

EROSION CONTROL NARRATIVE

DESCRIPTION OF PROJECT

THIS PROJECT INVOLVES THE RECONSTRUCTION OF A BRIDGE OVER THE DOWSVILLE BROOK. THE PROJECT IS ON VT ROUTE 100, A MINOR ARTERIAL, STATE ROUTE, IN THE TOWN OF DUXBURY. A NEW, SINGLE SPAN, INTEGRAL ABUTMENT, STEEL GIRDER BRIDGE WILL BE CONSTRUCTED ON THE EXISTING ALIGNMENT. A TEMPORARY DETOUR WILL BE CONSTRUCTED TO MAINTAIN TRAFFIC WHILE THE NEW BRIDGE IS UNDER CONSTRUCTION. TOTAL ROADWAY APPROACH WORK, INCLUDING BOTH APPROACHES, IS APPROXIMATELY 139.1 METERS. THE LIMITS OF CONSTRUCTION DO NOT APPROACH ANY BUILDING OR OTHER STRUCTURES. NO THREATENED & ENDANGERED SPECIES, WETLANDS, OR HISTORIC RESOURCES HAVE BEEN IDENTIFIED IN THE PROJECT AREA. THE SITE IS LOCATED UPON NAD 83/92 AT 192066.061N, 477279.311E.

IN THE NE QUADRANT OF THE PROJECT THERE IS A PRIVATE POND AND IN THE NW QUADRANT THERE IS A CLASS III WETLANDS.

IT IS ANTICIPATED THAT THIS PROJECT WILL LAST ONE CONSTRUCTION SEASON.

TOTAL DISTURBED AREA (EXCLUDING WASTE, BORROW AND STAGING AREAS): 0.34 ha (0.84 ac.)

SITE INVENTORY & ANALYSIS

OFF SITE DRAINAGE CHARACTERISTICS:

THE PROPERTY SURROUNDING THE PROJECT SITE CONSISTS OF WELL ESTABLISHED VEGETATION, MODERATE TO STEEPLY SLOPING, MIXED SOFTWOOD AND HARDWOOD FOREST. THE DRAINAGE WAYS ARE WELL DEFINED AND RUNOFF WATER ENTERING THE PROJECT SITE WILL BE PRIMARILY LIMITED TO THAT WHICH IS CONVEYED ALONG ROADWAY DITCHES, AND THAT WHICH FOLLOWS ROUTE 100 ALONG THE 5.24% GRADE AT THE BEGINNING OF THE PROJECT LIMITS. THE CURRENT DITCHES ARE NOT WELL DEFINED AND ARE NOT LINED WITH STONE.

DRAINAGE, WATERWAYS, BODIES OF WATER:

DOWSVILLE BROOK IS LOCATED IN THE PROJECT AREA. THE DOWSVILLE BROOK IS CHARACTERIZED AS A SMALL TO MEDIUM, STABLE, PERENIAL AND STRAIGHT RIVER WITH A STREAMBED OF COBBLES TO LARGE BOULDERS. THE AREA SURROUNDING DOWSVILLE BROOK IS CONSIDERED FORESTED, WITH HILLY TO MOUNTAINOUS TERRAIN. DOWSVILLE BROOK HAS A DRAINAGE AREA OF 18.62 SQUARE KILOMETERS (7.19 SQUARE MILES).

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:

THE TOPOGRAPHY OF THE PROJECT SITE IS MOUNTAINOUS AND WOODED WITH VT ROUTE 100 RUNNING PERPENDICULAR TO DOWSVILLE BROOK WHICH IS CONTAINED BY STEEP RIVER BANKS ALONG EACH SIDE. DEVELOPMENT ALONG VT ROUTE 100 CONSISTS OF THREE RESIDENCES THAT EXIST NEAR THE PROJECT LIMITS. THERE ARE NO OVERHEAD UTILITIES IN THE VICINITY OF THE PROJECT LIMITS.

VEGETATION:

A MIX OF HARDWOOD AND SOFTWOOD TREES OF ALL SIZES EXIST ALONG VT ROUTE 100. THE THREE RESIDENCES NEAR THE BRIDGE SITE HAVE SMALL AREAS OF LAWN AND LANDSCAPE PLANTINGS. NO AGRICULTURAL CROPS EXIST NEAR THE PROJECT. IMPACTS TO VEGETATION WILL BE LIMITED TO THAT WHICH ARE EFFECTED BY THE CONSTRUCTION OF THE NEW BRIDGE ALONG THE EXISTING ALIGNMENT AND THE TEMPORARY DETOUR. THE TEMPORARY DETOUR CUTS THROUGH THE ADJACENT WOODS, SO A SIGNIFICANT AMOUNT OF TREES WILL NEED TO BE REMOVED.

SOILS:

SOIL NAME	DEPTH	ERODABILITY	K-VALUE
GRANGE SILT LOAM	0"-65"	HIGHLY ERODABLE	0.43

GRANGE SOILS FORMED IN LOAMY OVER SANDY GLACIOFLUVIAL DEPOSITS ON TERRACES. THEY ARE VERY DEEP TO BEDROCK AND POORLY AND SOMEWHAT POORLY DRAINED. THESE SOILS HAVE A WATER TABLE AT DEPTHS OF 0 TO 455mm BELOW THE SURFACE FROM LATE FALL THROUGH LATE SPRING. PERMEABILITY IS MODERATE IN SOLUM AND MODERATELY RAPID TO PERMEABILITY IN THE SUBSTRATUM.

THE MAJORITY OF THIS PROJECT IS CONSIDERED TO BE "IN A FILL TYPICAL," MEANING THE ROADWAY IS HIGHER THAN THE SURROUNDING MEAN GROUND ELEVATION. DUE TO ENGINEERING REQUIREMENTS FOR SELECTIVE FILL MATERIAL DEPTHS, MUCH OF THIS FILL MATERIAL WILL NEED TO BE BROUGHT IN FROM AN OUTSIDE SOURCE. SINCE WE DO NOT KNOW WHERE THIS SOURCE PIT WILL BE, WE CAN NOT PROVIDE ITS ERODABILITY PROPERTIES.

SENSITIVE RESOURCE AREAS:

NO "THREATENED & ENDANGERED SPECIES" HAVE BEEN IDENTIFIED WITHIN THE PROJECT LIMITS AND THERE WILL BE NO ADVERSE EFFECT TO HISTORIC OR ARCHAEOLOGICAL FEATURES. SENSITIVE AREAS INCLUDE DOWSVILLE BROOK, A CLASS III WETLAND, AND A PRIVATE POND.

PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES:

DISTURBANCE OF SOILS NEAR NATURAL OR MAN-MADE WATERWAYS CONSISTS OF THAT WHICH IS NECESSARY TO CONSTRUCT TWO NEW INTEGRAL ABUTMENTS AND A TEMPORARY DETOUR. STABILIZATION OF DISTURBANCES TO STREAM BANKS WILL BE ACCOMPLISHED WITH STONE FILL, TYPE IV.

DESCRIPTION OF SLOPES:

THE EXISTING SHAPE OF THE PROJECT AREA CAN BE SEEN BY LOOKING AT THE "EXISTING EROSION CONTROL" SHEET, WHERE THE EXISTING CONTOURS ARE SHOWN. THE CONTOURS ARE SHOWN IN TWO LINE STYLES. THE MAJOR CONTOUR LINES ARE SOLID LINES (WITH ELEVATIONS) AT ONE METER INTERVALS, WHILE THE MINOR CONTOUR LINES ARE DASHED AND DEPICT THE HALF METER INTERVAL BETWEEN TWO MAJOR CONTOUR LINES.

EXISTING SLOPES:

GENERALLY SPEAKING THE PROJECT IMPACTS MODERATELY STEEP AND STEEP AREAS. BEGINNING AT THE PROPOSED BEGIN APPROACH THE WEST SIDE OF VT 100, THE SLOPES ARE VERY MODERATE FROM THE TURNAROUND AND WARD HILL ROAD TO THE BEGINNING OF THE PROPOSED ABUTMENT #1. AFTER DOWSVILLE BROOK THE SLOPES STEEPEN FOR 20m AND THEN FLATTEN OUT FOR THE REMAINDER OF THE PROJECT.

THE SLOPES ON THE EAST SIDE OF US#2 FROM THE BEGIN APPROACH TO PROPOSED STA. 0+210 ARE MODERATELY FLAT AND THE STEEPEN UNTIL DOWSVILLE BROOK. AFTER DOWSVILLE BROOK THE SLOPES ARE STILL RELATIVELY STEEP AND CONTINUE UNTIL THE PROPOSED END APPROACH.

PROPOSED SLOPES:

THE PROPOSED ROADWAY EMBANKMENTS WILL HAVE MODERATELY STEEP TO STEEP SLOPES. THE ROADWAY FILL SLOPES ON THE EAST SIDE OF VT 100 FROM STA. 0+210 TO DOWSVILLE BROOK ARE ALL A SLOPE OF 1-1.5 (67%). EMBANKMENTS WITH A SLOPE STEEPER THAN 1-2 (50%) REQUIRE GUARDRAIL AND ARE LINED WITH STONE. AFTER DOWSVILLE BROOK, THE EMBANKMENTS REMAIN AT 1-1.5 FOR SLOPE UNTIL STA. 0+310 SLOPES OF 1-2 (50%) AND 1-3 (33%) TO THE END OF THE APPROACH.

THE SLOPES ON THE WEST SIDE OF US#2 ARE GRADUAL FROM THE TURNAROUND AND WARD HILL ROAD FROM THE BEGINNING OF THE PROJECT TO STA. 0+239.54 WHICH HAS A SLOPE 1-4 (25%). A SLOPE OF 1-4 IS CONTINUED ONTO DOWSVILLE BROOK. AFTER DOWSVILLE BROOK THE SLOPE BECOMES 1-2 UNTIL THE END OF THE PROJECT STA 0+280. THE SLOPES AT 1-1.5 REQUIRE GUARDRAIL AND STONE LINING. THE SLOPE THEN FLATTENS OUT TO THE END OF THE APPROACH.

THE SLOPES ALONG CHANNEL BANKS ARE LINED WITH HEAVY STONE AND ARE AT 1-1.5 (67%).

TEMPORARY EROSION PREVENTION & SEDIMENT CONTROL

TEMPORARY EROSION PREVENTION MEASURES TO BE UTILIZED INCLUDE:

"PROJECT DEMARCATION FENCING," DENOTED -PDF- ON THE PLANS, TO DELINEATE THE LIMITS THE CONTRACTOR CAN ACCESS WITH CONSTRUCTION EQUIPMENT. THIS MEASURE LIMITS THE AREA THAT CAN BE DISTURBED.

SEEDING, MULCHING AND BIODEGRADABLE EROSION CONTROL MATTING, OR AN EQUIVALENT PRODUCT, WILL BE UTILIZED ON ALL SLOPES STEEPER THAN 3:1 THAT ARE NOT LINED WITH STONE FILL. AREAS AT STATIONS 1+125 - 1+135 RT AND 1+147 - 1+160 LT WILL REQUIRE THIS TECHNIQUE. THESE SLOPES SHALL BE STABILIZED WITHIN 48 HOURS OF REACHING FINAL GRADE OR DURING INTERMITTENT PHASES OF CONSTRUCTION ACTIVITY.

TRACKING OF ALL EXPOSED SLOPES, COMBINED WITH TEMPORARY MULCHING, WILL ALSO BE UTILIZED ON A REGULAR BASIS. ANY SLOPES TO BE EXPOSED FOR SEVERAL DAYS PRIOR TO FINAL GRADING SHALL BE TRACKED AND MULCHED. THE FORECAST OF RAINFALL EVENTS SHALL ALSO TRIGGER PROTECTION OF EXPOSED SLOPES.

TEMPORARY STONE CHECK DAMS WILL BE PLACED IN DITCHES TO REDUCE FLOW VELOCITIES AND THUS REDUCE THE POTENTIAL FOR EROSION. CHECK DAMS WILL BE PLACED ALONG THE DITCHES SUCH THAT THE ELEVATION OF THE TOP OF EACH CHECK DAM CORRESPONDS WITH THE ELEVATION OF THE TOE OF THE PRECEDING UPSLOPE CHECK DAM. SEE 'EROSION CONTROLS DETAILS' SHEET. THE CHECK DAMS MAY BE REMOVED ONCE THE STONE LINING OF THE DITCHES IS COMPLETE AND THE SURROUNDING AREA STABILIZED.

TEMPORARY MEASURES TO CONTROL SEDIMENT TRANSPORT INCLUDE:

SILT FENCE WILL BE PLACED ALONG THE CONTOUR WITH ENDS TURNED SLIGHTLY UPHILL TO CREATE A PONDING EFFECT SHOULD WATER TRY TO RUN ALONG THE FENCING AND AROUND THE ENDS. THE MAXIMUM SLOPE LENGTH BETWEEN SEPARATE RUNS OF SILT FENCE IS 30 000 (100'). SILT FENCE SHALL BE INSTALLED PRIOR TO ANY UPSLOPE EARTHWORK.

INLET PROTECTION WILL BE UTILIZED AROUND DROP INLETS TO CREATE A TEMPORARY PONDING AREA FOR PARTICLES TO SETTLE OUT AS WATER DRAINS THROUGH THE BARRIER. INLET PROTECTION SHALL BE INSTALLED AS SOON AS THERE IS THE POSSIBILITY OF WATER FLOWING TO THE STRUCTURE. THE HEIGHT OF THE BARRIER SHALL BE LIMITED SUCH THAT THE PONDING AREA DOES NOT PRESENT A HAZARD TO THE TRAVELING PUBLIC. ALTERNATIVE INLET CONTROL MEASURES SHALL BE APPROVED BY THE ENGINEER AND ON-SITE COORDINATOR PRIOR TO IMPLEMENTATION.

ALL EROSION CONTROL MEASURES THAT TRAP SEDIMENT SUCH AS TEMPORARY STONE CHECK DAMS, SILT FENCE, SEDIMENT BASINS, AND INLET PROTECTION SHALL BE CHECKED REGULARLY FOR ACCUMULATION OF SEDIMENT. SEDIMENT BUILD-UP SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT REACHES ONE-HALF THE HEIGHT OF THE CONTROL MEASURE. SEDIMENTS SHALL BE DISPOSED OF IN AN APPROVED AREA SUCH THAT THEY WILL NOT BE SUBJECT TO EROSION.

STABILIZED CONSTRUCTION ENTRANCES TO THE PROJECT SITE, STAGING AREAS, AS WELL AS TO WASTE AND BORROW AREAS SHALL BE ESTABLISHED. COARSE STONE FILL OVER THE FILTER FABRIC SHOULD BE UTILIZED WHERE AN ALL READY ESTABLISHED STABLE ENTRANCE DOES NOT EXIST. THE CRUSHED STONE PRODUCT USED FOR THE CONSTRUCTION OF THE STABILIZED ENTRANCES SHALL BE MONITORED FOR SEDIMENT ACCUMULATION AND REPLACED AS NECESSARY AS DIRECTED BY THE RESIDENT ENGINEER. THE MINIMUM SIZE OF A STABILIZED CONSTRUCTION ENTRANCE IS 3700 x 15 000 (12' x 50'). ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARDS A CONSTRUCTION ENTRANCE SHALL BE PIPED UNDER THE STONE. PIPES SHALL BE APPROPRIATELY SIZED FOR THE CONTRIBUTING AREA, HOWEVER, NO PIPES SMALLER THAN 150mm DIAMETER SHALL BE USED. SEE TYPICAL DETAIL ON 'EROSION AND SEDIMENT CONTROL PLAN' SHEET FOR MATERIALS AND CONSTRUCTION METHOD TO BE UTILIZED WHEN CONSTRUCTING A STABILIZED ENTRANCE.

AFTER THE CLEARING OF TREES AND SHRUBS, BUT PRIOR TO ANY GRUBBING AND EXCAVATION, CONSTRUCT PERIMETER CONTROLS TO ENSURE THAT ANY DISTURBED SEDIMENT DOES NOT LEAVE THE SITE. SEDIMENT TRAPS/BASINS, WHERE WATER HAS BEEN ADEQUATELY TREATED, MAY BE DIRECTED TO NEARBY UNDISTURBED STREAMS OR SWALES.

INSTALL PERIMETER SILT FENCE IN AREAS OF PROPOSED WORK AS SHOWN ON THE PLANS PRIOR TO GRUBBING AND FILLING ACTIVITIES. IN AREAS OF HIGH EXPOSURE, IT MAY BE NECESSARY TO DOUBLE UP PROTECTION WITH ADDITIONAL SILT FENCING. IN AREAS OF EXPOSED LEDGE, STONE CHECK DAMS WILL BE UTILIZED.

DURING GRUBBING OPERATIONS, STONE CHECK DAM BARRIERS SHALL BE INSTALLED AT ANY OBVIOUS CONCENTRATED FLOW DISCHARGE POINTS, OR AS DIRECTED BY THE RESIDENT ENGINEER AND ON-SITE COORDINATOR.

ALL AREAS OF EXPOSED SOILS AFTER THE GRUBBING ACTIVITY SHALL BE TEMPORARILY STABILIZED WITH MULCHING AND SEEDING, EROSION MATTING, OR STRAW MATTING AS SOON AS PRACTICABLE AND BEFORE ANY PREDICTED RAINFALL EVENT. THESE TEMPORARY EROSION MEASURES CAN BE PLACED IN ANY COMBINATION IN AREAS OF POTENTIAL EROSION AS DEEMED NECESSARY BY THE RESIDENT ENGINEER AND ON-SITE COORDINATOR.

AFTER PERIMETER CONTROLS ARE IN PLACE, AND PRIOR TO GRADING OPERATIONS, CONSTRUCT TEMPORARY ONSITE SEDIMENT TRAPS WHERE NECESSARY. GRADE DISTURBED AREAS TO DRAIN TOWARDS SEDIMENT TRAP WHERE POSSIBLE.

ANY MATERIAL STOCKPILES, INCLUDING BUT NOT LIMITED TO, GRUBBING MATERIAL, SAND BORROW, EARTH BORROW, GRANULAR BORROW, TOPSOIL, AND ANY EXCAVATED WASTE PILES SHALL BE MULCHED AND SHALL ALSO HAVE SILT FENCE INSTALLED AROUND THE BASE OF THE STOCKPILE. REMOVAL OF THE SILT FENCES AROUND THE WASTE AREAS AND STOCKPILES SHALL BE PERFORMED ONLY AFTER THE APPROVAL OF THE RESIDENT ENGINEER AND ON-SITE COORDINATOR.

STONE FILL FOR CHANNEL AND SLOPE STABILIZATION AT THE OUTLET END OF CULVERTS IS TO BE PLACED PRIOR TO INSTALLATION OF CULVERTS. ALL WORK ON NEW CULVERTS SHOULD PROCEED FROM THE OUTLET TOWARDS THE INLET. SILT FENCE AND/OR CRUSHED STONE CHECK DAMS ARE TO BE INSTALLED ON UNDISTURBED GROUND AND DOWNSTREAM OF THE STONE FILL PADS AT OUTLETS. STONE FILL FOR DITCH STABILIZATION SHALL BE PLACED DURING THE SAME WORKING DAY THAT THE DITCH EXCAVATION WAS PERFORMED, UNLESS DIRECTED OTHERWISE BY THE RESIDENT ENGINEER AND ON-SITE COORDINATOR.

ON ANY PARTIALLY COMPLETED TEMPORARY OR PERMANENT CUT AND FILL SLOPES, ALL EXPOSED SOILS WILL BE STABILIZED WITH STRAW MATTING OR SEEDED AND MULCHED. IN AREAS OF CONCENTRATED RUNOFF ABOVE NEWLY CONSTRUCTED FILL SLOPES, FLEXIBLE SLOPE PIPES OR OTHER APPROVED DIVERSION METHODS WILL BE USED TO TRANSPORT RUNOFF DOWN THE FILL SLOPES TO SEDIMENT TRAPS OR SETTLING BASINS.

ANY NEW FILL SLOPES THAT ARE DESIGNED WITH STONE FILL BLANKETS FOR SLOPE STABILIZATION SHALL BE CONSTRUCTED WITH THE STONE FILL BEING PLACED AS THE FILL SLOPE EMBANKMENT CONSTRUCTION PROGRESSES.

THE SUBBASE MATERIAL SHOULD BE PLACED AS SOON AS THE SUBGRADE HAS REACHED ITS FINAL GRADE AND SLOPE. THE TEMPORARY TRAVELING SURFACE WILL BE GRADED TO PROMOTE SHEET FLOW OFF THE SURFACE ONTO SLOPES.

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