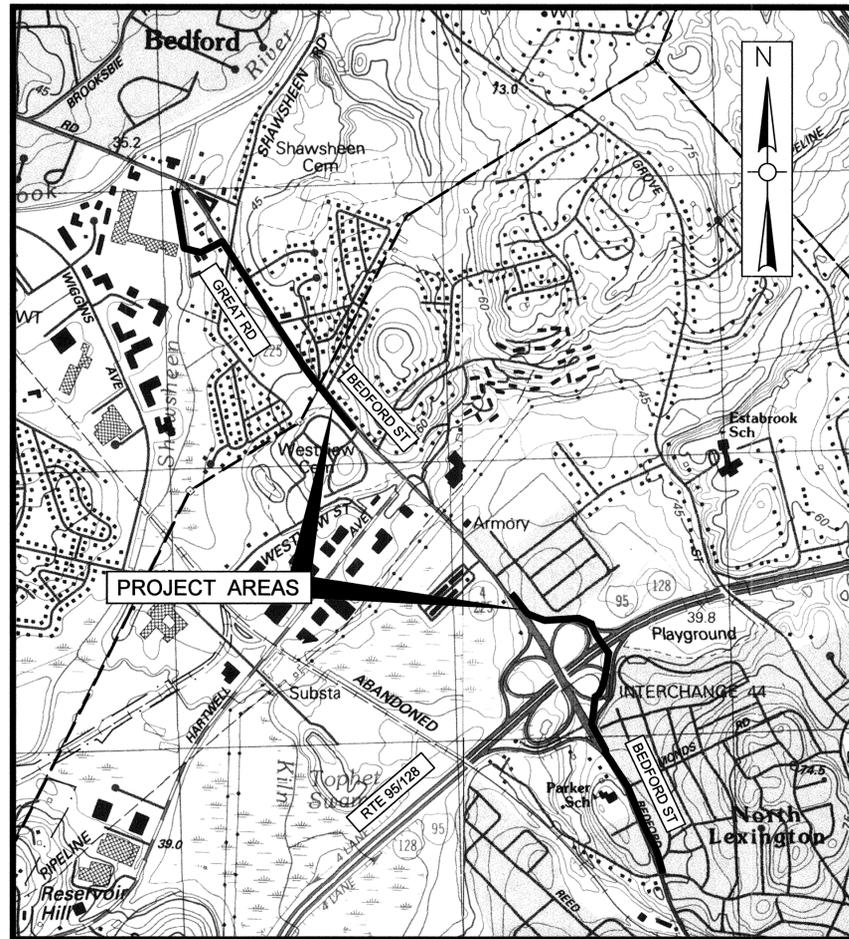


# TOWN OF BEDFORD, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

## BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION



LOCUS MAP  
SCALE: 1"=1000'

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**JUNE 2015**



**Weston & Sampson®**

Five Centennial Drive, Peabody, Massachusetts 01960

LEGEND

DESCRIPTION	EXISTING	PROPOSED
SANITARY SEWER	—S—	—8" PVC—
FORCE MAIN	—FM—	—6" FM DI—
WATER MAIN	—W—	—6" W DI—
TEMPORARY WATER	—TW—	—4" W—
STORM DRAIN	—D—	—18" D RCP—
GAS	—G—	—4" G—
ELECTRIC	—E—	—E—
TELEPHONE	—T—	—T—
HOUSE CONNECTION		6" HOUSE CONN (TYP)
GRINDER PUMP	⊙	● GP
SANITARY SEWER MANHOLE	⊙	● SMH
STORM DRAIN MANHOLE	⊙	● SDMH
ELECTRICAL MANHOLE	⊙	● EMH
TELEPHONE MANHOLE	⊙	● TMH
AIR RELEASE VALVE MANHOLE	⊙	● FMARV
FORCE MAIN CLEANOUT MANHOLE	○	● FMCO
CLEANOUT	○	● CO
CATCH BASIN	□	■ CB
CATCH BASIN (CURB INLET)	■	
HYDRANT	⊕	⊕
TEMPORARY HYDRANT		⊕
GATE VALVE	⊕	⊕
CHECK VALVE	⊕	⊕
CURB STOP	⊕	⊕
BUTTERFLY VALVE	⊕	⊕
BALL VALVE	⊕	⊕
REDUCER	⊕	⊕
CAP OR PLUG	⊕	⊕
GAS GATE VALVE	⊕	⊕
UTILITY POLE	⊕	⊕
GUY POLE	⊕	⊕
LIGHT POST	⊕	⊕
EDGE OF PAVEMENT	—	—
EDGE OF UNPAVED ROAD	—	—
CURB	—	—
SIDEWALK	—	—
RAILROAD	—	—
STONE WALL	—	—
RETAINING WALL	—RET WALL—	—RET WALL—
FENCE	—x—x—	—x—x—
INDIVIDUAL DECIDUOUS TREE	⊕	⊕
INDIVIDUAL EVERGREEN TREE	⊕	⊕
TREE LINE	—	—
SURVEY MARKER	⊕	⊕
PROPERTY LINE	—	—
EASEMENT LINE	—	—
LIMIT OF WORK	—	—
APPROX. LIMIT OF REFUSE	—	—
SPOT ELEVATIONS	x 141.5	x 141.5
CONTOUR LINES	—56—	—56—
DEPRESSION CONTOUR LINES	—	—
HOUSE NUMBER	#35	
FLOOR ELEVATION	FL=56.7	
SILL ELEVATION	S=56.7	
WETLAND	—	—
WETLAND FLAGS	—	—
RIP RAP	—	—
STATE HIGHWAY STATION	○	○
SURFACE MOUNTED DELINEATOR	△	△
GUARD POST	△	△
BOLLARD	○B	●B
SIGN	—	—
BENCH MARK	⊕	⊕
AUGER	⊕ A-1	⊕ A-1
PERCOLATION TEST	⊕ 1	⊕ PT-1
TEST PIT	⊕ 1	⊕ TP-1
BORING	⊕ B-10	⊕ B-11
PROBE	⊕ P-10	⊕ P-11
GROUNDWATER MONITORING WELL	⊕ WS-1	⊕ WS-1
GAS MONITORING WELL	⊕ GMW-10	⊕ GMW-10
GAS VENT	○ GV	● GV
COMPOST FILTER TUBE	—	—
ROCK OUTCROP	—	—
DRAINAGE DITCH / SWALE	—	—

NOTE: ITEMS SHOWN IN THE LEGEND MAY NOT BE PRESENT IN THESE PLANS

ABBREVIATIONS

AC	ASBESTOS CEMENT PIPE
ACCMP	ASPHALT COATED CORRUGATED METAL PIPE
ARV	AIR RELEASE VALVE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
BC	BITUMINOUS CONCRETE
BIT	BITUMINOUS
BLDG	BUILDING
BM	BENCH MARK
BO	BLOW OFF
BV	BUTTERFLY VALVE
CATV	CABLE TELEVISION
CB	CATCH BASIN
CC	CONCRETE CURB
CI	CAST IRON
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
CU FT	CUBIC FEET
CY	CUBIC YARD
D	STORM DRAIN, DEPTH FROM RIM TO INVERT
DI	DROP INLET, DUCTILE IRON
DIA	DIAMETER
DMH	DRAIN MANHOLE
DWG	DRAWING
E	EAST, ELECTRIC
EA	EACH
EF	EACH FACE
ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
EW	EACH WAY
EXIST	EXISTING
FLG	FLANGE
FT	FEET, FOOT
G	NATURAL GAS
GALV	GALVANIZED
GC	GRANITE CURB
GR	GRANITE
HC	HOUSE CONNECTION
HORIZ	HORIZONTAL
HP	HIGH PRESSURE
HYD	FIRE HYDRANT
I	INVERT
INV	INVERT
ID	INSIDE DIAMETER
IP	IRON PIPE
LB	POUND
LF	LINEAR FEET
LS	LUMP SUM
MAX	MAXIMUM
MB	MAIL BOX
MDC	METROPOLITAN DISTRICT COMMISSION
MDFW	MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
MECH	MECHANICAL
MH	MANHOLE
MassDOT	MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MWRA	MASSACHUSETTS WATER RESOURCES AUTHORITY
N	NORTH
NE	NORTH EAST
NW	NORTH WEST
NF	NOT FOUND
NO OR #	NUMBER
OD	OUTSIDE DIAMETER
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PE	PLAIN END, POLYETHYLENE
PL	PROPERTY LINE
PL	PLATE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT-OF-WAY
RQD	ROCK QUALITY
S	SEWER, SOUTH
SE	SOUTH EAST
SECT	SECTION
SF	SQUARE FEET
SHT	SHEET
SPEC	SPECIFICATIONS
SQ FT	SQUARE FEET
SS	SEWER SERVICE, STAINLESS STEEL
STA	STATION
STL	STEEL
SW	SIDEWALK, SOUTH WEST
T	HYDROSTATIC THRUST, TELEPHONE
TBM	TEMPORARY BENCH MARK
THK	THICK (NESS)
TYP	TYPICAL
UP	UTILITY POLE
VC	VITRIFIED CLAY
VERT	VERTICAL
W	WEST
W/O	WITHOUT

CONSTRUCTION NOTES:

- THE CONTRACTOR SHALL CALL DIGSAFE AT 1-888-344-7233 AT LEAST 72 HOURS, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE DIGSAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER PRIOR TO EXCAVATION.
- LOCATIONS OF EXISTING PIPES, CONDUITS, UTILITIES, FOUNDATIONS AND OTHER UNDERGROUND OBJECTS ARE NOT WARRANTED TO BE CORRECT AND THE CONTRACTOR SHALL HAVE NO CLAIM ON THAT ACCOUNT SHOULD THEY BE OTHER THAN SHOWN.
- TEST PITS TO LOCATE EXISTING UTILITIES MAY BE ORDERED BY THE ENGINEER.
- STONE WALLS, FENCES, MAIL BOXES, SIGNS, CURBS, LIGHT POLES, ETC.. SHALL BE REMOVED AND REPLACED AS NECESSARY TO PERFORM THE WORK. UNLESS OTHERWISE INDICATED, ALL SUCH WORK SHALL BE INCIDENTAL TO CONSTRUCTION OF THE PROJECT.
- ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.
- ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND PAYMENT LIMITS SHALL BE RESTORED AT NO ADDITIONAL COST TO THE OWNER.
- CONCRETE CRADLES OR ARCHES SHALL BE CONSTRUCTED WHERE SHOWN ON THE DRAWINGS OR WHERE REQUIRED BY THE ENGINEER. UNLESS OTHERWISE INDICATED, CONCRETE USED FOR PIPE ANCHOR BLOCKS, BACKING, PIPE CRADLES, ARCHES, AND FILL SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
- THE CONTRACTOR SHALL NOT STORE ANY APPARATUS, MATERIALS, SUPPLIES, OR EQUIPMENT ON DRAINAGE STRUCTURES OR WITHIN 100 FEET OF WETLANDS.
- SEWER TRENCHES MAY BE EXCAVATED WIDER THAN THE 'LIMIT OF EXCAVATION AND PAYMENT FOR EARTH EXCAVATION' ABOVE THE 'LINE OF NARROW TRENCH LIMIT.' ANY SUCH ADDITIONAL EXCAVATION SHALL BE AT THE CONTRACTOR'S EXPENSE AND SHALL NOT BE MEASURED FOR PAYMENT.
- BELOW THE 'LINE OF NARROW TRENCH LIMIT' THE TRENCH SHOULD NOT BE EXCAVATED BEYOND THE TRENCH WIDTH 'W'. IF MATERIAL IS LOOSENED OR REMOVED BEYOND THE ABOVE MENTIONED LIMITS, THE CONTRACTOR WILL BE REQUIRED TO PROVIDE CRUSHED STONE FOR THE FULL WIDTH OF THE TRENCH AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL BE AVAILABLE 24/7 TO RESPOND PROMPTLY TO FORCE MAIN BY-PASS REPAIRS REQUIRED DURING THE PROJECT.
- OPENINGS FOR PIPE IN PRECAST MANHOLE BASES SHALL BE CAST IN THE REQUIRED LOCATIONS DURING MANHOLE MANUFACTURE. FIELD CUT OPENINGS WILL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER.
- IN PAVED AREAS THE TOP OF THE MANHOLE COVER SHALL BE SET FLUSH WITH THE PAVED SURFACE. IN OTHER AREAS THE TOP OF THE COVER SHALL EXTEND 6 INCHES ABOVE FINISHED GRADE, OR AS SHOWN ON THE DRAWINGS, OR AS REQUIRED BY THE ENGINEER.
- PROTECTION OF WATER SUPPLIES - WHENEVER A SEWER MUST CROSS UNDER A WATER MAIN, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE TOP OF THE SEWER IS AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER MAIN. WHEN THE ELEVATION OF THE SEWER CANNOT BE VARIED TO MEET THE ABOVE REQUIREMENT, THE WATER MAIN SHALL BE RELOCATED BY THE CONTRACTOR AS REQUIRED BY THE ENGINEER TO PROVIDE THIS SEPARATION OR THE CONTRACTOR SHALL CONSTRUCT THE NEW SEWER OF CLASS 150 PRESSURE PIPE FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE WATER MAIN. ONE FULL LENGTH OF CLASS 150 PRESSURE PIPE SEWER SHOULD BE CENTERED ON THE WATER MAIN AS MUCH AS POSSIBLE. THE SEWER CONSTRUCTED OF THE PRESSURE PIPE MUST BE PRESSURE TESTED TO ASSURE WATER TIGHTNESS.
- ALL STREET EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING OR COVERING WITH RECESSED STEEL PLATES.
- ALL WORK PERFORMED WITHIN STATE HIGHWAY LIMITS SHALL CONFORM TO THE PERMIT ISSUED FOR THIS PROJECT. SEE SPECIFICATION SECTION 00890 - PERMITS.
- CONTRACTOR SHALL MAINTAIN TWO WAY TRAFFIC AT ALL TIMES. CONTRACTOR SHALL REFERENCE SPECIFICATION SECTION 00890 - PERMITS FOR ADDITIONAL MDOT REQUIREMENTS.
- CONTRACTOR SHALL PROVIDE NECESSARY FLOW CONTROL (e.g. PUMPING TRUCKS) AT THE GREAT ROAD AND HANSCOM PUMPING STATIONS AS NECESSARY DURING CONSTRUCTION ACTIVITIES WHEN FLOW CANNOT BE DIRECTED INTO THE EXISTING FORCE MAINS OR THE TEMPORARY BYPASS SYSTEM.
- CONTRACTOR SHALL PROVIDE NECESSARY FLOW CONTROL TO DEWATER EXISTING 20-INCH FORCE MAIN.
- EXISTING PAVEMENT DEPTH WAS FOUND TO BE 12"-16" DURING A RECENT EXCAVATION WITHIN BEDFORD STREET.
- GREAT ROAD PUMP STATION IS LOCATED AT 299 GREAT ROAD, BEDFORD, MA.
- HANSCOM PUMP STATION IS LOCATED AT BUILDING 1306 ON HANSCOM AIR FORCE BASE. THE 12" CONNECTION TO BEDFORD'S 20" FORCE MAIN IS LOCATED AT THE INTERSECTION OF BEDFORD STREET AT HARTWELL AVE.
- WORK DURING OFF-PEAK HOURS (NIGHT TIME WORK) WITHIN THE LIMITS OF ROUTE 95/128 MAY BE REQUIRED.
- WORK HOURS OF 9:00 A.M. TO 3:00 P.M. MAY BE REQUIRED AT THE INTERSECTION OF NORTH HANCOCK STREET AND BEDFORD STREET.
- ALL EXPOSED DI PIPE AND FITTING SHALL BE ENCASED IN POLYETHYLENE CONFORMING TO AWWA C105.
- ROLLERS SHALL BE USED DURING SLIP LINING AT ALL PIPE BENDS GREATER THAN 11.25'.



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No.	Date	Dr. By	Ck. By	App. By	Description
					A P P R O V E D
					DATE



REGISTERED PROFESSIONAL ENGINEER

TOWN OF BEDFORD, MASSACHUSETTS  
DEPARTMENT OF PUBLIC WORKS

BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION

**ABBREVIATIONS, NOTES AND LEGEND**

CADD NO.	211-93	SCALE:	G-1	CONTRACT:	NOTED	CHK. BY:	JRH	APP. BY:	DME
DR. BY:	MAIM	JOB NO.:	2140707	DR. BY:	MAIM	CHK. BY:	JRH	APP. BY:	DME

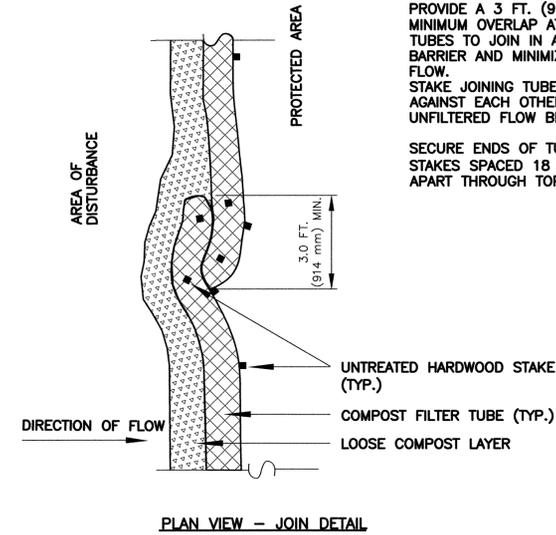
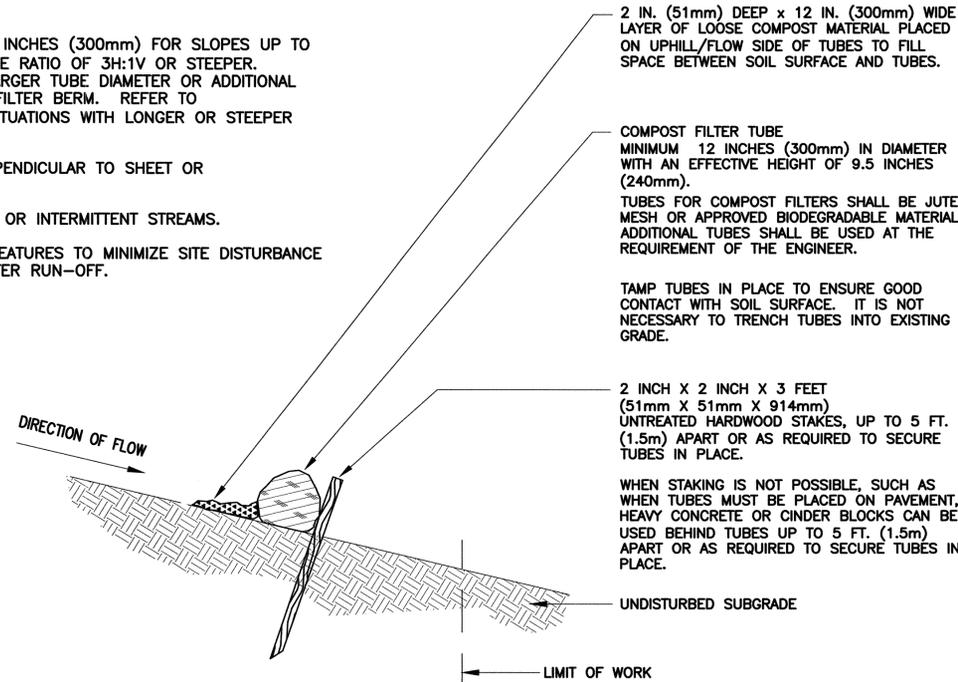


FILE NO. 211-93

D:\Bedford MA\2140707 - Force Main Design Phase 2\CADD\Design\01 - Legend Notes.dwg

**GENERAL NOTES:**

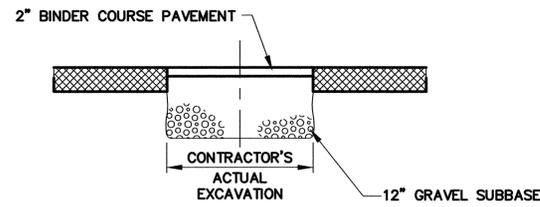
1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES (300mm) FOR SLOPES UP TO 50 FEET (15.24m) IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
4. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.



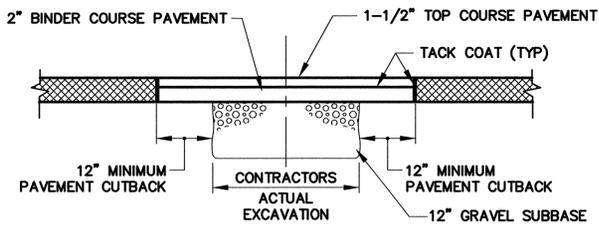
PROVIDE A 3 FT. (914mm) MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW. STAKE JOINING TUBES SNUGLY AGAINST EACH OTHER TO PREVENT UNFILTERED FLOW BETWEEN THEM.

SECURE ENDS OF TUBES WITH STAKES SPACED 18 IN. (457mm) APART THROUGH TOPS OF TUBES.

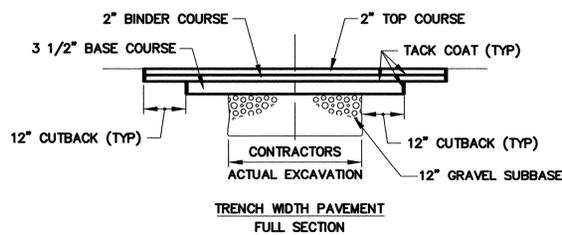
**SINGLE COMPOST FILTER TUBE DETAIL**  
NOT TO SCALE



**TYPE C - TEMPORARY PAVEMENT**

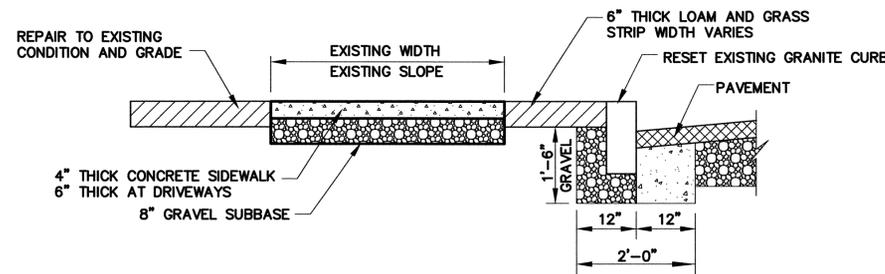


**TYPE B - PERMANENT PAVEMENT**

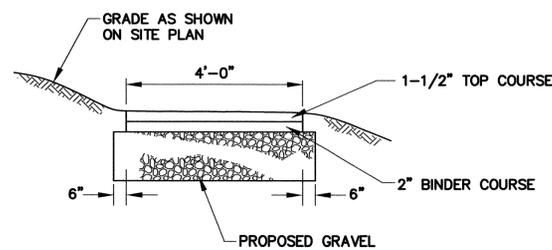


**TYPE A - PERMANENT PAVEMENT**

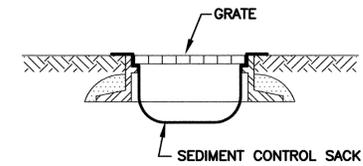
**PAVEMENT REPLACEMENT DETAILS**  
N.T.S.



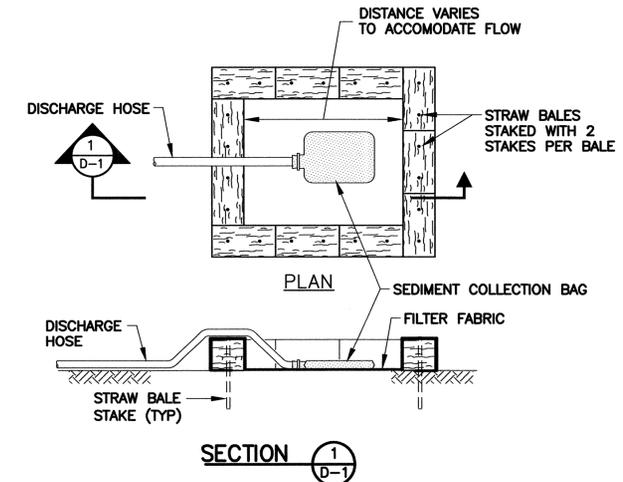
**TYPICAL SECTION THROUGH CONCRETE SIDEWALK**  
N.T.S.



**BITUMINOUS PAVEMENT WALKWAY DETAIL**  
N.T.S.



**CATCH BASIN PROTECTION DETAIL**  
N.T.S.

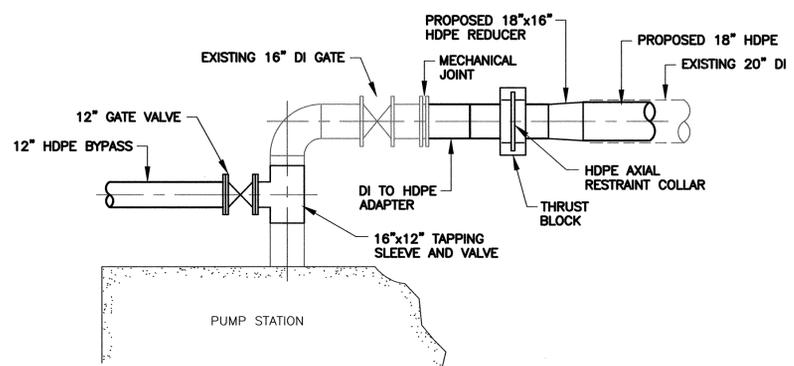


**DEWATERING DISCHARGE DISPOSAL DETAIL**  
N.T.S.

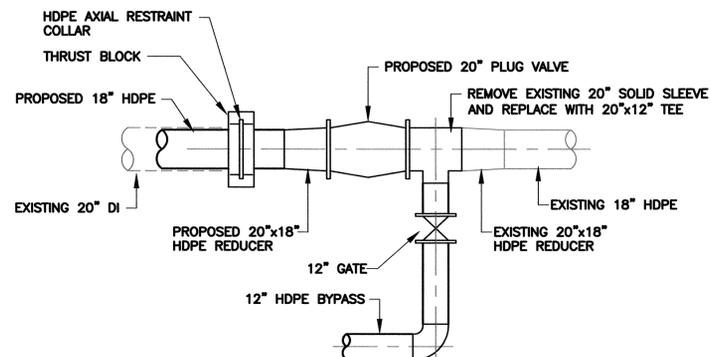
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					P R O V E D
					6/15/15 DATE



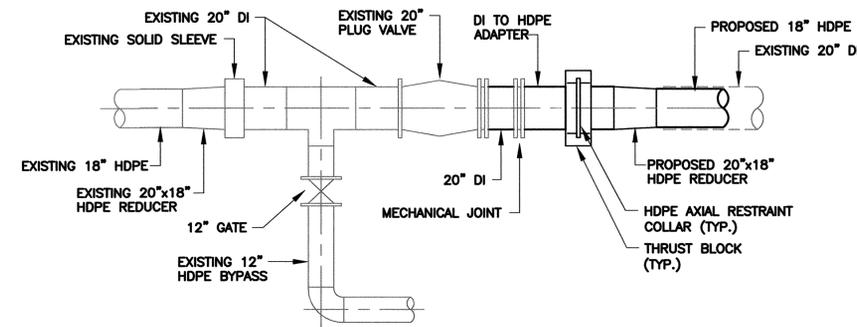
TOWN OF BEDFORD, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS	CONTRACT:	SCALE:	NOTED	DR. BY:	DR. BY:	DR. BY:	DR. BY:	APP. BY:
BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION	2140707	NOTED	NOTED	MJM	JRH	PMS	DME	
DETAILS								
FILE NO. 211-92								



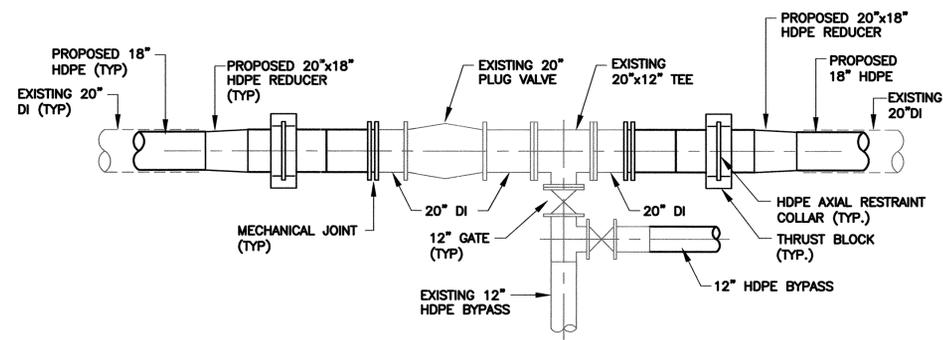
**STA 0+00 (PUMP STATION)**  
N.T.S.



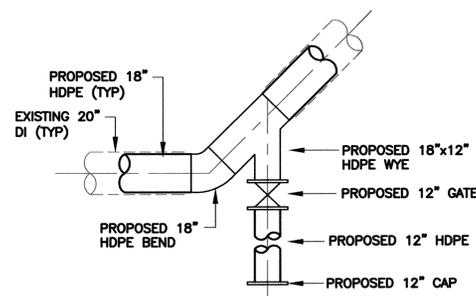
**STA 38+77 (CEMETERY)**  
N.T.S.



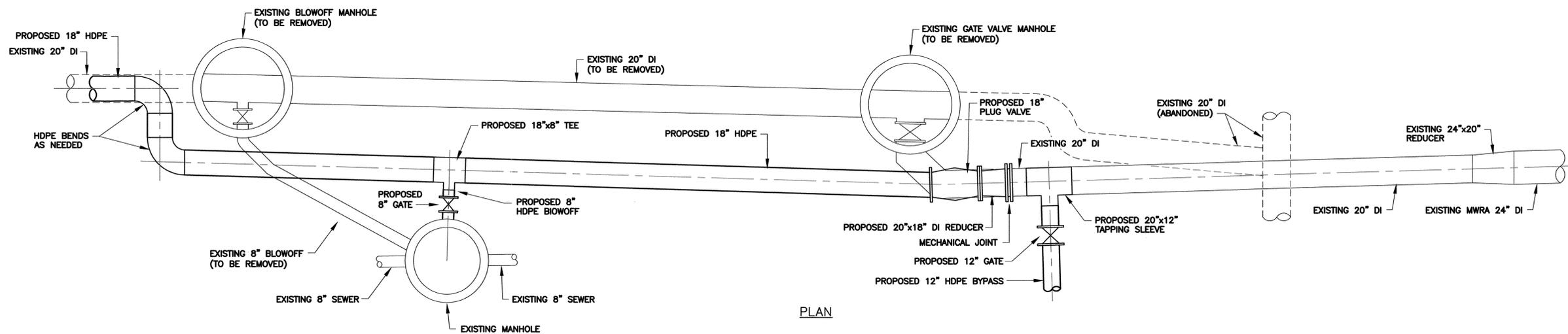
**STA 65+50**  
N.T.S.



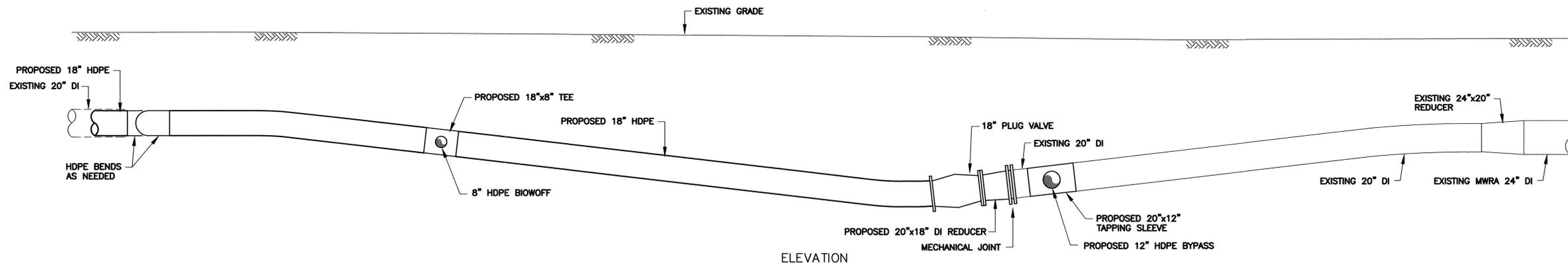
**STA 88+12**  
N.T.S.



**STA 89+10**  
N.T.S.



**PLAN**



**ELEVATION**

**STA 108+30 TO STA 109+00**  
N.T.S.

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No.	Date	Dr. By	Chk. By	App. By	Description
1	4/15/15				DESIGN
2					REVISED
3					REVISED
4					REVISED
5					REVISED
6					REVISED
7					REVISED
8					REVISED
9					REVISED
10					REVISED

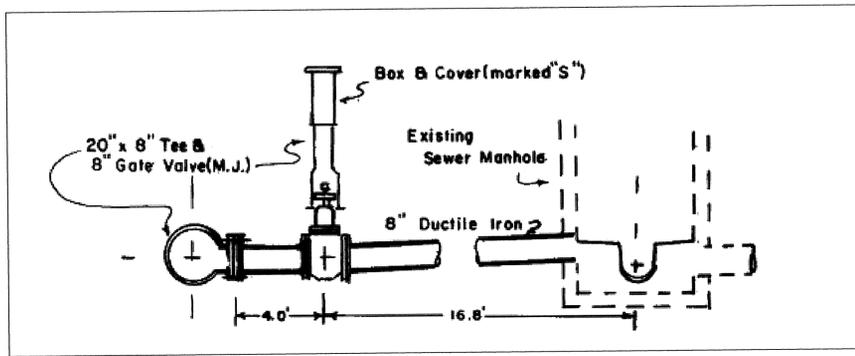


TOWN OF BEDFORD, MASSACHUSETTS  
DEPARTMENT OF PUBLIC WORKS  
**DETAILS**  
BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION

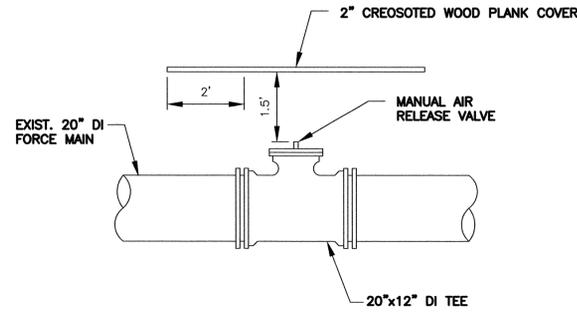
SCALE: NOTED  
CONTRACT: 2140707  
JOB NO. 2140707  
DR. BY: MJM  
CHK. BY: JRH  
APP. BY: DME

C:\Bedford\MA\2140707 - Force Main Design Phase 2\CADD\Design\0-1 to 0-3 Details.dwg

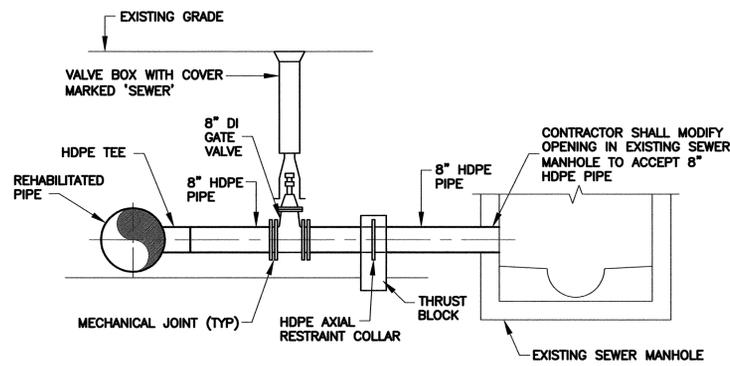
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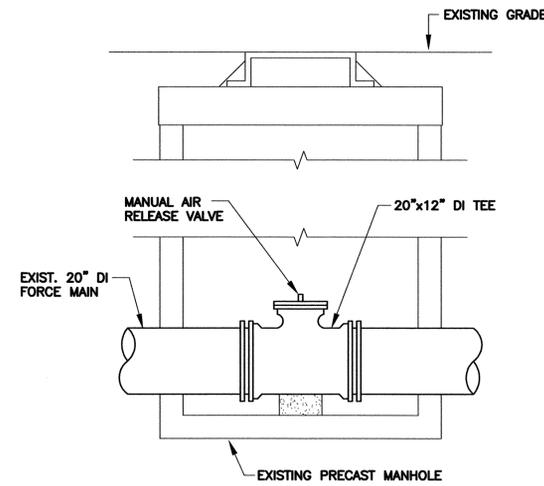
**EXISTING BLOWOFF ASSEMBLY AND MANHOLE**  
**TYPE 'B'**  
 N.T.S.



**EXISTING AIR RELEASE VALVE & CLEAN OUT STRUCTURE**  
**TYPE 'A'**  
 N.T.S.



**PROPOSED BLOWOFF ASSEMBLY**  
**MASARDIS STREET AND NORTH HANCOCK STREET**  
 N.T.S.

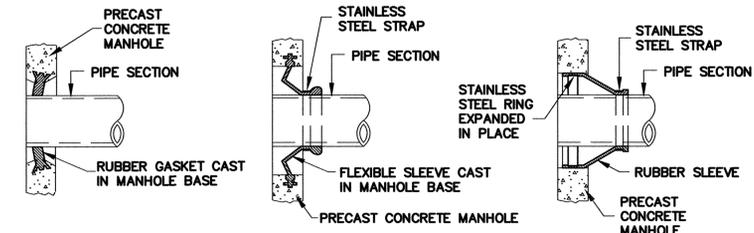


**EXISTING AIR RELEASE VALVE & CLEAN OUT STRUCTURE**  
**TYPE 'B'**  
 N.T.S.

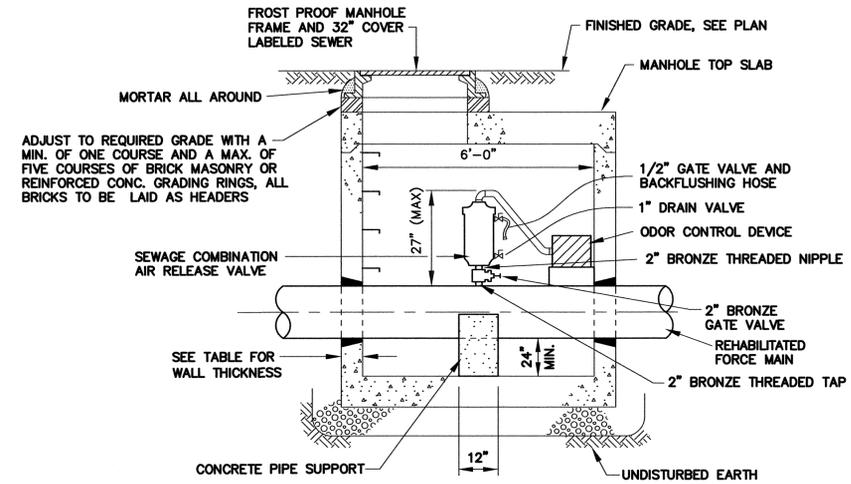
**TABLE 1**  
 REQUIRED LENGTH OF RESTRAINED JOINTS FROM FITTINGS (FEET)

PIPE SIZE	90° BEND	45° BEND OR WYE BRANCH	22 1/2° BEND	11 1/4° BEND	PLUG, CAP OR IN-LINE VALVE	TEE (BRANCH)
6"	25 (30.5)	10.5 (12.5)	5 (6)	2.5 (3)	43 (64)	34 (51)
8"	33 (40)	13.5 (16.5)	6.5 (8)	3 (4)	55 (82)	47 (70)
10"	40 (48.5)	16.5 (20)	8 (9.5)	4 (5)	67 (100)	58 (87)
12"	47 (56.5)	19.5 (23.5)	9.5 (11.5)	4.5 (5.5)	79 (118)	70 (105)
16"	59.5 (72)	24.5 (30)	12 (14.5)	6 (7)	101 (152)	92 (139)
20"	72 (86.5)	30 (36)	14.5 (17)	7 (8.5)	123 (184)	114 (171)
24"	84 (100)	35 (41)	16.5 (20)	8 (10)	144 (216)	134 (202)
30"	100 (120)	41 (50)	20 (24)	10 (12)	174 (261)	165 (247)

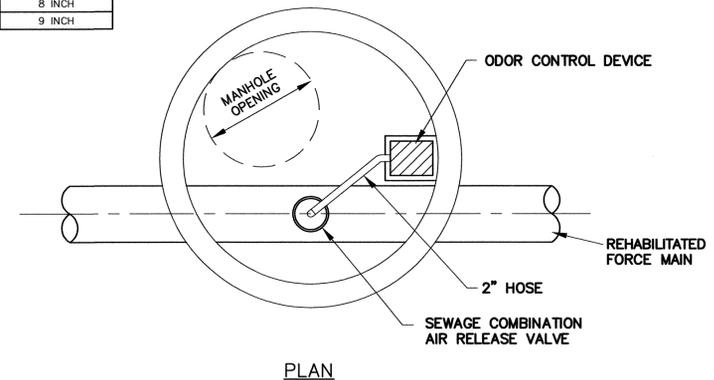
- NOTES:**
- RESTRAINED LENGTHS LISTED IN PARENTHESES ARE FOR PIPE WRAPPED IN POLYETHYLENE. THE OTHER ASSOCIATED LENGTHS ARE FOR PLAIN UNWRAPPED DUCTILE IRON PIPE.
  - THE CONTRACTOR SHALL USE THIS TABLE IN CONJUNCTION WITH THE APPROPRIATE PIPE SPECIFICATION SECTION.



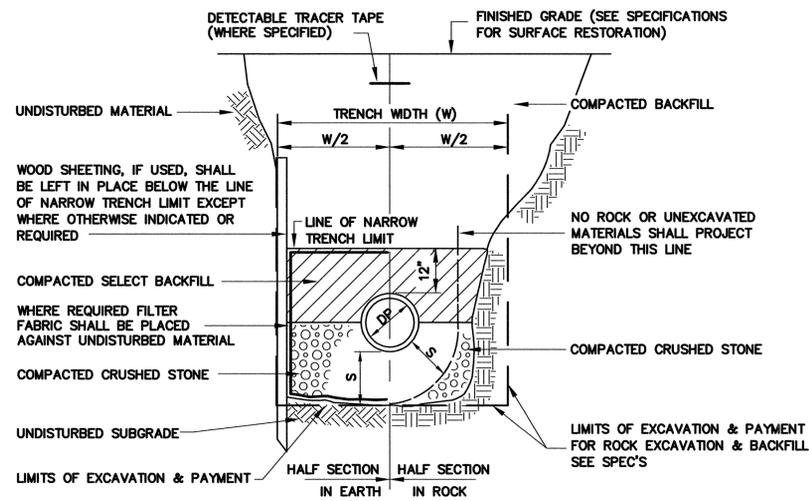
**MANHOLE SEAL DETAILS**  
 N.T.S.



MH DIA.	MINIMUM WALL THICKNESS
5 FOOT	6 INCH
6 FOOT	7 INCH
7 FOOT	8 INCH
8 FOOT	9 INCH



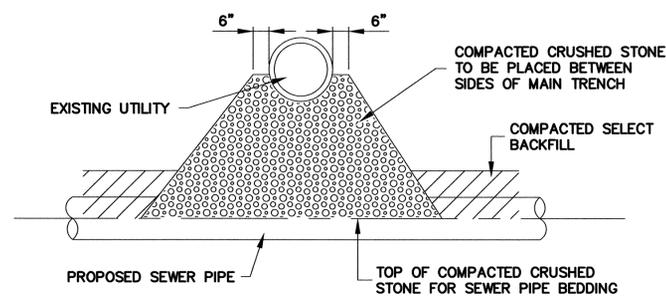
**SEWAGE COMBINATION AIR VALVE STRUCTURE**  
 N.T.S.



**TRENCH DETAIL**  
**(SEWER, FORCE MAIN, STORM DRAIN)**  
 N.T.S.

DEPTH TO INVERT	DIAMETER OF PIPE (DP)	MAXIMUM TRENCH WIDTH BELOW LINE OF NARROW TRENCH LIMIT (SHEETED OR UNSHEETED) (W)	MINIMUM CLEARANCE (S)
0-12'	TO 18"	5'	6"
0-12'	21"-24"	5'	7-1/2"
OVER 12'	TO 18"	7'	6"
OVER 12'	21"-24"	7'	7-1/2"

**TABLE A**



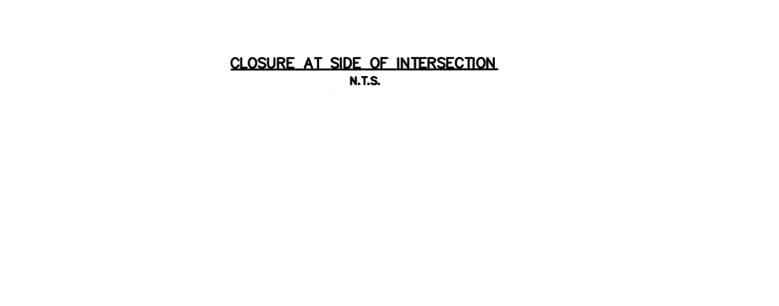
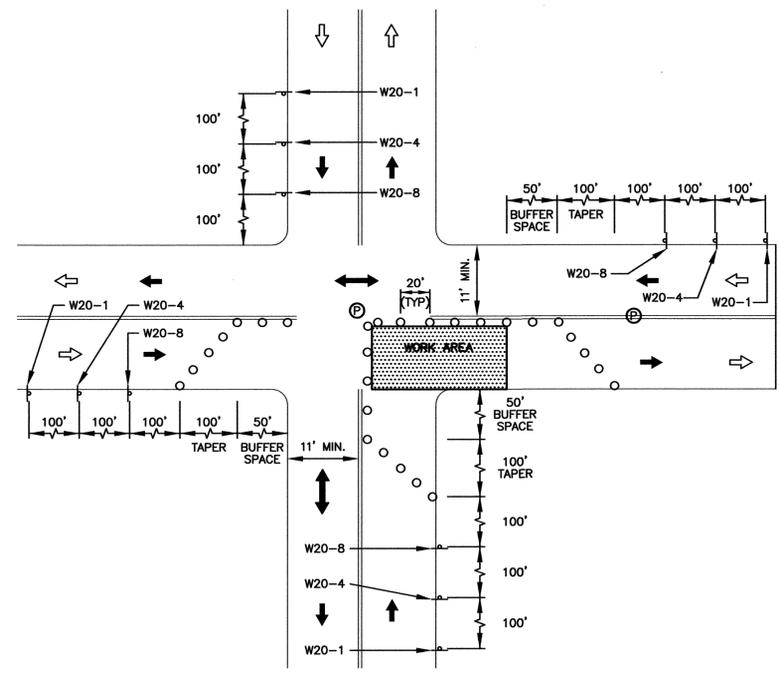
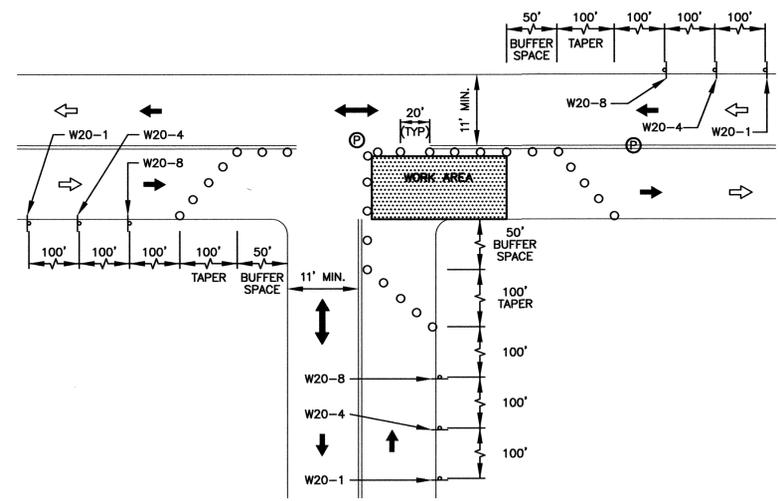
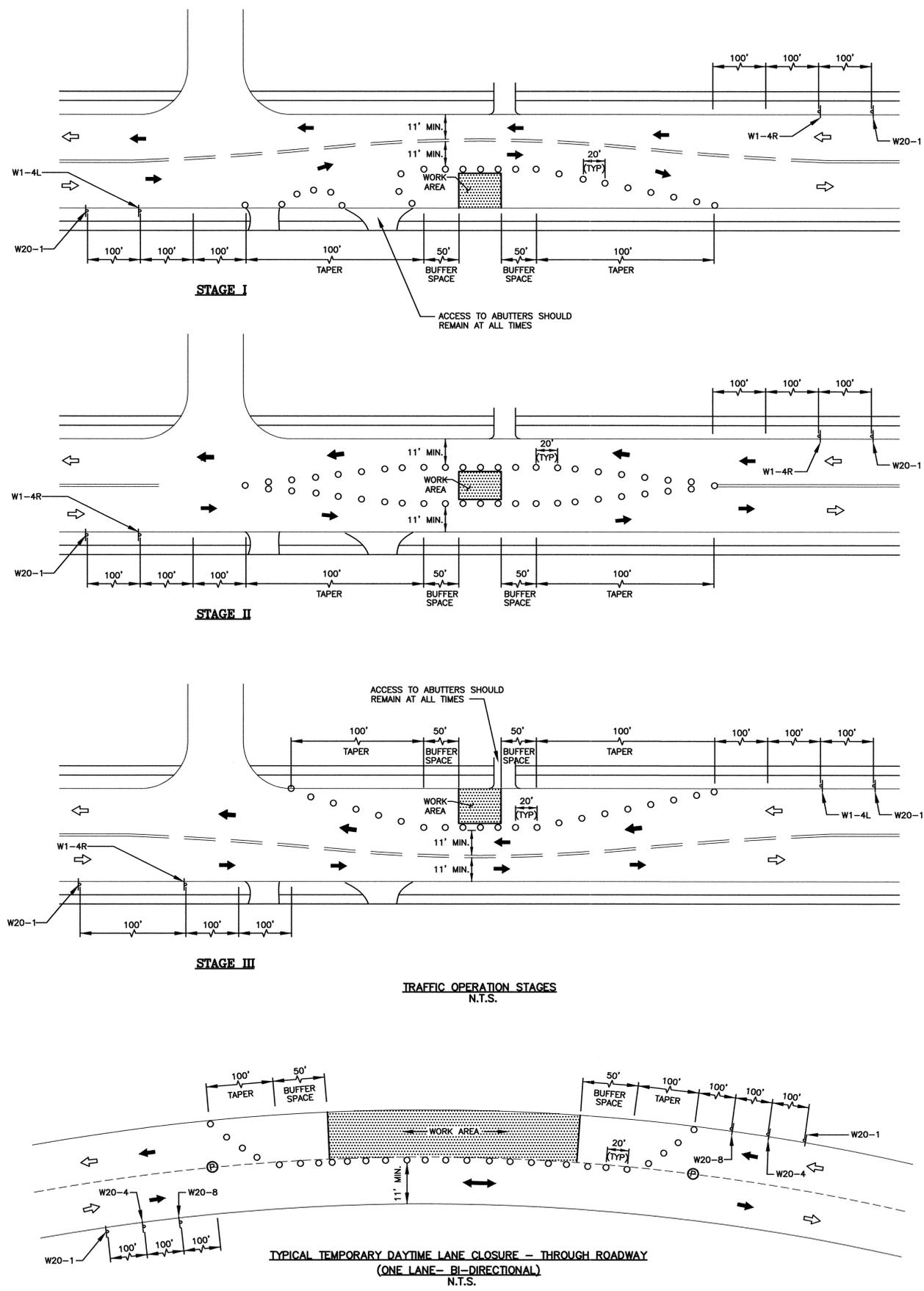
**UTILITY CROSSING DETAIL**  
 N.T.S.

No.	Date	Dr. By	Chk. By	App. By	Description	DATE
1						



FILE NO.	SCALE	NOTED	CONTRACT	JOB NO.	APP. BY
D-3	211-90	NOTED		2140707	DME

D:\Bedford MA\2140707 - Force Main Design Phase 2\CADD\Design\0-4 D-4 Traffic Plans.dwg



MUTCD CODE	SIZE OF SIGN		SIGN
	WIDTH	HEIGHT	
W1-4L	30"	30"	
W1-4R	30"	30"	
W20-1	36"	36"	
W20-4	36"	36"	
W20-8	36"	36"	
G20-2	36"	18"	

**NOTE:**

- FOR THE LATEST SPECIFICATION ON TEXT DIMENSIONS AND COLOR, CONTRACTOR SHALL REFER TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CURRENT EDITION).

**LEGEND:**

- REFLECTORIZED DRUM
- ⇐ TRAFFIC FLOW DURING CONSTRUCTION
- ⇨ NORMAL TRAFFIC FLOW
- ⊙ POLICE DETAIL OFFICER
- ⊕ CONSTRUCTION SIGN
- ▨ WORK AREA

- GENERAL NOTES:**
- PLACEMENT OF ALL CONSTRUCTION SIGNS, DRUMS, BARRICADES, TRAFFIC DEVICES AND THE SHAPE, SIZE & COLOR OF ALL TEMPORARY TRAFFIC SIGNS SHALL CONFORM WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
  - ADVANCE WARNING SIGN PLACEMENT AND TAPER LENGTH TO BE ADJUSTED ACCORDING TO STREET CONDITIONS AND DRIVEWAY OPENINGS.
  - ALL DRUMS SHALL BE APPROXIMATELY PLACED AND MOVED AS NECESSARY TO MAINTAIN ADEQUATE ABUTTER ACCESS AT ALL TIMES.
  - THE CONTRACTOR SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT AND SIMILAR OPERATIONS.
  - NONESSENTIAL TRAFFIC CONTROL DEVICES SHALL BE COVERED OR REMOVED DURING NON-WORKING HOURS.
  - PEDESTRIANS SHALL BE PROVIDED WITH ACCESS AND SAFE PASSAGE THROUGH THE TEMPORARY TRAFFIC CONTROL ZONE AT ALL TIMES.
  - W20-8 SHALL BE TAKEN DOWN OR COVERED AFTER EACH WORKING DAY OR WHEN OTHERWISE NOT APPLICABLE, OR WHEN POLICE OFFICERS ARE NOT PRESENT TO DIRECT TRAFFIC.
  - ADVISORY SPEED PLATES (W13-1 - SEE CURRENT EDITION OF MUTCD) SHALL BE USED IF APPLICABLE AND AS REQUIRED BY THE ENGINEER.
  - NO DIFFERENCE IN ROADWAY LANE ELEVATION WILL BE ALLOWED AT THE END OF THE WORK DAY.
  - SAMPLE TRAFFIC PLANS INCLUDED ON THIS PLAN SHEET ARE BASED ON AN URBAN (LOW SPEED) ROAD TYPE FROM THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
  - DASHED LINES SHOW LANE DESIGNATIONS TO BE USED DURING CONSTRUCTION.
  - THE CONTRACTOR SHALL SUBMIT ANY REVISIONS TO THE CONSTRUCTION ZONE SAFETY PLAN TO THE ENGINEER FOR APPROVAL.
  - THIS CONSTRUCTION ZONE SAFETY PLAN SHALL NOT RELIEVE THE CONTRACTOR OF HIS SOLE RESPONSIBILITY FOR CONSTRUCTION SITE SAFETY.

**Weston & Sampson**  
Fire Centennial Drive, Fenwick, MA 01830  
(978) 552-1900 (800) 5AMPSON  
www.westonandsampson.com

No.	Date	Dr. By	Ck. By	App. By	Description
					A P P R O V E D
					DATE: 11/15/15
					REGISTERED PROFESSIONAL ENGINEER

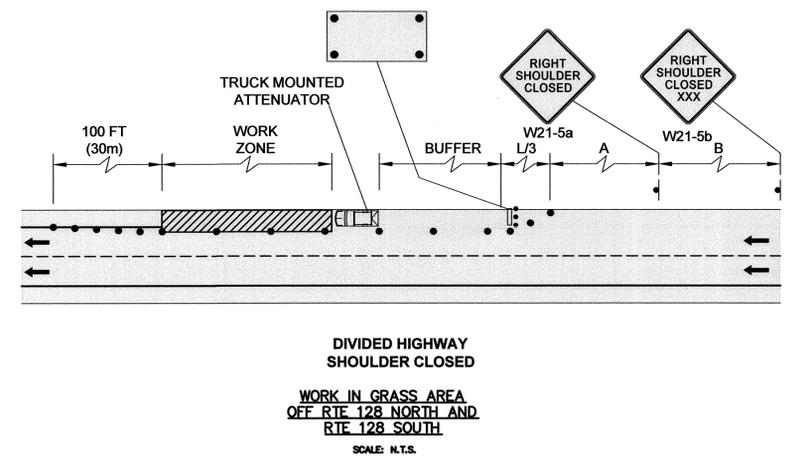
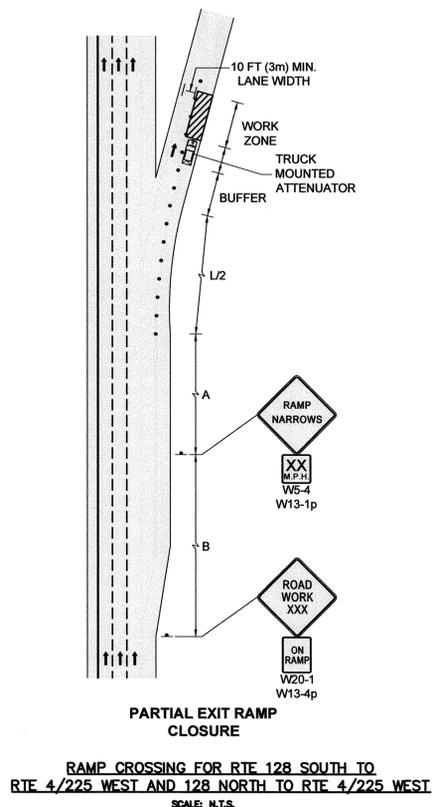
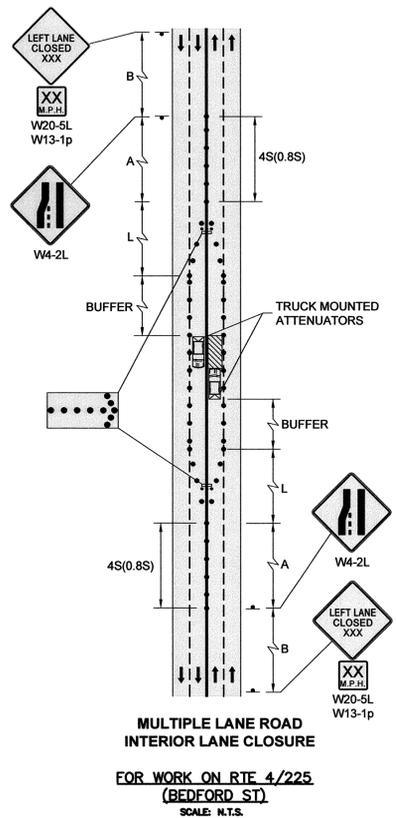


TOWN OF BEDFORD, MASSACHUSETTS  
DEPARTMENT OF PUBLIC WORKS  
BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION  
**CONSTRUCTION ZONE SAFETY PLAN I**

CADD NO. 211-89  
JOB NO. 2140707  
CONTRACT: NOTED  
SCALE: 1"=40'

DR BY: MAM  
DSN BY: JRH  
CHK BY: PMS  
APP BY: DME

**D-4**  
SHEET 6 OF 15



**LEGEND:**

- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- P/F POLICE/FLAGGER DETAIL
- ▨ TYPE III BARRICADE
- CHANGEABLE MESSAGE SIGN
- ➡ ARROW BOARD
- ▨ WORK ZONE
- ➡ DIRECTION OF TRAFFIC
- ▨ IMPACT ATTENUATOR
- ▨ MEDIAN BARRIER
- ▨ MEDIAN BARRIER WITH WARNING LIGHTS
- ▨ WORK VEHICLE
- ▨ TRUCK MOUNTED ATTENUATOR
- ➡ TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN

**SUGGESTED WORK ZONE WARNING SIGN SPACING**

ROAD TYPE	DISTANCE BETWEEN SIGNS **		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350 (100)	350 (100)	350 (100)
MOST OTHER ROADWAYS*	500 (150)	500 (150)	500 (150)
FREEWAYS AND EXPRESSWAYS*	1,000 (300)	1,500 (450)	2,640 (800)

\* ROAD TYPE TO BE DETERMINED BY MASSDOT OFFICE OF TRANSPORTATION PLANNING.

\*\* DISTANCES ARE SHOWN IN FEET (METERS). THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/ TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE).

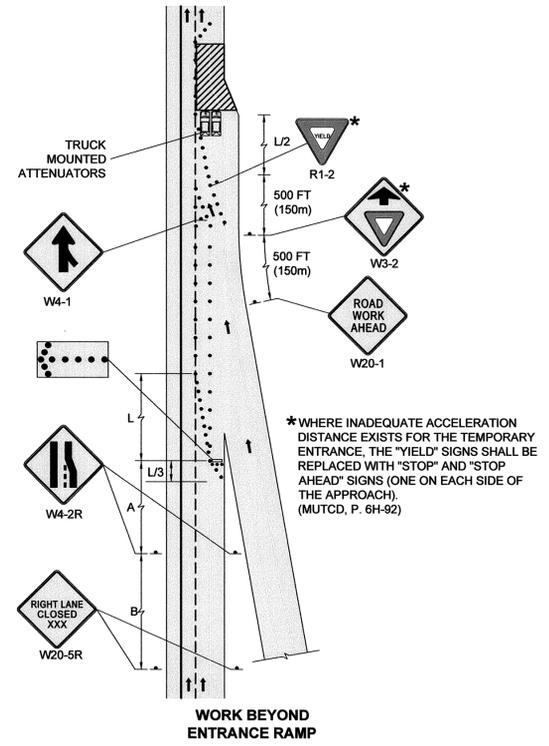
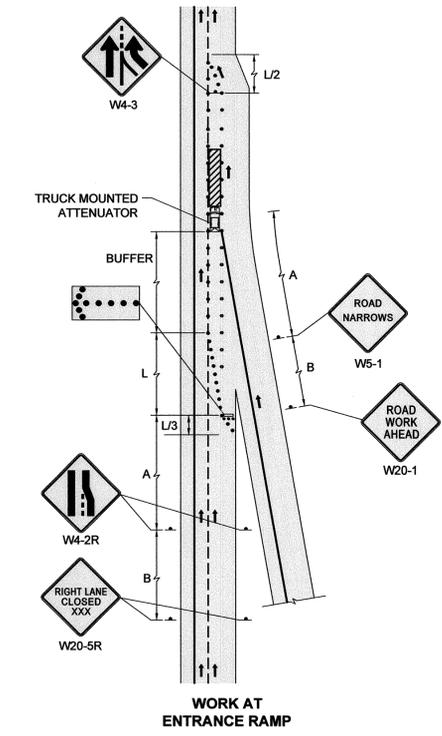
THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TTC SETUPS. THESE ADVANCE WARNING SIGNS ARE LOCATED PRIOR TO THE PROJECT LIMITS ON ALL APPROACHES (I.E. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT. ADDITIONAL SIGNS (I.E. "RIGHT LANE CLOSED 1 MILE" AND "LEFT LANE CLOSED 1 MILE") HAVE BEEN SHOWN IN SOME FIGURES AS EXAMPLES OF REINFORCEMENT SIGN PLACEMENT BUT ARE USED IN RARE OCCASIONS.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

R2-10a, R2-10e, AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

FOR >45 MPH L=W  
W = WIDTH OF OFFSET (FT)  
S = POSTED SPEED LIMIT

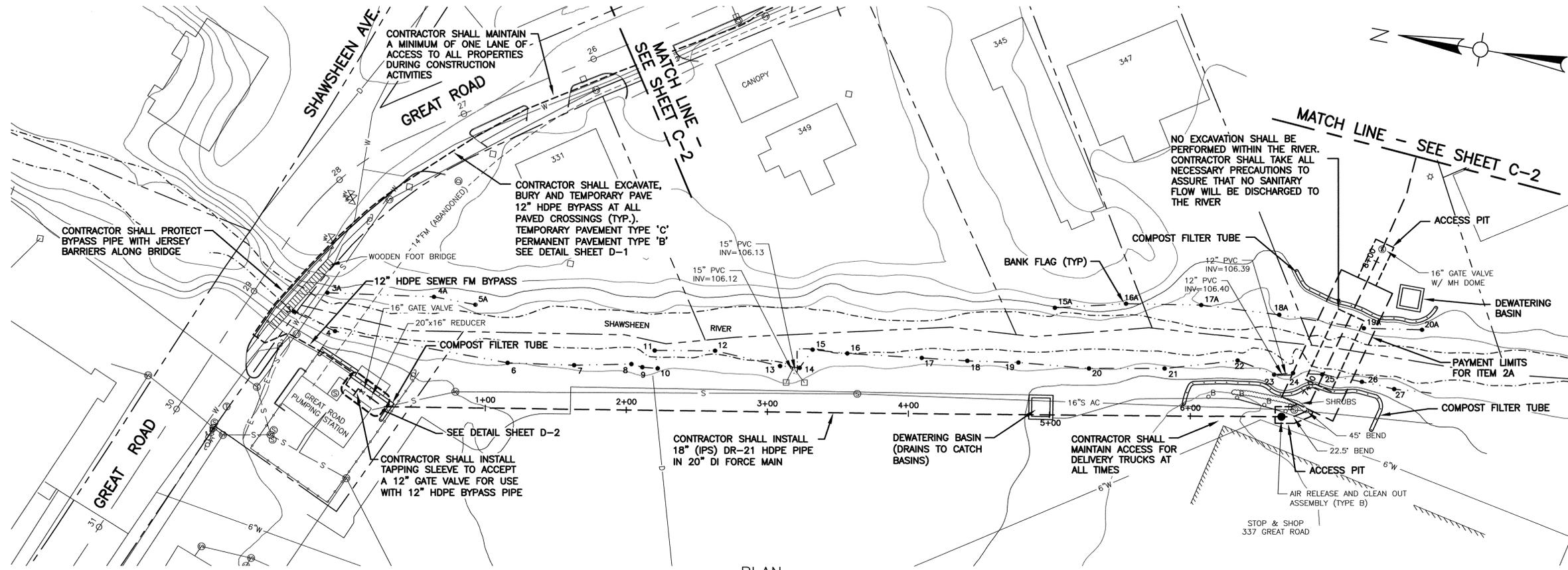


No.	Date	Dr. By	Ck. By	App. By	Description

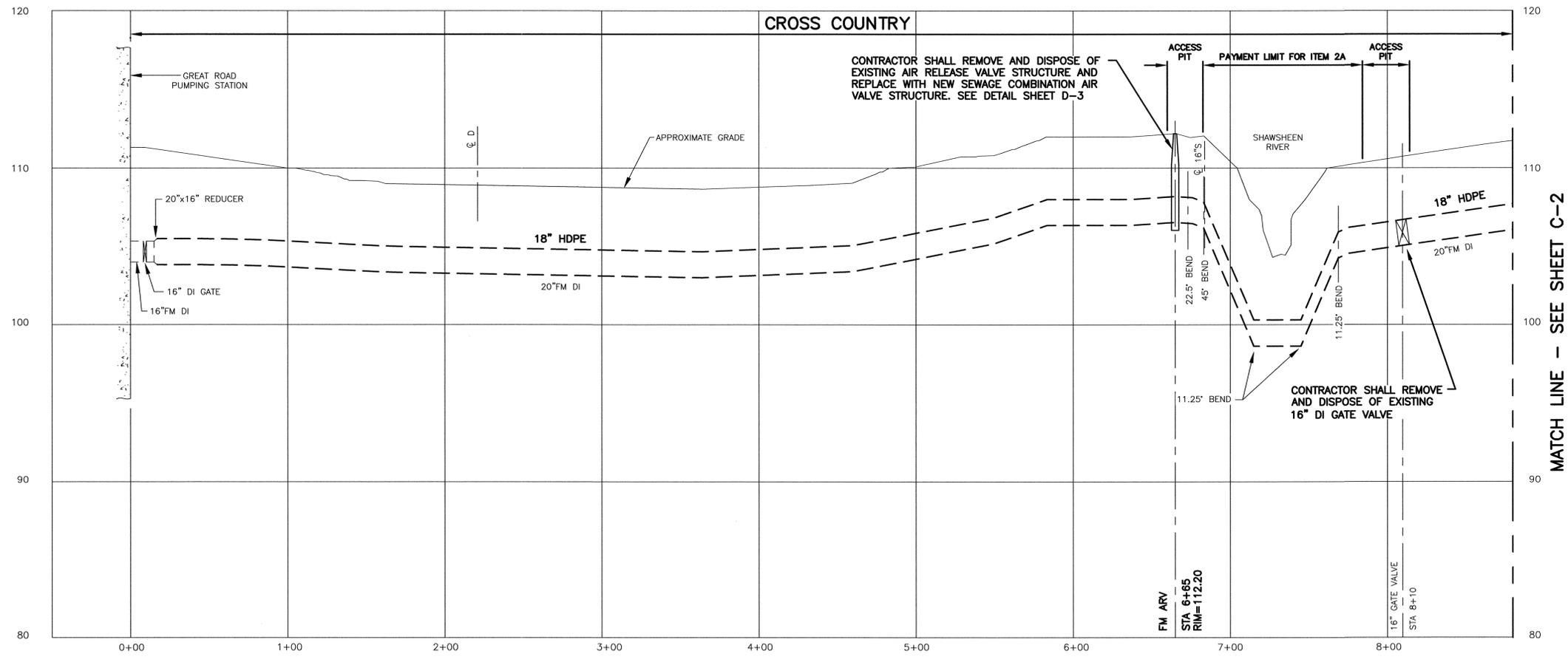


TOWN OF BEDFORD, MASSACHUSETTS  
DEPARTMENT OF PUBLIC WORKS  
BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION  
**CONSTRUCTION ZONE SAFETY PLAN II**

SCALE: NOTED  
TRAFFIC PLANS  
JOB NO. 21-40707  
DR. BY: MIM  
CHK. BY: JRH  
APP. BY: DME



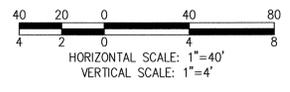
PLAN  
SCALE: 1" = 40'



PROFILE  
SCALE: 1"=40' HORIZ  
1"=4' VERT

**NOTES:**

1. WORK ZONE SHALL BE PROTECTED FROM FLOODING DURING WET WEATHER EVENTS.
2. CONTRACTOR MAY LOCATE ACCESS PITS AT THEIR DISCRETION TO FACILITATE SLIP LINE PIPE WORK.
3. CONTRACTOR SHALL PROVIDE TRENCH SHORING AS NECESSARY FOR ACCESS PITS.
4. ACCESS PITS SHALL BE INCIDENTAL TO THE SLIP LINE COST.

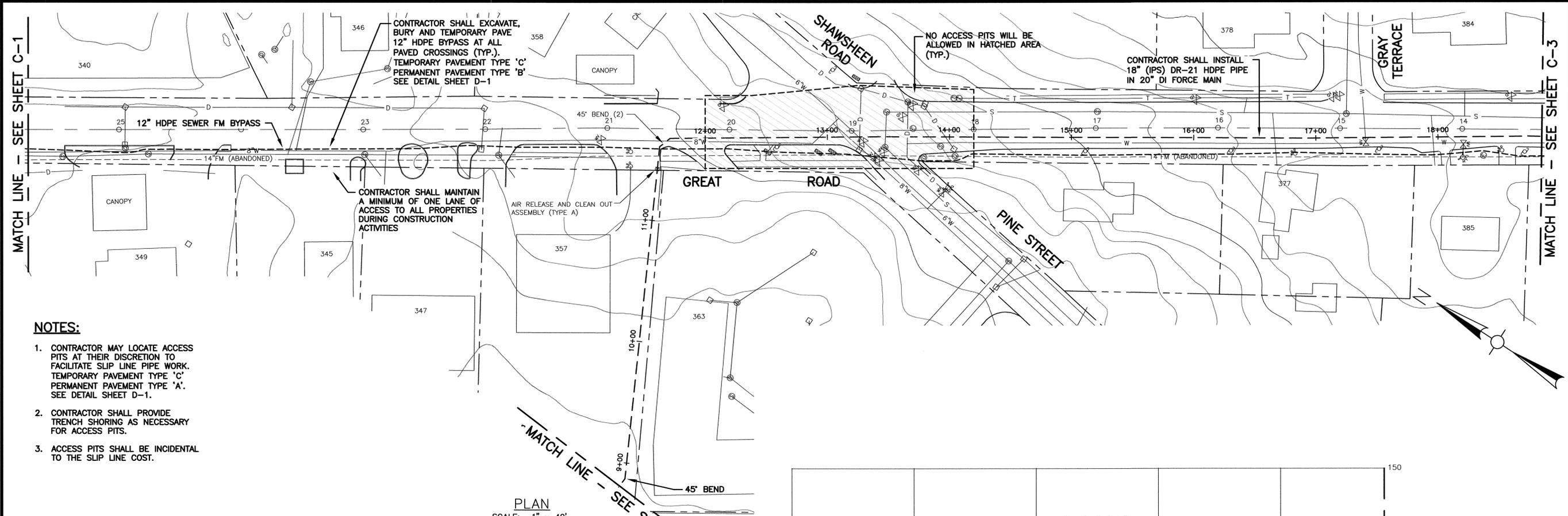


No.	Date	Dr. By	Chk. By	App. By	Description
1					P R O V E D
					DATE: 6/15/15



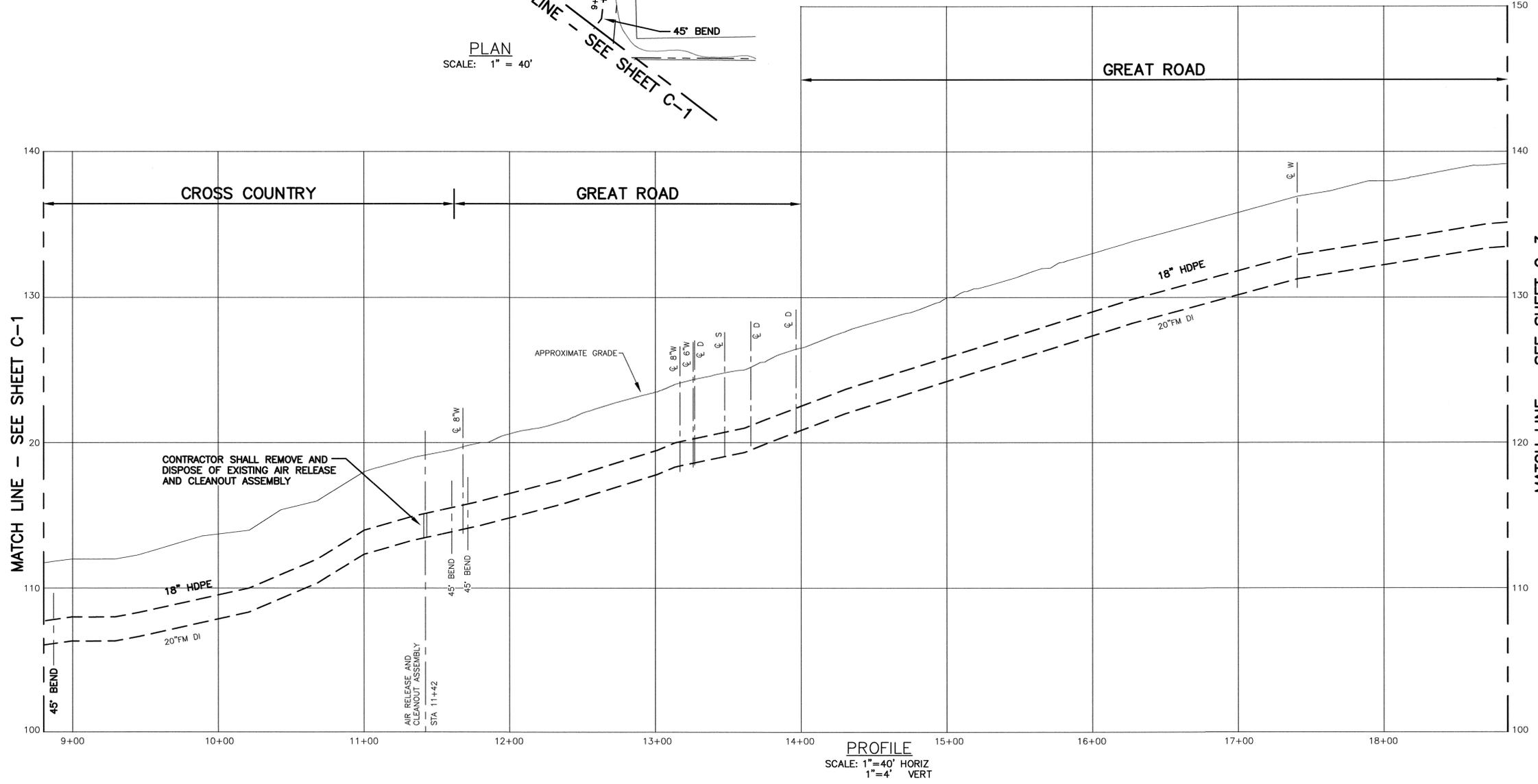
TOWN OF BEDFORD, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS	CONTRACT NO. 2140707	DR. BY: RWS	CHK. BY: JRH	APP. BY: DME
BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION	SCALE: NOTED	DR. BY: RWS	CHK. BY: JRH	APP. BY: DME
GREAT ROAD 0+00 TO STA 8+80	CONTRACT: NOTED	DR. BY: RWS	CHK. BY: JRH	APP. BY: DME
FILE NO. 211-87	SCALE: NOTED	DR. BY: RWS	CHK. BY: JRH	APP. BY: DME

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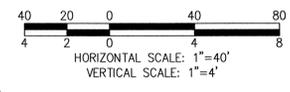


- NOTES:**
1. CONTRACTOR MAY LOCATE ACCESS PITS AT THEIR DISCRETION TO FACILITATE SLIP LINE PIPE WORK. TEMPORARY PAVEMENT TYPE 'C' PERMANENT PAVEMENT TYPE 'A'. SEE DETAIL SHEET D-1.
  2. CONTRACTOR SHALL PROVIDE TRENCH SHORING AS NECESSARY FOR ACCESS PITS.
  3. ACCESS PITS SHALL BE INCIDENTAL TO THE SLIP LINE COST.

PLAN  
SCALE: 1" = 40'



PROFILE  
SCALE: 1"=40' HORIZ  
1"=4' VERT



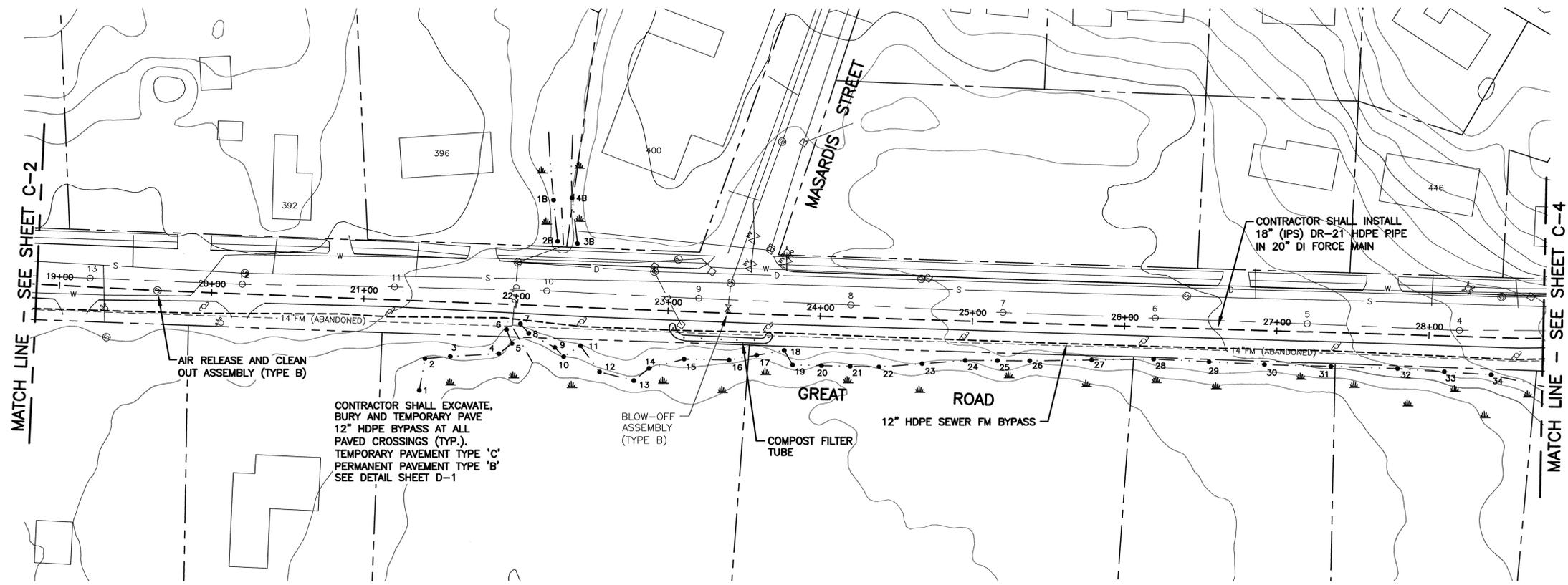
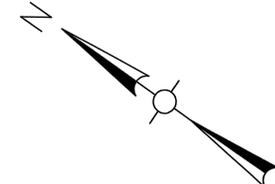
No.	Date	Dr. By	Ck. By	App. By	Description
1	6/15/15				P R O V E D

REGISTERED PROFESSIONAL ENGINEER

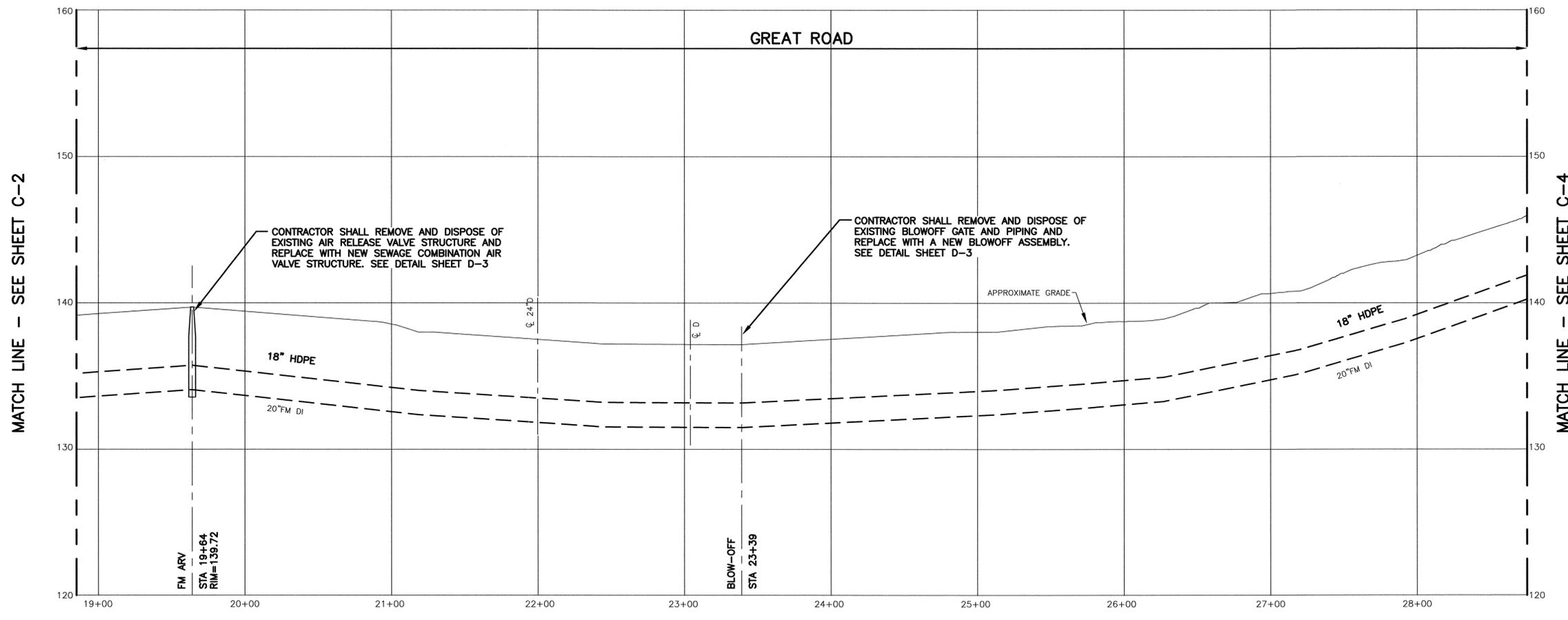


TOWN OF BEDFORD, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS	DR. BY: RWS	DSN. BY: JRH	CHK. BY: PMS	APP. BY: DME
GREAT ROAD STA 8+80 TO STA 18+85	CONTRACT: NOTED	SCALE: 1"=40' HORIZ 1"=4' VERT	FILE NO: 211-86	CADD NO: GreatRd-Bedford

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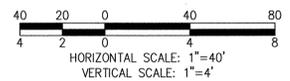


PLAN  
 SCALE: 1" = 40'



PROFILE  
 SCALE: 1" = 40' HORIZ  
 1" = 4' VERT

- NOTES:**
- CONTRACTOR MAY LOCATE ACCESS PITS AT THEIR DISCRETION TO FACILITATE SLIP LINE PIPE WORK. TEMPORARY PAVEMENT TYPE 'C' PERMANENT PAVEMENT TYPE 'A'. SEE DETAIL SHEET D-1.
  - CONTRACTOR SHALL PROVIDE TRENCH SHORING AS NECESSARY FOR ACCESS PITS.
  - ACCESS PITS SHALL BE INCIDENTAL TO THE SLIP LINE COST.



No.	Date	Dr. By	Ck. By	App. By	Description

REGISTERED PROFESSIONAL ENGINEER: *[Signature]* DATE: 6/15

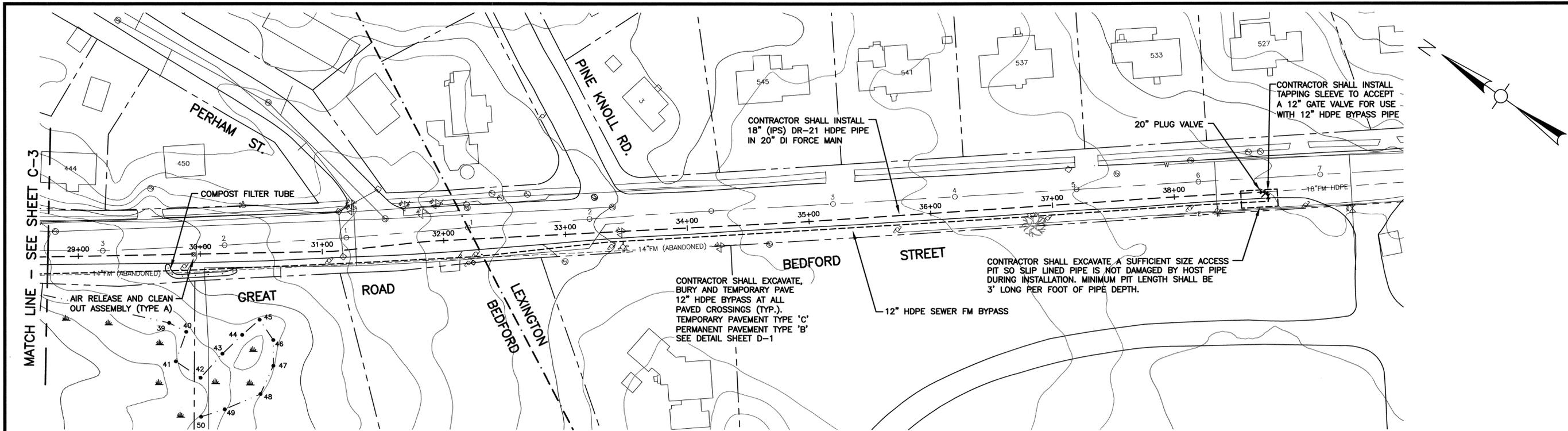


TOWN OF BEDFORD, MASSACHUSETTS  
 DEPARTMENT OF PUBLIC WORKS  
 BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION  
 GREAT ROAD STA 18+85 TO STA 28+75

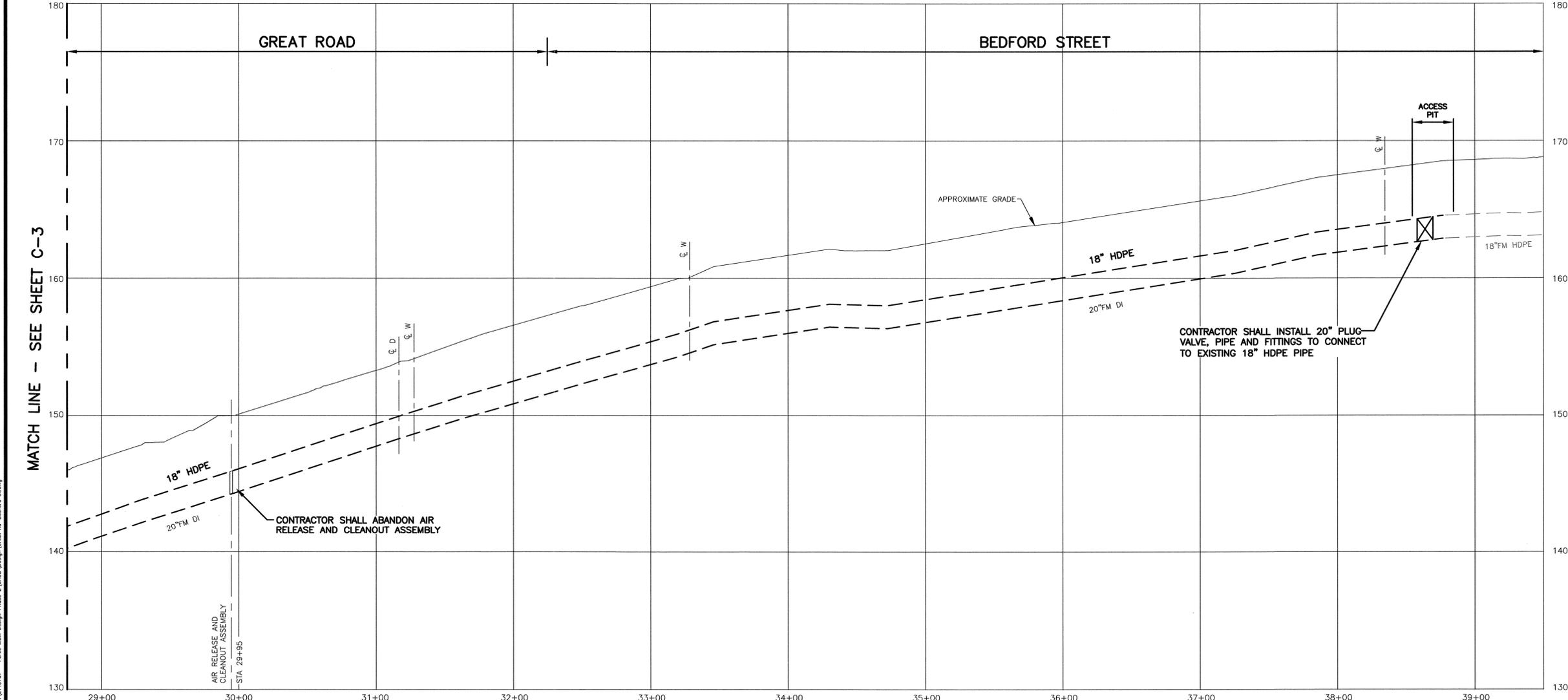
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 SCALE: NOTED  
 CONTRACT: NOTED  
 JOB NO: 2140707  
 DR BY: RWS  
 CHK BY: JRH  
 PMS: DME  
 APP BY: DME



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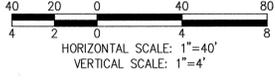
PLAN  
SCALE: 1" = 40'



PROFILE  
SCALE: 1" = 40' HORIZ  
1" = 4' VERT

**NOTES:**

1. CONTRACTOR MAY LOCATE ACCESS PITS AT THEIR DISCRETION TO FACILITATE SLIP LINE PIPE WORK. TEMPORARY PAVEMENT TYPE 'C' PERMANENT PAVEMENT TYPE 'A'. SEE DETAIL SHEET D-1.
2. CONTRACTOR SHALL PROVIDE TRENCH SHORING AS NECESSARY FOR ACCESS PITS.
3. ACCESS PITS SHALL BE INCIDENTAL TO THE SLIP LINE COST.



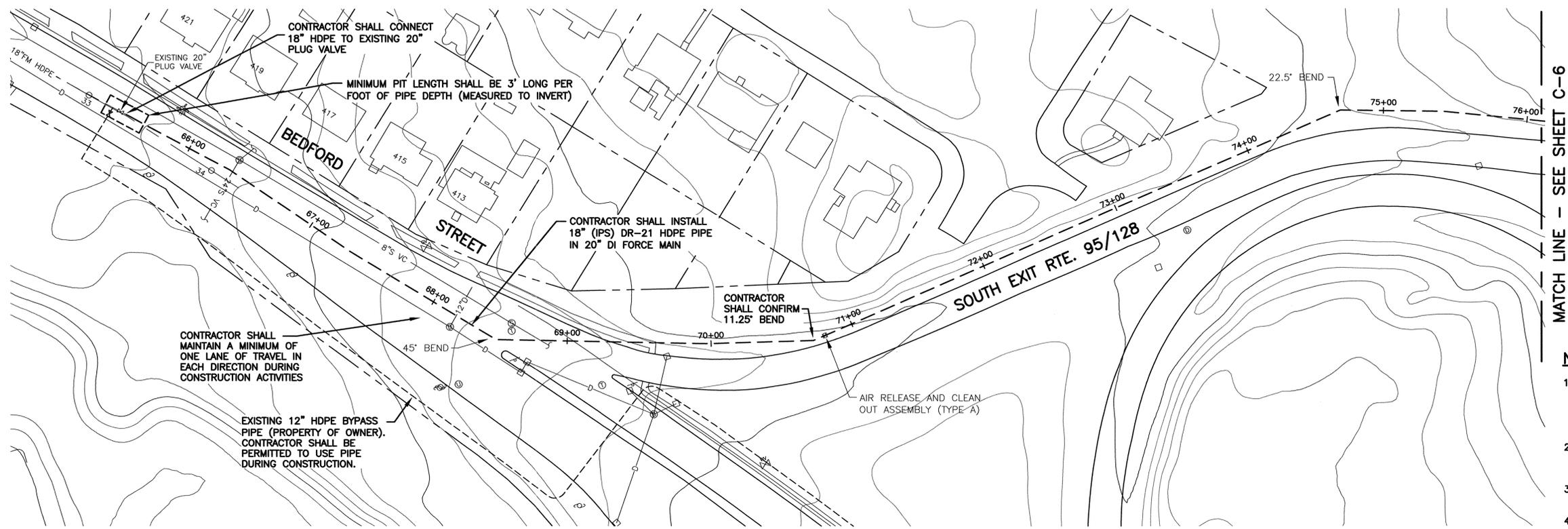
No.	Date	Dr. By	Ck. By	App. By	Description
					P R O V E D
					DATE 6/14/15

REGISTERED PROFESSIONAL ENGINEER



TOWN OF BEDFORD, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS	DR. BY: RWS	CHK. BY: JRH	APP. BY: DME
BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION	CONTRACT: NOTED	SCALE: 1"=40'	SCALE: 1"=4'
GREAT ROAD STA 28+75 TO STA 32+25	CONTRACT: NOTED	SCALE: 1"=40'	SCALE: 1"=4'
BEDFORD STREET STA 32+25 TO STA 38+77	CONTRACT: NOTED	SCALE: 1"=40'	SCALE: 1"=4'
FILE NO: 211-84	CONTRACT: NOTED	SCALE: 1"=40'	SCALE: 1"=4'

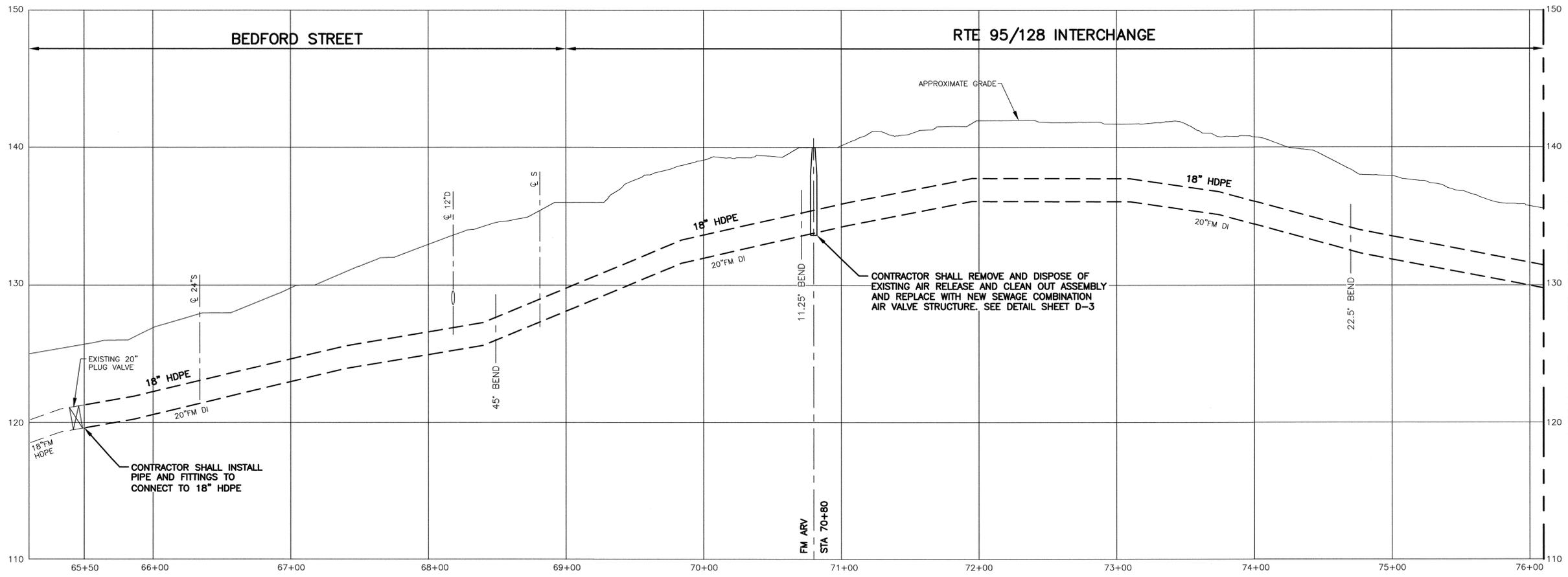
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PLAN  
SCALE: 1" = 40'

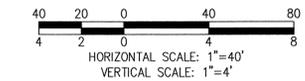
**NOTES:**

1. CONTRACTOR MAY LOCATE ACCESS PITS AT THEIR DISCRETION TO FACILITATE SLIP LINE PIPE WORK. TEMPORARY PAVEMENT TYPE 'C' PERMANENT PAVEMENT TYPE 'A' SEE DETAIL SHEET D-1.
2. CONTRACTOR SHALL PROVIDE TRENCH SHORING AS NECESSARY FOR ACCESS PITS.
3. ACCESS PITS SHALL BE INCIDENTAL TO THE SLIP LINE COST.
4. CONTRACTOR MAY BE REQUIRED TO WORK DURING LOW TRAFFIC PERIODS (NIGHTTIME) BETWEEN STA 65+50 AND STA 89+00 (RTE 95/128 HIGHWAY CROSSING).



PROFILE  
SCALE: 1"=40' HORIZ  
1"=4' VERT

MATCH LINE - SEE SHEET C-6



No.	Date	Dr. By	Chk. By	App. By	Description
					P R O V E D
					DATE
					REGISTERED PROFESSIONAL ENGINEER



TOWN OF BEDFORD, MASSACHUSETTS  
DEPARTMENT OF PUBLIC WORKS

BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION

BEDFORD STREET STA 65+50 TO STA 76+10

CONTRACT: NOTED

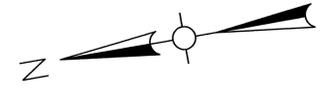
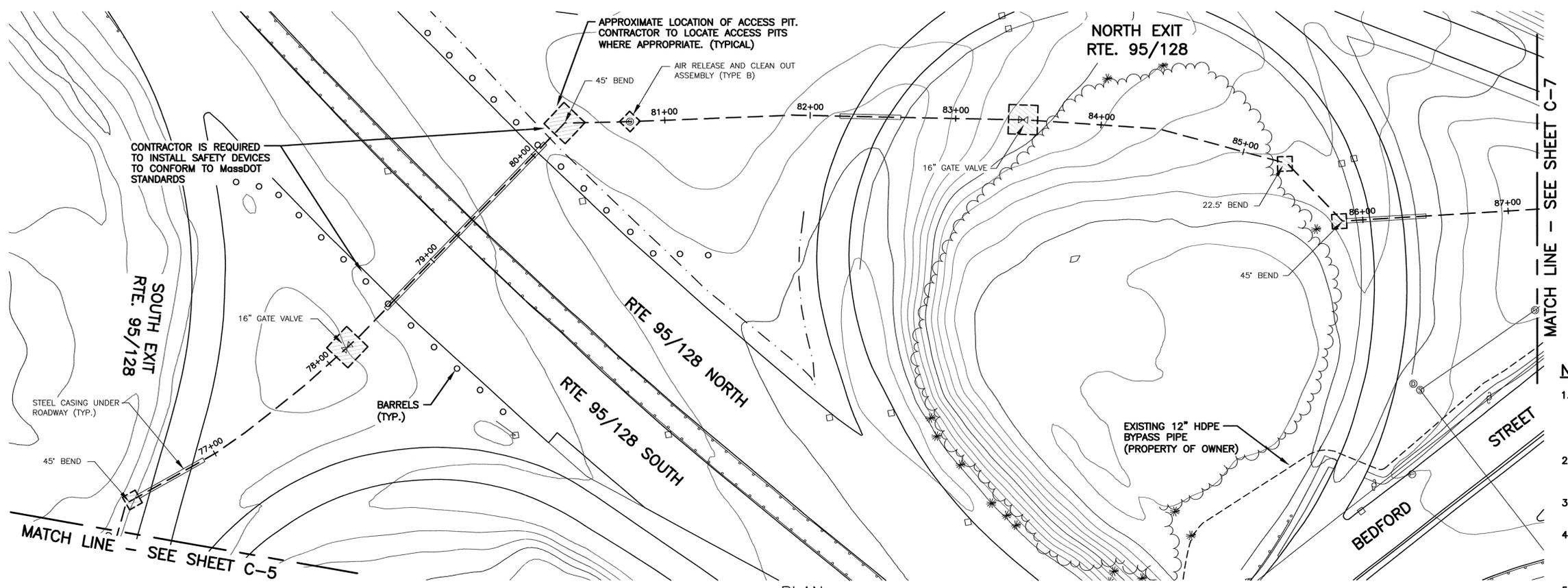
SCALE: Bedford

DR. BY: RWS  
CHK. BY: JRH  
APP. BY: DME

JOB NO. 2140707

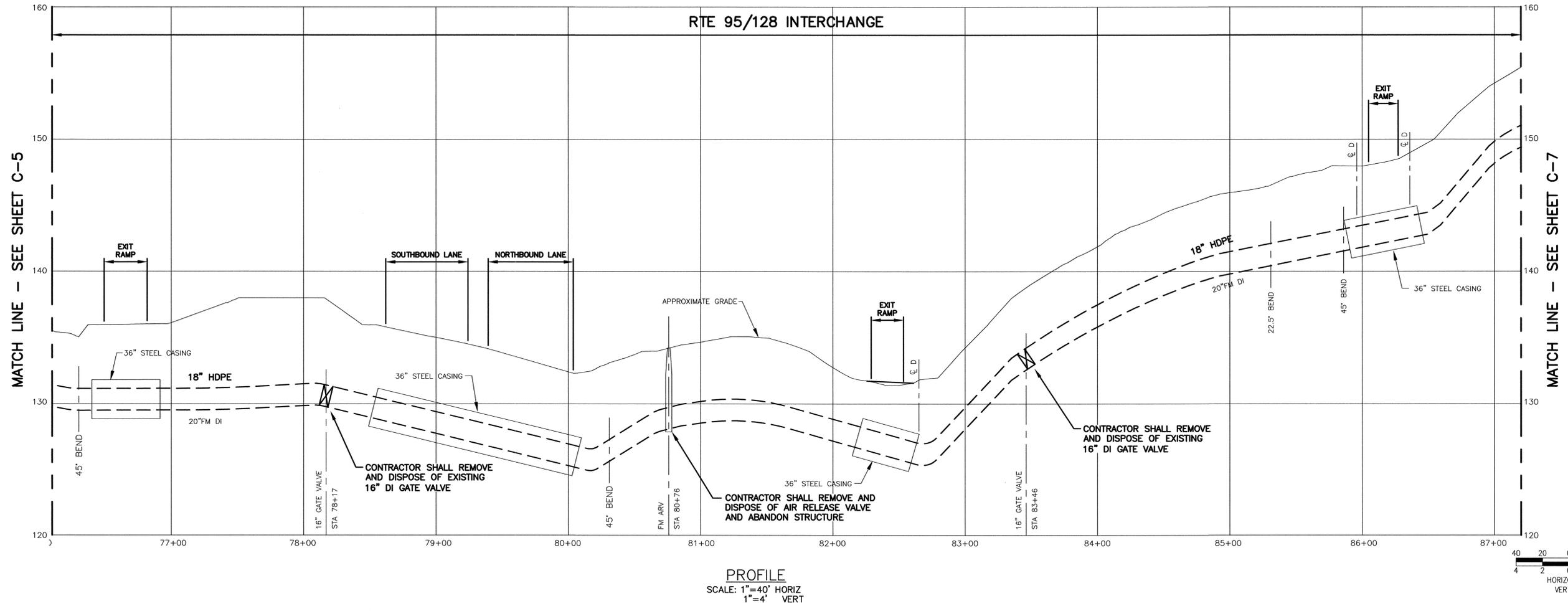
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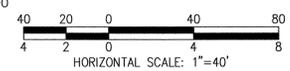


- NOTES:**
1. CONTRACTOR MAY LOCATE ACCESS PITS AT THEIR DISCRETION TO FACILITATE SLIP LINE PIPE WORK. TEMPORARY PAVEMENT TYPE 'C' PERMANENT PAVEMENT TYPE 'A'. SEE DETAIL SHEET D-1.
  2. CONTRACTOR SHALL PROVIDE TRENCH SHORING AS NECESSARY FOR ACCESS PITS.
  3. ACCESS PITS SHALL BE INCIDENTAL TO THE SLIP LINE COST.
  4. CONTRACTOR MAY BE REQUIRED TO WORK DURING LOW TRAFFIC PERIODS (NIGHTTIME) BETWEEN STA 65+50 AND STA 89+00 (RTE 95/128 HIGHWAY CROSSING).
  5. TRAFFIC CONTROL AND SAFETY DEVICES MUST CONFORM TO MassDOT STANDARDS.

**PLAN**  
SCALE: 1" = 40'



**PROFILE**  
SCALE: 1"=40' HORIZ  
1"=4' VERT



No.	Date	Dr. By	Chk. By	App. By	Description
1	6/16/15				P R O V E D

REGISTERED PROFESSIONAL ENGINEER  
DATE: 6/16/15

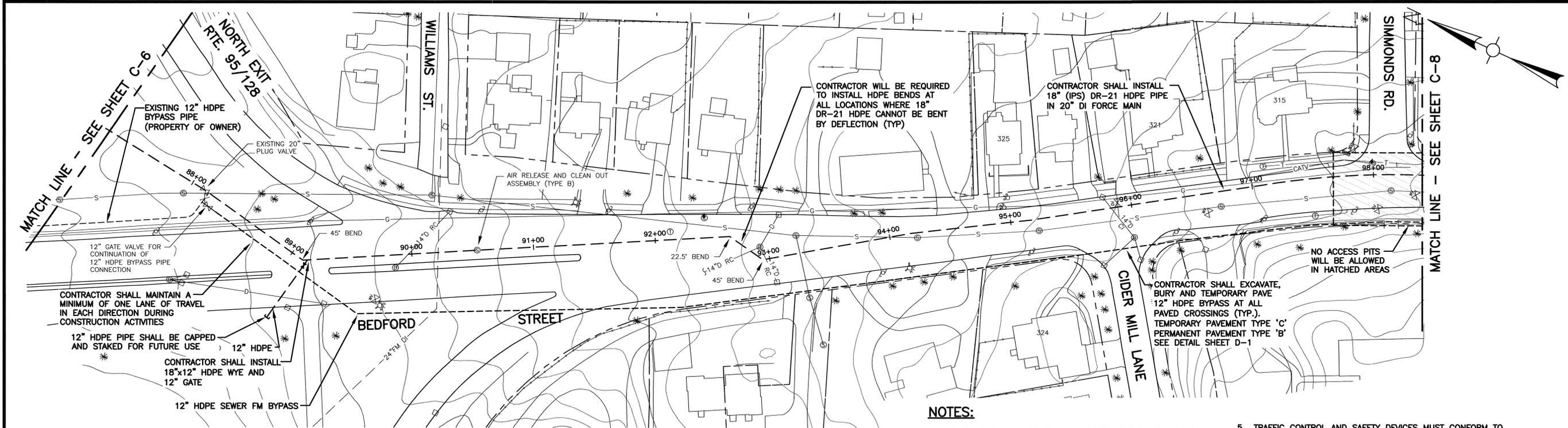


TOWN OF BEDFORD, MASSACHUSETTS  
DEPARTMENT OF PUBLIC WORKS

**BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION**

**BEDFORD STREET STA 76+10 TO STA 87+20**

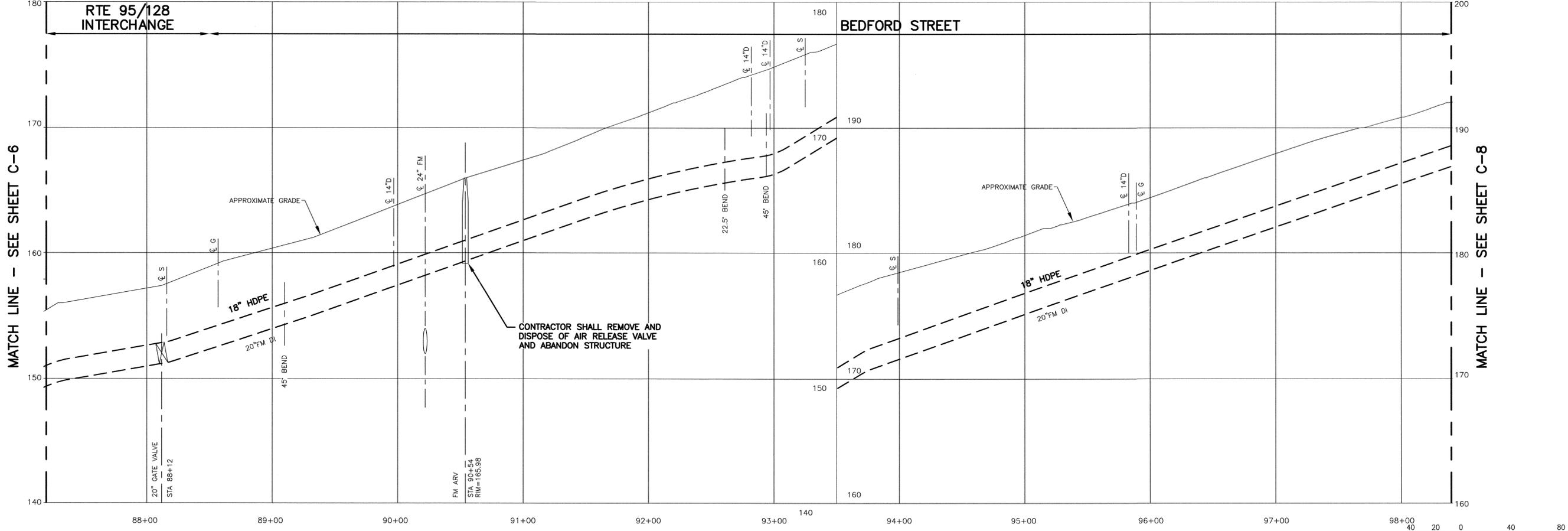
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CADD NO. GreatRd-Bedford  
JOB NO. 2140707  
CONTRACT: NOTED  
SCALE: NOTED  
DR BY: RWS  
DSN BY: JRH  
CHK BY: PMS  
APP BY: DME



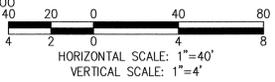
PLAN  
SCALE: 1" = 40'

**NOTES:**

- CONTRACTOR MAY LOCATE ACCESS PITS AT THEIR DISCRETION TO FACILITATE SLIP LINE PIPE WORK. TEMPORARY PAVEMENT TYPE 'C' PERMANENT PAVEMENT TYPE 'A' SEE DETAIL SHEET D-1.
- CONTRACTOR SHALL PROVIDE TRENCH SHORING AS NECESSARY FOR ACCESS PITS.
- ACCESS PITS SHALL BE INCIDENTAL TO THE SLIP LINE COST.
- CONTRACTOR MAY BE REQUIRED TO WORK DURING LOW TRAFFIC PERIODS (NIGHTTIME) BETWEEN STA 65+50 AND STA 89+00 (RTE 95/128 HIGHWAY CROSSING).
- TRAFFIC CONTROL AND SAFETY DEVICES MUST CONFORM TO MassDOT STANDARDS.
- CONTRACTOR SHALL COORDINATE WITH LEXINGTON POLICE TO ALTER TRAFFIC LIGHT TO ALLOW RIGHT TURN FROM SIMMONDS ROAD DETOUR.
- CONTRACTOR SHALL PROVIDE DETOUR SIGNS THAT CONFORM TO MUTCD STANDARDS.



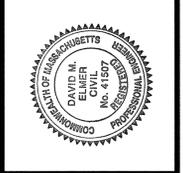
PROFILE  
SCALE: 1"=40' HORIZ  
1"=4' VERT



**Weston & Sampson**  
 Fire Centennial Drive, Peabody, MA 01960  
 (978) 532-1900 (603) 532-1900  
 www.westonandsampson.com

No.	Date	Dr. By	Chk. By	App. By	Description
1		A. P.	J. R. H.	D. M. E.	DESIGN
2	6/15/16				DATE

REGISTERED PROFESSIONAL ENGINEER



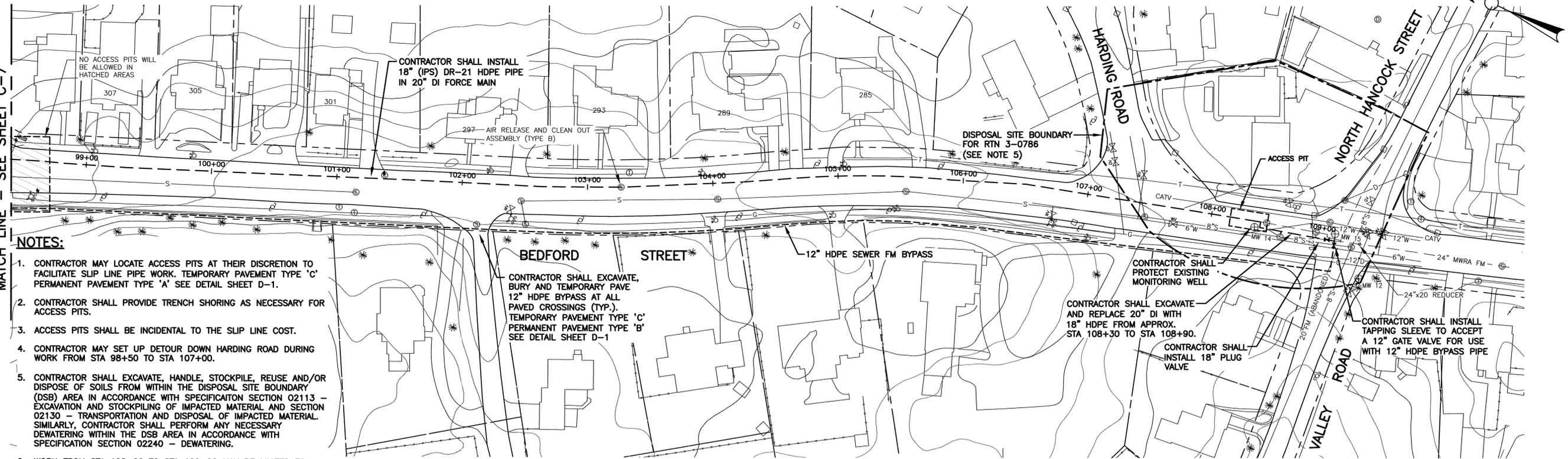
TOWN OF BEDFORD, MASSACHUSETTS  
 DEPARTMENT OF PUBLIC WORKS  
 BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION  
**BEDFORD STREET STA 87+20 TO STA 98+40**  
 CADD NO. 211-81  
 CONTRACT: NOTED  
 SCALE: 1"=40' HORIZ, 1"=4' VERT  
 JOB NO. 2140707  
 DR. BY: RWS  
 CHK. BY: J.R.H.  
 APP. BY: D.M.E.

C:\Bedford MA\2140707 - Force Main Design Phase 2\CADD\Design\West Rec-Bedford Sl.Lwg

MATCH LINE - SEE SHEET C-7

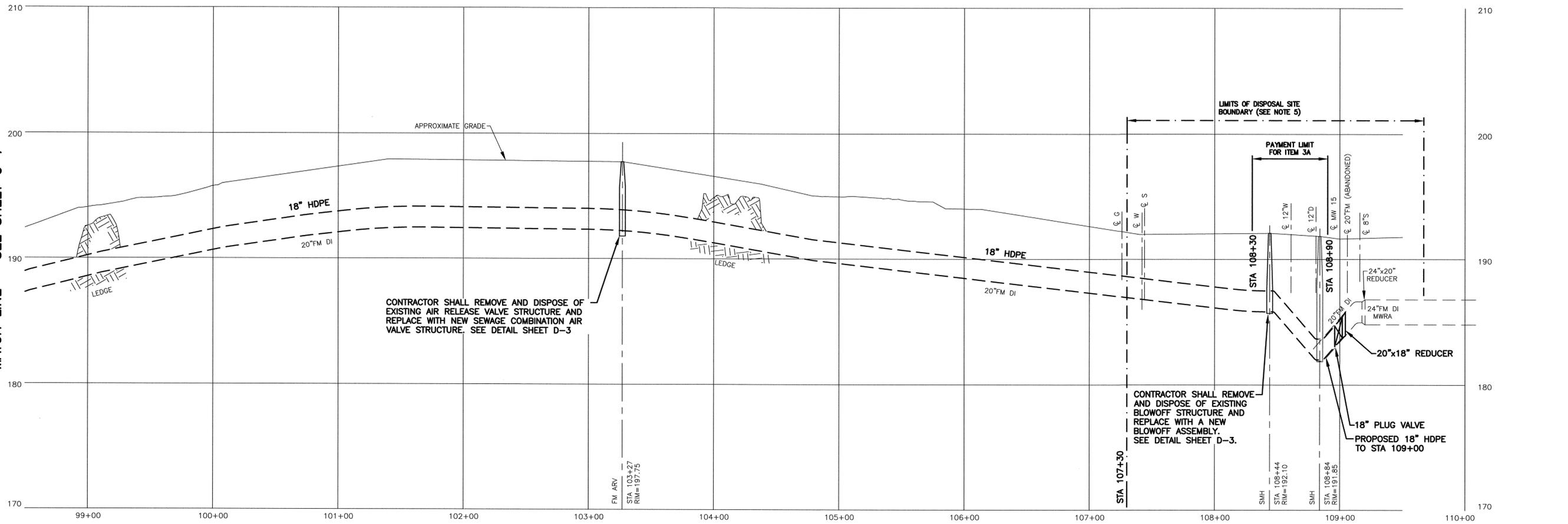
NOTES:

1. CONTRACTOR MAY LOCATE ACCESS PITS AT THEIR DISCRETION TO FACILITATE SLIP LINE PIPE WORK. TEMPORARY PAVEMENT TYPE 'C' PERMANENT PAVEMENT TYPE 'A' SEE DETAIL SHEET D-1.
2. CONTRACTOR SHALL PROVIDE TRENCH SHORING AS NECESSARY FOR ACCESS PITS.
3. ACCESS PITS SHALL BE INCIDENTAL TO THE SLIP LINE COST.
4. CONTRACTOR MAY SET UP DETOUR DOWN HARDING ROAD DURING WORK FROM STA 98+50 TO STA 107+00.
5. CONTRACTOR SHALL EXCAVATE, HANDLE, STOCKPILE, REUSE AND/OR DISPOSE OF SOILS FROM WITHIN THE DISPOSAL SITE BOUNDARY (DSB) AREA IN ACCORDANCE WITH SPECIFICATION SECTION 02113 - EXCAVATION AND STOCKPILING OF IMPACTED MATERIAL AND SECTION 02130 - TRANSPORTATION AND DISPOSAL OF IMPACTED MATERIAL. SIMILARLY, CONTRACTOR SHALL PERFORM ANY NECESSARY DEWATERING WITHIN THE DSB AREA IN ACCORDANCE WITH SPECIFICATION SECTION 02240 - DEWATERING.
6. WORK FROM STA 108+00 TO STA 109+00 MAY BE LIMITED TO WEEKDAYS, 9:00 A.M. TO 3:00 P.M. OR LOW TRAFFIC PERIODS (NIGHT TIME) UNLESS WRITTEN APPROVAL IS OBTAINED FROM THE TOWN OF LEXINGTON, MA.

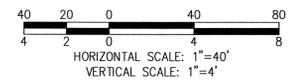


PLAN  
SCALE: 1" = 40'

MATCH LINE - SEE SHEET C-7



PROFILE  
SCALE: 1"=40' HORIZ  
1"=4' VERT



No.	Date	Dr. By	Ck. By	App. By	Description
1	6/15/15				DATE



TOWN OF BEDFORD, MASSACHUSETTS  
 DEPARTMENT OF PUBLIC WORKS  
**BEDFORD SEWER FORCE MAIN PHASE II REHABILITATION**  
**BEDFORD STREET STA 98+40 TO STA 109+00**

FILE NO. 211-80  
 CADD NO. 2140707  
 CONTRACT: NOTED  
 SCALE: Bedford  
 JOB NO. 2140707  
 DR. BY: RWS  
 DSN. BY: JRH  
 CHK. BY: PMS  
 APP. BY: DME

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