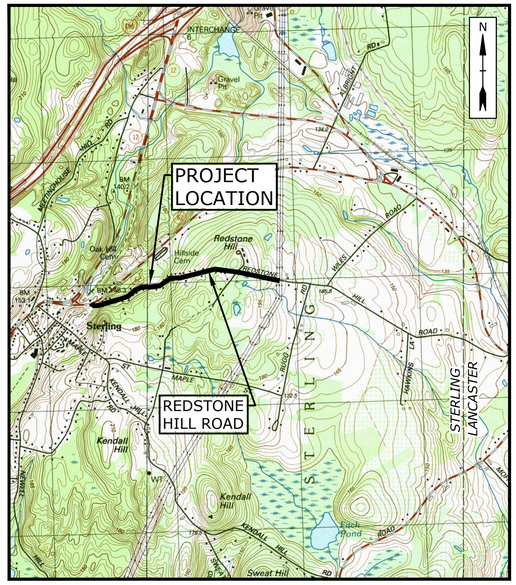
TOWN OF STERLING, MASSACHUSETTS
REDSTONE HILL ROAD
WATER MAIN REPLACEMENT PROJECT
CONTRACT NO. 2

MARCH 2024

LIST OF DRAWINGS		
SHEET NO.	DRAWING NO.	DRAWING TITLE
1	G-001	COVER SHEET AND LIST OF DRAWINGS
2	G-002	GENERAL NOTES
3	G-003	LEGEND AND ABBREVIATIONS
4	G-004	SHEET INDEX
5	G-005	TEMPORARY BYPASS PIPING
6	C-101	REDSTONE HILL ROAD WATER MAIN - STA 00+00 TO STA 20+35
7	C-102	REDSTONE HILL ROAD WATER MAIN - STA 20+35 TO STA 40+80
8	C-103	REDSTONE HILL ROAD WATER MAIN - STA 40+80 TO STA 51+33
9	C-501	CONSTRUCTION DETAILS - 1
10	C-502	CONSTRUCTION DETAILS - 2
11	C-503	CONSTRUCTION DETAILS - 3
12	C-504	TRAFFIC MANAGEMENT PLAN



LOCATION MAP
SCALE: 1" = 2000'

PREPARED BY:

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ
CIVIL
No. 41808
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

Digitally signed by Antonio da Cruz
Date: 2024.03.26 14:45:56-04'00'

ANTONIO J. daCRUZ, PE

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH
CIVIL
No. 56991
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

Digitally signed by EMILY CHURCH
Date: 2024.03.26 14:42:17-04'00'

EMILY R. CHURCH, PE

PREPARED FOR:
TOWN OF STERLING

DEPARTMENT OF PUBLIC WORKS
RYAN MOURADIAN - SUPERINTENDENT
DEANE DAY - CHAIRMAN
BLAINE BERSHAD - DPW BOARD MEMBER
ANDREW PARKER - DPW BOARD MEMBER

COMPLETE SET 12 SHEETS

BASE PLAN NOTES

1. THE EXISTING CONDITIONS INFORMATION SHOWN ON THE DRAWINGS IS BASED ON THE FOLLOWING:
   - DRAWINGS PROVIDED BY LOCAL UTILITY COMPANIES
   - FIELD INVESTIGATIONS PERFORMED BY TIGHE & BOND ON SEPTEMBER 22, 2022
   - GIS INFORMATION PROVIDED BY THE TOWN
2. UTILITY LOCATIONS SHOWN WERE PLOTTED FROM INFORMATION SUPPLIED BY RESPECTIVE UTILITY COMPANIES AND DATA OBTAINED FROM FIELD SURVEYS AND AS BUILT DRAWINGS. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION SHOWN ON THESE DRAWINGS IS NOT GUARANTEED. DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL UTILITIES WHICH MAY AFFECT CONSTRUCTION OPERATIONS.
3. SUB-SURFACE EXPLORATIONS WERE PERFORMED BY MARTIN GEO-ENVIRONMENTAL FROM AUGUST 31 TO SEPTEMBER 2, 2022. BORING LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND BORING INFORMATION IS NOT GUARANTEED IN ANY WAY TO REPRESENT EXISTING CONDITIONS. BORING LOGS ARE INCLUDED IN THE PROJECT MANUAL FOR THE CONTRACTORS INFORMATION ONLY.
4. THE DRAWINGS ARE BASED ON THE FOLLOWING DATUMS: HORIZONTAL-NAD 83; VERTICAL-NAD 88
5. THE EXISTING CONDITIONS SHOWN ARE APPROXIMATE. FIELD VERIFY EXISTING CONDITIONS.

GENERAL NOTES

1. NOTIFY DIGSAFE AT 1-888-344-7233 AND OTHER UTILITY OWNERS IN THE AREA NOT ON THE DIGSAFE LIST AT LEAST 72 HOURS PRIOR TO ANY DIGGING, TRENCHING, ROCK REMOVAL, DEMOLITION, BORING, BACKFILLING, GRADING, LANDSCAPING, OR ANY OTHER EARTH MOVING OPERATIONS.
2. LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE. IN ADDITION, SOME UTILITIES MAY NOT BE SHOWN. DETERMINE THE EXACT LOCATION OF UTILITIES BY TEST PIT OR OTHER METHODS, AS NECESSARY TO PREVENT DAMAGE TO UTILITIES AND/OR INTERRUPTIONS IN UTILITY SERVICE. PERFORM TEST PIT EXCAVATIONS AND OTHER INVESTIGATIONS TO LOCATE UTILITIES, AND PROVIDE THIS INFORMATION TO THE ENGINEER, PRIOR TO CONSTRUCTING THE PROPOSED IMPROVEMENTS. LOCATE ALL EXISTING UTILITIES TO BE CROSSED BY HAND EXCAVATION.
3. NOT ALL OF THE UTILITY SERVICES TO BUILDINGS ARE SHOWN. THE CONTRACTOR SHALL ANTICIPATE THAT EACH PROPERTY HAS SERVICE CONNECTIONS FOR THE VARIOUS UTILITIES.
4. BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.
5. TIGHE & BOND ASSUMES NO RESPONSIBILITY FOR ANY ISSUES, LEGAL OR OTHERWISE, RESULTING FROM CHANGES MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION FROM TIGHE & BOND.
6. EXCAVATE ADDITIONAL TEST PITS TO LOCATE EXISTING UTILITIES AS DIRECTED OR APPROVED BY THE ENGINEER.
7. NOTIFY THE ENGINEER OF ANY UTILITIES IDENTIFIED DURING CONSTRUCTION THAT ARE NOT SHOWN ON THE DRAWINGS OR THAT DIFFER IN SIZE OR MATERIAL.
8. THE CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY; COORDINATION WITH THE OWNER, ALL SUBCONTRACTORS, AND WITH OTHER CONTRACTORS WORKING WITHIN THE LIMITS OF WORK, THE MEANS AND METHODS OF CONSTRUCTING THE PROPOSED WORK.
9. OBTAIN, PAY FOR AND COMPLY WITH PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK. ARRANGE AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE JURISDICTIONAL AUTHORITIES.
10. SHORE UTILITY TRENCHES WHERE FIELD CONDITIONS DICTATE AND/OR WHERE REQUIRED BY LOCAL, STATE AND FEDERAL HEALTH AND SAFETY CODES.
11. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION. IF FIELD CONDITIONS ARE OBSERVED THAT VARY SIGNIFICANTLY FROM THOSE SHOWN ON THE DRAWINGS, IMMEDIATELY NOTIFY THE ENGINEER IN WRITING FOR RESOLUTION OF THE CONFLICTING INFORMATION.
12. PROTECT AND MAINTAIN ALL UTILITIES IN THE AREAS UNDER CONSTRUCTION DURING THE WORK. LEAVE ALL PIPES AND STRUCTURES WITHIN THE LIMITS OF THE CONTRACT IN A CLEAN AND OPERABLE CONDITION AT THE COMPLETION OF THE WORK. TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SAND AND SILT FROM DISTURBED AREAS FROM ENTERING THE DRAINAGE SYSTEM.
13. NOTIFY THE ENGINEER IN WRITING OF ANY CONFLICT, ERROR, AMBIGUITY, OR DISCREPANCY WITH THE PLANS OR BETWEEN THE PLANS AND ANY APPLICABLE LAW, REGULATION, CODE, STANDARD SPECIFICATION, OR MANUFACTURER'S INSTRUCTIONS.
14. THE CONTRACTOR IS RESPONSIBLE FOR SUPPORT OF EXISTING UTILITIES AND REPAIR OR REPLACEMENT COSTS OF UTILITIES DAMAGED DURING CONSTRUCTION, WHETHER ABOVE OR BELOW GRADE. REPLACE DAMAGED UTILITIES IMMEDIATELY AT NO ADDITIONAL COST TO THE OWNER AND AT NO COST TO THE PROPERTY OWNER.
15. TAKE NECESSARY MEASURES AND PROVIDE CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE, AND STRENGTH TO PREVENT ACCESS TO ALL WORK AND STAGING AREAS AT THE COMPLETION OF EACH DAYS WORK.
16. NO OPEN TRENCHES WILL BE ALLOWED OVER NIGHT. THE USE OF ROAD PLATES TO PROTECT THE EXCAVATION WILL BE CONSIDERED UPON REQUEST, BUT BACKFILLING IS PREFERRED.
17. THE CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY TRAFFIC CONTROL/SAFETY DEVICES TO ENSURE SAFE VEHICULAR AND PEDESTRIAN ACCESS THROUGH THE WORK AREA, OR FOR SAFELY IMPLEMENTING DETOURS AROUND THE WORK AREA. PERFORM TRAFFIC CONTROL IN ACCORDANCE WITH THE CONTRACTOR'S APPROVED TRAFFIC CONTROL PLAN.
18. MAINTAIN EMERGENCY ACCESS TO ALL PROPERTIES WITHIN THE PROJECT AREA AT ALL TIMES DURING CONSTRUCTION.
19. WHEN WORKING IN THE ROAD, PROVIDE THE OWNER AND LOCAL FIRE/POLICE/SCHOOL AUTHORITIES A DETAILED PLAN OF APPROACH INDICATING METHODS OF PROPOSED TRAFFIC ROUTING ON A DAILY BASIS. PROVIDE COORDINATION TO ENSURE COMMUNICATION AND COORDINATION BETWEEN THE OWNER, CONTRACTOR AND LOCAL FIRE/POLICE/SCHOOL AUTHORITIES THROUGHOUT THE CONSTRUCTION PERIOD.
20. REMOVE AND DISPOSE OF ALL CONSTRUCTION-RELATED WASTE MATERIALS AND DEBRIS IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS.
21. THE TERM "DEMOLISH" USED ON THE DRAWINGS MEANS TO REMOVE AND DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
22. THE TERM "ABANDON" USED ON THE DRAWINGS MEANS TO LEAVE IN PLACE AND TAKE APPROPRIATE MEASURES TO DECOMMISSION AS SPECIFIED OR NOTED ON THE DRAWINGS.
23. ALL PROPOSED WORK MAY BE ADJUSTED IN THE FIELD BY THE OWNER'S PROJECT REPRESENTATIVE TO MEET EXISTING CONDITIONS.

EROSION CONTROL AND RESOURCE AREA PROTECTION NOTES

1. PROVIDE ALL EROSION CONTROL MEASURES SHOWN, SPECIFIED, REQUIRED BY PERMIT, AND/OR REQUIRED BY THE ENGINEER PRIOR TO ANY CONSTRUCTION OR IMMEDIATELY UPON REQUEST. MAINTAIN SUCH CONTROL MEASURES UNTIL FINAL SURFACE TREATMENTS ARE IN PLACE AND/OR UNTIL PERMANENT VEGETATION IS ESTABLISHED. INSPECT AFTER EACH RAINSTORM AND DURING MAJOR STORM EVENTS TO CONFIRM THAT ALL SEDIMENTATION AND EROSION CONTROL MEASURES REQUIRED ARE IN PLACE AND EFFECTIVE.
2. INSTALL SILT SACKS OR OTHER APPROVED SEDIMENTATION BARRIERS IN/AT ALL CATCH BASINS IN THE PROJECT AREA.
3. COMPACT, STABILIZE, AND LOAM AND SEED SIDE SLOPES, SHOULDER AREAS AND DISTURBED VEGETATED AREAS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND AS REQUIRED BY PERMITS. GRADE SIDE SLOPES, SHOULDER AREAS AND DISTURBED VEGETATED AREAS TO A MAXIMUM SLOPE OF 3 HORIZONTAL TO 1 VERTICAL (3H:1V), WHERE POSSIBLE. PROVIDE BIODEGRADABLE EROSION CONTROL BLANKETS TO PREVENT EROSION WHERE SLOPES ARE STEEPER THAN 3H:1V.
4. SETTLE OR FILTER ALL SILT-LADEN WATER FROM DEWATERING ACTIVITIES IN A SEDIMENTATION OR FILTER BAG TO REMOVE SEDIMENTS PRIOR TO RELEASE USING A SEDIMENTATION OR FILTER BAG LOCATED DOWN-GRADIENT OF THE DEWATERED AREA.
5. REMOVE AND PROPERLY DISPOSE OF SILT TRAPPED AT BARRIERS IN UPLAND AREAS OUTSIDE BUFFER ZONES. REMOVE MATERIALS DEPOSITED IN ANY TEMPORARY SETTLING BASINS AT THE COMPLETION OF THE PROJECT. RESTORE ALL DISTURBED AREAS TO THEIR PRECONSTRUCTION CONDITION.
6. SWEEP, COLLECT, REMOVE AND DISPOSE OF ANY SEDIMENT TRACKED ONTO PUBLIC RIGHT-OF-WAYS AT THE END OF EACH DAY.
7. LOAM AND SEED ALL DISTURBED VEGETATED AREAS TO ESTABLISH COVER AND STABILIZATION AS SOON AS POSSIBLE FOLLOWING DISTURBANCE.
8. MAINTAIN AN ADDITIONAL SUPPLY OF EROSION CONTROL MEASURES ON-SITE FOR EMERGENCY REPAIRS.
9. STORE FUEL, OIL, PAINT, OR OTHER HAZARDOUS MATERIALS IN A SECONDARY CONTAINER AND REMOVE TO A SECURE LOCKED AND COVERED AREA DURING NON-WORK HOURS.
10. PROVIDE A SUPPLY OF ABSORBENT SPILL RESPONSE MATERIALS SUCH AS BOOMS, BLANKETS, AND OIL ABSORBENT MATERIALS AT THE CONSTRUCTION SITE AT ALL TIMES TO CLEAN UP POTENTIAL SPILLS OF HAZARDOUS MATERIALS. IMMEDIATELY REPORT SPILLS OF HAZARDOUS MATERIALS TO THE STATE ENVIRONMENTAL AGENCY AND THE MUNICIPALITY WHERE THE WORK IS OCCURRING.

WATER SYSTEM IMPROVEMENTS NOTES

1. PROPOSED WATER MAINS SHALL BE PROVIDED IN ACCORDANCE WITH THE OWNER'S STANDARDS, AS SPECIFIED, AND AS SHOWN ON THE DRAWINGS. WHERE THERE IS A CONFLICT BETWEEN THE OWNER'S STANDARDS AND THE DRAWINGS AND SPECIFICATIONS, THE OWNER'S STANDARDS SHALL GOVERN.
2. HORIZONTAL AND VERTICAL LOCATION OF WATER MAINS MAY BE MODIFIED TO FIT EXISTING FIELD CONDITIONS, UPON APPROVAL OF THE ENGINEER.
3. WORKING PRESSURE OF WATER MAIN IN PROJECT AREA IS BETWEEN 75 AND 100 PSI. TESTING PRESSURE SHALL BE AT A MINIMUM OF 200 PSI.
4. MINIMUM DEPTH OF COVER OVER PROPOSED WATER MAIN SHALL BE 5 FEET, UNLESS OTHERWISE NOTED OR APPROVED BY THE ENGINEER.
5. ALL BELOW GRADE VALVES AND FITTINGS SHALL HAVE MECHANICAL JOINT (MJ) ENDS. RESTRAIN ALL VALVE AND FITTING JOINTS WITH RETAINER GLANDS.
6. WHERE A COUPLING IS CALLED FOR ON THE DRAWINGS TO CONNECT A PROPOSED WATER MAIN TO AN EXISTING WATER MAIN PROVIDE A SOLID SLEEVE, IF POSSIBLE. RESTRAIN SOLID SLEEVE TO PIPES WITH RETAINER GLANDS. IF OUTSIDE DIAMETER OF EXISTING WATER MAIN DOES NOT ALLOW INSTALLATION OF SOLID SLEEVE, PROVIDE RESTRAINING TYPE TRANSITION COUPLING.
7. SLEEVES, NIPPLES, AND ACCESSORIES NECESSARY FOR CONNECTION BETWEEN EXISTING AND PROPOSED PIPES MAY NOT BE SHOWN ON THE DRAWINGS. PROVIDE ITEMS NECESSARY FOR CONNECTING TO EXISTING MAINS AND MAKE CONNECTIONS AS INDICATED IN THE CONTRACT DOCUMENTS.
8. RESTRAIN PIPE JOINTS IN ACCORDANCE WITH "MINIMUM RESTRAINED LENGTHS FOR PIPE" TABLE ON THE DRAWINGS.
9. MAINTAIN A MINIMUM HORIZONTAL DISTANCE OF 10 FEET BETWEEN THE PROPOSED WATER MAIN AND ANY EXISTING OR PROPOSED SANITARY SEWER OR STORM DRAIN. WHEN CONDITIONS PREVENT THIS, A LESSER DISTANCE WILL BE ALLOWED IF: A.) THE WATER MAIN IS IN A SEPARATE TRENCH OR B.) THE PROPOSED WATER MAIN IS LOCATED IN THE SAME TRENCH TO ONE SIDE ON A BENCH OF UNDISTURBED EARTH WITH AT LEAST 12 INCHES, AND PREFERABLY 18 INCHES, HORIZONTAL SEPARATION BETWEEN THE EDGES OF THE SEWER/DRAIN PIPE AND THE WATER MAIN. IN EITHER CASE, THE BOTTOM OF THE WATER MAIN SHALL BE 18 INCHES ABOVE THE CROWN OF THE SEWER/DRAIN PIPE.
10. WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER. IT IS PREFERRED THAT THE WATER MAIN CROSS ABOVE THE SEWER. AT CROSSINGS, ONE FULL LENGTH OF WATER PIPE SHALL BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE.
11. WHERE THE PROPOSED WATER MAIN IS TO BE INSTALLED BELOW A DRAIN PIPE, MAINTAIN A MINIMUM OF 18 INCHES BETWEEN THE BOTTOM OF THE STORM DRAIN AND THE CROWN OF THE WATER MAIN.
12. OPERATION OF EXISTING VALVES SHALL BE BY THE WATER DISTRIBUTION SYSTEM OWNER, UNLESS OTHERWISE AUTHORIZED. COORDINATE OPERATION OF VALVES WITH THE WATER DISTRIBUTION SYSTEM OWNER.
13. THE WATER DISTRIBUTION SYSTEM OWNER DOES NOT GUARANTEE A TIGHT SHUTDOWN OF ITS EXISTING VALVES. THE CONTRACTOR IS RESPONSIBLE FOR CONTROL OF LEAKAGE AND DISPOSAL OF WATER UP TO 100 GALLONS PER MINUTE.
14. COORDINATE THE ACTIVATION AND DEACTIVATION OF WATER MAINS WITH THE WATER DISTRIBUTION SYSTEM OWNER.
15. WHERE WATER MAINS ARE BEING REPLACED, RECONNECT ALL EXISTING WATER SERVICES TO THE PROPOSED WATER MAINS, UNLESS NOTED OTHERWISE IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING UNINTERRUPTED WATER SERVICE TO ALL CUSTOMERS IN THE PROJECT AREA DURING CONSTRUCTION, UNLESS OTHERWISE NOTED OR APPROVED BY THE OWNER.
16. WHERE A PROPOSED UTILITY CROSSES BELOW AN EXISTING ASBESTOS CEMENT (AC) WATER MAIN, REPLACE THE AC WATER MAIN ABOVE THE CROSSING AND 10 FEET ON EACH SIDE OF THE CROSSING WITH NEW PVC PIPE. HANDLE, REMOVE, TRANSPORT AND DISPOSE OF AC PIPE IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.
17. COVER EACH FIRE HYDRANT TAKEN OUT OF SERVICE WITH A NON-DEGRADABLE BAG SECURELY TIED. IMMEDIATELY NOTIFY FIRE DEPARTMENT WHEN HYDRANTS ARE TAKEN OUT OF SERVICE.WHERE A HYDRANT IS MOVED AND THE EXISTING MAIN SHALL REMAIN IN SERVICE, CAP AND BLOCK LEADER.
18. WHERE TEMPORARY OR PROPOSED CAPS ARE PROPOSED, RESTRAIN CAPS TO ACCOMMODATE THE WORKING PRESSURE OF THE WATER SYSTEM WITHOUT MOVEMENT OR LEAKAGE. WHERE CAPS ARE PROPOSED AT TEES, ROD CAP TO TEE USING MINIMUM TWO ¾" DIA. TIE RODS FOR PIPING 8-INCH DIAMETER AND SMALLER AND A MINIMUM OF FOUR ¾" DIA. TIE RODS FOR PIPES 10-INCH AND 12-INCH DIAMETER. TIE RODS SHALL CONFORM TO ASTM A588.
19. REMOVE AND DISPOSE OF THE TOP SECTION OF THE VALVE BOXES ON WATER MAIN TO BE ABANDONED, UNLESS DIRECTED OTHERWISE. FILL HOLES WITH SUITABLE BACKFILL MATERIAL. RESTORE THE GROUND SURFACE TO MATCH EXISTING CONDITIONS.
20. CONTRACTOR SHALL TEST PIT INVESTIGATION CROSSINGS IN ADVANCE.
21. VERTICAL BENDS SHALL BE AVOIDED AND ONLY INSTALLED AT THE APPROVAL OF THE OWNER AND ENGINEER.
22. WHERE WATER MAINS ARE BEING REPLACED, RECONNECT ALL EXISTING WATER SERVICES TO THE PROPOSED WATER MAINS, UNLESS NOTED OTHERWISE IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING UNINTERRUPTED WATER SERVICE TO ALL CUSTOMERS IN THE PROJECT AREA DURING CONSTRUCTION, UNLESS OTHERWISE APPROVED BY THE OWNER.
24. FOR EACH PROPOSED WATER SERVICE, PROVIDE NEW TAPPING SLEEVE AND CORPORATION AT THE MAIN, NEW PE WATER SERVICE PIPING, AND NEW CURB STOP AND BOX. PROPOSED WATER SERVICES SHALL BE INSTALLED FROM THE PROPOSED WATER MAIN TO THE PROPERTY LINE FOR EACH PROPERTY IDENTIFIED AS REQUIRING A WATER SERVICE ON THE DRAWINGS. CONNECT PROPOSED WATER SERVICE TO EXISTING WATER SERVICE PIPING AT PROPERTY LINE. PROVIDE ALL COMPONENTS NECESSARY TO CONNECT PROPOSED WATER SERVICE TO EXISTING WATER SERVICE. EXISTING SERVICE PIPING TO BE ABANDONED SHALL BE CAPPED/CRIMPED ONCE SERVICE HAS BEEN TRANSFERRED TO THE NEW WATER MAIN.
25. IF THE EXISTING CURB STOP AND BOX ARE LOCATED BEYOND THE PROPERTY LINE, EXCAVATE AND REMOVE THE EXISTING BOX AND USE NEW PE WATER SERVICE PIPING AND REQUIRED ADAPTERS AND FITTINGS TO CONNECT THE EXISTING SERVICE TO A NEW CURB STOP AND BOX LOCATED AT THE PROPERTY LINE.
26. SIZE OF PROPOSED WATER SERVICE SHALL BE AS SHOWN ON THE DRAWINGS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
27. LAYOUTS OF SMALL DIAMETER WATER SERVICES (LESS THAN OR EQUAL TO 2") SHOWN ON THE DRAWINGS ARE APPROXIMATE. ACTUAL LAYOUT SHALL BE DETERMINED IN THE FIELD AND APPROVED BY THE ENGINEER.

SURFACE RESTORATION NOTES

1. ALL PAVEMENT DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
2. PROVIDE SITE GRADING AT HANDICAPPED RAMPS, SIDEWALKS, AND BUILDING ENTRANCES THAT IS CONSISTENT WITH THE RELEVANT ACCESS REQUIREMENTS OF THE ARCHITECTURAL BARRIERS ACT (ABA), THE AMERICANS WITH DISABILITIES ACT (ADA), AND MA ARCHITECTURAL ACCESS BOARD REQUIREMENTS (AAB). SMALL CHANGES IN GRADE OVER RELATIVELY SHORT DISTANCES (E.G. AT PARKING SPACES, ACCESSIBLE ROUTES, AND RAMPS) MIGHT NOT BE CLEARLY DEPICTED WITHIN THE CONTOUR INTERVAL SHOWN. COMPLY WITH THE CRITERIA IN THESE STANDARDS. SELECT MAXIMUM SLOPE CRITERIA ARE REPRODUCED BELOW:
   - ACCESSIBLE PARKING STALL AND PASSENGER LOADING ZONE (ANY DIRECTION) SLOPE < 2.0%
   - LONGITUDINAL SLOPE ALONG ACCESSIBLE ROUTES < 5.0%
   - CROSS SLOPE ALONG ACCESSIBLE ROUTES < 2.0%
3. PROTECT PROJECT FEATURES (E.G., WALLS, FENCES, MAIL BOXES, SIGNS, SIDEWALKS, CURBING, STAIRS, WALKWAYS, TREES, ETC.) FROM DAMAGE DURING CONSTRUCTION, INCLUDING PROVIDING TEMPORARY SUPPORTS, WHEN APPROPRIATE.
4. IF REMOVAL OF PROJECT FEATURES IS REQUIRED IN ORDER TO PERFORM THE PROPOSED WORK, REMOVE THOSE SITE FEATURES ONLY UPON APPROVAL OF ENGINEER. REPLACE ALL REMOVED PROJECT FEATURES; NEW ITEMS SHALL BE EQUAL OR BETTER IN QUALITY AND CONDITION TO THE ITEMS REMOVED.
5. EXISTING SURVEY MONUMENTS DISTURBED BY THE CONTRACTOR SHALL BE REPLACED BY A LAND SURVEYOR LICENSED IN THE STATE IN WHICH THE WORK IS PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
6. COORDINATE THE ADJUSTMENT OF EXISTING UTILITY STRUCTURES WITH EACH RESPONSIBLE UTILITY OWNER PRIOR TO RECONSTRUCTION AND/OR PAVING OPERATIONS. RAISE ALL STRUCTURES TO FINISHED GRADES PRIOR TO THE END OF THE CONSTRUCTION SEASON AND PRIOR TO FINISHED PAVING.
7. REPAIR DISTURBED PAVED SURFACES AT THE END OF EACH WORK WEEK, UNLESS OTHERWISE APPROVED/REQUIRED BY THE OWNER.
8. TRANSFER ALL TEMPORARY BENCHMARKS, AS NECESSARY.
9. ACCOMMODATE PEDESTRIAN TRAFFIC WHERE A SIDEWALK IS TO BE CLOSED FOR SAFETY. "SIDEWALK CLOSED HERE" SIGNS SHALL BE USED AT THE NEAREST SAFE INTERSECTION. SEE TRAFFIC CONTROL DETAILS FOR SIGN INFORMATION.
10. RESTORE ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE PAYLINE LIMITS TO ORIGINAL CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
11. REGRADE ALL UNPAVED AREAS DISTURBED BY THE WORK AS REQUIRED. REPAIR/REPLACE PAVED SURFACES DISTURBED BY THE WORK IN-KIND, UNLESS OTHERWISE NOTED. RESTORE SURFACES TO EXISTING OR PROPOSED CONDITIONS AS INDICATED ON THE DRAWINGS.
12. PROVIDE A SMOOTH, FLUSH TRANSITION BETWEEN ALL NEW AND EXISTING PAVEMENTS AND WALKING SURFACES.

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH CIVIL No. 56991 REGISTERED PROFESSIONAL ENGINEER
03/26/2024

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ CIVIL No. 41808 PROFESSIONAL ENGINEER
03/26/2024

Redstone Hill Road Water Main Replacement Project Contract No. 2

Department of Public Works

Sterling, Massachusetts

MARK	DATE	DESCRIPTION
0	3/27/2024	ISSUED FOR BIDDING

PROJECT NO:	S5121-001
DATE:	MARCH 2023
FILE:	S5121-001 G-002_C2.dwg
DRAWN BY:	LEP/ MMO
CHECKED BY:	ERC
APPROVED BY:	AJC

GENERAL NOTES

SCALE: NO SCALE

G-002
SHEET 2 OF 12

Last Saved: 3/19/2024
Plotted: Mar 20, 2024-1:08pm By: MOlson
Tighe & Bond: J:\S\S5121 Town of Sterling\001 Redstone Hill Road Water Main Replacement\Drawings_Figures\AutoCAD\Sheet\Contract No. 2\S5121-001 G-002_C2.dwg

LEGEND

DESCRIPTION	EXISTING	PROPOSED
PROPERTY LINE		
STORM DRAIN	SD SD	
STORM UNDER DRAIN		
WATER SERVICE	W W	
POTABLE WATER	PW	PW PW
OVERHEAD ELECTRIC	OE OE	
GAS SERVICE	G G	
OVERHEAD UTILITY (UNSPECIFIED)	OHW OHW	
CURB		
EDGE OF PAVEMENT		
DIRT ROAD		
SIDEWALK		
RETAINING WALL		
STONE WALL		
FENCE - CHAIN LINK		
FENCE - WOOD POST		
GUARDRAIL		
METAL BEAM RAIL		
STORM DRAIN STRUCTURES	MANHOLE CATCH BASIN CULVERT END	
SANITARY SEWER MANHOLE	S	
WATER SERVICE STRUCTURES	HYDRANT MANHOLE VALVE	HYDRANT CURB STOP VALVE COUPLING REDUCER CAP
GAS SERVICE STRUCTURES	MANHOLE VALVE GG	
ELECTRIC SERVICE STRUCTURES	UTILITY CO. POLE MANHOLE LIGHT	
TELECOMMUNICATIONS MANHOLE	T	
TREELINE		
TREE	EVERGREEN DECIDUOUS	EVERGREEN DECIDUOUS

LEGEND

RESOURCE AREAS	
VEGETATED WETLAND LIMIT	
TOP OF BANK	
MEAN ANNUAL HIGH WATER	
LAND SUBJECT TO FLOODING	
100-FOOT BUFFER ZONE	
200-FOOT RIVERFRONT AREA	
LOCAL RESOURCE AREA	
LOCAL BUFFER ZONE - 1	
LOCAL BUFFER ZONE - 2	
WETLANDS WATER COURSE	
WETLAND FLAG	WF

LEGEND

DEMOLITION / GEOTECHNICAL	
STRAW WATTLES	
UTILITY TO BE ABANDONED	
UTILITY TO BE DEMOLISHED	
ITEM TO BE DEMOLISHED	
TEST PIT	
BORING	

ABBREVIATIONS

ABDN('D)	ABANDON(ED)
AC	ASBESTOS CEMENT PIPE
BC	BITUMINOUS CURB
BIT	BITUMINOUS
CB	CATCH BASIN
CEM	CEMENT
CI	CAST IRON PIPE
CONC	CONCRETE
CMP	CORRUGATED METAL PIPE
CY	CUBIC YARD
DI	DUCTILE IRON PIPE
DIA	DIAMETER
DMH	DRAIN MANHOLE
EL/ELEV	ELEVATION
ELEC	ELECTRIC
EOP	EDGE OF PAVEMENT
EW	EACH WAY
EXIST	EXISTING
FES	FLARED END SECTION
HDPE	HIGH DENSITY POLYETHYLENE
HMA	HOT MIX ASPHALT
HYD	HYDRANT
IN	INCHES
INV	INVERT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
NITC	NOT IN THIS CONTRACT
NTS	NOT TO SCALE
N/A	NOT APPLICABLE
N/F	NOW OR FORMERLY
OCS	OUTLET CONTROL STRUCTURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYLCHLORIDE
PVCO	MOLECULARLY ORIENTED POLYVINYL CHLORIDE
PVMT	PAVEMENT
RCP	REINFORCED CONCRETE PIPE
REV	REVISION
ROW	RIGHT OF WAY
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
SS	STAINLESS STEEL
STA	STATION
TP	TEST PIT
TYP	TYPICAL
UP	UTILITY POLE
W	WATER
WG	WATER GATE
WV	WATER VALVE

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH
CIVIL
No. 56991
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ
CIVIL
No. 41808
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

Redstone Hill Road Water Main Replacement Project Contract No. 2

Department of Public Works

Sterling, Massachusetts

MARK	DATE	DESCRIPTION
0	3/27/2024	ISSUED FOR BIDDING

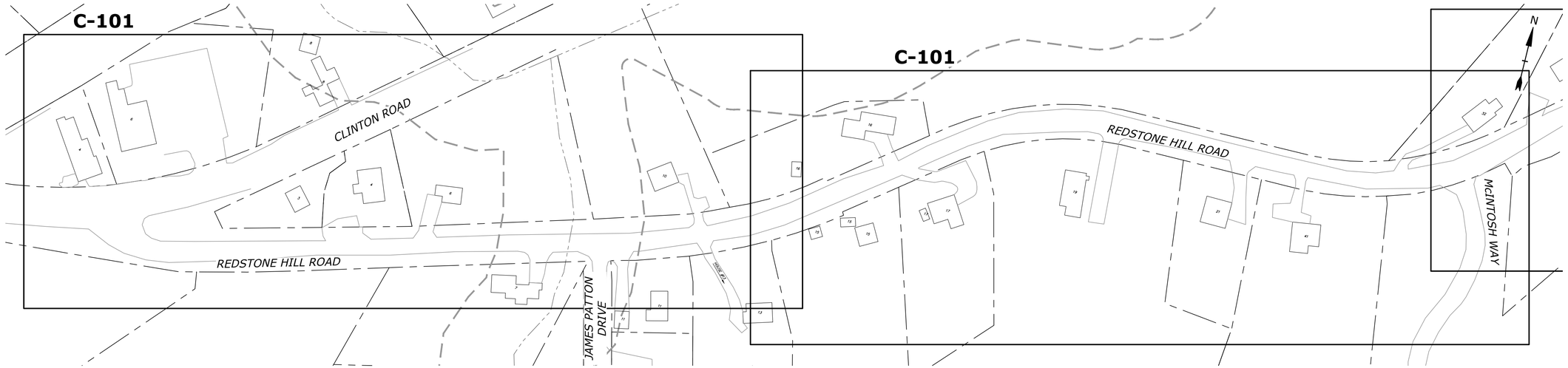
PROJECT NO:	S5121-001
DATE:	MARCH 2023
FILE:	S5121-001 G-002_C2.dwg
DRAWN BY:	LEP/ MMO
CHECKED BY:	ERC
APPROVED BY:	AJC

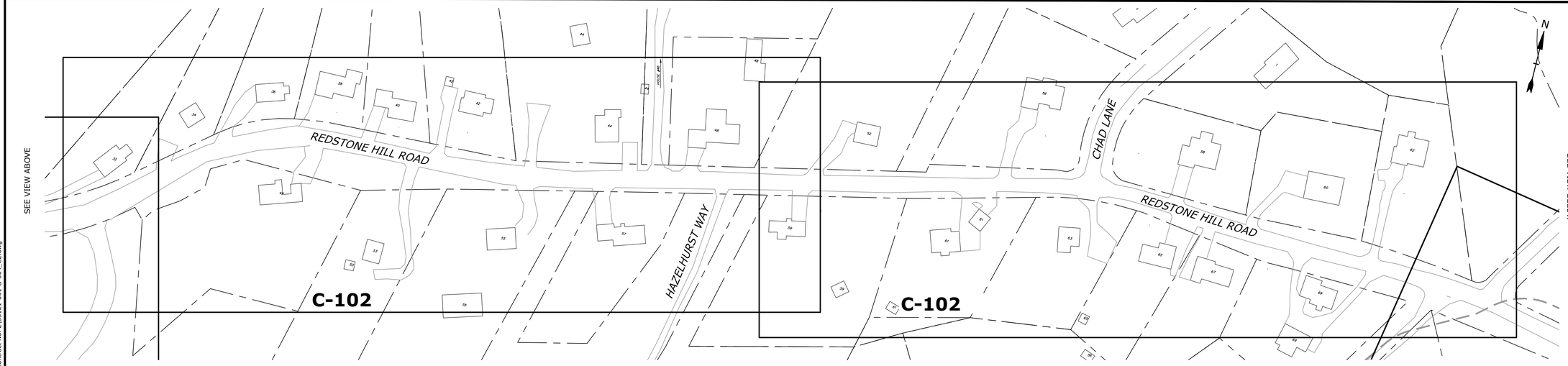
LEGEND AND ABBREVIATIONS

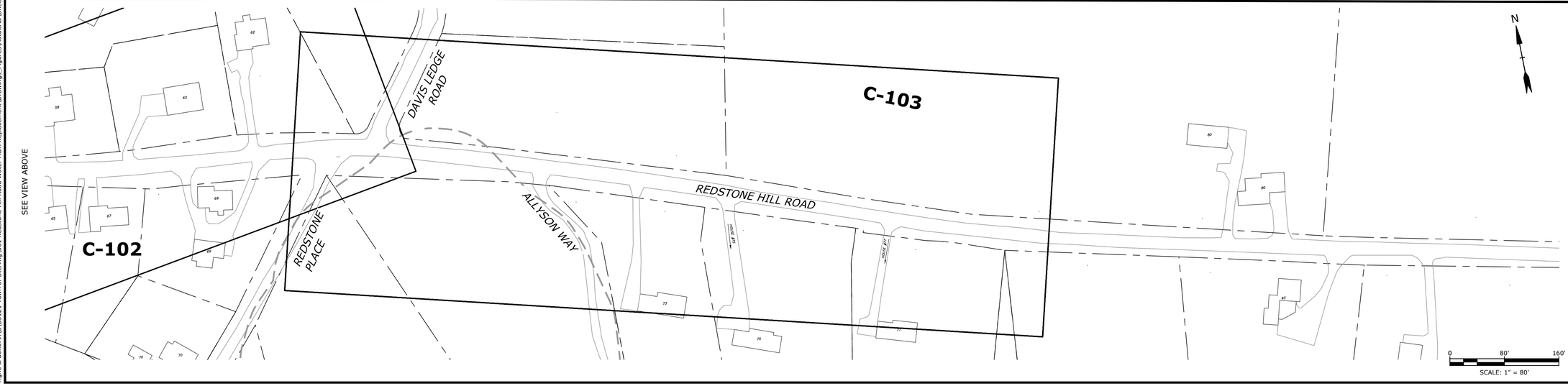
SCALE: NO SCALE

G-003
SHEET 3 OF 12

Last Saved: 3/19/2024
Plotted On: Mar 26, 2024-1:09pm By: MOlson
Tighe & Bond: J:\S\S5121 Town of Sterling\001 Redstone Hill Road Water Main Replacement\Drawings_Figures\AutoCAD\Sheet\Contract No. 2\S5121-001 G-002_C2.dwg







Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH
CIVIL
No. 56991
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ
CIVIL
No. 41808
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

Redstone Hill Road Water Main Replacement Project Contract No. 2

Department of Public Works

Sterling, Massachusetts

MARK	DATE	DESCRIPTION
0	3/27/2024	ISSUED FOR BIDDING

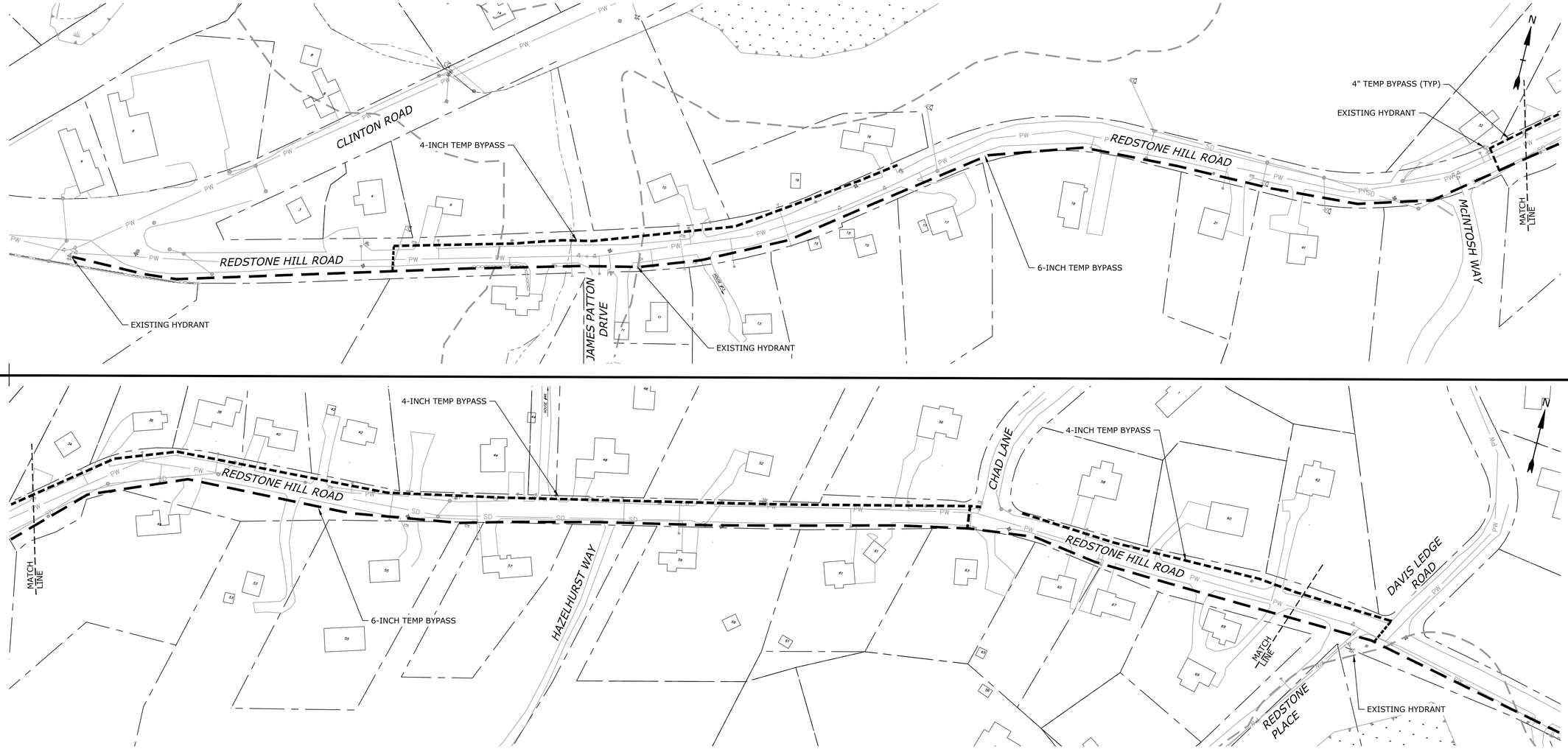
PROJECT NO:	S5121-001
DATE:	MARCH 2023
FILE:	S5121-001 G-004_C2.dwg
DRAWN BY:	LEP/ MMO
CHECKED BY:	ERC
APPROVED BY:	AJC

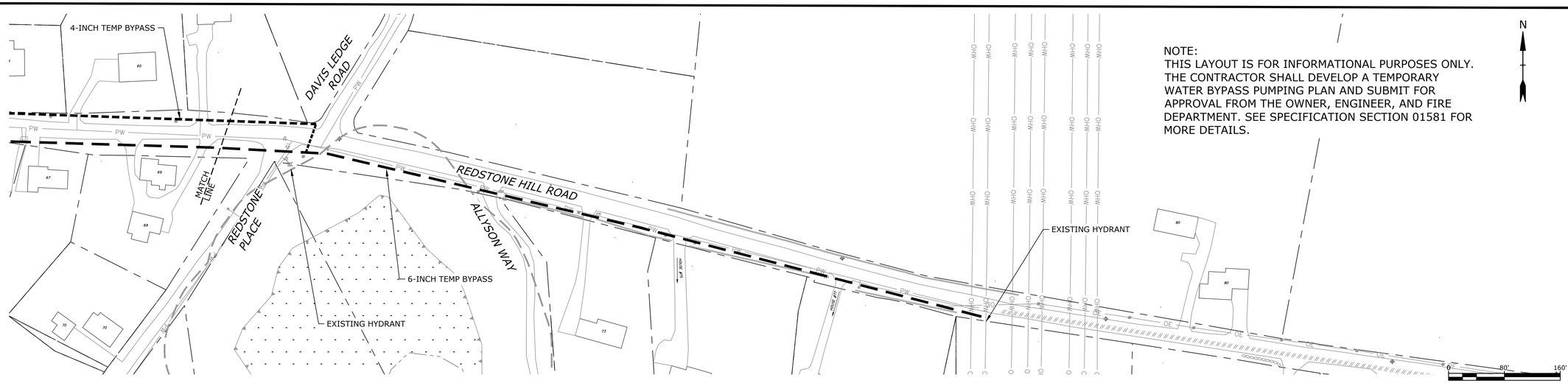
SHEET INDEX

SCALE: AS SHOWN

G-004
SHEET 4 OF 12

Last Saved: 3/20/2024
Plotted On: Mar 20, 2024-1:10pm By: MOlsen
Tighe & Bond: J:\S\S5121 Town of Sterling\001 Redstone Hill Road Water Main Replacement\Drawings. Figures\AutoCAD\Sheet\Contract No. 2\S5121-001 G-004_C2.dwg





Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH CIVIL No. 56991 REGISTERED PROFESSIONAL ENGINEER
03/26/2024

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ CIVIL No. 41808 REGISTERED PROFESSIONAL ENGINEER
03/26/2024

Redstone Hill Road Water Main Replacement Project Contract No. 2

Department of Public Works

Sterling, Massachusetts

MARK	DATE	DESCRIPTION
0	3/27/2024	ISSUED FOR BIDDING

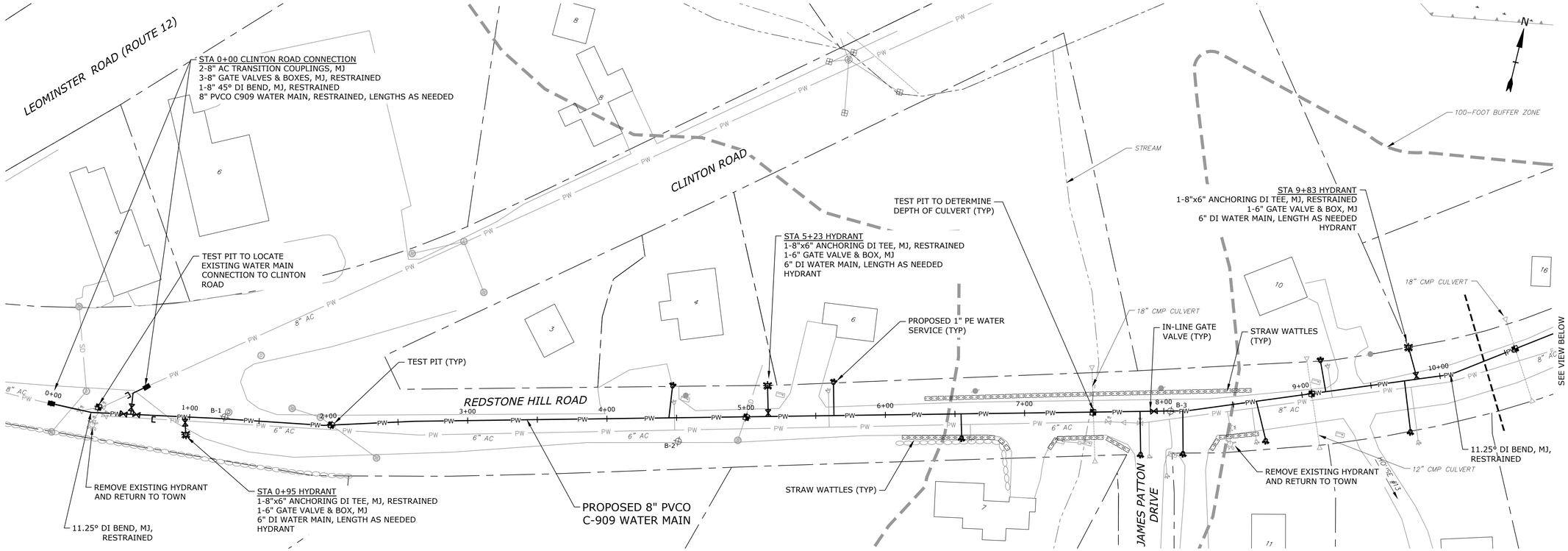
PROJECT NO:	S5121-001
DATE:	MARCH 2023
FILE:	S5121-001 G-005_C2.dwg
DRAWN BY:	LEP/ MMO
CHECKED BY:	ERC
APPROVED BY:	AJC

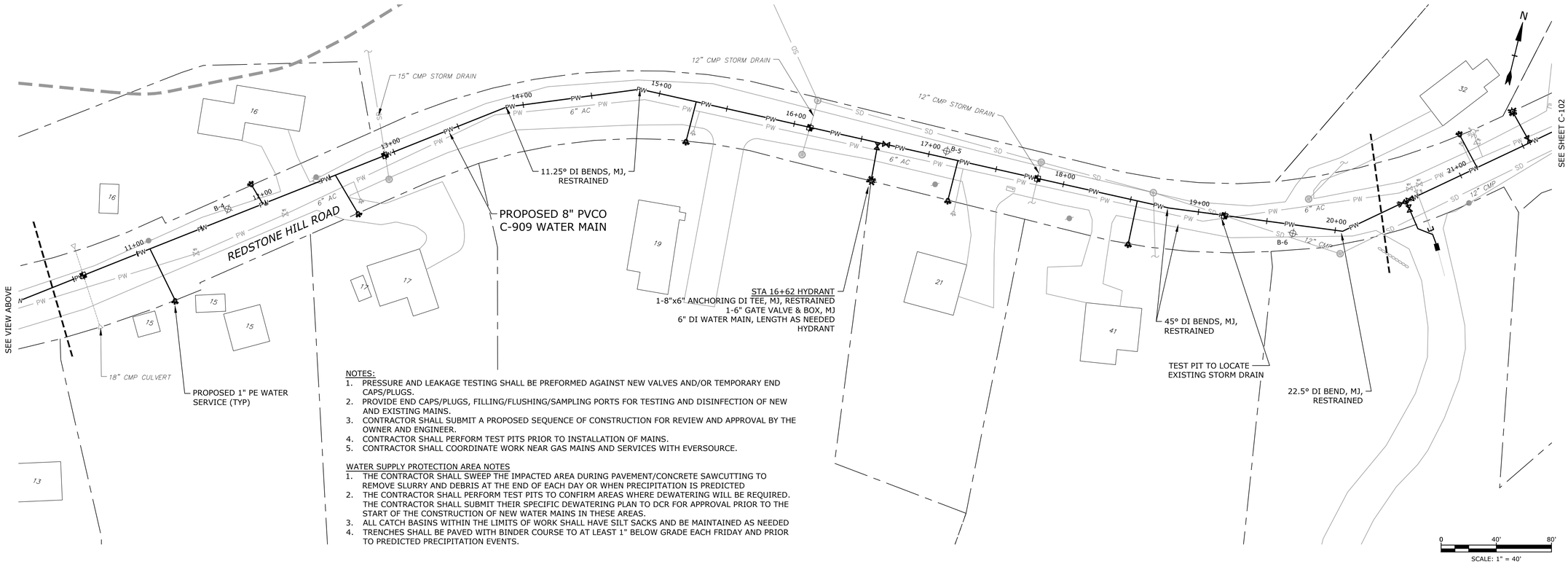
TEMPORARY BYPASS PIPING

SCALE: AS SHOWN

G-005
SHEET 5 OF 12

Last Saved: 3/20/2024
Plotted on: Mar 20, 2024-4:56pm By: MOlson
Tighe & Bond:J:\S\S5121 Town of Sterling\001 Redstone Hill Road Water Main Replacement\Drawings_Figures\AutoCAD\Sheet\Contract No. 2\S5121-001 G-005_C2.dwg





NOTES:
1. PRESSURE AND LEAKAGE TESTING SHALL BE PREFORMED AGAINST NEW VALVES AND/OR TEMPORARY END CAPS/PLUGS.
2. PROVIDE END CAPS/PLUGS, FILLING/FLUSHING/SAMPLING PORTS FOR TESTING AND DISINFECTION OF NEW AND EXISTING MAINS.
3. CONTRACTOR SHALL SUBMIT A PROPOSED SEQUENCE OF CONSTRUCTION FOR REVIEW AND APPROVAL BY THE OWNER AND ENGINEER.
4. CONTRACTOR SHALL PERFORM TEST PITS PRIOR TO INSTALLATION OF MAINS.
5. CONTRACTOR SHALL COORDINATE WORK NEAR GAS MAINS AND SERVICES WITH EVERSOURCE.

WATER SUPPLY PROTECTION AREA NOTES
1. THE CONTRACTOR SHALL SWEEP THE IMPACTED AREA DURING PAVEMENT/CONCRETE SAWCUTTING TO REMOVE SLURRY AND DEBRIS AT THE END OF EACH DAY OR WHEN PRECIPITATION IS PREDICTED
2. THE CONTRACTOR SHALL PERFORM TEST PITS TO CONFIRM AREAS WHERE DEWATERING WILL BE REQUIRED. THE CONTRACTOR SHALL SUBMIT THEIR SPECIFIC DEWATERING PLAN TO DCR FOR APPROVAL PRIOR TO THE START OF THE CONSTRUCTION OF NEW WATER MAINS IN THESE AREAS.
3. ALL CATCH BASINS WITHIN THE LIMITS OF WORK SHALL HAVE SILT SACKS AND BE MAINTAINED AS NEEDED
4. TRENCHES SHALL BE PAVED WITH BINDER COURSE TO AT LEAST 1" BELOW GRADE EACH FRIDAY AND PRIOR TO PREDICTED PRECIPITATION EVENTS.

SCALE: 1" = 40'

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH
CIVIL
No. 56991
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ
CIVIL
No. 41808
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

Redstone Hill Road Water Main Replacement Project Contract No. 2

Department of Public Works

Sterling, Massachusetts

MARK	DATE	DESCRIPTION
0	3/27/2024	ISSUED FOR BIDDING

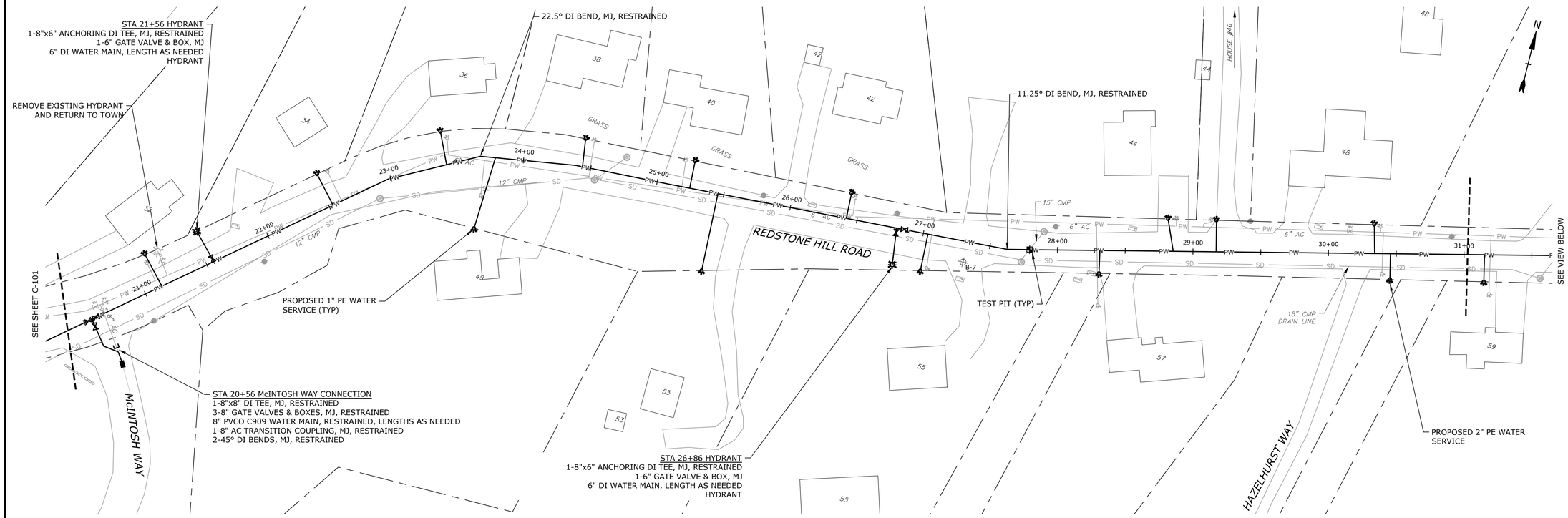
PROJECT NO:	S5121-001
DATE:	MARCH 2023
FILE:	S5121-001 WatPlns_C2.dwg
DRAWN BY:	LEP/ MMO
CHECKED BY:	ERC
APPROVED BY:	AJC

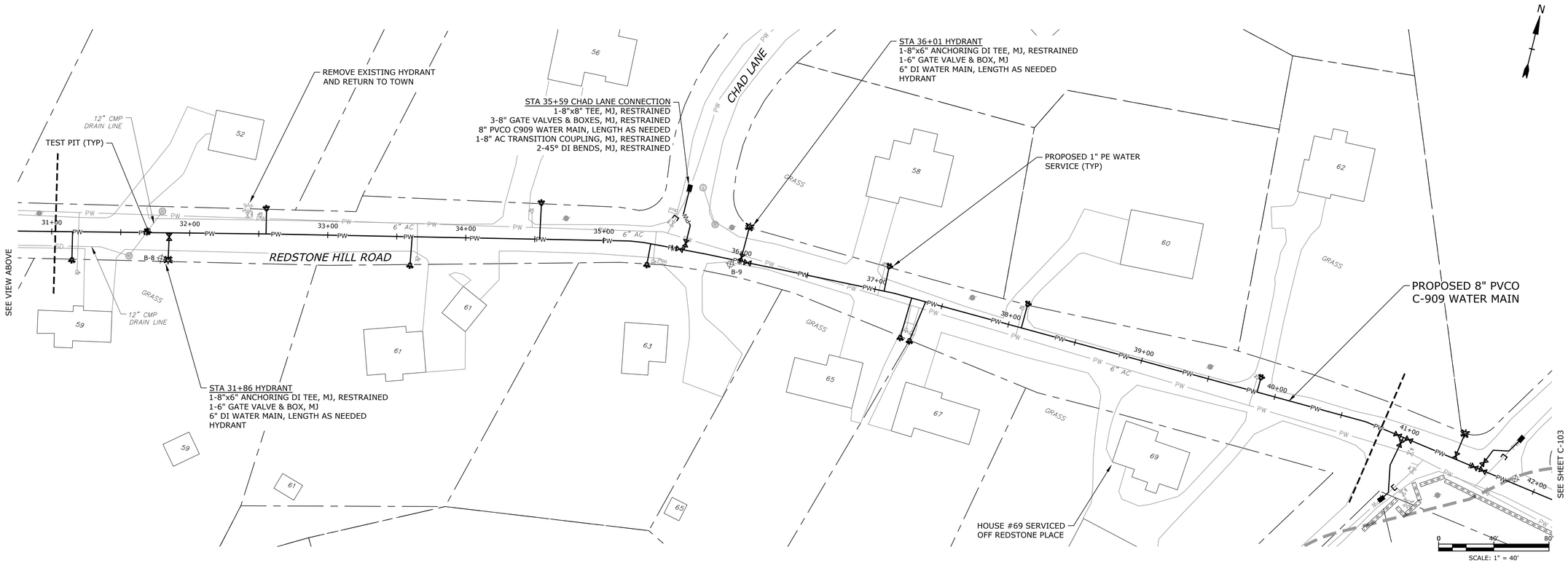
REDSTONE HILL ROAD
WATER MAIN
STA 00+00 TO STA 20+35

SCALE: 1" = 40'

C-101
SHEET 6 OF 12

Last Saved: 3/20/2024
Plotted On: Mar 20, 2024-2:16pm By: MOlson
Tighe & Bond: J:\S\S5121 Town of Sterling\001 Redstone Hill Road Water Main Replacement\Drawings_Figures\AutoCAD\Sheet\Contract No. 2\S5121-001 WatPlns_C2.dwg





Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH
CIVIL
No. 56991
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ
CIVIL
No. 41808
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

Redstone Hill Road Water Main Replacement Project Contract No. 2

Department of Public Works

Sterling, Massachusetts

MARK	DATE	DESCRIPTION
0	3/27/2024	ISSUED FOR BIDDING

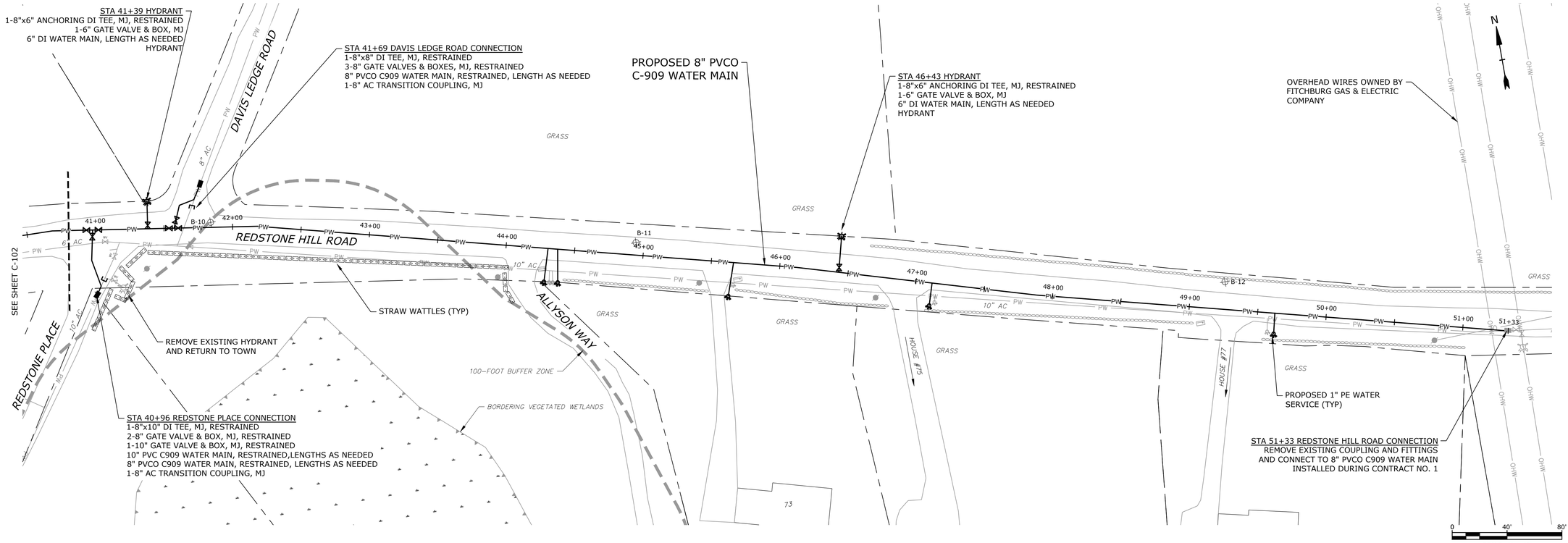
PROJECT NO:	S5121-001
DATE:	MARCH 2023
FILE:	S5121-001 WatPlns_C2.dwg
DRAWN BY:	LEP/ MMO
CHECKED BY:	ERC
APPROVED BY:	AJC

REDSTONE HILL ROAD
WATER MAIN
STA 20+35 TO STA 40+80

SCALE: 1" = 40'

C-102
SHEET 7 OF 12

Last Saved: 3/20/2024
Plotted On: Mar 26, 2024-2:16pm By: MOlson
Tighe & Bond: J:\S\S5121 Town of Sterling\001 Redstone Hill Road Water Main Replacement\Drawings_Figures\AutoCAD\Sheet\Contract No. 2\S5121-001 WatPlns_C2.dwg



Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH
CIVIL
No. 56991
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ
CIVIL
No. 41808
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

Redstone Hill Road Water Main Replacement Project Contract No. 2

Department of Public Works

Sterling, Massachusetts

MARK	DATE	DESCRIPTION
0	3/27/2024	ISSUED FOR BIDDING

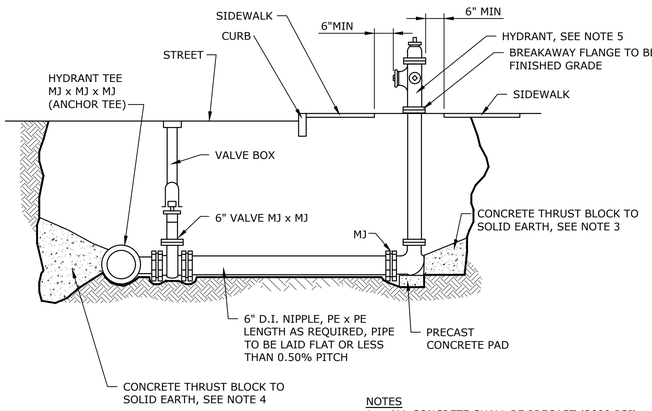
PROJECT NO:	S5121-001
DATE:	MARCH 2023
FILE:	S5121-001 WatPlns_C2.dwg
DRAWN BY:	LEP/ MMO
CHECKED BY:	ERC
APPROVED BY:	AJC

REDSTONE HILL ROAD
WATER MAIN
STA 40+80 TO STA 51+33

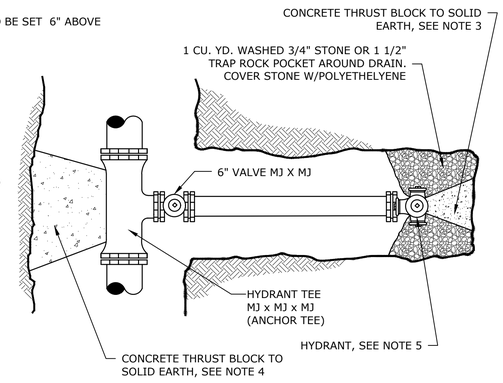
SCALE: 1" = 40'

C-103
SHEET 8 OF 12

Last Saved: 3/20/2024
Plotted: Mar 20, 2024-2:16pm By: MOlson
Tighe & Bond: J:\S\S5121 Town of Sterling\001 Redstone Hill Road Water Main Replacement\Drawings_Figures\AutoCAD\Sheet\Contract No. 2\S5121-001 WatPlns_C2.dwg



ELEVATION



PLAN

NOTES

1. ALL CONCRETE SHALL BE PRECAST (3000 PSI)
2. ALL MJ JOINTS SHALL HAVE RETAINER GLANDS
3. CARE SHALL BE TAKEN TO SHIELD HYDRANT BASE DRAIN HOLES DURING PLACEMENT OF THE CONCRETE THRUST BLOCK. DRAIN HOLES SHALL BE VERIFIED AS OPEN AND FREE OF OBSTRUCTIONS PRIOR TO BACKFILLING.
4. CARE SHALL BE TAKEN TO SHIELD ALL MECHANICAL JOINT GLANDS AND BOLTS DURING PLACEMENT OF CONCRETE THRUST BLOCK. ALL BOLTS AND GLANDS SHALL BE FREE AND UNOBSTRUCTED BEFORE BACKFILLING.
5. HYDRANT SHALL BE SET PLUMB. VERTICAL HYDRANT EXTENSIONS SHALL BE USED AS NECESSARY TO PROPERLY LOCATE THE BREAKAWAY FLANGE PER MANUFACTURERS RECOMMENDATIONS.
6. POLYETHYLENE SHEETING SHALL BE PLACED OVER THE FITTING AND/OR HYDRANT BASE TO PREVENT DIRECT CONTACT OF CONCRETE WITH THE FITTING.

HYDRANT INSTALLATION

NO SCALE

SIZE (IN.)	FITTING	MINIMUM RESTRAINED LENGTH, FT. *
8"	90° BEND	29
8"	45° BEND	12
8"	22 1/2° BEND	6
8"	11 1/4° BEND	3
8"	DEAD END	79
8"	45° VERTICAL UP BEND	33
8"	45° VERTICAL DOWN BEND	8
8"	8"x8" TEE	1
	8"x6" REDUCER	33
	8"x6" TEE	1

MINIMUM RESTRAINED LENGTH BASED ON EBAA IRON RESTRAINT LENGTH CALCULATOR, LATEST EDITION.

FOLLOWING CONDITIONS APPLY:
SOIL TYPE: SAND SILT
MAX. PRESSURE: 200psi
TRENCH TYPE 4
BURIED DEPTH: 5'

ALL RESTRAINED LENGTH FOR 6-INCH PIPE TO MATCH THOSE FOR 8-INCH PIPE SHOWN IN TABLE.

TABLE SUBJECT TO RECALCULATIONS BASED ON
* OBSERVED FIELD CONDITIONS.

MINIMUM RESTRAINED LENGTHS FOR PVC PIPE

SIZE (IN.)	FITTING	MINIMUM RESTRAINED LENGTH, FT. *
8"	90° BEND	25
8"	45° BEND	10
8"	22 1/2° BEND	5
8"	11 1/4° BEND	3
8"	DEAD END	52
8"	45° VERTICAL UP BEND	22
8"	45° VERTICAL DOWN BEND	7
8"	8"x8" TEE	1
	8"x6" REDUCER	22
	8"x6" TEE	1

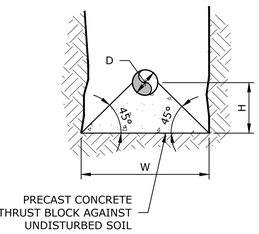
MINIMUM RESTRAINED LENGTH BASED ON EBAA IRON RESTRAINT LENGTH CALCULATOR, LATEST EDITION.

FOLLOWING CONDITIONS APPLY:
SOIL TYPE: SAND SILT
MAX. PRESSURE: 200psi
TRENCH TYPE 4
BURIED DEPTH: 5'

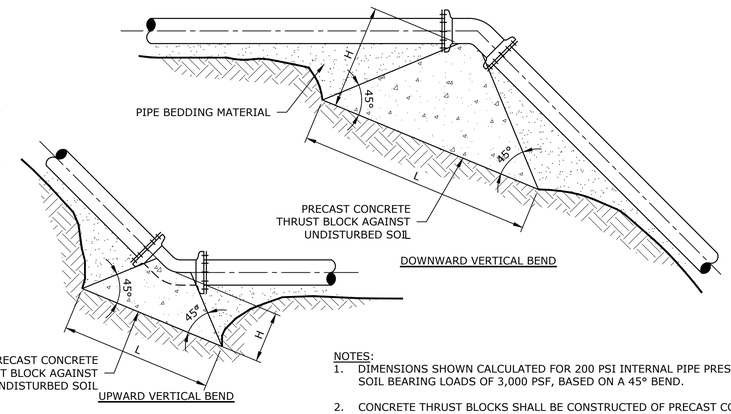
ALL RESTRAINED LENGTH FOR 6-INCH PIPE TO MATCH THOSE FOR 8-INCH PIPE SHOWN IN TABLE.

TABLE SUBJECT TO RECALCULATIONS BASED ON
* OBSERVED FIELD CONDITIONS.

MINIMUM RESTRAINED LENGTHS FOR DI PIPE



SECTION



NOTES:

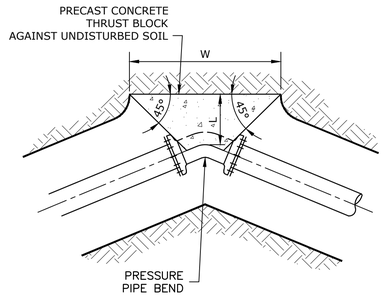
1. DIMENSIONS SHOWN CALCULATED FOR 200 PSI INTERNAL PIPE PRESSURE, SOIL BEARING LOADS OF 3,000 PSF, BASED ON A 45° BEND.
2. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED OF PRECAST CONCRETE MATERIAL AGAINST UNDISTURBED SOIL.
3. DIMENSIONS L, W, & H MAY BE ADJUSTED TO MEET FIELD CONDITIONS, PROVIDED THE BEARING AREA AND VOLUME REMAIN UNCHANGED.
4. POLYETHYLENE SHEETING SHALL BE PLACED OVER MJ FITTINGS TO PREVENT DIRECT CONTACT BETWEEN CONCRETE AND THE FITTING.

	CONCRETE THRUST BLOCK							
	UPWARD VERTICAL BENDS				DOWNWARD VERTICAL BENDS			
D	"L" (FT)	"H" (FT)	"W" (FT)	BEARING AREA (SF)	"L" (FT)	"H" (FT)	"W" * (FT)	BEARING AREA (SF)
10"	2.0	1.9	2.9	5.56	6.4	3.2	5.0	16.0
8"	2.1	1.6	2.3	3.69	5.2	2.6	5.0	13.0
6"	2.2	1.2	1.8	2.15	4.0	2.0	5.0	10.0

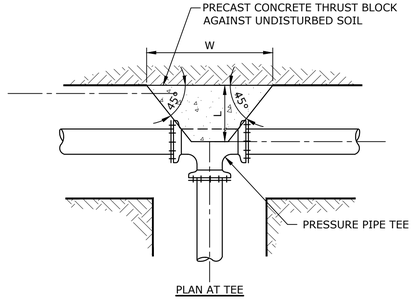
* THE WIDTH OF THE BLOCK (W) IS ASSUMED TO BE THE WIDTH OF THE TRENCH.

CONCRETE THRUST BLOCK FOR VERTICAL BENDS

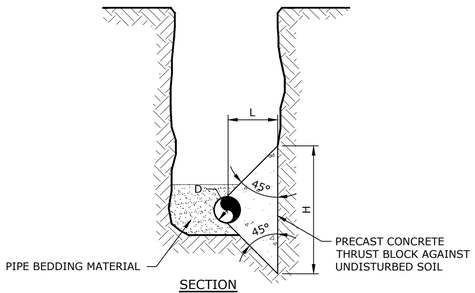
NO SCALE



PLAN AT BEND



PLAN AT TEE



SECTION

NOTES:

1. DIMENSIONS SHOWN CALCULATED PER 200 PSI INTERNAL PIPE PRESSURE FOR SOIL BEARING LOADS OF 3,000 PSF.
2. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED OF PRECAST CONCRETE AGAINST UNDISTURBED SOIL.
3. DIMENSIONS L, W, & H MAY BE ADJUSTED TO MEET FIELD CONDITIONS PROVIDED THE BEARING AREA REMAINS UNCHANGED.
4. THE HEIGHT OF THE BLOCK (H) SHALL BE LESS THAN OR EQUAL TO HALF THE TRENCH DEPTH.
5. POLYETHYLENE SHEETING SHALL BE PLACED OVER MJ FITTINGS TO PREVENT DIRECT CONTACT BETWEEN CONCRETE AND THE FITTING.

	CONCRETE THRUST BLOCK															
		11 1/4° BEND				22 1/2° BEND				45° BEND				TEE/DEAD END			
D	AREA (OUTSIDE DIA.) (IN SQ)	"L" (FT)	"H" (FT)	"W" (FT)	BEARING AREA (SF)	"L" (FT)	"H" (FT)	"W" (FT)	BEARING AREA (SF)	"L" (FT)	"H" (FT)	"W" (FT)	BEARING AREA (SF)	"L" (FT)	"H" (FT)	"W" (FT)	BEARING AREA (SF)
10"	96.8	0.5	1.0	1.4	1.42	0.7	1.4	2.0	2.83	1.0	1.9	2.9	5.56	1.1	2.2	3.3	7.26
8"	64.3	0.4	0.8	1.2	0.95	0.6	1.1	1.7	1.88	0.8	1.6	2.3	3.69	0.9	1.8	2.7	4.82
6"	37.4	0.3	0.6	0.9	0.55	0.5	0.9	1.2	1.09	0.6	1.2	1.8	2.15	0.7	1.4	2.0	2.81

CONCRETE THRUST BLOCK FOR HORIZONTAL BENDS AND TEES

NO SCALE

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH
CIVIL
No. 56991
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ
CIVIL
No. 41808
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

Redstone Hill Road Water Main Replacement Project Contract No. 2

Department of Public Works

Sterling, Massachusetts

MARK	DATE	DESCRIPTION
0	3/27/2024	ISSUED FOR BIDDING

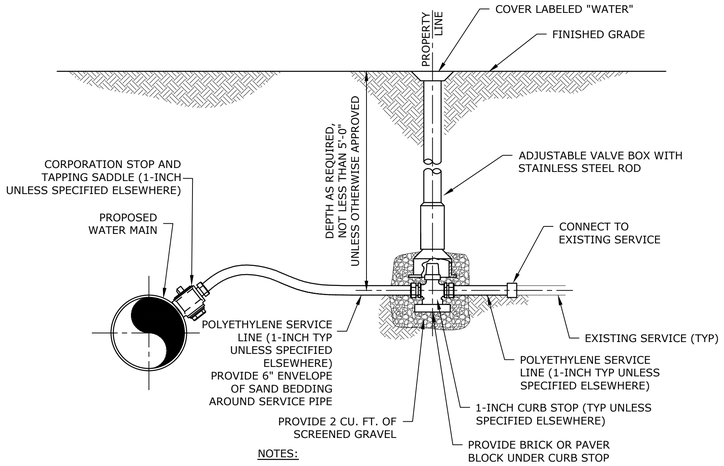
PROJECT NO:	S5121-001
DATE:	MARCH 2023
FILE:	S5121-001 Details_C2.dwg
DRAWN BY:	LEP/ MMO
CHECKED BY:	ERC
APPROVED BY:	AJC

CONSTRUCTION DETAILS - 1

SCALE: NO SCALE

C-501
SHEET 9 OF 12

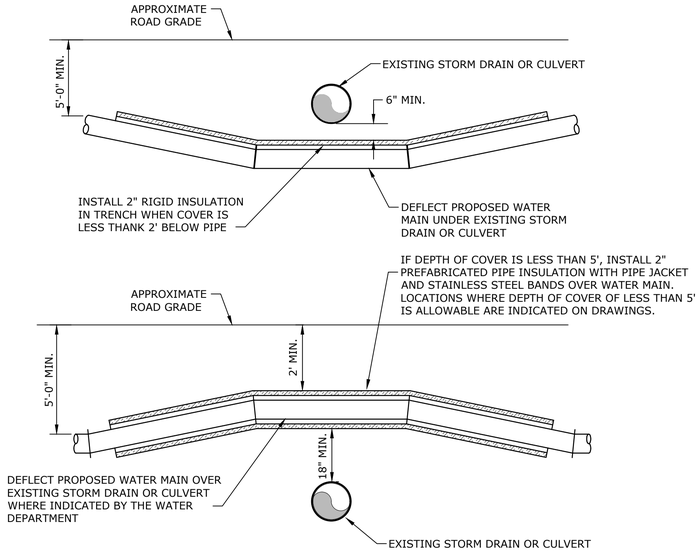
Last Saved: 3/20/2024
Plotted On: Mar 26, 2024-2:38pm By: MOlsen
Tighe & Bond: J:\S\S5121 Town of Sterling\001 Redstone Hill Road Water Main Replacement\Drawings, Figures\AutoCAD\Sheet\Contract No. 2\S5121-001 Details_C2.dwg



NOTES:

1. SERVICE CONNECTION TO BE FIELD VERIFIED.
2. PROVIDE SERVICES AT ALL PROPERTIES. LOCATIONS TO BE FIELD LOCATED WITH STERLING WATER DEPARTMENT.
3. CURB BOXES TO BE LOCATED IN LAWN AREAS AT PROPERTY LINE. AVOID INSTALLATION IN SIDEWALK WHERE POSSIBLE.

WATER SERVICE CONNECTION
NO SCALE



WATER MAIN CULVERT CROSSING
NO SCALE

TYPICAL TRENCH SECTION - EARTH AND ROCK EXCAVATION PIPE TRENCH PAYLINE LIMITS
NO SCALE

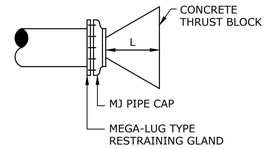
TABLE A - MAXIMUM SURFACE REPAIR PAY WIDTHS (SEE NOTES)
NOMINAL PIPE DIAMETER 0 - 24"
LOAMING & SEEDING 8'-6" MAX.

TABLE B - MAXIMUM TRENCH EXCAVATION PAY WIDTHS (SEE NOTES)
NOMINAL PIPE DIAMETER 0 - 24"
5'-0"

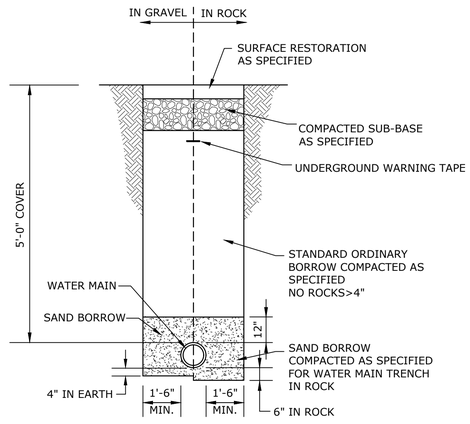
NOTES:

1. THE PAYLINE DIMENSIONS SHOWN REPRESENT THE MAXIMUM PAYLINE LIMITS TO BE PAID. WHEN THE ACTUAL SURFACE REPAIR OR TRENCH WIDTH IS LESS, THE ACTUAL WIDTH SHALL BE PAID FOR AT THE APPLICABLE UNIT PRICE.
2. ALL EXCAVATION EXCLUDING ROCK THAT IS RELATED TO PIPE AND STRUCTURE INSTALLATION IS INCLUDED IN THE UNIT PRICE PER PIPE OR STRUCTURE ITEM. TRENCH PAYLINE LIMITS ARE USED FOR ROCK EXCAVATION ONLY.

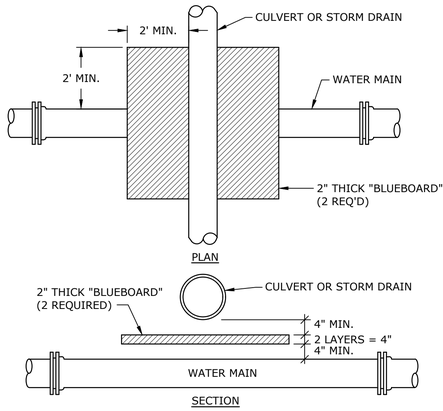
TRENCH PAYLINES
NO SCALE



WATER MAIN CAPPING DETAIL
NO SCALE



TYPICAL WATER MAIN TRENCH SECTION
NO SCALE



WATER MAIN INSULATION DETAIL
NO SCALE

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH CIVIL No. 56991 REGISTERED PROFESSIONAL ENGINEER
03/26/2024

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ CIVIL No. 41808 PROFESSIONAL ENGINEER
03/26/2024

Redstone Hill Road Water Main Replacement Project Contract No. 2

Department of Public Works

Sterling, Massachusetts

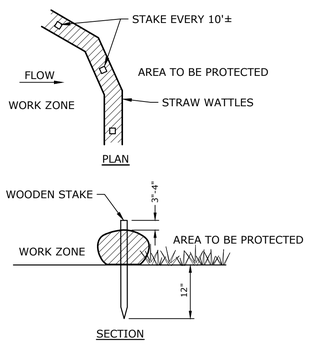
MARK	DATE	DESCRIPTION
0	3/27/2024	ISSUED FOR BIDDING

PROJECT NO:	S5121-001
DATE:	MARCH 2023
FILE:	S5121-001 Details_C2.dwg
DRAWN BY:	LEP/ MMO
CHECKED BY:	ERC
APPROVED BY:	AJC

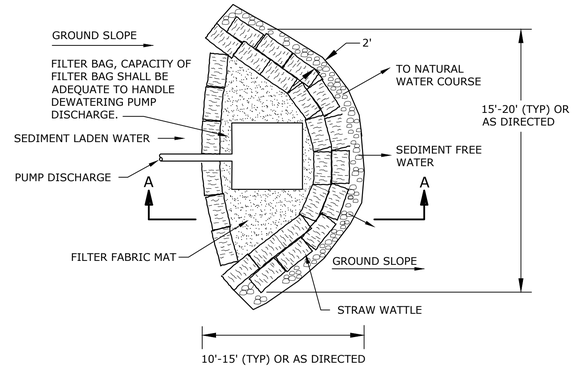
CONSTRUCTION DETAILS - 2

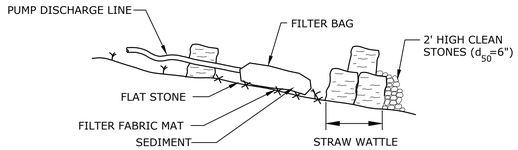
SCALE: NO SCALE

C-502
SHEET 10 OF 12



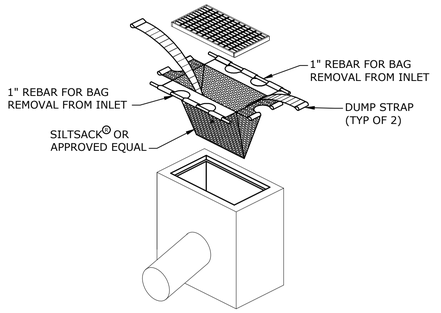
STRAW WATTLES
NO SCALE





NOTE:
THE GROUNDWATER DISCHARGE FILTER SHALL BE INSTALLED FOR ANY DEWATERING ACTIVITY LOCATED WITHIN THE 100' WETLAND REGULATED AREA. A FILTER BAG IS REQUIRED FOR DEWATERING ACTIVITIES LOCATED OUTSIDE OF THE REGULATED AREA.

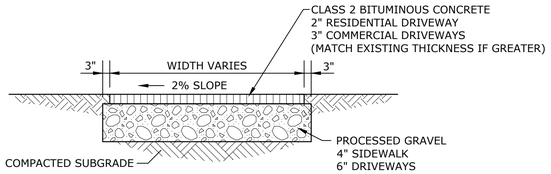
DEWATERING DISCHARGE FILTER
NO SCALE



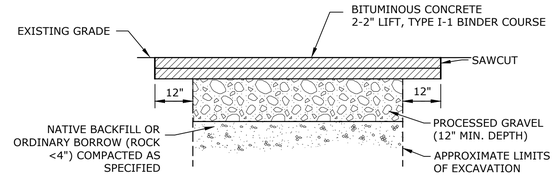
NOTES:
1. "SILT SACKS", "DANDY BAG II," "BLOCKSON & CO. NATURAL FIBER INLET FILTER MAT" OR OTHER SIMILAR SILT RETENTION DEVICE SHALL BE INSTALLED IN LIEU OF STRAW WATTLES FOR CATCH BASINS LOCATED IN EXISTING PAVED AREAS.

CATCH BASIN PROTECTION
SILTSACK® EROSION CONTROL
NO SCALE

SILTSACK MANUFACTURED BY:
ATLANTIC CONSTRUCTION FABRICS, INC.
1801-A WILLIS ROAD
RICHMOND, VIRGINIA 23237



BITUMINOUS CONCRETE
DRIVEWAY DETAIL
NO SCALE



NOTES:
1. PLACED WEEKLY ON FRIDAYS (OR LAST DAY OF THE WORK WEEK).
2. ANY ROUGH OR DAMAGED TRENCH EDGES SHALL BE SAWCUT CLEAN AND REPAVED.
3. PROVIDE ALL REQUIRED BACKUP MATERIAL (GRAVEL OR LOAM AND SEED) ALONG THE EDGES OF THE COMPLETED TOP COURSE.

PAVEMENT REPAIR
NO SCALE

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH
CIVIL
No. 56991
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ
CIVIL
No. 41808
REGISTERED PROFESSIONAL ENGINEER
03/26/2024

Redstone Hill Road Water Main Replacement Project Contract No. 2

Department of Public Works

Sterling, Massachusetts

MARK	DATE	DESCRIPTION
0	3/27/2024	ISSUED FOR BIDDING

PROJECT NO:	S5121-001
DATE:	MARCH 2023
FILE:	S5121-001 Details_C2.dwg
DRAWN BY:	LEP/ MMO
CHECKED BY:	ERC
APPROVED BY:	AJC

CONSTRUCTION DETAILS - 3

SCALE: NO SCALE

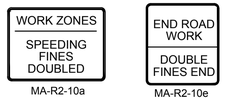
C-503
SHEET 11 OF 12

GENERAL NOTES:

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
2. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
6. 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 CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
7. THE FIRST FIVE PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH TYPE A LIGHTS.
8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
9. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
10. MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
11. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
12. SIGN MA-R2-10a AND MA-R2-10e SHALL BE LOCATED AT THE PROJECT LIMITS FOR THE DURATION OF THE WORK.

LEGEND

- ● REFLECTORIZED PLASTIC DRUM OR 36" CONE
- P/F POLICE/FLAGGER DETAIL
- TYPE III BARRICADE
- WORK ZONE
- DIRECTION OF TRAFFIC
- CHANGEABLE MESSAGE SIGN
- ARROW BOARD



R2-10
60"X48"

WORK ZONE LIMIT SIGNS

SEE NOTE 12

FORMULAS FOR DETERMINING TAPER LENGTHS

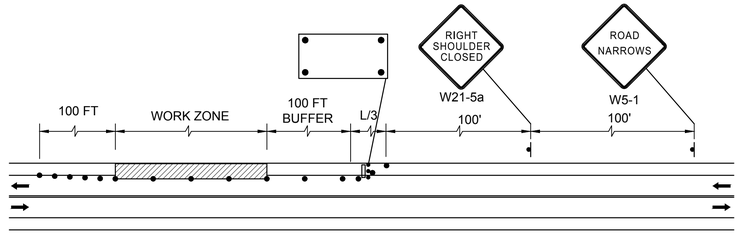
SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L=\frac{WS^2}{60}$
45 MPH OR MORE	L = WS

WHERE:

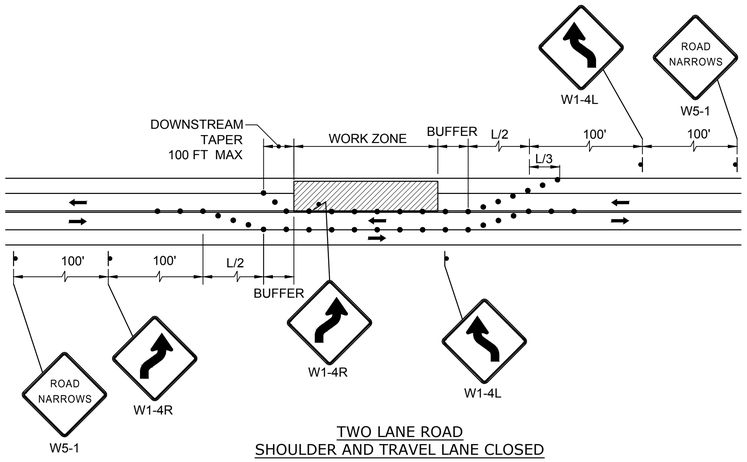
L = TAPER LENGTH IN FEET

W = WIDTH OF OFFSET IN FEET

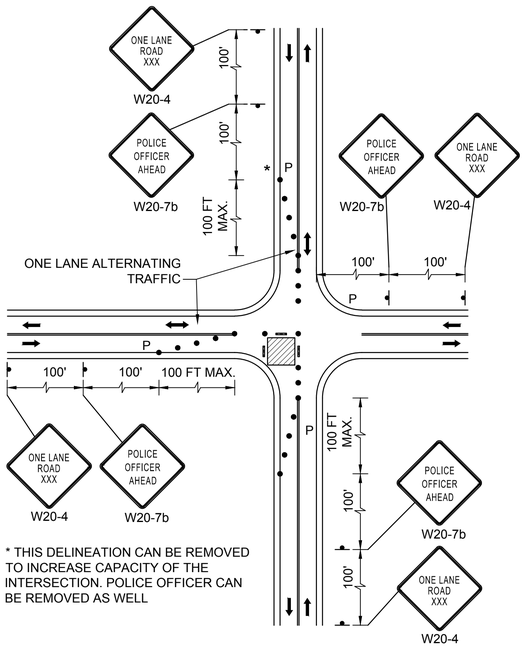
S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH



TWO LANE ROAD SHOULDER CLOSED

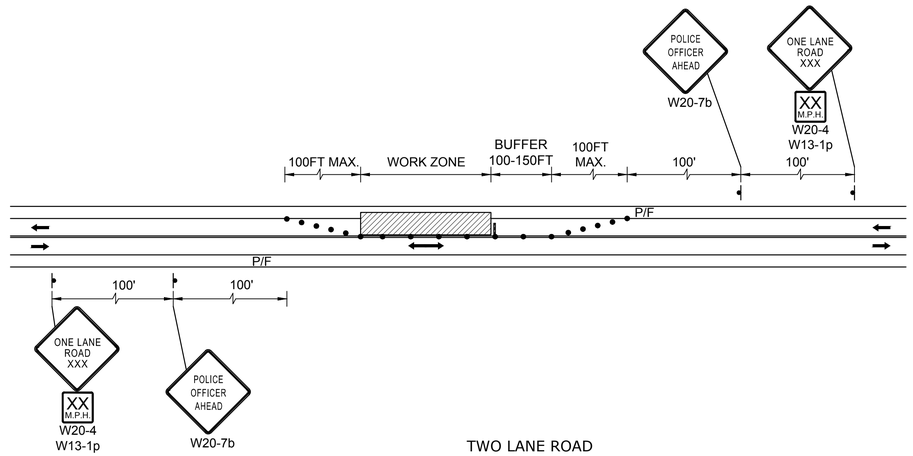


TWO LANE ROAD SHOULDER AND TRAVEL LANE CLOSED

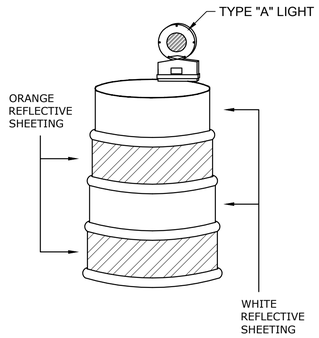


* THIS DELINEATION CAN BE REMOVED TO INCREASE CAPACITY OF THE INTERSECTION. POLICE OFFICER CAN BE REMOVED AS WELL

SINGLE LANE APPROACH ONE QUADRANT CLOSURE



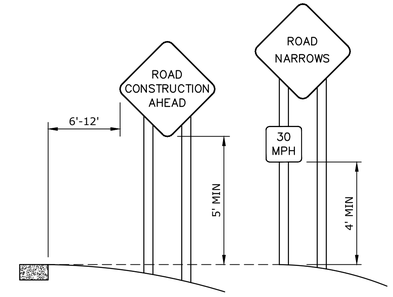
TWO LANE ROAD ONE LANE ALTERNATING TRAFFIC



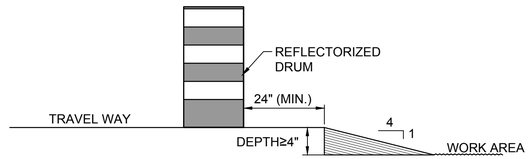
NOTES:

1. DRUM DESIGN AND APPLICATION SHALL BE AS PER THE CURRENT EDITION OF THE MUTCD.
2. DRUMS SHALL BE APPROXIMATELY 36" IN HEIGHT, HAVING A MINIMUM WALL THICKNESS OF 3/32" AND A MINIMUM DIAMETER OF 18" REGARDLESS OF ORIENTATION.
3. DRUM MATERIAL MUST BE APPROVED UV RESISTANT, LOW DENSITY, IMPACT RESISTANT, LINEAR POLYETHYLENE (OR APPROVED EQUIVALENT).
4. SHEETING SHALL BE APPROVED ORANGE AND WHITE TYPE IV REFLECTORIZED SHEETING CONFORMING TO M9.30.0.
5. ALL DRUMS SHALL BE WELL MAINTAINED INCLUDING REMOVAL OF DUST OR ROAD FILM, SO AS NOT TO REDUCE REFLECTIVE EFFICIENCY. WHEN A DRUM LOSES TARGET VALUE IT SHALL BE REPLACED.
6. STORE UNUSED DRUMS IN ONE LOCATION, AWAY FROM ALL TRAFFIC, OR REMOVE FROM SITE ENTIRELY.

PLASTIC DRUMS

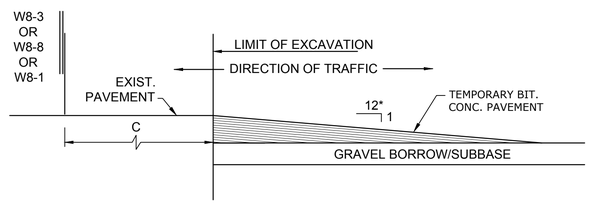


TYPICAL INSTALLATION OF PROJECT SIGNS



LATERAL DROP-OFF DETAIL

NO SCALE



LONGITUDINAL DROP-OFF DETAIL

NO SCALE

* - INCREASE SLOPE RATIO FOR HIGHER SPEEDS

LATERAL AND LONGITUDINAL DROP-OFF DETAILS

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
EMILY CHURCH CIVIL No. 56991 REGISTERED PROFESSIONAL ENGINEER
03/26/2024

COMMONWEALTH OF MASSACHUSETTS
ANTONIO J. DA CRUZ CIVIL No. 41808 REGISTERED PROFESSIONAL ENGINEER
03/26/2024

Redstone Hill Road Water Main Replacement Project Contract No. 2

Department of Public Works

Sterling, Massachusetts

MARK	DATE	DESCRIPTION
0	3/27/2024	ISSUED FOR BIDDING

PROJECT NO:	S5121-001
DATE:	MARCH 2023
FILE:	S5121-001 TMP_C2.dwg
DRAWN BY:	LEP/ MMO
CHECKED BY:	ERC
APPROVED BY:	AJC

TRAFFIC MANAGEMENT PLAN

SCALE: NO SCALE

C-504

SHEET 12 OF 12

Last Saved: 11/30/2023
Plotted: Mar 20, 2024 - 1:12pm By: MOlson
Tighe & Bond: J:\S5121 Town of Sterling\001 Redstone Hill Road Water Main Replacement\Drawings_Figures\AutoCAD\Sheet\Contract No. 2\S5121-001 TMP_C2.dwg