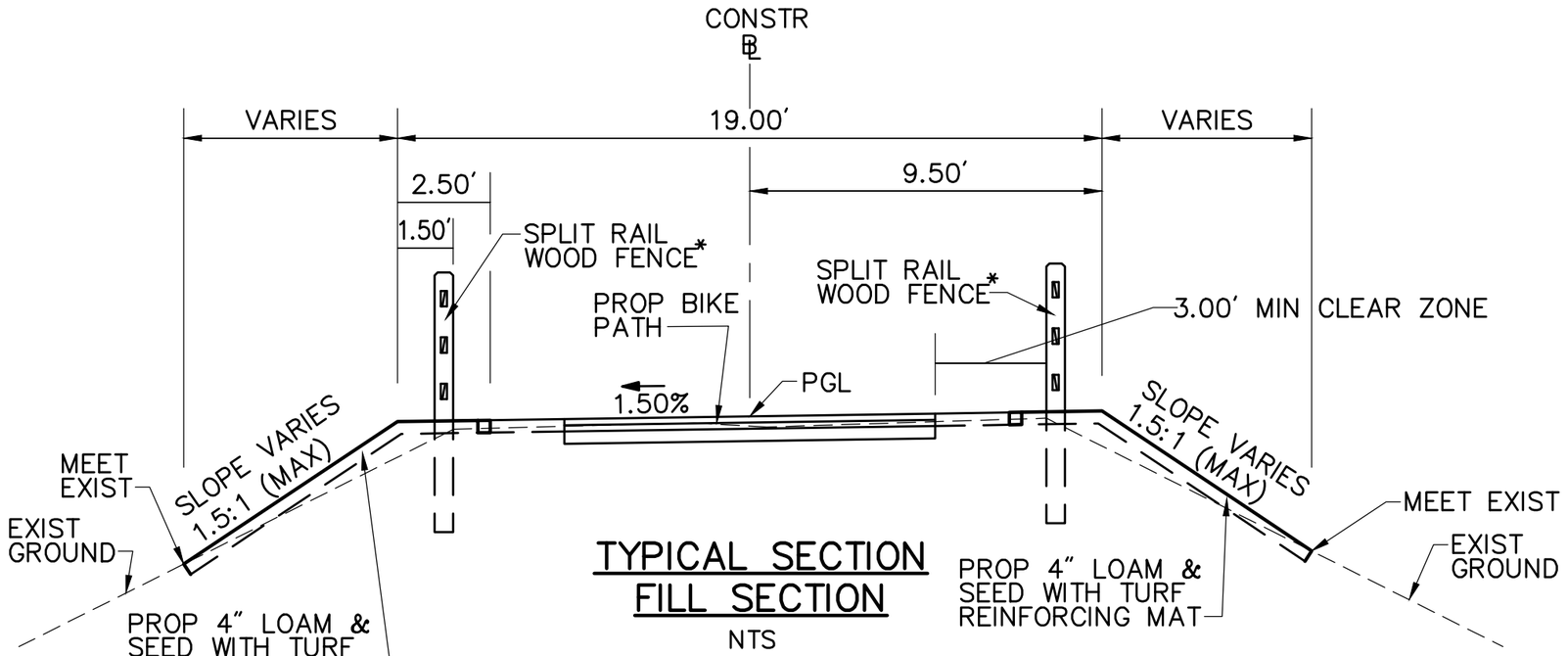
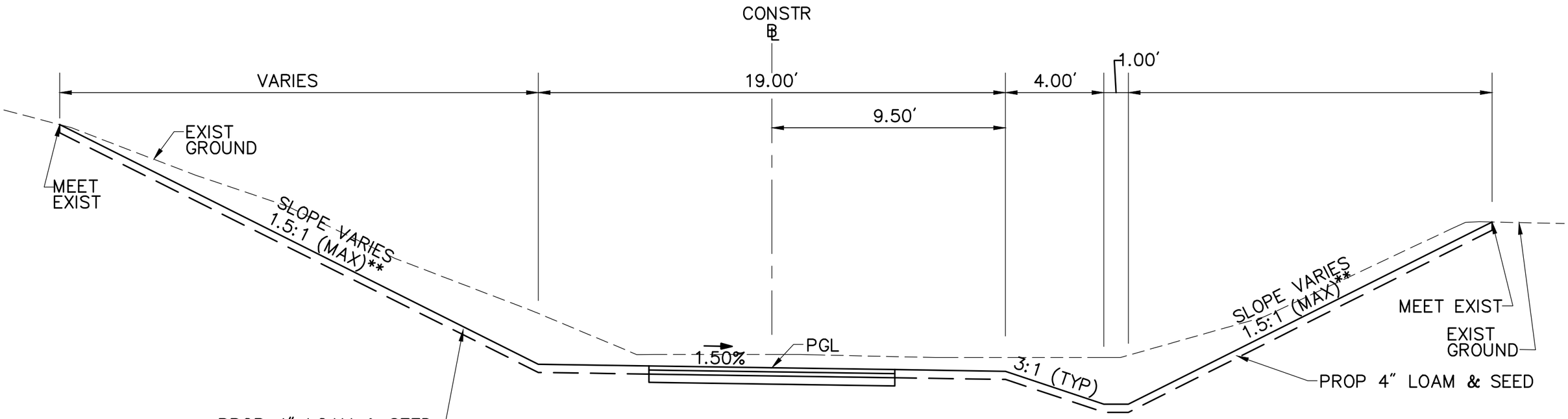


TYPICAL SECTION
FILL SECTION

NTS

* SPLIT RAIL FENCE TO BE USED ONLY AS NEEDED

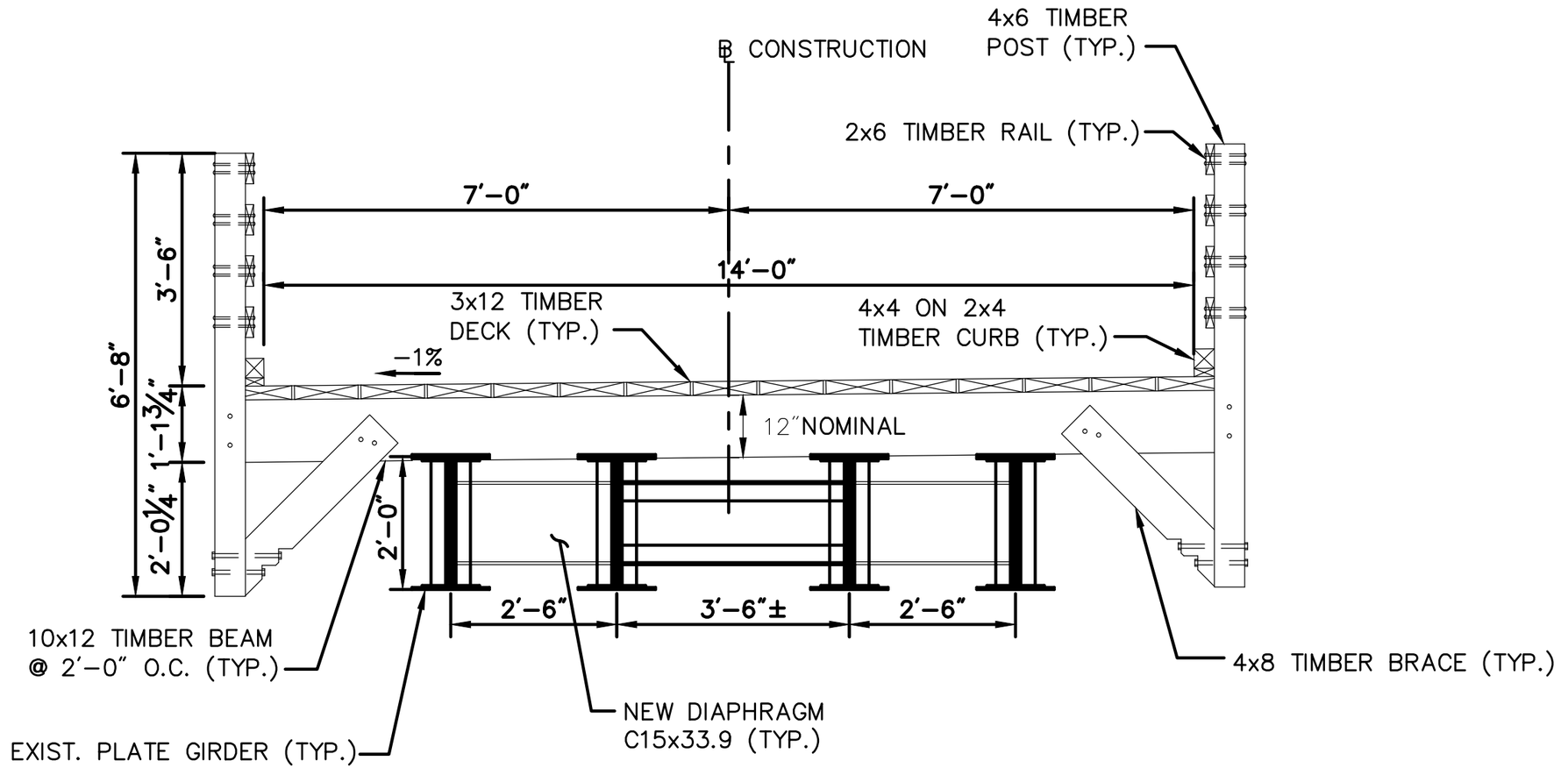
CONSTRUCTION DETAILS 1 OF 16	
MASS CENTRAL RAIL TRAIL	
SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00



TYPICAL SECTION
CUT SECTION

NTS

CONSTRUCTION DETAILS 2 OF 16	
MASS CENTRAL RAIL TRAIL	
SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00



PROPOSED TRANSVERSE SECTION (LOOKING UPSTATION)

SCALE: ½″ = 1′–0″

CONSTRUCTION DETAILS 3 OF 16	
MASS CENTRAL RAIL TRAIL	
SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00

NOTES:

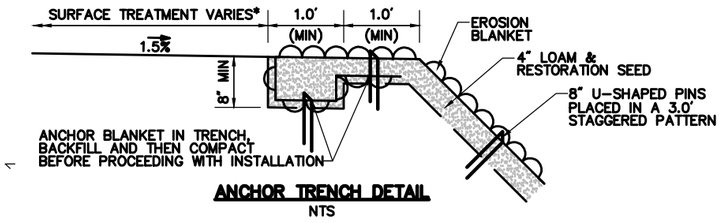
1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH SPECIAL PROVISION FOR ITEM 996.41 "REINFORCED EARTH SLOPE".
2. THE FIRST 12" OF EXCAVATED MATERIAL SHALL NOT BE RE-USED AS FILL FOR THE REINFORCED EARTH SLOPE. THIS FILL SHALL BE USED ELSEWHERE ON THE PROJECT IF IT IS FOUND TO BE SUITABLE BY THE ENGINEER.
3. FILL CONTAINING BRUSH, SOD, PEAT, ROOT OR OTHER ORGANIC, PERISHABLE OR DELETERIOUS MATERIAL INCLUDING, BUT NOT LIMITED TO SNOW, ICE OR FROZEN SOILS, SHALL BE CONSIDERED UNSUITABLE MATERIAL AND SHALL BE REMOVED.
4. PRIOR TO CONSTRUCTION OF THE REINFORCED EARTH SLOPE, THE CONTRACTOR SHALL CLEAR AND GRUB THE FILL ZONE AREA, REMOVING TOP SOILS, BRUSH, SOD OR OTHER ORGANIC OR DELETERIOUS MATERIALS. ANY SOFT AREA SHALL BE OVER EXCAVATED AND REPLACED PRIOR TO PLACING ADDITIONAL FILL SOILS.
5. BENCH CUT ALL EXCAVATED SLOPES IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF OSHA REGULATIONS.
6. REINFORCED BACKFILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 8 INCHES IN COMPACTED THICKNESS.
7. REINFORCED BACKFILL MATERIALS SHALL BE PLACED FROM THE FRONT FACE OF THE SLOPE BACK TOWARDS THE RETAINED FILL TO ENSURE FURTHER TENSIONING OF THE GEOGRID MATERIALS.
8. REINFORCED BACKFILL SHALL BE COMPACTED TO A MINIMUM 95 PERCENT OF THE MAXIMUM DENSITY, AND WITHIN +1/-3 PERCENT OF OPTIMUM MOISTURE CONTENT AS DETERMINED IN ACCORDANCE WITH ASTM D-698 (STANDARD PROCTOR DENSITY), WHICHEVER IS GREATER.
9. TESTING METHODS AND FREQUENCY, AND VERIFICATION OF MATERIAL SPECIFICATIONS AND COMPACTION SHALL BE THE RESPONSIBILITY OF THE ENGINEER.
10. THE GEOGRID LENGTHS AND GEOGRID DEPTHS BETWEEN PRIMARY AND INTERMEDIATE LAYERS SHALL BE BASED ON THE HEIGHT OF EMBANKMENT AND THE MANUFACTURER'S STANDARDS AND RECOMMENDATIONS. THE CONTRACTOR'S REINFORCED EARTH SLOPE DESIGN ENGINEER SHALL PROVIDE DESIGN COMPUTATIONS AND LAYOUT, FOR APPROVAL BY THE ENGINEER, IN ACCORDANCE WITH THE SPECIAL PROVISION FOR ITEM 996.41.
11. GEOGRID SHALL BE PLACED IN DIRECTION INDICATED. FOLLOW GEOGRID MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS AS APPLICABLE.
12. GEOGRID MAY BE SPLICED UTILIZING AN HDPE FLAT BAR CAPABLE OF TRANSFERRING 100% OF THE GEOGRID ULTIMATE TENSILE STRENGTH. NO SPLICING OF GEOGRID LENGTHS LESS THAN SIX FEET SHALL BE ALLOWED AND A MAXIMUM OF ONE SPLICE PER REQUIRED EMBEDMENT LENGTH.
13. A MINIMUM OVERLAP OF 2 FEET SHALL BE PROVIDED FOR BIAXIAL GEOGRID SECONDARY REINFORCEMENT WHERE REQUIRED TO SATISFY SPECIFIED EMBEDMENT LENGTHS.
14. PRIOR TO PLACING FILL, THE GEOGRID MATERIALS SHALL BE PLACED TO LAY FLAT AND PULLED TIGHT TO REMOVE ANY SLACK IN THE GEOGRID.
15. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM FILL THICKNESS OF SIX INCHES IS REQUIRED FOR OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TURNING OF TRACKED VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND THE GEOGRID.
16. RUBBER-TIRED VEHICLES MAY PASS OVER THE GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.
17. NO CHANGES TO THE GEOGRID OR EROSION CONTROL SYSTEM LAYOUT, INCLUDING, BUT NOT LIMITED TO LENGTH, GEOGRID TYPE, OR ELEVATION, SHALL BE MADE WITHOUT THE EXPLICIT WRITTEN CONSENT OF THE DESIGN ENGINEER.
18. BACKFILL SHALL BE GRADED AWAY FROM THE SLOPE FACE AND ROLLED AT THE END OF EACH WORK DAY TO PREVENT PONDING OF WATER ON THE SURFACE OF THE REINFORCED SOIL MASS. SITE SHALL BE MAINTAINED TO PREVENT UNCONTROLLED WATER FLOW FROM OVERTOPPING SLOPE CREST DURING CONSTRUCTION AND AFTER COMPLETION OF SLOPE.
19. RETAINED BACKFILL SHALL SATISFY THE GRADIATION REQUIREMENTS AS SPECIFIED IN THE SPECIAL PROVISION FOR ITEM 996.41.

DESIGN PARAMETERS:

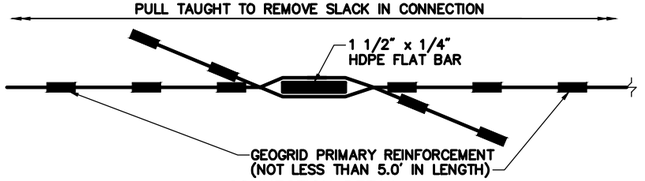
1. INTERNAL STABILITY OF SLOPES:

		PRESSURE
MIN FACTOR OF SAFETY ON GEOGRID PULLOUT	= 1.5	0
SOIL – GEOGRID INTERACTION COEFFICIENT	= 0.9	0
PERCENT COVERAGE OF GEOGRID	= 100%	0

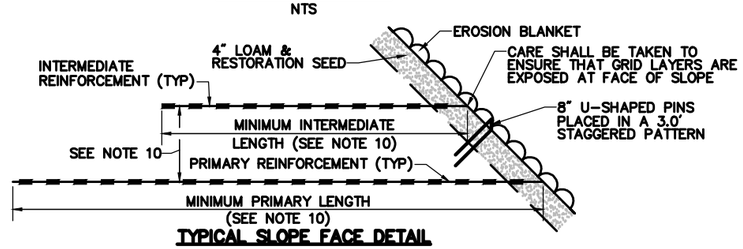
2. EXTERNAL STABILITY:
   MIN FACTOR OF OVERALL SLOPE STABILITY = 1.4
3. UNIFORM SURCHARGE = 250 PSF
4. SEISMIC FORCES HAVE NOT BEEN INCLUDED IN THE DESIGN OF THE REINFORCED SOIL STRUCTURE.



ANCHOR TRENCH DETAIL
NTS



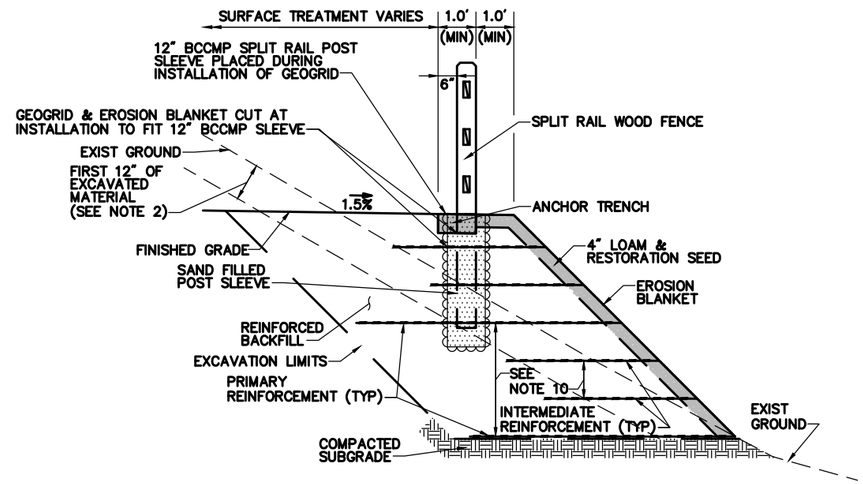
CONNECTION DETAIL
NTS

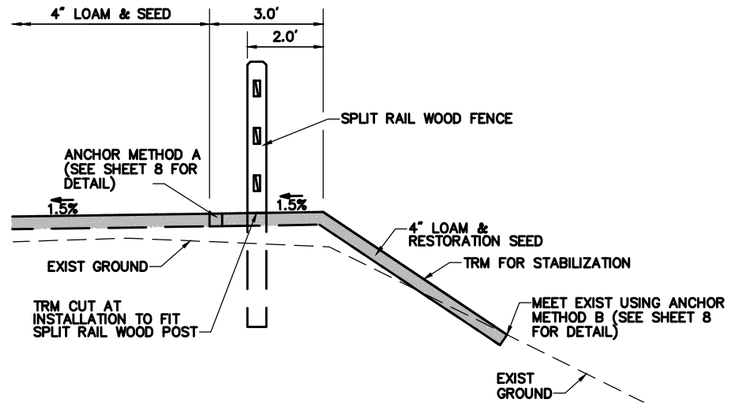


TYPICAL SLOPE FACE DETAIL
NTS

REINFORCED EARTH SLOPE

SCALE: NOT TO SCALE





TURF REINFORCING MAT FOR SIDE SLOPES

SCALE: NOT TO SCALE

CONSTRUCTION DETAILS 4 OF 16

MASS CENTRAL RAIL TRAIL

SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00

NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE SPECIAL PROVISION FOR ITEM 996.33 "MECHANICALLY STABILIZED EARTH SLOPE".
2. THE FIRST 12" OF EXCAVATED MATERIAL SHALL NOT BE RE-USED AS FILL FOR THE REINFORCED EARTH SLOPE. THIS FILL SHALL BE USED ELSEWHERE ON THE PROJECT IF IT IS FOUND TO BE SUITABLE BY THE ENGINEER.
3. FILL CONTAINING BRUSH, SOD, PEAT, ROOT OR OTHER ORGANIC, PERISHABLE OR DELETERIOUS MATERIAL INCLUDING, BUT NOT LIMITED TO SNOW, ICE OR FROZEN SOILS, SHALL BE CONSIDERED UNSUITABLE MATERIAL AND SHALL BE REMOVED.
4. PRIOR TO CONSTRUCTION OF THE MECHANICALLY STABILIZED EARTH SLOPE, THE CONTRACTOR SHALL CLEAR AND GRUB THE FILL ZONE AREA, REMOVING TOP SOILS, BRUSH, SOD OR OTHER ORGANIC OR DELETERIOUS MATERIALS. ANY SOFT AREA SHALL BE OVER EXCAVATED AND REPLACED PRIOR TO PLACING ADDITIONAL FILL SOILS.
5. BENCH CUT ALL EXCAVATED SLOPES IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF OSHA REGULATIONS.
6. REINFORCED BACKFILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 8 INCHES IN COMPACTED THICKNESS.
7. REINFORCED BACKFILL MATERIALS SHALL BE PLACED FROM THE FRONT FACE OF THE SLOPE BACK TOWARDS THE RETAINED FILL TO ENSURE FURTHER TENSIONING OF THE GEOGRID MATERIALS.
8. REINFORCED BACKFILL SHALL BE COMPACTED TO A MINIMUM 95 PERCENT OF THE MAXIMUM DENSITY, AND WITHIN +1/-3 PERCENT OF OPTIMUM MOISTURE CONTENT AS DETERMINED IN ACCORDANCE WITH ASTM D-698 (STANDARD PROCTOR DENSITY), WHICHEVER IS GREATER.
9. TESTING METHODS AND FREQUENCY, AND VERIFICATION OF MATERIAL SPECIFICATIONS AND COMPACTION SHALL BE THE RESPONSIBILITY OF THE ENGINEER.
10. THE GEOGRID LENGTHS SHALL BE BASED ON THE HEIGHT OF EMBANKMENT AND THE MANUFACTURER'S STANDARDS AND RECOMMENDATIONS. THE CONTRACTOR'S MECHANICALLY STABILIZED EARTH SLOPE DESIGN ENGINEER SHALL PROVIDE DESIGN COMPUTATIONS AND LAYOUT, FOR APPROVAL BY THE ENGINEER, IN ACCORDANCE WITH THE SPECIAL PROVISION FOR ITEM 996.33.
11. GEOGRID SHALL BE PLACED IN DIRECTION INDICATED. FOLLOW GEOGRID MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS AS APPLICABLE.
12. GEOGRID MAY BE SPLICED UTILIZING AN HDPE FLAT BAR CAPABLE OF TRANSFERRING 100% OF THE GEOGRID ULTIMATE TENSILE STRENGTH. NO SPLICING OF GEOGRID LENGTHS LESS THAN SIX FEET SHALL BE ALLOWED AND A MAXIMUM OF ONE SPLICE PER REQUIRED EMBEDMENT LENGTH.
13. A MINIMUM OVERLAP OF 2 FEET SHALL BE PROVIDED FOR BIAXIAL GEOGRID SECONDARY REINFORCEMENT WHERE REQUIRED TO SATISFY SPECIFIED EMBEDMENT LENGTHS.
14. PRIOR TO PLACING FILL, THE GEOGRID MATERIALS SHALL BE PLACED TO LAY FLAT AND PULLED TIGHT TO REMOVE ANY SLACK IN THE GEOGRID.
15. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM FILL THICKNESS OF SIX INCHES IS REQUIRED FOR OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TURNING OF TRACKED VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND THE GEOGRID.
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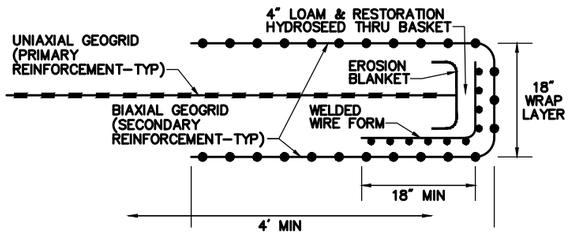
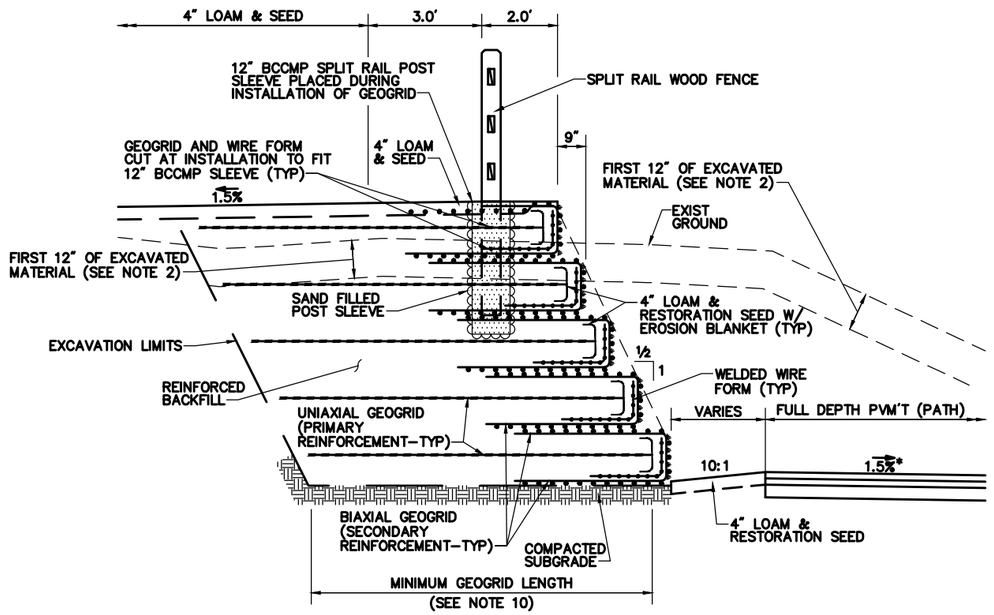
17. NO CHANGES TO THE GEOGRID OR EROSION CONTROL SYSTEM LAYOUT, INCLUDING, BUT NOT LIMITED TO LENGTH, GEOGRID TYPE, OR ELEVATION, SHALL BE MADE WITHOUT THE EXPLICIT WRITTEN CONSENT OF THE DESIGN ENGINEER.
18. BACKFILL SHALL BE GRADED AWAY FROM THE SLOPE FACE AND ROLLED AT THE END OF EACH WORK DAY TO PREVENT PONDING OF WATER ON THE SURFACE OF THE REINFORCED SOIL MASS. SITE SHALL BE MAINTAINED TO PREVENT UNCONTROLLED WATER FLOW FROM OVERTOPPING SLOPE CREST DURING CONSTRUCTION AND AFTER COMPLETION OF SLOPE.
19. RETAINED BACKFILL SHALL SATISFY THE GRADIATION REQUIREMENTS AS SPECIFIED IN THE SPECIAL PROVISION FOR ITEM 996.33.

CONNECTION DETAIL
NTS



TYPICAL DETAIL AT SLOPE FACE
NTS



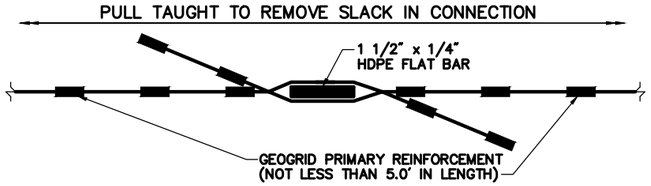
DESIGN PARAMETERS:

1. INTERNAL STABILITY OF SLOPES:

		PRESSURE
MIN FACTOR OF SAFETY ON GEOGRID PULLOUT	= 1.5	0
SOIL – GEOGRID INTERACTION COEFFICIENT	= 0.9	0
PERCENT COVERAGE OF GEOGRID	= 100%	0

2. EXTERNAL STABILITY:

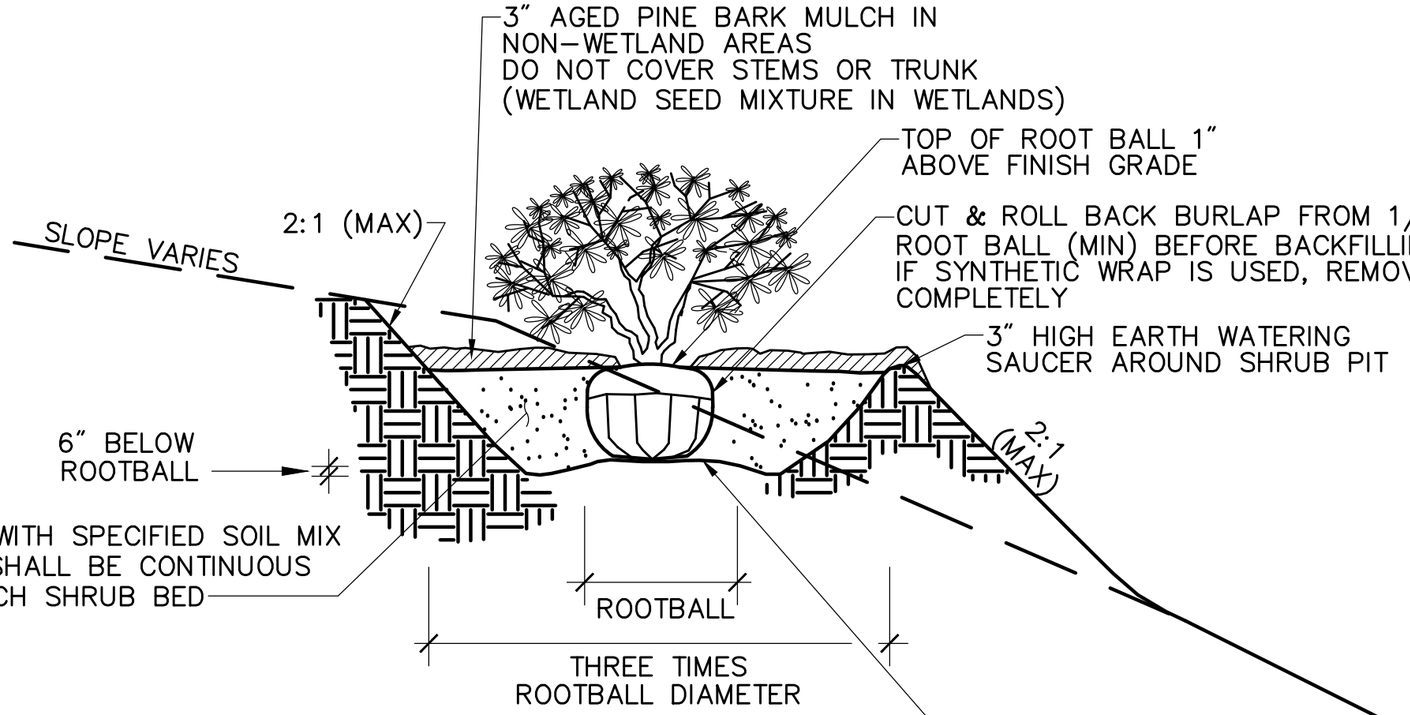
   MIN FACTOR OF OVERALL SLOPE STABILITY = 1.4
3. UNIFORM SURCHARGE = 250 PSF
4. SEISMIC FORCES HAVE NOT BEEN INCLUDED IN THE DESIGN OF THE REINFORCED SOIL STRUCTURE.



MECHANICALLY STABILIZED EARTH SLOPE

SCALE: NOT TO SCALE

CONSTRUCTION DETAILS 5 OF 16	
MASS CENTRAL RAIL TRAIL	
SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00



NOTES:

1. WATERING SAUCER SHALL BE FLOODED TWICE DURING THE FIRST 24 HOURS AFTER PLANTING
2. DO NOT CUT LEADER
3. SHRUB WRAP SHALL NOT BE USED
4. SHRUB SHALL BE SET PLUMB
5. IN AREAS WITH PHYSICAL CONSTRAINTS ON BOTH SIDES OF PROP SHRUB LOCATIONS, SIDE SLOPES AND PLANTING PIT SIZE MAY VARY TO FACILITATE TREE PLANTING.

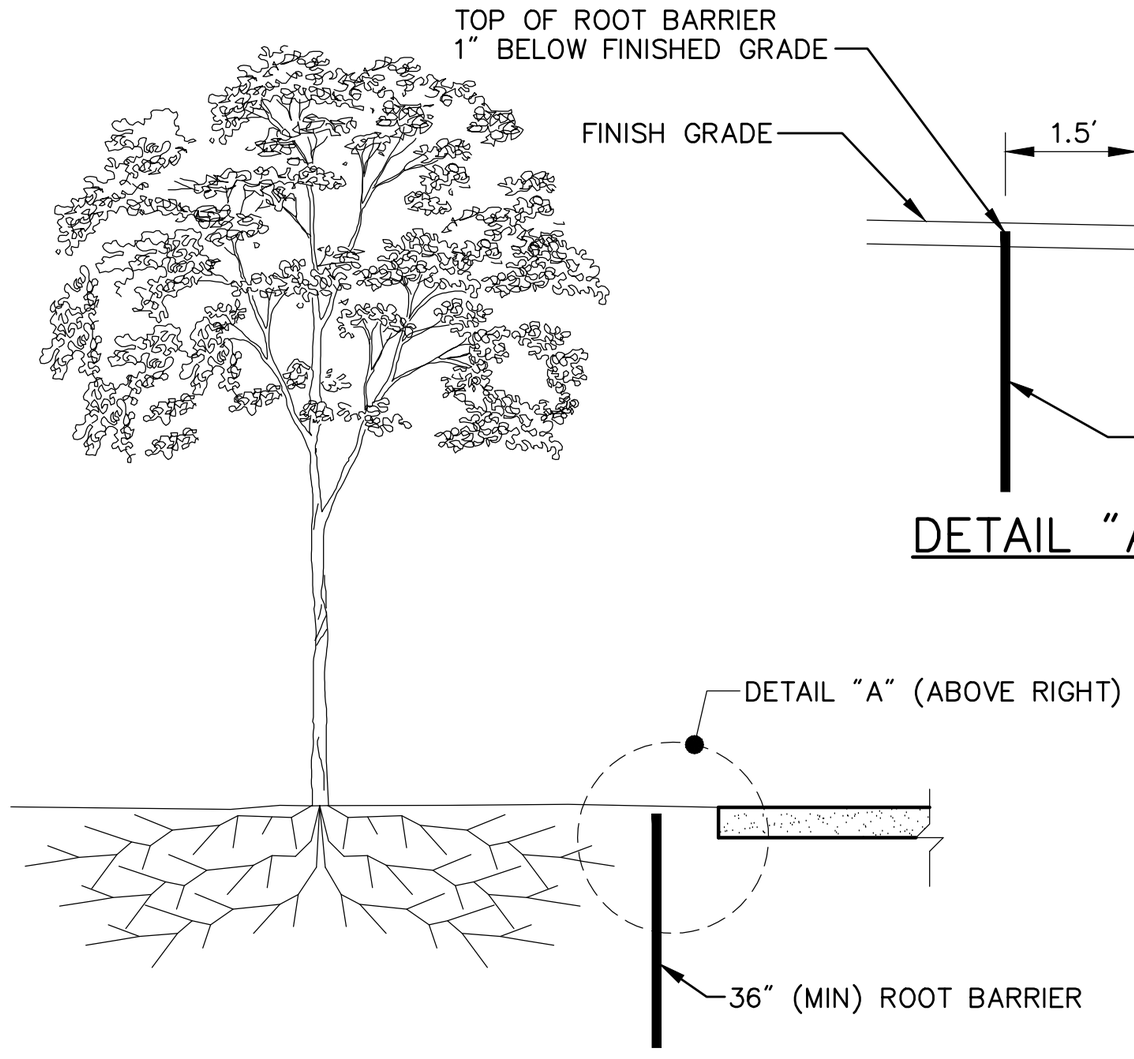
SHRUB PLANTING IN SLOPE OR ON LEVEL GROUND

SCALE: NOT TO SCALE

CONSTRUCTION DETAILS
6 OF 16

MASS CENTRAL
RAIL TRAIL

SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00



ROOT BARRIER TREATMENT

SCALE: NOT TO SCALE

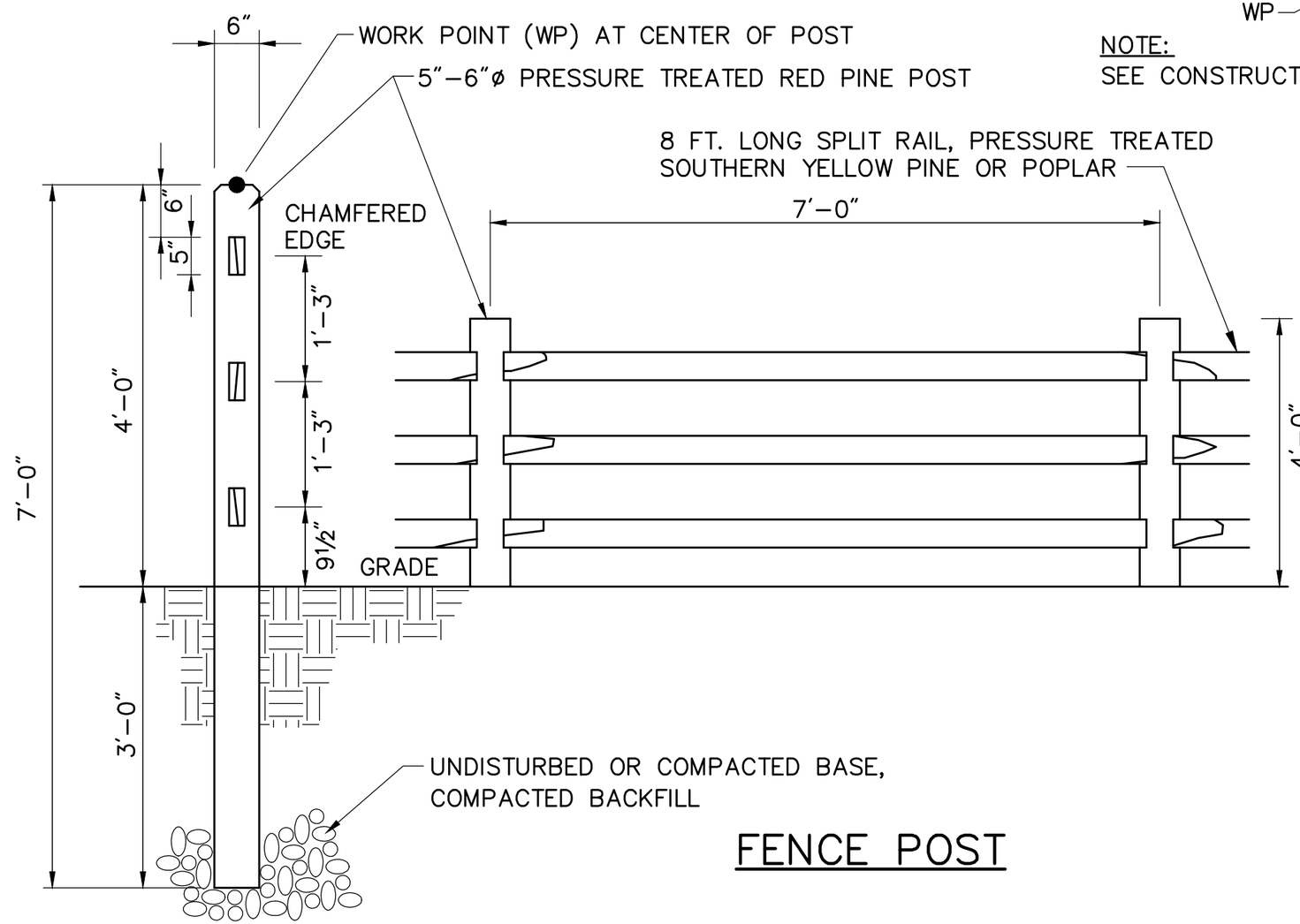
DATE:

DWG:

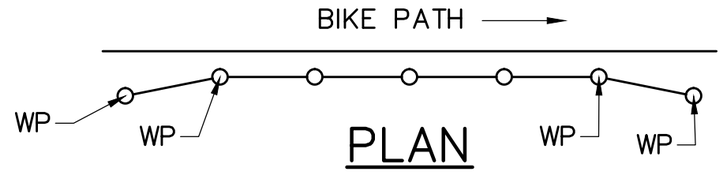
CONSTRUCTION DETAILS
7 OF 16

MASS CENTRAL
RAIL TRAIL

SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00



FENCE POST



PLAN

NOTE:
SEE CONSTRUCTION PLANS FOR POST WORKING POINT LOCATIONS.

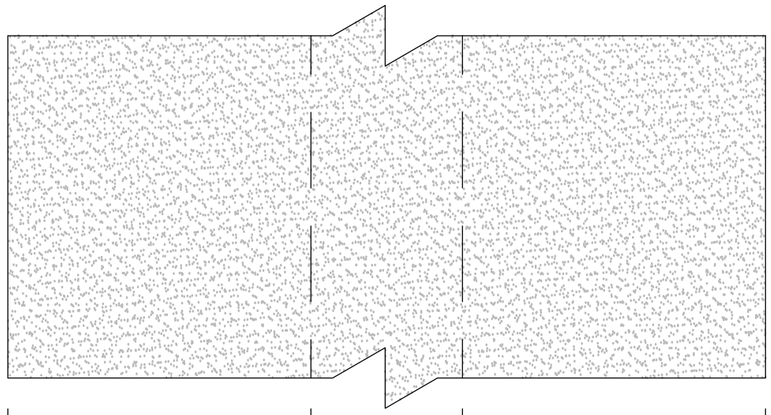
SPLIT RAIL WOOD FENCE

SCALE: NOT TO SCALE

CONSTRUCTION DETAILS
8 OF 16

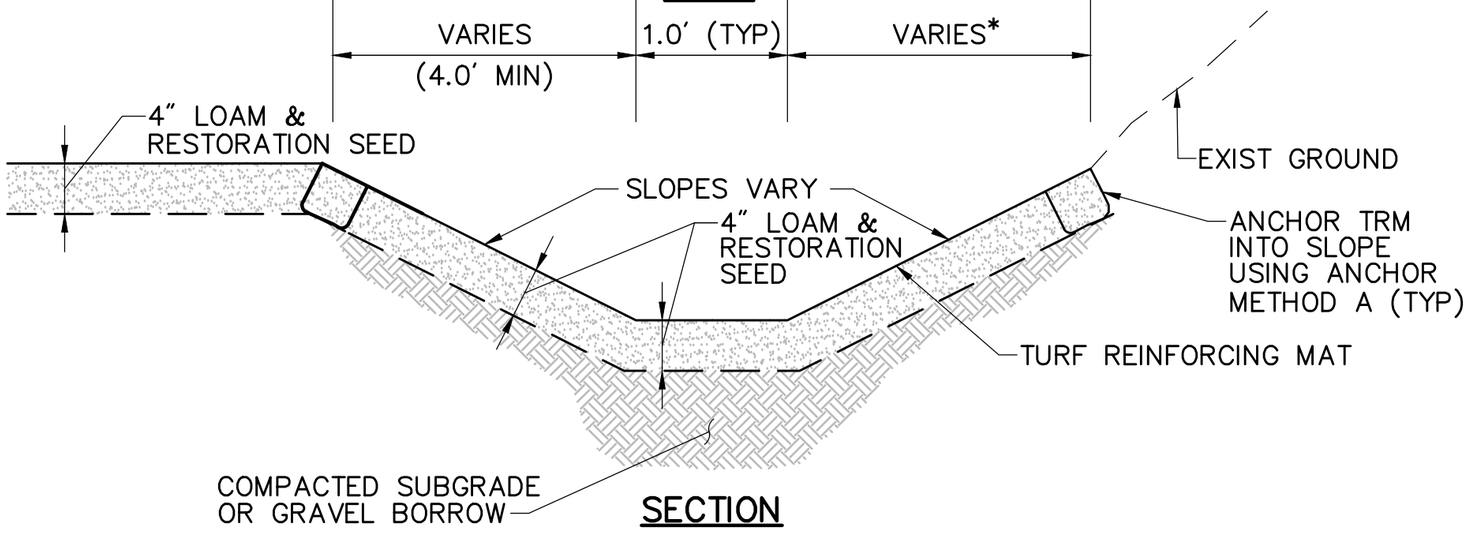
MASS CENTRAL
RAIL TRAIL

SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00

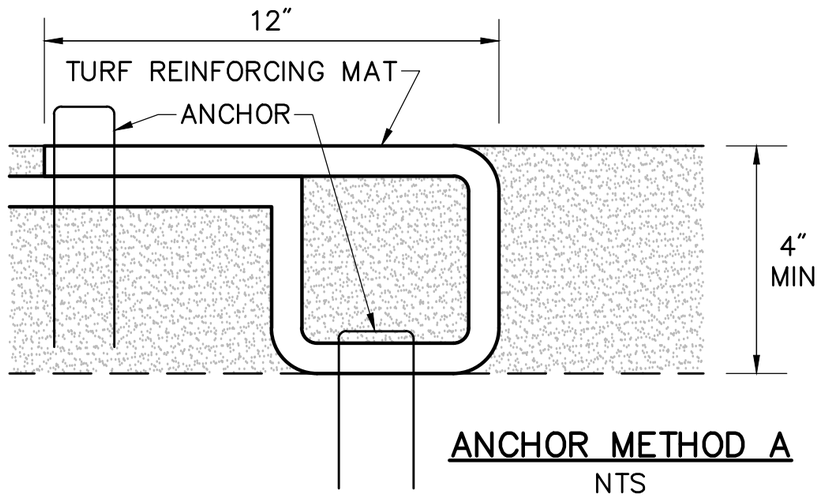


PLAN

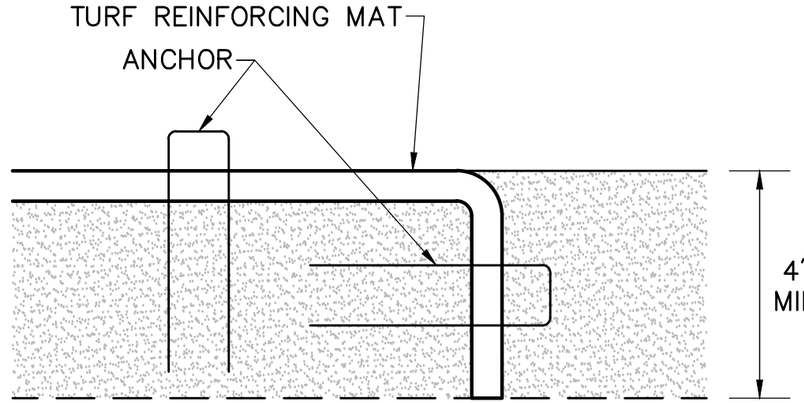
VARIES (4.0' MIN) | 1.0' (TYP) | VARIES*



SECTION



ANCHOR METHOD A
NTS



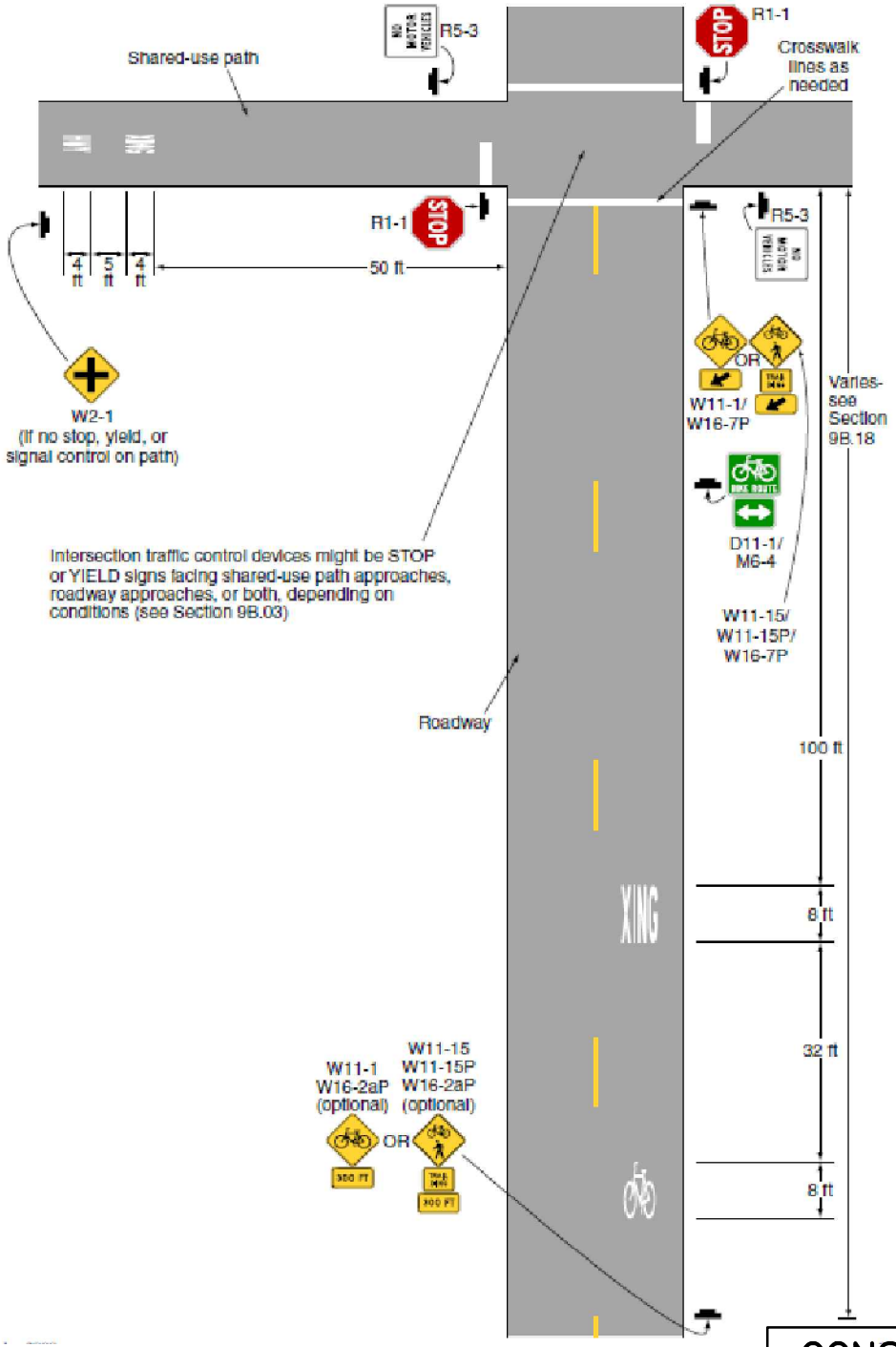
ANCHOR METHOD B
NTS

LOAM & SEED SWALE

SCALE: NOT TO SCALE

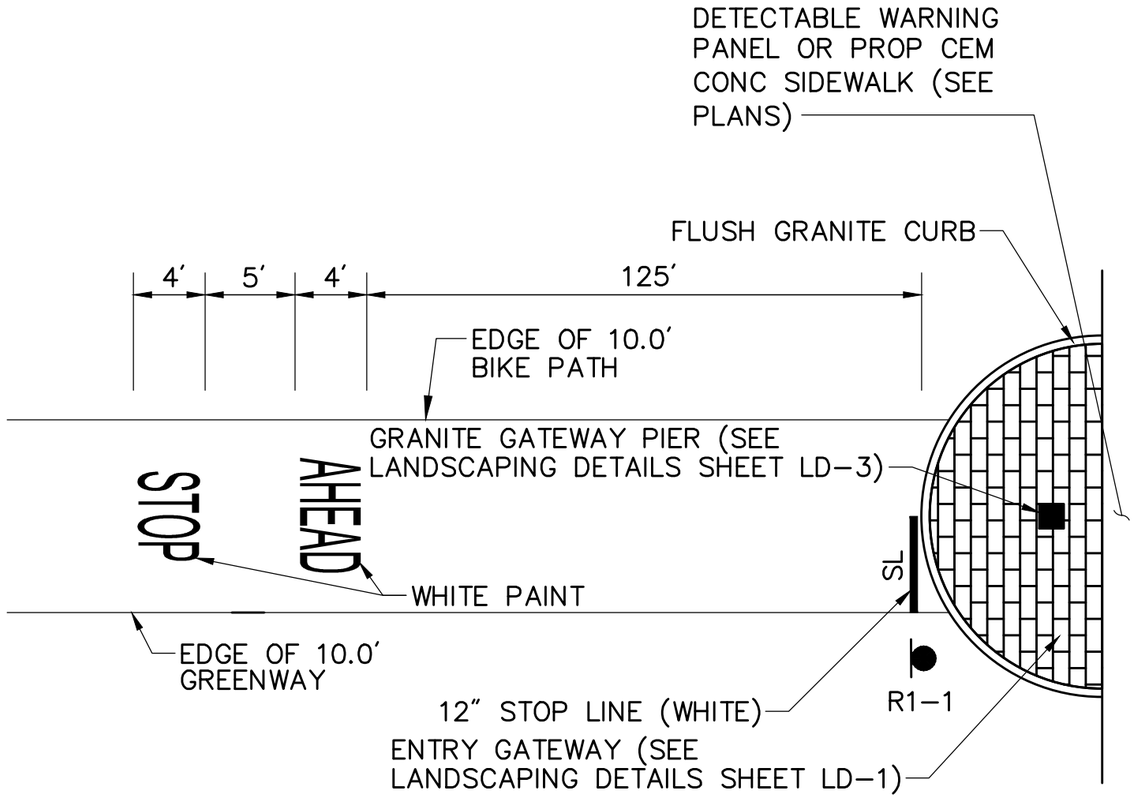
CONSTRUCTION DETAILS 9 OF 16	
MASS CENTRAL RAIL TRAIL	
SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00

Figure 9B-7. Examples of Signing and Markings for a Shared-Use Path Crossing



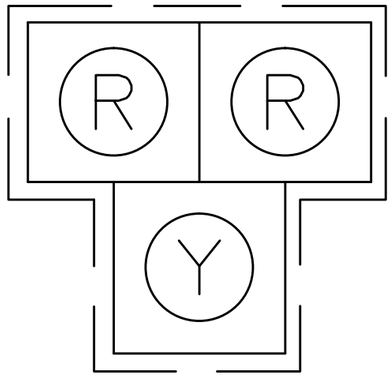
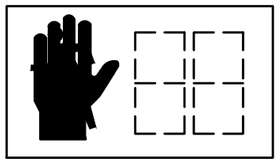
FROM: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, 2009 EDITION

CONSTRUCTION DETAILS 10 OF 16	
MASS CENTRAL RAIL TRAIL	
SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00



TYPICAL PATH STRIPING

SCALE: NOT TO SCALE

SIGNAL HEAD DATA	
A,B,C,D	P1–P2
	 HAND/MAN W/COUNTDOWN TIMER (L.E.D.) SINGLE SECTION
ALL 12″ LENS	

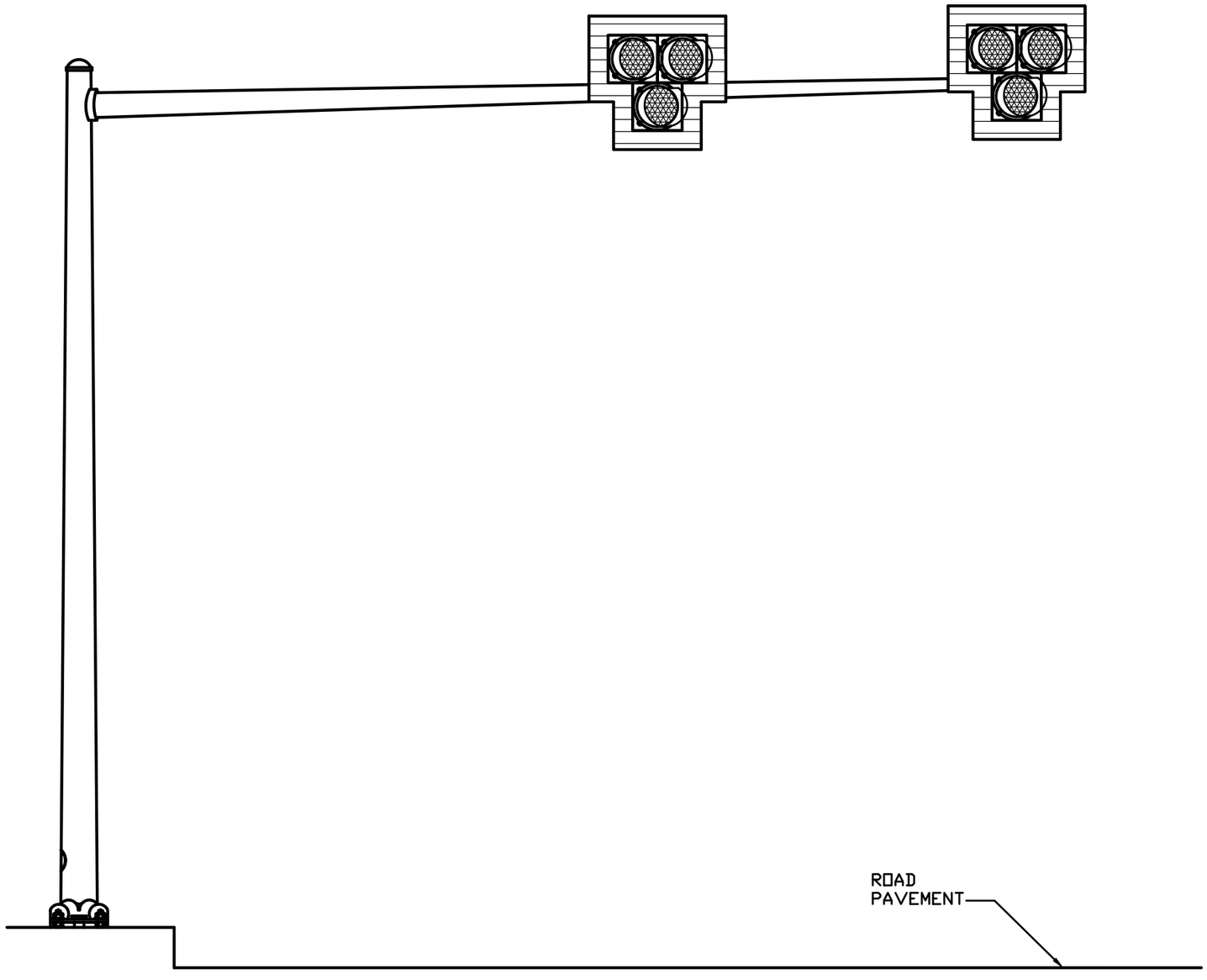
NOTES: 1. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH 5″± LOUVERED BACKPLATES AND TUNNEL VISORS.
2. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/L.E.D. MODULES.

PEDESTRIAN HAWK SIGNAL HEAD

CONSTRUCTION DETAILS
11 OF 16

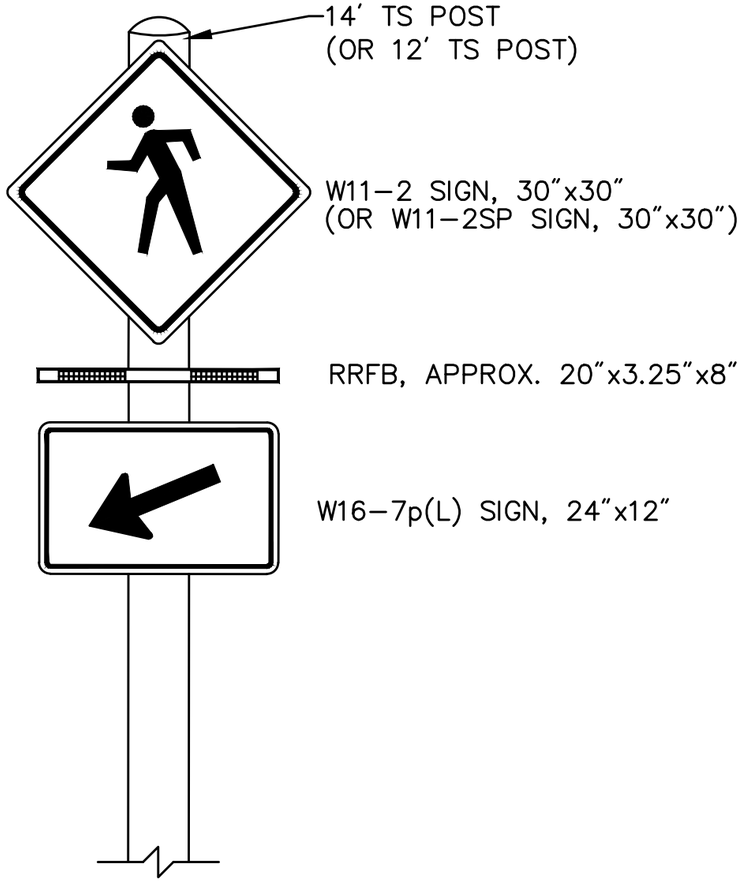
MASS CENTRAL
RAIL TRAIL

SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00



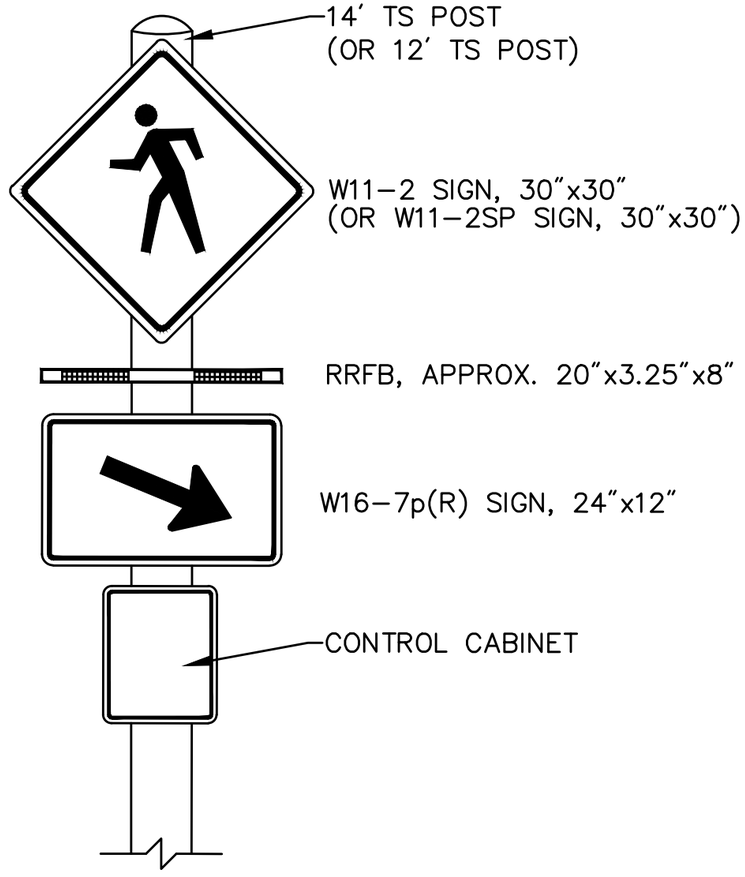
PEDESTRIAN HAWK SIGNAL MAST ARM

CONSTRUCTION DETAILS 12 OF 16	
MASS CENTRAL RAIL TRAIL	
SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00



FRONT VIEW (FACING ON-COMING TRAFFIC)

NOT TO SCALE



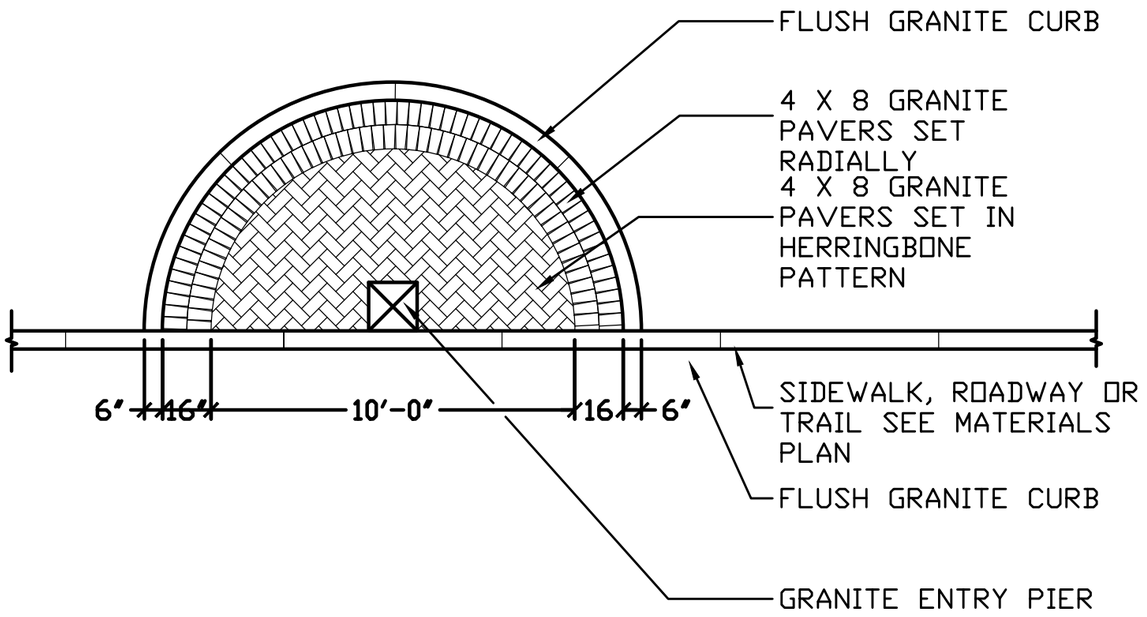
BACK VIEW

NOT TO SCALE

RAPID REFLECTORIZED FLASHING BEACON DETAIL

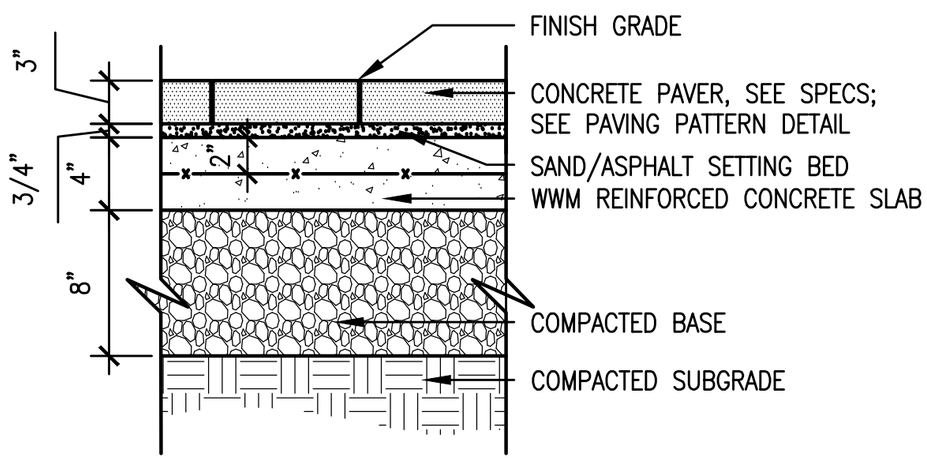
SCALE: NOT TO SCALE

CONSTRUCTION DETAILS 13 OF 16	
MASS CENTRAL RAIL TRAIL	
SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00



ENTRY GATEWAY

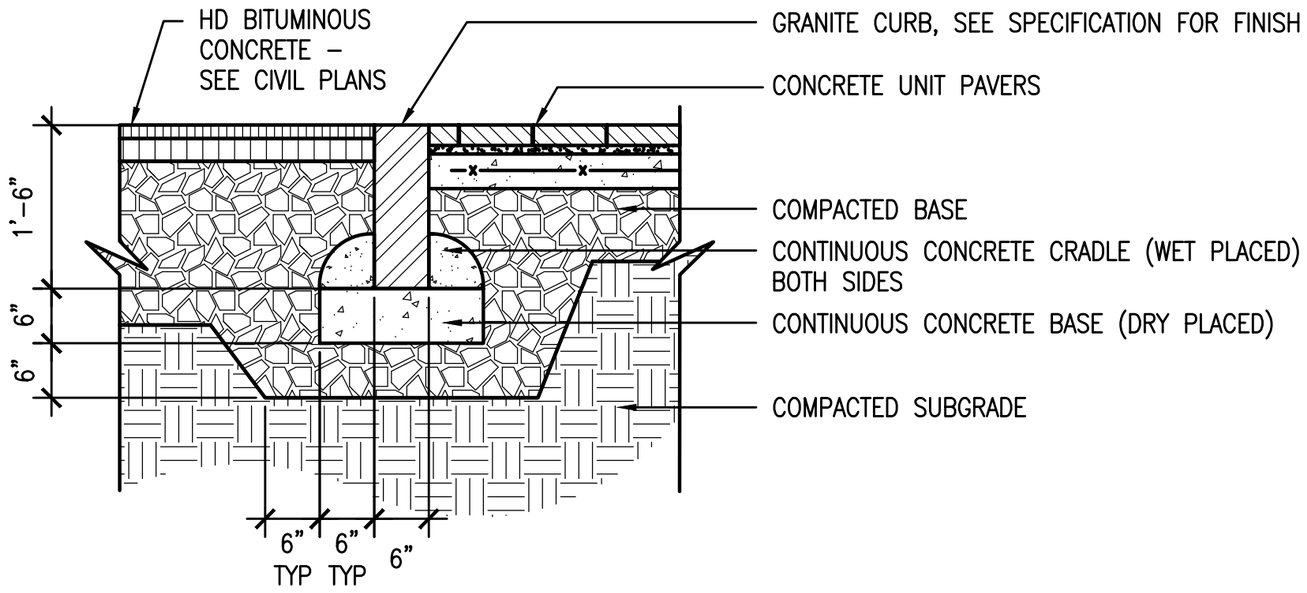
NTS



CONCRETE UNIT PAVER

NTS

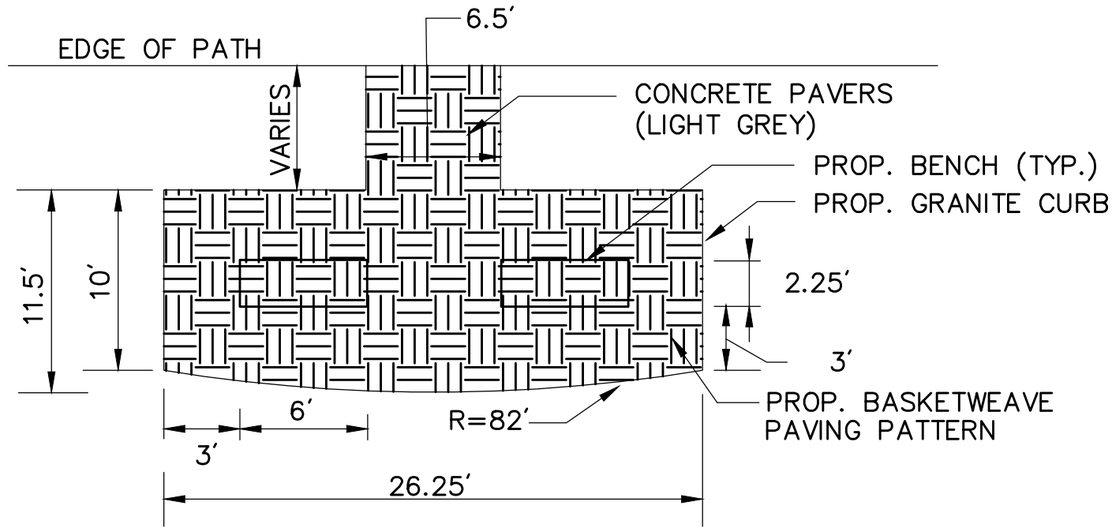
CONSTRUCTION DETAILS 14 OF 16	
MASS CENTRAL RAIL TRAIL	
SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00



FLUSH GRANITE CURB

NTS

CONSTRUCTION DETAILS 15 OF 16	
MASS CENTRAL RAIL TRAIL	
SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00



PROPOSED OVERLOOK /REST AREA

SCALE: NOT TO SCALE

CONSTRUCTION DETAILS
16 OF 16

MASS CENTRAL
RAIL TRAIL

SCALE: N.T.S.	
DRAWN BY: SLB	
APPROVED: PGD	JOB #: 12029.00