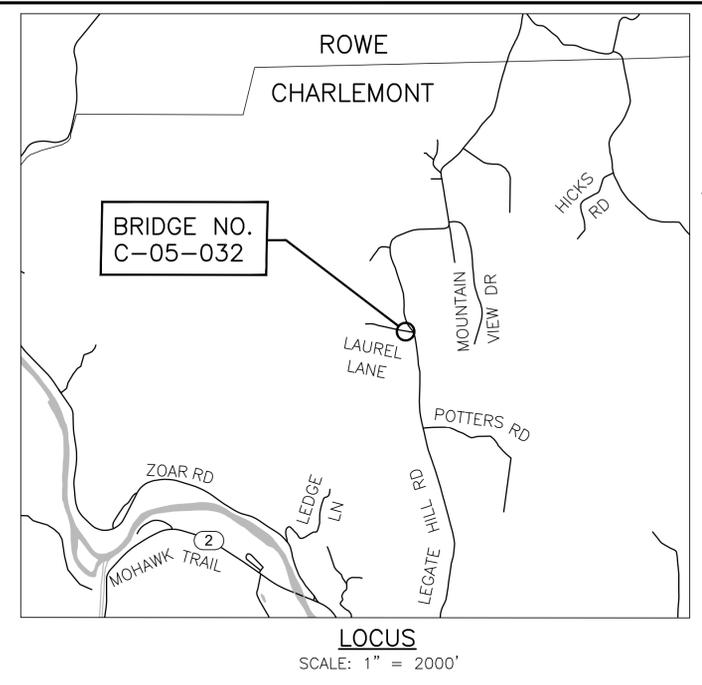


**KEY PLAN**  
SCALE: 1" = 10'

**INDEX OF DRAWINGS**

SHEET NO.	DESCRIPTION
1	KEY PLAN LOCUS PROFILE & NOTES
2	BORING LOGS & HYDRAULIC DATA
3	EAST WALL REPAIR
4	WEST WALL REPAIR
5	REINFORCEMENT REPAIR
6	ROADWAY PLAN AND TYPICAL SECTION
7	TEMPORARY TRAFFIC CONTROL PLAN
8	CROSS SECTIONS



**LOCUS**  
SCALE: 1" = 2000'

**GENERAL NOTES:**

**EXISTING CONDITIONS:**  
THE CONTRACTOR SHALL DETERMINE AND ESTABLISH ALL DIMENSIONS AND EXISTING DETAILS NECESSARY FOR THE COMPLETION OF WORK BY FIELD MEASUREMENT AND SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUACY AND ACCURACY THEREOF AND SHALL NOT ORDER ANY MATERIALS OR COMMENCE ANY FABRICATION UNTIL THE REQUIRED MEASUREMENTS HAVE BEEN MADE ON THE ACTUAL STRUCTURE AND THE EXTENT OF PROPOSED WORK HAS BEEN APPROVED BY THE ENGINEER.

THE CONTRACTOR SHALL LOCATE AND PROTECT FROM DAMAGE ALL EXISTING UTILITIES.

**SCALES:**  
THESE DRAWINGS WERE FORMATTED FOR 24"x36" PLAN SHEETS. SCALES NOTED ON THE DRAWINGS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS.

**ELEVATIONS:**  
NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

**BENCHMARK:**  
ALL ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM 1988.

**BENCHMARK CONTROL POINTS:**  
MAG. NAIL #1 N 3067045.49 E 279638.10  
EL = 1130.53  
SPIKE SET #4 N 3067053.50 E 279575.68  
EL = 1117.75

**SURVEY:**  
SURVEY PERFORMED BY SURVEYING AND MAPPING CONSULTANTS, SEPTEMBER 2019. COPY OF FILE MAY BE OBTAINED FROM GILL ENGINEERING ASSOCIATES.

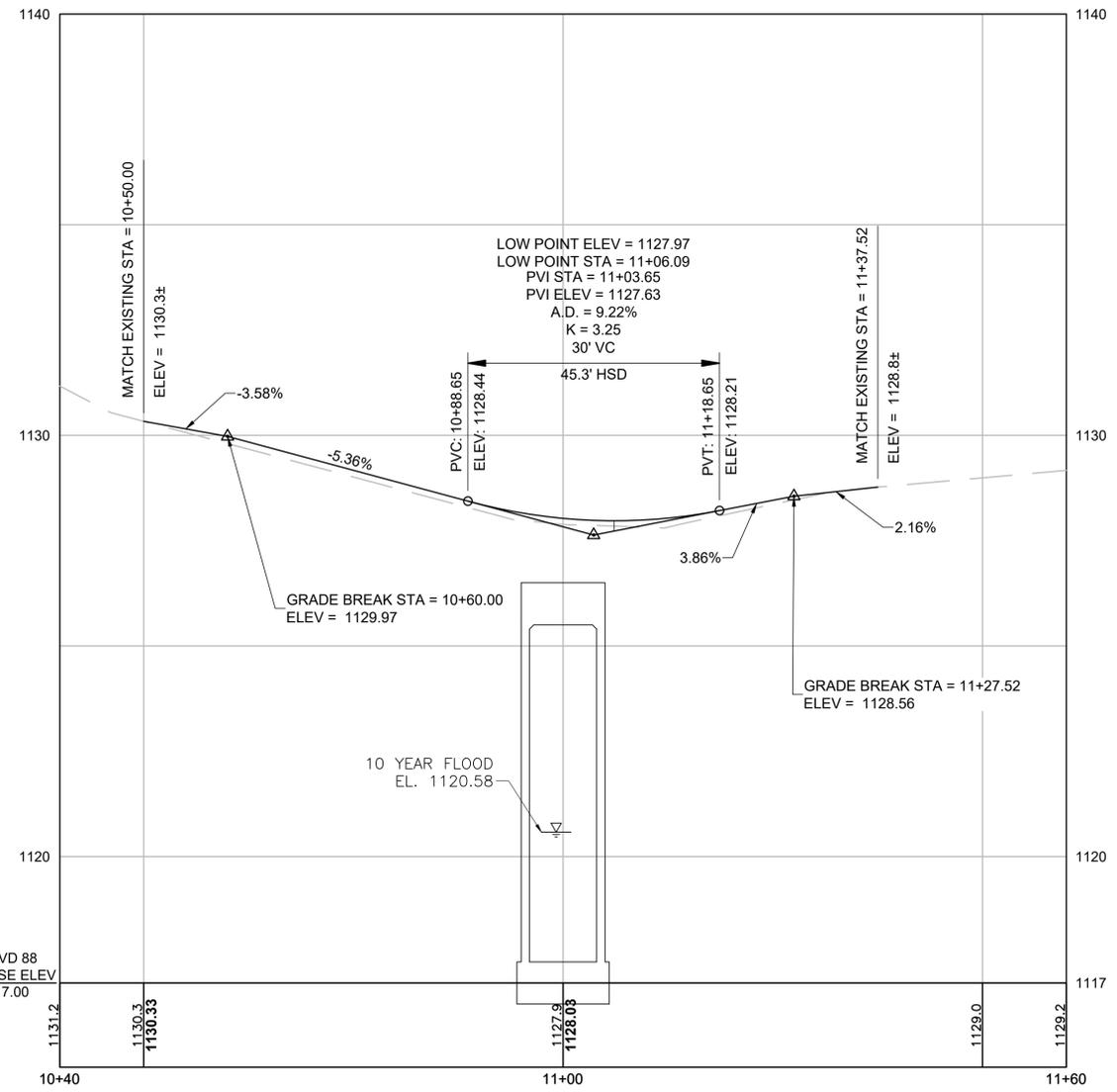
**LOAD RATING:**  
THE EXISTING CULVERT HAS BEEN LOAD RATED USING THE AASHTO CULVERT LRFR ANALYSIS ENGINE FOR THE PROPOSED REHABILITATED CONDITION WITH HL-93 LOADING. THE CONTROLLING RATING FACTOR AT INVENTORY LEVEL WAS 2.06.

**REINFORCEMENT:**  
REINFORCING STEEL SHALL BE UNCOATED AND CONFORM TO THE REQUIREMENTS OF AASHTO M31 GRADE 60.

**CONCRETE:**  
4000 PSI, 3/8 IN., 660 CEMENT CONCRETE SHALL BE USED FOR PARTIAL AND FULL DEPTH CULVERT WALL REPAIRS. CEMENTITIOUS MORTAR FOR PATCHING SHALL BE USED FOR SHALLOW REPAIRS.

**QUANTITIES**

NO.	ITEM	QUANTITY	UNIT
107.855	PRESSURE INJECTION OF CRACKS	55	FT
120.1	UNCLASSIFIED EXCAVATION	11	CY
127.1	REINFORCED CONCRETE EXCAVATION	8	CY
140	BRIDGE EXCAVATION	8	CY
452	ASPHALT EMULSION FOR TACK COAT	7	GAL
460.23	SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5)	16	TON
460.31	SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5)	2	TON
482.3	SAWCUTTING ASPHALT PAVEMENT	34	FT
620.12	GUARDRAIL, TL-2 (SINGLE FACED)	150	FT
627.1	TRAILING ANCHORAGE	4	EA
751	LOAM BORROW	6	CY
765	SEEDING	47	SY
767.12	COMPOST FILTER TUBES	235	FT
769	PAVEMENT MILLING MULCH UNDER GUARD RAIL	300	FT
852	SAFETY SIGNING FOR TRAFFIC MANAGEMENT	140	SF
905	4000 PSI, 3/8 INCH, 660 CEMENT CONCRETE	6	CY
909.2	CEMENTITIOUS MORTAR FOR PATCHING	180	SF
910	STEEL REINFORCEMENT FOR STRUCTURES	244	LB
910.4	MECHANICAL REINFORCING BAR SPLICER	85	EA
912.6	DRILLED AND GROUTED #6 DOWELS	38	EA
968.5	WEEP HOLE RETROFIT	16	EA
991.1	CONTROL OF WATER - STRUCTURE NO. C-05-032	1	LS



**PROFILE - LAUREL LANE**  
HORIZONTAL SCALE: 1" = 10'  
VERTICAL SCALE: 1" = 2'

63 KENDRICK STREET  
NEEDHAM, MA 02484  
781-355-7100  
781-355-7101 (FAX)

**GILL ENGINEERING**

DATE: \_\_\_\_\_  
REGISTERED PROFESSIONAL ENGINEER: \_\_\_\_\_

**CULVERT PRESERVATION**  
TOWN OF CHARLEMONT  
CHARLEMONT C-05-032  
LAUREL LANE OVER LEGATE HILL BROOK TRIB.

**KEY PLAN**  
**LOCUS**  
**PROFILE & NOTES**

SHEET 1 OF 8

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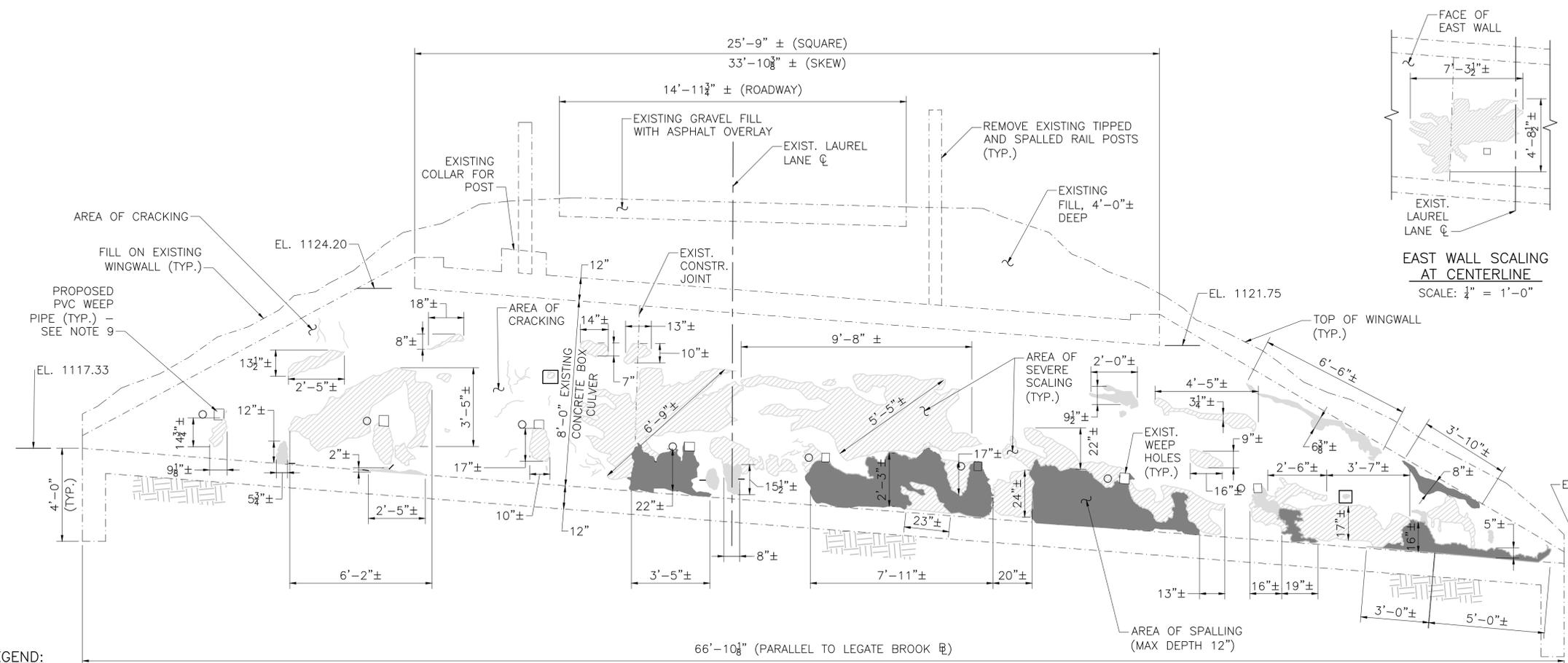
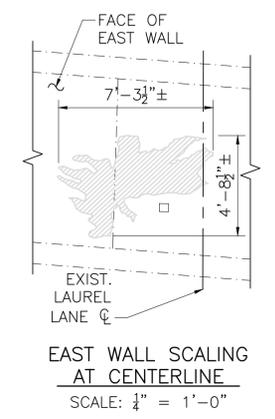


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**CULVERT PRESERVATION**  
TOWN OF CHARLEMONT  
CHARLEMONT C-05-032  
LAUREL LANE OVER LEGATE HILL BROOK TRIB.

**REPAIR NOTES:**

1. THE ACTUAL LOCATIONS OF CONCRETE REPAIR WILL BE DETERMINED IN THE FIELD. THE CONTRACTOR SHALL REPAIR ALL AREAS NECESSARY AS DIRECTED BY THE ENGINEER AFTER THE CONTRACTOR HAS SOUNDED AND MARKED OUT ALL REPAIR AREAS.
2. SPALLED, DELAMINATED, AND DETERIORATED CONCRETE AREAS SHALL BE REPAIRED USING 4000 PSI, 3/8", 660 CEMENT CONCRETE OR OTHER APPROVED REPAIR CONCRETE.
3. PARTIAL DEPTH REPAIRS: ALL DETERIORATED AND DELAMINATED CONCRETE SHALL BE REMOVED TO A MINIMUM DEPTH OF 1" BELOW THE BOTTOM OF THE TOP LAYER OF EXISTING REINFORCEMENT STEEL.
4. FULL DEPTH REPAIRS: ALL DETERIORATED AND DELAMINATED CONCRETE SHALL BE REMOVED, AND IF THE SOUND CONCRETE SURFACE IS LOCATED AT A DEPTH GREATER THAN 50% OF THE WALL THICKNESS, A FULL DEPTH REPAIR SHALL BE PERFORMED. CONCRETE SHALL BE CUT ON A 1:4 SLOPE.
5. ALL EXISTING REINFORCING STEEL AND CONCRETE SURFACES THAT ARE TO BE IN CONTACT WITH REPAIR CONCRETE SHALL BE ABRASIVELY BLAST CLEANED IN ORDER TO REMOVE ALL RUST, OIL, AND DEBRIS THAT IS NOT TIGHTLY ADHERED, FOLLOWED BY APPLICATION OF COMPRESSED AIR TO REMOVE ALL DUST. EXISTING CONCRETE SURFACES THAT WILL BE IN CONTACT WITH REPAIR CONCRETE SHALL BE PRE-WETTED FOR A MINIMUM OF 24 HOURS USING POTABLE WATER IN ORDER TO ACHIEVE A SATURATED SURFACE DRY CONDITION IMMEDIATELY PRIOR TO PLACEMENT OF REPAIR CONCRETE.
6. NEW UNCOATED (BLACK) STEEL REINFORCEMENT SHALL BE PLACED TO SUPPLEMENT EXISTING REINFORCEMENT THAT HAS A SECTION LOSS OF 25% OR MORE OF THE ORIGINAL CROSS SECTION AREA OR HAS BROKEN, AS DETERMINED BY THE ENGINEER. NEW REINFORCEMENT SHALL BE MECHANICALLY CONNECTED TO REPLACE EXISTING DETERIORATED BAR SEGMENTS WITH THE SPICERS LOCATED BEYOND THE LIMITS OF DETERIORATION.
7. ALL REPAIR AREAS SHALL BE DELINEATED BY A 3/4" SAWCUT.
8. THE CONTRACTOR SHALL OVER EXCAVATE THE EXISTING CONCRETE AT THE TOP OF EACH REPAIR AREA TO PROVIDE AN OPENING THAT IS LARGE ENOUGH TO DELIVER THE 4000 PSI - 3/8" INCH - 660 CEMENT CONCRETE INTO THE FORMS. THESE EXCAVATED OPENINGS SHALL NOT BE SPACED MORE THAN 12" ON CENTER TO ENSURE THAT THE VOIDS ARE FULLY FILLED WITH CONCRETE. ONE INCH NOMINAL DIAMETER VIBRATORS SHALL BE INSERTED INTO THE FORM OPENINGS TO ENSURE THAT ALL REPAIR CONCRETE IS FULLY CONSOLIDATED.
9. THE EXISTING RECTANGULAR WEEP HOLES SHALL BE RETROFITTED BY INSTALLING THE MAXIMUM SIZE SCHEDULE 40 PVC PIPE THAT WILL FIT INTO THE EXISTING OPENINGS, 23 GAUGE 1/2" GALVANIZED MESH SHALL COVER THE INLET END OF EACH PIPE. THE OUTLET END OF EACH PIPE SHALL EXTEND 1" BEYOND THE WALL FACE. THE VOID SPACE AROUND THE PVC PIPES SHALL BE PACKED WITH NON-SHRINK MORTAR.

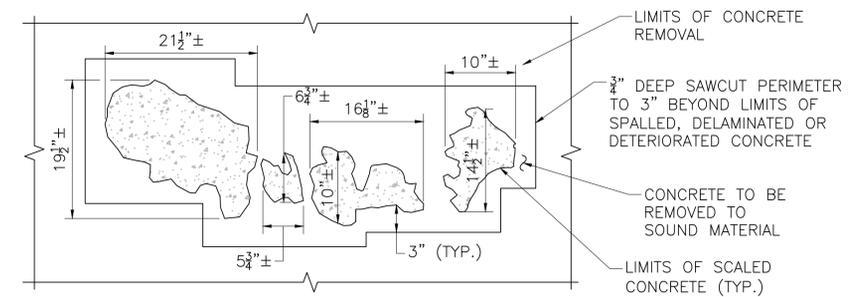


**LEGEND:**

- CRACK TO BE SEALED
- ▨ AREA OF SCALING TO BE REPAIRED USING CEMENTITIOUS MORTAR FOR PATCHING (DEPTH VARIES)
- ▩ AREA OF PARTIAL DEPTH SPALLING TO BE REPAIRED USING 4000 3/8" IN. 660 CEMENT CONCRETE (MAX DEPTH = 6")
- AREA OF FULL DEPTH SPALLING TO BE REPAIRED USING 4000 3/8" IN. 660 CEMENT CONCRETE (MAX DEPTH = 12")

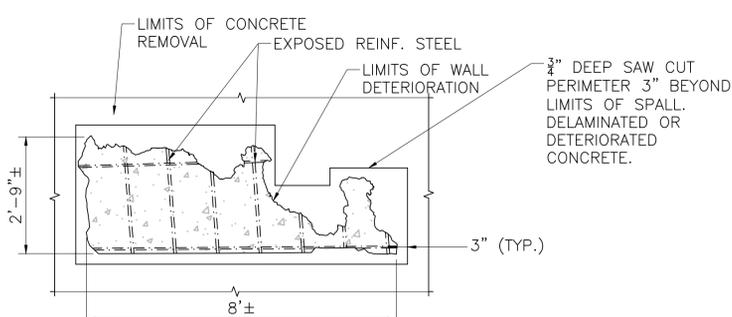
**EAST WALL ELEVATION DETERIORATION**

SCALE: 3/8" = 1'-0"



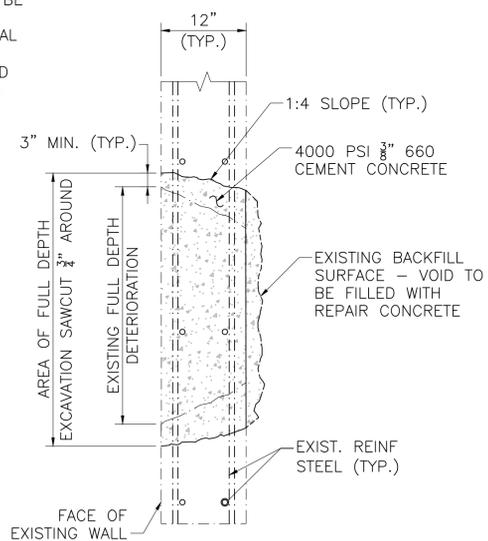
**LIMITS OF SCALING REPAIR**

SCALE: 1" = 1'-0"



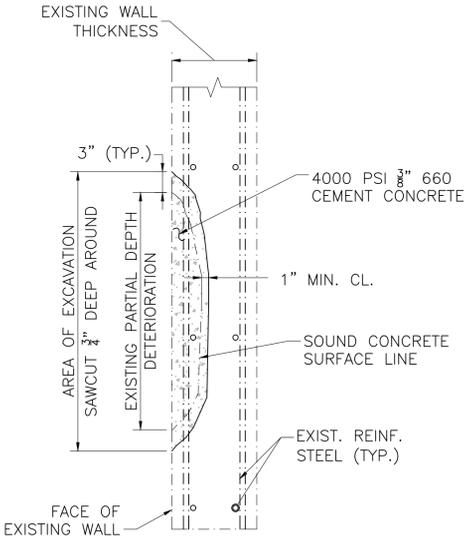
**LIMITS OF SPALL REPAIR**

SCALE: 1/2" = 1'-0"



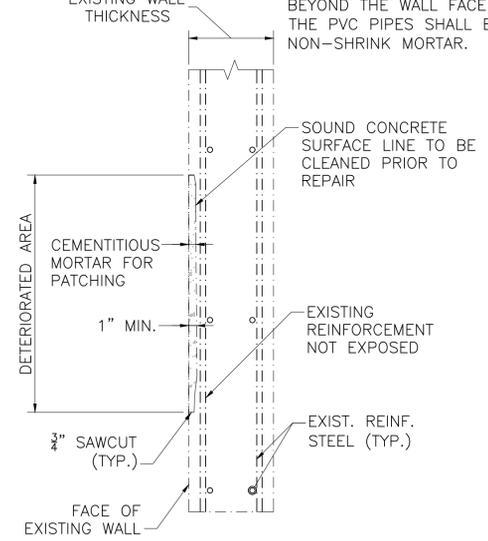
**FULL DEPTH WALL REPAIR**

SCALE: 1" = 1'-0"



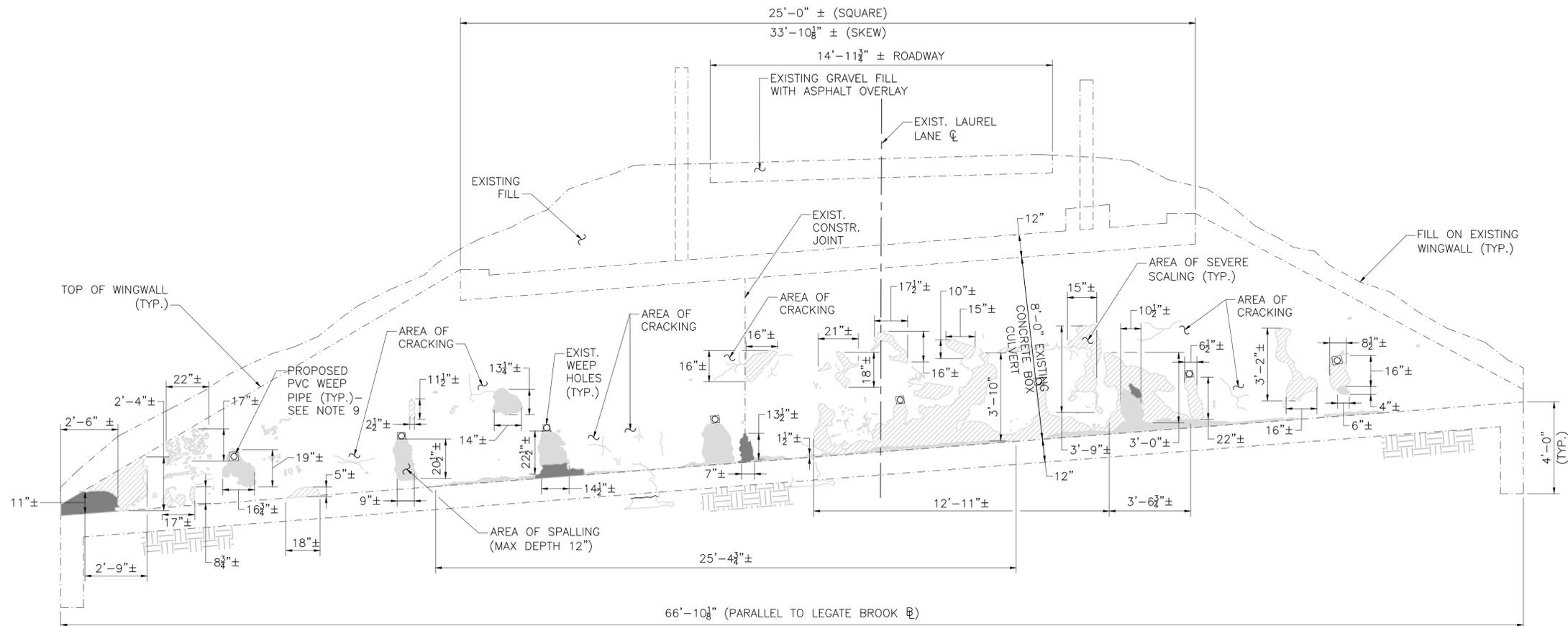
**PARTIAL DEPTH WALL REPAIR**

SCALE: 1" = 1'-0"



**SHALLOW DEPTH WALL REPAIR**

SCALE: 1" = 1'-0"



**LEGEND:**

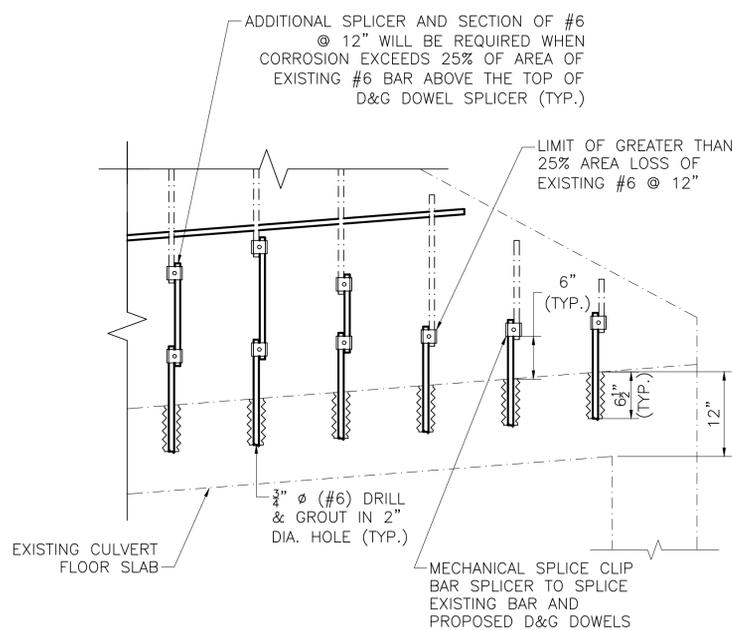
- CRACK TO BE SEALED
- AREA OF SCALING TO BE REPAIRED USING CEMENTITIOUS MORTAR FOR PATCHING (DEPTH VARIES)
- AREA OF PARTIAL DEPTH SPALLING TO BE REPAIRED USING 4000  $\frac{3}{8}$  IN. 660 CEMENT CONCRETE (MAX DEPTH = 6")
- AREA OF FULL DEPTH SPALLING TO BE REPAIRED USING 4000  $\frac{3}{8}$  IN. 660 CEMENT CONCRETE (MAX DEPTH = 12")

**WEST WALL ELEVATION DETERIORATION**

SCALE:  $\frac{3}{8}$ " = 1'-0"

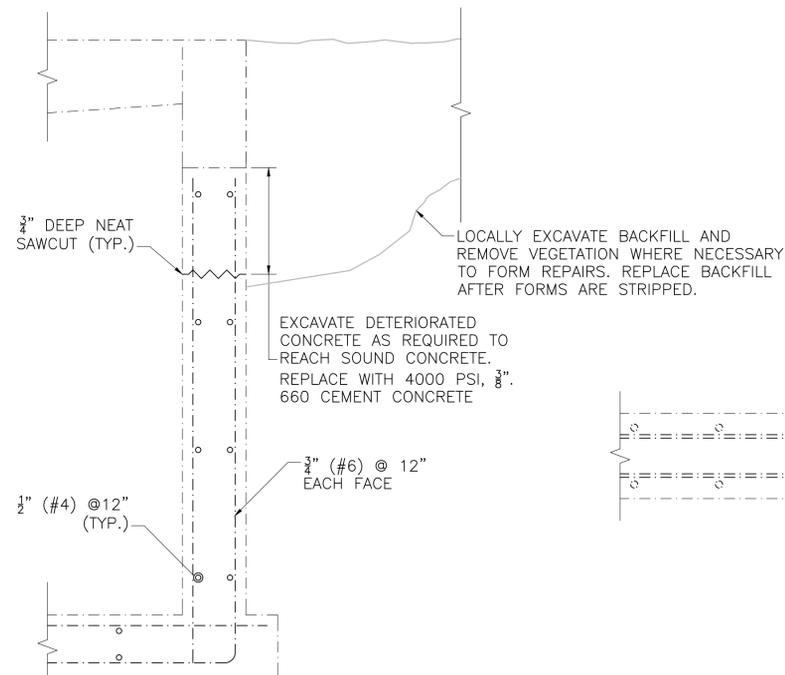
**REPAIR NOTE:**

REFER TO SHEET 3 FOR CONCRETE REPAIR NOTES



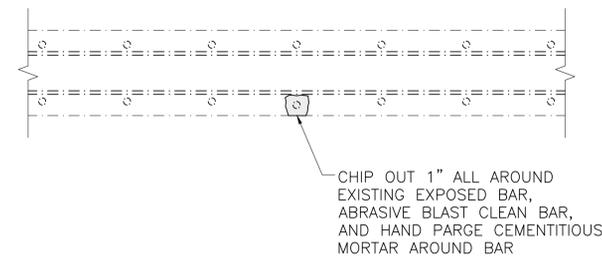
**TYPICAL BOTTOM OF WALL REPAIR**

SCALE: 1" = 1'-0"



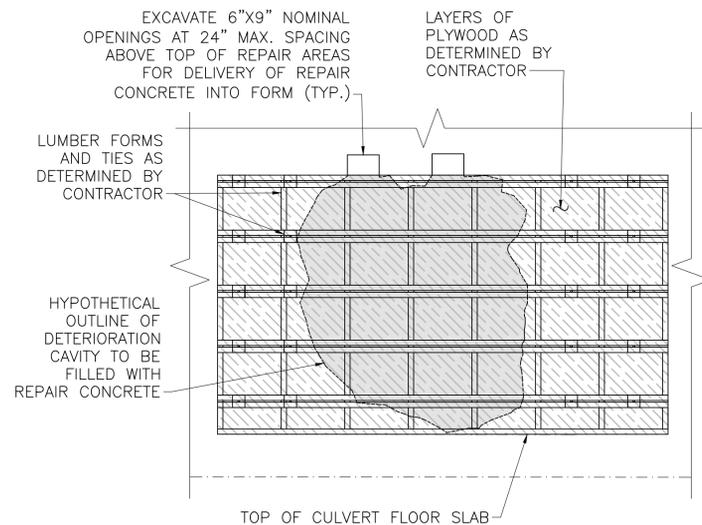
**INLET/OUTLET END WALL REPAIR DETAIL**

SCALE:  $\frac{3}{4}$ " = 1'-0"



**OVERHEAD SLAB EXPOSED BAR MORTAR REPAIR DETAIL**

SCALE:  $\frac{3}{4}$ " = 1'-0"

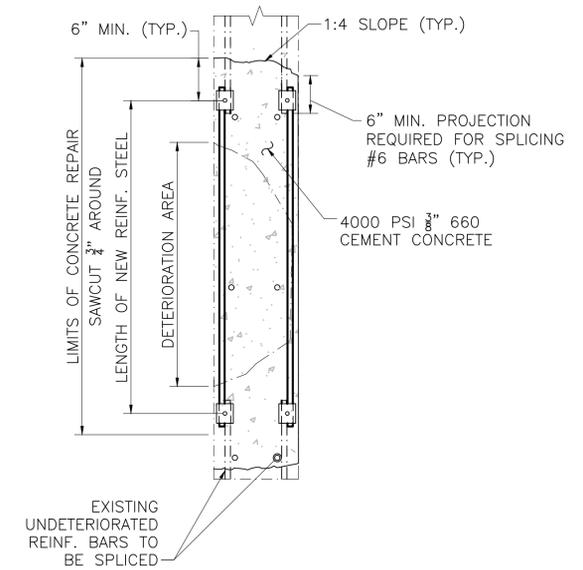
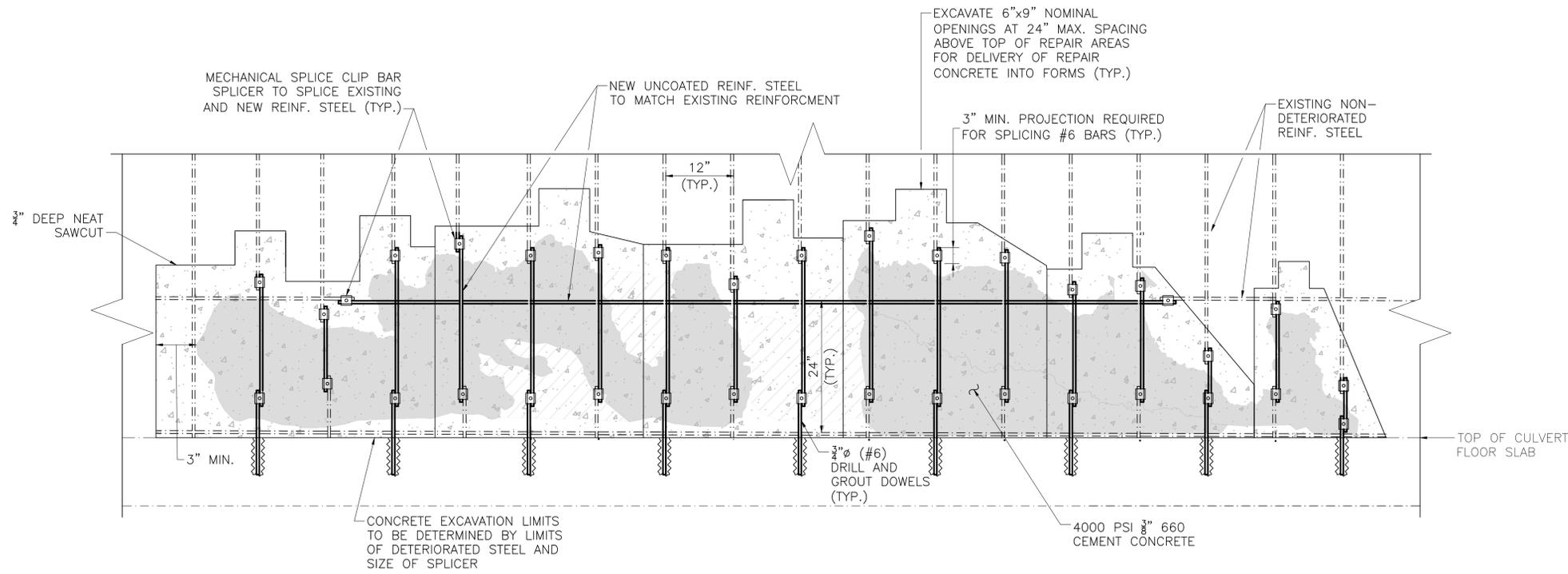


**WALL REPAIR FORM DETAIL**

SCALE:  $\frac{1}{2}$ " = 1'-0"

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**CULVERT PRESERVATION**  
TOWN OF CHARLEMONT  
CHARLEMONT C-05-032  
LAUREL LANE OVER LEGATE HILL BROOK TRIB.



FULL DEPTH REINFORCEMENT STEEL REPAIR SECTION

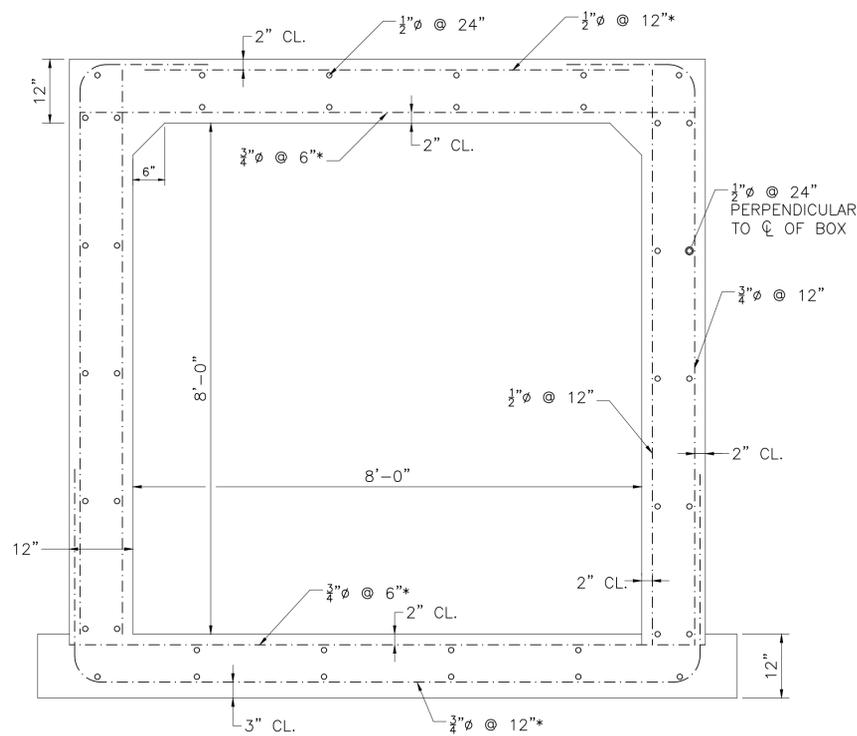
SCALE: 1" = 1'-0"

**NOTES:**

1. WHERE THE LENGTH OF FULL DEPTH REPAIRS EXTEND 6 FEET OR MORE ALONG THE LENGTH OF THE CULVERT, THE REPAIRS SHALL BE DIVIDED INTO SECTIONS NO MORE THAN 4 FEET IN LENGTH.
2. ALTERNATING SECTIONS SHALL BE EXCAVATED, FORMED AND REPAIRED AND THE CONCRETE SHALL CURE FOR 7 DAYS BEFORE ADJACENT SECTIONS ARE EXCAVATED AND REPAIRED.

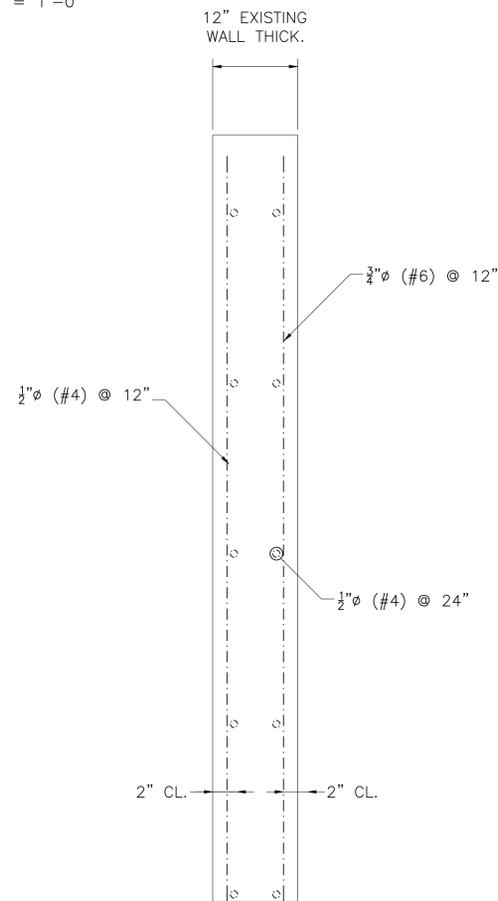
TYPICAL REPAIR ELEVATION

SCALE: 1" = 1'-0"



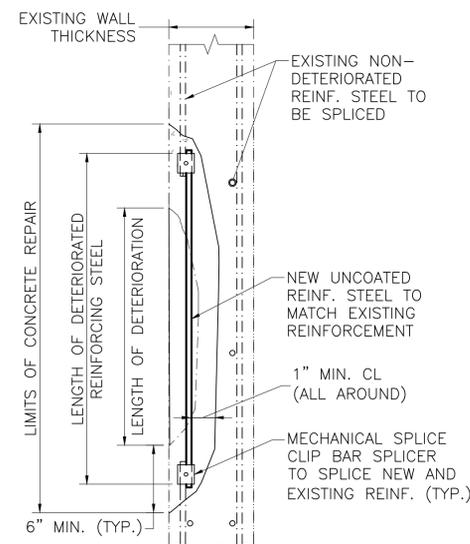
EXISTING CULVERT SQUARE SECTION

SCALE: 3/4" = 1'-0"



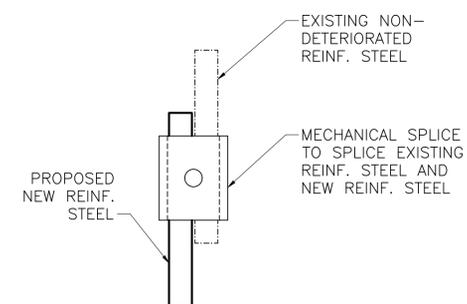
EXISTING WALL REINFORCEMENT

SCALE: 1" = 1'-0"



PARTIAL DEPTH REINFORCEMENT STEEL REPAIR SECTION

SCALE: 1" = 1'-0"



MECHANICAL SPLICE DETAIL

NOT TO SCALE

**REINFORCEMENT REPAIR NOTES:**

1. AFTER EXCAVATION IS COMPLETE ANY EXPOSED REINFORCING STEEL SHALL BE INSPECTED FOR DETERIORATION AND NEW UNCOATED STEEL REINFORCEMENT SHALL BE PLACED TO REPLACE EXISTING REINFORCEMENT THAT HAS A SECTION LOSS OF 25% OR MORE OF THE ORIGINAL CROSS SECTION AREA OR HAS BROKEN, AS DETERMINED BY THE ENGINEER. THE LIMITS OF THE REPAIR SHALL BE MODIFIED TO MEET THE REINFORCEMENT STEEL MECHANICAL SPLICE REQUIREMENTS. NEW REINFORCING STEEL SHALL BE MECHANICALLY CONNECTED TO REPLACE EXISTING DETERIORATED BAR SEGMENTS WITH THE SPLICERS LOCATED BEYOND THE LIMITS OF DETERIORATION.
2. ALL EXPOSED REINFORCING STEEL SHALL BE CLEANED BY MECHANICAL CLEANING AND HIGH PRESSURE WASHING WITH WATER THAT CONTAINS NO DETERGENTS OR BOND INHIBITING CHEMICALS. WHERE ACTIVE CORROSION HAS OCCURRED (THAT WHICH WOULD INHIBIT BONDING) SANDBLAST STEEL TO WHITE METAL FINISH.

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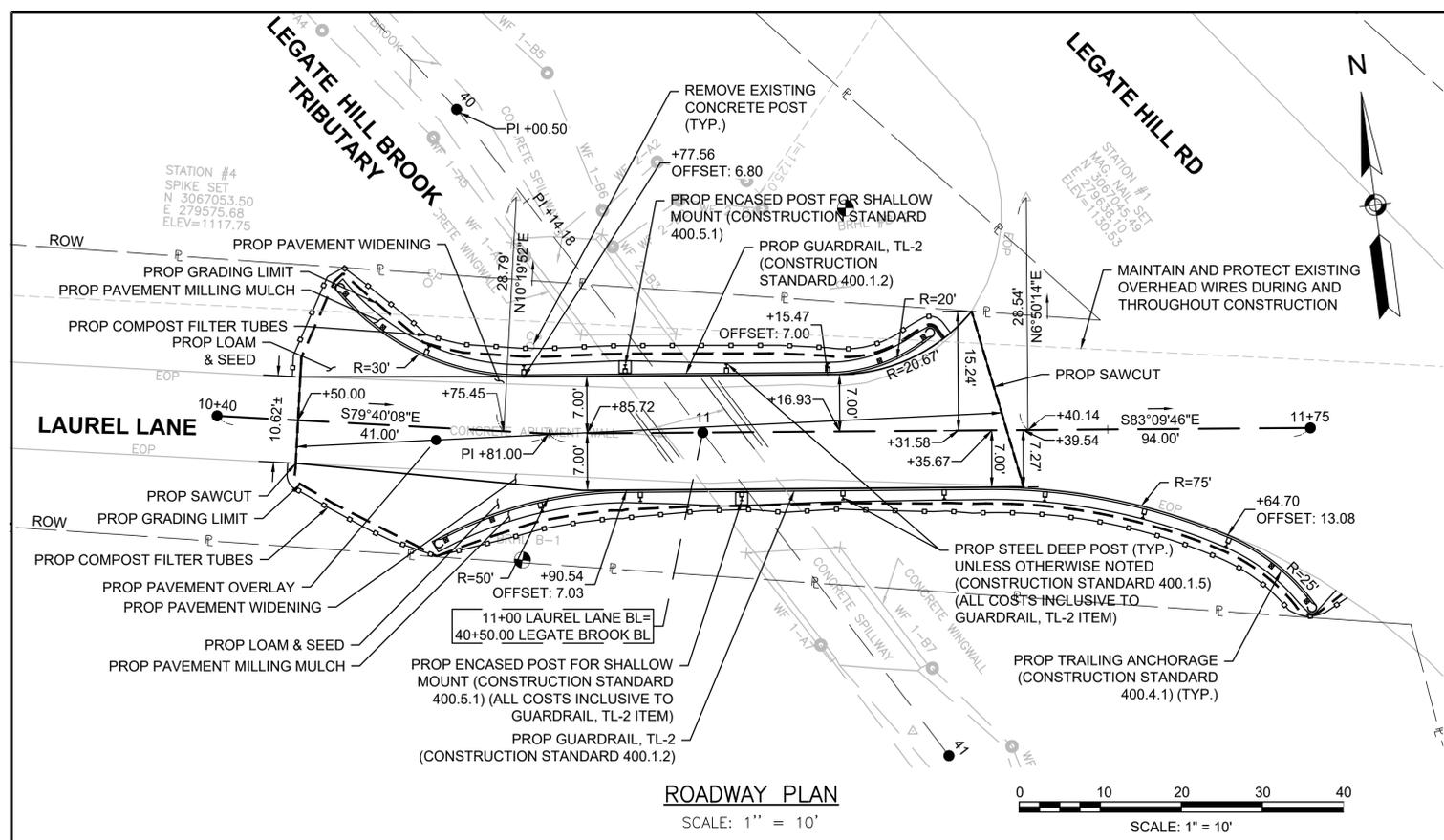
CULVERT PRESERVATION

TOWN OF CHARLEMONT

CHARLEMONT C-05-032

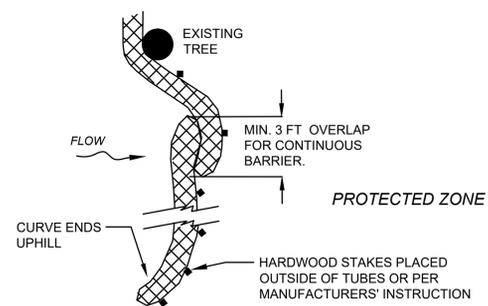
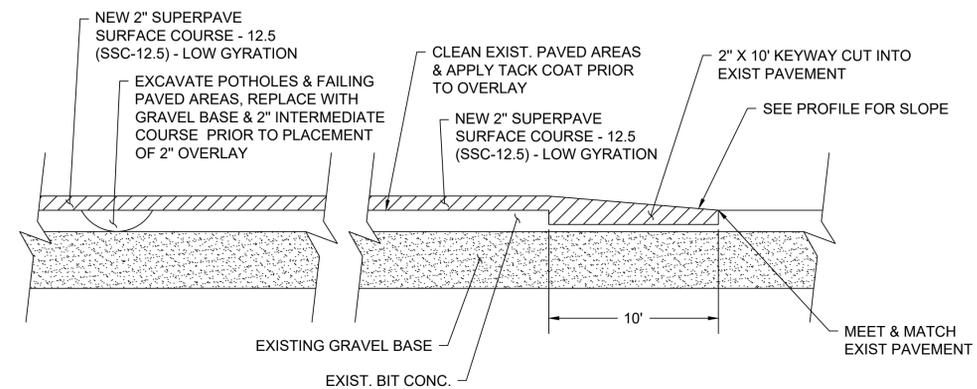
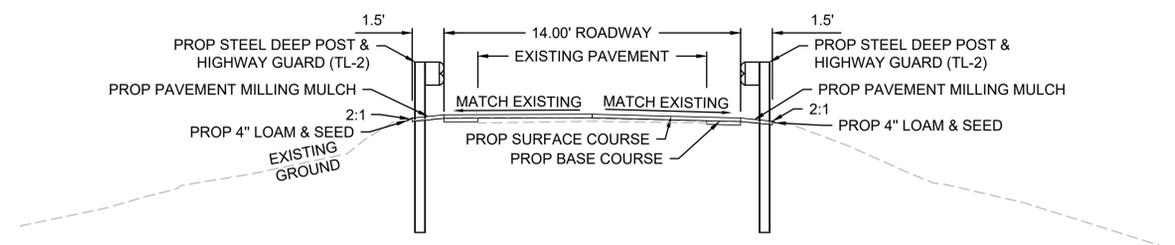
LAUREL LANE OVER LEGATE HILL BROOK TRIB.

STEEL REPAIR

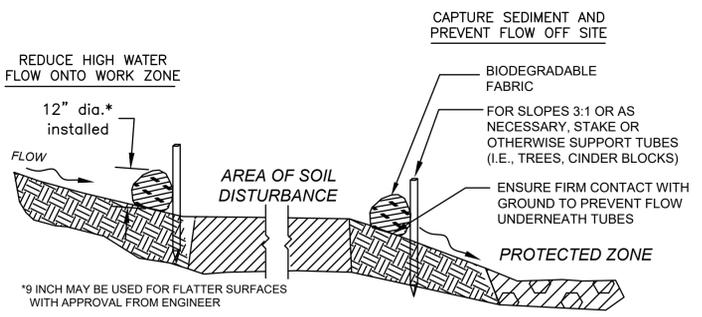


**PAVEMENT NOTES:**

- PROPOSED OVERLAY**  
SURFACE COURSE: 2.0" SUPERPAVE - 12.5 (SSC-12.5) - LOW GYRATION OVER EXISTING WITH EMULSION FOR TACK COAT
- PROPOSED WIDENING**  
SURFACE COURSE: 2.0" SUPERPAVE - 12.5 (SSC-12.5) - LOW GYRATION OVER EMULSION FOR TACK COAT  
INTERMEDIATE COURSE: 2.0" SUPERPAVE - 12.5 (SIC-12.5) - LOW GYRATION OVER EXISTING



PLACE TUBE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE, ALONG CONTOURS, AND PERPENDICULAR TO FLOW.  
ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.



**SEDIMENT BARRIER - COMPOST FILTER TUBE**  
NOT TO SCALE

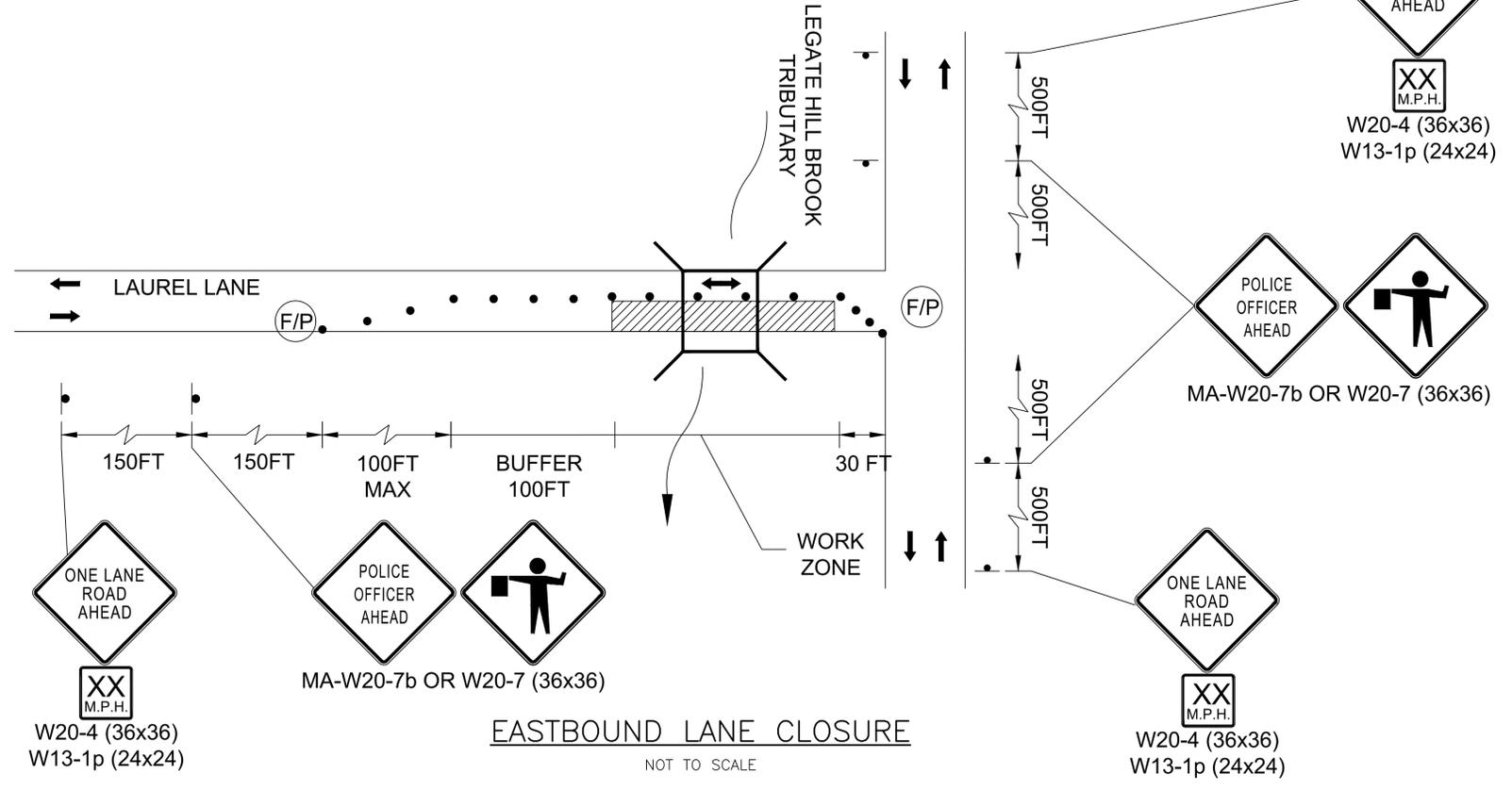
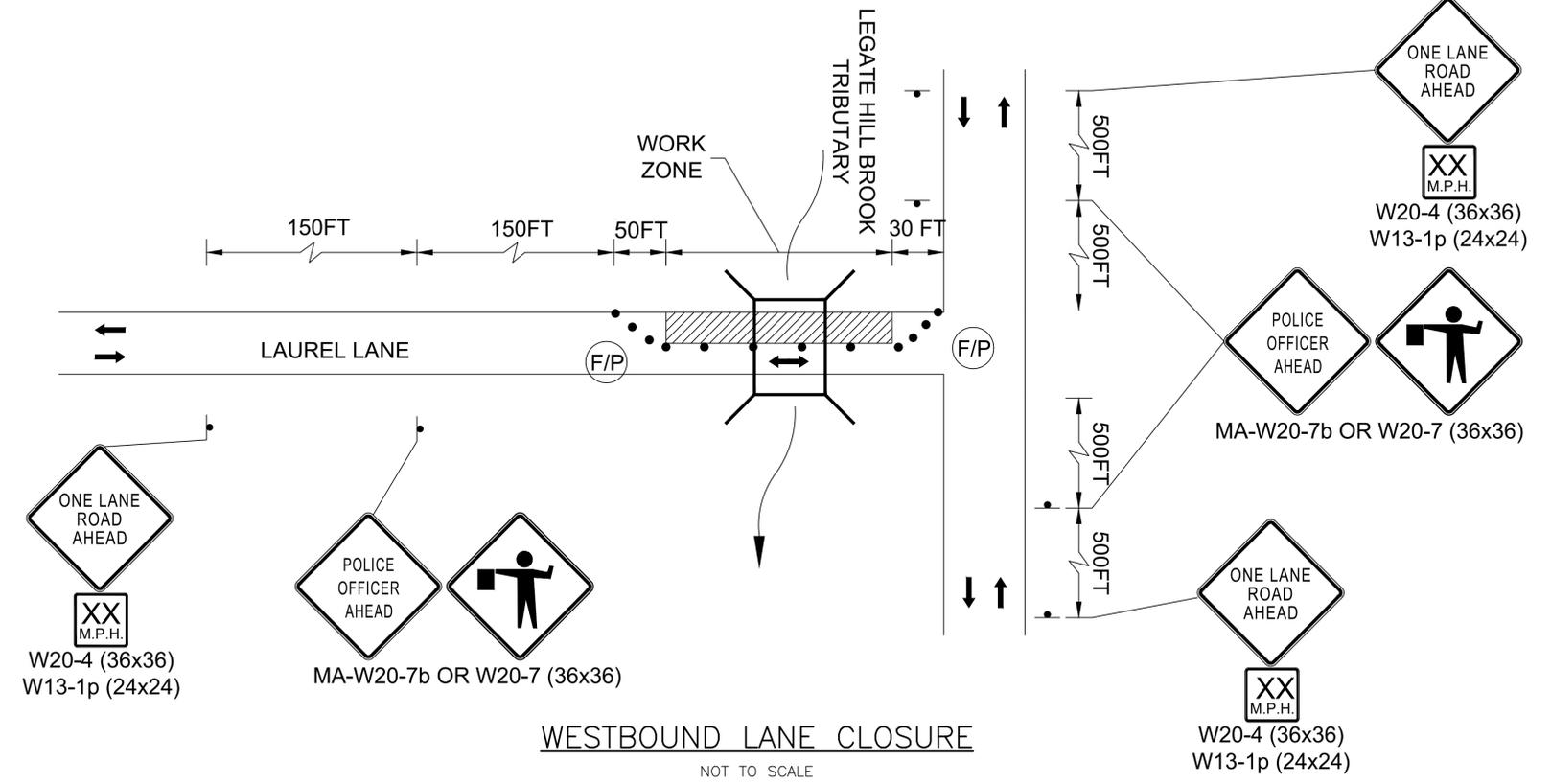
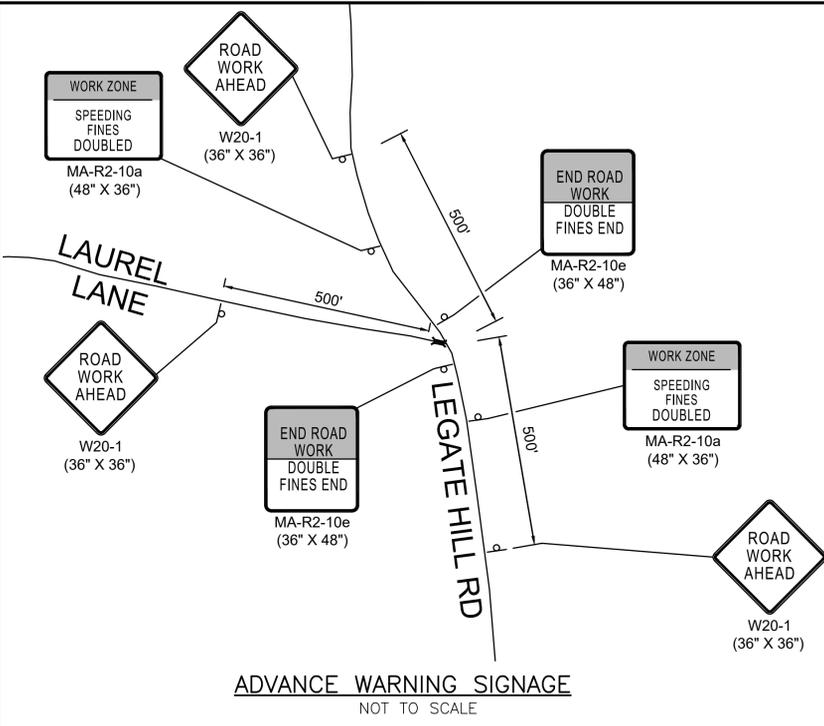
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**CULVERT PRESERVATION**  
TOWN OF CHARLEMONT  
CHARLEMONT C-05-032  
LAUREL LANE OVER LEGATE HILL BROOK TRIB.



**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. CONTRACTOR TO MAINTAIN ACCESS FOR LAUREL LANE ABUTTERS AND SHALL MOVE EQUIPMENT FOR ACCESS IF NECESSARY.
7. CONTRACTORS 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, GUARDRAIL INSTALLATION, CULVERT REPAIRS, AND SIMILAR OPERATIONS.
8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
9. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
10. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
11. MINIMUM LANE WIDTH IS TO BE 10 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.

**LEGEND** SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- (F/P) POLICE DETAIL OR ROADSIDE TRAFFIC FLAGGER
- ▨ WORK ZONE
- ➔ DIRECTION OF TRAFFIC
- SIGN

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781-355-7100  
781-355-7101 (FAX)

**GILL ENGINEERING**

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REGISTERED PROFESSIONAL ENGINEER

**CULVERT PRESERVATION**  
TOWN OF CHARLEMONT  
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**TEMPORARY TRAFFIC CONTROL PLAN**

SHEET 7 OF 8

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