8" TEE	123 ~~137~~	LBS
167+70	~~168+18~~ ~~59'~~60' LT	8" PLUG		26 LBS
+48	168+~~45~~ – 27' LT	12" X 6" TEE	115 ~~123~~	LBS
	169+83 – 27' LT	12" X 6" TEE	115 ~~123~~	LBS
	169+83 – 40' RT	6" PLUG		15 LBS

WATER SERVICE LINE 1–1/2" COPPER

+47	167+~~45~~ – 27' LT TO 167+45 – ~~38'~~ 49 53 RT	26 ~~65~~		LF
+59	167+~~50~~ – 27' LT TO 167+~~58~~ – ~~45'~~ LT	13 ~~18~~		LF
	168+81 – 27' LT TO 168+81 – ~~40'38'~~ LT	11		LF
	169+80 – 27' LT TO 169+80 – 40' LT	13		LF
	169+59 – 27' LT TO 169+59 – 40' RT	13'		LF
	167+66 – 27' LT TO 167+66 – 40' RT	13'		LF

WATER SERVICE CONNECTION

+47	167+~~45~~ – 27' LT	1	EA
+59	167+~~50~~ – 27' LT	1	EA
	168+81 – 27' LT	1	EA
	169+80 – 27' LT	1	EA
	167+66 – 27' LT	1	EA

CURB STOP AND BOX 1–1/2"

+47	167+~~45~~ – ~~38'~~ RT	1		EA
+49	167+~~58~~ – ~~53'45'~~ LT	1		EA
	168+81 – ~~40'38'~~ LT	1		EA
	169+80 – 40' LT	1		EA
	169+59 – 40' RT	1		EA
	167+66 – 40' RT	1		EA

REMOVE HYDRANT

	168+42 – 43' LT	1	EA

CONSTRUCTION NOTES

(1) CONNECTED ~~CONNECT~~ NEW 1–1/2" COPPER TO EXISTING SERVICE LINE

Record Drawing

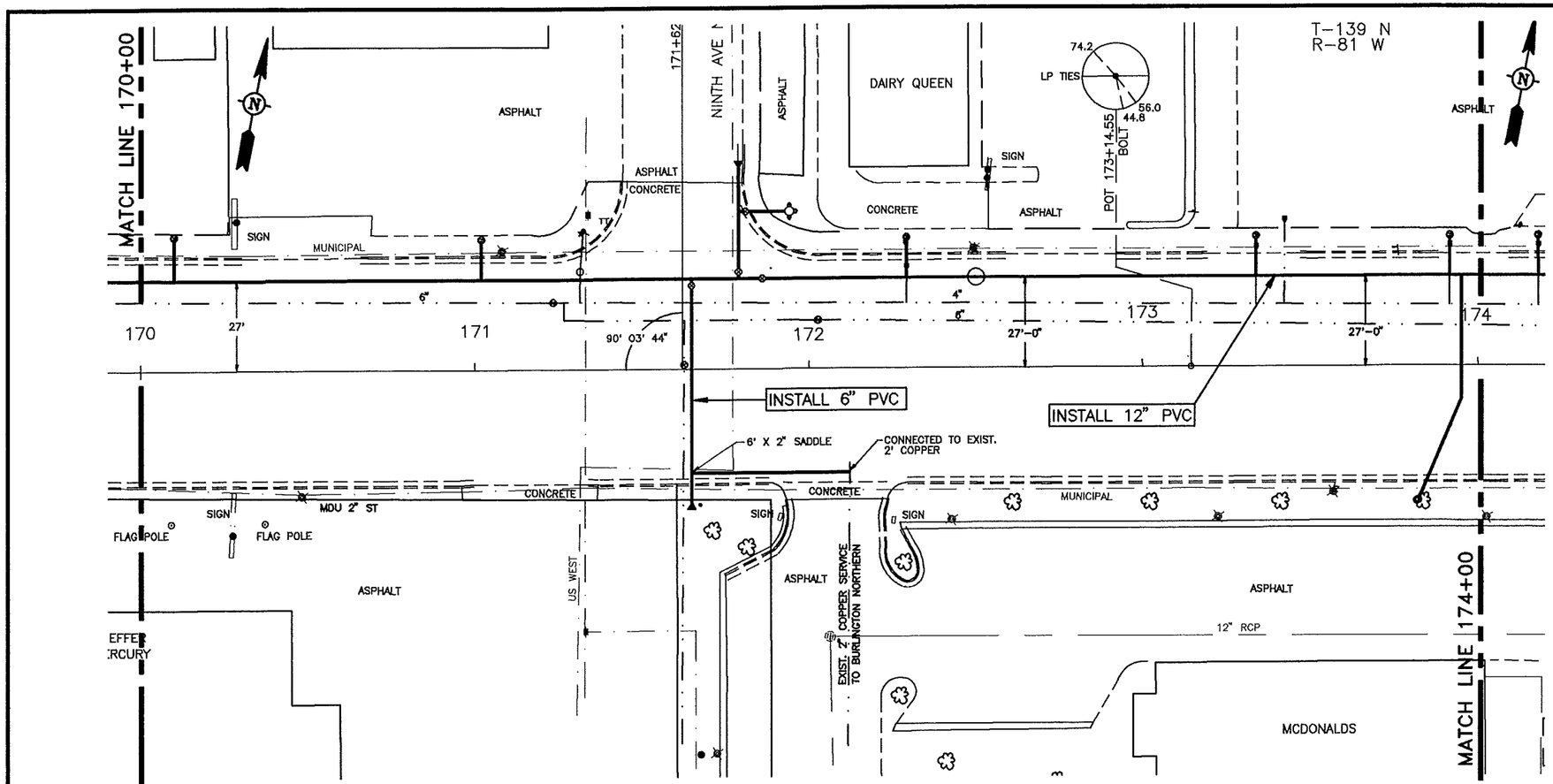
REV.	DATE	DESCRIPTION	BY
	2/14/97	RECORD DRAWING	DMS

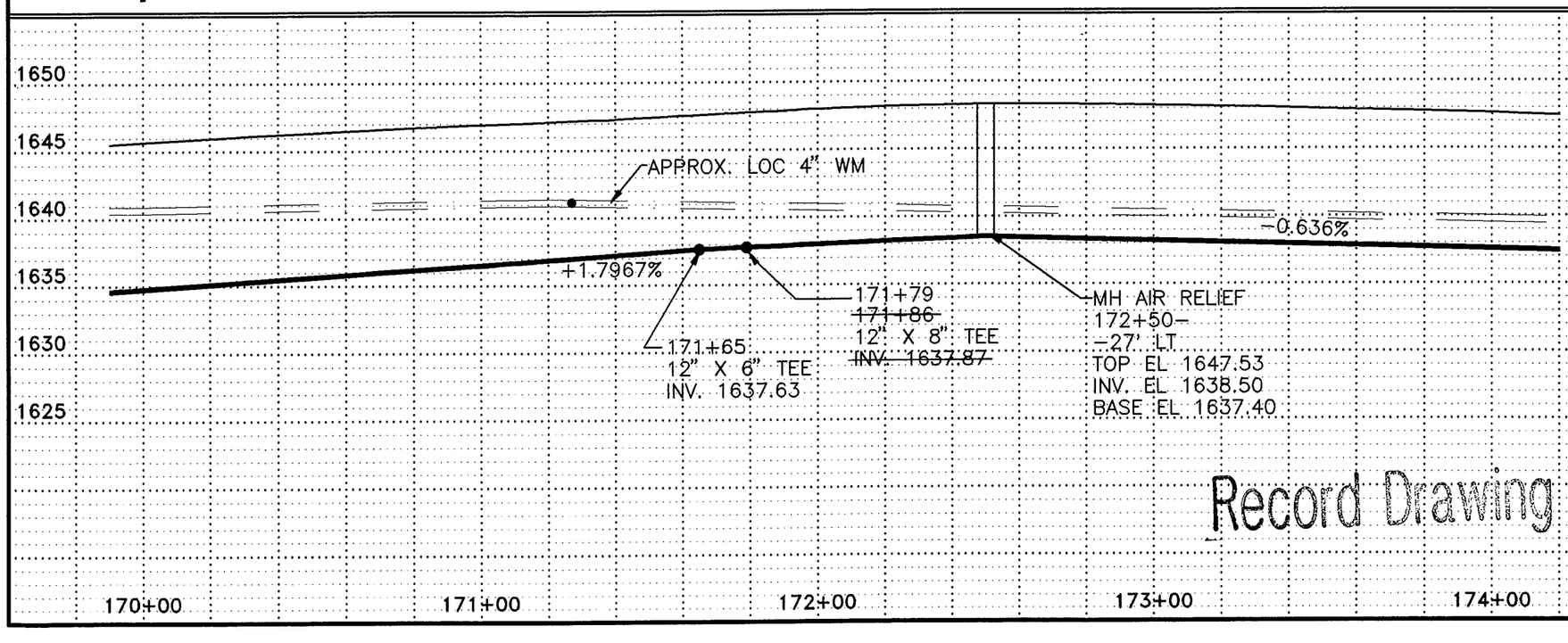
CITY OF MANDAN
DISTRICT #59, WATER IMPROVEMENT PROJECT 96-2, PHASE III

STA 166+00 TO STA 170+00

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS BISMARCK • FARGO • MINNEAPOLIS

DRAWN BY: MJH	SCALE: 1" = 40'	PROJECT NO. 95834
CHECKED BY: BPM	DATE: MAY 17, 1995	SHEET 9 of 20
APPROVED BY: BPM		





Record Drawing

6" HYDRANT
171+94 – 47' LT 1 EA

GATE VALVE AND BOX, 6"
171+65 – ~~25'~~ 24' LT 1 EA
+81 171+~~89~~ – 47' LT 1 EA

GATE VALVE AND BOX, 8"
+79 171+~~86~~ – ~~29'~~ 30' LT 1 EA

GATE VALVE AND BOX, 12"
+86 171+~~83~~ – 27' LT 1 EA

WATERMAIN, 6" PVC
171+65 – 27' LT TO 171+65 – 40' RT 67 LF
+79 171+~~86~~ – 47' LT TO 171+94 – 47' LT 15 ~~8~~ LF

WATERMAIN, 8" PVC
+79 171+~~86~~ – 27' LT TO 171+~~86~~ – 60' LT 33 LF

WATERMAIN, 12" PVC
170+00 – 27' LT TO 174+00 – 27' LT 400 LF

FITTINGS, DUCTILE IRON
171+65 – 27' LT 12" X 6" TEE 115 ~~123~~ LBS
171+65 – 40' RT 2 – 6" 1/8 BENDS 62 LBS
+79 171+~~86~~ – 27' LT 12" X 8" TEE 123 ~~137~~ LBS
+79 171+~~86~~ – 47' LT 8" X 6" TEE 80 ~~73~~ LBS
+79 171+~~86~~ – 60' LT 8" PLUG 26 LBS

MANHOLE, AIR RELIEF
172+50 – 27' LT 1 EA

WATER SERVICE LINE 1–1/2" COPPER
170+10 – 27' LT TO 170+10 – ~~40'~~ 38' LT 13 ~~11~~ LF
172+29 – 27' LT TO 173+29 – ~~39'~~ 38' LT 12 ~~11~~ LF
173+34 – 27' LT TO 173+34 – ~~39'~~ 38' LT 12 ~~11~~ LF
+95 173+~~50~~ – 27' LT TO 173+~~50~~ +82 – 40' RT 67 LF
173+91 – 27' LT TO 173+91 – ~~39'~~ 38' LT 12 ~~11~~ LF
171+02 – 27' LT TO 171+02 – 39' LT 12 LF

WATER SERVICE CONNECTION 1 1/2"
170+10 – 27' LT 1 EA
172+29 – 27' LT 1 EA
173+34 – 27' LT 1 EA
+95 173+~~50~~ – 27' LT 1 EA
173+91 – 27' LT 1 EA
171+02 – 27' LT 1 EA

CURB STOP AND BOX 1–1/2"
170+10 – ~~40'~~ 38' LT 1 EA
172+29 – ~~39'~~ 38' LT 1 EA
173+34 – ~~39'~~ 38' LT 1 EA
+82 173+~~50~~ – 40' RT 1 EA
173+91 – ~~39'~~ 38' LT 1 EA
171+02 – 39' LT 1 EA

REMOVE HYDRANT
171+33 – 40' LT 1 EA

WATER SERVICE CONNECTION 2"
171+65 – 31' RT 1 EA

WATER SERVICE LINE 2"
171+65 – 31' RT TO 172+12 – 31' RT 47 LF

CONSTRUCTION NOTES

1. ~~CONNECT 6" WATERMAIN TO EXISTING 6" WATERMAIN~~

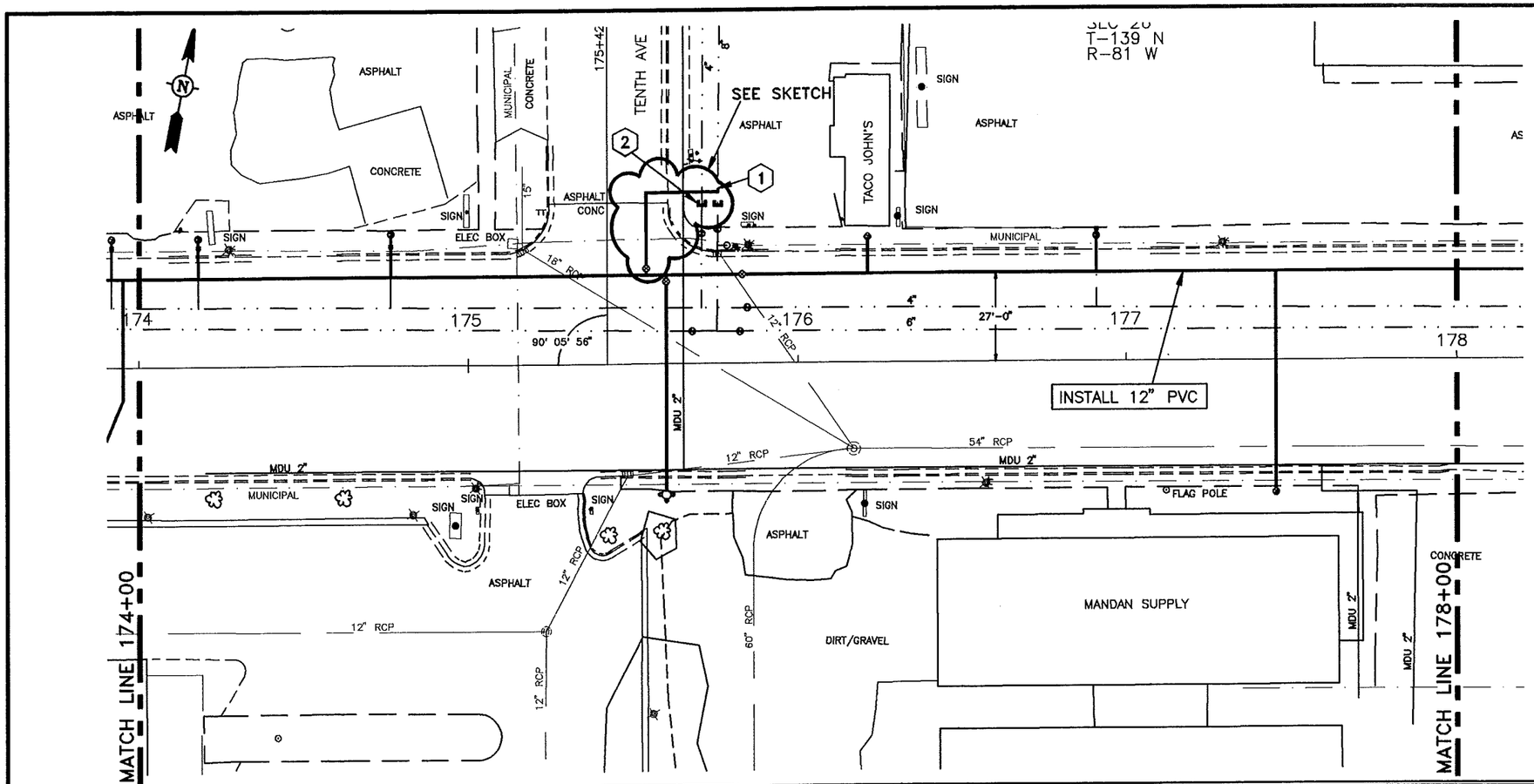
REV.	DATE	DESCRIPTION	BY
1	2/14/97	RECORD DRAWING	DMS

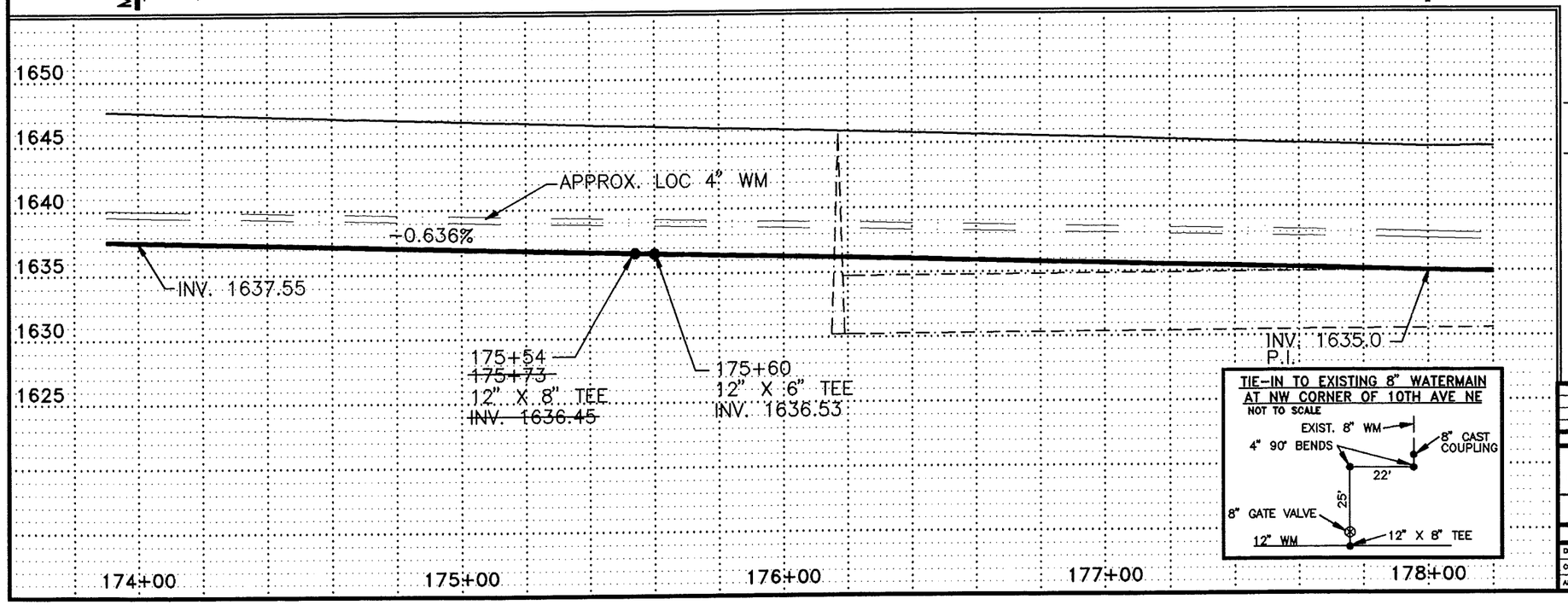
CITY OF MANDAN
DISTRICT #39, WATER IMPROVEMENT PROJECT 95-2, PHASE III

STA 170+00 TO STA 174+00

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS BISMARCK • FARGO • MINNEAPOLIS

DRAWN BY: MJH	SCALE: 1" = 40'	PROJECT NO. 95834
CHECKED BY: BPM	DATE: MAY 17, 1995	SHEET 10 of 20
APPROVED BY: BPM		





TIE-IN TO EXISTING 8" WATERMAIN AT NW CORNER OF 10TH AVE NE
NOT TO SCALE

6" HYDRANT
175+60 – ~~25'~~ 39.5' RT 1 EA

GATE VALVE AND BOX, 6"
175+60 – 24' LT 1 EA

GATE VALVE AND BOX, 8"
+54 175+~~73~~ – ~~29'~~ 30' LT 1 EA

GATE VALVE AND BOX, 12"
+83 175+~~70~~ – 27' LT 1 EA

WATERMAIN, 6" PVC
175+60 – 27' LT TO 175+60 – 39.5' RT 66.5 LF

WATERMAIN, 8" PVC
+54 175+~~73~~ – 27' LT TO 175+~~73~~ +76 ~~49'~~ 55' LT 22 ~~28~~ LF
175+54 – 27' LT TO 175+54 – 52' LT 25 LF

WATERMAIN, 12" PVC
174+00 – 27' LT TO 178+00 – 27' LT 400 LF

FITTINGS, DUCTILE IRON
175+60 – 27' LT 12" X 6" TEE 115 ~~123~~ LBS
+73 175+~~70~~ ~~48'~~ 55' LT 4" PLUG 10 ~~8~~ LBS
+53 175+~~73~~ – 27' LT 12" X 8" TEE 123 ~~137~~ LBS
~~175+73 55' LT 2 8" 1/8 BENDS 184 LBS~~
175+76 – 48' LT 8" PLUG 26 LBS

WATER SERVICE LINE 1-1/2" COPPER
174+76 – 27' LT TO 174+76 ~~40'~~ 38' LT 13 ~~11~~ LF
176+21 – 27' LT TO 176+21 – 38' LT 11 LF
176+91 – 27' LT TO 176+91 – 38' LT 11 LF
+45 177+~~05~~ – 27' LT TO 177+~~05~~ – 40' RT 67 LF

WATER SERVICE LINE 2" COPPER
174+18 – 27' LT TO 174+18 ~~39'~~ 38' LT 12 ~~11~~ LF

WATER SERVICE CONNECTION
174+18 – 27' LT 1 EA – 2" CONNECTION
174+76 – 27' LT 1 EA
176+21 – 27' LT 1 EA
176+91 – 27' LT 1 EA
+45 177+~~05~~ – 27' LT 1 EA

CURB STOP AND BOX 1-1/2"
174+76 ~~40'~~ 38' LT 1 EA
176+21 – 38' LT 1 EA
176+91 – 38' LT 1 EA
177+~~05~~ +45 – 40' RT 1 EA

CURB STOP AND BOX 2"
174+18 ~~39'~~ 38' LT 1 EA

REMOVE HYDRANT
175+80 – 36' LT 1 EA

CONSTRUCTION NOTES

1. CONNECTED ~~CONNECT~~ NEW 8" W.M. TO EXISTING 8" W.M.
2. PLUGGED ~~PLUG~~ EXISTING 4"

Record Drawing

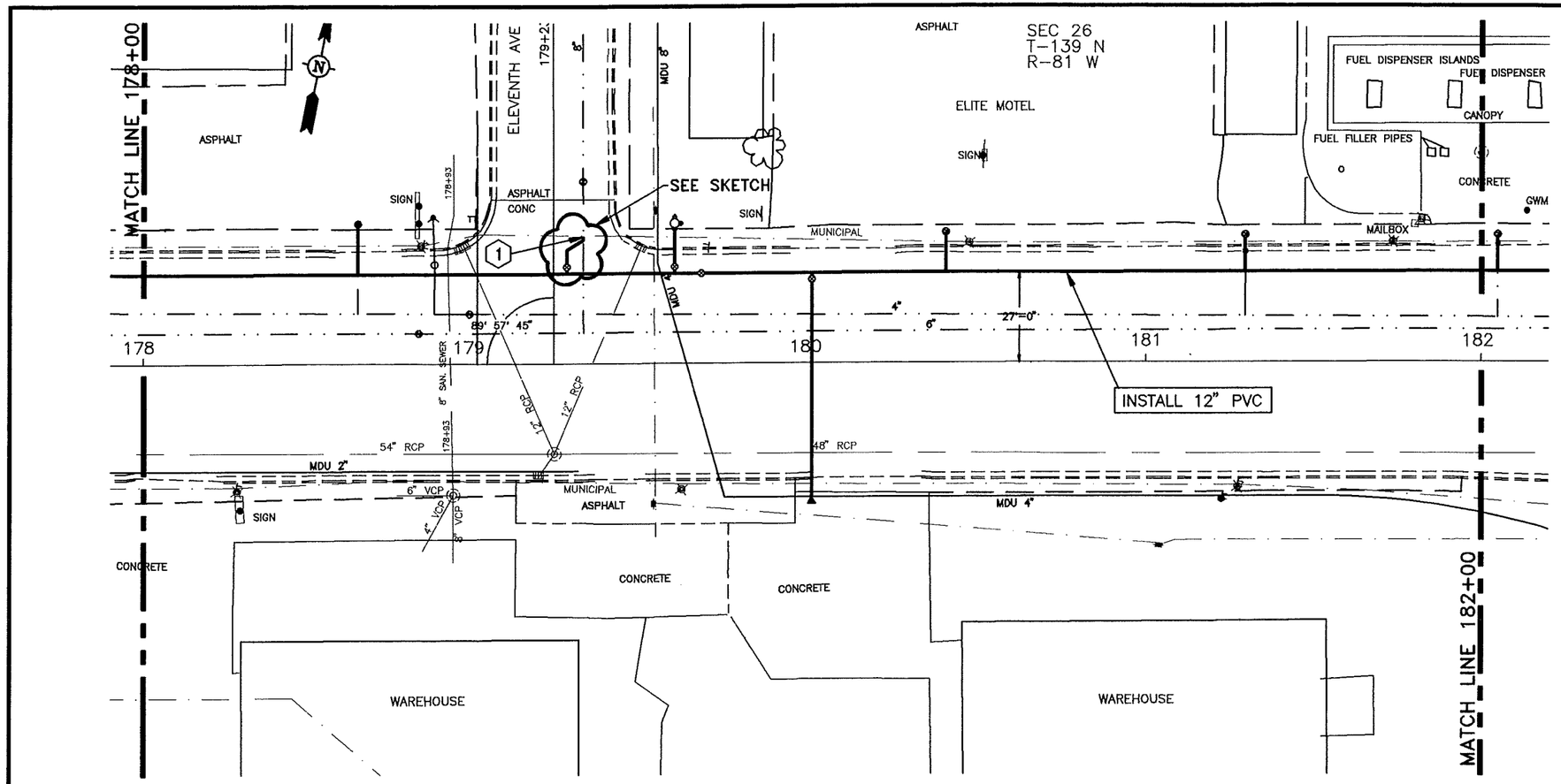
REV.	DATE	DESCRIPTION	BY
	2/14/97	RECORD DRAWING	DMS

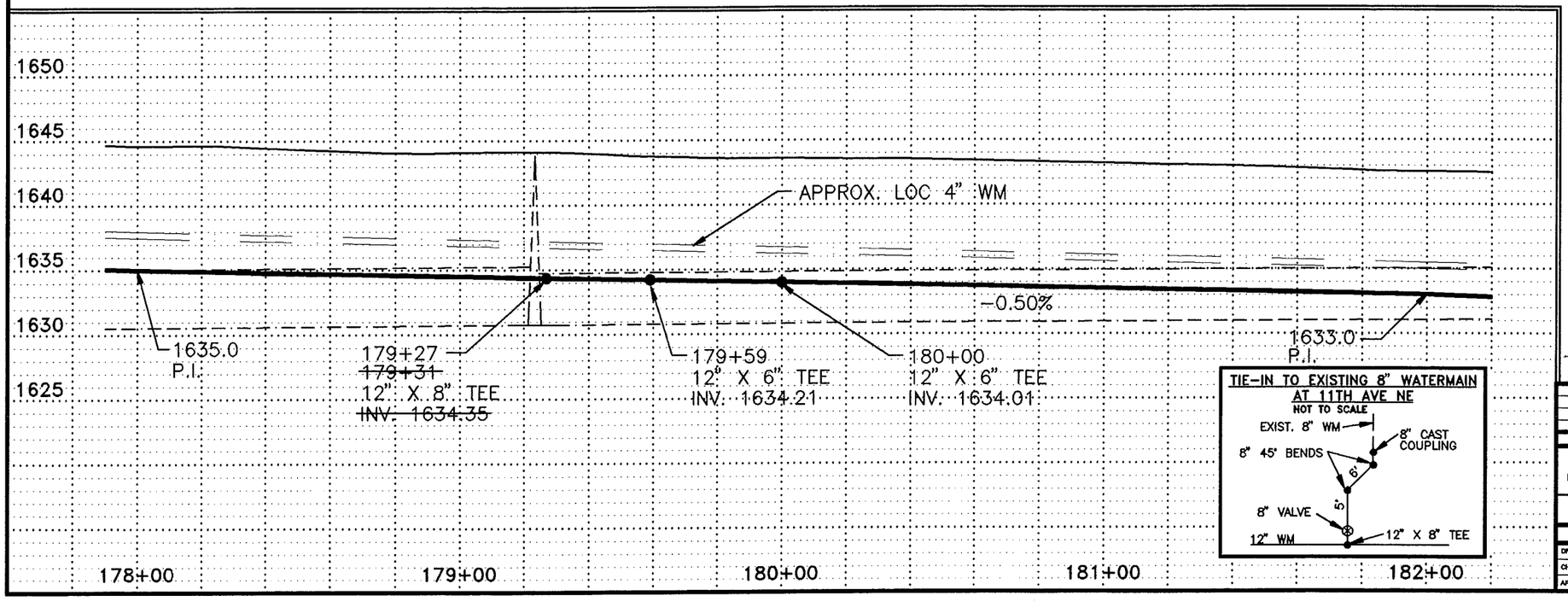
CITY OF MANDAN
DISTRICT #38, WATER IMPROVEMENT PROJECT 96-2, PHASE III

STA 174+00 TO STA 178+00

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS BISMARCK • FARGO • MINNEAPOLIS

DRAWN BY: MJH	SCALE: 1" = 40'	PROJECT NO. 95834
CHECKED BY: BPM	DATE: MAY 17, 1995	SHEET 11 of 20
APPROVED BY: BPM		





TIE-IN TO EXISTING 8" WATERMAIN AT 11TH AVE NE
NOT TO SCALE

6" HYDRANT
179+59 ~~42' 47'~~ LT 1 EA

GATE VALVE AND BOX, 6"
179+59 ~~29' 30'~~ LT 1 EA
180+00 ~~25' 24'~~ LT 1 EA

GATE VALVE AND BOX, 8"
+27 179+~~31~~ ~~29' 30'~~ LT 1 EA

GATE VALVE AND BOX, 12"
+67 179+~~28~~ – 27' LT 1 EA

WATERMAIN, 6" PVC
179+59 – 27' LT TO 179+59 ~~42' 47'~~ LT 15 ~~20~~ LF
180+00 – 27' LT TO 180+00 – 40' RT 67 LF

WATERMAIN, 8" PVC
+27 179+~~31~~ – 27' LT TO 179+~~31~~ ~~37' 35'~~ LT 11 ~~8~~ LF

WATERMAIN, 12" PVC
178+00 – 27' LT TO 182+00 – 27' LT 400 LF

FITTINGS, DUCTILE IRON

+27 179+~~31~~ – 27' LT	12" X 8" TEE	123 ~~137~~	LBS
179+59 – 27' LT	12" X 6" TEE	115 ~~123~~	LBS
180+00 – 27' LT	12" X 6" TEE	115 ~~123~~	LBS
180+00 – 40' RT	6" PLUG	15	LBS
180+00 – 15' LT	2 – 6" 1/8 BEND	76	LBS
179+27 – 33' LT	1 – 8" 1/8 BEND	38	LBS
179+31 – 37' LT	1 – 8" 1/8 BEND	38	LBS

WATER SERVICE LINE 1-1/2" COPPER
~~178+65 – 27' LT TO 178+65 – 42' LT 15 LF~~
181+30 – 27' LT TO 181+30 ~~38' 39'~~ LT 11 ~~12~~ LF

WATER SERVICE LINE 2" COPPER
180+40 – 27' LT TO 180+40 ~~38' 39'~~ LT 11 ~~12~~ LF
178+65 – 27' LT TO 178+65 – 42' LT 15 LF

WATER SERVICE CONNECTION

178+65 – 27' LT	1 EA – 2" CONNECTION
180+40 – 27' LT	1 EA – 2" CONNECTION
181+30 – 27' LT	1 EA – 1 1/2" CONNECTION

CURB STOP AND BOX 1-1/2"
~~178+65 – 42' LT 1 EA~~
181+30 ~~38' 39'~~ LT 1 EA

CURB STOP AND BOX 2"
180+40 ~~38' 39'~~ LT 1 EA
178+65 – 42' LT 1 EA

REMOVE HYDRANT
178+90 – 30' LT 1 EA

CONSTRUCTION NOTES

(1) CONNECTED ~~CONNECT~~ NEW 8" W.M. TO EXISTING 8" W.M.

Record Drawing

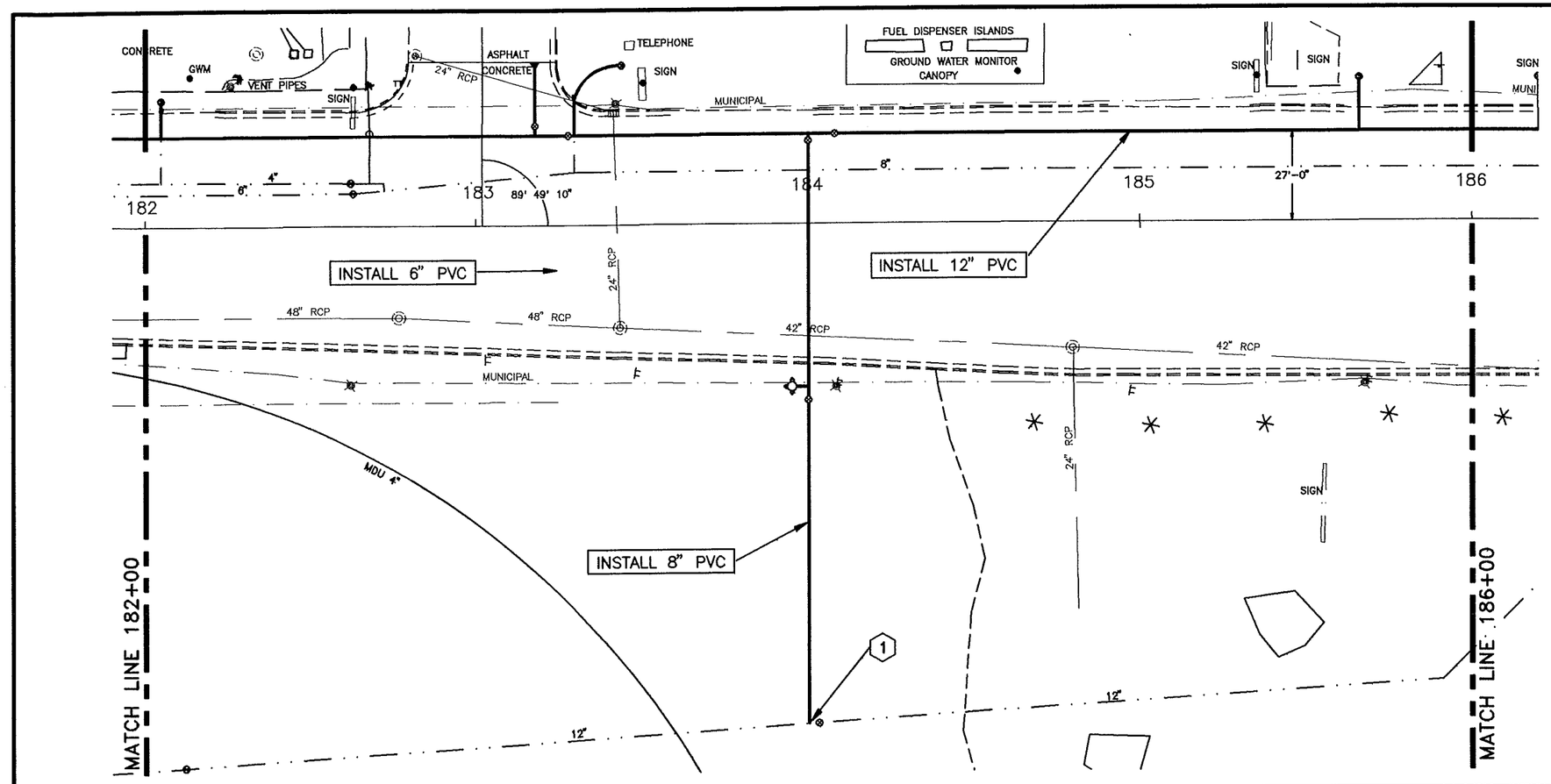
REV.	DATE	DESCRIPTION	BY
3			
2			
1	2/14/97	RECORD DRAWING	DMS

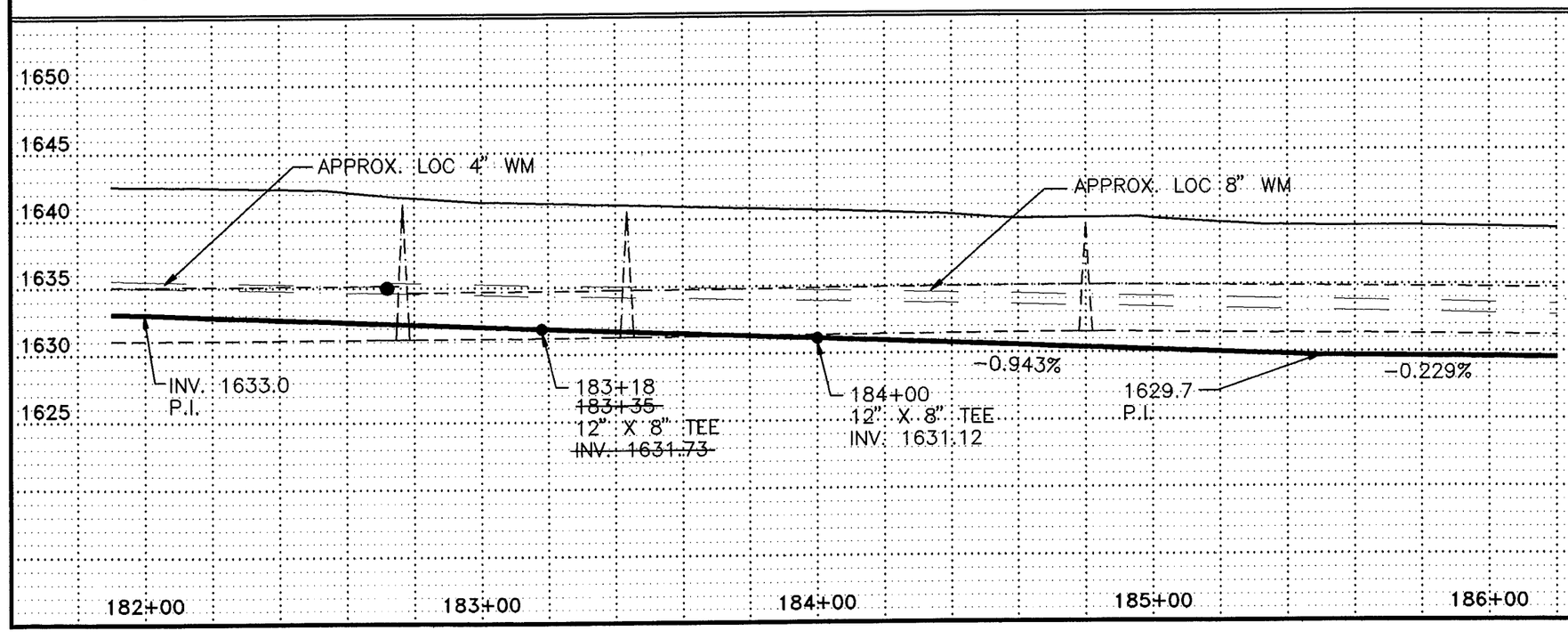
CITY OF MANDAN
DISTRICT #39, WATER IMPROVEMENT PROJECT 96-2, PHASE III

STA 178+00 TO STA 182+00

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS BISMARCK • FARGO • MINNEAPOLIS

DRAWN BY: MJH	SCALE: 1" = 40'	PROJECT NO. 95834
CHECKED BY: BPM	DATE: MAY 17, 1995	SHEET 12 of 20
APPROVED BY: BPM		





6" HYDRANT

+95 183+~~25~~ – ~~49'~~ 41' RT 1 EA

GATE VALVE AND BOX, 6"

~~183+25 24' LT 1 EA~~

GATE VALVE AND BOX, 8"

+18 183+~~35~~ – ~~29'~~ 30' LT 1 EA
184+00 – ~~25'~~ 24' LT 1 EA
184+00 – ~~53'~~ ~~147'~~ RT 1 EA
~~184+03 150' RT 1 EA~~

GATE VALVE AND BOX, 12"

+28 183+~~32~~ – 27' LT 1 EA
+08 184+~~03~~ – 27' LT 1 EA
184+02 – 156' RT 1 EA

WATERMAIN, 6" PVC

~~183+25 27' LT TO 183+25 41' RT 68 LF~~
~~184+00 – 49' RT TO 183+95 – 49' RT 5 LF~~

WATERMAIN, 8" PVC

+18 183+~~35~~ – 27' LT TO 183+~~35~~ – 47' LT 20 LF
184+00 – 27' LT TO 184+00 – ~~156'~~ 150' RT ~~183~~ 177 LF

WATERMAIN, 12" PVC

182+00 – 27' LT TO 186+00 – 27' LT 400 LF
184+00 – 156' RT 4 LF

FITTINGS, DUCTILE IRON

184+00 183+~~25~~ – ~~49'~~ ~~27' LT~~ RT ~~8"~~ 12" X 6" TEE 80 ~~123~~ LBS
~~183+25 25' RT 6" 1/8 BEND 31 LBS~~
~~183+25 28.5' RT 6" 1/8 BEND 31 LBS~~
+18 183+~~35~~ – 27' LT 12" X 8" TEE 123 ~~137~~ LBS
+18 183+~~35~~ – 47' LT 8" PLUG 26 LBS
184+00 – 27' LT 12" X 8" TEE 123 ~~137~~ LBS
184+00 – ~~156'~~ 150' LT ~~12"~~ 8" X 8" TEE 123 ~~82~~ LBS

WATER SERVICE LINE 1–1/2" COPPER

182+05 – 27' LT TO 182+05 – ~~38'~~ 39' LT 11 ~~12~~ LF
183+30 – 27' LT TO 183+~~30~~ – ~~48'~~ ~~47'~~ LT 21 ~~20~~ LF
+66 185+~~65~~ – 27' LT TO 185+~~65~~ – ~~43'~~ ~~40'~~ LT 16 ~~13~~ LF

WATER SERVICE CONNECTION 1–1/2"

182+05 – 27' LT 1 EA
183+30 – 27' LT 1 EA
+66 185+~~65~~ – 27' LT 1 EA

CURB STOP AND BOX 1–1/2"

182+05 – ~~38'~~ 39' LT 1 EA
+44 183+~~30~~ – ~~48'~~ ~~47'~~ LT 1 EA
+66 185+~~65~~ – ~~43'~~ ~~40'~~ LT 1 EA

REMOVE HYDRANT

182+67 – 43' LT 1 EA

POLYSTYRENE INSULATION

184+00 – 35' RT 128 BDFT

CONSTRUCTION NOTES

(1) CUT IN ~~8"~~ 12" X 8" TEE AND ~~8"~~ 12" VALVE AND BOX ON EAST LEG

Record Drawing

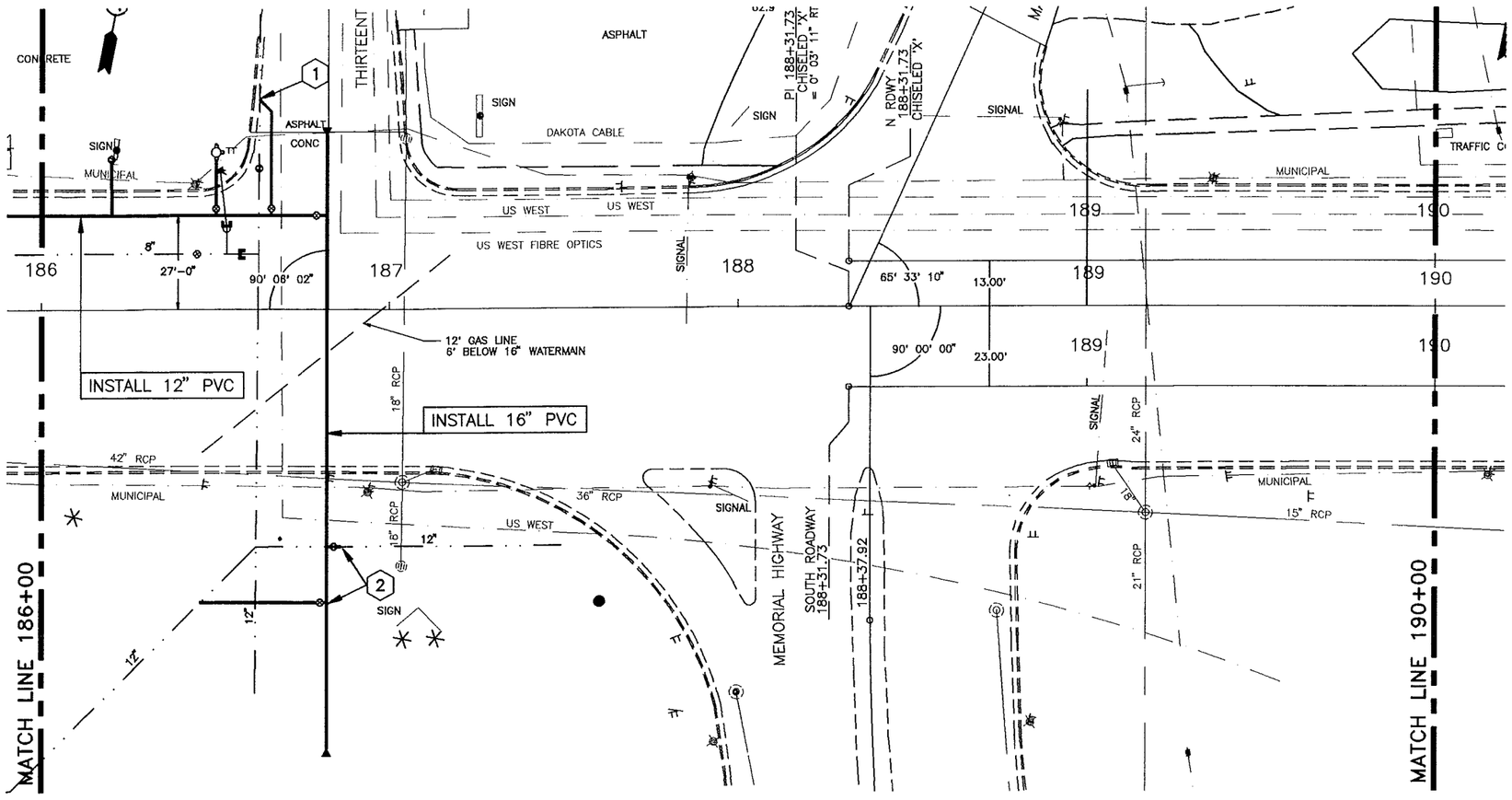
REV.	DATE	DESCRIPTION	BY
2	2/14/97	RECORD DRAWING	DMS

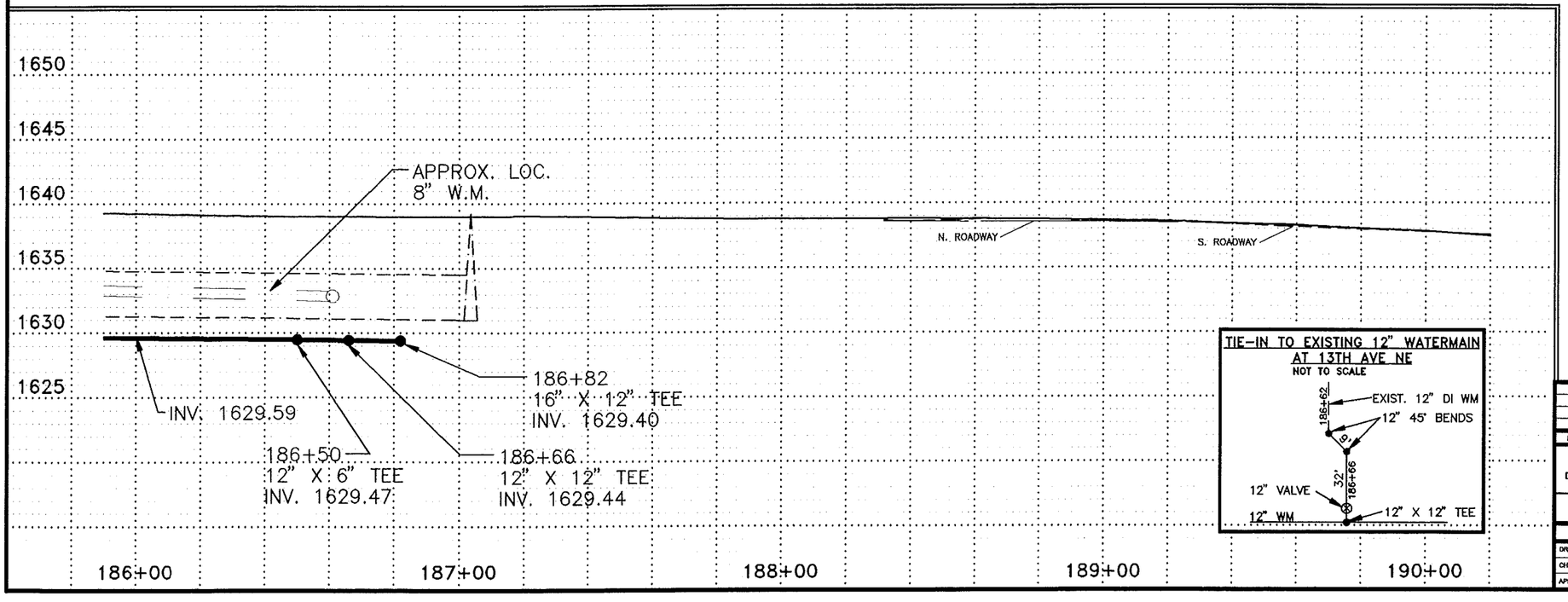
CITY OF MANDAN
DISTRICT #39, WATER IMPROVEMENT PROJECT 96-2, PHASE III

STA 182+00 TO STA 186+00

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS BISMARCK • FARGO • MINNEAPOLIS

DRAWN BY: MJH	SCALE: 1" = 40'	PROJECT NO. 95834
CHECKED BY: BPM	DATE: MAY 17, 1995	SHEET 13 of 20
APPROVED BY: BPM		





TIE-IN TO EXISTING 12" WATERMAIN AT 13TH AVE NE
NOT TO SCALE

6" HYDRANT
186+50 – 45' LT 1 EA

GATE VALVE AND BOX, 6"
186+50 – ~~29'~~ 30' LT 1 EA

GATE VALVE AND BOX, 8"
186+79 – 120' RT 1 EA

GATE VALVE AND BOX, 12"
186+66 – ~~29'~~ 30' LT 1 EA
186+79 – 27' LT 1 EA
+84 186+~~85~~ – ~~68'~~ 115' RT 1 EA
186+80 – 84' RT 1 EA

WATERMAIN, 6" PVC
186+50 – 27' LT TO 186+50 – 45' LT 18 LF

WATERMAIN, 8" PVC
~~186+47 – 120' RT TO 186+82 – 120' RT 35 LF~~

WATERMAIN, 12" PVC
186+00 – 27' LT TO 186+82 – 27' LT 82 LF
186+66 – 27' LT TO 186+62 – 60' LT 32 ~~33~~ LF
186+82 ~~68'~~ 115' RT TO ~~187+04~~ 186+86 – ~~68'~~ 115' RT 4 ~~22~~ LF
186+45 – 84' RT TO 186+82 – 84' RT 37 LF

WATERMAIN, 16" PVC (OR 18")
186+82 – 50' LT TO 186+82 – 126' RT 176 LF

FITTINGS, DUCTILE IRON

186+47 – 120' RT	8" 1/8 BEND	45 LBS
186+50 – 27' LT	12" X 6" TEE	115 ~~123~~ LBS
186+62 – 60' LT	2 – 12" 1/8 BENDS	184 LBS
186+66 – 27' LT	12" X 12" TEE	178 ~~164~~ LBS
186+82 – 27' LT	16" X 12" TEE	281 ~~590~~ LBS
186+82 – 50' LT	16" PLUG	93 ~~150~~ LBS
186+82 – ~~68'~~ 115' RT	16" X 12" TEE	281 ~~590~~ LBS
186+82 – ~~84'~~ 120' RT	16" X ~~8"~~ 12" TEE	281 ~~550~~ LBS
186+82 – 126' RT	16" PLUG	93 ~~150~~ LBS
~~187+04 – 115' RT~~	~~12" 1/32 BEND~~	~~65 LBS~~
186+53 – 24' LT	6" PLUG	18 LBS
186+57 – 18' LT	6" PLUG	18 LBS

WATER SERVICE LINE 1-1/2" COPPER
186+20 – 27' LT TO 186+20 – ~~43'~~ 40' LT 16 ~~13~~ LF

WATER SERVICE CONNECTION 1-1/2"
186+20 – 27' LT 1 EA

CURB STOP AND BOX 1-1/2"
186+20 – ~~43'~~ 40' LT 1 EA

REMOVE HYDRANT
186+50 – 35' LT 1 EA

POLYSTYRENE INSULATION
186+82 – 50' RT 64 BDFT

CONSTRUCTION NOTES

1. CONNECTED
~~CONNECT~~ NEW 12" TO EXISTING 12" GOING NORTH ONCE EXISTING 12" UNDER MAIN CAN BE ABANDONED
2. CONNECTED
~~CONNECT~~ NEW LINE TO EXISTING LINE

Record Drawing

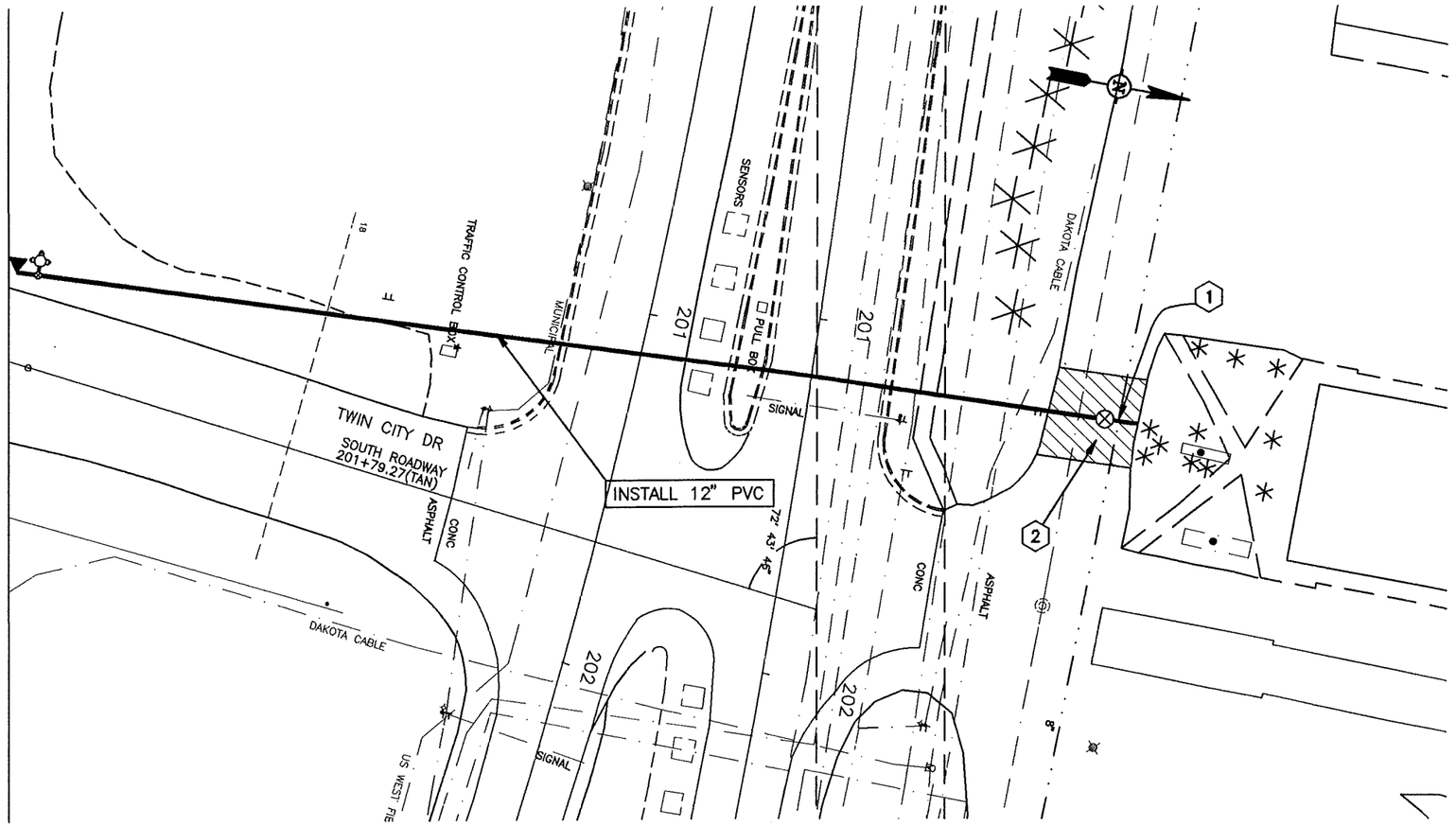
REV.	DATE	DESCRIPTION	BY
1	2/14/97	RECORD DRAWING	DMS

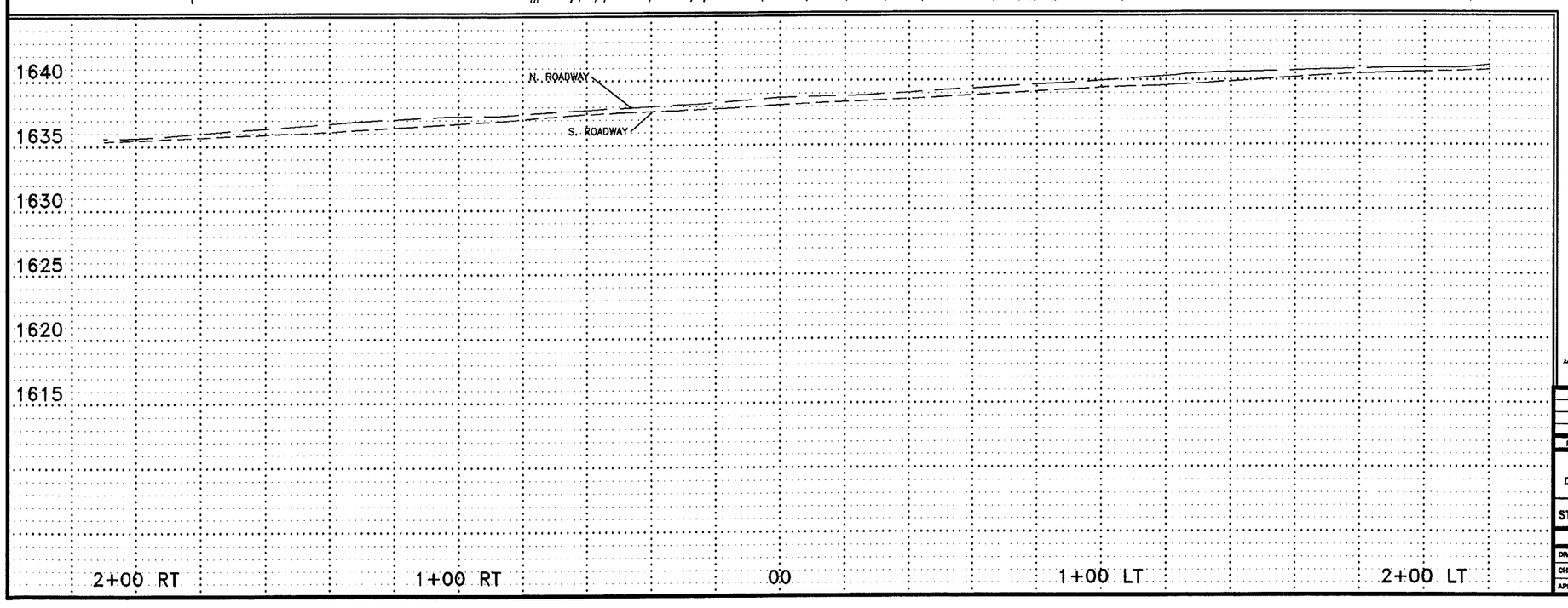
CITY OF MANDAN
DISTRICT #39, WATER IMPROVEMENT PROJECT 96-2, PHASE III

STA 186+00 TO STA 190+00

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS BISMARCK • FARGO • MINNEAPOLIS

DRAWN BY: MJH	SCALE: 1" = 40'	PROJECT NO. 95834	
CHECKED BY: BPM	DATE: MAY 17, 1995	SHEET 14 of 20	
APPROVED BY: BPM			





6" HYDRANT		
201+12 – 218' RT OF N RDWY ℄		1 EA
GATE VALVE AND BOX, 6"		
201+18 – 218' RT OF N RDWY ℄		1 EA
GATE VALVE AND BOX, ~~12~~ 8"		
201+18 – 83' LT OF N RDWY ℄		1 EA
WATERMAIN, 6" PVC		
201+12 – 218' RT TO 201+18 – 218' RT		6 LF
WATERMAIN, 12" PVC		
201+18 – 86' LT TO 201+18 – 224' RT		310 LF
FITTINGS, DUCTILE IRON		
201+18 – 86' LT	8"X12" TEE	123 ~~137~~ LBS
201+18 – 218' RT	12"X6" TEE	123 LBS
201+18 – 224' RT	12" PLUG	49 LBS
201+18 – 83' LT	12" TO 8" REDUCER	64 LBS

CONSTRUCTION NOTES

1. CUT IN 12" X 8" TEE
2. ~~REMOVE~~ REMOVED AND ~~REPLACE~~ REPLACED ASPHALT PAVEMENT AS REQUIRED, ALL COSTS INCIDENTAL

Record Drawing

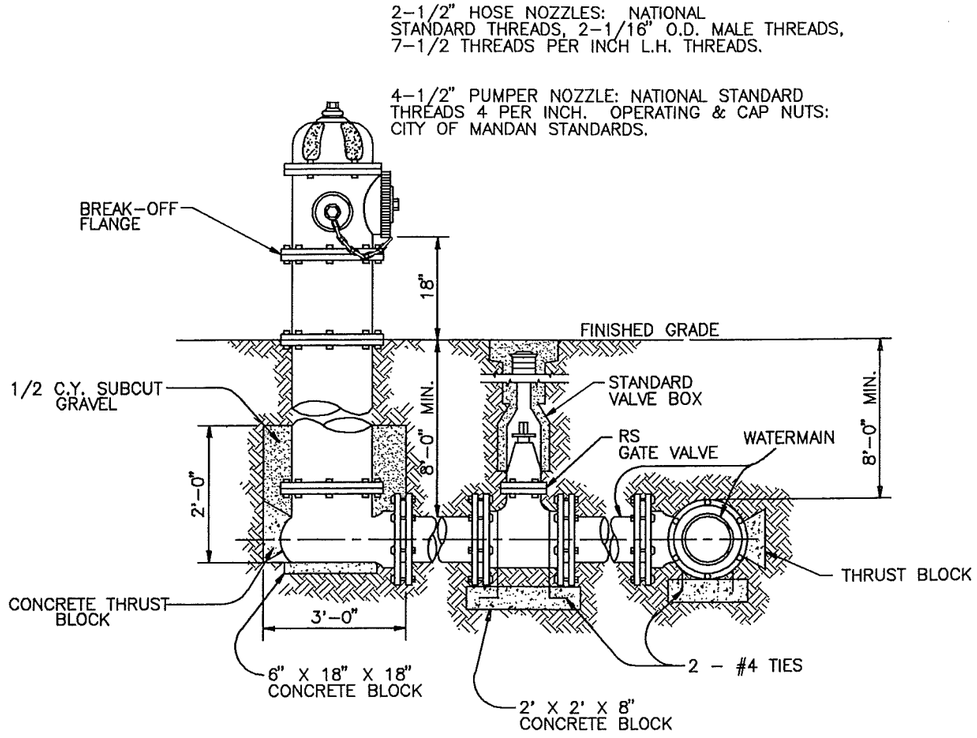
REV.	DATE	DESCRIPTION	BY
1	2/14/97	RECORD DRAWING	DMS

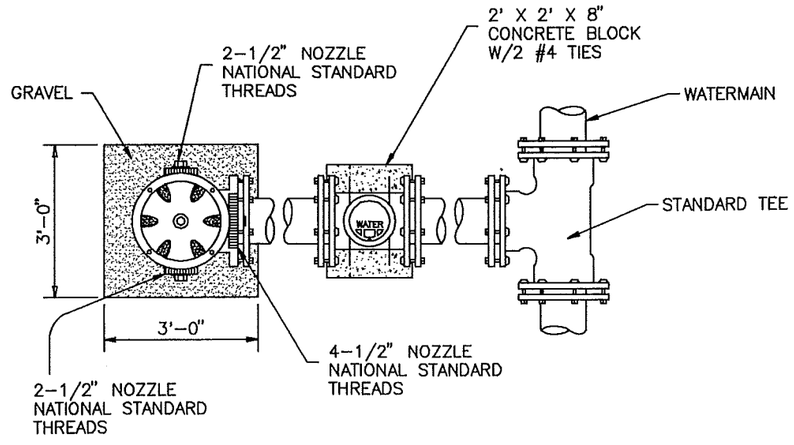
CITY OF MANDAN
DISTRICT #39, WATER IMPROVEMENT PROJECT 96-2, PHASE III

STA 201+18 – 86' LT TO STA 201+18 – 224' RT

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS RESEARCH & FARGO & MINNEAPOLIS

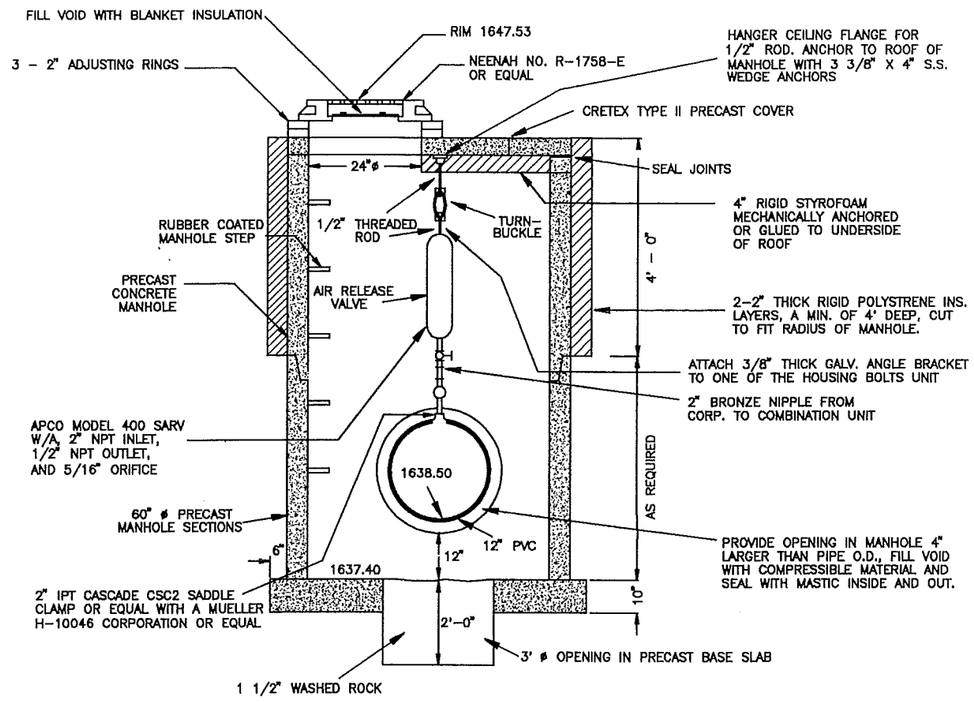
DRAWN BY: MJH	SCALE: 1" = 40'	PROJECT NO. 95834
CHECKED BY: BPM	DATE: MAY 17, 1995	SHEET 15 of 20
APPROVED BY: BPM		





HYDRANT & VALVE DETAIL

NOT TO SCALE



AIR RELIEF VALVE AND MANHOLE DETAIL

CONSTRUCTION NOTES

(1) THE UNIT PRICE BID PER EACH (EA) "AIR RELIEF VALVE AND MANHOLE" SHALL COVER ALL COSTS FOR PROVIDING ALL MATERIALS SHOWN ON THE DETAIL AND THEIR INSTALLATION.

Record Drawing

REV.	DATE	DESCRIPTION	BY
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CITY OF MANDAN
DISTRICT #39, WATER IMPROVEMENT PROJECT 96–2, PHASE III

DETAILS

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS FARGO • BISMARCK • MINNEAPOLIS

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CHECKED BY: BPM	DATE: SEPT, 27, 1995	SHEET 16 of 20	
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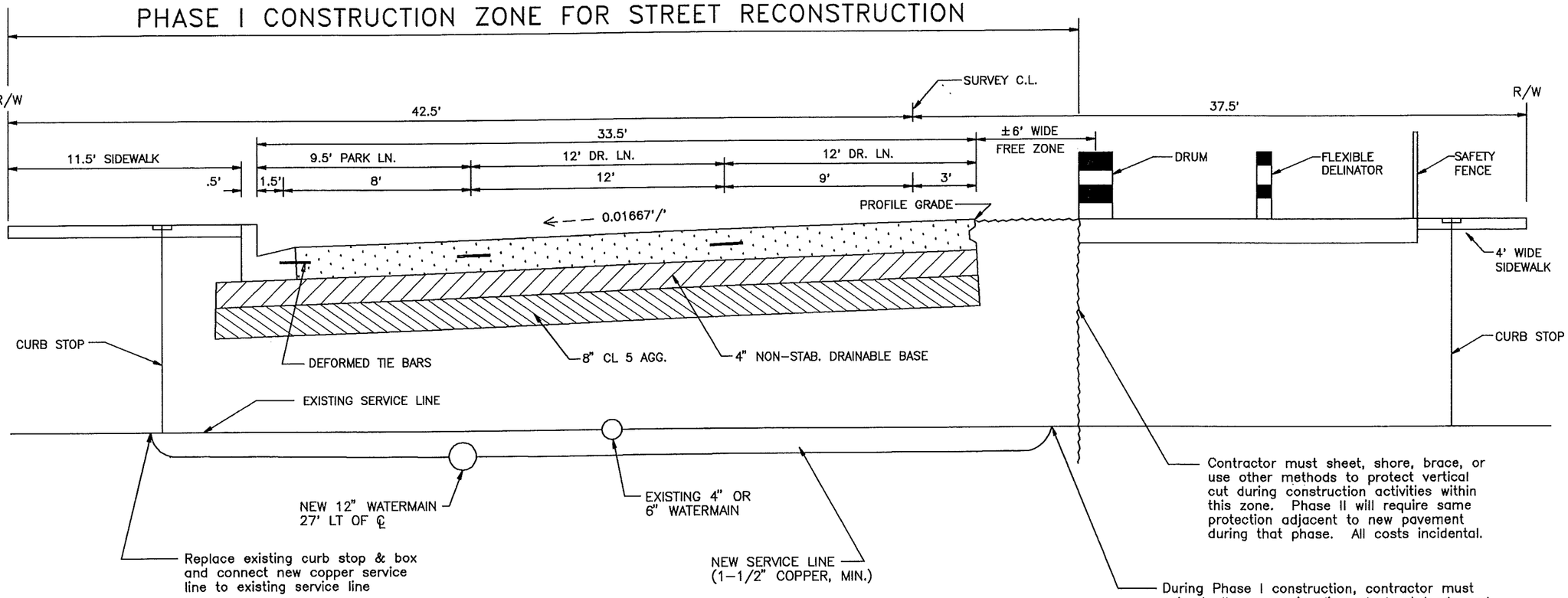
PHASE I CONSTRUCTION ZONE FOR STREET RECONSTRUCTION



Contractor must sheet, shore, brace, or use other methods to protect vertical cut during construction activities within this zone. Phase II will require same protection adjacent to new pavement during that phase. All costs incidental.

Replace existing curb stop & box and connect new copper service line to existing service line

During Phase I construction, contractor must extend all new service lines, hydrant leads and all other water or sewer related piping into this zone. New lines must be connected to existing lines within this area so that services are maintained to all users on the south side of main street. All costs for connections incidental.

Record Drawing

REV.	DATE	DESCRIPTION	BY

CITY OF MANDAN

DISTRICT #30, WATER IMPROVEMENT PROJECT 98-2, PHASE III

PHASING DETAILS

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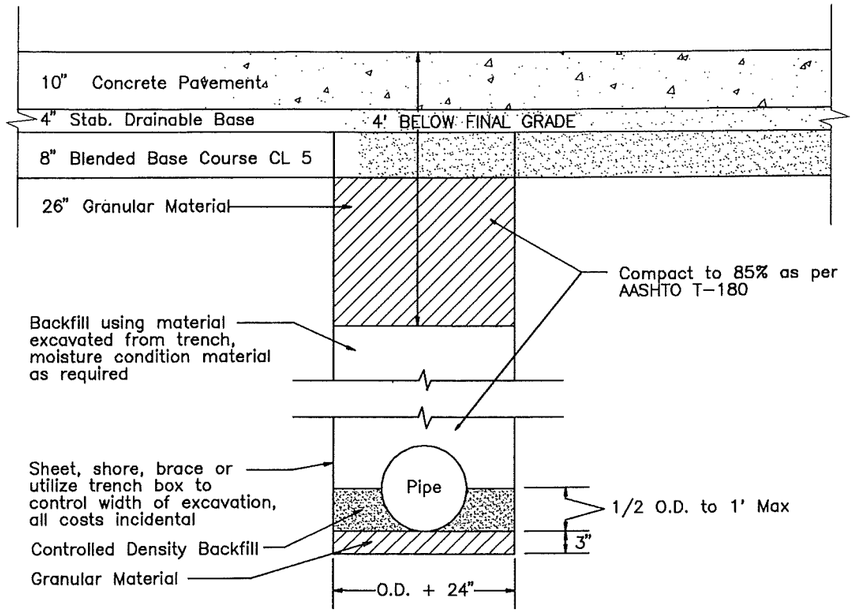
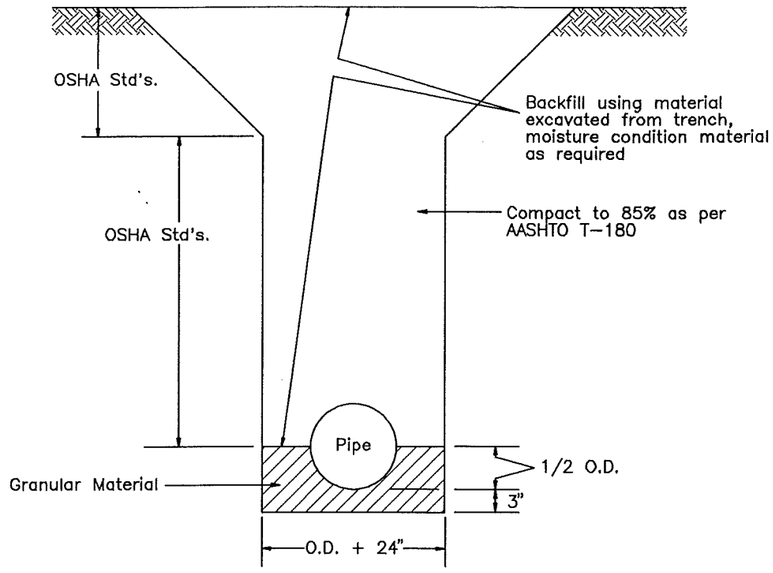
CHECKED BY: BPM	DATE: SEPT.27,1995	SHEET 17 of 20
APPROVED BY: BPM		



BEDDING AND BACKFILL FOR PIPE UNDER THE ROADWAY

CONTROLLED DENSITY BACKFILL:
Shall be a blend of cement, water, pozzolanic materials and fillers. The material shall be fluid on placement to flow around and fill voids around pipes in the backfill area. The material shall be able to support normal loads after six hours and shall have a compressive strength in the range of 75 psi. to 125 psi. at 28 days. the material shall be such that it lends itself to easy removal with a tractor backhoe. The contractor shall provide mix design and compression strength test results of the material to the engineer for approval five days prior to placement. Two typical mix designs are shown below. Both mix designs yield approximately one cubic yard of flowable mortar.

Mix No. 1		Mix No. 2	
Sand	3000 lbs.	Cement	100 lbs.
Water	450 lbs.	Fly Ash	300 lbs.
Fly Ash	250 lbs.	Fine Aggregate	2600 lbs.
Cement	30 lbs.	Water	70 gals.



BEDDING AND BACKFILL FOR PIPE NOT UNDER ROADWAY

NOTES:

1) All granular material shall be class 5.
2) The cost for all backfill material, to include granular material, controlled density backfill, moisture conditioned existing soils, etc., shall be included in the price bid for the pipe.
3) Four (4) feet below final grade the moisture content of material used for backfill can not be higher or lower than what will allow compaction to the specified density. The moisture content of the upper four (4) feet shall be from optimum to +5%.
4) These notes are applicable to both types of trenches.
5) Controlled density backfill not required on copper service lines.

Record Drawing

REV.	DATE	DESCRIPTION	BY

CITY OF MANDAN
DISTRICT #38, WATER IMPROVEMENT PROJECT 96-2, PHASE III

TRENCH DETAILS

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS FARGO • BISMARCK • MINNEAPOLIS

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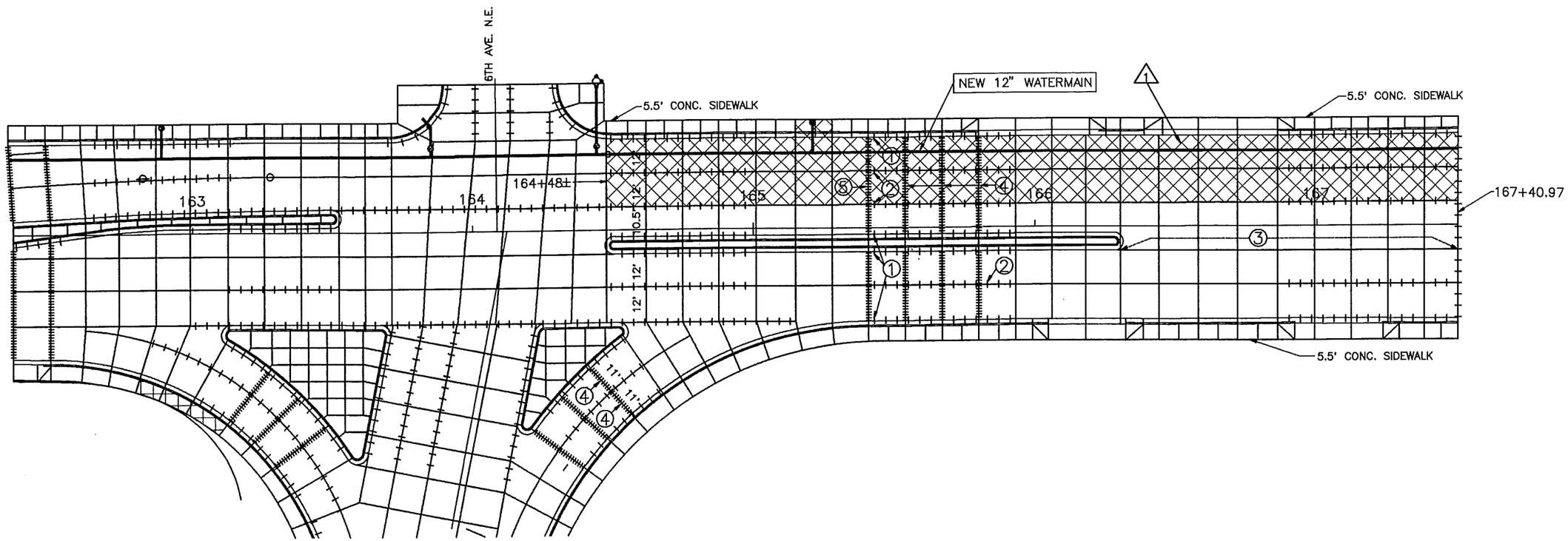
CHECKED BY: BPM	DATE: SEPT. 27, 1995	SHEET 18 of 20	
APPROVED BY: BPM			



CONSTRUCTION NOTES

1. REMOVE AND REPLACE CROSS-HATCHED 10" THICK CONCRETE PAVEMENT IN ORDER TO INSTALL NEW 12" WATERMAIN. PROTECT ALL EXISTING CURB & GUTTER AND SIDEWALK ALONG NORTH SIDE OF STREET EXCEPT WHERE THEY NEED TO BE REMOVED TO INSTALL SERVICE LINES. SAW PAVEMENT FULL DEPTH ALONG JOINTS WHERE REMOVAL IS TO TAKE PLACE. COSTS FOR SAWING INCIDENTAL TO REMOVAL OF CONCRETE PAVEMENT. INSTALL REPLACEMENT 10" CONCRETE PAVEMENT ON 12" THICK CL5 SUBBASE. COSTS FOR CL5 SUBBASE INCIDENTAL TO 10" CONCRETE PAVEMENT REPAIR. ALL NEW PANELS TO MATCH EXISTING WIDTHS AND LENGHTS.

2. DRILL AND EPOXY NO. 3 X 1'-6" TIE BARS INTO FACE OF EXISTING GUTTER AND ALONG NORTH EDGE OF EXISTING PAVEMENT PRIOR TO REPLACING CONCRETE PAVEMENT. RESTORE ALL OTHER LONGITUDINAL AND TRANSVERSE JOINTS TO MATCH EXISTING. ALL COSTS FOR JOINTS INCIDENTAL TO 10" CONCRETE PAVEMENT REPAIR.

3. WIDEN AND SEAL ALL JOINTS WITH SILICONE. COSTS INCIDENTAL TO 10" CONCRETE PAVEMENT REPAIR.

4. REMOVE AND REPLACE SIDEWALK AND CURB AND GUTTER AS NEEDED TO INSTALL SERVICE CONNECTIONS OR HYDRANTS.

QUANTITIES

REMOVE CONCRETE, SIDEWALK	8 SY
REMOVE CONCRETE, PAVEMENT	808 SY
10" CONCRETE PAVEMENT	808 SY
REMOVE CURB AND GUTTER	13 LF
SIDEWALK	8 SY
CURB AND GUTTER	13 LF

EXISTING JOINT KEY

① NO. 3 X 1'-6" TIE BAR @ 4'-0" C-C (CONTINUOUS)
② NO. 4 X 2'-6" TIE BAR @ 4'-0" C-C (CONTINUOUS)
③ KEYED JOINT (SILICONE SEAL)
④ DOWELED CONTRACTION JOINT
⑤ DOWELED EXPANSION JOINT

Record Drawing

REV.	DATE	DESCRIPTION	BY

CITY OF MANDAN

DISTRICT #39, WATER IMPROVEMENT PROJECT 96-2, PHASE III

PAVEMENT LAYOUT STA 164+48± TO 167+40.97

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SCALE: 1" = 40'
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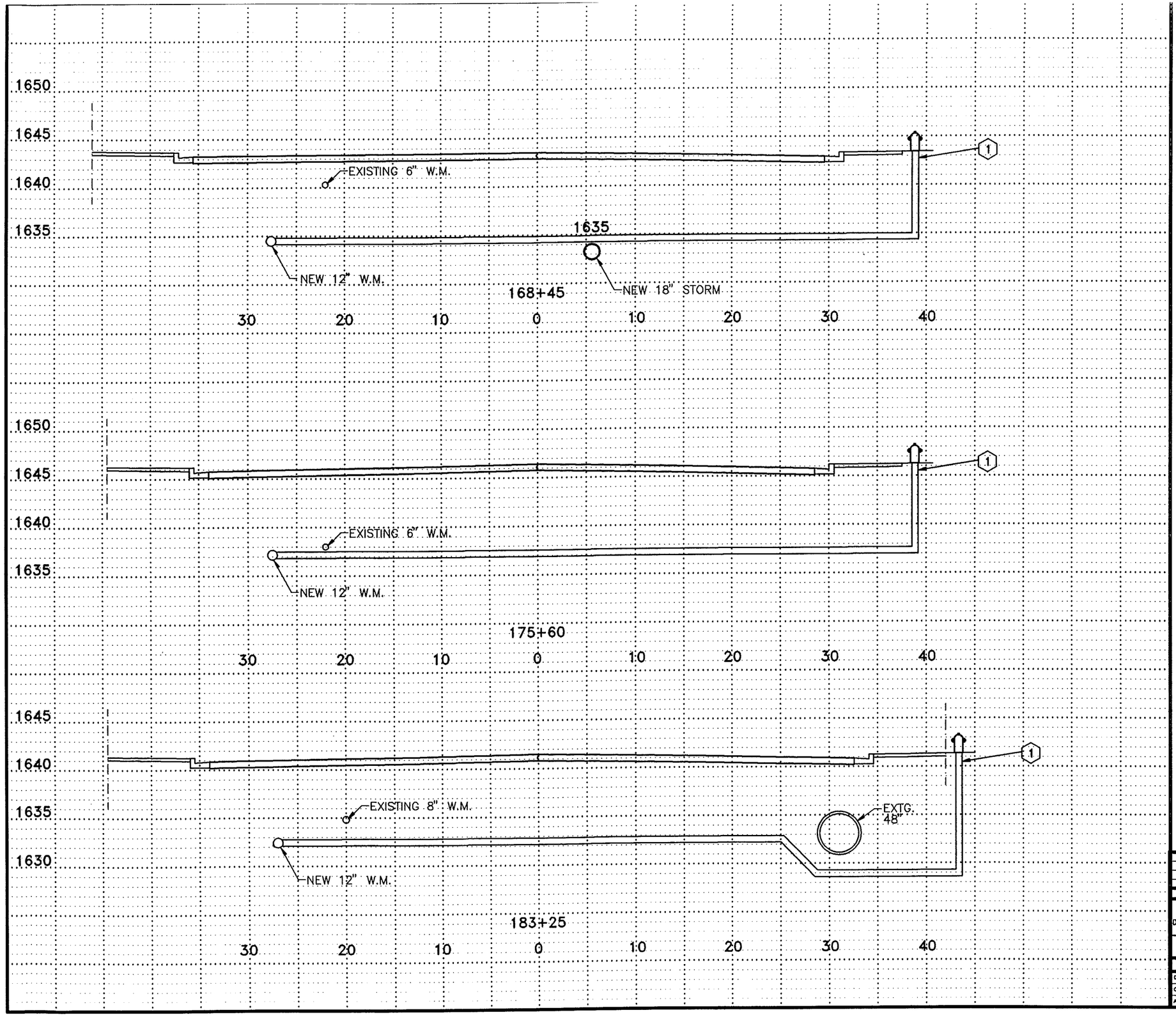
PROJECT NO. 95834
SHEET 19 of 20



CONSTRUCTION NOTES

(1) INSTALL HYDRANT EXTENSIONS OF LENGTH REQUIRED TO BRING TOP OF HYDRANT TO PROPER GRADE

Record Drawing

REV.	DATE	DESCRIPTION	BY

CITY OF MANDAN

DISTRICT #39, WATER IMPROVEMENT PROJECT 96-2, PHASE III

CROSS-SECTIONS AT HYDRANTS

ULTEIG ENGINEERS, INC. CONSULTING ENGINEERS BISMARCK • FARGO • MINNEAPOLIS

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