

4.0.6 EMBANKMENT REQUIREMENTS

THE FOLLOWING EMBANKMENT SPECIFICATIONS APPLY TO ALL Bmps WITH EMBANKMENTS THAT ARE DESIGNED TO HOLD WATER, EVEN IF THE EMBANKMENT IS DESIGNED TO HOLD WATER ONLY DURING A STORM EVENT.

4.0.6.1 EMBANKMENT FILL MATERIALS

THE FOLLOWING PARAMETERS APPLY TO MATERIALS USED TO CONSTRUCT EMBANKMENTS:

- BORROW MATERIAL SHALL BE CLASSIFIED AS ML, MH, SC, SM, CL OR CH SOILS ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487) OR ANY MIXTURE OF THESE SOILS.
- BORROW MATERIALS SHALL HAVE A LIQUID LIMIT (LL) BETWEEN 40 AND 60 AND A PLASTICITY INDEX (PI) BETWEEN 15 AND 30 (ASTM D4318).
- MATERIALS SHALL BE FREE OF TOPSOIL, ORGANIC MATERIAL, ROOTS, STUMPS, BRUSH, ROCKS LARGER THAN 3 INCHES, SUBSOIL, DEBRIS, VEGETATION, AND OTHER FOREIGN MATTER.
- ALL MATERIAL CLODS WILL BE BROKEN DOWN WITH TILERS AND/OR DISCS TO PROVIDE A HOMOGENEOUS SOIL THAT IS FREE OF CLAY CLODS GREATER THAN 3 INCHES IN DIAMETER.

4.0.6.2 EMBANKMENT CONSTRUCTION

THE FOLLOWING STEPS APPLY TO CONSTRUCTION OF AN EMBANKMENT:

- STEP 1: SUBGRADE PREPARATION**
- COMPACT SUBGRADE TO DENSITY REQUIREMENTS FOR SUBSEQUENT FILL MATERIALS.
 - CUT OUT SOFT AREAS OF SUBGRADE NOT CAPABLE OF COMPACTION IN PLACE.
 - SCARIFY SUBGRADE SURFACE TO DEPTH OF 6 INCHES.
 - PROOF ROLL SUBGRADE TO IDENTIFY SOFT SPOTS, FILL AND COMPACT TO DENSITY EQUAL TO OR GREATER THAN REQUIREMENTS FOR SUBSEQUENT FILL MATERIAL.
- STEP 2: SEEPAGE KEY PLACEMENT**
- SEEPAGE KEY TRENCH WILL BE LOCATED BETWEEN EMBANKMENT ABUTMENTS.
 - SEEPAGE KEY SHALL EXTEND TO A MINIMUM DEPTH OF 4 FEET OR AS REQUIRED THROUGH GEOTECHNICAL SEEPAGE ANALYSIS. A MINIMUM BOTTOM TRENCH WIDTH SHALL BE 10 FEET AND THE TRENCH SIDEWALLS SHALL BE SLOPED OR BENCHED TO PROMOTE STABILITY AND BONDING BETWEEN THE SIDEWALL SOILS AND SEEPAGE KEY FILL.

- STEP 3: EMBANKMENT FILL PLACEMENT**
- EMBANKMENT FILL SHALL BE CONSTRUCTED AT 3(HORIZONTAL):1(VERTICAL) OR AS SHOWN ON THE DRAWINGS. DEMONSTRATION OF APPROPRIATE SAFETY FACTORS AGAINST FAILURE THROUGH GEOTECHNICAL ANALYSIS SHALL BE REQUIRED FOR SLOPES STEEPER THAN 3(HORIZONTAL):1(VERTICAL).
 - FILL SOILS SHALL BE PLACED IN LOOSE LIFTS NOT TO EXCEED 8 INCHES IN THICKNESS AND BE COMPACTED TO A MINIMUM OF 95 PERCENT OF THE SOILS STANDARD PROCTOR (ASTM D698) MAXIMUM DRY DENSITY, OR AS SPECIFIED ON THE DRAWINGS.
 - COMPACTED MOISTURE CONTENT SHALL BE BETWEEN 3 PERCENT BELOW AND 3 PERCENT ABOVE THE OPTIMUM MOISTURE CONTENT FOR ALL FILL PLACED, OR AS OTHERWISE APPROVED BY ENGINEER.
 - FILL SOILS SHOULD BE PLACED IN CONTINUOUS, HORIZONTAL LAYERS FROM ABUTMENT TO ABUTMENT. EXISTING SLOPES GREATER THAN 4(HORIZONTAL):1(VERTICAL) SHALL BE BENCHED TO PROMOTE BONDING OF NEWLY PLACED FILL WITH EXISTING SOILS. BENCHING SHALL BE PERFORMED AT MAXIMUM OF 2 FEET VERTICAL INTERVALS AND SHALL EXTEND A MINIMUM OF 4 FEET HORIZONTALLY OR AS SPECIFIED ON DRAWINGS.
 - WITHIN THE UPPER 12 INCHES OF EMBANKMENT, FILL SOILS SHOULD BE COMPACTED TO 100% OF ITS STANDARD PROCTOR (ASTM D698) MAXIMUM DRY DENSITY.
 - FILL AGAINST SUPPORTED STRUCTURES. DO NOT FILL AGAINST UNSUPPORTED STRUCTURES.
 - PLACE FILL SIMULTANEOUSLY ON EACH SIDE OF UNSUPPORTED STRUCTURES UNTIL SUPPORTS ARE IN PLACE.
 - PLACE A MINIMUM OF SIX INCHES OF TOPSOIL ACROSS DAM EMBANKMENT TO PROMOTE VEGETATIVE GROWTH.

- STEP 4: OUTLET PIPE FILL PLACEMENT**
- FILL OF THE CULVERTS SHALL BE PLACED AND COMPACTED IN 6-INCH THICK LOOSE LIFTS AROUND THE DROP INLETS AND UP TO 2 FEET ABOVE THE CULVERTS.
 - COMPACTION SHALL BE PERFORMED BY HAND TAMPERS OR SMALL HAND OPERATED COMPACTORS.
 - COMPACTION SHALL BE AT A MINIMUM 95 PERCENT OF THE STANDARD PROCTOR (ASTM D698) MAXIMUM DRY DENSITY. COMPACTED MOISTURE CONTENT SHALL BE BETWEEN 3 PERCENT BELOW AND 3 PERCENT ABOVE THE OPTIMUM MOISTURE CONTENT FOR ALL FILL PLACED, OR AS OTHERWISE APPROVED BY ENGINEER.
 - ADDITIONAL COMPACTION OF LIFTS 2 FEET OR GREATER ABOVE CULVERTS SHALL CONFORM TO THE EMBANKMENT FILL PLACEMENT SECTION OF THIS SPECIFICATION.

- STEP 5: FIELD QUALITY CONTROL**
- LABORATORY TESTING
 - PERFORM LABORATORY MATERIAL TESTS IN ACCORDANCE WITH ASTM D422, ASTM D698, ASTM D2216, AND ASTM D4318.
 - TEST AT A FREQUENCY OF EVERY 500 CUBIC YARDS OF EMBANKMENT FILL MATERIAL PLACED, WHEN MATERIALS USING FOR EMBANKMENT FILL CHANGE, AND/OR AS DIRECTED BY THE ENGINEER.
 - SAMPLE SIZE SHALL BE 50 LB.
 - IN PLACE COMPACTION AND NATURAL MOISTURE CONTENT TESTS
 - PERFORM IN PLACE COMPACTION TESTS IN ACCORDANCE WITH ASTM D1556, ASTM D2922, OR ASTM D2937 AND NATURAL MOISTURE CONTENT TEST IN ACCORDANCE WITH ASTM D2216.
 - FREQUENCY OF COMPACTION/NATURAL MOISTURE CONTENT TESTS
 - EMBANKMENT FILL: EACH LIFT AT A MINIMUM FREQUENCY OF 1 PER 2,500 SQ. FT.
 - PIPE INSTALLATION: EACH LIFT AT A MINIMUM FREQUENCY OF 1 PER 30 LF OF PIPE.
 - WHEN TESTS INDICATE WORK DOES NOT MEET SPECIFIED REQUIREMENTS, REMOVE WORK, REPLACE AND RETEST.

TEMPORARY EROSION CONTROL SEEDBED PREPARATION

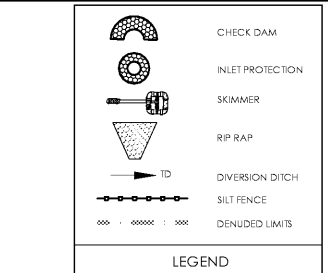
- SURFACE WATER CONTROL MEASURES TO BE INSTALLED ACCORDING TO PLAN. AREAS TO BE SEEDBED SHALL BE RIPPED AND SPREAD WITH AVAILABLE TOPSOIL 3" DEEP TOTAL SEEDBED PREPARED DEPTH SHALL BE 4" TO 6" DEEP.
- LOOSE ROCKS, ROOTS, AND OTHER OBSTRUCTIONS SHALL BE REMOVED FROM THE SURFACE SO THAT THEY WILL NOT INTERFERE WITH ESTABLISHMENT AND MAINTENANCE OF VEGETATION. SURFACE FOR FINAL SEEDBED PREPARATION, AT FINISH GRADES SHOWN, SHALL BE REASONABLY SMOOTH AND UNIFORM.
- IF NO SOIL TEST IS TAKEN, FERTILIZER AND LIME TO BE ACCORDING TO SEEDING SPECIFICATIONS SHOWN. IN ADDITION, PROVIDE 15 LBS./1000 SQ. FT. OF SUPERPHOSPHATE.
- IF SOIL TEST IS TAKEN, PROVIDE LIME AND FERTILIZER ACCORDING TO SOIL TEST REPORT.
- LIME & FERTILIZER SHALL BE APPLIED UNIFORMLY & MIXED WITH THE SOIL DURING SEEDBED PREPARATION.
- GRADED SLOPES AND FILL: THE ANGLE FOR GRADED SLOPES AND FILL SHALL BE NO GREATER THAN THE ANGLE WHICH CAN BE RETAINED BY VEGETATIVE COVER OR OTHER ADEQUATE EROSION CONTROL DEVICES OR STRUCTURES. IN ANY EVENT, SLOPES LEFT EXPOSED SHALL, WITHIN 14 WORKING DAYS OF COMPLETION OF ANY PHASE OF GRADING, BE PLANTED OR OTHERWISE PROVIDED WITH GROUND COVER, DEVICES, OR STRUCTURES SUFFICIENT TO RESTRAIN EROSION CONTROL.
- GROUND COVER: WHENEVER LAND-DISTURBING ACTIVITY IS UNDERTAKEN ON A TRACT COMPRISING MORE THAN ONE ACRE, IF MORE THAN ONE CONTIGUOUS ACRES IS UNCOVERED A GROUND COVER SUFFICIENT TO RESTRAIN EROSION MUST BE PLANTED OR OTHERWISE PROVIDED WITHIN 14 WORKING DAYS ON THAT PORTION OF THE TRACT UPON WHICH FURTHER ACTIVE CONSTRUCTION IS NOT BEING UNDERTAKEN.
- ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED DEPENDING ON FIELD CONDITIONS.
- MULCH TO BE TACKED WITH ASPHALT EMULSION OR MECHANICALLY TIED DOWN WITHIN ONE DAY AFTER MULCH IS SPREAD.
- CONTRACTOR SHALL ESTABLISH AND MAINTAIN A GOOD STAND OF GRASS UNTIL PROJECT IS COMPLETED.

ENHANCED EROSION CONTROL NOTES

- SURFACE WATER DRAW DOWN DEVICES (RISERS OR SKIMMERS) SHALL BE INSTALLED IN ALL SEDIMENT BASINS. FOREBAYS SHALL BE USED IN CONJUNCTION WITH ALL SEDIMENT BASINS. ROCK FOREBAY EMBANKMENTS MAY BE USED IN LIEU OF POROUS BARRIERS.
- POLYACRYLAMIDES (PAM) SHALL BE USED TO REDUCE TURBIDITY AND SUSPENDED SOLIDS WHENEVER A SEDIMENT TRAP, BASIN, PIT, HOLE, OR BUILDING FOUNDATION IS BEING PUMPED OUT TO REMOVE SEDIMENT LADEN WATER. PAM IS NOT REQUIRED WHEN ANY OF THE ABOVE IS BEING PUMPED TO AN APPROVED SEDIMENT BASIN ON SITE. THIS ACTIVITY MUST BE INSPECTED AND APPROVED BY THE MCKENNA COUNTY EROSION CONTROL INSPECTOR.
- DOUBLE SILT FENCE SHALL BE USED ALONG WETLANDS, STREAMS, LAKES OR OTHER SURFACE WATER BODIES AS WELL AS ADJACENT TO ALL S.W.H.A. OR OTHER WATER QUALITY BUFFERS. HIGH HAZARD SILT FENCE WITH WIRE BACKING AND WASHED STONE WILL BE INSTALLED AS DETERMINED NECESSARY BY THE COUNTY ENGINEER OR FIELD INSPECTOR.
- THE AMOUNT OF UNCOVERED AREA AT ANY ONE TIME SHALL BE LIMITED TO NO MORE THAN 20 ACRES, UNLESS APPROVED BY THE COUNTY ENGINEERING.
- A 10-FOOT UNDISTURBED BUFFER SHALL BE PROVIDED AROUND THE OUTSIDE EDGE OF DRAINAGE FEATURES SUCH AS INTERMITTENT AND PERENNIAL STREAMS, PONDS, AND WETLANDS. INCIDENTAL DRAINAGE IMPROVEMENTS OR REPAIRS WILL BE PERMITTED WITHIN THE BUFFER AS APPROVED BY COUNTY STAFF.
- INSTALLATION OF TEMPORARY GROUND COVER OR SEEDING MUST BE PERFORMED WITHIN FIVE (5) WORKING DAYS OR SLOPE DRAINS INSTALLED AFTER FILL SLOPES ARE BROUGHT UP TO HEIGHT.
- PERMANENT TERRACES SHALL BE INSTALLED ON 2:1 OR STEEPER SLOPES OVER 19 FEET IN HEIGHT TO REDUCE RUNOFF VELOCITY COMING DOWN THE SLOPES.

CONSTRUCTION SEQUENCE NOTES:

- SCHEDULE PRE-CONSTRUCTION MEETING AND OBTAIN PRELIMINARY GRADING PERMIT FROM CITY OF BELMONT.
- INSTALL STABILIZED CONSTRUCTION ENTRANCES/EXIST.
- CLEAR & GRUB ONLY THE AREAS REQUIRED FOR INSTALLATION OF PERIMETER CONTROLS.
- CONSTRUCT ALL TEMPORARY SILT FENCE AND SKIMMER SEDIMENT BASIN AS SHOWN.
- INSTALL & STABILIZE (OR UTILIZE OTHER EROSION CONTROL MEASURES, EG ROCK FILTER RINGS OR STRUCTURE FILTERS, TO AVOID EROSION RUNOFF) THE DIVERSION DITCHES. INSPECTION & APPROVAL REQUIRED PRIOR TO ADDITIONAL LAND DISTURBANCE ACTIVITIES.
- CLEAR, GRUB AND GRADE SITE.
- MAINTAIN POSITIVE DRAINAGE AS FILL IS ADDED.
- PREP ALL DISTURBED AREAS FOR SEEDING.
- SEED, FERTILIZE AND STRAW ALL DISTURBED AREAS, IN ACCORDANCE WITH THE SEEDING SCHEDULE PROVIDED ON SHEET XXX.
- SILT FENCE SHALL REMAIN IN PLACE UNTIL ALL AREAS DRAINING TO THEM ARE BUILT OUT AND PERMANENTLY STABILIZED UNLESS OTHERWISE APPROVED BY THE COUNTY INSPECTOR.
- BMP WILL REMAIN IN SKIMMER BASIN CONFIGURATION UNTIL SITE STABILIZATION. AFTER SITE IS STABILIZED SKIMMERS ARE TO BE REMOVED. PROPER FILTER QUALITY OFFICE INSTALLED AND BMP TO BE CONVERTED TO FINAL SAND FILTER CONFIGURATION.



IF ANY CONFLICTS, DISCREPANCIES, OR OTHER UNSATISFACTORY CONDITIONS ARE ENCOUNTERED, EITHER ON THE CONSTRUCTION DOCUMENTS OR IN THE FIELD, THE CONTRACTOR MUST NOTIFY THE ENGINEER IMMEDIATELY AND SHALL NOT COMMENCE OR CONTINUE WORK IN THE CONFLICTING AREAS UNTIL THE CONFLICTING CONDITIONS ARE RESOLVED.

ANY ADDITIONAL TEMPORARY CURBS NOT LOCATED BY SURVEY OR THE CONFLICTING PROPOSED PAVEMENT & CURB AND STABILIZATION SHALL BE REMOVED.

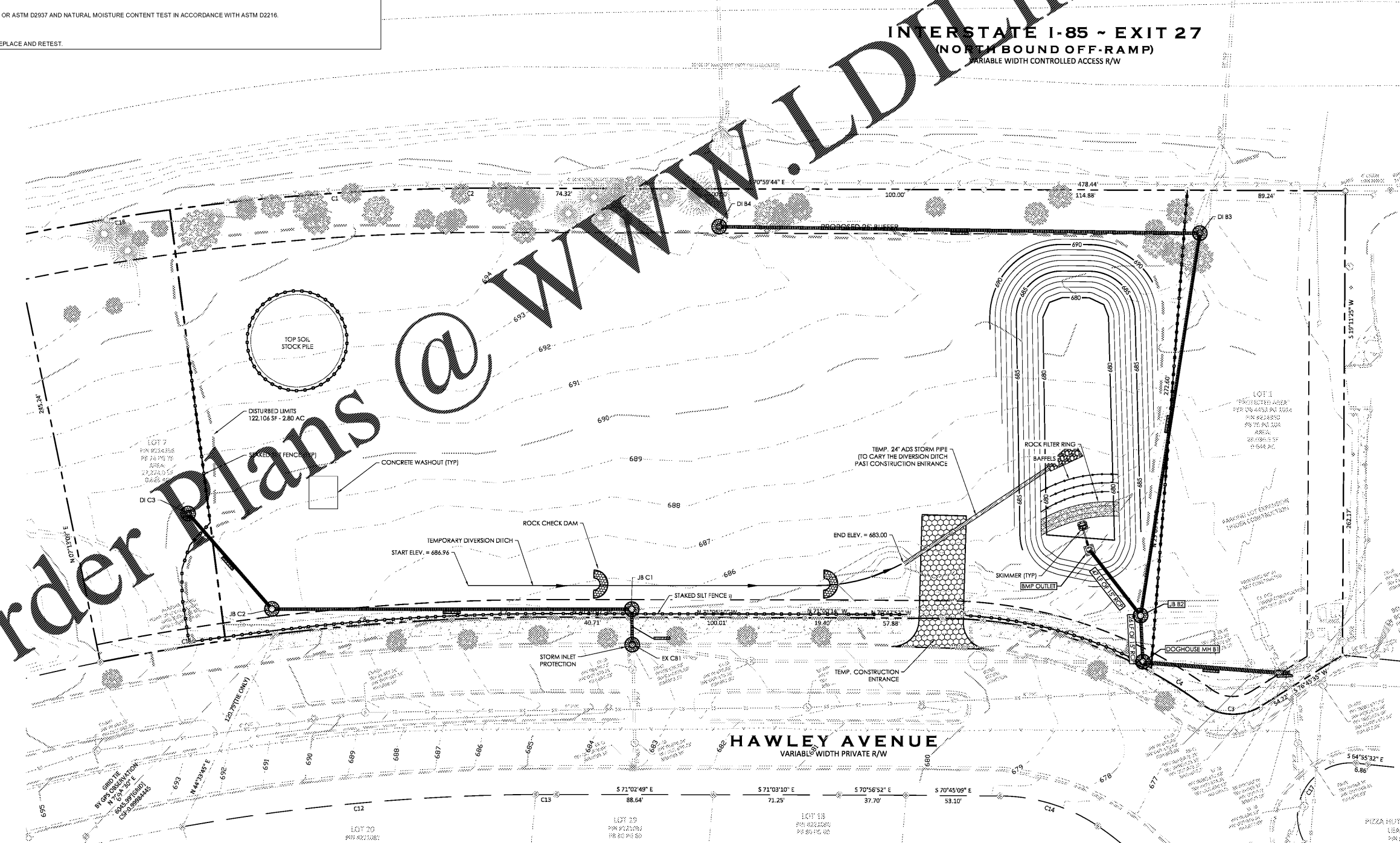
ALL TEMPORARY CURBS AND CURB TO BE REMOVED SHALL BE SAW CUT TO A CLEAN EDGE OR NEAREST TO THE PROPOSED JOINT LOCATION.

ALL OFF-SITE BORROW AND WASTE REQUIRED FOR THIS PROJECT MUST COME FROM A SITE WITH AN APPROVED EROSION CONTROL PLAN. A SITE REGULATED UNDER THE MINING ACT OF 1971, OR A LANDFILL REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT. TRASH/DEBRIS FROM DEMOLITION ACTIVITIES MUST BE DISPOSED OF AT A FACILITY REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT.

ALL DEMOLITION DEBRIS SHALL BE HAULED TO A PERMITTED APPROVED HAUL SITE WHETHER INERT OR ORGANIC. ALL HAZARDOUS WASTE SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL LAWS.

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EROSION CONTROL PH 1

REVISIONS:

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C05 OF 15
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