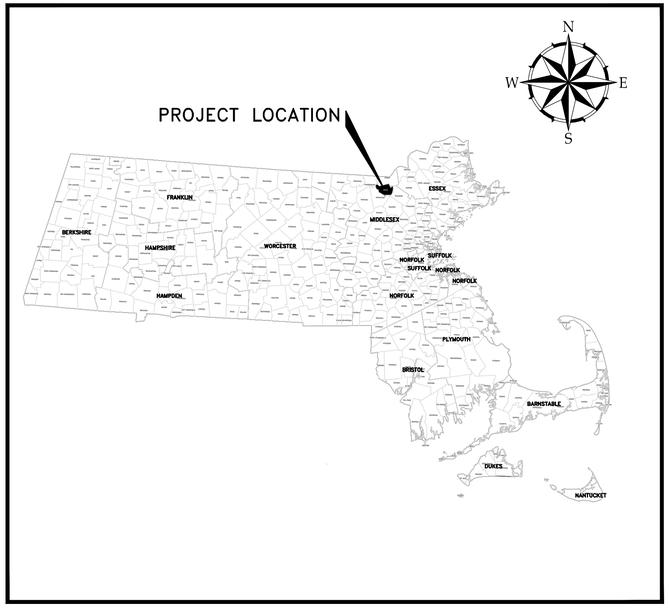
LOWELL REGIONAL WATER UTILITY
LOWELL, MASSACHUSETTS
HUMPHREY STREET
WATER MAIN REPLACEMENT

PROJECT NO. 227251.50
JULY 2016



PROJECT LOCATION MAP

50 0 50 100
scale mile

SHEET INDEX

GENERAL

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CIVIL

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C-102 HUMPHREY STREET CENTRAL
C-103 HUMPHREY STREET SOUTH & ABERDEEN STREET NORTH
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DETAILS

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C-502 WATER MAIN DETAILS – 2

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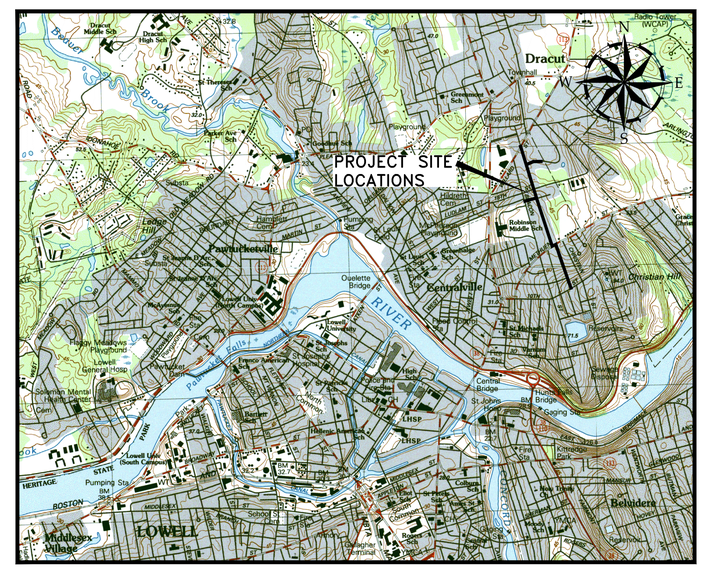
COMMITMENT & INTEGRITY DRIVE RESULTS



SITE LOCATION MAP

NTS

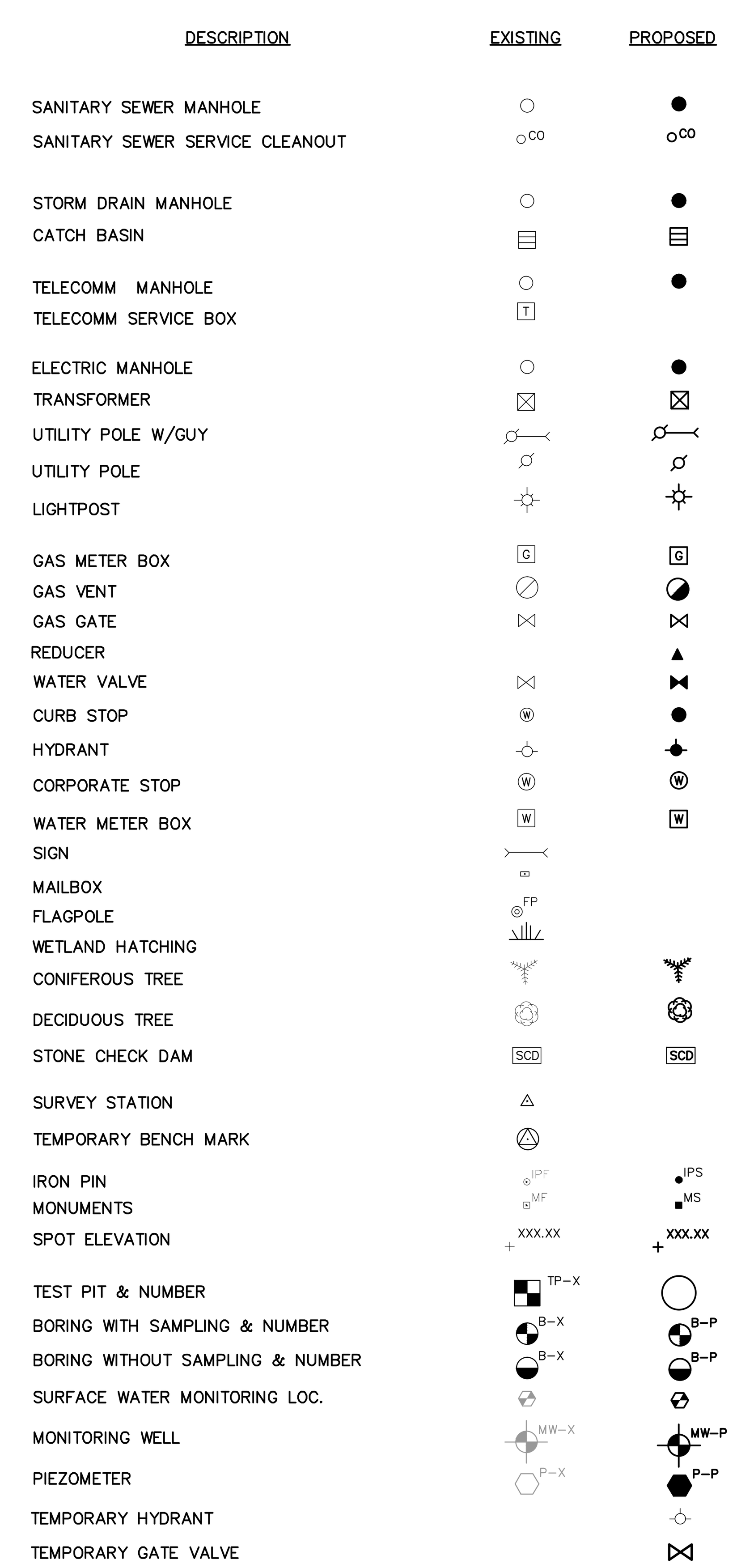
GENERAL NOTES

1. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PERFORM THE WORK INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS. ALL WORK TO BE COMPLETED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES.
2. THE LOCATION, TYPE AND SIZE OF EXISTING PIPES, DUCTS, CONDUITS, UTILITIES AND UNDERGROUND STRUCTURES SHOWN ON THE DRAWINGS ARE NOT WARRANTED TO BE EXACT, NOR IS IT WARRANTED THAT ALL UNDERGROUND STRUCTURES ARE SHOWN. CONTRACTOR SHALL FIELD VERIFY ALL LOCATIONS, SIZES AND DEPTHS.
3. COORDINATE CONSTRUCTION ACTIVITIES WITH THE LOWELL REGIONAL WATER UTILITY (LRWU), LOWELL REGIONAL WASTEWATER UTILITY, LOWELL DEPARTMENT OF PUBLIC WORKS, LOWELL ENGINEERING DEPARTMENT, UTILITY COMPANIES AND THE ENGINEER.
4. RESTORE ALL AREAS DISTURBED BY CONTRACTOR'S OPERATIONS TO ORIGINAL CONDITION UNLESS NOTED OTHERWISE (GRAVEL, CONCRETE, PAVEMENT, GRASS, ETC.).
5. ALL NEW BURIED PIPE SHALL HAVE MINIMUM 5 FEET OF COVER UNLESS NOTED OTHERWISE OR APPROVED BY THE ENGINEER. BURIED PIPE WITH LESS THAN 5 FEET OF COVER SHALL HAVE A MINIMUM OF 4" OF RIGID INSULATION WITH AN R-VALUE OF R-20 INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. TAKE ALL NECESSARY PRECAUTIONS TO PREVENT EQUIPMENT FLUIDS FROM REACHING ANY WATER RESOURCE AREA. FLUID DISCHARGED INADVERTENTLY SHALL BE IMMEDIATELY CLEANED FROM THE WATER RESOURCE USING WHATEVER MEANS REQUIRED AS DETERMINED BY THE ENGINEER, AND THE CONTRACTOR SHALL CONTACT THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION.
7. LOCATION OF EXISTING UTILITIES, BUILDINGS, AND EQUIPMENT LAYOUTS ARE BASED ON BEST INFORMATION AVAILABLE. INFORMATION INCLUDES PLANS PROVIDED BY OWNER AND UTILITY COMPANIES AND SURVEY INFORMATION.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO START OF CONSTRUCTION.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO STRUCTURES AND EQUIPMENT NOT SCHEDULED FOR REMOVAL.
10. EXISTING FACILITIES (I.E. GUARDRAILS, TREES, POLES, SIGNS, LIGHT POLES, MAIL BOXES, ETC.) SHALL BE REMOVED AND REPLACED IN KIND, IN ACCORDANCE WITH LOCAL AND STATE REQUIREMENTS, OR PROTECTED AS REQUIRED DURING CONSTRUCTION. THE ASSOCIATED COSTS ARE CONSIDERED INCIDENTAL TO THE PROJECT.
11. CONTRACTOR TO PROVIDE TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH SPECIFICATION SECTION 01 50 00 PARAGRAPH 1.04F AND LOCAL REQUIREMENTS. THE CONTRACTOR MUST MAINTAIN CONTINUOUS TRAFFIC FLOW (MINIMUM OF ONE LANE EACH DIRECTION) DURING CONSTRUCTION.
12. ALL CURB DAMAGED DURING CONSTRUCTION SHALL BE REPLACED IN KIND AND SHALL CONFORM TO CITY OF LOWELL SPECIFICATIONS.
13. LOOP DETECTORS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED IN KIND AND SHALL CONFORM TO MASSDOT AND CITY OF LOWELL SPECIFICATIONS. THE ASSOCIATED COSTS SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
14. WHERE NEW WATER MAINS OR APPURTENANCES ARE TO BE CONNECTED TO EXISTING PIPE, CONTRACTOR SHALL CUT AND REMOVE THE EXISTING PIPE AS NECESSARY TO INSTALL THE NEW WORK. TEST PIT LOCATIONS WHERE NEW MAINS CONNECT TO EXISTING MAINS TO VERIFY PIPE AND MATERIAL TYPE.
15. FINAL LOCATIONS FOR NEW WATER MAINS, HYDRANTS, VALVES AND FITTINGS SHALL BE ESTABLISHED IN THE FIELD BY THE OWNER.
16. CONTRACTOR IS RESPONSIBILE TO NOTIFY THE LOWELL REGIONAL WATER UTILITY, LOWELL REGIONAL WASTEWATER UTILITY, LOWELL DEPARTMENT OF PUBLIC WORKS, LOWELL ENGINEERING DEPARTMENT, AND UTILITY COMPANIES PRIOR TO COMMENCING WORK TO ALLOW SUFFICIENT TIME TO LOCATE AND MARK THE LOCATION OF ALL BURIED UTILITIES. CONTRACTOR SHALL ALSO CONTACT "DIG SAFE", TELEPHONE NO. 888-344-7233, AT LEAST 72 HOURS PRIOR TO CONSTRUCTION. REPAIR OF ANY DAMAGED UTILITY WILL BE INCIDENTAL TO THE CONTRACT.
17. BRACING OF UTILITY POLES, WHERE REQUIRED, SHALL BE INCIDENTAL TO THE INSTALLATION OF THE WATER MAIN, NO SEPARATE PAYMENT SHALL BE MADE.
18. THE CONTRACTOR SHALL NOT STORE TOOLS, VEHICLES, MATERIALS, SUPPLIES, OR EQUIPMENT ON DRAINAGE STRUCTURES OR WITHIN 100 FEET OF WETLANDS OR RIVERFRONT RESOURCE AREAS.
19. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES OR HYDRANTS IN THE DISTRIBUTION SYSTEM.
20. THE LRWU WILL OPERATE EXISTING VALVES AND HYDRANTS TO ISOLATE SECTIONS OF THE WORK. CONTRACTOR TO PROVIDE A MINIMUM 48-HOUR ADVANCE NOTICE TO LRWU WHEN REQUESTING OPERATION OF EXISTING VALVES AND HYDRANTS.
21. INITIAL TRENCH-WIDTH PAVEMENT SHALL BE INSTALLED AT THE END OF EACH WEEK.
22. SAWCUT ALL DRIVEWAYS, WALKWAYS, AND SIDEWALKS AT EDGE OF RIGHT OF WAY TO TRANSITION EXSITING GRADE TO FINISH GRADE.
23. ALL CITY OF LOWELL ORDINANCES APPLY.
24. SIDEWALK RESTORATION TO INCLUDE REPLACEMENT IN KIND OF EXISTING PRIOR TO CONSTRUCTION WITH RESPECT TO WIDTH AND MATERIALS. ALL SIDEWALK RESTORATION SHALL BE CONSTRUCTED TO THE SPECIFICATIONS SET FORTH IN THE COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF PUBLIC SAFETY, AAB, "RULES AND REGULATIONS" WHICH APPEAR IN THE CODE OF MA REG (C) 521 CMR 1.00.
25. SOLID SLEEVES ARE SHOWN ON THE DRAWINGS FOR ALL CONNECTIONS TO EXISTING WATER MAIN. IF OUTER DIAMETER OF EXISTING WATER MAIN IS FOUND TO BE GREATER THAN THE MAXIMUM OUTER DIAMETER COMPATIBLE WITH SOLID SLEEVES, CONTRACTOR SHALL INSTALL A COUPLING TO COMPLETE CONNECTION WITH EXISTING WATER MAIN.

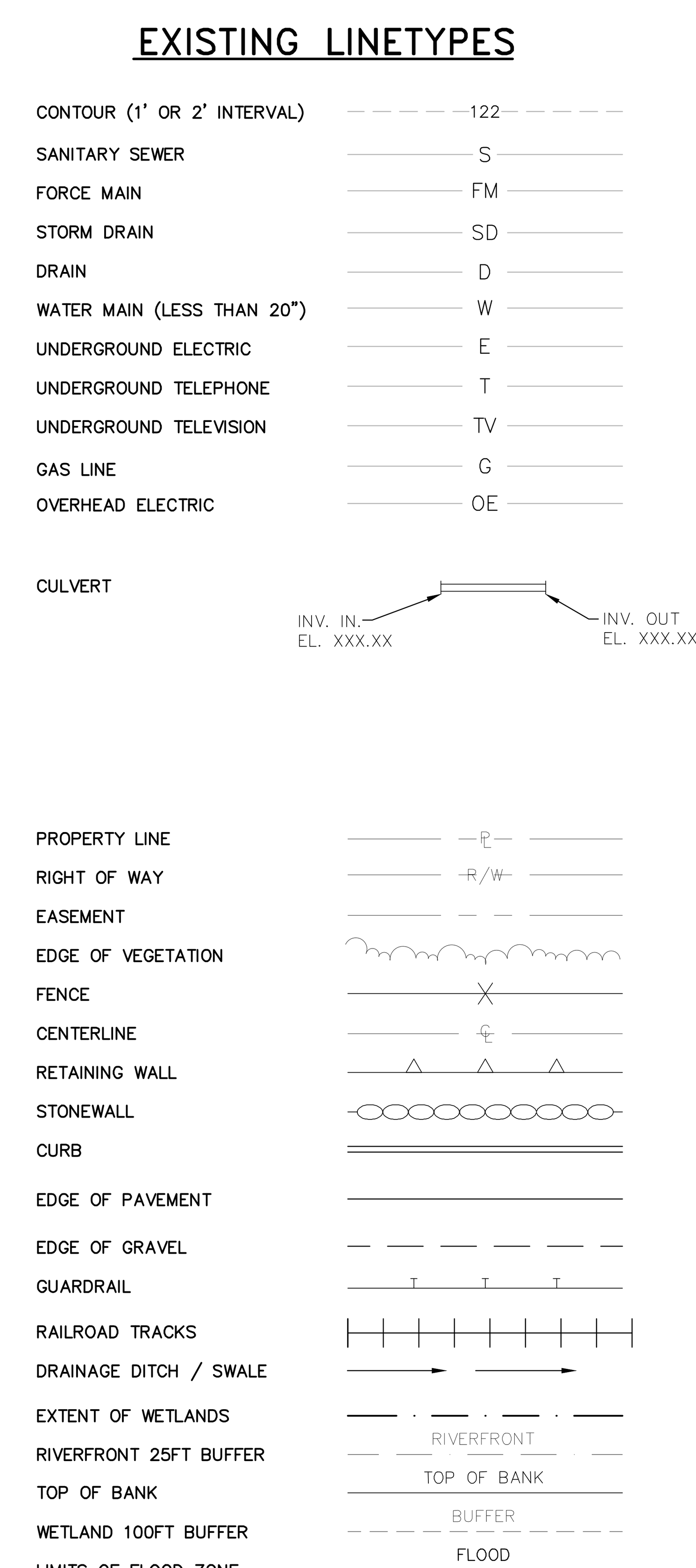
ABBREVIATIONS

@	AT
ADJ.	ADJUSTABLE
ALUM.	ALUMINUM
APA	AMERICAN PLYWOOD ASSOCIATION
APPROX.	APPROXIMATE
ASS'Y	ASSEMBLY
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS
B	BEAM
B	BORING
BLDG.	BUILDING
BOT	BOTTOM
BV	BUTTERFLY VALVE
C	COLUMN
C.E.	CONTINUOUS END
CB	CATCH BASIN
CJ	CONTROL JOINT
CK.	CHECKED
CLR.	CLEAR
CLF	CHAIN LINK FENCE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
COL.	COLUMN
CONC.	CONCRETE
CONT.	CONTINUOUS
COR	CORNER
CORR.	CORRUGATED
CPE	CORRUGATED POLYETHYLENE
CU	COPPER
D	DIAMETER
D.E.	DISCONTINUOUS END
D.I.	DUCTILE IRON
DES.	DESIGNED
DIA.	DIAMETER
DIAG.	DIAGONALLY
DISCONT.	DISCONTINUOUS
DR.	DRAWN
DRI	DOUBLE RING INFILTROMETER
DRWGS.	DRAWINGS
E	EASTING
EA.	EACH
EFFL.	EFFLUENT
EL.	ELEVATION
ELECT.	ELECTRICAL
ELEV.	ELEVATION
EMBED.	EMBEDDMENT
EQ.	EQUALIZATION
EXP.	EXPANSION
F	FOOTING
FD	FLOOR DRAIN
FF	FINISH FLOOR
FIN	FINISH
FIN. FLR.	FINISH FLOOR
FL.	FLANGE
FM	FORCE MAIN
FRP	FIBERGLASS REINFORCED PLASTIC
FT.	FOOT
FTG.	FOOTING
FTG.	FITTING
G	GAS
GALV.	GALVANIZED
GV	GATE VALVE
H	HATCH
H	HEIGHT
HOR.	HORIZONTAL
HORIZ.	HORIZONTAL
HP	HIGH POINT
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
IMFO	INTEGRALLY MOLDED FLANGED OPENING
INV.	INVERT
L	LENGTH
L.L.V.	LONG LEG VERTICAL
LB	POUND
LG.	LONG
LP	LOW POINT
M.O.	MASONRY OPENING
MAX.	MAXIMUM
MECH.	MECHANICAL
MH	MANHOLE
MIN.	MINIMUM
MPH	MILES PER HOUR
MR	MONORAIL
MW	MONITORING WELL
N	NORTHING
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
#	NUMBER
NO.	NUMBER
NOM.	NOMINAL
O.C.	ON CENTER
O.C.E.F.	ON CENTER EACH FACE
O.C.E.W.	ON CENTER EACH WAY
O.D.	OUTSIDE DIAMETER
O.I.T.	OPERATOR INTERFACE TERMINAL
OZ.	OUNCE
PL	PLATE
PL	PROPERTY LINE
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVE
PCF	PER CUBIC FOOT
PE	POLYETHYLENE
PIC	POST INDICATOR VALVE
PRC	POINT OF REVERSE CURVE
PSI	PER SQUARE INCH
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PZ	PIEZOMETER
RCP	REINFORCED CONCRETE PIPE
REINF.	REINFORCEMENT
RIBS	RAPID INFILTRATION BASINS
S	SEWER
S	SLOPE
S.S.	STAINLESS STEEL
SCH.	SCHEDULE
SECT	SECTION
SHLDR.	SHOULDER
SHT.	SHEET
SP. AL.	SPECIAL ALUMINUM
SQ.	SQUARE
SUP.	SUPPORT
TEMP.	TEMPERATURE
THD.	THREADED
TMB	TEMPORARY BENCH MARK
TOC	TOP OF CONCRETE
TP	TEST PIT
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
UGE	UNDERGROUND ELECTRIC
UGT	UNDERGROUND TELEPHONE
UV	ULTRAVIOLET
V	VELOCITY
VERT.	VERTICAL
W	WATER
W	WIDE
W/	WITH
YR.	YEAR

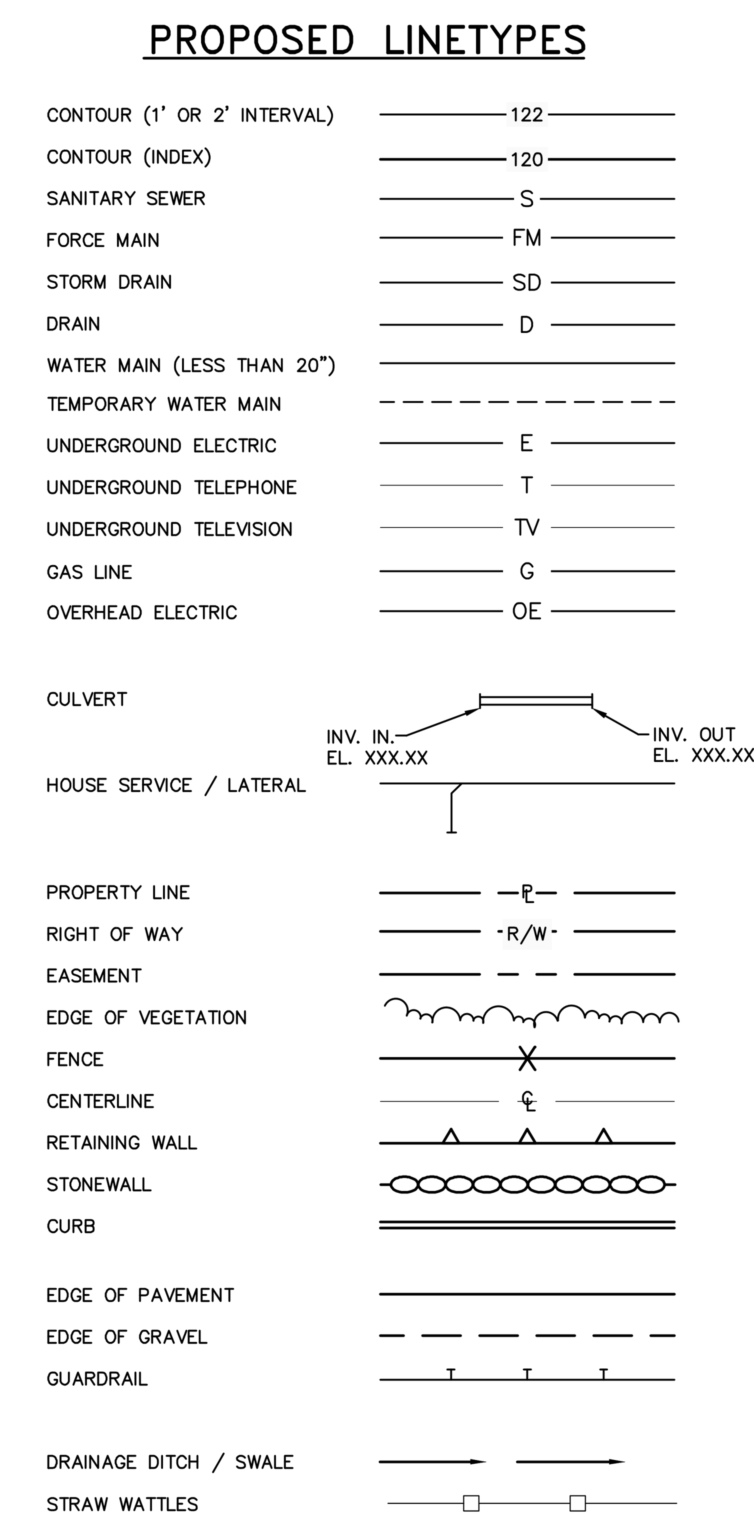
CIVIL SYMBOLS



EXISTING LINETYPES



PROPOSED LINETYPES



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COMMONWEALTH OF MASSACHUSETTS TODD R. PROKOP CIVIL No. 49898 REGISTERED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION

DESIGNED BY: KTR CHECKED BY: TRP
DRAWN BY: KTR

SITE INDEX, GENERAL NOTES, LEGEND, AND ABBREVIATIONS

LOWELL REGIONAL WATER UTILITY
LOWELL MASSACHUSETTS

HUMPHREY STREET WATER MAIN REPLACEMENT

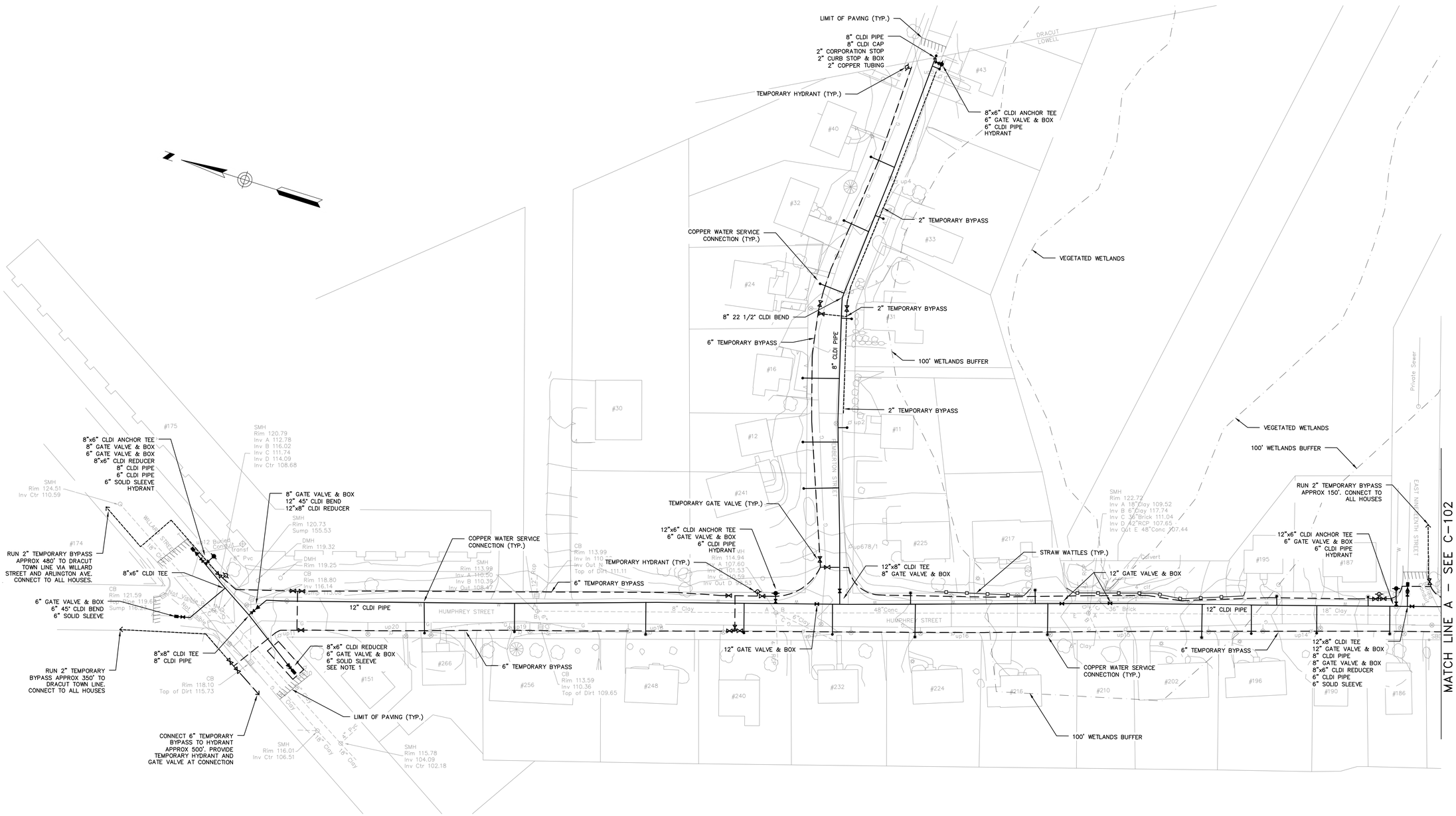
JOB NO.: 227251.50
DATE: JULY 2016
SCALE: N.T.S.
SHEET: 1 OF 7

G-100

24x36
1:1

NOTES:

1. CONTRACTOR SHALL INSTALL ALL WORK SHOWN IN BOX (VALVE, FITTINGS, AND NO LESS THAN 25' OF 8" CLDI WATER MAIN) IN A SINGLE, 8-HOUR SHUTDOWN AND VISUALLY INSPECT FOR LEAKS.



PLAN
SCALE: 1"=40'

40' 0 40' 80'
BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

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COMMONWEALTH OF MASSACHUSETTS
TODD R. PROKOP
LICENSED PROFESSIONAL ENGINEER
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE

DESIGNED BY: KTR
DRAWN BY: KTR
CHECKED BY: TRP
227251.50 – C-101 – C-1*.dwg

HUMPHREY STREET NORTH

LOWELL REGIONAL WATER UTILITY
LOWELL MASSACHUSETTS

HUMPHREY STREET WATER MAIN REPLACEMENT

JOB NO.: 227251.50
DATE: JULY 2016
SCALE: 1" = 40'
SHEET: 2 OF 7

C-101

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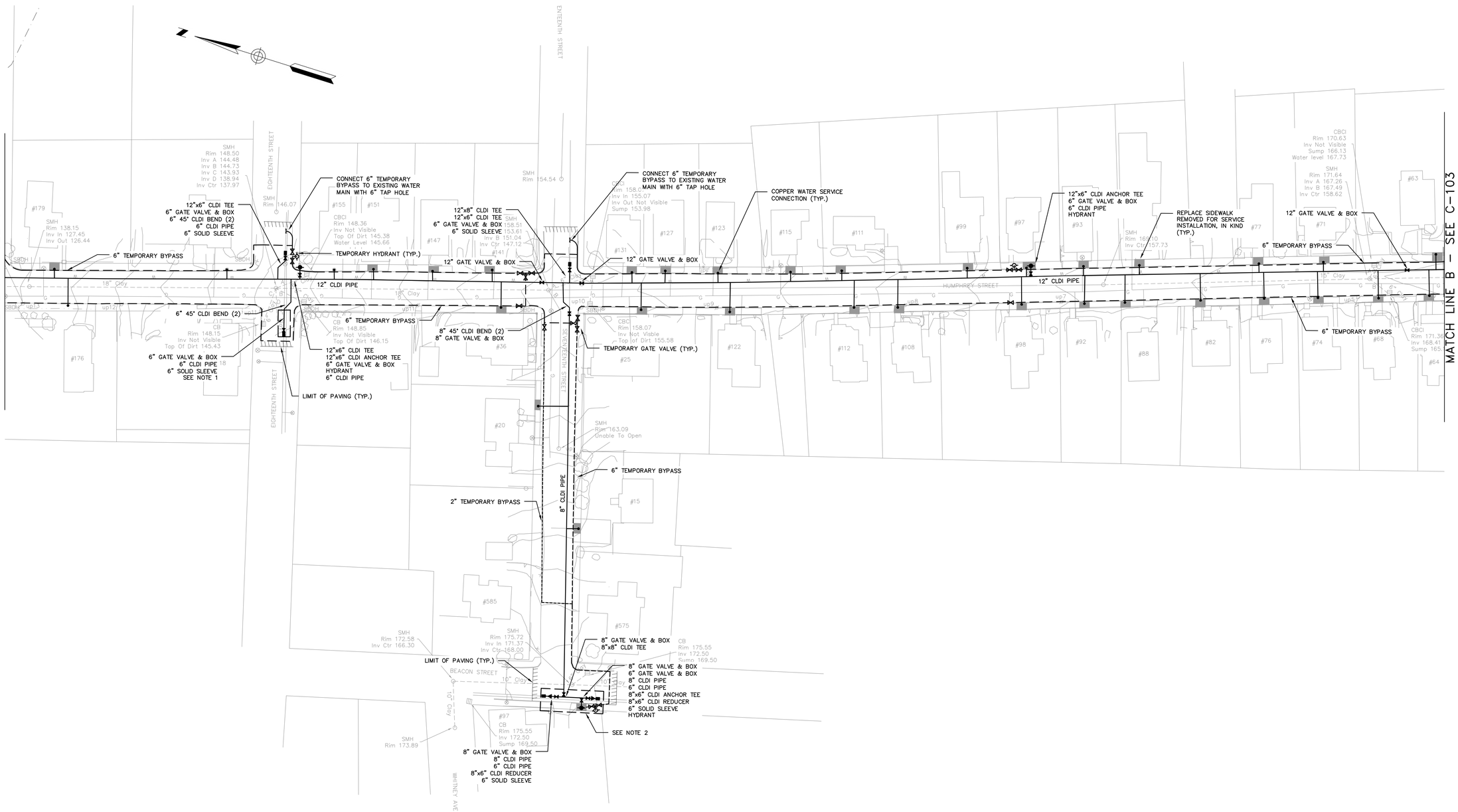
24x36
1:1

NOTES:

1. CONTRACTOR SHALL INSTALL ALL WORK SHOWN IN BOX (VALVE, FITTINGS, AND NO LESS THAN 25' OF 8" CLDI WATER MAIN) IN A SINGLE, 8-HOUR SHUTDOWN AND VISUALLY INSPECT FOR LEAKS.
2. CONTRACTOR SHALL INSTALL ALL WORK SHOWN WITHIN BOX IN A SINGLE, 8-HOUR SHUTDOWN ON A FRIDAY OR SATURDAY BETWEEN 9 PM AND 5 AM. CONTRACTOR SHALL NOTIFY LRWU A MINIMUM OF FOURTEEN (14) DAYS PRIOR TO CONDUCTING WORK.



PLAN
SCALE: 1"=40'

40' 0 40' 80'
BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

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COMMONWEALTH OF MASSACHUSETTS
TODD R. PROKOP
No. 49898
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE

DESIGNED BY: KTR
DRAWN BY: KTR
CHECKED BY: TRP
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HUMPHREY STREET CENTRAL

LOWELL REGIONAL WATER UTILITY
LOWELL MASSACHUSETTS

HUMPHREY STREET WATER MAIN REPLACEMENT

JOB NO.: 227251.50
DATE: JULY 2016
SCALE: 1" = 40'
SHEET: 3 OF 7

C-102

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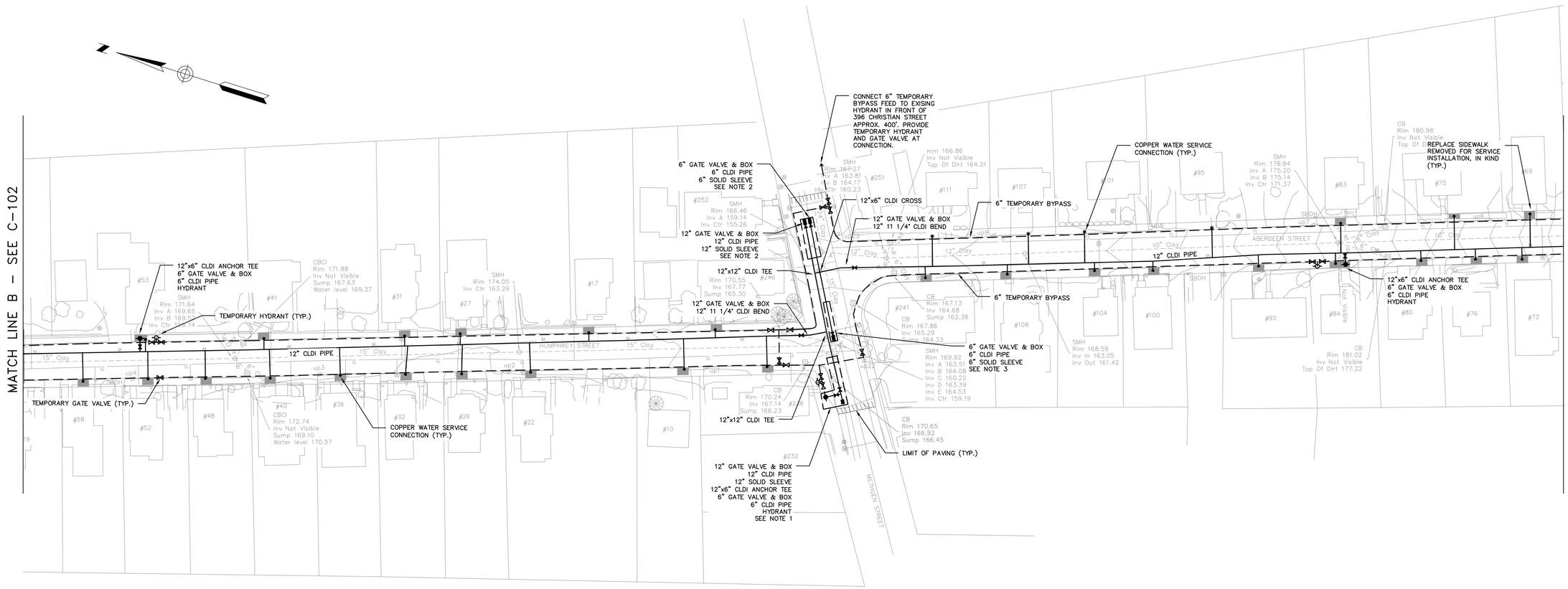
NOTES:

1. CONTRACTOR SHALL INSTALL ALL WORK SHOWN IN BOX (VALVES, HYDRANT FITTINGS, AND NO LESS THAN 33' OF 12" CLDI WATER MAIN) IN A SINGLE, 8-HOUR SHUTDOWN AND VISUALLY INSPECT FOR LEAKS PRIOR TO INSTALLATION OF TEMPORARY BYPASS.
2. CONTRACTOR SHALL INSTALL ALL WORK SHOWN IN BOX (VALVE, FITTINGS, NO LESS THAN 33' OF 12" CLDI WATER MAIN FOR NORTH CONNECTION AND NO LESS 25' OF 6" CLDI WATER MAIN FOR SOUTH CONNECTION) IN A SINGLE, 8-HOUR SHUTDOWN AND VISUALLY INSPECT FOR LEAKS.
3. CONTRACTOR SHALL INSTALL ALL WORK SHOWN IN BOX (VALVE, FITTINGS, AND NO LESS THAN 25' OF 6" CLDI WATER MAIN) IN A SINGLE, 8-HOUR SHUTDOWN AND VISUALLY INSPECT FOR LEAKS.



PLAN
SCALE: 1"=40'

40' 0 40' 80'
BAR SCALE
1" = 40'
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TODD R. PROKOP
No. 49898
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE

DESIGNED BY: KTR
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HUMPHREY STREET SOUTH & ABERDEEN STREET NORTH

LOWELL REGIONAL WATER UTILITY
LOWELL MASSACHUSETTS

HUMPHREY STREET WATER MAIN REPLACEMENT

JOB NO.: 227251.50
DATE: JULY 2016
SCALE: 1" = 40'
SHEET: 4 OF 7

C-103

24x36
1:1

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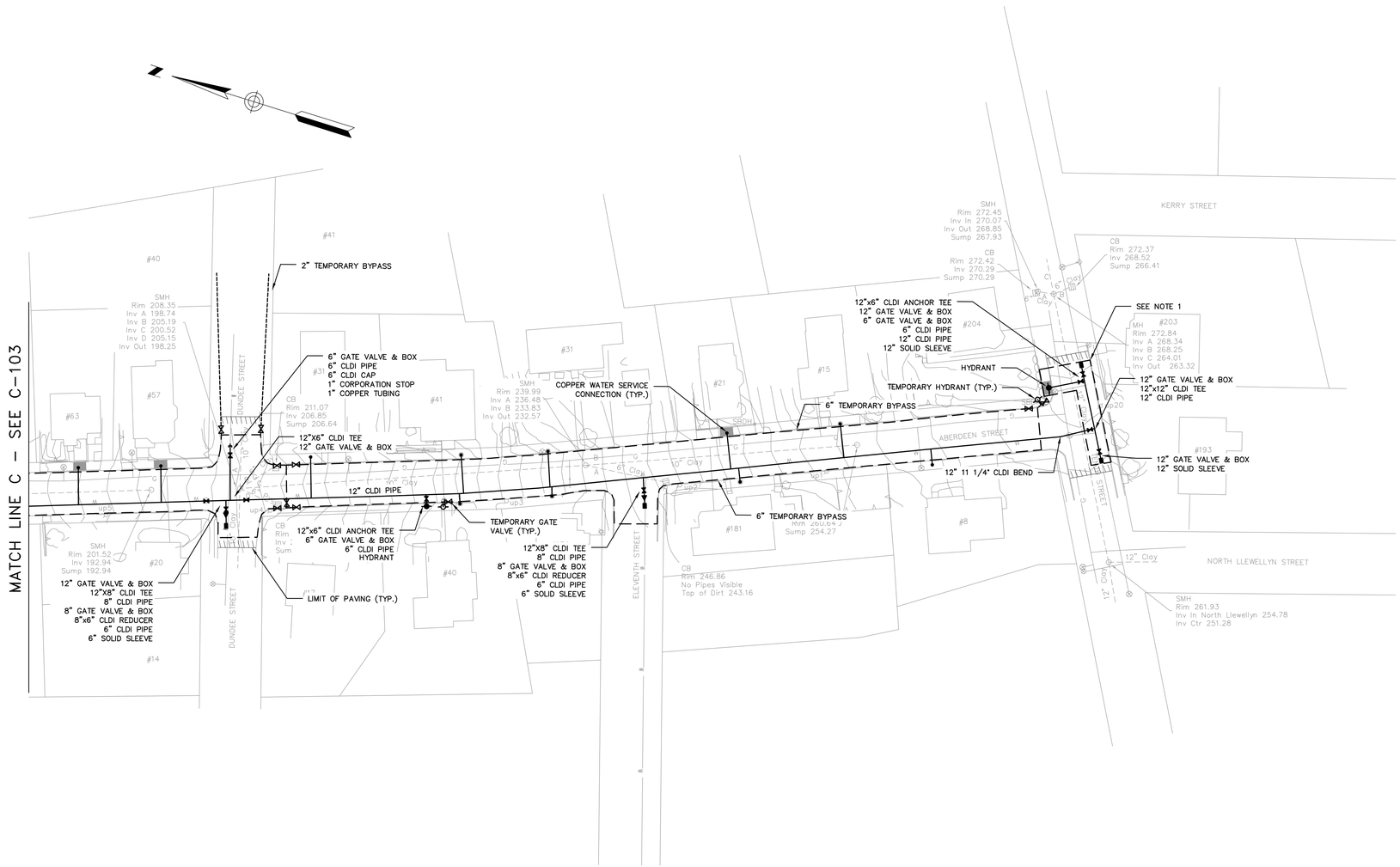
NOTES:

1. CONTRACTOR SHALL INSTALL ALL WORK SHOWN WITHIN BOX IN A SINGLE, 8-HOUR SHUTDOWN AND VISUALLY INSPECT FOR LEAKS PRIOR TO INSTALLATION OF TEMPORARY BYPASS.



PLAN

SCALE: 1"=40'

40' 0 40' 80'

BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

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COMMONWEALTH OF MASSACHUSETTS
TODD R. PROKOPI
No. 49898
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE

DESIGNED BY: KTR
DRAWN BY: KTR
CHECKED BY: TRP
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ABERDEEN STREET SOUTH

LOWELL REGIONAL WATER UTILITY
LOWELL MASSACHUSETTS

HUMPHREY STREET WATER MAIN REPLACEMENT

JOB NO.: 227251.50
DATE: JULY 2016
SCALE: 1" = 40'
SHEET: 5 OF 7

C-104

24x36
1:1

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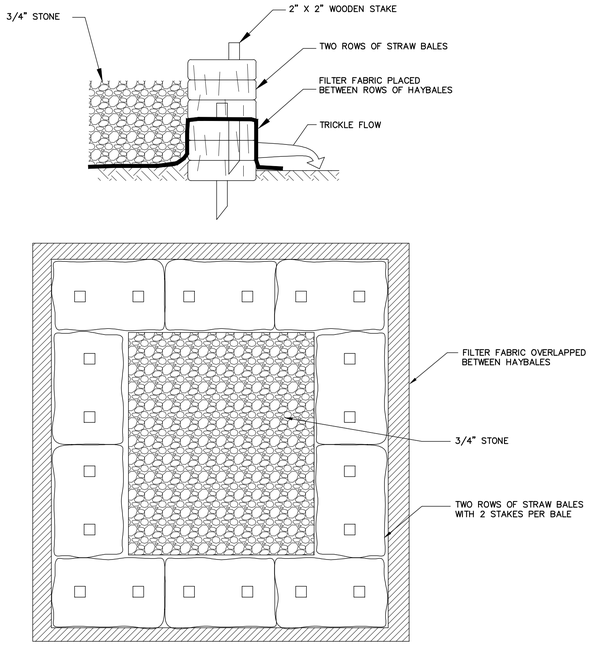


DETENTION BASIN NOTES:

1. ALL BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY, AT NO ADDITIONAL COST TO THE OWNER.

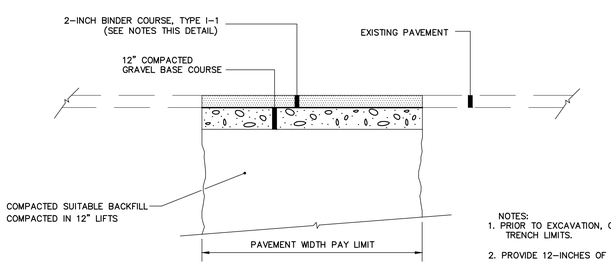
2. SHOULD THE BARRIER DECOMPOSE OR BECOME INEFFECTIVE BEFORE THE END OF THE EXPECTED LIFE AND THE BARRIER IS STILL NECESSARY, IT SHALL BE REPLACED PROMPTLY.

3. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN THE DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.

4. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE BARRIER IS NO LONGER REQUIRED SHALL BE REMOVED AND DISPOSED.

DETENTION BASIN DETAIL

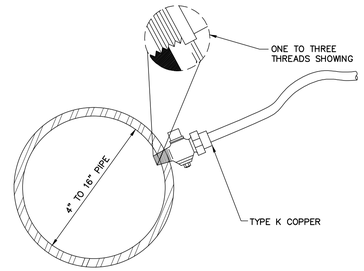
N.T.S.



NOTES:
1. PRIOR TO EXCAVATION, CONTRACTOR SHALL SAWCUT PAVEMENT TO TRENCH LIMITS.
2. PROVIDE 12-INCHES OF GRAVEL BASE COURSE, COMPACTED IN 2" LIFTS.
3. CONTRACTOR SHALL LAY 2-INCHES (COMPACTED LIFT THICKNESS) OF BINDER COURSE, TYPE I-1.

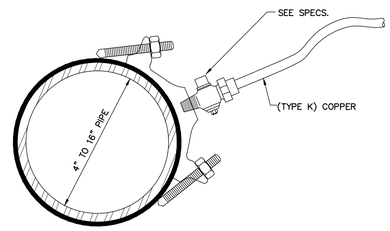
TEMPORARY TRENCH PAVEMENT SECTION

N.T.S.



SERVICE TAP

(3/4" AND 1" C.C. THREAD, DUCTILE IRON)
N.T.S.



NOTE:

- SERVICE CONNECTIONS (DIRECT TAPS AND SERVICE CLAMPS) WILL BE INSTALLED SO THAT THE OUTLET IS AT AN ANGLE OF NOT MORE THAN 45° ABOVE THE HORIZONTAL. ALWAYS PUT A BEND OR "GOOSENECK" IN THE SERVICE LINE PRIOR TO CONNECTING TO PROVIDE FLEXIBILITY AND "GIVE" TO COUNTER THE EFFECTS OF A LOAD DUE TO SETTLEMENT OR EXPANSION AND/OR CONTRACTION (SEE DETAILS)

SERVICE SADDLE

(1-1/2" AND 2" C.C. OR IRON PIPE THREAD, DUCTILE IRON)
N.T.S.

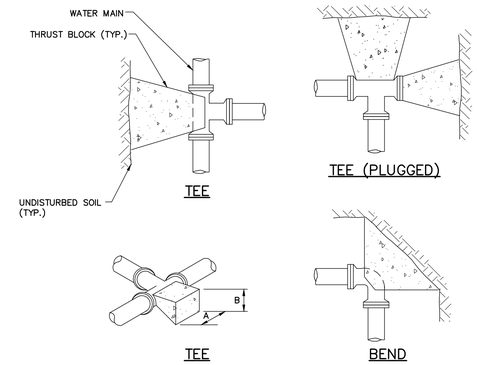


TABLE 1: 4" THRU 10" FITTINGS				
SOIL TYPE	TEES		BENDS	
	A	B	A	B
SOFT CLAY	48"	24"	48"	24"
SAND	24"	24"	24"	24"
GRAVEL	24"	18"	24"	18"

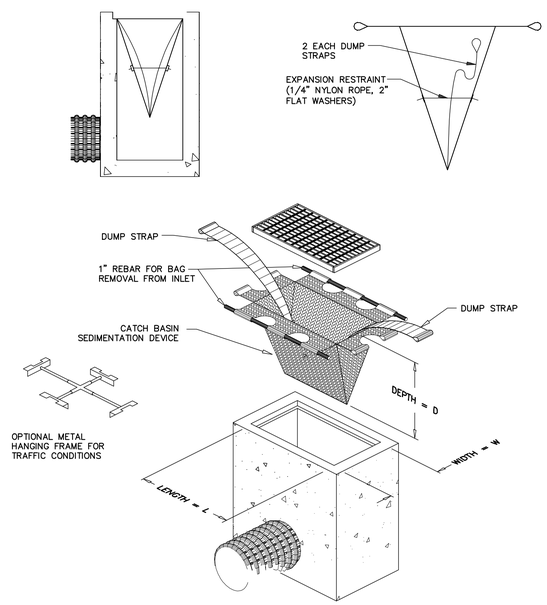
TABLE 2: 12" THRU 16" FITTINGS				
SOIL TYPE	TEES		BENDS	
	A	B	A	B
SOFT CLAY	60"	36"	72"	36"
SAND	36"	30"	48"	30"
GRAVEL	30"	24"	40"	24"

NOTES:

1. CONCRETE FOR ALL THRUST BLOCKS TO BE MINIMUM 3,000 PSI., 28 DAY STRENGTH, TYPE I CEMENT, 3/4" STONE.
2. WHERE POSSIBLE, CONSTRUCT THRUST BLOCKS AGAINST UNDISTURBED SOIL. WHERE NOT POSSIBLE, PLACE FILL BETWEEN THE THRUST BLOCK AND THE UNDISTURBED SOIL COMPACTED TO 95% STANDARD PROCTOR DENSITY.
3. WRAP FITTINGS WITH POLYETHYLENE PRIOR TO CONSTRUCTING THRUST BLOCKS. NO JOINTS SHALL BE COVERED WITH CONCRETE.
4. THRUST BLOCK DIMENSIONS ARE BASED ON A MAXIMUM WATER MAIN PRESSURE OF 150 PSI.

TYPICAL THRUST BLOCK DETAIL

N.T.S.



INLET SEDIMENT CONTROL DEVICE

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COMMONWEALTH OF MASSACHUSETTS TODD R. PRICKETT No. 49396 REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE

DESIGNED BY: KTR
DRAWN BY: KTR
CHECKED BY: TRP
227251.50 - C-501 - C-502.DWG

WATER MAIN DETAILS – 1

LOWELL REGIONAL WATER UTILITY
LOWELL MASSACHUSETTS

HUMPHREY STREET WATER MAIN REPLACEMENT

JOB NO.: 227251.50
DATE: JULY 2016
SCALE: NOT TO SCALE
SHEET: 6 OF 7

C-501

24x36
1:1

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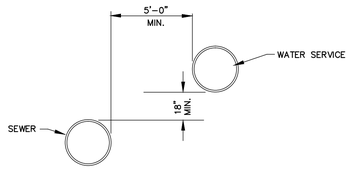

UNUSUAL CONDITION PARALLEL INSTALLATION

NOTES:

THE SEPARATION OF WATER MAINS AND SEWERS SHALL COMPLY WITH THE FOLLOWING GENERAL REQUIREMENTS.

A. PARALLEL INSTALLATION:

1. NORMAL CONDITIONS: THE INSIDE EDGE OF A WATER MAIN SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM THE INSIDE EDGE OF ANY SANITARY SEWER, STORM SEWER OR SEWER MANHOLE.
2. UNUSUAL CONDITIONS: WHEN LOCAL CONDITIONS PREVENT A HORIZONTAL SEPARATION OF 10 FEET, THE INSIDE EDGE OF A WATER MAIN MAY BE LAID A MINIMUM OF 5 FEET FROM THE INSIDE EDGE OF A SEWER PROVIDED THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES HIGHER THAN THE TOP OF THE SEWER (SEE DETAIL).

B. CROSSINGS:

1. NORMAL CONDITIONS: WHENEVER POSSIBLE, THE BOTTOM OF THE WATER MAIN SHALL BE AT LEAST 18 INCHES HIGHER THAN THE TOP OF THE SEWER.
2. UNUSUAL CONDITIONS: IF A WATER MAIN MUST CROSS UNDER A SEWER, THE TOP OF THE WATER MAIN SHALL BE AT LEAST 18 INCHES LOWER THAN THE BOTTOM OF THE SEWER, THE WATER MAIN PIPE SHALL BE CENTERED AT THE CROSSING SO THAT THE JOINTS ARE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER, AND ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO PREVENT EXCESSIVE DEFLECTION OF THE SEWER AT THE CROSSING.

MINIMUM WATER AND SEWER PIPE SEPARATION DETAIL

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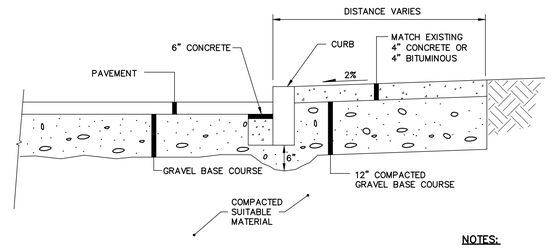

NOTES:

- SEE PAVEMENT DETAILS FOR PAVEMENT THICKNESS.
- REPLACE SIDEWALK IN KIND.

TYPICAL REPLACEMENT SIDEWALK DETAIL

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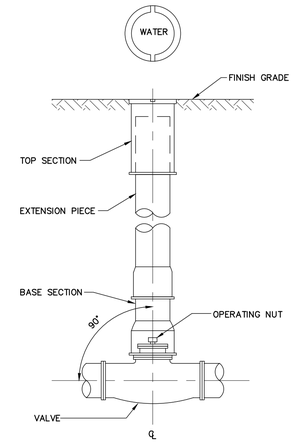

GATE VALVE WITH VALVE BOX

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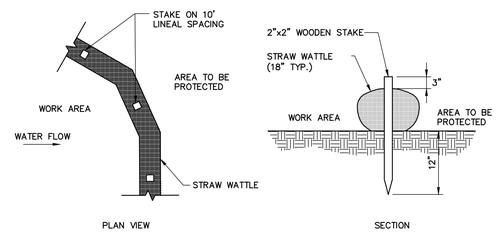

SEDIMENT BARRIER – STRAW WATTLE

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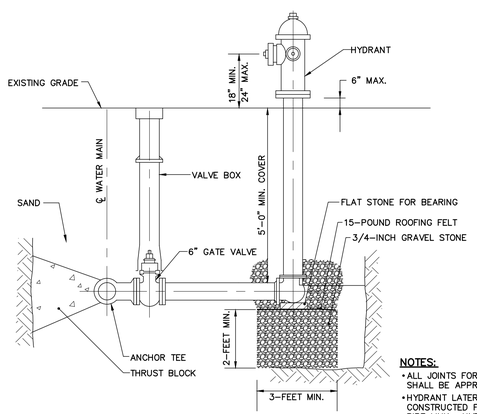


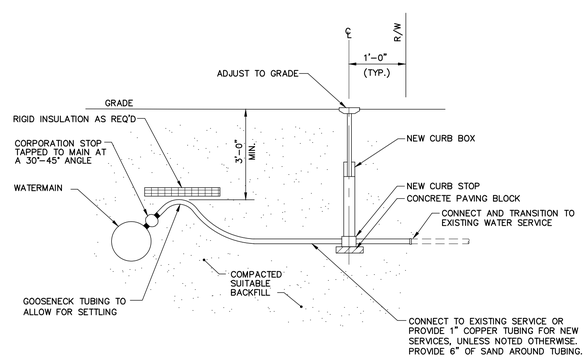
ELEVATION

HYDRANT DETAIL

N.T.S.

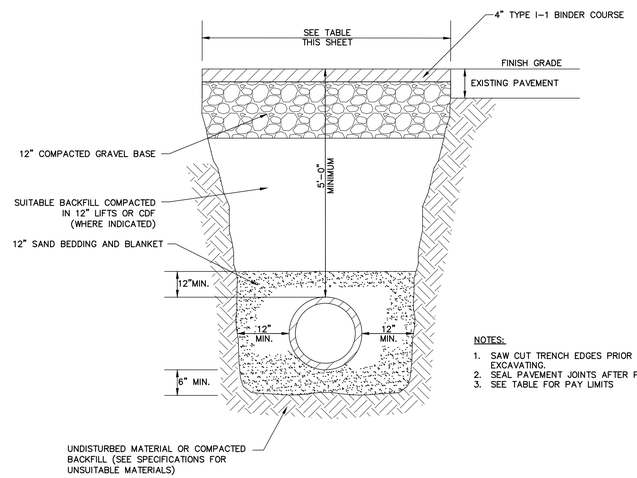
NOTES:

- ALL JOINTS FOR HYDRANT INSTALLATION SHALL BE APPROVED RETAINER GLANDS.
- HYDRANT LATERALS SHALL BE CONSTRUCTED FROM ONE CONTINUOUS PIPE LINK. HYDRANT LATERALS WITH BELL JOINTS AND COUPLINGS WILL NOT BE ACCEPTED.
- CONTRACTOR SHALL CONSTRUCT A HYDRANT DRAINING SUMP TO EITHER SIDE OF THE HYDRANT. THE HYDRANT DRAINING SUMP SHALL BE 3-FEET WIDE BY 2-FEET IN DEPTH. THE SUMP SHALL CONSIST OF 3/4-INCH GRAVEL STONE WITH 15-POUND ROOFING FELT LAID OVER THE 3/4-INCH GRAVEL STONE.



TYPICAL WATER SERVICE DETAIL

N.T.S.



NOTES:

1. SAW CUT TRENCH EDGES PRIOR TO EXCAVATING.
2. SEAL PAVEMENT JOINTS AFTER PAVING.
3. SEE TABLE FOR PAY LIMITS

TYPICAL TEMPORARY TRENCH DETAIL

N.T.S.

TRENCH, PAVEMENT & ROCK WIDTH PAY LIMITS (FT.)				
TRENCH DEPTH	NOMINAL PIPE DIAMETER (D)	TRENCH WIDTH	TEMPORARY TRENCH WIDTH PAVEMENT	ROCK EXCAVATION
0 TO 12'	0 TO 24"	4' – 0"	4' – 0"	4' – 0"

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COMMONWEALTH OF MASSACHUSETTS TODD R. PRICKETT No. 49996 REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE

DESIGNED BY: KTR
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227251.50 – C-501 – C-502.DWG

WATER MAIN DETAILS – 2

LOWELL REGIONAL WATER UTILITY
LOWELL MASSACHUSETTS

HUMPHREY STREET WATER MAIN REPLACEMENT

JOB NO.: 227251.50
DATE: JULY 2016
SCALE: NOT TO SCALE
SHEET: 7 OF 7

C-502

24x36
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