

**FENCE LENGTHS**

THE LENGTHS OF FENCE SHOWN IN THE PLANS ARE HORIZONTAL DIMENSIONS. MEASUREMENTS OF THE FINAL QUANTITIES SHALL BE MADE IN ACCORDANCE WITH ITEM 607.

**STRUCTURE REMOVED AS PER PLAN**

ALL THE EXISTING STONE FROM THE CULVERT AT STATION 41+25 ON STATE ROUTE 615 SHALL BE CAREFULLY REMOVED BY THE CONTRACTOR AND DELIVERED TO THE CITY OF MENTOR MAINTENANCE FACILITY.

**PAVING UNDER GUARDRAIL**

THIS OPERATION SHALL INCLUDE PREPARATION OF THE GRADED SHOULDER USING 203, LINEAR GRADING, AND PAVING UNDER THE GUARDRAIL USING 448 ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, UNDER GUARDRAIL, PG 64-22.

ITEM 203, LINEAR GRADING, SHALL CONSIST OF EXCAVATING TOPSOIL, PLACING GRANULAR MATERIAL AND APPLYING HERBICIDE AS SPECIFIED IN THE PLANS AND IN ACCORDANCE WITH THE FOLLOWING:

ALL COLLECTED DEBRIS AND TOPSOIL, INCLUDING RHIZOMES, ROOTS AND OTHER VEGETATIVE PLANT MATERIAL SHALL BE RE- MOVED AND DISPOSED OF AS SPECIFIED IN 203.05.

THE REMOVED MATERIAL SHALL BE REPLACED WITH COMPACTABLE GRANULAR MATERIAL CONFORMING TO 203.02 PLACED TO GRADE AS DETAILED ON THE TYPICAL SECTION OR AS APPROVED BY THE ENGINEER.

HERBICIDE SHALL BE EPA APPROVED FOR PAVING UNDER GUARD- RAIL. IT SHALL BE APPLIED TO THE PREPARED AREA AFTER FINAL LEVELING AND GRADING HAS BEEN COMPLETED. THE APPLICATION SHALL BE JUST PRIOR TO PAVING AND SHALL STRICTLY ADHERE TO THE MANUFACTURER'S INSTRUCTIONS.

EACH SUCCESSFUL BIDDER MUST BE LICENSED BY THE OHIO DEPARTMENT OF AGRICULTURE AS A COMMERCIAL APPLICATOR AND ALL PERSONS INVOLVED IN THE ACTUAL SPRAYING SHALL BE LICENSED AS COMMERCIAL OPERATORS IN THE APPROPRIATE SPRAY CATEGORY.

HERBICIDE LABEL, MATERIAL SAFETY DATA SHEET AND COPY OF APPLICATORS LICENSES SHALL BE SUBMITTED TO THE ENGINEER FOR VERIFICATION PRIOR TO COMMENCING WORK.

ALL EQUIPMENT, MATERIALS AND LABOR REQUIRED TO PERFORM THE WORK OUTLINED ABOVE SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 203, LINEAR GRADING. PAVING UNDER GUARDRAIL SHALL CONSIST OF PLACING ITEM 448 TO THE DEPTH SPECIFIED USING ONE OF THE FOLLOWING METHODS:

METHOD A:

- 1) SET GUARDRAIL POSTS
- 2) PLACE ITEM 448

METHOD B:

- 1) PLACE ITEM 448
- 2) BORE ASPHALT AT POST LOCATIONS (MAY BE OMITTED IF STEEL POSTS ARE USED)
- 3) SET GUARDRAIL POSTS

4) PATCH AROUND POSTS. THE MATERIALS USED FOR PATCHING SHALL BE A BITUMINOUS CONCRETE APPROVED BY THE ENGINEER. PATCHED AREAS SHALL BE COMPACTED USING EITHER HAND OR MECHANICAL METHODS. FINISHED SURFACES SHALL BE SMOOTH AND SLOPED TO DRAIN AWAY FROM THE POSTS.

ALL EQUIPMENT, MATERIALS AND LABOR REQUIRED TO PERFORM THE WORK OUTLINED ABOVE, WITH THE EXCEPTION OF SETTING GUARDRAIL POSTS, SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 448, ASPHALT CONCRETE, INTERMEDIATE COURSE, TYPE 1, UNDER GUARDRAIL, PG 64-22.

**EROSION CONTROL**

**ITEM 870. SEEDING AND MULCHING**

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES, AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. THE CONTRACTOR SHALL ESTABLISH A GOOD STRAND OF GRASS WITH UNIFORM COLOR AND DENSITY, TO THE SATISFACTION OF THE ENGINEER. QUANTITY CALCULATIONS FOR ITEM 870, SEEDING AND MULCHING, ARE BASED ON THESE LIMITS.

**SEEDING AND MULCHING OF LAWNS**

IN ADDITION TO "AREAS IN FRONT OF RESIDENCES" REFERRED TO IN 659.09, THE SPECIAL PREPARATION SHALL BE EXTENDED TO ENCOMPASS ALL LAWNS AND/OR LAWN-LIKE AREAS AS DETERMINED BY THE ENGINEER.

**WATERING AND MOWING PERMANENT SEEDED AREAS**

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER TO PROMOTE GROWTH AND TO CARE FOR PERMANENT SEEDED AREAS PER 870.18 :

870, WATER	215	M. GAL.
870, MOWING	223	M. SQ.FT.
870, SOIL ANALYSIS TEST	3	EACH

**TEMPORARY SOIL EROSION AND SEDIMENT CONTROL**

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES:

601, ROCK CHANNEL PROTECTION, TYPE C	1000	CU.YDS.
601, ROCK CHANNEL PROTECTION, TYPE C, WITH FILTER	382	CU.YDS.
870, INTER-SEEDING	4980	SQ.YDS.
870, COMMERCIAL FERTILIZER	.47	TONS
870, REPAIR SEEDING AND MULCHING	4980	SQ.YD.
870, WATER	48	M GALS.
877, TEMPORARY SEEDING AND MULCHING	19920	SQ.YDS.
877, TEMPORARY PERIMETER FILTER FABRIC FENCE	4025	LIN.FT.
877, DITCH CHECK FILTER FABRIC FENCE	600	LIN.FT.
877, INLET PROTECTION FILTER FABRIC FENCE	1210	LIN.FT.
877, SEDIMENT REMOVAL	1000	CU.YDS.
877, TEMPORARY DITCH PROTECTION	2065	SQ.YDS.
877, TEMPORARY SLOPE DRAIN	90	LIN.FT.
877, TEMPORARY BENCHES, DAMS AND SEDIMENT BASIN	1000	CU.YDS.
877, TEMPORARY DIKES	175	CU.YDS.

**EROSION CONTROL**

ITEMS 660 AND 667 ARE PROVIDED IN THE PLANS FOR EROSION CONTROL. ROCK OF A STABLE NATURE SHALL NOT BE REMOVED IN ORDER TO PLACE ANY OF THESE ITEMS AND TURF OF A STABLE NATURE SHALL NOT BE REMOVED IN ORDER TO PLACE 660 OR 667. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES OF THESE ITEMS WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION. IN ADDITION, THESE ITEMS SHALL MEET THE REQUIREMENT OF 108.04.

**STORM WATER POLLUTION PREVENTION PLAN**

THE CONDITIONS OF THE NPDES CONSTRUCTION STORM WATER GENERAL PERMIT (SEE PROPOSAL) SHALL BE MET DURING ALL STAGES OF CONSTRUCTION. THE LOCATION AND TIMING OF ALL EROSION AND SEDIMENT CONTROL ITEMS SHALL BE FIELD ADJUSTED TO PREVENT SIGNIFICANT IMPACTS ON RECEIVING WATERS. IMPLEMENTATION OF THIS STORM WATER POLLUTION PREVENTION PLAN SHALL CONTINUE THROUGHOUT THE DURATION OF THE PROJECT OR UNTIL SUCH TIME THAT THE UPSLOPE DISTURBED AREAS ARE STABILIZED.

INSTALLATION OF SEDIMENT BASINS/DAMS, PERIMETER FILTER FABRIC FENCE, AND DITCH CHECKS TEMPORARY SEEDING AND MULCHING, EROSION CONTROL MATTING OR OTHER APPROPRIATE EROSION SHALL BE CONCURRENT WITH CLEARING AND GRUBBING AND/OR GRADING OPERATIONS.

ALL REASONABLE ATTEMPTS SHOULD BE MADE TO MINIMIZE THE TOTAL AREA OF DISTURBED LAND.

AREAS TO REMAIN DORMANT FOR MORE THAN 45 DAYS SHOULD BE IMMEDIATELY STABILIZED WITH TEMPORARY SEEDING AND MULCHING, EROSION CONTROL MATTING OR OTHER APPROPRIATE EROSION CONTROL MEASURES.

ADDITIONAL QUANTITIES OF TEMPORARY SOIL EROSION AND SEDIMENT CONTROL ITEMS ARE GIVEN IN THE GENERAL NOTES.

**ITEM SPECIAL -- SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT**

DESCRIPTION. THE WORK SHALL CONSIST OF FURNISHING, PLACING AND MAINTAINING SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT ON AREAS SHOWN ON THE PLANS.

MATERIALS. EROSION CONTROL WITH TURF REINFORCING MAT TYPE 1 AND TYPE 2 SHALL BE A FLEXIBLE MAT OF PERMANENT, POLYMER MONOFILAMENTS BONDED TOGETHER TO FORM A STABLE THREE-DIMENSIONAL WEB. STRAW, COCONUT FIBER OR OTHER BIODEGRADABLE MATERIALS MAY BE INTERTWINED WITH THE PERMANENT COMPONENT OF THE MAT.

TYPE 3 SHALL BE A MAT COMPOSED OF A PERMANENT MATRIX OF POLYMER MONOFILAMENT YARNS WOVEN INTO A UNIFORM CONFIGURATION OF THREE-DIMENSIONAL PROJECTIONS, OR RANDOMLY ORIENTED MONOFILAMENT YARNS FUSED TOGETHER AT CROSSOVER POINTS, AND ENTANGLED WITH HIGH TENACITY GEOGRID OR STEEL WIRE MESH. THE MAT MUST EXHIBIT HIGH INTERLOCK AND REINFORCEMENT CAPACITY WITH BOTH THE SOIL AND ROOT SYSTEM. STRAW, COCONUT FIBER OR OTHER BIODEGRADABLE MATERIALS MAY BE INTERTWINED WITH THE PERMANENT COMPONENT OF THE MAT.

THE PERMANENT COMPONENT OF ALL MAT TYPES SHALL BE MANUFACTURED FROM 100% NON-BIODEGRADABLE MATERIALS, AND SHALL BE PERMEABLE, RESISTANT TO CHEMICAL, ENVIRONMENTAL AND ULTRAVIOLET DEGRADATION. THE PERMANENT COMPONENT OF THE MAT SHALL HAVE THE FOLLOWING MINIMUM AVERAGE ROLL VALUES (MARV) FOR PHYSICAL PROPERTIES.

PROPERTY	TEST METHOD	TYPE 1	TYPE 2	TYPE 3
POROSITY (PERCENT, MAX.)	CALCULATED	95	95	95
GROUND COVER FACTOR <sup>2</sup> PERCENT, MINIMUM)	ECTC TEST METHOD 18	60	70	75
MASS PER UNIT AREA (G/M <sup>2</sup> )	ASTM D 5261	270	340	475
THICKNESS (MM, MIN.)	ASTM D 1777, AT 200 PA	3.05	12.7	12.7
WIDE WIDTH TENSILE STRENGTH <sup>1</sup> (KN/M, MIN.)	ASTM D 4595	N/A	N/A	46.0 X 33.0
WIDE WIDTH TENSILE STRENGTH <sup>1</sup> @10% ELONGATION (KN/M, MIN.)	ASTM D 4595	N/A	N/A	27.0 X 23.0
TENSILE STRENGTH <sup>1</sup> (KN/M, MIN.)	ASTM D 5035	2.1 X 1.6	2.4 X 1.8	N/A
WIDE WIDTH TENSILE STRENGTH <sup>1</sup> @10% ELONGATION (KN/M, MIN.)	ASTM D 5035	1.4 X 1.1	1.5 X 1.3	N/A
ULTRAVIOLET RESISTANCE (PERCENT, MIN.)	ASTM D 4355, 1000 HOURS TOTAL EXPOSURE	80	80	80

<sup>1</sup> MACHINE DIRECTION X CROSS DIRECTION

<sup>2</sup> IF PROVIDED, THE BIODEGRADABLE PORTION OF THE MAT SHALL BE INCLUDED IN THE TEST

TESTING FOR PHYSICAL PROPERTIES SHALL BE PERFORMED AT FREQUENCIES EXCEEDING ASTM D 4354, PROCEDURE B, WITH A LOT DEFINED AS THE LESSER OF THE MANUFACTURER'S PLANNED PRODUCTION QUANTITY AND ONE CALENDAR DAY'S PRODUCTION.

THE MAT SHALL MEET THE FOLLOWING MAXIMUM PERMISSIBLE DESIGN VALUES, WITH A MAXIMUM OF 25 MM OF SOIL LOSS. TESTING SHALL BE BASED ON SHORT-TERM (0.5 HOUR), UNVEGETATED DATA OBTAINED IN AN INDEPENDENT HYDRAULICS TESTING FACILITY ON AN ERODIBLE SOIL BED OF SAND OR FIRM LOAM.

DESIGN PROPERTY	TYPE 1	TYPE 2	TYPE 3
VELOCITY RESISTANCE (M/SEC, MIN.)	2.5	4	5.5
SHEAR STRESS RESISTANCE (N/M <sup>2</sup> , MIN.)	140 N/M <sup>2</sup>	260 N/M <sup>2</sup>	380 N/M <sup>2</sup>

THE MAT SHALL BE FREE OF ANY TREATMENT WHICH MIGHT SIGNIFICANTLY ALTER ITS PHYSICAL PROPERTIES. DURING SHIPMENT AND STORAGE, THE MAT SHALL BE WRAPPED IN A HEAVY-DUTY COVERING TO PROTECT IT FROM DIRECT SUNLIGHT, DIRT, DUST AND OTHER DEBRIS.

FASTENERS SHALL BE AS PER 667.02. 450 MM PINS, 4.5 MM DIAMETER, WITH ATTACHED 38 MM WASHER MAY BE USED IN LIEU OF WIRE STAPLES. PINS SHALL BE DRIVEN ONLY UNTIL THE ATTACHED WASHER IS FLUSH WITH THE GROUND SURFACE.

THE MANUFACTURER SHALL SUBMIT CERTIFIED TEST DATA TO COVER EACH SHIPMENT OF MATERIAL DELIVERED TO THE JOB SITE.

THE MANUFACTURER SHALL SUPPLY RECOMMENDED INSTALLATION PROCEDURES WITH EACH ROLL OF MAT DELIVERED TO THE JOB SITE.

CONSTRUCTION. PRIOR TO PLACEMENT OF THE MAT, THE AREA TO BE COVERED SHALL BE PREPARED AND SEEDED IN ACCORDANCE WITH 659, WITH THE FOLLOWING EXCEPTIONS:

1. THE SURFACE SHALL BE FREE OF ROCK, CLODS AND FOREIGN MATERIAL 38MM OR GREATER IN SIZE.
2. NO MULCH SHALL BE APPLIED PRIOR TO PLACEMENT OF THE MAT.