

UNIVERSITY OF PITTSBURGH

**STANDARD SITE
CONSTRUCTION DETAILS**



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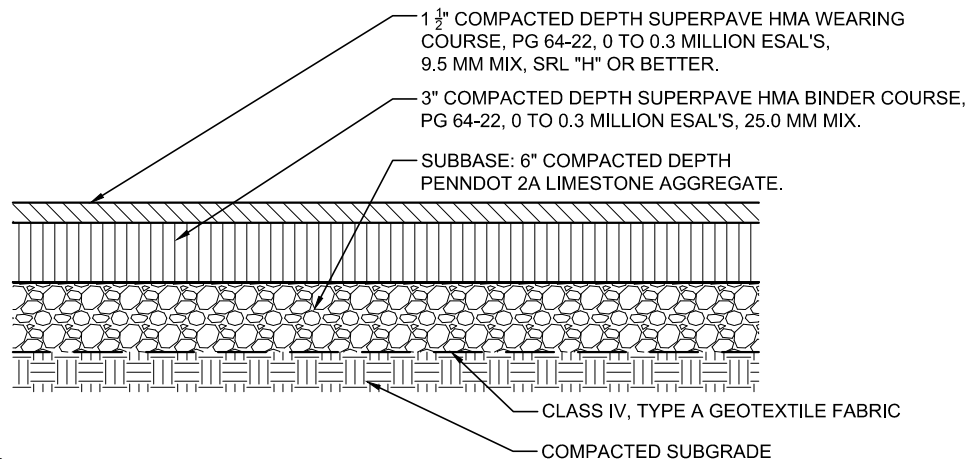
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**STANDARD SITE
CONSTRUCTION DETAILS**


REVISIONS		
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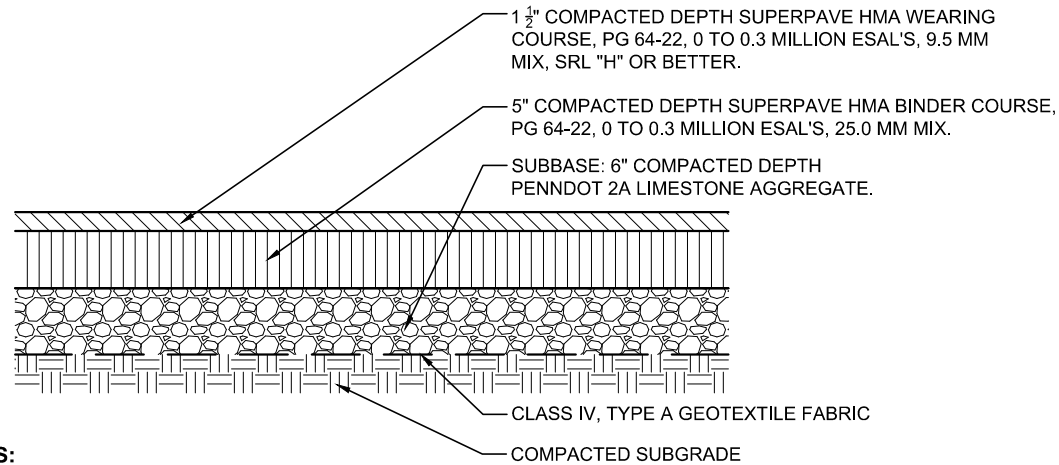
NOTES:

1. ONCE THE FINAL WEARING COURSE OF BITUMINOUS PAVING IS PLACED, THE CONTRACTOR SHALL SEAL THE GUTTER LINE WITH PG 64-22 ASPHALT CEMENT BY OVERLAPPING 3" ONTO THE WEDGE CURB AND EXTENDING 9" ON TO THE CARTWAY IN ACCORDANCE WITH PENNDOT. PUBLICATION 408.
2. SUBGRADE DRAINS MAY BE REQUIRED WHERE UNDERGROUND WATER IS ENCOUNTERED.
3. CONSTRUCTION MATERIALS AND INSTALLATION SHALL CONFORM TO PENNDOT PUBLICATION 408 UNLESS OTHERWISE INDICATED.
4. SUBBASE SHALL BE COMPACTED TO 70% RELATIVE DENSITY PER ASTM D4253 AND ASTM D4254.
5. SUBBASE SHALL BE COMPACTED TO VISUAL NON-MOVEMENT PRIOR TO PLACEMENT OF FABRIC AND SUBBASE.

01	STANDARD DUTY ASPHALT PAVEMENT (PRIVATE)
SH 1	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	
Job No. X5887	
Issue Date MAY 2016	
Drawing Description STANDARD DUTY ASPHALT PAVEMENT (PRIVATE)	
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
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Drawing Number 10690	
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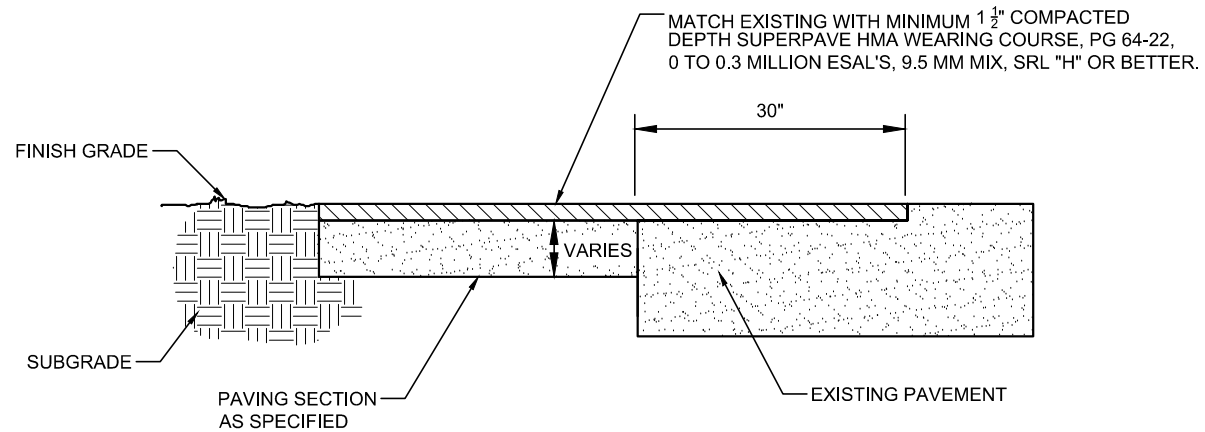
NOTES:

1. ONCE THE FINAL WEARING COURSE OF BITUMINOUS PAVING IS PLACED, THE CONTRACTOR SHALL SEAL THE GUTTER LINE WITH PG 64-22 ASPHALT CEMENT BY OVERLAPPING 3" ONTO THE WEDGE CURB AND EXTENDING 9" ON TO THE CARTWAY IN ACCORDANCE WITH PENNDOT. PUBLICATION 408.
2. SUBGRADE DRAINS MAY BE REQUIRED WHERE UNDERGROUND WATER IS ENCOUNTERED.
3. CONSTRUCTION MATERIALS AND INSTALLATION SHALL CONFORM TO PENNDOT PUBLICATION 408 UNLESS OTHERWISE INDICATED.
4. SUBBASE SHALL BE COMPACTED TO 70% RELATIVE DENSITY PER ASTM D4253 AND ASTM D4254.
5. SUBBASE SHALL BE COMPACTED TO VISUAL NON-MOVEMENT PRIOR TO PLACEMENT OF FABRIC AND SUBBASE.


02	HEAVY DUTY ASPHALT PAVEMENT (PRIVATE)
SH 2	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
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Job No. X5887	
Issue Date MAY 2016	
Drawing Description HEAVY DUTY ASPHALT PAVEMENT (PRIVATE)	
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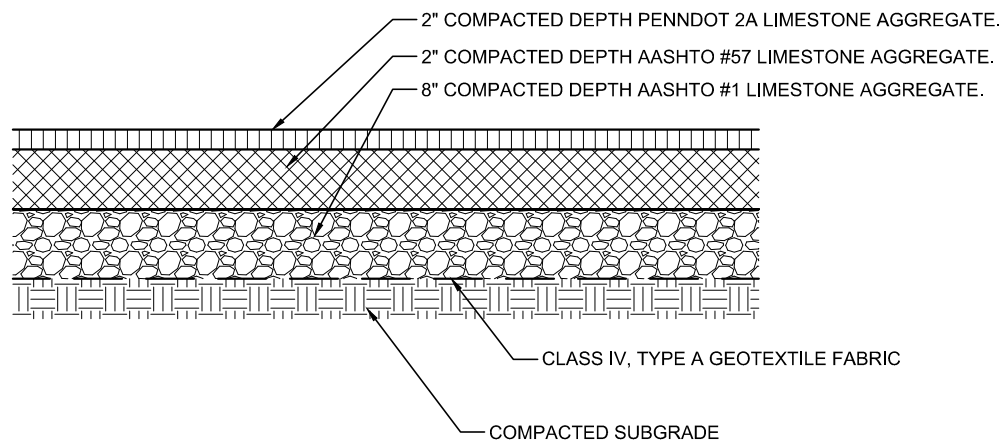
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03	PAVEMENT PATCH
SH 3	

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Drawing Description PAVEMENT PATCH	Issue Date MAY 2016
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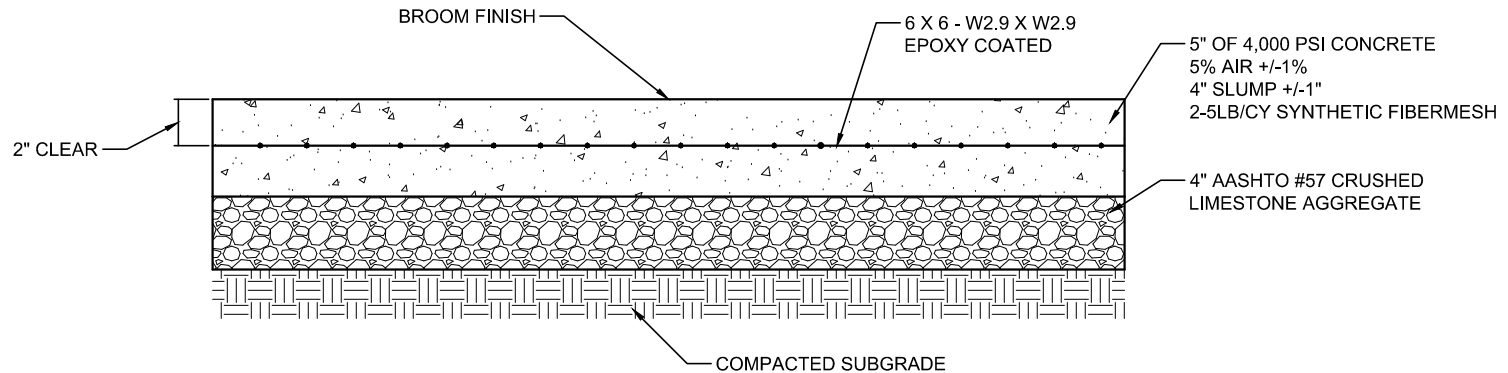
NOTES:

1. AGGREGATE PAVING SECTION SHALL BE COMPACTED TO 70% RELATIVE DENSITY PER ASTM D4253 AND D4254.
2. SUBGRADE DRAINS MAY BE REQUIRED WHERE UNDERGROUND WATER IS ENCOUNTERED.
3. CONSTRUCTION MATERIALS AND INSTALLATION SHALL CONFORM TO PENNDOT PUBLICATION 408 UNLESS OTHERWISE INDICATED.
4. SUBGRADE SHALL BE COMPACTED TO VISUAL NON-MOVEMENT PRIOR TO PLACEMENT OF FABRIC AND AGGREGATE.

04	AGGREGATE PAVEMENT
SH 4	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
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Drawing Description AGGREGATE PAVEMENT	Issue Date MAY 2016
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NOTES:

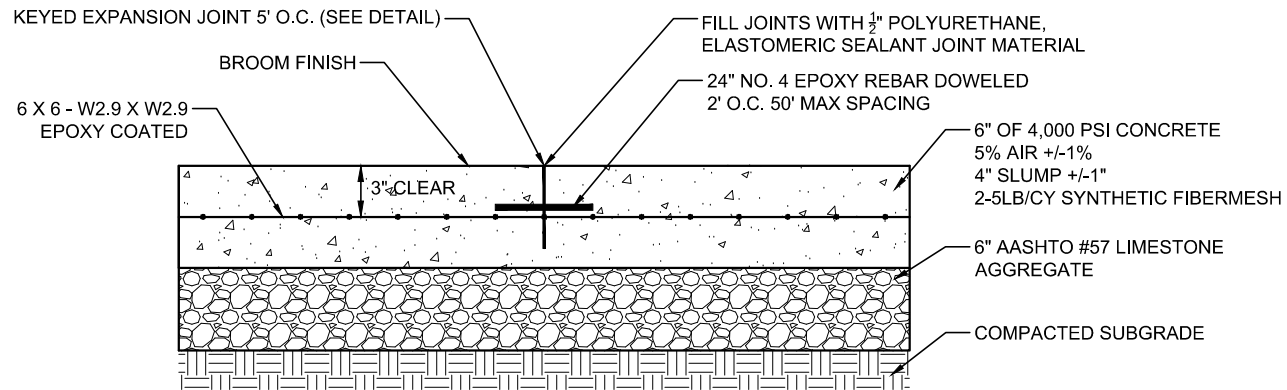
1. CONTRACTOR SHALL PLACE CONTROL JOINTS AT INTERVALS EQUAL TO THE PAVEMENT WIDTH NOT TO EXCEED 12'.
2. EXPANSION JOINTS SHALL BE INSTALLED AT 50' MAXIMUM INTERVALS.
3. CURING SHALL BE BY ABSORPTIVE COVER; MOISTURE-RETAINING COVER; OR APPROVED CURING COMPOUND. CONTRACTOR SHALL SUBMIT PROPOSED CURING METHOD TO OWNER FOR APPROVAL PRIOR TO CONCRETE INSTALLATION.
4. APPLY WATER BASED 40% SILANE PENETRATING SEALER AFTER A MINIMUM OF 28 DAYS PER MANUFACTURERS RECOMMENDATIONS.
5. PROVIDE MINIMUM CROSS-SLOPE OF 1.5% TO MAXIMUM CROSS SLOPE OF 2%.
6. FIBERMESH DOSAGE RATE SHALL BE SPECIFIED IN CONCRETE MIX DESIGN SUBMITTED BY CONTRACTOR.

05	5" THICK CONCRETE PAVEMENT (PRIVATE)
SH 5	

University of Pittsburgh FACILITIES MANAGEMENT	
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Drawing Description 5" THICK CONCRETE PAVEMENT (PRIVATE)	Issue Date MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
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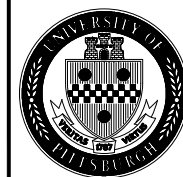


NOTES:

1. CONTRACTOR SHALL PLACE CONTROL JOINTS AT INTERVALS EQUAL TO THE PAVEMENT WIDTH NOT TO EXCEED 12'.
2. EXPANSION JOINTS SHALL BE INSTALLED AT 50' MAXIMUM INTERVALS.
3. CURING SHALL BE BY ABSORPTIVE COVER; MOISTURE-RETAINING COVER; OR APPROVED CURING COMPOUND. CONTRACTOR SHALL SUBMIT PROPOSED CURING METHOD TO OWNER FOR APPROVAL PRIOR TO CONCRETE INSTALLATION.
4. APPLY WATER BASED 40% SILANE PENETRATING SEALER AFTER A MINIMUM OF 28 DAYS PER MANUFACTURERS RECOMMENDATIONS.
5. USE EPOXY DOWELS FOR NON-CONSECUTIVE POURS.
6. PROVIDE MINIMUM CROSS SLOPE OF 1.5% TO MAXIMUM CROSS SLOPE OF 2.0%..
7. FIBERMESH DOSAGE RATE SHALL BE SPECIFIED IN CONCRETE MIX DESIGN SUBMITTED BY CONTRACTOR.

06	6" THICK CONCRETE HEAVY-DUTY PAVEMENT (PRIVATE)
SH 6	

University of Pittsburgh
FACILITIES MANAGEMENT



Professional Stamp

Project Name	Job No.
STANDARD DETAILS	X5887
Issue Date	MAY 2016

Drawing Description
6" THICK CONCRETE PAVEMENT (PRIVATE)
UNIVERSITY OF PITTSBURGH STANDARD DETAILS

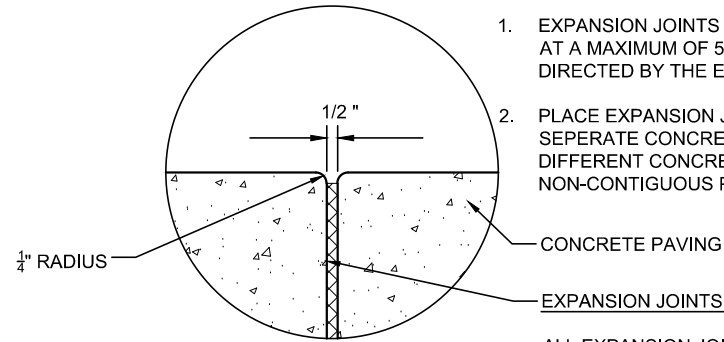
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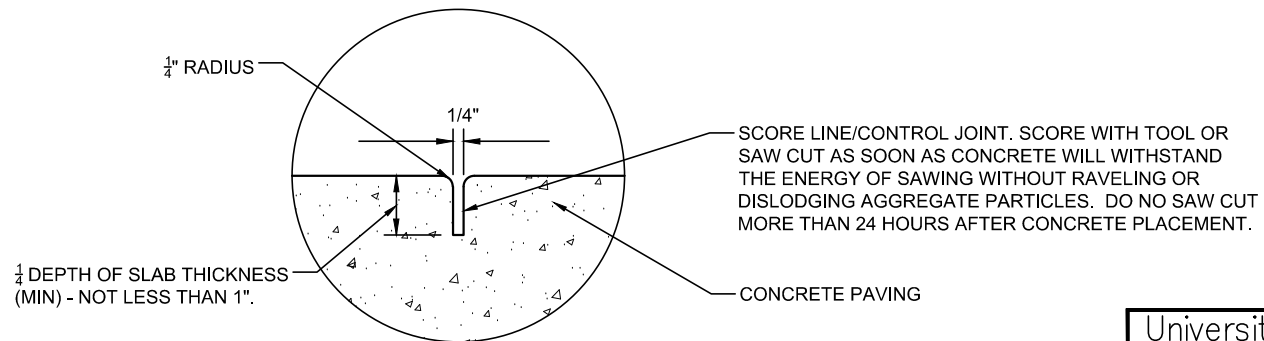
NOTE:

1. EXPANSION JOINTS SHALL BE PLACED AT A MAXIMUM OF 50' O.C. OR AS DIRECTED BY THE ENGINEER
2. PLACE EXPANSION JOINTS TO SEPERATE CONCRETE FROM FIXED OR DIFFERENT CONCRETE STRUCTURE OR NON-CONTIGUOUS POURS.



EXPANSION JOINT

ALL EXPANSION JOINTS SHALL BE PLACED FULL DEPTH AND FILLED WITH "SIKAFLEX 1A POLYURETHANE, ELASTOMERIC SEALANT/ADHESIVE OR APPROVED EQUAL."



LINE/ CONTROL JOINT

NOTE:

CONTROL JOINTS SHALL BE A MAXIMUM OF 5' O.C.

07	EXPANSION - CONTROL JOINTS
SH 7	

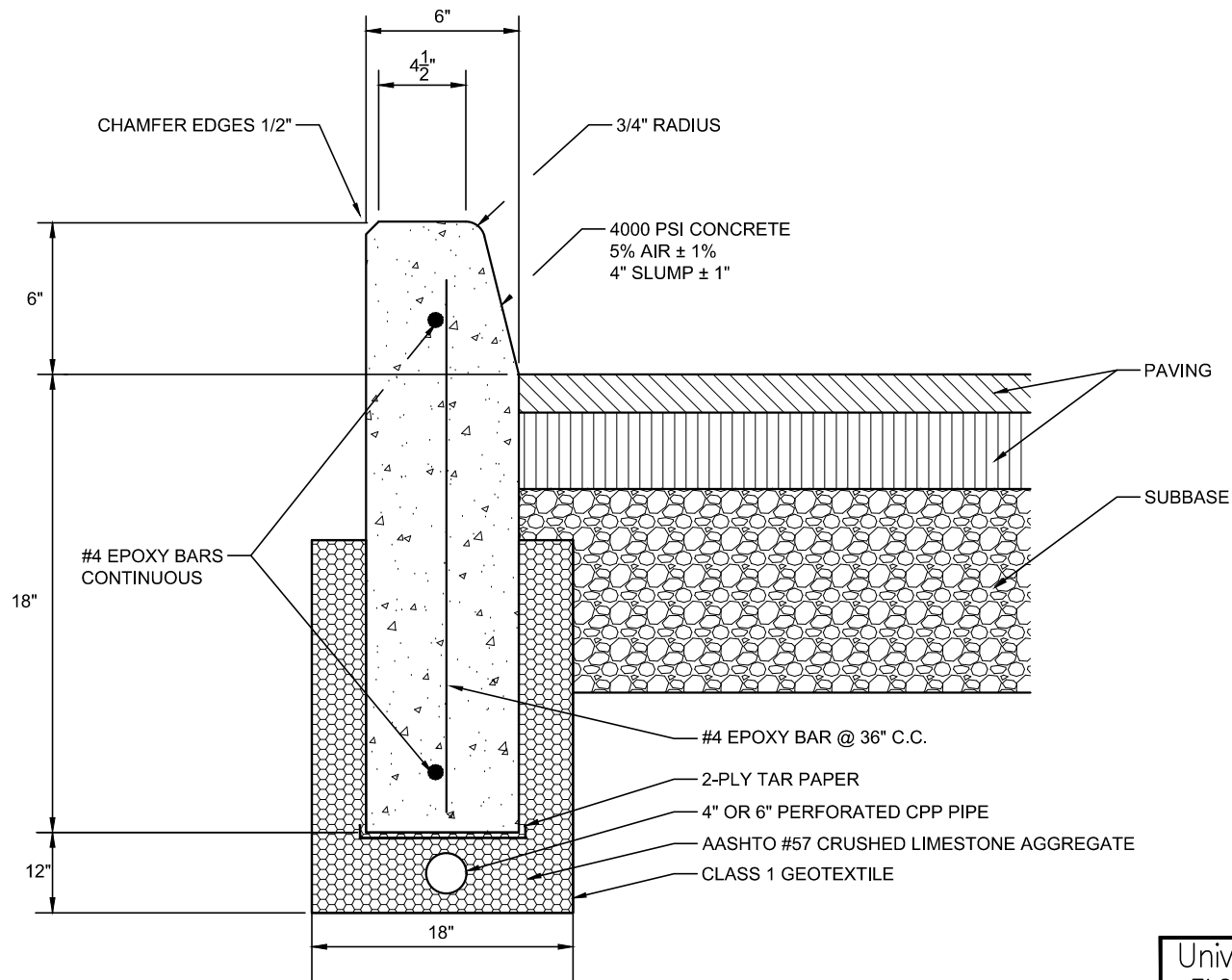
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Project Name	Job No.
STANDARD DETAILS	X5887
Drawing Description	Issue Date
EXPANSION - CONTROL JOINTS	MAY 2016

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Drawing Number	Set Order
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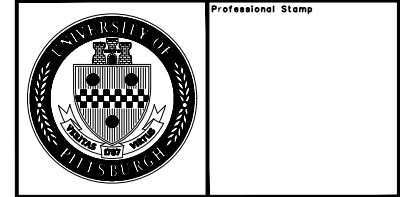


NOTES:

1. PROVIDE EXPANSION JOINTS @ 50' O.C. OR AS DIRECTED BY THE ENGINEER
2. CONTROL JOINTS @ 10' O.C.
3. PLACE CURB DRAIN AS DIRECTED BY OWNER.

08	6" DEEP SET CONCRETE CURB
SH 8	(PRIVATE)

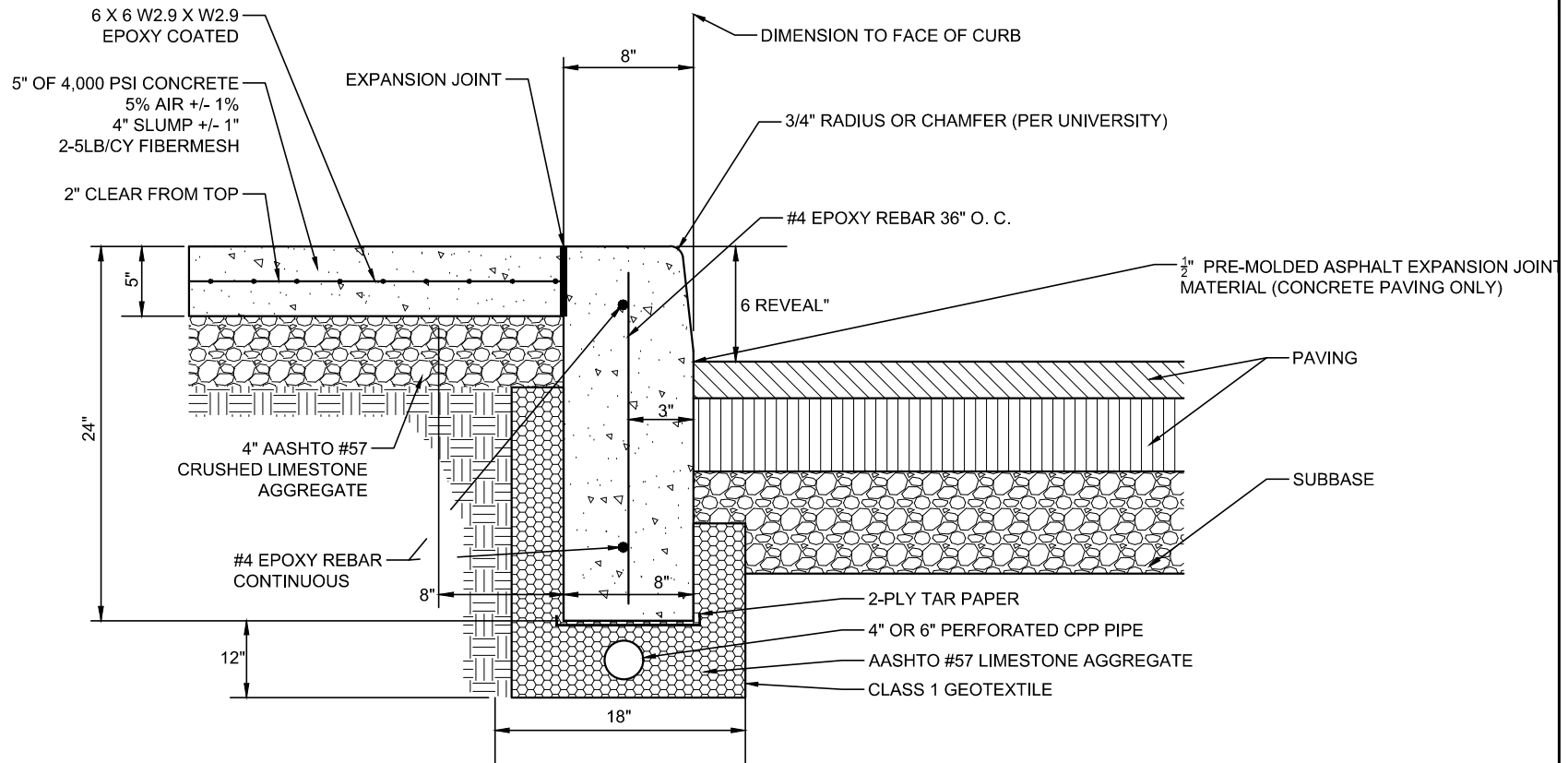
University of Pittsburgh
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Project Name	Job No.
STANDARD DETAILS	X5887
Drawing Description	Issue Date
6" DEEP SET CONCRETE CURB (PRIVATE)	MAY 2016

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NOTES:

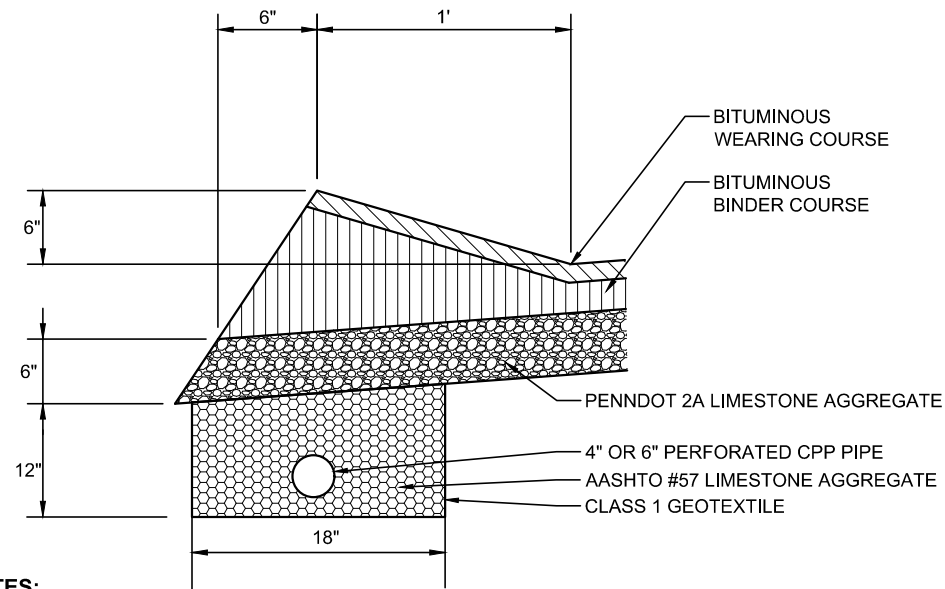
1. ALL CURBS AND WALKS SHALL BE MONOLITHIC POURS. SCORE JOINTS IN VERTICAL CURB SURFACE TO ALIGN WITH WALKWAY JOINTS.
2. CONTRACTOR SHALL PLACE CONTROL JOINTS AT INTERVALS EQUAL TO THE PAVEMENT WIDTH NOT TO EXCEED 12'.
3. EXPANSION JOINTS SHALL BE INSTALLED AT 50' MAXIMUM INTERVALS.
4. PLACE CONCRETE CURB DRAIN AS DIRECTED BY OWNER.

09	CONCRETE CURB AND SIDEWALK (PRIVATE)
SH 9	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
Drawing Description CONCRETE CURB AND SIDEWALK (PRIVATE)	Issue Date MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
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REV. 08/17


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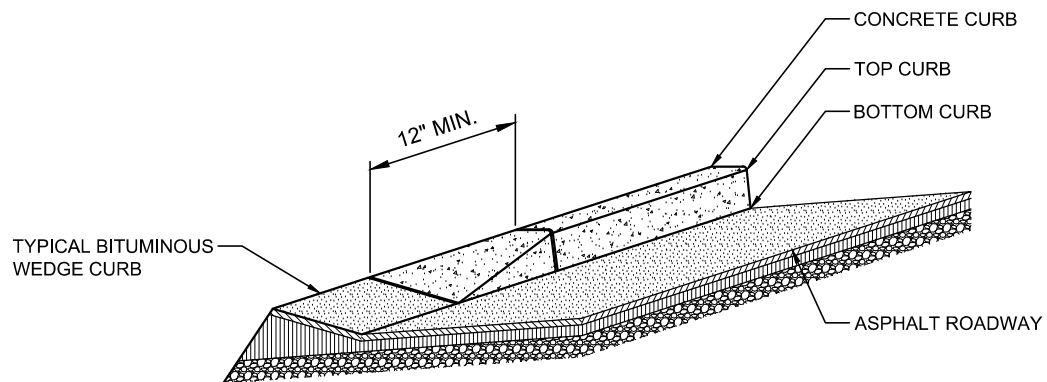
NOTES:

1. ONCE THE FINAL WEARING COURSE OF BITUMINOUS PAVING IS PLACED, THE CONTRACTOR SHALL SEAL THE GUTTER LINE WITH PG 64-22 ASPHALT CEMENT BY OVERLAPPING 3" ONTO THE WEDGE CURB AND EXTENDING 9" ON TO THE CARTWAY IN ACCORDANCE WITH PENNDOT PUBLICATION 408.
2. SUBGRADE DRAINS MAY BE REQUIRED BY WHERE UNDERGROUND WATER IS ENCOUNTERED.
3. CONSTRUCTION MATERIALS AND INSTALLATION SHALL CONFORM TO PENNDOT PUBLICATION 408 UNLESS OTHERWISE INDICATED.
4. PLACE BITUMINOUS WEDGE CURB DRAIN AS DIRECTED BY OWNER.

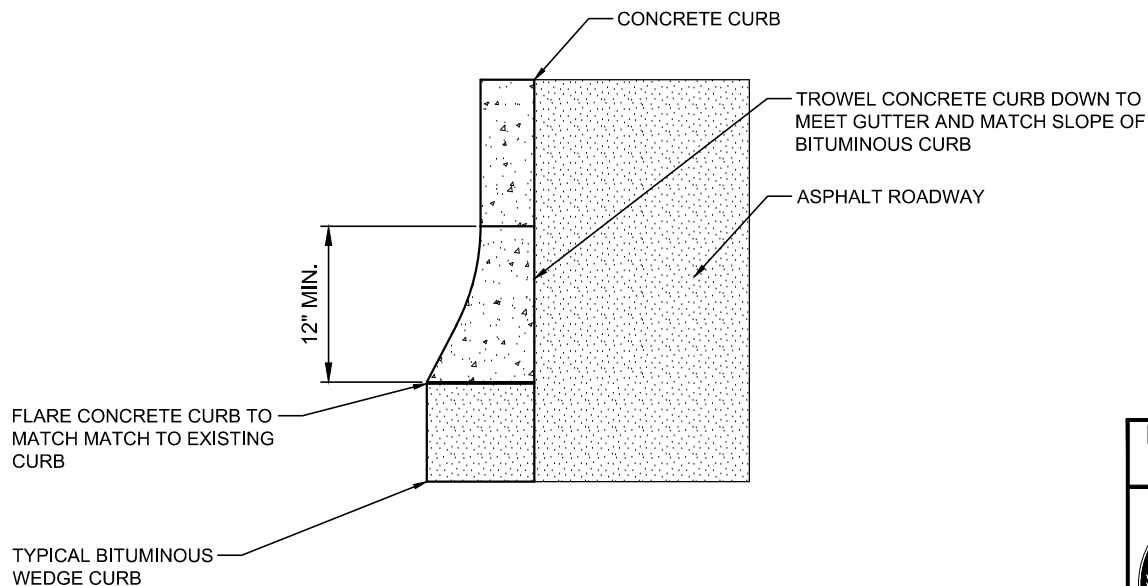
10	BITUMINOUS WEDGE CURB (PRIVATE)
SH 10	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
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Drawing Description BITUMINOUS WEDGE CURB (PRIVATE)	Issue Date MAY 2016
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Drawing Number 10690	Set Order 10 of 44

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ISOMETRIC VIEW

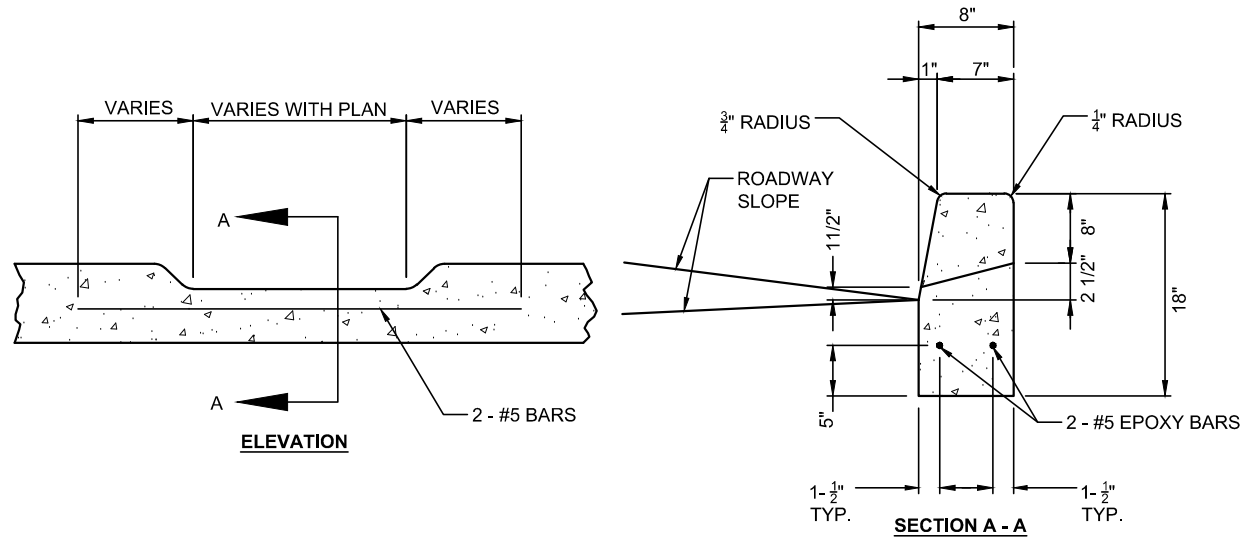


PLAN VIEW

11	CONCRETE CURB TO BITUMINOUS WEDGE CURB TRANSITION
SH 11	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
Drawing Description CONCRETE CURB TO WEDGE CURB TRANSITION	Issue Date MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
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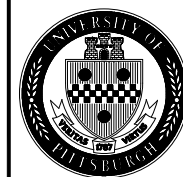


NOTES:

1. CONSTRUCTION MATERIALS AND INSTALLATION SHALL CONFORM TO PENNDOT PUBLICATION 408 UNLESS OTHERWISE INDICATED.
2. SPACE CONTRACTION JOINTS IN UNIFORM LENGTHS OR SECTIONS.
3. PLACE 1/2 INCH PREMOLDED EXPANSION JOINT FILLER MATERIAL AT STRUCTURES AND AT THE END OF THE WORK DAY. CUT MATERIAL TO CONFORM TO AREA ADJACENT TO CURB OR TO CONFORM TO CROSS SECTIONAL AREA OF CURB.

12	DEPRESSED CURB (ON-SITE)
SH 12	

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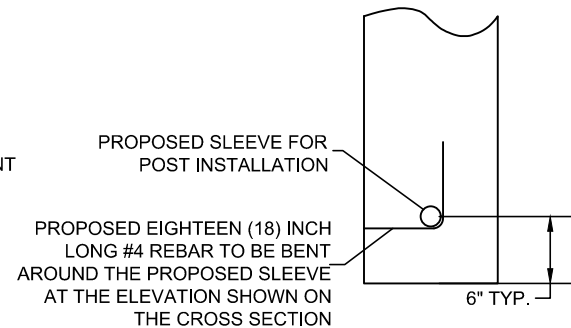
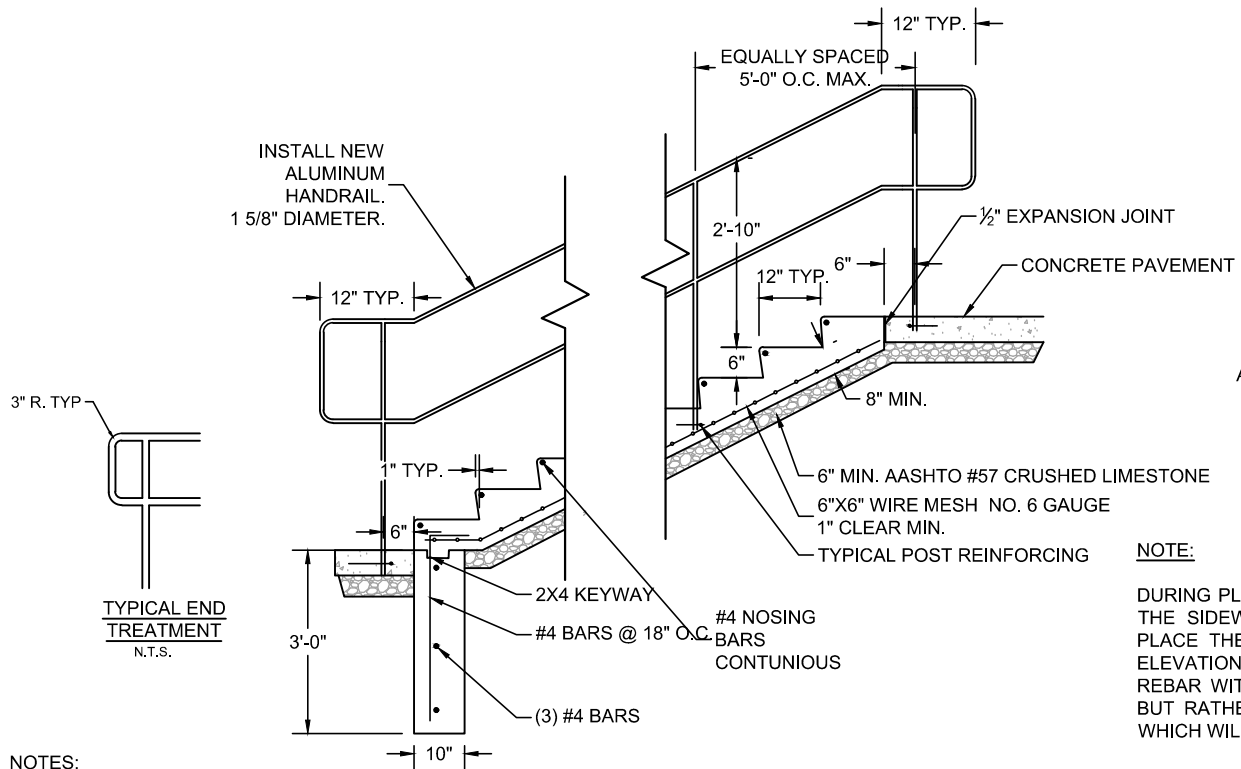


Professional Stamp

Project Name	Job No.
STANDARD DETAILS	X5887
Drawing Description	Issue Date
DEPRESSED CURB (ON-SITE)	MAY 2016

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CAD File Name	Drawn By
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Drawing Number	Set Order
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PLAN VIEW
POST REINFORCEMENT DETAIL
(IN A STAIR)
N.T.S.


NOTE:

DURING PLACEMENT OF THE POST REINFORCEMENT REBAR WITHIN THE SIDEWALK AREA, THE CONTRACTOR WILL BE REQUIRED TO PLACE THE #4 REBAR ON THE OUTSIDE OF THE SLEEVE AT THE ELEVATION SHOWN ON THE ABOVE DETAIL. THE REINFORCEMENT REBAR WITHIN THE SIDEWALK AREA WILL NOT NEED TO BE BENT, BUT RATHER WILL BE REQUIRED TO REMAIN AS A STRAIGHT BAR WHICH WILL BE TIED TO THE WELDED WIRE MESH.

NOTES:

- CONTRACTOR TO EMBED POSTS INTO CONCRETE STEPS EIGHT (8) INCHES. POSTS WITHIN CONCRETE SLABS-ON-GRADES SHALL BE EMBEDDED FOUR (4) INCHES.
- AN 18-INCH LONG REBAR MUST BE PROVIDED ON THE OUTSIDE OF EACH POST SLEEVE TO HELP PREVENT THE CRACKING AND BREAKING AWAY OF THE CONCRETE. THE 18-INCH LONG #4 REBAR MUST BE TIED TO THE REBAR IN THE STEPS/SLABS.
- MIX DESIGNS MUST BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO THE START OF CONSTRUCTION.
- ALL POSTS ARE REQUIRED TO BE GROUTED INTO PVC SLEEVES THAT WILL BE SET DURING THE POURING OF THE STEPS/WALKWAY. DRILLING OF THE CONCRETE FOR POST INSTALLATION WILL NOT BE PERMITTED UNLESS PREVIOUSLY APPROVED BY THE ENGINEER.
- ALL REBAR ARE TO BE TIED TOGETHER AND THE BOTTOM ROWS OF REBAR ARE REQUIRED TO BE SET ON CHAIRS TO ENSURE THAT THEY DO NOT MOVE DURING THE POURING OF THE CONCRETE.
- CURING SHALL BE BY ABSORPTIVE COVER; MOISTURE RETAINING COVER; OR APPROVED CURING COMPOUND. CONTRACTOR SHALL SUBMIT PROPOSED CURING METHOD TO OWNER FOR APPROVAL PRIOR TO CONCRETE INSTALLATION. ALL CONCRETE SIDEWALK AND STEPS SHALL BE FINISHED WITH A BROOM FINISH.
- APPLY WATER BASED 40% SILANE PENETRATING SEALER AFTER A MINIMUM OF 28 DAYS PER MANUFACTURERS RECOMMENDATIONS.
- THE STEPS ARE REQUIRED TO POSITIVELY SLOPE (~0.5%) AWAY FROM THE RISER TO ELIMINATE THE POTENTIAL FOR PONDING OF WATER ON THE STEPS.
- END TREATMENTS WILL BE WELDED IN PLACE AND GROUND SMOOTH AND FINISHED. BOLTED, SCREWED OR COUPLING, ETC CONNECTIONS WILL NOT BE PERMITTED

13	CONCRETE STAIR SECTION
SH 13	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
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Drawing Description CONCRETE STAIR SECTION	Issue Date MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
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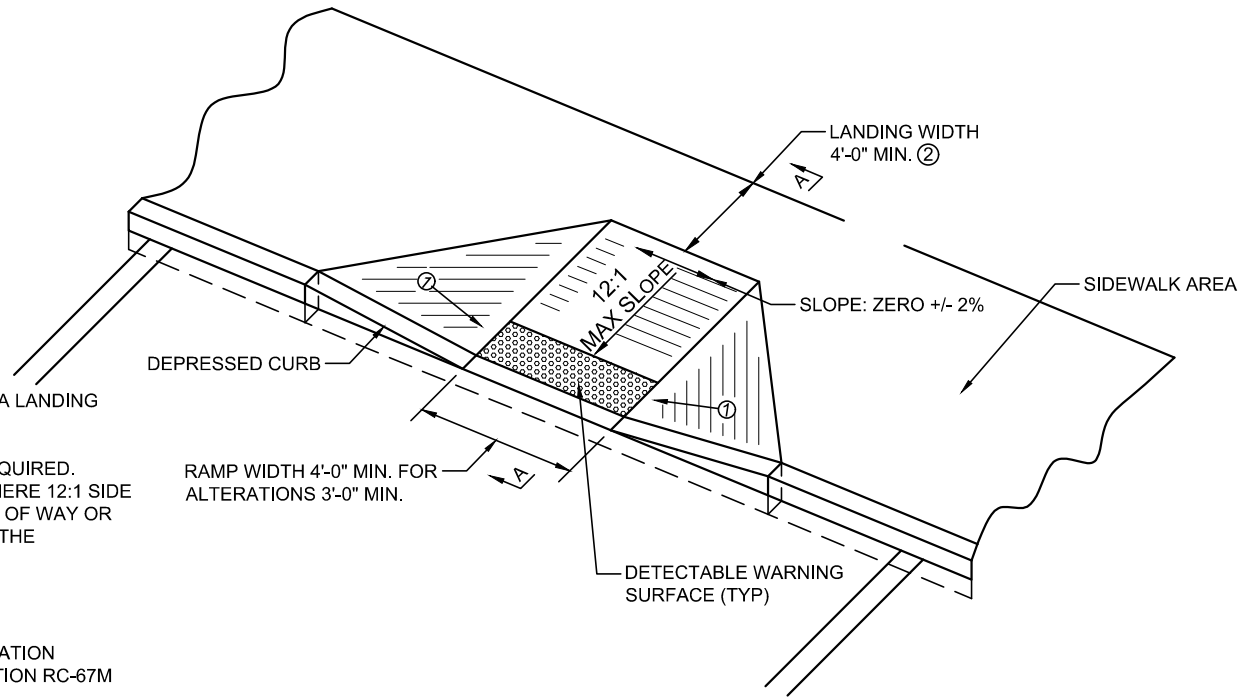
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① SIDE FLARES 10:1 MAX SLOPE

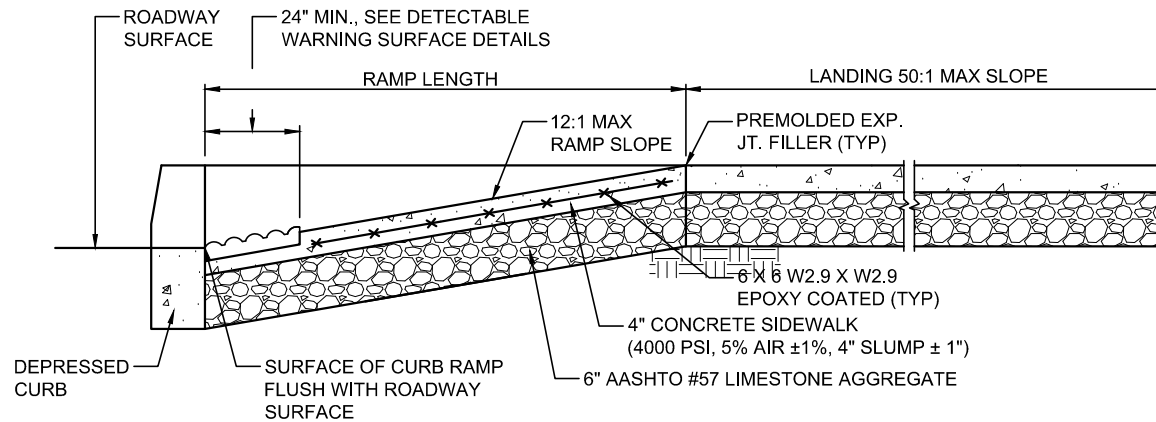
② SIDE FLARES 12:1 MAX FOR RAMPS WITH A LANDING LESS THAN 4'-0". FOR ALTERATIONS: IF TECHNICALLY FEASIBLE A LANDING IS REQUIRED. HOWEVER A LANDING IS NOT REQUIRED WHERE 12:1 SIDE FLARES SLOPES ARE PROVIDED AND RIGHT OF WAY OR OTHER STRUCTURAL FEATURES RESTRICT THE INSTALLATION OF A LANDING.

NOTES :

- REFER TO DEPARTMENT OF TRANSPORTATION STANDARDS FOR ROADWAY CONSTRUCTION RC-67M FOR ADDITIONAL DETAILS AND NOTES.
- CONTRACTOR TO ENSURE USE OF THE MOST CURRENT DEPARTMENT OF TRANSPORTATION STANDARDS FOR ROADWAY CONSTRUCTION, JUNE 2010 EDITION OR NEWER.



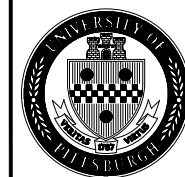
TYPE 1 CURB RAMP



TYPE 1 SECTION A-A

14	TYPE 1 CURB RAMP (RC-67M)
SH 14	

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Professional Stamp

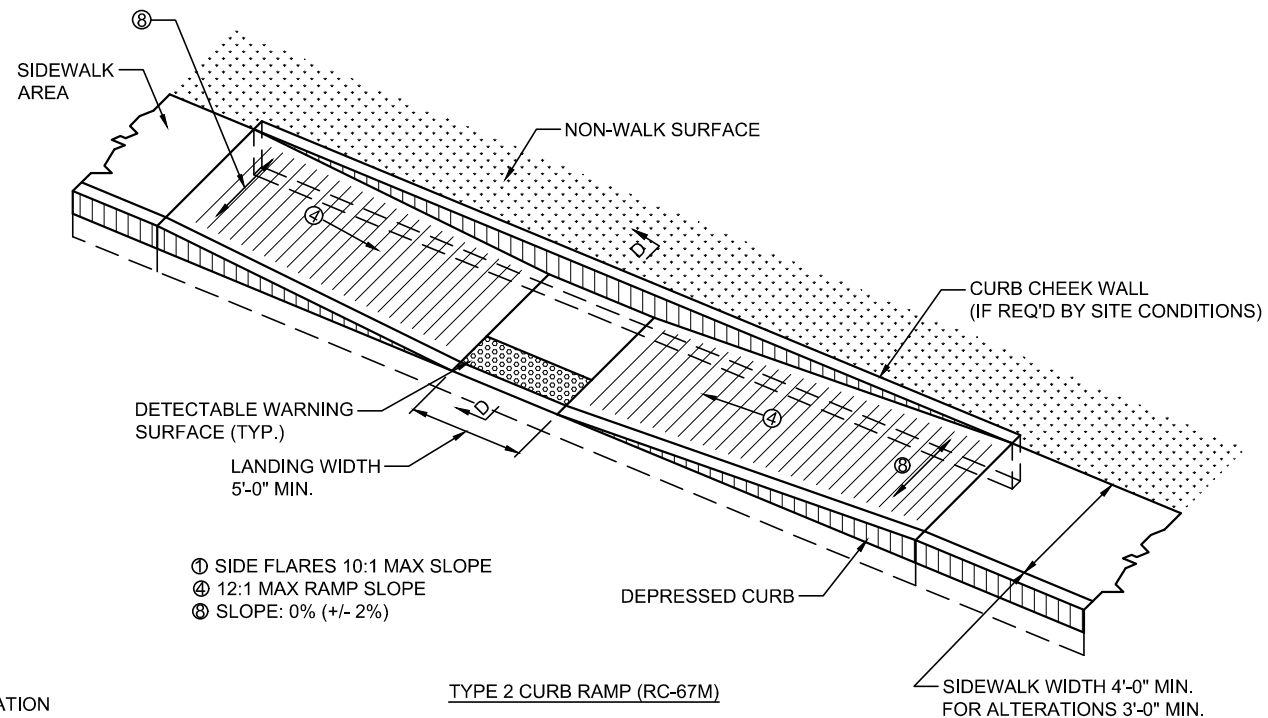
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STANDARD DETAILS	X5887
Drawing Description	Issue Date
TYPE 1 CURB RAMP (RC-67M)	MAY 2016

UNIVERSITY OF PITTSBURGH STANDARD DETAILS

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Drawing Number	Set Order
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THIS DETAIL WAS BASED ON CURRENT ACCEPTED ADA STANDARD CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT ADA REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

REVISIONS		
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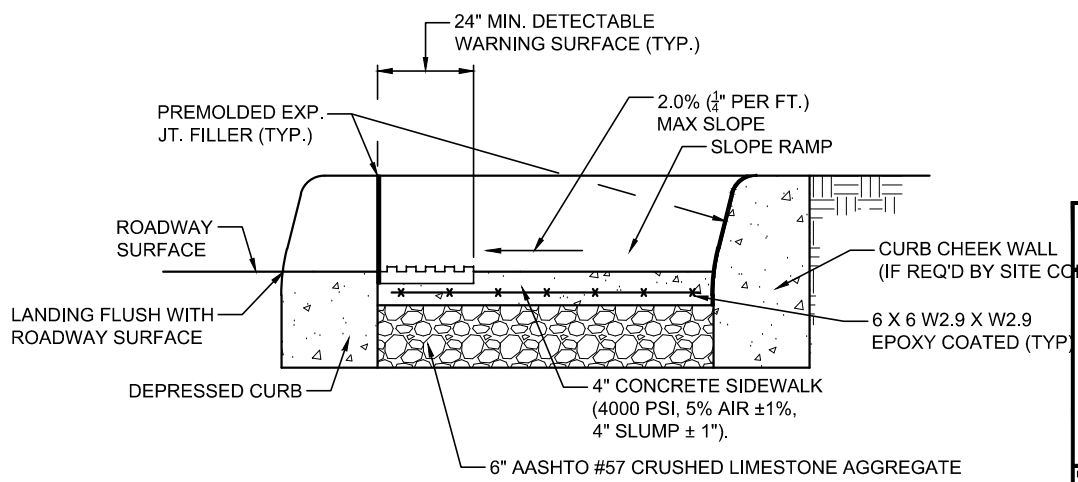


- ① SIDE FLARES 10:1 MAX SLOPE
- ② 12:1 MAX RAMP SLOPE
- ③ SLOPE: 0% (+/- 2%)

TYPE 2 CURB RAMP (RC-67M)

NOTES :


1. REFER TO DEPARTMENT OF TRANSPORTATION STANDARDS FOR ROADWAY CONSTRUCTION RC-67M FOR ADDITIONAL DETAILS AND NOTES.
2. CONTRACTOR TO ENSURE USE OF THE MOST CURRENT DEPARTMENT OF TRANSPORTATION STANDARDS FOR ROADWAY CONSTRUCTION, JUNE 2010 EDITION OR NEWER.



TYPE 2 CURB RAMPS SECTION D-D (RC-67M)

15	TYPE 2 CURB RAMP (RC-67M)
SH 15	

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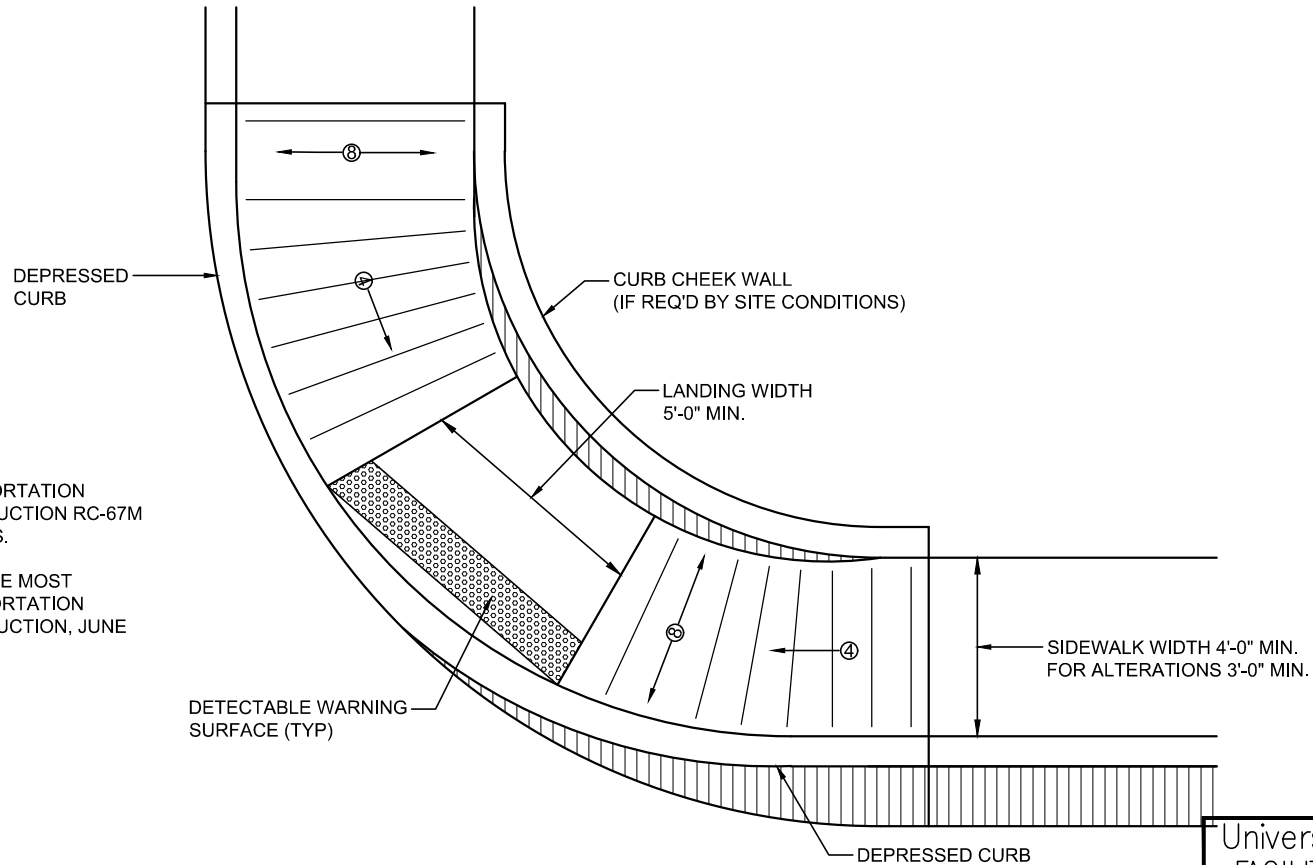


Professional Stamp

Project Name	Job No.
STANDARD DETAILS	X5887
Drawing Description	Issue Date
TYPE 2 CURB RAMP (RC-67M)	MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name	Drawn By
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Drawing Number	Set Order
10690	15 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED ADA STANDARD CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT ADA REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

REVISIONS			
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02	-	-	-



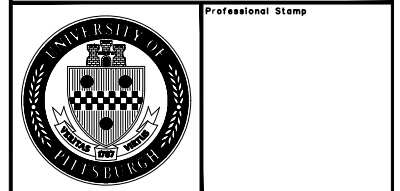
NOTES :

1. REFER TO DEPARTMENT OF TRANSPORTATION STANDARDS FOR ROADWAY CONSTRUCTION RC-67M FOR ADDITIONAL DETAILS AND NOTES.
2. CONTRACTOR TO ENSURE USE OF THE MOST CURRENT DEPARTMENT OF TRANSPORTATION STANDARDS FOR ROADWAY CONSTRUCTION, JUNE 2010 EDITION OR NEWER.

- ① SIDE FLARES 10:1 MAX SLOPE.
- ④ 12:1 MAX RAMP SLOPE.
- ⑧ SLOPE: 0% (+/- 2%).

16	TYPE 2 CURB RAMP (DIAGONAL) (RC-67M)
SH 16	

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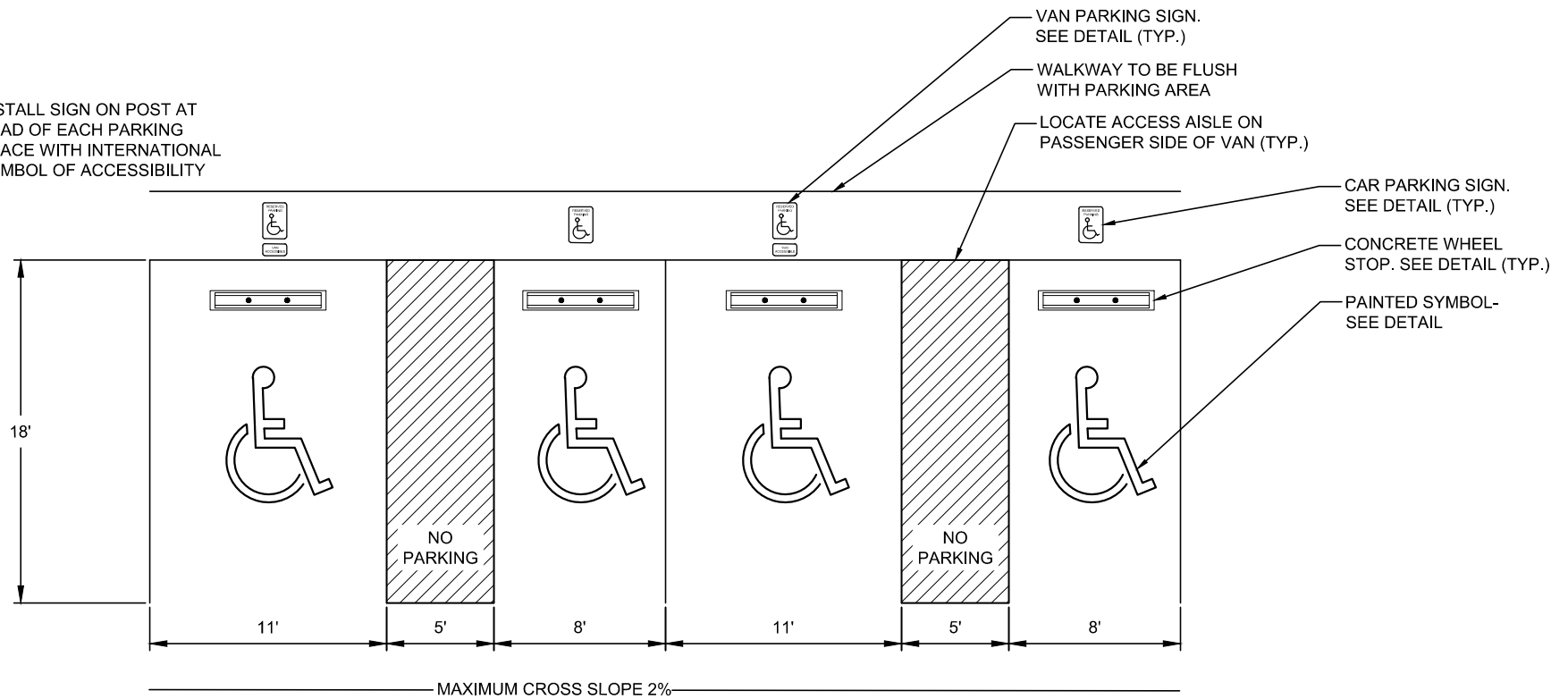
Project Name	Job No.
STANDARD DETAILS	X5887
Drawing Description	Issue Date
TYPE 2 CURB RAMP (DIAGONAL) (RC-67M)	MAY 2016

UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name	Drawn By
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Drawing Number	Set Order
10690	16 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED ADA STANDARD CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT ADA REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

REVISIONS		
No.	By	Date
01	-	-
02	-	-

INSTALL SIGN ON POST AT HEAD OF EACH PARKING SPACE WITH INTERNATIONAL SYMBOL OF ACCESSIBILITY



NOTES:

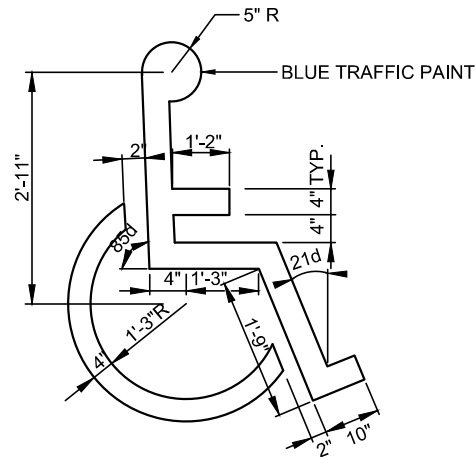
1. REFER TO SITE PLAN FOR ADDITIONAL INFORMATION.

17	TYPICAL HANDICAP PARKING
SH 17	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
Drawing Description TYPICAL HANDICAP PARKING	Issue Date MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name G:\Projects\12000\12807- Pitt Greensburg\0070 Pitt Standard Details\0wg\02-Sheet\Details.dwg	Drawn By --
Drawing Number 10690	Set Order 17 of 44


THIS DETAIL WAS BASED ON CURRENT ACCEPTED ADA STANDARD CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT ADA REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

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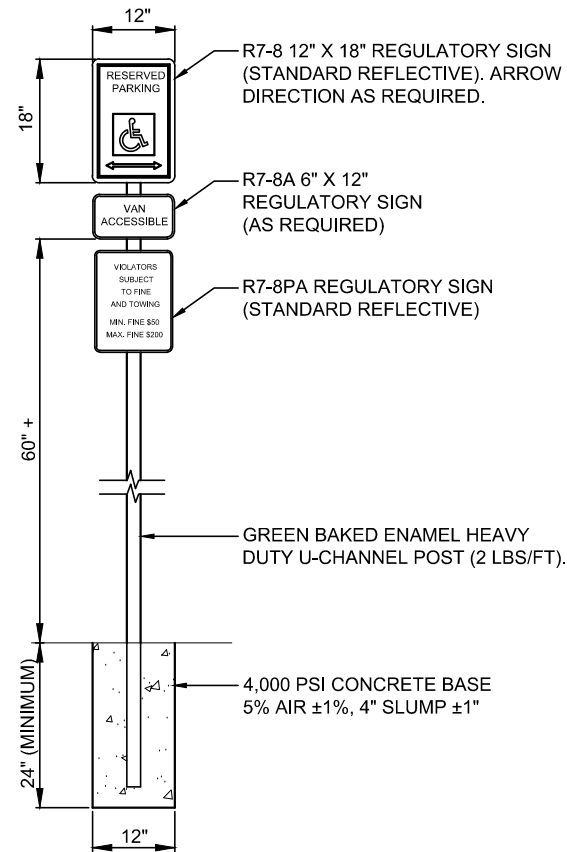
NOTE:
1. REFER TO SITE PLAN FOR ADDITIONAL INFORMATION.

18	HANDICAPPED SYMBOL FOR PARKING
SH 18	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name	
STANDARD DETAILS	Job No. X5887
Drawing Description	
HANDICAPPED SYMBOL FOR PARKING	
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name	
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Drawing Number	
10690	Set Order 18 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED ADA STANDARD CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT ADA REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

REVISIONS		
No.	By	Description
01	-	-
02	-	-

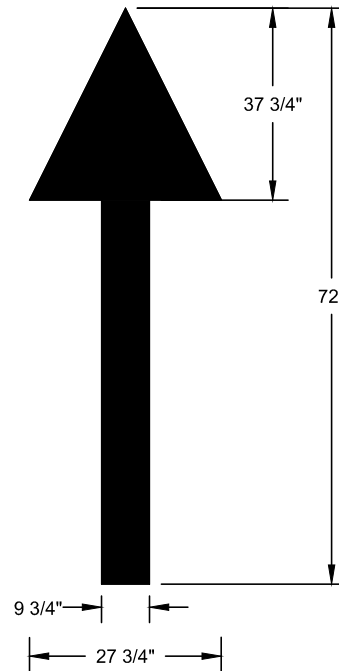


19	ACCESSIBILITY HANDICAPPED
SH 19	PARKING SIGN

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
Drawing Description ACCESSIBILITY HANDICAPPED PARKING SIGN	Issue Date MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name <small>G:\Projects\12000\12807- Pitt Greensburg-0070 Pitt Standard Details\0wg\02-Sheet\Details.dwg</small>	Drawn By --
Drawing Number 10690	Set Order 19 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED ADA STANDARD CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT ADA REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.


REVISIONS		
No.	By	Description
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02	-	-



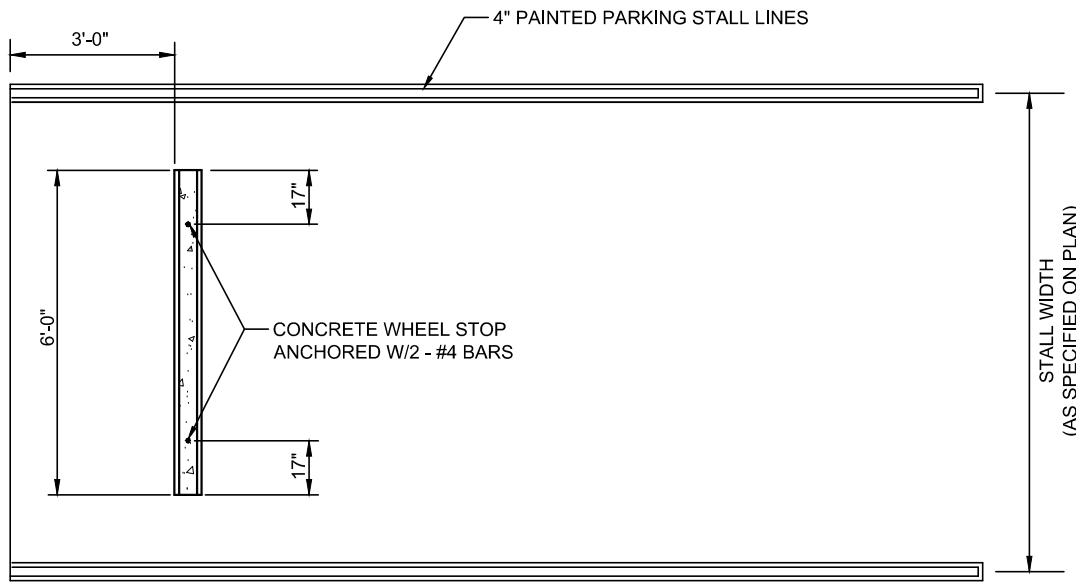
NOTES:

1. USE 6" WIDE LANE MARKING PAINT WITH MECHANICAL EQUIPMENT TO PRODUCE UNIFORM STRAIGHT EDGES.
2. USE LATEX TYPE, READY MIXED COMPLYING WITH FEDERAL SPECIFICATION TT-P-1952E TYPES 1 AND 2, COLOR: WHITE.
3. NEW ARROWS TO BE 15 MILS THICK.
4. APPLY PER MANUFACTURERS RECOMMENDATIONS.

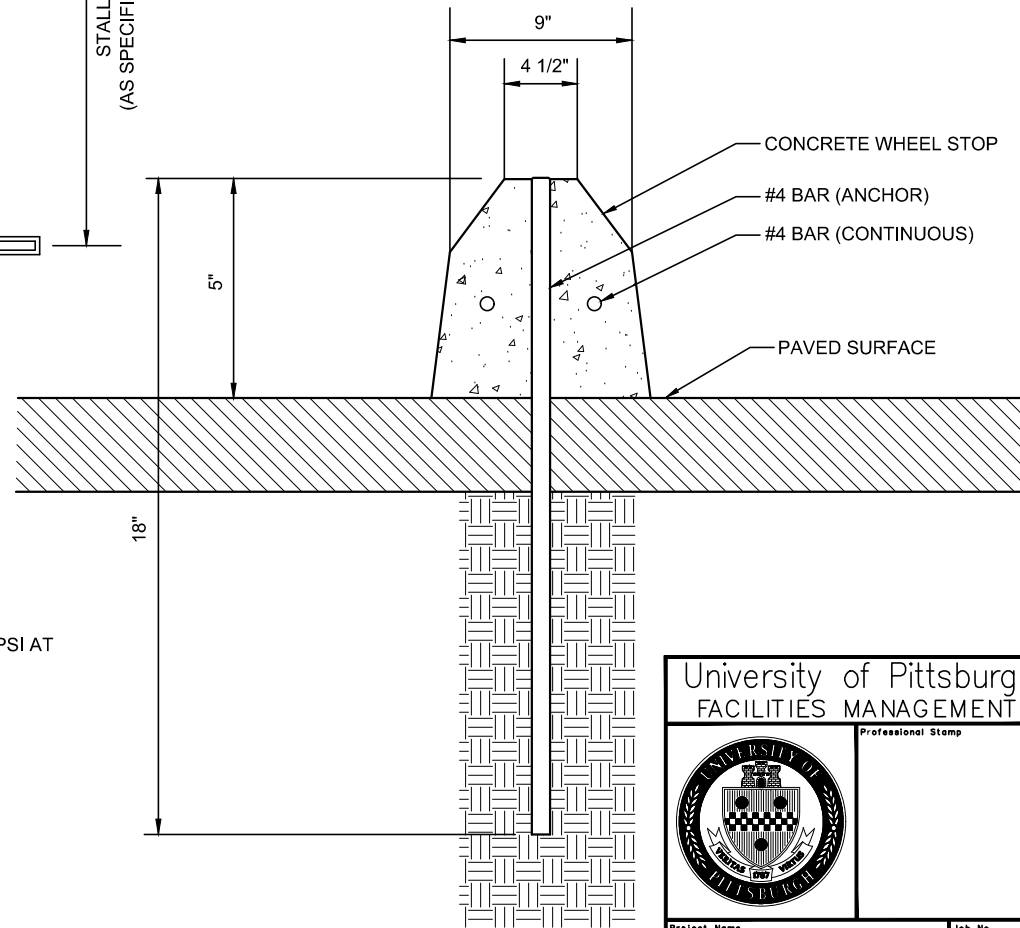
20	PAINTED DIRECTIONAL ARROW
SH 20	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
	Issue Date MAY 2016
Drawing Description PAINTED DIRECTIONAL ARROWS	
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name G:\Projects\12000\12807- Pitt Greensburg\0070 Pitt Standard Details\0wg\02-Sheet\Details.dwg	Drawn By --
Drawing Number 10690	Set Order 20 of 44

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PLAN VIEW



SECTION

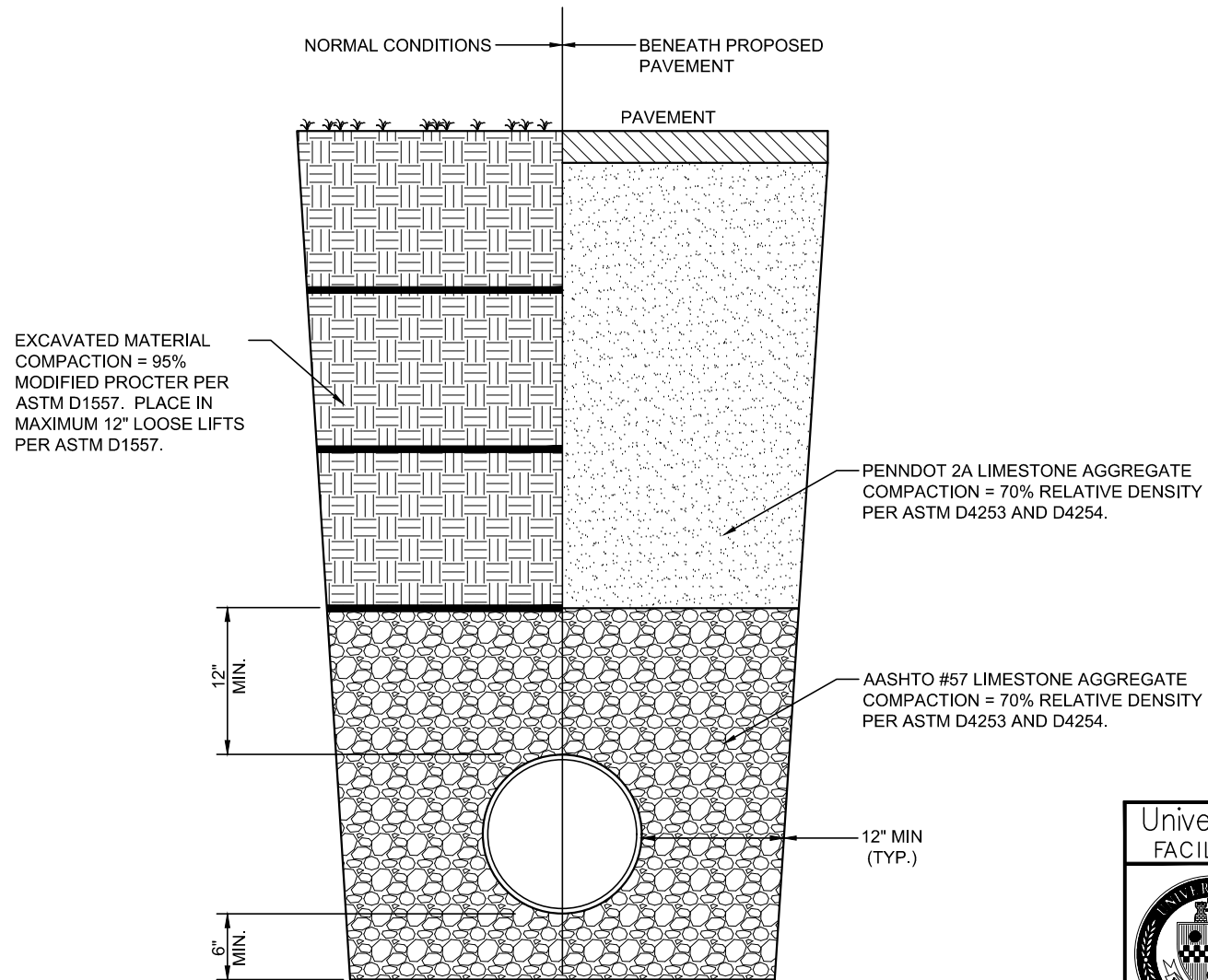
NOTES:

1. REINFORCED PRECAST CONCRETE SHALL HAVE A COMPRESSION STRENGTH OF 5000 PSI AT 28 DAYS.
2. REINFORCING TO BE (2) #4 BARS FULL LENGTH OF EACH PIECE.


University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
Drawing Description CONCRETE WHEEL STOP	Issue Date MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name G:\Projects\12000\12807- Pitt Greensburg-0070 Pitt Standard Details\0wg\02-Sheet\Details.dwg	Drawn By --
Drawing Number 10690	Set Order 21 of 44

21	CONCRETE WHEEL STOP
SH 21	

REVISIONS		
No.	By	Date/Description
01	-	-
02	-	-



22	UNDERGROUND PIPE OR CONDUIT BACKFILL
SH 22	


University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
Drawing Description UNDERGROUND PIPE OR CONDUIT BACKFILL	Issue Date MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name G:\Projects\12000\12807- Pitt Greensburg-0070 Pitt Standard Details\0wg\02-Sheet\Details.dwg	Drawn By --
Drawing Number 10690	Set Order 22 of 44

**STANDARD SITE
CONSTRUCTION EROSION AND
SEDIMENTATION CONTROL DETAILS**

STANDARD EROSION AND SEDIMENT CONTROL PLAN NOTES

REVISIONS		
No.	By	Date/Description
01	-	-
02	-	-

1. ALL EARTH DISTURBANCES, INCLUDING CLEARING AND GRUBBING AS WELL AS CUTS AND FILLS SHALL BE DONE IN ACCORDANCE WITH THE APPROVED E&S PLAN. A COPY OF THE APPROVED DRAWINGS (STAMPED, SIGNED AND DATED BY THE REVIEWING AGENCY) MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE REVIEWING AGENCY SHALL BE NOTIFIED OF ANY CHANGES TO THE APPROVED PLAN PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES FOR REVIEW AND APPROVAL AT ITS DISCRETION.
2. AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE PCSM PLAN PREPARER, THE LICENSED PROFESSIONAL RESPONSIBLE FOR OVERSIGHT OF CRITICAL STAGES OF IMPLEMENTATION OF THE PCSM PLAN, AND A REPRESENTATIVE FROM THE LOCAL CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING.
3. AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM INC. SHALL BE NOTIFIED AT 1-800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.
4. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM THE LOCAL CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION.
5. AREAS TO BE FILLED ARE TO BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL.
6. CLEARING, GRUBBING, AND TOPSOIL STRIPPING SHALL BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE OF THE CONSTRUCTION SEQUENCE. GENERAL SITE CLEARING, GRUBBING AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE E&S BMPS SPECIFIED BY THE BMP SEQUENCE FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THIS E&S PLAN.
7. AT NO TIME SHALL CONSTRUCTION VEHICLES BE ALLOWED TO ENTER AREAS OUTSIDE THE LIMIT OF DISTURBANCE BOUNDARIES SHOWN ON THE PLAN MAPS. THESE AREAS MUST BE CLEARLY MARKED AND FENCED OFF BEFORE CLEARING AND GRUBBING OPERATIONS BEGIN.
8. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED AT THE LOCATION(S) SHOWN ON THE PLAN MAPS(S) IN THE AMOUNT NECESSARY TO COMPLETE THE FINISH GRADING OF ALL EXPOSED AREAS THAT ARE TO BE STABILIZED BY VEGETATION. EACH STOCKPILE SHALL BE PROTECTED IN THE MANNER SHOWN ON THE PLAN DRAWINGS. STOCKPILE HEIGHTS SHALL NOT EXCEED 35 FEET. STOCKPILE SLOPES SHALL BE 2H:1V OR FLATTER.
9. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT POLLUTION AND NOTIFY THE LOCAL CONSERVATION DISTRICT AND/OR THE REGIONAL OFFICE OF THE DEPARTMENT.
10. ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1, AND 287.1 ET. SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE.
11. ALL OFF-SITE WASTE AND BORROW AREAS MUST HAVE AN E&S PLAN APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT FULLY IMPLEMENTED PRIOR TO BEING ACTIVATED.
12. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ANY MATERIAL BROUGHT ON SITE IS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE PROPERTY OWNER FOR ANY FILL MATERIAL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE BUT QUALIFYING AS CLEAN FILL DUE TO ANALYTICAL TESTING.
13. ALL PUMPING OF WATER FROM ANY WORK AREA SHALL BE DONE ACCORDING TO THE PROCEDURE DESCRIBED IN THIS PLAN, OVER UNDISTURBED VEGETATED AREAS.
14. VEHICLES AND EQUIPMENT MAY NEITHER ENTER DIRECTLY NOR EXIT DIRECTLY FROM THE PROJECT SITE ONTO PUBLIC ROADS.
15. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS SHALL BE MAINTAINED PROPERLY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RENETTING MUST BE PERFORMED IMMEDIATELY. IF THE E&S BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.
16. A LOG SHOWING DATES THAT E&S BMPS WERE INSPECTED AS WELL AS ANY DEFICIENCIES FOUND AND THE DATE THEY WERE CORRECTED SHALL BE PROVIDED UPON REQUEST OF THE REGULATORY AGENCY.
17. SEDIMENT TRACKED ONTO ANY PUBLIC ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE BY THE END OF EACH WORK DAY AND DISPOSED IN THE MANNER DESCRIBED IN THIS PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED, SHOVELED, OR SWEEPED INTO ANY ROADSIDE DITCH, STORM SEWER, OR SURFACE WATER.
18. ALL SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF IN THE MANNER DESCRIBED ON THE PLAN DRAWINGS.
19. AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 TO 5 INCHES – 6 TO 12 INCHES ON COMPACTED SOILS – PRIOR TO PLACEMENT OF TOPSOIL. AREAS TO BE VEGETATED SHALL HAVE A MINIMUM 4 INCHES OF TOPSOIL IN PLACE PRIOR TO SEEDING AND MULCHING. FILL OUTSLOPES SHALL HAVE A MINIMUM OF 2 INCHES OF TOPSOIL.
20. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES. REFER TO GEOTECHNICAL REPORT AND CROSS SECTIONS.
21. ALL EARTHEN FILLS SHALL BE PLACED IN COMPACTED LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.
22. FILL MATERIALS SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.
23. FROZEN MATERIALS OR SOFT, MUCKY, OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILLS.
24. FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.
25. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAIN OR OTHER APPROVED METHOD.
26. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY UPON REACHING FINISHED GRADE. CUT SLOPES IN COMPETENT BEDROCK AND ROCK FILLS NEED NOT BE VEGETATED. SEEDED AREAS WITHIN 50 FEET OF A SURFACE WATER, OR AS OTHERWISE SHOWN ON THE PLAN DRAWINGS, SHALL BE BLANKETED ACCORDING TO THE STANDARDS OF THIS PLAN.
27. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE IN ANY AREA OR SUBAREA OF THE PROJECT, THE OPERATOR SHALL STABILIZE ALL DISTURBED AREAS. DURING NON-GERMINATING MONTHS, MULCH OR PROTECTIVE BLANKETING SHALL BE APPLIED AS DESCRIBED IN THE PLAN. AREAS NOT AT FINISHED GRADE, WHICH WILL BE REACTIVATED WITHIN 1 YEAR, MAY BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY STABILIZATION SPECIFICATIONS. THOSE AREAS WHICH WILL NOT BE REACTIVATED WITHIN 1 YEAR SHALL BE STABILIZED IN ACCORDANCE WITH THE PERMANENT STABILIZATION SPECIFICATIONS.
28. PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION. CUT AND FILL SLOPES SHALL BE CAPABLE OF RESISTING FAILURE DUE TO SLUMPING, SLIDING, OR OTHER MOVEMENTS.
29. E&S BMPS SHALL REMAIN FUNCTIONAL AS SUCH UNTIL ALL AREAS TRIBUTARY TO THEM ARE PERMANENTLY STABILIZED OR UNTIL THEY ARE REPLACED BY ANOTHER BMP APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT.
30. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE INSPECTING AUTHORITY FOR AN INSPECTION PRIOR TO REMOVAL/CONVERSION OF THE E&S BMPS.
31. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED OR CONVERTED TO PERMANENT POST CONSTRUCTION STORMWATER MANAGEMENT BMPS. AREAS DISTURBED DURING REMOVAL OR CONVERSION OF THE BMPS SHALL BE STABILIZED IMMEDIATELY, IN ORDER TO ENSURE RAPID REVEGETATION OF DISTURBED AREAS, SUCH REMOVAL/CONVERSIONS ARE TO BE DONE ONLY DURING THE GERMINATING SEASON.
32. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE INSPECTING AUTHORITY T TO SCHEDULE A FINAL INSPECTION.
33. FAILURE TO CORRECTLY INSTALL E&S BMPS, FAILURE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE, OR FAILURE TO TAKE IMMEDIATE CORRECTIVE ACTION TO RESOLVE FAILURE OF E&S BMPS MAY RESULT IN ADMINISTRATIVE, CIVIL, AND/OR CRIMINAL PENALTIES BEING INSTITUTED BY THE DEPARTMENT AS DEFINED IN SECTION 602 OF THE PENNSYLVANIA CLEAN STREAMS LAW. THE CLEAN STREAMS LAW PROVIDES FOR UP TO \$10,000 PER DAY IN CIVIL PENALTIES, UP TO \$10,000 IN SUMMARY CRIMINAL PENALTIES, AND UP TO \$25,000 IN MISDEMEANOR CRIMINAL PENALTIES FOR EACH VIOLATION.
34. CONCRETE WASH WATER SHALL BE HANDLED IN THE MANNER DESCRIBED ON THE PLAN DRAWINGS. IN NO CASE SHALL IT BE ALLOWED TO ENTER ANY SURFACE WATERS OR GROUNDWATER SYSTEMS.
35. UNDERGROUND UTILITIES CUTTING THROUGH ANY ACTIVE CHANNEL SHALL BE IMMEDIATELY BACKFILLED AND THE CHANNEL RESTORED TO ITS ORIGINAL CROSS-SECTION AND PROTECTIVE LINING. ANY BASE FLOW WITHIN THE CHANNEL SHALL BE CONVEYED PAST THE WORK AREA IN THE MANNER DESCRIBED IN THIS PLAN UNTIL SUCH RESTORATION IS COMPLETE.
36. SEDIMENT BASINS AND/OR TRAPS SHALL BE KEPT FREE OF ALL CONSTRUCTION WASTE, WASH WATER, AND OTHER DEBRIS HAVING POTENTIAL TO CLOG THE BASIN/TRAP OUTLET STRUCTURES AND/OR POLLUTE THE SURFACE WATERS.
37. SEDIMENT BASINS SHALL BE PROTECTED FROM UNAUTHORIZED ACTS BY THIRD PARTIES.
38. ANY DAMAGE THAT OCCURS IN WHOLE OR IN PART AS A RESULT OF BASIN OR TRAP DISCHARGE SHALL BE IMMEDIATELY REPAIRED BY THE PERMITTEE IN A PERMANENT MANNER SATISFACTORY TO THE MUNICIPALITY, LOCAL CONSERVATION DISTRICT, AND THE OWNER OF THE DAMAGED PROPERTY.
39. UPON REQUEST, THE APPLICANT OR HIS CONTRACTOR SHALL PROVIDE AN AS-BUILT (RECORD DRAWING) FOR ANY SEDIMENT BASIN OR TRAP TO THE INSPECTING AUTHORITY OR THE DEPARTMENT.
40. EROSION CONTROL BLANKETING SHALL BE INSTALLED ON ALL SLOPES 3H:1V OR STEEPER WITHIN 50 FEET OF A SURFACE WATER AND ON ALL OTHER DISTURBED AREAS SPECIFIED ON THE PLAN MAPS AND/OR DETAIL SHEETS.
41. FILL MATERIAL FOR EMBANKMENTS SHALL BE FREE OF ROOTS, OR OTHER WOODY VEGETATION, ORGANIC MATERIAL, LARGE STONES, AND OTHER OBJECTIONABLE MATERIALS. THE EMBANKMENT SHALL BE COMPACTED IN MAXIMUM 10" LAYERED LIFTS AT 90% DENSITY.

<h2>University of Pittsburgh</h2> <h3>FACILITIES MANAGEMENT</h3>			Professional Stamp
Project Name <h1>STANDARD DETAILS</h1>		Job No. X5887	Issue Date MAY 2016
Drawing Description <h2>STANDARD EROSION AND SEDIMENT CONTROL NOTES</h2> UNIVERSITY OF PITTSBURGH STANDARD DETAILS			
CAD File Name G:\Projects\12000\12807- Pitt Greensburg\0070 Pitt Standard Details\02-Sheet\Details.dwg		Drawn By --	Set Order 23 of 44
Drawing Number 10690			

23	STANDARD EROSION AND SEDIMENT CONTROL PLAN NOTES
SH 23	

MAINTENANCE SCHEDULE

REVISIONS		
No.	By	Date/Description
01	-	-
02	-	-

CONTROL MEASURE	INSPECT	PROBLEMS TO LOOK FOR	POSSIBLE REMEDIES
VEGETATION	WEEKLY AND AFTER EVERY RUNOFF EVENT	SEDIMENT AT TOE OF SLOPE RILLS AND GULLIES FORMING BARE SOIL PATCHES	CHECK FOR TOP-OF-SLOPE DIVERSION AND INSTALL IF NEEDED. FILL RILLS AND REGRADE GULLIED SLOPES. RESEED, FERTILIZE, AND MULCH BARE AREAS.
DIVERSION OR INTERCEPTOR CHANNELS & BENCHES	WEEKLY AND AFTER EVERY RUNOFF EVENT	GULLY ON SLOPE BELOW CHANNEL WHEEL TRACK; LOW POINT (WATER PONDED IN CHANNEL) SEDIMENT OR DEBRIS IN CHANNEL EROSION OF UNLINED CHANNEL SURFACE EROSION OF VEGETATED CHANNEL LINING LOSS OF PROTECTIVE LINING RUNOFF ESCAPING THROUGH EMBANKMENT SIDES	REPAIR BREACHES. BUILD UP LOW POINTS WITH COMPACTED SOIL OR SANDBAGS OR REBUILD CHANNEL WITH POSITIVE DRAINAGE. REMOVE OBSTRUCTION. SEED AND MULCH CHANNEL AND ANCHOR WITH NETTING; OR LINE CHANNEL WITH CRUSHED ROCK; OR INSTALL CHECK DAMS; OR REALIGN CHANNEL ON GENTLER GRADIENT; OR DIVERT SOME OR ALL OF CHANNEL DRAINAGE TO A MORE STABLE FACILITY. RESEED, MULCH, AND ANCHOR WITH NETTING; OR INSTALL CHECK DAMS. RESHAPE CHANNEL TO DESIGN SPECIFICATIONS AS PER DETAILS AND REPLACE PROTECTIVE LINER WITH MORE DURABLE MATERIAL (I.E. LARGER RIP-RAP) REBUILD/RAISE EMBANKMENT
INTERCEPTOR CHANNELS IN ACCESS ROAD	EVERY DAY AT THE END OF THE DAY	CHANNEL CONFIGURATION DOES NOT MEET DESIGN CONFIGURATION	REGRADE CHANNEL TO DESIGN CONFIGURATION REGRADE FOR POSITIVE SLOPE
ROCK CONSTRUCTION ENTRANCES	WEEKLY AND AFTER EVERY RUNOFF EVENT	SINK HOLES OR RUTS SEDIMENT ON PUBLIC ROADWAY	ADD ROCK TO BRING TO SPECIFIED DIMENSIONS. SWEEP MATERIAL BACK TO PROJECT SITE. DO NOT WASH ROADWAY WITH WATER.

THE PERMITTEE SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL TEMPORARY CONTROL MEASURES DURING CONSTRUCTION. ALL DEVICES SHOULD BE INSPECTED WEEKLY AND AFTER EVERY RUNOFF EVENT. IF DURING THESE INSPECTIONS, ANY DEVICE IS FOUND TO BE CLOGGED, DAMAGED, HALF-FULL OF SILT OR NOT FULLY OPERATIONAL, THE DEVICE(S) SHALL BE CLEANED OF ALL DEBRIS. ALL REPAIRS MUST BE COMPLETED WITHIN 72 HOURS OF DISCOVERY.

UPON COMPLETION OF THE PROJECT, RECYCLING OR DISPOSAL OF ALL TEMPORARY EROSION CONTROL MATERIALS SHALL BE THE RESPONSIBILITY OF THE EARTHMOVING CONTRACTOR. CONSTRUCTION WASTE INCLUDES, BUT IS NOT LIMITED TO, EXCESS SOIL MATERIALS, SILT REMOVED FROM EROSION CONTROL FACILITIES, EXCESS BUILDING MATERIALS, CONCRETE WASH WATER, SANITARY WASTES, AND OBSOLETE EROSION CONTROL MATERIALS (SILT FENCE, SILT SACKS, ETC.).

SILT REMOVED FROM SEDIMENT CONTROL FACILITIES SHALL BE SPREAD ON THE TOPSOIL STOCKPILE, OR IN LAWN OR LANDSCAPE AREAS. OBSOLETE EROSION CONTROL MATERIALS AND EXCESS BUILDING MATERIALS MUST BE DISPOSED OF AT A DEP APPROVED SITE.

24	MAINTENANCE SCHEDULE
SH 24	

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	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
	Issue Date MAY 2016
Drawing Description MAINTENANCE SCHEDULE	
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name G:\Projects\12000\12807- Pitt Greensburg\0070 Pitt Standard Details\0wg\02-Sheet\Details.dwg	Drawn By --
Drawing Number 10690	Set Order 24 of 44

REVISIONS		
No.	By	Date/Description
01	-	-
02	-	-

MAINTENANCE SCHEDULE


CONTROL MEASURE	INSPECT	PROBLEMS TO LOOK FOR	POSSIBLE REMEDIES
FILTER FABRIC FENCE	WEEKLY AND AFTER EVERY RUNOFF EVENT	UNDERCUTTING OF FENCE FENCE COLLAPSING TORN FABRIC RUNOFF ESCAPING AROUND BARRIER SEDIMENT LEVEL NEAR TOP OF FENCE	REPLACE FAILED SECTION WITH ROCK FILTER OUTLET CHECK FENCE POST SIZE AND SPACING, GAUGE OF WIRE MESH, AND FABRIC STRENGTH. CHECK DRAINAGE AREA, SLOPE LENGTH, AND GRADIENT BEHIND BARRIER. CORRECT ANY SUBSTANDARD CONDITION. REPLACE WITH CONTINUOUS PIECE OF FABRIC FROM POST TO POST. SECURELY ANCHOR WITH PROPER STAPLES. EXTEND FENCE. REMOVE SEDIMENT WHEN LEVEL REACHES HALF OF FENCE HEIGHT.
INLET PROTECTION	WEEKLY AND AFTER EVERY RUNOFF EVENT	SEDIMENT ACCUMULATION SEDIMENT ACCUMULATED IN INLET FILTER BAG TO 1/2 FULL RUNOFF ESCAPING AROUND BARRIER FILTER BAG TORN OR DAMAGED	REMOVE SEDIMENT AND DISPOSE ON SITE. CLEAN AND/OR REPLACE BAG REBUILD BARRIER REPLACE BAG
SEDIMENT BASINS AND TRAPS	WEEKLY AND AFTER EVERY RUNOFF EVENT	SEDIMENT ACCUMULATION ABOVE DESIGNATED CLEANOUT LEVEL	REMOVE SEDIMENT AND DISPOSE ON SITE.
RIP-RAP APRONS	WEEKLY AND AFTER EVERY RUNOFF EVENT	APRON WASHED AWAY	RESHAPE AS NECESSARY AND REPLACE RIPRAP WITH LARGER SIZE RIPRAP.
JUTE MAT	WEEKLY AND AFTER EVERY RUNOFF EVENT	LOSS OF PROTECTIVE LINING TORN/PUNCHED FABRIC	RESHAPE AS NECESSARY AND REPLACE FABRIC OVERLAP WITH CONTINUOUS PIECE OF MATTING. SECURELY ANCHOR WITH PROPER STAPLES.
ROCK FILTER	WEEKLY AND AFTER EVERY RUNOFF EVENT	CLOGGED FILTER STONE SEDIMENT ACCUMULATION	REPLACE REMOVE SEDIMENT WHEN LEVEL REACHES HALF OF FILTER HEIGHT.

THE PERMITTEE SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL TEMPORARY CONTROL MEASURES DURING CONSTRUCTION. ALL DEVICES SHOULD BE INSPECTED WEEKLY AND AFTER EVERY RUNOFF EVENT. IF DURING THESE INSPECTIONS, ANY DEVICE IS FOUND TO BE CLOGGED, DAMAGED, HALF-FULL OF SILT OR NOT FULLY OPERATIONAL, THE DEVICE(S) SHALL BE CLEANED OF ALL DEBRIS. ALL REPAIRS MUST BE COMPLETED WITHIN 72 HOURS OF DISCOVERY.

UPON COMPLETION OF THE PROJECT, RECYCLING OR DISPOSAL OF ALL TEMPORARY EROSION CONTROL MATERIALS SHALL BE THE RESPONSIBILITY OF THE EARTHMOVING CONTRACTOR. CONSTRUCTION WASTE INCLUDES, BUT IS NOT LIMITED TO, EXCESS SOIL MATERIALS, SILT REMOVED FROM EROSION CONTROL FACILITIES, EXCESS BUILDING MATERIALS, CONCRETE WASH WATER, SANITARY WASTES, AND OBSOLETE EROSION CONTROL MATERIALS (SILT FENCE, SILT SACKS, ETC.).

SILT REMOVED FROM SEDIMENT CONTROL FACILITIES SHALL BE SPREAD ON THE TOPSOIL STOCKPILE, OR IN LAWN OR LANDSCAPE AREAS. OBSOLETE EROSION CONTROL MATERIALS AND EXCESS BUILDING MATERIALS MUST BE DISPOSED OF AT A DEP APPROVED SITE.

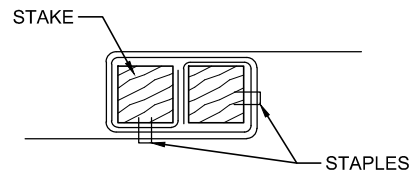
25	MAINTENANCE SCHEDULE (CONT.)
SH 25	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
Drawing Description MAINTENANCE SCHEDULE (CONTINUED)	Issue Date MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name G:\Projects\12000\12807- Pitt Greensburg-0070 Pitt Standard Details\0wg\02-Sheet\Details.dwg	Drawn By --
Drawing Number 10690	Set Order 25 of 44

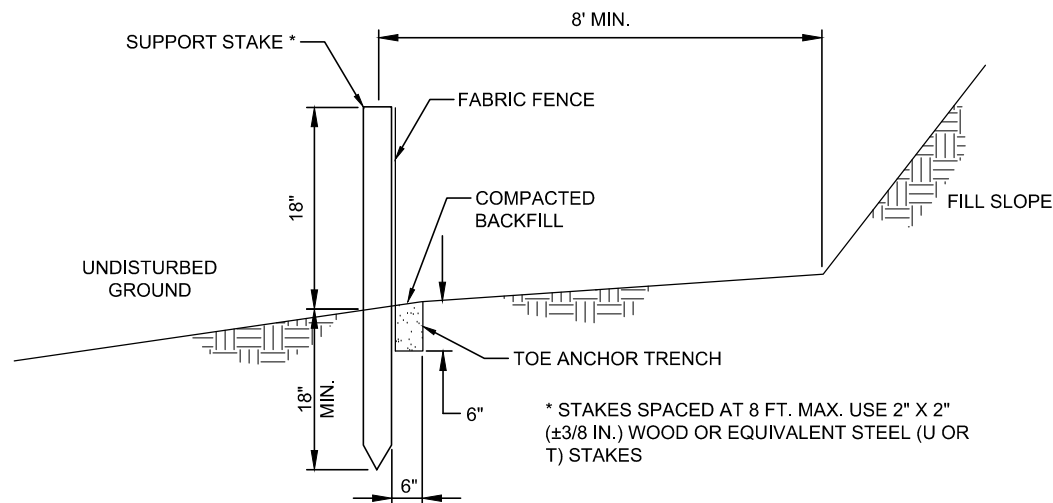
REVISIONS		
No.	By	Description
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02	-	-

FABRIC PROPERTY	MINIMUM ACCEPTABLE VALUE	TEST METHOD
GRAB TENSILE STRENGTH (LB)	120	ASTM D1682
ELONGATION AT FAILURE (%)	20% MAX	ASTM D1682
MULLEN BURST STRENGTH (PSI)	200	ASTM D3786
TRAPEZOIDAL TEAR STRENGTH (LB)	50	
PUNCTURE STRENGTH (LB)	40	ASTM D751 (MODIFIED)
SLURRY FLOW RATE (GAL/MIN/SF)	0.3	ASTM 5141
EQUIVALENT OPENING SIZE	30	US STD. SIEVE CW-02215
ULTRAVIOLET RADIATION STABILITY (%)	80	ASTM G-26

TABLE 4.3 OF THE PA DEP EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL, MARCH 2012



JOINING FENCE SECTIONS



SECTION VIEW

NOTES:

FABRIC SHALL HAVE THE MINIMUM PROPERTIES AS SHOWN IN TABLE 4.3 OF THE PA DEP EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL, MARCH 2012.

FABRIC WIDTH SHALL BE 30 IN. MINIMUM. STAKES SHALL BE HARDWOOD OR EQUIVALENT STEEL (U OR T) STAKES.


SILT FENCE SHALL BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE FENCE SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.

SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH HALF THE ABOVE GROUND HEIGHT OF THE FENCE.

ANY SECTION OF SILT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED SHALL BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET (STANDARD CONSTRUCTION DETAIL # 4-6 OF THE PA DEP EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL, MARCH 2012).

FENCE SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN TRIBUTARY AREA IS PERMANENTLY STABILIZED.

26	STANDARD SILT FENCE (18" HIGH)
SH 26	

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Project Name STANDARD DETAILS	Job No. X5887
Drawing Description STANDARD SILT FENCE (18 IN HIGH)	Issue Date MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name G:\Projects\12000\12807- Pitt Greensburg\0070 Pitt Standard Details\0wg\02-Sheet\Details.dwg	Drawn By --
Drawing Number 10690	Set Order 26 of 44

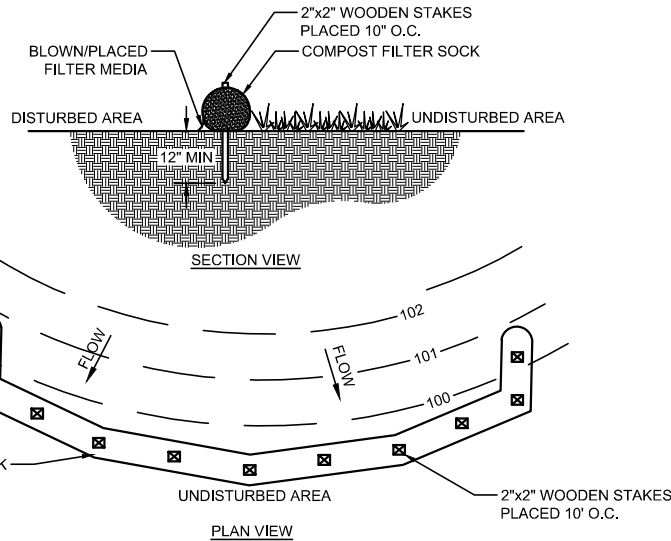
REVISIONS		
No.	Date	Description
01	-	-
02	-	-

TABLE 4.1
COMPOST SOCK FABRIC MINIMUM SPECIFICATIONS

MATERIAL TYPE	3 mil HDPE	5 mil HDPE	5 mil HDPE	MULTI-FILAMENT POLYPROPYLENE (MFPP)	HEAVY DUTY MULTI-FILAMENT POLYPROPYLENE (HDMFPP)
MATERIAL CHARACTERISTICS	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE	BIO-DEGRADABLE	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE
SOCK DIAMETERS	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
MESH OPENING	3/8"	3/8"	3/8"	3/8"	3/8"
TENSILE STRENGTH		26 PSI	26 PSI	44 PSI	202 PSI
ULTRAVIOLET STABILITY % ORIG. STRENGTH (ASTM G-155)	23% AT 1000 HR.	23% AT 1000 HR.		100% AT 1000 HR.	100% AT 1000 HR.
MINIMAL FUNCTIONAL LONGEVITY	6 MONTHS	9 MONTHS	6 MONTHS	1 YEAR	2 YEARS
TWO-PLY SYSTEM					
INNER CONTAINMENT NETTING	HDPE BIAXIAL NET				
	CONTINUOUSLY WOUND				
	FUSION-WELDED JUNCTURES				
OUTER FILTRATION MESH	3/4" X 3/4" MAX. APERTURE SIZE				
	COMPOSITE POLYPROPYLENE FABRIC (WOVEN LAYER AND NON-WOVEN FLEECE MECHANICALLY FUSED VIA NEEDLE PUNCH)				
	3/16" MAX. APERTURE SIZE				
SOCK FABRICS COMPOSED OF BURLAP MAY BE USED ON PROJECTS LASTING 6 MONTHS OR LESS.					

TABLE 4.2
COMPOST STANDARDS

ORGANIC MATTER CONTENT	25% - 100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
Ph	5.5 - 8.5
MOISTURE CONTENT	30% - 60%
PARTICLE SIZE	30%-50% PASS THRU 3/8" SIEVE
SOLUBLE SALT CONCENTRATION	5,0 dS/m (mmhos/cm) MAXIMUM



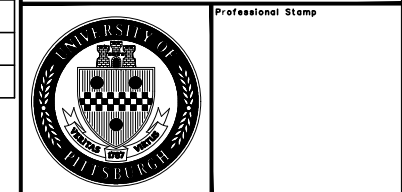
NOTES:

- 1.COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8' UP SLOPE AT 45° TO THE MAIN SOCK ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY SOCK SHALL NOT EXCEED THAT SHOWN ON FIGURE 4.2. SEE TABLE BELOW.
- 2.TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.
- 3.ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
- 4.SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
- 5.BIODEGRADABLE FILTER SOCK SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- 6.UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.
- 7.SILT SOCK FABRIC MATERIAL SHALL BE MULTI-FILAMENT POLYPROPYLENE (MFPP), MINIMUM FUNCTIONAL LONGEVITY 1 YEAR.
- 9.SLOPE LENGTH TABLE FROM FIGURE 4.2. PADEP BMP MANUAL:

SILT SOCK DIAMETER	3:1 SLOPE	2:1 SLOPE
12"	40'	25'
18"	70'	35'
24"	90'	50'
32"	110'	65'

27	COMPOST FILTER SOCK
SH 27	

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Project Name
STANDARD DETAILS
Job No.
X5887
Issue Date
MAY 2016

Drawing Description
COMPOST FILTER SOCK

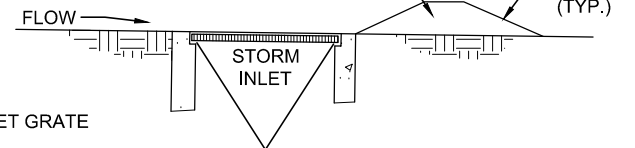
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Drawn By
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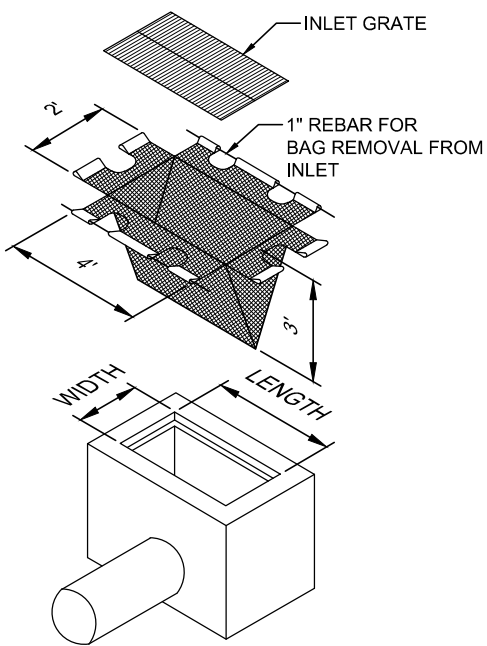
Drawing Number
10690
Set Order
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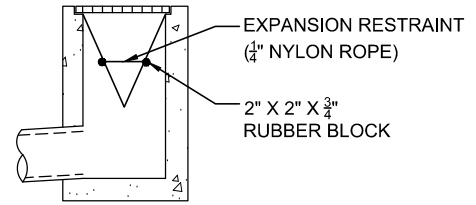
EARTHEN BERM TO BE STABILIZED WITH TEMPORARY OR PERMANENT VEGETATION



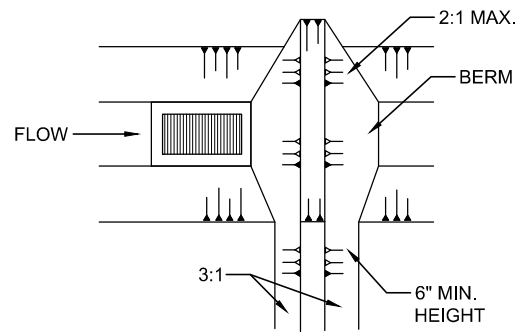
SECTION VIEW



ISOMETRIC VIEW



INSTALLATION DETAIL



PLAN VIEW

NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.


ROLLED EARTHEN BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM ON ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR REMAIN PERMANENTLY.

AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS., A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

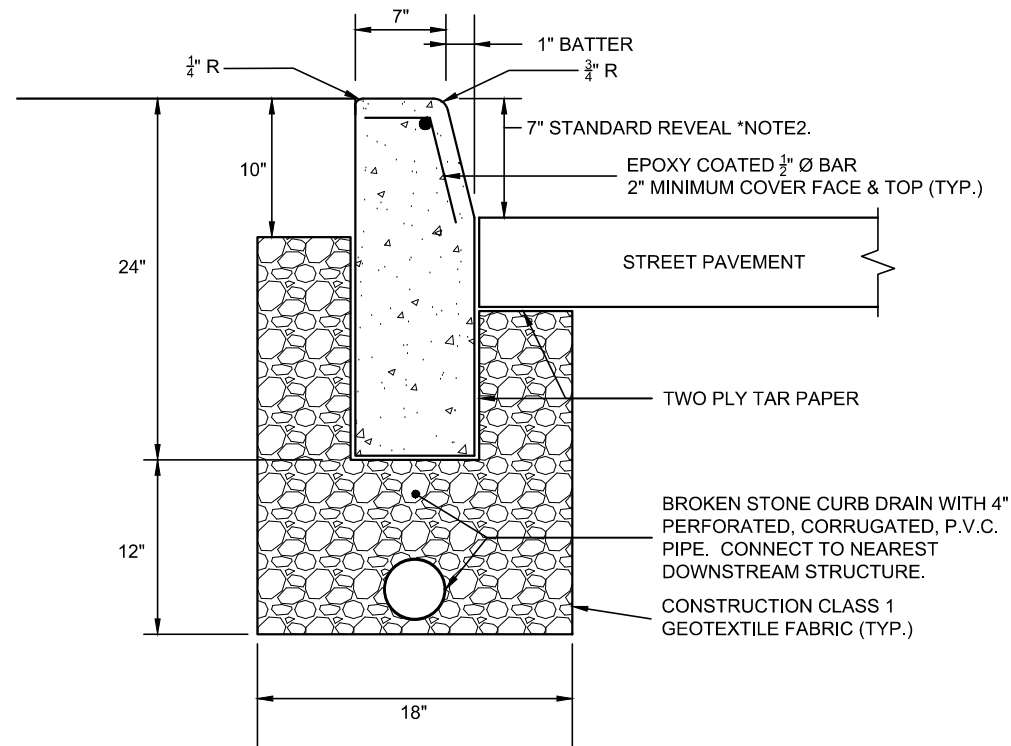
DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

28	FILTER BAG INLET PROTECTION
SH 28	

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	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
Drawing Description FILTER BAG INLET PROTECTION	Issue Date MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name G:\Projects\12000\12807- Pitt Greensburg\0070 Pitt Standard Details\0wg102-SheetDetails.dwg	Drawn By --
Drawing Number 10690	Set Order 28 of 44

**CITY OF PITTSBURGH
CONSTRUCTION DETAILS**

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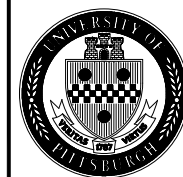
NOTES:

1. CURB CONSTRUCTION JOINTS SHALL COINCIDE WITH TRANSVERSE JOINTS IN THE EXISTING OR NEW STREET PAVEMENT. 10'-0" MAXIMUM LENGTH OF CURB SECTIONS.
2. HEIGHT TO MATCH EXISTING IF NOTED AS SUCH.

CITY OF PITTSBURGH RIGHT-OF-WAY

29	CITY OF PITTSBURGH STANDARD CONCRETE CURB
SH 29	

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Professional Stamp

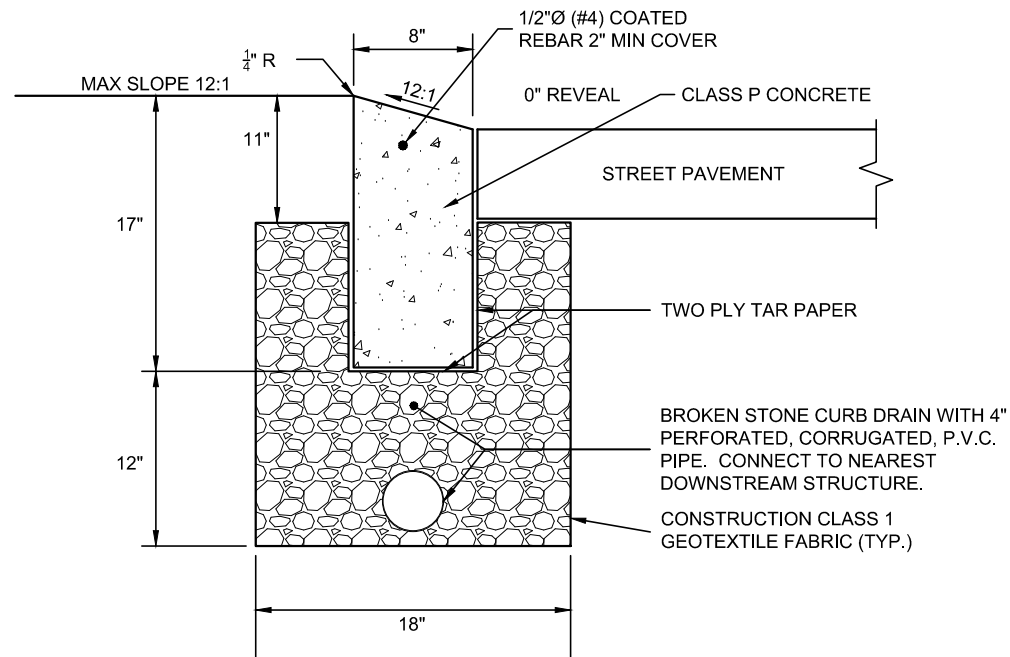
Project Name	Job No.
STANDARD DETAILS	X5887
Issue Date	MAY 2016

Drawing Description
CITY OF PITTSBURGH
STANDARD CONCRETE CURB
UNIVERSITY OF PITTSBURGH STANDARD DETAILS

CAD File Name	Drawn By
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Drawing Number	Set Order
10690	29 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

REVISIONS		
No.	By	Description
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02	-	-



NOTES:


1. CURB CONSTRUCTION JOINTS SHALL COINCIDE WITH TRANSVERSE JOINTS IN THE EXISTING OR NEW STREET PAVEMENT. 10'-0" MAXIMUM LENGTH OF CURB SECTIONS.

CITY OF PITTSBURGH RIGHT-OF-WAY

30	CITY OF PITTSBURGH STANDARD CURB RAMP
SH 30	

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Professional Stamp



Project Name
STANDARD DETAILS

Job No.
X5887

Issue Date
MAY 2016

Drawing Description
CITY OF PITTSBURGH STANDARD CURB RAMP
UNIVERSITY OF PITTSBURGH STANDARD DETAILS

CAD File Name
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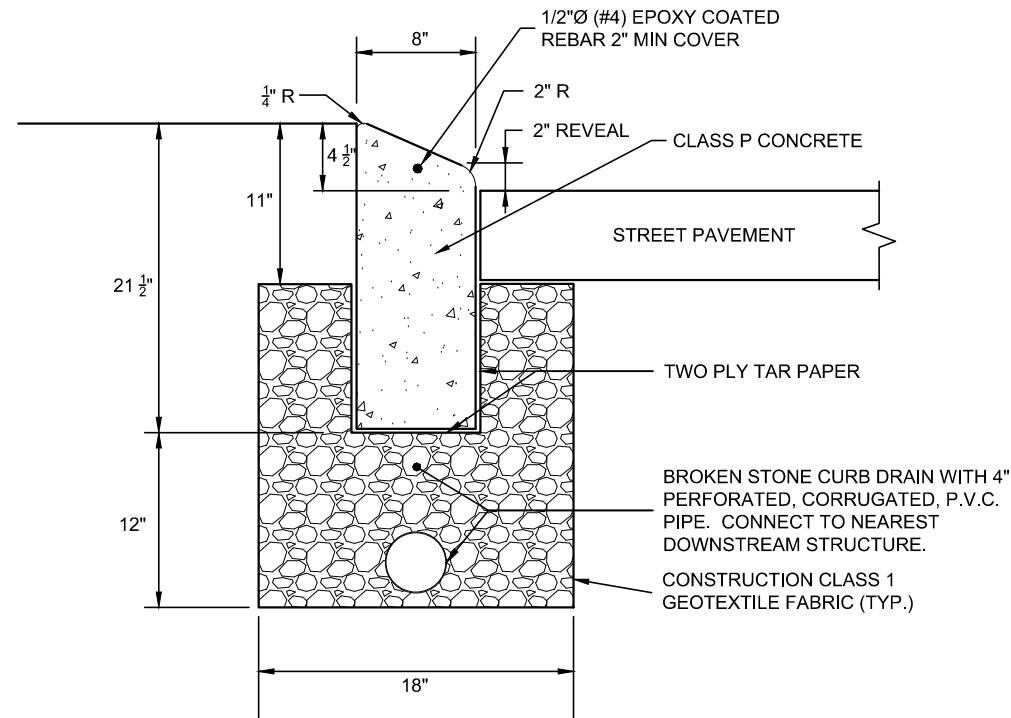
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Drawing Number
10690

Set Order
30 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

REVISIONS		
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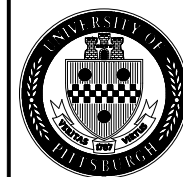
NOTES:

1. CURB CONSTRUCTION JOINTS SHALL COINCIDE WITH TRANSVERSE JOINTS IN THE EXISTING OR NEW STREET PAVEMENT. 10'-0" MAXIMUM LENGTH OF CURB SECTIONS.

CITY OF PITTSBURGH RIGHT-OF-WAY

31	CITY OF PITTSBURGH STANDARD DEPRESSED CURB
SH 31	

University of Pittsburgh
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Professional Stamp

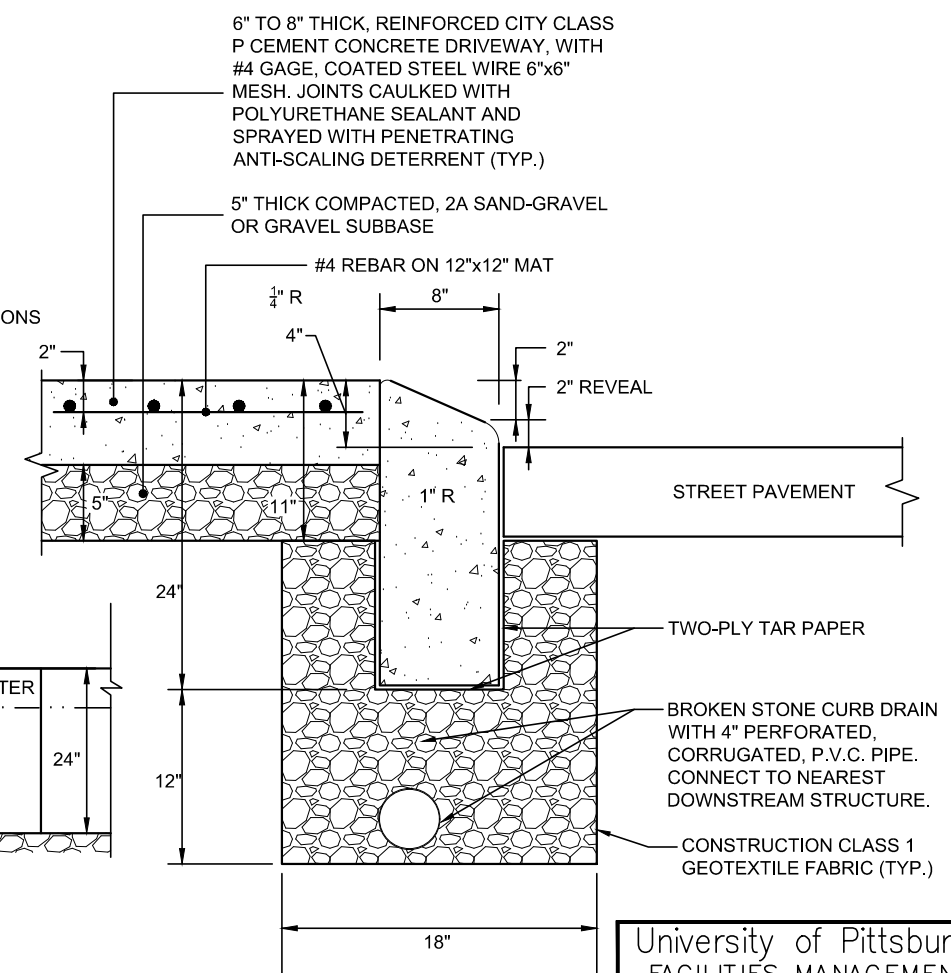
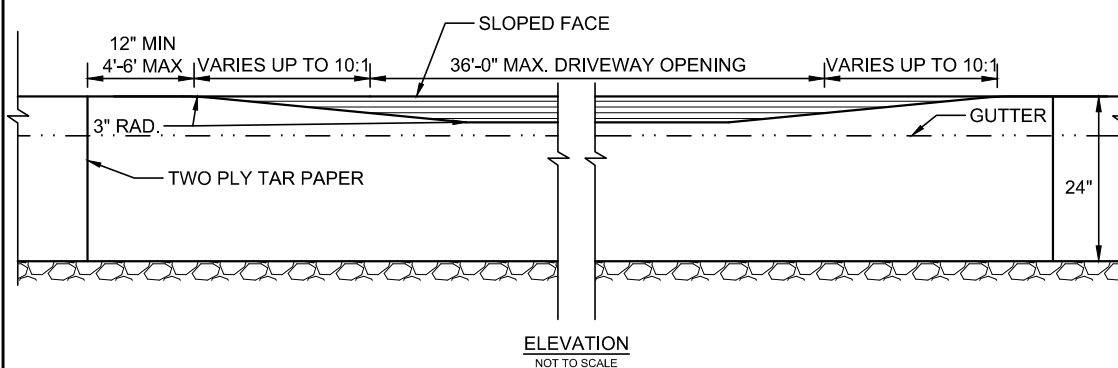
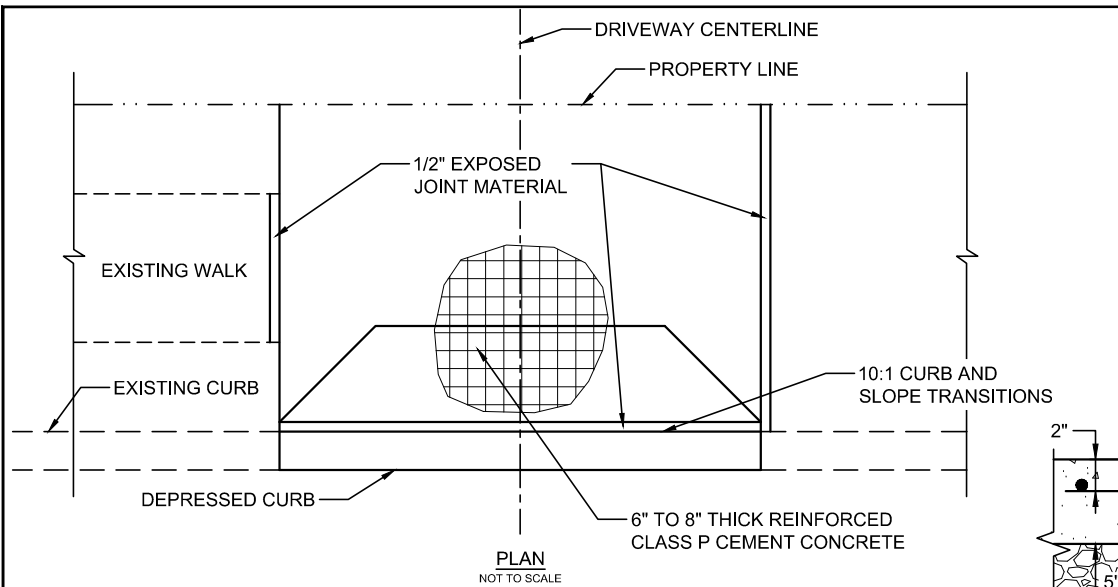
Project Name	Job No.
STANDARD DETAILS	X5887
Drawing Description	Issue Date
CITY OF PITTSBURGH STANDARD DEPRESSED CURB	MAY 2016

CITY OF PITTSBURGH
STANDARD DEPRESSED CURB
UNIVERSITY OF PITTSBURGH STANDARD DETAILS

CAD File Name	Drawn By
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Drawing Number	Set Order
10690	31 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.


REVISIONS		
No.	By	Description
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CITY OF PITTSBURGH RIGHT-OF-WAY

32	CITY OF PITTSBURGH STANDARD CONCRETE DEPRESSED CURB FOR PRIVATE DRIVEWAY ENTRANCE
SH 32	

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FACILITIES MANAGEMENT



Professional Stamp

Project Name	Job No.
STANDARD DETAILS	X5887
Drawing Description	Issue Date
STANDARD DEPRESSED CURB FOR PRIVEWAY DRIVEWAY ENTRANCE (PGH)	MAY 2016
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name	Drawn By
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Drawing Number	Set Order
10690	32 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.


REVISIONS		
No.	By	Date/Description
01	-	-
02	-	-

NOTES:

1. ALL CONCRETE CURB AND DECK CURB WILL BE PLACED SEPARATELY FROM THE SIDEWALK, DRIVEWAY, CURB RAMP, AND STREET PAVEMENTS.
2. ALL EXPOSED CONCRETE WILL BE CITY OF PITTSBURGH, CLASS P OR PP, CEMENT CONCRETE AND WILL BE CURED BY THE SAME METHOD AS CONCRETE PAVEMENT, OR BASE COURSE, AND CURBS WILL BE CONSTRUCTED IN SECTIONS NOT TO EXCEED 10'-0" AND TRANSVERSE PAVEMENT JOINTS WILL BE EXTENDED IN KIND THROUGH CURBS.
3. ITEMS LISTED AS COATED CAN BE EITHER STAINLESS STEEL, FULLY HOT DIPPED GALVANIZED OR EPOXY COATED.
4. STONE DRAINS WILL BE COMPOSED OF AASHTO #57 OR 2A GRAVEL. NO SLAG OF ANY KIND WILL BE PERMITTED.
5. USE ACCEPTABLE METAL FORMS FOR STRAIGHT CURB AND WOODEN FORMS FOR RADIUS CURB LESS THAN 100'-0" RADIUS OR SHORT TANGENT SECTIONS.
6. CONCRETE CURBS MAY BE PLACED WITH A SLIP FORMING, SELF-PROPELLED EXTRUSION MACHINE. UNIFORMLY FEED THE STIFF CONCRETE THROUGH THE MACHINE SO THAT THE CURB'S SHAPE IS MAINTAINED.
7. CONTACT CITY OF PITTSBURGH DEPARTMENT OF PUBLIC WORKS FOR ALL RELATIVE AND CURRENT DETAILS.

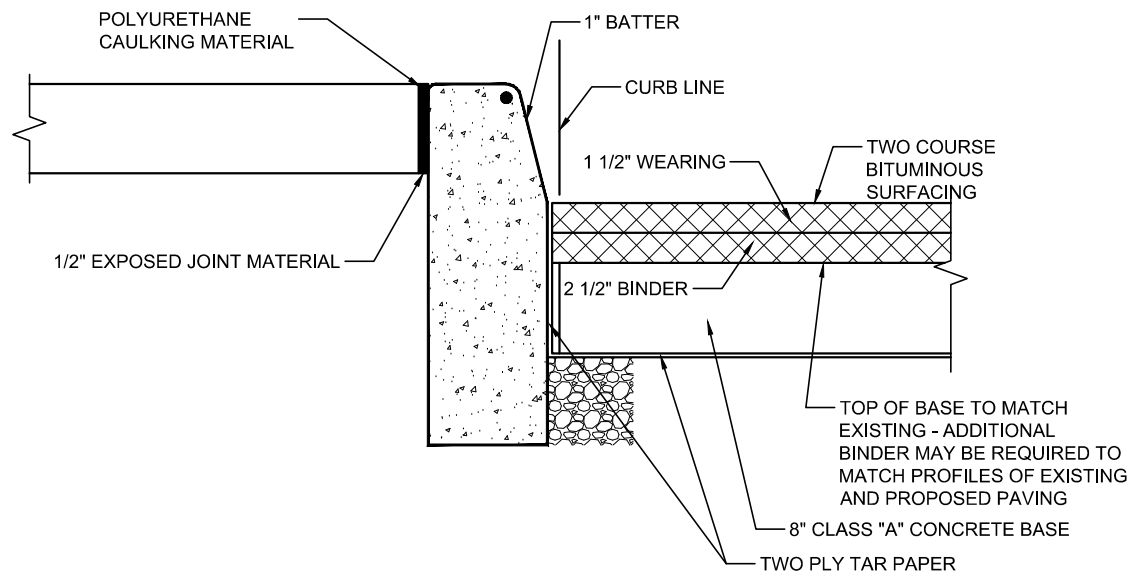
CITY OF PITTSBURGH RIGHT-OF-WAY

33	CITY OF PITTSBURGH STANDARD
SH 33	CURB NOTES

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	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
	Issue Date MAY 2016
Drawing Description CITY OF PITTSBURGH STANDARD CURB NOTES	
UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
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Drawing Number 10690	Set Order 33 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

REVISIONS		
No.	By	Description
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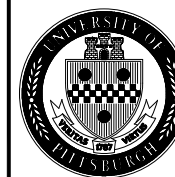
NOTES:

1. CURB CONSTRUCTION JOINTS SHALL COINCIDE WITH TRANSVERSE JOINTS IN THE EXISTING OR NEW STREET PAVEMENT. 10'-0" MAXIMUM LENGTH OF CURB SECTIONS.
2. MATERIAL TO MEET PENNDOT AND CITY OF PITTSBURGH DPW MINIMUM SPECIFICATIONS.

CITY OF PITTSBURGH RIGHT-OF-WAY

34	CITY OF PITTSBURGH BITUMINOUS PAVEMENT SECTION
SH 34	

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Professional Stamp

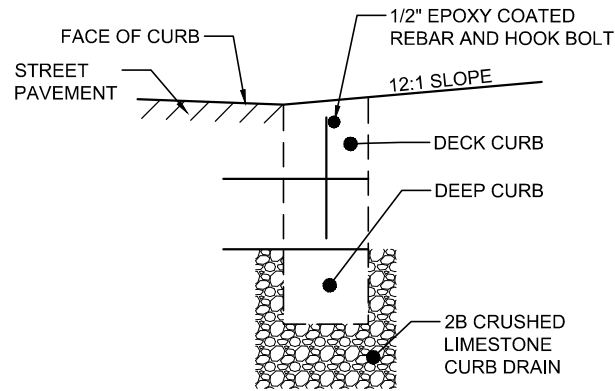
Project Name	Job No.
STANDARD DETAILS	X5887
Issue Date	MAY 2016

Drawing Description
**CITY OF PITTSBURGH BIT.
PAVEMENT SECTION**
UNIVERSITY OF PITTSBURGH STANDARD DETAILS

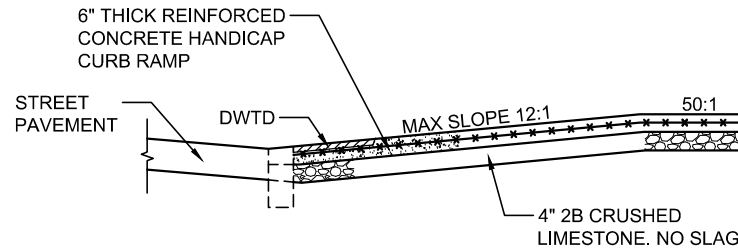
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Drawing Number	Set Order
10690	34 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

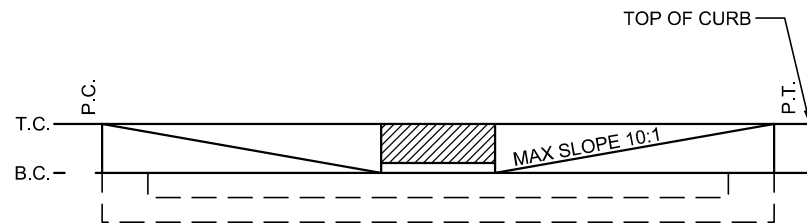
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CURB DETAIL
NOT TO SCALE



SECTION B-B
NOT TO SCALE



SECTION A-A
NOT TO SCALE

CITY OF PITTSBURGH RIGHT-OF-WAY

35	CITY OF PITTSBURGH TRUNCATED DOME HANDICAP CURB TYPE 3 RAMP SECTIONS
SH 35	

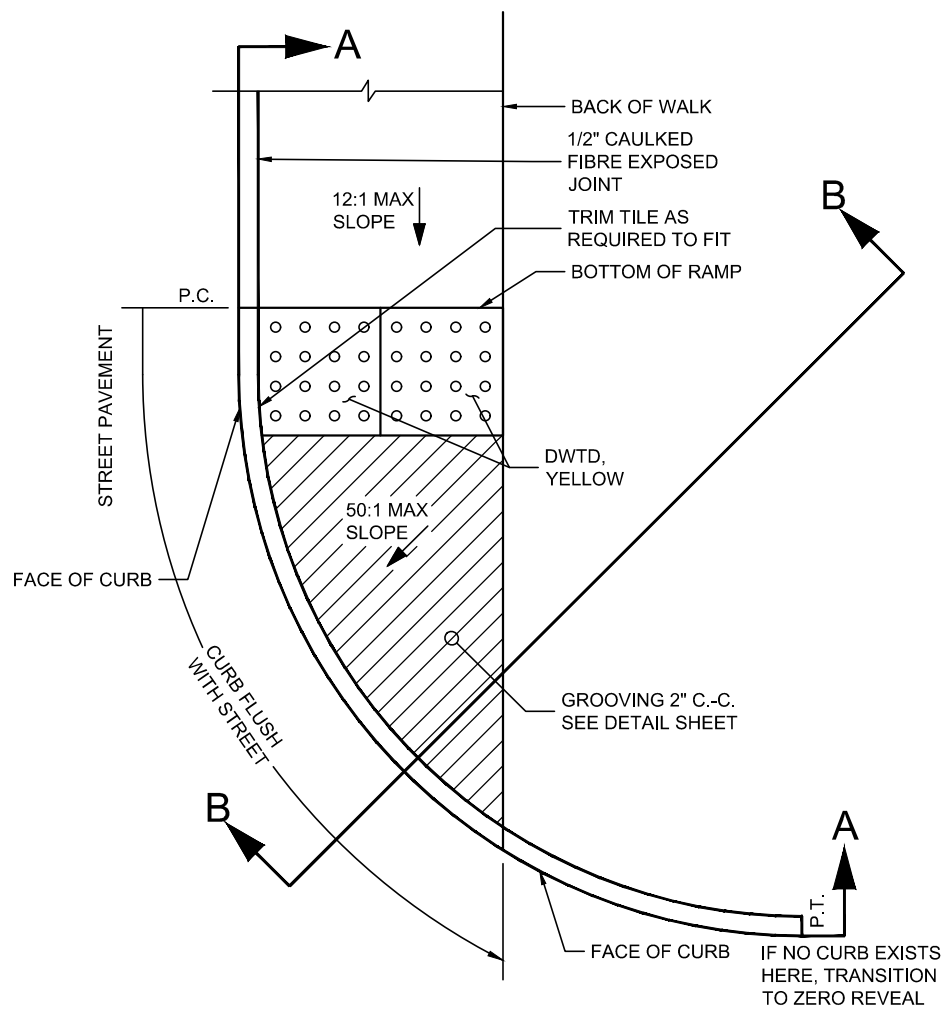
University of Pittsburgh
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Project Name		Job No.
STANDARD DETAILS		X5887
Drawing Description		Issue Date
TRUNCATED DOME HANDICAP CURB TYPE 3 RAMP SECTIONS (CITY OF PGH) UNIVERSITY OF PITTSBURGH STANDARD DETAILS		MAY 2016
CAD File Name	Drawn By	
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Drawing Number	Set Order	
10690	35 of 44	

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

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02	-	-




NOTE:

1. USE 12:1 SLOPE ON SIDE TRANSITIONS IF 4' LANDING CANNOT BE INSTALLED.
2. REFER TO CITY OF PITTSBURGH TRUNCATED DOME HANDICAP CURB RAMP SECTION.

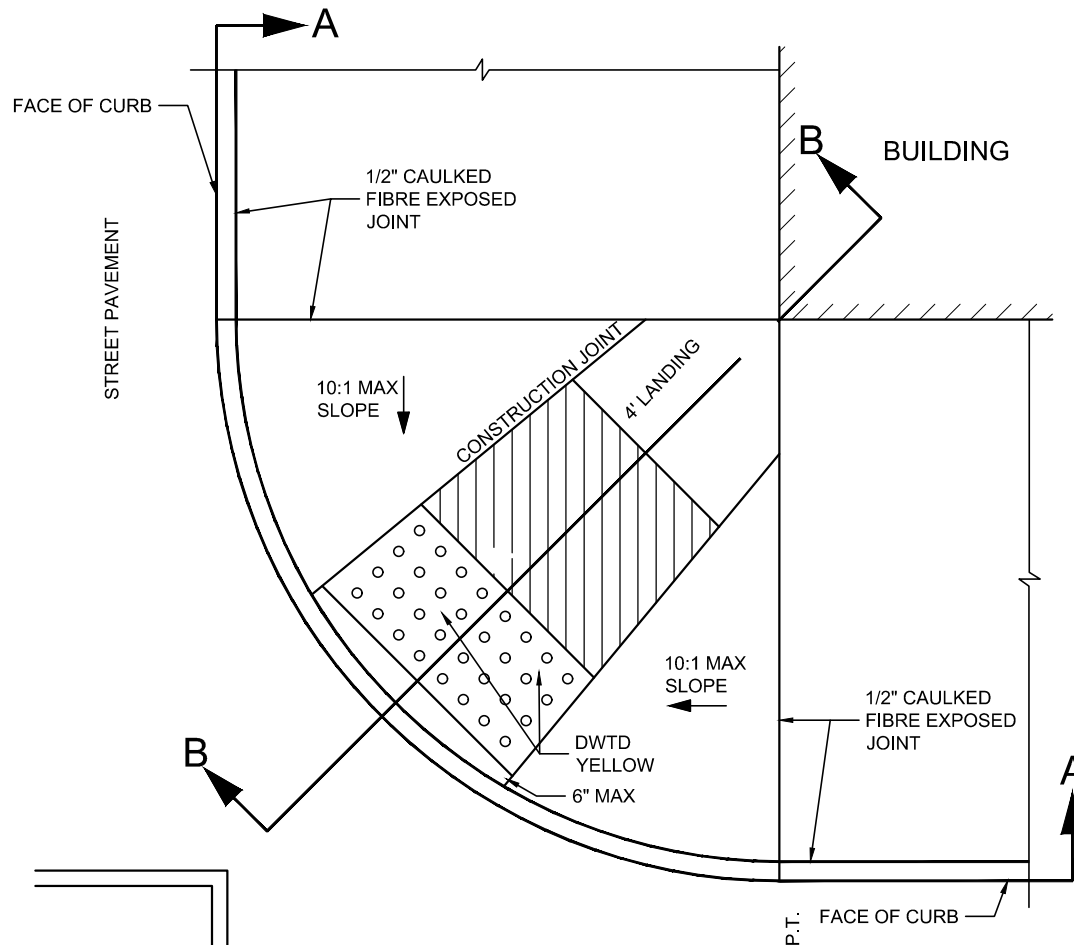
CITY OF PITTSBURGH RIGHT-OF-WAY

36	CITY OF PITTSBURGH TRUNCATED DOME HANDICAP CURB RAMP TYPE 1
SH 36	

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

University of Pittsburgh FACILITIES MANAGEMENT	
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Project Name	Job No.
STANDARD DETAILS	X5887
Drawing Description	Issue Date
TRUNCATED DOME HANDICAP CURB CURB RAMP TYPE 1 (CITY OF PGH) UNIVERSITY OF PITTSBURGH STANDARD DETAILS	MAY 2016
CAD File Name	Drawn By
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Drawing Number	Set Order
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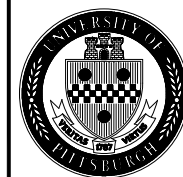
NOTE:

1. USE 12:1 SLOPE ON SIDE TRANSITIONS IF 4' LANDING CANNOT BE INSTALLED.

CITY OF PITTSBURGH RIGHT-OF-WAY

37	CITY OF PITTSBURGH TRUNCATED DOME HANDICAP CURB RAMP TYPE 2
SH 37	

University of Pittsburgh
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Professional Stamp

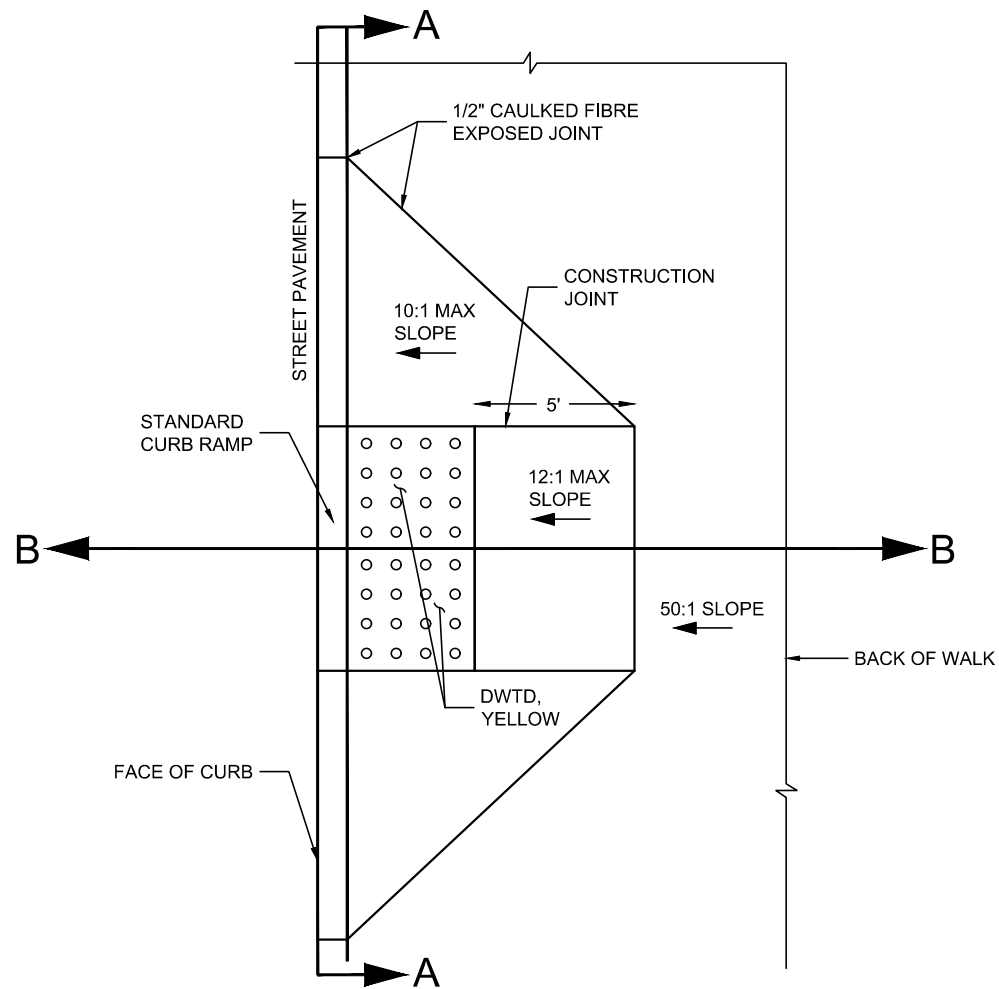
Project Name	Job No.
STANDARD DETAILS	X5887
	Issue Date
	MAY 2016

Drawing Description
TRUNCATED DOME
HANDICAP CURB RAMP
TYPE 2 (CITY OF PGH)
UNIVERSITY OF PITTSBURGH STANDARD DETAILS

CAD File Name	Drawn By
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Drawing Number	Set Order
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THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

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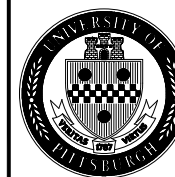
NOTE:

1. USE 12:1 SLOPE ON SIDE TRANSITIONS IF 4' LANDING CANNOT BE INSTALLED.
2. REFER TO CITY OF PITTSBURGH TRUNCATED DOME HANDICAP CURB RAMP SECTION.

CITY OF PITTSBURGH RIGHT-OF-WAY

38	CITY OF PITTSBURGH TRUNCATED DOME HANDICAP CURB RAMP TYPE 3
SH 38	

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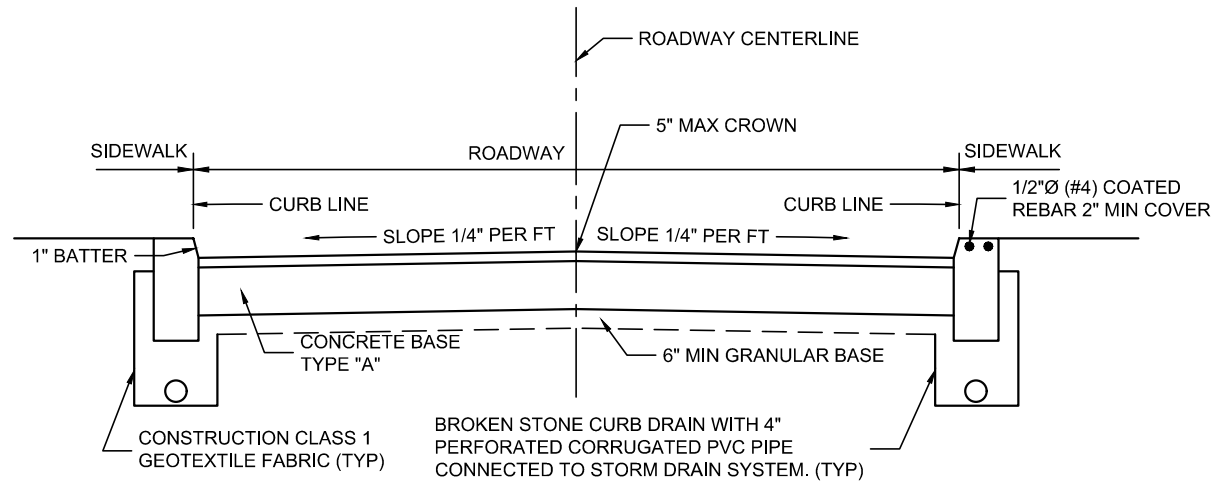


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Project Name		Job No.
STANDARD DETAILS		X5887
Drawing Description		Issue Date
TRUNCATED DOME HANDICAP CURB CURB RAMP TYPE 3 (CITY OF PGH) UNIVERSITY OF PITTSBURGH STANDARD DETAILS		MAY 2016
CAD File Name	Drawn By	
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Drawing Number	Set Order	
10690	38 of 44	

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

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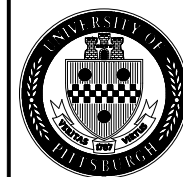
NOTES:

1. CURB CONSTRUCTION JOINTS SHALL COINCIDE WITH TRANSVERSE JOINTS IN THE EXISTING OR NEW STREET PAVEMENT. 10'-0" MAXIMUM LENGTH OF CURB SECTIONS.

CITY OF PITTSBURGH RIGHT-OF-WAY

39	CITY OF PITTSBURGH GENERAL ROADWAY SECTION
SH 39	

University of Pittsburgh
FACILITIES MANAGEMENT



Professional Stamp

Project Name	Job No.
STANDARD DETAILS	X5887
Drawing Description	Issue Date
CITY OF PITTSBURGH GENERAL ROADWAY SECTION	MAY 2016

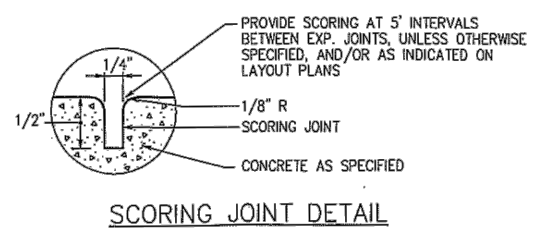
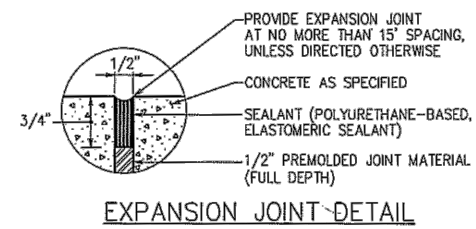
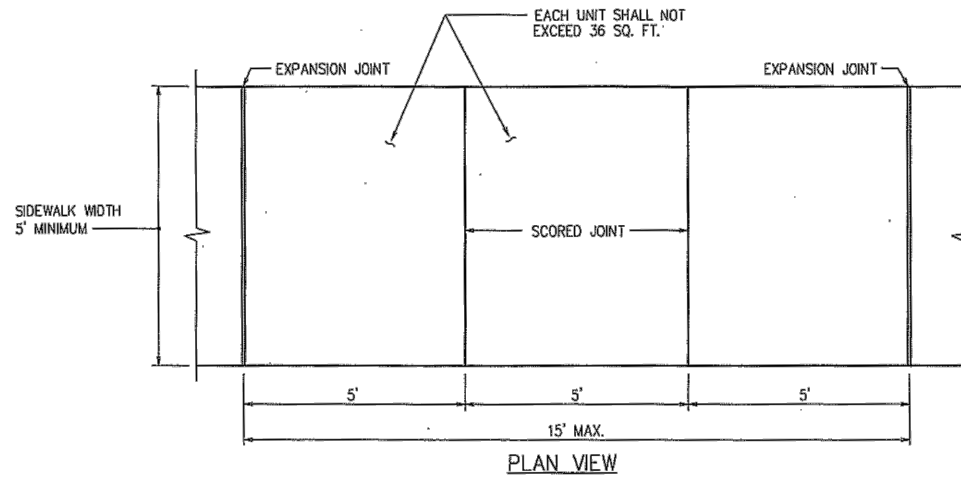
CITY OF PITTSBURGH GENERAL
ROADWAY SECTION

UNIVERSITY OF PITTSBURGH STANDARD DETAILS

CAD File Name	Drawn By
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Drawing Number	Set Order
10690	39 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.


REVISIONS		
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02	-	-



CITY OF PITTSBURGH RIGHT-OF-WAY

40	CITY OF PITTSBURGH EXPANSION AND SCORING JOINT DETAILS
SH 40	

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Professional Stamp

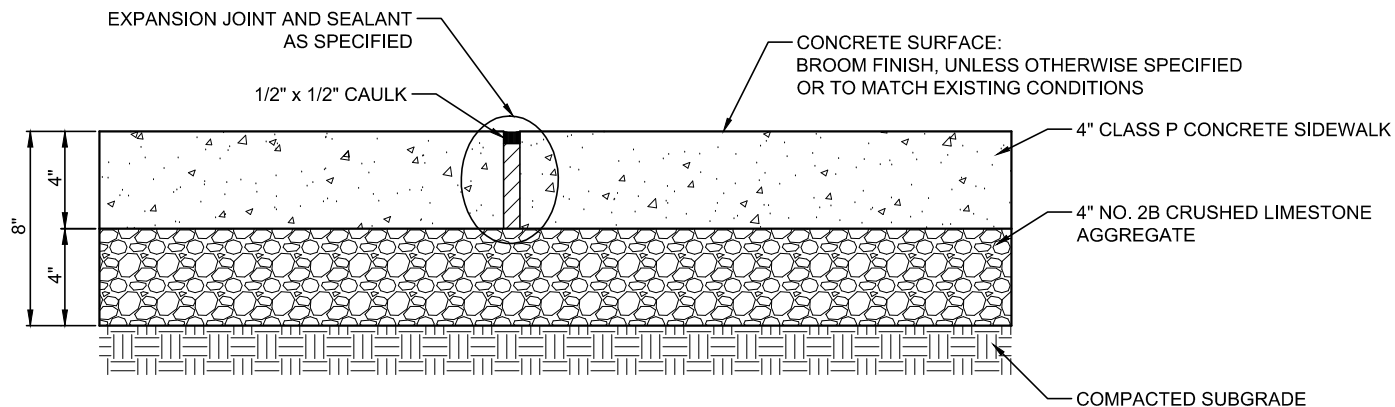
Project Name	Job No.
STANDARD DETAILS	X5887
	Issue Date
	MAY 2016

Drawing Description
CITY OF PITTSBURGH EXP. AND SCORING JOINT
UNIVERSITY OF PITTSBURGH STANDARD DETAILS

CAD File Name	Drawn By
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Drawing Number	Set Order
10690	40 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

REVISIONS		
No.	By	Date/Description
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02	-	-




NOTES:

1. CONTRACTOR SHALL PLACE CONTROL JOINTS AT INTERVALS EQUAL TO THE PAVEMENT WIDTH NOT TO EXCEED 12'.
2. EXPANSION JOINTS SHALL BE INSTALLED AT 50' MAXIMUM INTERVALS.
3. CURING SHALL BE BY ABSORPTIVE COVER; MOISTURE-RETAINING COVER; OR APPROVED CURING COMPOUND. CONTRACTOR SHALL SUBMIT PROPOSED CURING METHOD TO OWNER FOR APPROVAL PRIOR TO CONCRETE INSTALLATION.
4. APPLY WATER BASED 40% SILANE PENETRATING SEALER AFTER A MINIMUM OF 28 DAYS PER MANUFACTURERS RECOMMENDATIONS.
5. PROVIDE MINIMUM CROSS-SLOPE OF 1.5% TO MAXIMUM CROSS SLOPE OF 2%.

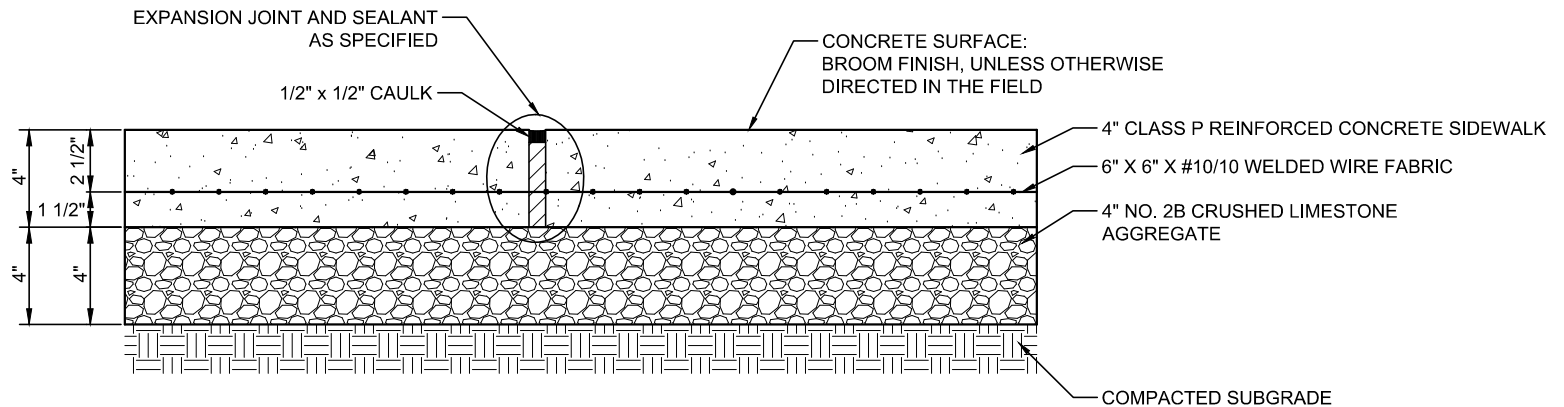
CITY OF PITTSBURGH RIGHT-OF-WAY

41	NON-REINFORCED CONCRETE
SH 41	SIDEWALK (4" THICK)

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
Drawing Description 4 IN. THICK NON-REINFORCED CONCRETE SIDEWALK (CITY OF PGH) UNIVERSITY OF PITTSBURGH STANDARD DETAILS	Issue Date MAY 2016
CAD File Name G:\Projects\12000\12807- Pitt Greensburg-0070 Pitt Standard Details\0wg\02-Sheet\Details.dwg	Drawn By --
Drawing Number 10690	Set Order 41 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

REVISIONS			
No.	By	Date	Description
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NOTES:

1. CONTRACTOR SHALL PLACE CONTROL JOINTS AT INTERVALS EQUAL TO THE PAVEMENT WIDTH NOT TO EXCEED 12'.
2. EXPANSION JOINTS SHALL BE INSTALLED AT 50' MAXIMUM INTERVALS.
3. CURING SHALL BE BY ABSORPTIVE COVER; MOISTURE-RETAINING COVER; OR APPROVED CURING COMPOUND. CONTRACTOR SHALL SUBMIT PROPOSED CURING METHOD TO OWNER FOR APPROVAL PRIOR TO CONCRETE INSTALLATION.
4. APPLY WATER BASED 40% SILANE PENETRATING SEALER AFTER A MINIMUM OF 28 DAYS PER MANUFACTURERS RECOMMENDATIONS.
5. PROVIDE MINIMUM CROSS-SLOPE OF 1.5% TO MAXIMUM CROSS SLOPE OF 2%.

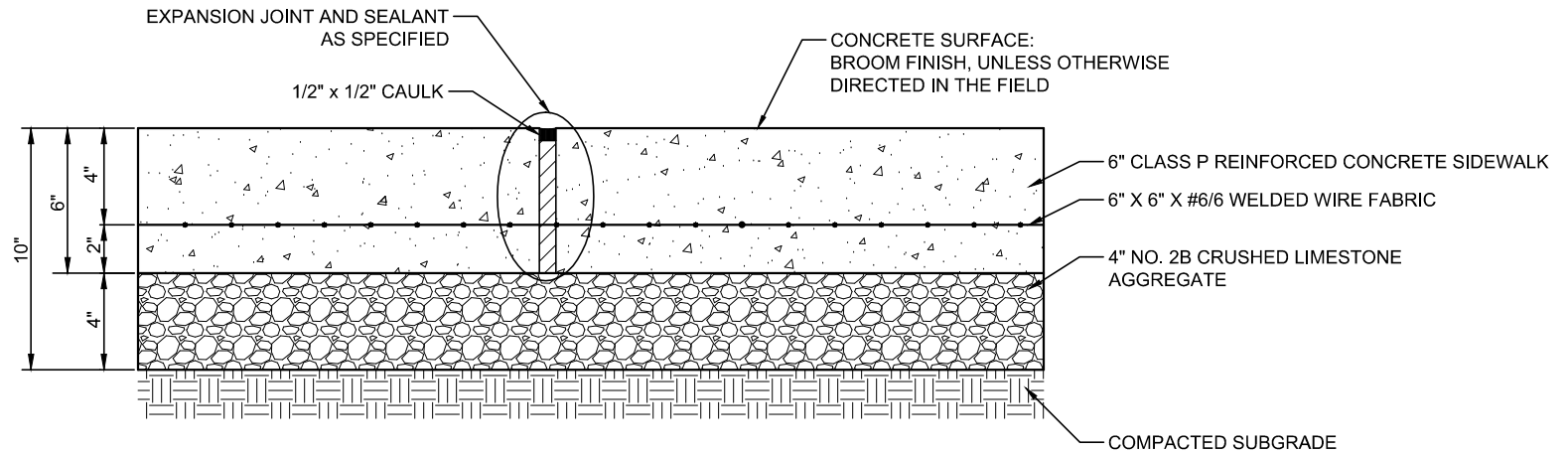
CITY OF PITTSBURGH RIGHT-OF-WAY

42	REINFORCED CONCRETE SIDEWALK (4" THICK)
SH 42	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name	Job No.
STANDARD DETAILS	X5887
Drawing Description	Issue Date
4 IN. THICK REINFORCED CONCRETE SIDEWALK (CITY OF PGH) UNIVERSITY OF PITTSBURGH STANDARD DETAILS	MAY 2016
CAD File Name	Drawn By
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Drawing Number	Set Order
10690	42 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

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No.	By	Date/Description
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NOTES:

1. CONTRACTOR SHALL PLACE CONTROL JOINTS AT INTERVALS EQUAL TO THE PAVEMENT WIDTH NOT TO EXCEED 12'.
2. EXPANSION JOINTS SHALL BE INSTALLED AT 50' MAXIMUM INTERVALS.
3. CURING SHALL BE BY ABSORPTIVE COVER; MOISTURE-RETAINING COVER; OR APPROVED CURING COMPOUND. CONTRACTOR SHALL SUBMIT PROPOSED CURING METHOD TO OWNER FOR APPROVAL PRIOR TO CONCRETE INSTALLATION.
4. APPLY WATER BASED 40% SILANE PENETRATING SEALER AFTER A MINIMUM OF 28 DAYS PER MANUFACTURERS RECOMMENDATIONS.
5. USE DOWELS FOR NON-CONSECUTIVE POURS.
6. PROVIDE MINIMUM CROSS SLOPE OF 1.5% TO MAXIMUM CROSS SLOPE OF 2.0%.

CITY OF PITTSBURGH RIGHT-OF-WAY

43	REINFORCED CONCRETE
SH 43	SIDEWALK (6" THICK)

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
Drawing Description 6 IN. THICK REINFORCED CONCRETE SIDEWALK (CITY OF PGH) UNIVERSITY OF PITTSBURGH STANDARD DETAILS	Issue Date MAY 2016
CAD File Name G:\Projects\12000\12807- Pitt Greensburg-0070 Pitt Standard Details\0wg\02-Sheet\Details.dwg	Drawn By --
Drawing Number 10690	Set Order 43 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.


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NOTES:

1. ALL SIDEWALKS SHALL BE A MINIMUM OF 5'-0" IN WIDTH.
2. EXPANSION JOINTS SHALL BE INSTALLED AT A MAXIMUM OF 15'-0". SCORED JOINTS SHALL BE INSTALLED AT 5'-0" APART WITH EACH UNIT NOT EXCEEDING 36 SQ. FT.
3. ALL CONCRETE SHALL BE 4000 PSI @ 28 DAYS. CEMENT SHALL BE HIGH EARLY STRENGTH (TYPE III).

CITY OF PITTSBURGH RIGHT-OF-WAY

44	CITY OF PITTSBURGH STANDARD SIDEWALK NOTES
SH 44	

University of Pittsburgh FACILITIES MANAGEMENT	
	Professional Stamp
Project Name STANDARD DETAILS	Job No. X5887
Issue Date MAY 2016	
Drawing Description CITY OF PITTSBURGH STANDARD SIDEWALK NOTES UNIVERSITY OF PITTSBURGH STANDARD DETAILS	
CAD File Name G:\Projects\12000\12807- Pitt Greensburg-0070 Pitt Standard Details\0wg\02-Sheet\Details.dwg	Drawn By --
Drawing Number 10690	Set Order 44 of 44

THIS DETAIL WAS BASED ON CURRENT ACCEPTED CITY OF PITTSBURGH DPW CONSTRUCTION DETAILS AT THE TIME OF ISSUANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPLIANCE WITH CURRENT DPW REGULATIONS PRIOR TO ANY WORK BEING COMPLETED.

STANDARD TECHNICAL SPECIFICATIONS

SECTION 02080 - PIPED UTILITIES - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Piping joining materials.
 - 2. Transition fittings.
 - 3. Piped utility demolition.

1.3 DEFINITIONS

- A. PVC: Polyvinyl chloride plastic.
- B. HDPE: High Density Polyethylene

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.
- B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Rain conductors shall match the diameter of the existing pipe and be PVC Schedule 40 pipe with fittings.
- B. All other piped utilities shall match the existing piping material.

2.2 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
- B. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- C. Solvent Cements for Joining Plastic Piping:
 - 1. PVC Piping: ASTM D2564. Include primer according to ASTM F656.

2.3 TRANSITION FITTINGS

- A. Transition Fittings: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.
- B. Plastic-to-Metal Transition Fittings:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Spears Manufacturing Co.
 - 2. Description: PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.

- C. Flexible Transition Shielded Couplings for Underground Non-pressure Drainage Piping:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cascade Waterworks Mfg. Co.
 - b. Fernco, Inc. – Strong Back RC Series.
 - c. Mission Rubber Company.
 - d. Plastic Oddities.
 - e. Approved Equal.
 2. Description: Comply with ASTM C1173, elastomeric, sleeve-type, reducing or transition pattern. Include shear rings, ends of the same size as piping to be joined, and corrosion-resistant metal tension band and tightening mechanism on each end.

PART 3 - EXECUTION

3.1 PIPED UTILITY DEMOLITION

- A. Disconnect, demolish, and remove piped utility systems, equipment, and components indicated to be removed.
1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 2. Piping to Be Abandoned in Place: Drain piping. Fill abandoned piping with flowable fill, and cap or plug piping with same or compatible piping material.
 3. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make operational.
- B. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.2 PIPING INSTALLATION

- A. Install piping according to the following requirements and Division 2 Sections specifying piping systems.
- B. Plans indicate general location and arrangement of piping systems. Adjust as required.
- C. Install piping at indicated slopes.
- D. Install piping free of sags and bends.
- E. Install fittings for changes in direction and branch connections.
- F. Select system components with pressure rating equal to or greater than system operating pressure.

3.3 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 2 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Plastic Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. PVC Non-pressure Piping: Join according to ASTM D2855.
- E. Plastic Non-pressure Piping Gasketed Joints: Join according to ASTM D3212.
- F. Plastic Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D2657.
 - 1. Plain-End PE Pipe and Fittings: Use butt fusion.
 - 2. Plain-End PE Pipe and Socket Fittings: Use socket fusion.
- G. Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

END OF SECTION 02080

SECTION 02300 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Preparing sub-grades for slabs on grade, walks, pavements, lawns and grasses and landscaping.
- B. Related Sections include the following:
 - 1. Division 2 Section "Trench Excavation and Backfill for Sewers and Utilities" for trench excavation and backfilling of sewer and utility trenches.

1.3 DEFINITIONS

- A. Backfill: Soil Material or aggregate material used to fill a trench excavation.
 - 1. Initial backfill (Pipe Zone): Aggregate material placed under, beside, and over pipes in a trench to depths indicated on the Standard Details and per pipe manufacturer's recommendations.
- B. Base Course: Course placed between the subgrade course and sidewalks, concrete pavement and hot mix asphalt paving.
- C. Borrow: Satisfactory soil material, free of organic or other deleterious material imported from off the project site for use as fill or backfill.
- D. Drainage Course: Course of washed granular material meeting PennDOT 2A or AASHTO #57 limestone requirements supporting the slab on grade that also minimizes upward capillary flow of pore water.

- E. Bulk Excavation (if applicable): Completion of all excavation (“cuts”) and structural fills to the lines and grades as shown on the Drawings.
1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Owner. Authorized additional excavation and replacement material will be paid for according to Contract provisions.
 2. Satisfactory Material: Soil whose composition is satisfactory for use in embankment construction. In general, any mineral (inorganic) soil, blasted or broken rock, and similar materials of natural or man-made origin including mixtures thereof.
 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Owner. Unauthorized excavation, as well as remedial work directed by the Owner, shall be at the Contractor’s sole expense.
 4. Unsatisfactory Material: Any soil containing vegetation or organic matter, such as muck, peat, organic silt, topsoil or sod, which is not satisfactory for use in embankment construction or for support of permanent structures. Certain manmade deposits such as land-fill material may also be determined to be unsatisfactory material.
- F. Trench Excavation: Removal and replacement of material in order to install new piping and structures. For purposes of this Specification, all trench excavation shall be defined as “unclassified”. See additional paragraphs in this Section for further definition.
- G. Fill: Soil materials used to raise existing grades.
- H. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below base, drainage fill, or topsoil materials.
- I. Topsoil: Natural or cultivated surface-soil layer containing not less than two (2%) percent nor more than ten (10%) percent of organic matter, as specified in AASHTO designation T194. The material contains sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than two (2) inches in diameter. Topsoil shall be free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- J. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.
- K. Final backfill: Aggregate material or fill placed over initial backfill to fill a trench to grades indicated on drawings.

1.4 SUBMITTALS

- A. Product Data: For the following:
1. Each type of geotextile.

1.5 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities unless permitted in writing by the Facility Owner and the Owner and then only after arranging to provide temporary utility services according to requirements indicated.
1. Notify Facility Owner and the Owner not less than two (2) days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without the Facility Owner's written permission.
 3. Obtain PA One Call Number prior to beginning work.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed unless indicated otherwise. Coordinate with Facility Owners to shut off services if lines are active.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow materials when sufficient satisfactory soil materials are not available from bulk excavations.
- B. Base or Subbase Material: AASHTO No. 57 limestone or PennDOT 2A limestone as required.
- C. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least ninety (90%) percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- D. Drainage Course: AASHTO No. 57 limestone.
- E. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 4 sieve.
- F. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.
- G. Sand: ASTM C 33, fine aggregate, natural, or manufactured sand.
- H. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, GC, SW, SP, SM, SC, ML and CL or a combination of these groups; free of rock or gravel larger than three (3) inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- I. Unsatisfactory Soils: ASTM D 2487 Soil Classification Groups OL, CL, MH, OH and PT expansive or carbonaceous shales and soils that cannot maintain an optimum moisture content of three (3) percent at the time of compaction.

2.2 GEOTEXTILES

1. Subsurface Drainage Geotextile: Shall comply with the requirements of a Class 1 geotextile in Section 735 in the current edition of PennDOT Publication 408.
2. Separation Geotextile: Shall comply with the requirements of a Class 4 Type A geotextile in Section 735 in the current edition of PennDOT Publication 408.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by bulk earthwork operations.
- B. Preparation of subgrade for bulk earthwork and trenching operations shall include removal of trees, vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering bulk excavations and trench excavations. Do not allow water to pond and collect on prepared subgrades. Do not allow water to flood project site and/or surrounding properties.
- B. Protect subgrades and trenches from softening, undermining, washout, and damage by rain or water accumulation.
- C. Provide and maintain all temporary drainage and dewatering systems, such as pumps, sumps and discharge lines as required during bulk excavation and trench excavation at no additional cost to the Owner.
- D. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations and trenches. Do not use excavated trenches as temporary drainage ditches.
- E. During grading operations, pits, cuts, excavation areas and/or embankments and subgrades shall be shaped, sloped and maintained to facilitate drainage of surface water. Existing drainage routes shall not be choked or obstructed until new ones are established. Temporary culverts, pumps or other equipment shall be used to facilitate drainage of fills during construction.
- F. Care shall be exercised during excavations to avoid discharge of surface flows across watershed lines.

3.3 BULK EXCAVATION REQUIREMENTS (IF APPLICABLE)

- A. The Contractor shall be responsible for bulk excavation (if applicable) of all material encountered regardless of type. All bulk excavation shall be considered as unclassified. The Contractor shall be responsible for any and all required excavation, including trench excavation, through any and all types of encountered material including soil, rock, and pavement materials (whether evident on the surface or not).
- B. The Contractor shall excavate all materials as required to the dimensions and grades indicated on the Drawings.
- C. The Contractor shall complete excavation and fill embankment procedures to the subgrade surface elevations which conform to the finished grades.
- D. The Contractor shall be responsible at all times for carrying out all excavation operations in a safe and prudent manner so that all persons and property will be protected from hazard.
- E. The Contractor shall prepare and submit a construction schedule for bulk excavation and trenching operations prior to beginning work.
- F. The Contractor shall be responsible for the offsite disposal of all surplus excavated or trenched material. Prior to commencement of work, the Contractor shall advise the Owner of the quantity of surplus material, if any, he estimates will be disposed of off-site. The Contractor shall provide the Owner with a copy of the approved grading permit and Erosion and Sedimentation Control Plan for the off-site spoil site.
- G. In the event the Contractor disposes of too much excavated material, he shall replace the material as necessary and required at his sole cost and expense. Material to be replaced shall meet the requirements for satisfactory material as specified herein and shall be subject to the approval of the Owner.
- H. The existing surface, subsurface and base may consist of any or all of the following materials: asphalt, plain concrete, brick pavers, cobblestone pavers, reinforced concrete, coarse aggregate, cinders, sand, slag, unclassified fill previously placed, rock and in-situ natural soils. Removal of the existing surface, subsurface and base shall include the removal of any materials encompassing manholes, utility boxes, utility lines, and trench lines.
- I. All excavations and trenching shall be considered as unclassified. No additional compensation, other than time, will be considered for excavation through any encountered subsurface materials.

- J. The Contractor shall provide all necessary measures to control dust through the use of water, calcium chloride, or other material approved by the Owner, at such locations and during such periods as directed or as be required by the Owner.
1. Calcium Chloride shall be spread in pellet or flake form by approved devices so that uniform distribution is attained over the entire area being treated.
 2. Watering equipment shall consist of pipelines, tanks, tank trucks or other approved devices capable of applying a uniform spread of water over the surface. A suitable device for regulating the flow and positive shut-off of the water shall be provided for positive control by the operator.
 3. The Owner will advise the Contractor of any unsatisfactory procedures used for dust control. If the unsatisfactory procedures are not corrected promptly, the Owner may suspend the performance of any or all construction until the condition has been corrected.
 4. Payment for dust control shall be incidental.

3.4 EXCAVATION FOR CONCRETE WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades to a tolerance of one-half ($\frac{1}{2}$) of an inch.

3.5 DISPOSAL OF MATERIAL OUTSIDE OF THE WORK SITE

- A. The Contractor shall dispose all waste and excess materials off-site and shall be responsible for all costs incurred therefore.
- B. The Contractor must first obtain a written permit from the off-site property owner on whose property the disposal is to be made. He shall file with the Owner said permit or a certified copy thereof, together with a written release from the property owner, absolving the Owner from any and all responsibility in connection with the disposal of material on said off-site property.
- C. During the disposal of waste and excess materials the Contractor shall comply with all Federal, State and Local governmental rules, regulations, laws and ordinances concerning such disposal of waste and excess materials.

3.6 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavations under pavement, sidewalks, landscaping areas, utilities, sewer lines and other construction areas with satisfactory soil to subgrade in accordance with the soil fill requirements at no additional cost to the Owner.

3.7 BACKFILL

- A. Place and mechanically compact backfill in excavations and trenches promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage.
 - 2. Removal of concrete form work.
 - 3. Removal of trash and debris.
 - 4. Removal of temporary shoring and bracing.
 - 5. Installation of permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of water, mud, frost, snow, or ice.
- C. Place on-site satisfactory soil final trench backfill material in maximum twelve (12")-inch loose lifts mechanically compacted to ninety five (95%)-percent modified Proctor density per ASTM D1557.

3.8 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
 - 3. Slope grades to direct water away from buildings and to prevent ponding.

3.9 GEOTEXTILE INSTALLATION

- A. The Contractor shall be required to install Class 4 Type A geotextile fabric on the subgrade prior to installing the stone subbase.
 - 1. The Contractor shall install the Class 4 Type A geotextile fabric in accordance with the requirements set forth in Section 212 in the most current edition of the PennDOT Publication 408. The maximum overlap between rolls is twelve (12) inches with no additional compensation for the cost of the overlapping or pins required for installation.
 - 2. The geotextile shall be pinned to the sub-base using eight (8) penny aluminum nails spaced twelve (12) inches center to center.
 - 3. Trucks shall not be permitted to travel over the fabric when aggregate is being installed. The aggregate shall be placed on the fabric by dumping the trucks and then blading the aggregate onto the fabric with a front loader. The aggregate must be dropped onto the fabric and not shoved over it.
 - 4. Protect the geotextile fabric from traffic and other damage and install the subbase material on it the same day.

3.10 SUBBASE FOR CEMENT CONCRETE PAVEMENT AND WALKS

- A. Concrete Sidewalks and Driveways subbase shall be in accordance with applicable Specification Sections and Details.
- B. Shape subbase to required crown elevations and cross-slope grades.
- C. Place subbase six (6) inches or less to compacted thickness in a single layer.
- D. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than seventy percent (70%) density as per ASTM D4253 and D4254.

3.11 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
 - 2. Stockpile topsoil for re-use in Owner-designated areas.

3.12 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by the Owner. Reshape and re-compact.
- C. Where settling occurs before project correction period elapses, remove finished surfacing, backfill with additional competent material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.
 - 2. All corrective work shall be conducted at the Contractor's sole expense.

END OF SECTION 02300

SECTION 02310 – TRENCH EXCAVATION AND BACKFILL FOR SEWERS AND UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes trench excavation and backfill for sewers and utility trenches, with the following components:
 - 1. Excavation Requirements
 - 2. PennDOT 2A Limestone
 - 3. AASHTO No. 57 Limestone
 - 4. Select On-site Final Backfill
- B. Related Sections include the following:
 - A. Division 1 Section “Earthwork” for additional requirements.
 - B. Division 2 Section “Hot Mix Asphalt Paving” for installation of bituminous asphalt pavement.

1.3 DEFINITIONS

- A. PennDOT: Pennsylvania Department of Transportation
- B. Backfill: Soil material or aggregate material used to fill an excavation.
 - 1. Aggregate Backfill: PennDOT 2A Limestone or AASHTO No. 57 Limestone
 - 2. Final Backfill: On-site material approved by the Owner
- C. Bedding Course: Six (6’)-inches of AASHTO No. 57 Limestone placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil, free of organic or other deleterious material imported from off-site for use as backfill.

- E. Trench Excavation: Removal of all material encountered above subgrade elevations and to lines and dimensions indicated regardless of type encountered.
 - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Owner. Authorized additional excavation and replacement material will be paid for according to applicable Contract provisions.
 - 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Owner. Unauthorized excavation, as well as remedial work directed by the Owner to correct unauthorized excavation, shall be at the Contractor's sole cost and expense.
- F. Fill: Soil materials used to raise existing grades.
- G. Pipe Zone: The area from the pipe invert to one (1) foot above the crown of the pipe for the full width and length of the trench.
- H. Utilities: On-site underground pipes, conduits, ducts and cables within the project limits.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. PennDOT 2A Limestone
 - 2. AASHTO No. 57 Limestone

PART 2 - PRODUCTS

2.1 AGGREGATE MATERIALS

- A. PennDOT 2A Limestone and/or AASHTO #57 Limestone meeting specifications set for in Section 703 in the most current edition of PennDOT Publication 408 for PennDOT 2A and/or AASHTO No. 57 Limestone.
- B. Sand: ASTM C33, fine aggregate, natural, or manufactured sand.

2.2 SOIL MATERIALS

- A. Soil Material: Fine, clean earth soil material free from large stones, clods, topsoil, sod, frozen earth, wood or any other objectionable material as determined by the Owner.
- B. Unsuitable Soil Material at Bottom of Trench: Soil material at the bottom of the trench unable to support the pipe and backfill, as determined by the Owner.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Where the location and depth of existing utilities are of concern in maintaining grade, the Contractor may be directed to make exploratory excavations to verify that the design grades can be achieved or for making adjustments as approved by the Owner.
- B. The Contractor shall be responsible for the protection of all utilities in the trench zone. All damage to gas, water, telephone, power, cable or sewer lines shall be repaired immediately according to applicable Contract provisions and Facility Owner standards. In no event shall any utility service remain interrupted overnight.

3.2 TRENCH EXCAVATION

- A. The Contractor shall protect the installation of the pipe at all times during construction.
- B. Trench excavation shall conform to the line and grade of the sewer or utilities as shown on the Drawings and according to minimum manufacturer's recommended trench widths.
- C. All excavations shall be kept free from water, snow and ice during construction.
- D. Mats shall be placed for excavation equipment where damage could be caused to existing pavements.
- E. The minimum trench width shall be the outside diameter of the pipe plus twelve (12) inches on both sides of the pipe to ensure proper compaction of the bedding and backfill or as recommended by the pipe manufacturer. The maximum trench width shall conform to current ASTM and OSHA requirements predetermined by the depth of the excavation and pipe size or as required by site conditions. No additional compensation will be considered for required trench widths caused by existing site conditions or necessary to meet ASTM, OSHA or pipe manufacturer requirements.

- F. The bottom of the trenches shall be prepared to conform to the grade of the pipe and the bottom of the foundation of structures. Special precautions shall be exercised to insure that pipes, when installed, will not rest on rock, masonry or any other material that would present a non-uniform foundation. Where two or more pipes are to be laid in the same trench, the Contractor shall excavate the trench so that all pipes are laid in conformance with the specified pipe bedding, or better.
- G. Excavation below Required Grade: Excavation below the grade of pipes or subsurface structures shown on the drawings necessitated by changes in grades in accordance with the directions of the Owner will be paid for under "Additional Trench Excavation", as hereinafter defined. Excavation carried below the required level without authorization by the Owner shall be backfilled at the Contractor's expense with aggregate material as approved by the Owner. Compaction of such backfill material shall be as specified elsewhere herein.
- H. Excavation in Paved Areas: When excavations are to be made in paved surfaces, the paved surfaces shall be neatly cut one (1) foot beyond each side of the trench and ahead of the excavation by means of pneumatic tool, saw cutting or other approved tools to provide a clean, uniform edge, with minimum disturbance of remaining pavements. The pavements so removed shall not be used for trench backfill, but shall be disposed of off-site in an approved manner.
- I. Surplus Excavated Material: The Contractor shall remove all excess excavated material from the site or haul it to an on-site Owner-approved stockpile for removal before project completion.

3.3 MATERIAL EXCAVATION AND BACKFILL

- A. Authorized Changes and/or Alterations: The Owner may, as a result of unforeseen conditions arising during the progress of the work, order the grade or location of any pipe or other structure changed from that established on the Drawings.
- B. Credit to Owner: Should such changes or alterations result in a reduction in the quantity of earth excavation, a credit to the Owner for the reduction in the amount of earth trench excavation occasioned by such change shall be made.
- C. Payment for trench excavation, aggregate bedding/backfill and select on-site backfill shall be included in the pipe and manhole bid prices.

3.4 AGGREGATE PIPE BEDDING

- A. Aggregate Bedding: Bedding in the “pipe zone” shall consist of a minimum of six (6)-inches of approved AASHTO #57 limestone installed below the pipe for the entire trench width. In addition, a minimum of twelve (12’’) -inches of approved AASHTO No. 57 limestone shall be installed above the crown of the pipe as well as aggregate placed in the trench alongside the pipe from the invert to the crown. The bedding shall be placed in six (6’’) -inch loose lifts and compacted using mechanical compaction equipment to seventy (70%)-percent relative density per ASTM D 4253 and ASTM D 4254.

3.5 TRENCH BACKFILL FOR SEWERS AND SEWER STRUCTURES

- A. Under non-paved areas and outside eight (8)-feet of structures and/or curbs, the backfill shall be approved select on-site material placed to within four (4’’) -inches from the final proposed elevation to allow for topsoil placement and compaction. Select on-site material shall be placed in eight (8’’) -inch loose lifts mechanically compacted to ninety five (95%) modified Proctor density per ASTM D 1557.
- B. Under pavement and within eight (8)-feet of structures and/or curbs:
 - 1. Backfill shall be approved PennDOT 2A limestone placed in six (6’’) -inch lifts to the subgrade elevation of the proposed impervious surface from twelve (12’’) -inches above the crown of the pipe compacted using mechanical compaction equipment to seventy (70%)-percent relative density per ASTM D 4253 and ASTM D 4254.
- C. Backfilled areas which settle shall be repaired at the Contractor's sole expense.

3.6 UNSUITABLE MATERIALS

- A. If unsuitable material as determined by the Owner is found at the trench bottom, the Contractor shall be required to excavate below grade and backfill the trench with AASHTO No. 57 limestone meeting the specifications set forth in the most current edition of PennDOT Publication 408, Section 703.2(c), and Table C. Payment for excavation and placement of such material shall be by applicable contract provisions. No payment for unsuitable replacement will be allowed unless specifically directed by the Owner.

3.7 TRENCH BACKFILL FOR UTILITIES

- A. The Contractor shall backfill trenches for utilities in accordance with the requirements of the Facility Owner having jurisdiction for the utility being installed.

END OF SECTION 02310

SECTION 02620 - SUBDRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes subdrainage systems for the following:
 - 1. Under slab areas.
 - 2. Curb drains.
 - 3. Landscaped areas.

1.3 DEFINITIONS

- A. PE: Polyethylene plastic.
- B. PVC: Polyvinyl chloride plastic.
- C. Sub-drainage: Drainage system that collects and removes subsurface or seepage water.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Drainage conduits.
 - 2. Geotextile filter fabrics.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
 2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 SOIL MATERIALS

- A. Backfill, drainage course, impervious fill, and satisfactory soil materials are specified in Division 2 Section "Earthwork."

2.3 PERFORATED WALL PIPES AND FITTINGS

- A. Perforated PE Pipe and Fittings:
1. NPS 3 to 6: ASTM F405 and AASHTO M252, Type CP, snap and/or split couplers with Type A or Type B perforation pattern.
- B. Perforated PVC Sewer Pipe and Fittings:
1. NPS 3 to 6: ASTM D2729 solvent weld drain pipe belled end with standard perforation pattern.

2.4 GEOTEXTILE FILTER FABRICS

- A. Description: Use fabric consisting of long chain polymeric filaments or yarns such as polyethylene, polyamide, polyvinylidene-chloride, polypropylene, or polyester formed into a stable network so that the filaments or yarns retain their position to each other. Use Class 1 geotextile (either woven or non-woven) meeting all physical requirements shown on Table A, Section 735 of PennDOT Publication 408 (most recent revision).
1. Source of Supply: Use supplier listed on PennDOT Bulletin 15 (Qualified Products List for Construction).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and areas for suitable conditions where subdrainage systems are to be installed.
- B. If subdrainage is required for landscaping, locate and mark existing utilities, underground structures, and above ground obstructions before beginning installation. Protect all utilities and structures to avoid disruption and damage.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."

3.3 PIPING APPLICATIONS

A. Underslab Subdrainage Piping:

- 1. Perforated PE pipe and fittings, couplings, and coupled joints.

B. Curb Drain

- 1. Curb drains shall be constructed using AASHTO #57 limestone aggregate to the detailed dimensions. Prior to placing the aggregate, the trench shall be thoroughly compacted and shaped to uniform grade for proper drainage. Four (4) inch, six (6) inch or eight (8) inch PE perforated drain tubing shall be placed where specified or detailed.
- 2. Any and all other items of construction, including geotextile and tar paper, shall be placed according to the applicable Detail.

3.4 UNDERSLAB DRAINAGE INSTALLATION

- A. Excavate for underslab drainage system after subgrade material has been compacted but before drainage course has been placed. Include horizontal distance of at least six (6") inches between drainage pipe and trench walls. Grade bottom of trench excavations to required slope, and compact to firm, solid bed for drainage system.
- B. Lay flat-style geotextile filter fabric in trench and overlap trench sides.
- C. Place supporting layer of drainage course over compacted subgrade and geotextile filter fabric, to compacted depth of not less than four (4") inches
- D. Install horizontal drainage panels as follows:
 - 1. Coordinate placement with other drainage materials.
 - 2. Lay perforated drainage pipe at inside edge of footings.
 - 3. Place drainage panel meeting CSI Section 33 46 00 over drainage pipe with core side up. Peel back fabric and wrap fabric around pipe. Locate top of core at bottom elevation of floor slab.
 - 4. Butt additional panels against other installed panels. If panels have plastic flanges, overlap installed panel with flange.
 - 5. Install all panels according to manufacturer's recommendations.
 - 6. Use in conjunction with Owner-approved waterproofing system if required.

3.5 PIPING INSTALLATION

- A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.
 - 1. Underslab Subdrainage: Install piping pitched down in direction of flow, at a minimum slope of one (1%) percent.
 - 2. Lay perforated pipe with perforations down.
 - 3. Excavate recesses in trench bottom for bell ends of pipe. Lay pipe with bells facing upslope and with spigot end entered fully into adjacent bell.
 - 4. All drainage piping must outlet into an existing storm structure or connect to existing drainage piping.
- B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.
- C. Install PE and PVC piping according to ASTM D 2321 and manufacturer's published guidelines.

3.6 PIPE JOINT CONSTRUCTION

- A. Join perforated, PE pipe and fittings with couplings for soil-tight joints according to manufacturer's recommendations and all applicable AASHTO and ASTM standards.
- B. Special Pipe Couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and fit materials and dimensions of both pipes.

3.7 IDENTIFICATION

- A. Materials and their installation are specified in Division 2 Section "Earthwork." Arrange for installation of green warning tapes directly over piping.
 - 1. Install detectable warning tape over nonferrous piping and over edges of underground structures.

3.8 FIELD QUALITY CONTROL

- A. Testing: After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

3.9 CLEANING

- A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 02620

SECTION 02741 – HOT MIX ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Hot mix asphalt paving
 - 2. Cold milling of existing bituminous pavement
 - 3. Aggregate base
 - 4. Keyways

1.3 DEFINITIONS

- A. Hot Mix Bituminous Paving Terminology: Refer to ASTM D8 for definitions of terms.
- B. Hot Mix Asphalt Paving: Bituminous paving or material
- C. PennDOT: Pennsylvania Department of Transportation.
- D. City: City of Pittsburgh. The Contractor shall become familiar with and strictly follow the City of Pittsburgh, Department of Public Works, Right of Way Procedures Manual (January 2015 with updates if applicable) for all procedures and requirements for work within City rights of way at no additional cost to the Owner.

1.4 SUBMITTALS

A. Job Mix Designs and Certifications:

1. PennDOT certification and job mix formulas from the supplier for the bituminous materials for the proposed Work seven (7) days prior to the pre-construction conference.
2. PennDOT Form TR 465 must be supplied for each day the bituminous material is delivered to the job.
3. PennDOT Form CS-4171 (Certificate of Compliance) and Form TR-448A (Job Mix Formula Report) being computer print outs for the weight of aggregate and asphalt cement content along with accumulated total tonnage listed and the temperature of the mix leaving the plant must be submitted daily.
4. Material Supplier's Bill of Lading indicating the temperature of the material is leaving the plant, the type of material, the net weight of material in the truck and a cumulative total tonnage of material being installed must be submitted on a daily basis.
5. Tack Coat: PennDOT certification and source of material must be submitted seven (7) days prior to the pre-construction meeting. Material Supplier's Bill of Lading must be submitted on a daily basis.

B. Qualification Data: PennDOT pre-qualification certifications from all Contractors and Suppliers meeting the appropriate classifications for the project and a minimum of three (3) references for previous projects completed or as listed on Pennsylvania State Contract 5610-36 for work with the City of Pittsburgh right of ways.

C. Material Test Reports: For each bituminous paving material by a company qualified and certified by PennDOT to complete the tests required by this specification.

D. Material Certificates: For each paving fabric, signed by manufacturers.

E. City Requirements: All bituminous (asphalt) for the City of Pittsburgh streets shall be in full accordance with the City of Pittsburgh, Department of Public Works, Right of Way Procedures Manual (January 2015 with updates if applicable).

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver geotextile materials to the project site in original packaging with the manufacturer's labels containing the brand name and type of material. Store geotextile materials and other paving fabrics in accordance with Section 735 in the most current edition of PennDOT Publication 408.

B. The temperature of the hot-mix asphalt paving mix being delivered shall not be more than fifteen (15) degrees below the minimum temperature shown on the material supplier's Bill of Lading and not above the maximum specified temperature.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply bituminous materials, geotextiles or paving fabrics unless the following requirements are met:
1. The subbase or existing bituminous material is dry as determined by the Owner.
 2. The existing pavement has been cleaned in accordance with Section 401 of the most current edition of PennDOT Publication 408.
 3. Tack Coat: Minimum air and surface temperature of 40 degrees F and rising in accordance with Section 460 in the most current edition of PennDOT Publication 408.
 4. Bituminous Base Course: Minimum surface and air temperature of 35 degrees F and rising at time of placement in accordance with Section 305 in the most current edition of PennDOT Publication 408.
 5. Superpave Bituminous Binder and Wearing Surface: Minimum surface and air temperature of 40 degrees F and rising at time of placement in accordance with Section 409 in the most current edition of PennDOT Publication 408. Binder and wearing courses shall not be installed between October 31 and April 1 without written permission of the Owner.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. Coarse Aggregate: Shall conform to the requirements in Sections 401 and 703 in the most current edition of PennDOT Publication 408.
- B. Fine Aggregate: Shall conform to the requirements in Sections 401 and 703 in the most current edition of PennDOT Publication 408.

2.2 ASPHALT PAVING MATERIALS

- A. Asphalt Cement: Shall conform to the requirements in Section 702 in the most current edition of PennDOT Publication 408 for AASHTO MP1, PG 64-22.
- B. Tack Coat: Shall conform to the requirements in Section 460 in the most current edition of PennDOT Publication 408 for emulsified asphalt, Class AE-T.
- C. Superpave Base, Binder and Wearing Surface: Superpave Asphalt Mixture Design, , PG 64-22, 0 to 0.3 million ESAL's, 9.5, 19 and 25 mm mix complying with the requirements in Section 409 in the most current edition of PennDOT Publication 408. The bituminous wearing surface shall incorporate coarse aggregate having a Skid Resistance Level (SRL) designation of "H" or better, supplied from sources approved for this classification as defined and listed in PennDOT Bulletin No. 14.
- D. Joint Sealant: Shall conform to the requirements for AET emulsified asphalt in Section 401 in the most current edition of PennDOT Publication 408.
- E. City Asphalt Paving Materials: Shall conform to City of Pittsburgh, Department of Public Works, Right of Way Procedures Manual (January 2015 with updates if applicable).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subbase and existing bituminous paving is dry and in suitable condition to support paving and imposed loads.
- B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 REPAIRS

- A. Leveling Course: Install and compact leveling course consisting of hot mix asphalt surface course to level sags and fill depressions in existing pavements.
- B. Crack and Joint Filling: Complete in accordance with the specifications of Section 469 of the most current editions of PennDOT Publication 408.

3.3 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade and all existing bituminous material are ready to receive paving.
1. Clean existing pavement surface of loose and deleterious material immediately before installing any bituminous material or paving fabric. Cleaning shall be completed with a power broom or mechanical sweepers capable of collecting the material and disposing of it offsite. If, in the opinion of the Owner the cleaning is not adequate, the Contractor shall repeat the procedure until it is deemed satisfactory.
 2. All joints in existing concrete pavements and all larger cracks in bituminous pavement (1/2" wide or larger) shall be thoroughly cleaned to a depth of one (1) inch and filled with an approved sand and asphalt grout mix.
 3. The existing pavement surface shall be brought to a uniform grade and cross section as specified. The surface of the existing pavement shall be brought to the same transverse slope and longitudinal cross section as the finished pavement section using scratch coat of bituminous binder at a variable thickness.
- B. Tack Coat: Apply in accordance with the specifications in Section 460 of the most current edition of PennDOT Publication 408, not exceeding 0.02 gallon per square yard variation.
1. The tack coat shall be applied at the specified rate and uniform manner of 0.02 to 0.07 gallon per square yard at a surface temperature of 40 degrees and rising.
 2. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 3. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
 4. The tack coat shall be applied to all paving areas of the cartway, driveway edges, catch basins, inlets, manholes, curbs and utility boxes.
- C. After the subgrade and/or existing pavement surfaces have been prepared as specified herein, the Contractor shall check all frames, covers, grates, water valve boxes and all other miscellaneous castings that are located in the proposed pavement area to insure that all such items have been accurately positioned and set to the proper slope and elevation. All covers and grates are to be set flush with the required finished pavement surface. No depressions or mounds will be permitted in the pavement to accommodate inaccuracies in the setting of these appurtenances. All corrective work that may be necessary shall be performed at the Contractor's sole cost and expense.

- D. Where new pavements are to meet existing pavements (except as specified herein under Bituminous Concrete Overlays), the Contractor shall line cut the existing pavements with an approved pneumatic, saw cutting or mechanical cutting tool so that there will be a vertical butting surface between the old and new pavements. There shall be a one (1) foot offset in each pavement course to permit each successive course to overlap the lower existing course. Line cutting of existing pavements shall be along neat, straight and even lines, and shall be performed in such a manner so as not to damage the adjacent pavement to remain. The Owner shall approve the acceptability of the line cutting device and the method of operation prior to new asphalt placement.
- E. All vertical surfaces of curbs, structures, gutters, and existing pavement in contact with new bituminous mixtures shall be painted with a uniform coating of an approved bituminous emulsion or priming material. Extreme care shall be exercised in the application of this material to prevent splattering or staining of surfaces that are to remain exposed. Work that is stained as a result of the Contractor's operations shall be repaired and/or replaced at the Contractor's sole cost and expenses.
- F. For milling operations, the Contractor shall provide a milling machine designed and built for milling existing bituminous pavements with an automatic grade and slope control system. The Contractor shall mill to provide a finished surface free from gouges, grooves and ridges and that conforms to the surface tolerance requirements of Section 409.3(l) in the most current edition of PennDOT Publication 408. Immediately after milling, remove milled material. When indicated that milled material is to be retained by the Contractor, satisfactorily dispose of milled material at an approved off-site facility off the Owner's property immediately after milling. When indicated that milled material is to be retained by the Owner, deliver milled material to the designated stockpiling location immediately after milling. Carefully remove the existing bituminous material around utility facilities within work areas. Repair or replace utility facilities damaged by the milling operation to the satisfaction of the Facility Owner at no additional cost to the Owner. Control the rate of milling to avoid tearing of the mat. If directed, separate oversized and chunky milled material. Maintain the milled surface free of all loose materials and dust. Place the first overlaying bituminous course within five (5) calendar days from the start of milling operations. Failure to overlay a milled section of roadway within five (5) calendar days will result in a penalty of five hundred (\$ 500.00) dollars per calendar day until overlay operations begin. Work stoppages caused by the Owner, Facility Owners, and documented weather delays will not count towards the five (5) calendar days for calculating the penalty.
- G. The Contractor shall cut or mill keyway into the existing pavement to provide a tight, smooth joint. The keyway length shall be a minimum of fifteen (15) feet per inch of vertical change or as directed by the Owner.
- H. Milling operations conducted on City of Pittsburgh primary and secondary streets shall follow all utility paving specifications listed in the City of Pittsburgh, Department of Public Works, Right of Way Procedures Manual (January 2015 with updates if applicable) at no additional cost to the Owner.

3.4 HOT MIX ASPHALT PAVING EQUIPMENT

- A. Trucks: Trucks used to transport hot mix bituminous material to the project site shall conform to Section 401.0(c) in the most current edition of PennDOT Publication 408.

3.5 HOT MIX ASPHALT MATERIAL INSTALLATION

- A. Place the bituminous paving material in accordance to the Details and PennDOT Publication 408.
- B. Install the bituminous materials in accordance with the following:
 - 1. All hot mix asphalt materials shall be installed in accordance with the most current edition of PennDOT Publication 408.
 - 2. Do not place bituminous paving when the surface is wet or when its air or surface temperature is less than 40 degrees Fahrenheit.
 - 3. No hot mix asphalt material shall be installed if the temperature of the material is less than 275 degrees Fahrenheit or greater than 325 degrees Fahrenheit. All temperatures must be shown on the Bill of Lading. If these requirements are not met, the bituminous material shall be rejected and removed from the project site.
 - 4. All asphalt trucks are to remain covered and/or tarped until ready to dump into the paver. Any truck with an uncovered partial load waiting for unloading will not be permitted to dump into the paver.
 - 5. No traffic shall be permitted on newly compacted hot mix asphalt material until its temperature is lower then 140 degrees F.
 - 6. No kerosene is to be used on the paving equipment.
 - 7. The edge of the overlay shall be sealed with PG 64-22 twelve (12'')-inches wide with six (6'')-inches on the overlay and six (6'')-inches on the existing pavement.
 - 8. A twelve (12'')-inch pass of PG 64-22 shall be placed along concrete curbs and the gutter section of bituminous curbs. Sand gutter line when sealing past driveways and sidewalks and at all roadway joints in order to prevent tracking.
 - 9. All sealing must be completed within two (2) working days after completion of asphalt placement.

3.6 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with the same texture and smoothness as adjacent sections of the hot mix asphalt course.
 - 1. Clean contact surfaces and apply tack coat to joints.
 - 2. Offset longitudinal joints, in successive courses, a minimum of six (6'')-inches.
 - 3. Offset transverse joints, in successive courses, a minimum twenty four (24'')-inches.
 - 4. Construct transverse and longitudinal joints per the most current edition of PennDOT Publication 408.

- B. Install Joint Sealant in accordance with the following:
1. All edges of the new pavement, including around inlet, manhole and utility box castings shall be sealed with PG 64-22.
 2. On pavements with bituminous wedge curbs, apply PG 64-22 twelve (12")-wide with four (4")-inches applied to the wedge curb.
 3. On pavements with concrete curbs, apply PG 64-22 twelve (12")-inches with two (2")-inches applied to the inside face of the curb.
 4. All joints at driveways and sidewalks shall be sanded to prevent tracking.
 5. All joints shall be sealed within two (2) working days of completion of asphalt placement.

3.7 COMPACTION

- A. Complete compaction as per the specifications in Section 401 in the most current edition of PennDOT Publication 408.
- B. Compact hot mix asphalt paving with hot, hand tampers or vibratory compactors in areas inaccessible to rollers.
- C. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot mix asphalt. Compact by rolling to the specified density and surface smoothness.
- D. Erect barricades to protect paving from traffic until the mixture has cooled enough not to become marked.

3.8 INSTALLATION TOLERANCES

- A. Thickness: In accordance with Section 401 in the most current edition of PennDOT Publication 408.
- B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
1. Base and Binder Course: 1/4 inch
 2. Wearing Surface: 1/8 inch
- C. Crowned Surfaces: Test using appropriate methods and procedures acceptable to the Owner to insure the required crown cross section is obtained.

3.9 FIELD QUALITY CONTROL

- A. Hot Mix Asphalt Pavement: The testing agency shall conduct compaction and depth tests as follows:
1. The Contractor shall be required to provide tests for density for all layers of bituminous material by following the requirements set for in Section 409.9b HMA in the most current edition of PennDOT Publication 408 for nuclear gage testing. The test shall be performed by a licensed nuclear gage operator as witnessed by the Owner utilizing the following procedure set forth in Section 409 in the most current edition of PennDOT Publication 408. The Contractor shall complete the following with regards to density testing:
 - a. Use a nuclear gage meeting the requirements of PTM No 402.
 - b. Use a nuclear gage calibrated in accordance with AASHTO Test Method T-238-86. Submit certification of annual calibration of gages and documentation of licensed operators training to the Owner prior to the placement of any material.
 - c. Use the control strip technique specified in PTM No. 402, Section 7.2.3., to determine the optimum rolling pattern for each material course. Record all counts and plot the rolling pattern growth curve on form TR 4276-B.
 - d. The Contractor shall submit the testing results to the Owner on a daily basis.
 2. The Contractor will be paid for material placed based on the above required testing and in accordance with the most current edition of PennDOT Publication 408. The Owner retains the right to verify density testing in accordance with the above testing procedure in order to confirm the results.

3.10 TEST FOR SURFACE IRREGULARITIES

- A. Use a template cut to the required cross section of the finished base course. Equip the template with metal or other vertical extensions attached to each end, so the bottom of the template will be at the elevation of the top of the base course. Test the cross section for surface irregularities at intervals of not more than twenty (25) feet
- B. Use a ten (10) foot straight edge to test for longitudinal irregularities in the surface of the base course. Hold the straight edge parallel to the road centerline in contact with the surface. Move the straight edge from one side of the base course to the other. Advance along the base course in five (5) foot increments.
- C. Correct all surface irregularities exceeding one-half (1/2")-inch loosening the surface and removing or adding material as required. Compact the repaired area and surrounding surface by rolling.

D. Tests for Materials

1. All materials used in permanent pavement construction shall be subject to all testing and certifications as required by the PennDOT procedures and regulations. All tests shall be performed by the Contractor, his suppliers or independent testing laboratories, at no cost additional cost to the Owner.
2. Aggregate - Supplier's certifications, plus one (1) grab sample per ten thousand (10,000) produced tons to be tested by an independent laboratory.
3. Hot Mix Asphalt Materials - Daily plant certification plus one (1) grab sample per day for each type of material placed for an extraction test by an independent testing laboratory.
4. The City reserves the right to test the paving material at the Asphalt Testing Laboratory located at 4501 Centre Avenue, Pittsburgh, PA.

END OF SECTION 02741

SECTION 02743 – DRIVEWAY RESTORATION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Bituminous driveway restoration.
 - 2. Concrete driveway restoration.
 - 3. Stone or aggregate driveway restoration.
- B. Related Sections include the following:
 - 1. Division 2 Section “Earthwork” for aggregate subbase and base courses.
 - 2. Division 2 Section “Hot Mix Asphalt Paving” for bituminous asphalt pavement.
 - 3. Division 2 Section “Cement Concrete Pavement” for concrete pavement.

1.3 DEFINITIONS

- A. Hot Mix Bituminous Paving Terminology: Refer to ASTM D 8 for definitions of terms.
- B. PennDOT.: Pennsylvania Department of Transportation

PART 2 - PRODUCTS

2.1 BITUMINOUS DRIVEWAY RESTORATION

- A. All products shall conform with the materials listed in Section 02741 “Hot Mix Asphalt Paving” for the installation of bituminous materials

2.2 CONCRETE DRIVEWAY RESTORATION

- A. All products shall conform to the materials listed in Section 02751 “Cement Concrete Pavement” for the installation of concrete material.

2.3 STONE OR AGGREGATE DRIVEWAY RESTORATION

- A. All products shall conform to aggregate materials listed in Section 02741 “Hot Mix Asphalt Paving” for the installation of stone or aggregate material.

PART 3 - EXECUTION

3.1 BITUMINOUS DRIVEWAY RESTORATION

- A. The Contractor shall prepare the edge of the existing driveway by saw cutting the pavement to achieve a straight edge, removing the asphalt material and subbase and hauling it to an approved offsite dump site.
- B. The Contractor shall remove adequate existing driveway material to allow for the installation of the following: three (3) inches compacted depth PennDOT 2A limestone base; four (4) inches compacted depth 19.0 mm Superpave binder and one and a half (1 1/2) inches compacted depth 9.5 mm Superpave wearing course (0 to < 0.3 ESAL's, PG 64-22, SRL “H” or better). The Contractor shall be directed by the Owner as to the limits of driveway removal required in order to achieve an adequate grade for a smooth transition.
- C. The Contractor shall proof roll the subgrade material in accordance with Section 02741 “Hot Mix Asphalt Paving” prior to installing the aggregate base.
- D. The Contractor shall install three (3) inches compacted depth of PennDOT 2A limestone base in accordance with Section 02741 “Hot Mix Asphalt Paving”.
- E. The Contractor shall install four (4) inches compacted depth of 19.0 mm Superpave binder and one and a half (1 1/2) inches compacted depth of 9.5 mm Superpave Wearing Course in accordance with Section 02741 “Hot Mix Asphalt Paving”.
- F. The Contractor shall seal all new joints in the asphalt paving with PG 64-22 in accordance with Section 02741 “Hot Mix Asphalt Paving”.

3.2 CONCRETE DRIVEWAY RESTORATION

- A. The Contractor shall remove the damaged existing concrete slab to the next existing joint or as directed by the Owner. The Contractor shall haul the removed material to an approved off-site dump.
- B. The Contractor shall remove adequate existing driveway material to allow for the installation of four (4) inches compacted depth AASHTO #57 limestone base and six (6) inches of 4000 psi concrete. The Contractor will be directed by the Owner as to the limits of driveway removal required in order to achieve an adequate grade for a smooth transition.
- C. The Contractor shall protect adjacent slabs from damage during restoration. Any damage to adjacent slabs shall be repaired at the Contractor's sole cost and expense.

- D. The Contractor shall proof roll the subgrade material in accordance with Section 02751 “Cement Concrete Pavement” prior to installing the aggregate base.
- E. The Contractor shall install four (4) inches compacted depth of AASHTO No. 57 limestone in accordance with Section 02751 “Cement Concrete Pavement”.
- F. The driveway shall be reinforced with welded wire fabric 6x6-W2.9xW2.9 (or most current designation) with a minimum cover of three (3) inches
- G. The Contractor shall install six (6) inches of 4000 psi air entrained (5% +/- 1%) concrete in accordance with Section 2751 “Cement Concrete Pavement”.
- H. Driveways shall be neatly saw-cut prior to beginning restoration work. Saw cutting shall be included in the price of the driveway restoration.
- I. Contraction joints shall be spaced at a maximum of five (5) foot intervals and formed with a device to have the completed joint at least ½” deep. Expansion joints shall be spaced no more than fifty (50) feet apart and formed with ¼” pre-molded filler to the full depth of the slab. The ¼” pre-molded filler shall also be placed adjacent to curbs, sidewalks, other driveways, manhole castings, buildings and pavements. If the driveway abuts a curb, the joints on the driveway shall match the joints on the curb.
- J. The surface of the slab shall be brought to a uniform plane surface by means of a wood screed riding on forms. The surface shall then be finished with a wood or magnesium float and finished to match the existing concrete. The tool marks for joints and edges shall match the marks in the existing driveway. Neither dry cement nor water shall be added to the surface during the finishing process.
- K. On any tooled joints or edges of concrete do not use the jointing or edging tool until the surface water has evaporated from the concrete. Bull float and broom the surface, finish the joint and edges and use the broom to remove the tool marks on the surface.
- L. After placement, the concrete shall be cured per Section 02751 “Cement Concrete Pavement”.
- M. Sealing of Joints
 - 1. All expansion joints and joints against structures shall be joints, both expansion shall be sealed.
 - 2. The sealant shall be “Sikaflex-1A Polyurethane, Elastomeric Sealant/Adhesive” (or Owner approved equal). Sealant color shall be selected from the range of available colors by the Owner prior to application.
 - 3. All joints must be sound, clean, dry and free from oil and grease. Curing compound residues and any foreign material must be thoroughly removed. A roughened surface will also enhance the bond. Install bond breaker tape or back rod to prevent bond at the base of the joint.

4. Apply Sikaflex-1A at a temperature between forty (40) degrees Fahrenheit and one hundred (100) degrees Fahrenheit with a gun using the twenty (20) ounce “uni-pac” sausage.
- N. Replace rain conductors in kind if found under a driveway. Place a piece of No. 9 gauge wire mesh reinforcing one (1) foot over the pipe for reinforcement. In addition, a construction joint shall be placed over the rain conductor location. No additional compensation will be considered for the removal and/or replacement of roof or driveway drains under the driveway.
- O. Restore and/or raise to grade all gas valves, water valves, sewer vents, or other utility valve boxes encountered during driveway restoration. No additional compensation will be considered for work associated with this requirement.
- P. Insulated protection of the concrete shall be required dependent on weather conditions at the time of pouring and during the curing period. A polyethylene plastic sheeting shall be considered as the adequate minimum protection required for concrete during adverse weather conditions. The Owner reserves the right to require additional protective measures such as blanketing. No additional compensation will be considered in the event protective measures above the minimum are required by the Owner.

3.3 STONE OR AGGREGATE DRIVEWAY RESTORATION

- A. The Contractor shall install a minimum of six (6) inches of in kind stone or aggregate material. The gradation, color and texture of the replacement material shall match the existing material as closely as practical.
- B. The Contractor will be directed by the Owner as to the limits of driveway removal required in order to achieve an adequate grade for a smooth transition.

END OF SECTION 02743

SECTION 02751 - CEMENT CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes exterior cement concrete pavement for the following:
 - 1. Curbs
 - 2. Sidewalks
 - 3. Driveways
 - 4. Concrete Encasement
- B. Related Sections include the following:
 - 1. Division 2 Section "Earthwork" for subgrade preparation, grading, and subbase course.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Qualification Data: For manufacturer
- D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:
 - 1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

- E. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
 - 1. Cementitious materials.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Fiber reinforcement.
 - 4. Admixtures.
 - 5. Curing compounds.
 - 6. Applied finish materials.
 - 7. Bonding agent or epoxy adhesive.
 - 8. Joint fillers.
- F. Field quality-control test reports.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
 - 2. On-site batching of concrete will not be permitted.
- B. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.
- C. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1.6 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 - 2. Products: Subject to compliance with requirements, provide one of the products specified.

3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
 1. Use flexible or curved forms for curves with a radius one hundred (100) feet or less.
 2. Forms shall be of metal or new wood at least ten (10) feet long.
 3. Wood forms shall be rigid enough not to bow and deflect when concrete is placed. Worn, broken or distorted forms shall not be used.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- C. Each form shall be braced and staked in at least three (3) places for each ten (10) foot length, closer if necessary to keep from deforming when concrete is placed.
- D. Forms must extend the full depth of the concrete curb, sidewalk or driveway.
- E. The entire front and rear face of the curb must be formed. No wild pours or partial forming will be allowed.

2.3 STEEL REINFORCEMENT

- A. The Contractor shall submit data sheets for all steel reinforcement.

2.4 SYNTHETIC FIBER REINFORCEMENT

- A. Synthetic Fiber: Monofilament or fibrillated polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches long.
 1. Products:
 - a. Monofilament Fibers:
 - 1) Axim Concrete Technologies; Fibrasol IIP.
 - 2) Euclid Chemical Company (The); Fiberstrand 100.
 - 3) FORTA Corporation; Forta Mono.
 - 4) Grace, W. R. & Co.--Conn.; Grace MicroFiber.
 - 5) Metalcrete Industries; Polystrand 1000.

b. Fibrillated Fibers:

- 1) Axim Concrete Technologies; Fibrasol F.
- 2) FORTA Corporation; Forta.
- 3) Euclid Chemical Company (The); Fiberstrand F.
- 4) Grace, W. R. & Co.--Conn.; Grace Fibers.

2.5 CONCRETE MATERIALS AND MIXTURES

- A. Cementitious Material: Use one of the following cementitious materials, of the same type, brand, and source throughout the Project:
1. Portland Cement: ASTM C 150, Type I, non-air Entraining Portland Cement.
- B. Normal Weight Aggregates: ASTM C 33 coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least ten (10) years satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
1. Maximum Coarse-Aggregate (1530 lbs/cu.yd) must be limestone for reinforced concrete pavement, concrete curb, concrete sidewalk, reinforced concrete drives and any exposed concrete in structures. To obtain approval the aggregate mix design must be submitted two (2) weeks before contemplated use.
 2. Fine Aggregate: Type A aggregate; 1220 lbs/cu.yd.
- C. Water: ASTM C 94/C 94M or 33 gallons/cu.yd.
- D. Twenty eight (28)-day strength: 4000 psi.
- E. Slump shall be four (4")-inches plus or minus one (1")-inch.
- F. Air Entraining Admixtures shall be in accordance with AASHTO Designation M-154 (ASTM C-260-01)
- G. Entrained air content shall be 5.0% with a tolerance of plus or minus 1.0%
- H. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 2.0 lb/cu. yd.. *Note: Synthetic Fiber is in addition to any traditional steel reinforcement required in the concrete.*
- I. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
1. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.
- J. The above requirements for concrete shall be superseded by the City of Pittsburgh Concrete Specifications for Class "P", Class "PP", Class "A" and Class "AA" concrete if the concrete is

to be placed within City of Pittsburgh right-of-ways. All listed strength and use requirements shall be strictly followed for work with City right-of-ways at no additional cost to the Owner.

2.6 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Curing and Sealing Compound: ASTM C 309, Type 1, Classes A and B; ASTM C 1315, Type 1, Class A; and AASHTO M 148, Type 1 Classes A and B. Must meet US EPA maximum allowable VOC requirements.

2.7 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber (AASHTO-M213)
- B. Concrete Joint Sealant: Sikaflex-1a (or approved equal). The sealant shall be a one part polyurethane, elastomeric sealant/adhesive meeting Federal Specification TT-S-00230C, Type II, Class A and ASTM C-920, Type S, Grade NS, Class 35 use T, NT, O, M, G and I. Color shall be limestone or as chosen by the Owner.
- C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to requirements, and as follows:
 - 1. Types I and II, non-load bearing or IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrade and subbase for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subgrade surface with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding as follows or as dictated by field conditions:

1. Completely proof-roll subgrade in one direction and repeat in perpendicular direction. Limit vehicle speed to three (3) mph.
 2. Proof-roll with a loaded tandem-axle dump truck weighing not less than fifteen (15) tons.
 3. Subgrade with soft spots and areas of pumping or rutting exceeding depth of one-half (1/2")-inch shall be repaired prior to placement of concrete.
 4. Concrete curb and sidewalk subbases shall be compacted using a mechanical whacker to seventy (70%) relative density per ASTM D 4253 and ASTM D 4254.
- C. Proceed with concrete pavement operations only after non-conforming conditions have been corrected.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.
- B. The subgrade shall be compacted
- C. Concrete slabs shall be a minimum of eight (8) inches thick for roadways, six (6) inches thick for driveways and four (4) inches thick for sidewalks. The aggregate bed shall be a minimum of six (6) inches thick for roadways, four (4) inches thick for driveways and four (4) inches thick for sidewalks. The aggregate bed shall be AASHTO 57 crushed limestone aggregate. Specific requirements for work with City of Pittsburgh right-of-ways shall supersede the above listed depths if applicable.
- D. All concrete shall be per this Specification or by the City of Pittsburgh Concrete Specifications as applicable.

3.3 SUBGRADE REPAIR

- A. After the existing pavement and subbase have been removed to subgrade, the Owner will determine if soft spots exist and, if so, mark the limits of soft spots to be corrected.
- B. If soft spots are marked, the Contractor shall excavate such areas and replace excavated unsuitable materials with PennDOT Class IV, Type A geotextile fabric placed under a minimum of twelve (12") inches of AASHTO No.1 limestone aggregate with a two (2) inch PennDOT 2A limestone aggregate "choke". The fabric shall wrap over the top of the placed aggregate prior to the placement of the required aggregate subbase. All unsuitable materials shall be removed from the site at no additional cost to the Owner.

3.4 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least twenty (24) hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. Concrete sidewalks and driveways shall be reinforced with 6x6 – W2.9 x W2.9 wire mesh with a minimum cover of two (2) inches and three (3) inches respectively.
- F. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.
- G. Concrete slabs shall be constructed per PennDOT Publication 408 (most current edition), PennDOT RC standards and applicable plan Details. All concrete slabs within City of Pittsburgh right of ways shall be constructed according to all applicable City of Pittsburgh Standards of Construction (most current edition).

3.6 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
 - 1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. All joints in new concrete shall be sealed including the joints in straight and rolled curbs, sidewalks, driveway and other concrete structures. The joints between old and new concrete must also be sealed.
- C. Contraction joints in the reinforced concrete pavement and/or base shall be constructed by sawing with a special concrete saw using one or more circular blades, cooled and lubricated with water.
- D. Expansion joints in reinforced concrete pavement and/or base shall be constructed with slip dowels, and minimum 3/4" thick expansion joint filler as detailed. A steel plate, slip dowels and minimum 3/4" joint filler can be used as an alternate. Spacing shall be at all points of curve, points of tangent and at street intersections. All expansion joints shall be sealed with "Sikaflex-1A" as soon as possible after construction of the joint, as well as joints between new and old concrete.

- E. Contraction joints in concrete curbs shall be made every ten (10) feet and a contraction joint shall be in line with each contraction joint in the sidewalk if one abuts said curb. They shall not exceed 1/4" in thickness and shall be formed with steel plates and mastic 1/8" in thickness. Expansion joints 1/2" thick, shall be formed at not more than 20 foot intervals.
- F. Contraction joints in concrete sidewalks shall be spaced at a minimum of five (5) foot intervals and formed with a device to have the completed joint at least 3/4" inch deep. Expansion joints shall be spaced no more than twenty (20) feet apart and formed with 1/4 inch pre-molded filler to the full depth of the slab. The 1/4 inch pre-molded filler shall also be placed adjacent to curbs, other sidewalks, buildings or pavement. If the sidewalk abuts a curb the joints on the sidewalk shall match the joints in the curb.
- G. Contraction joints in concrete driveways shall be spaced at a maximum of ten (10) foot intervals and formed with a device to have the completed joint at least 1.25" deep. Expansion joints shall be spaced no more than fifty (50) feet apart and formed with 1/4" thick pre-molded filler to the full depth of the slab. The 1/4" pre-molded filler shall also be placed adjacent to curbs, sidewalks, other driveways, buildings or pavements. If the driveway abuts a curb the joints on the driveway shall match the joints in the curb.
- H. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
- I. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
 - 1. Locate expansion joints at intervals of fifty (50) feet unless otherwise indicated or directed.
 - 2. Extend joint fillers full width and depth of joint.
 - 3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
 - 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 - 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 - 6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- J. On any tooled joints or edges of concrete do not use the jointing or edging tool until the surface water has evaporated from the concrete (sheen disappears). Bull float and broom the surface, then finish the joint and edges and use broom to remove the tool marks on the surface.

3.7 SEALING OF CONCRETE JOINTS

- A. All expansion joints and joints against structures shall be sealed.
- B. The sealant shall be "Sikaflex-1A Polyurethane, Elastomeric Sealant/Adhesive" (or Owner approved equal). Sealant color shall be selected from the range of available colors by the Owner prior to application.

- C. All joints must be sound, clean, dry and free from oil and grease. Curing compound residues and any foreign material must be thoroughly removed. A roughened surface will also enhance the bond. Install bond breaker tape or back rod to prevent bond at the base of the joint.
- D. Apply Sikaflex-1A at a temperature between forty (40) degrees Fahrenheit and one hundred (100) degrees Fahrenheit with a gun using the twenty (20) ounce “uni-pac” sausage.

3.8 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. No concrete shall be placed prior to April 15th or after December 1st except with written permission of the Owner and only if the Contractor is prepared to comply with the cold weather requirements specified in PennDOT Specification 408 (most current edition).
- D. When the air temperature is expected to drop below forty (40) degrees Fahrenheit at any time during the day or night for the first twenty (24) hours following the placement of concrete, an additional three (3) bales of straw hay, weighing approximately 100 pounds each, shall be spread for each thirty five (35) square yards of concrete placed and then covered with a tarpaulin. The concrete shall be maintained at a temperature of not less than fifty (50) degrees Fahrenheit and not more than eighty (80) degrees Fahrenheit. Gradually lower the temperature to the surrounding area for at least three (3) additional days.
- E. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- F. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- G. Do not add water to concrete during delivery or at project site.
- H. Do not add water to fresh concrete after testing.
- I. No private, public or contractor vehicles and/or equipment shall be placed or moved on concrete pavement until fourteen (14) days have elapsed from time of pour, and then only when earth shoulders are placed against the pavement edges. Opening to traffic shall not constitute a final acceptance of pavement from centerline. The Contractor shall provide the Owner with breaks at 7, 14, and 28 days from the date of the pour to determine the strength.
- J. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- K. The concrete shall be placed in forms in horizontal layers not to exceed five (5) inches and vibrated sufficiently to eliminate all voids.

- L. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.
 - 1. Remove and replace concrete that has been placed for more than fifteen (15) minutes without being covered by top layer or use bonding agent if approved by Owner.
- M. The crown in any pavement or base shall be measured from the high side edge where one edge is higher than the other except where otherwise noted.
- N. Screed pavement surfaces with a straightedge and strike off.
- O. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- P. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.
- Q. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.
- R. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.9 TRENCH REPAIR IN CITY OF PITTSBURGH CONCRETE STREETS

- A. Under this item the Contractor will be required to repair all trenches in City of Pittsburgh concrete streets to the complete satisfaction of the City using all applicable City provisions and details.

- B. If a curb or sidewalk is disturbed during the bituminous street restoration, it shall be replaced in kind and will be paid for under the appropriate item of the specifications.
- C. The concrete streets proposed to be disturbed due to a point repair, manhole installation, etc. shall be saw cut prior to excavation. Saw cutting shall be included in the price of the concrete street restoration. No additional compensation will be provided for saw cutting.
- D. Payment for the above will be made on a square yard basis (or as determined by the Owner), complete in place, with a maximum trench width of eight (8) feet. This item will also be used to pay for any saw cutting and repaving around inlets to be replaced. Required dowels or mesh are also included under this item.

3.10 CONCRETE SIDEWALKS

- A. All concrete sidewalks within the City of Pittsburgh right of way shall be replaced according to approved City of Pittsburgh Details and Manuals. All other concrete sidewalks shall be replaced according to this Specification and applicable details.
- B. Forms shall be of metal or new wood at least ten (10) feet long. Each form shall be braced and staked in at least three (3) places for each ten (10) foot length and closer if necessary to keep from deforming when concrete is placed. They shall be thoroughly cleaned and coated with non-staining oil. Wood forms shall be rigid enough not to bow and deflect when concrete is placed. Worn, broken or distorted forms shall not be used.
- C. The sidewalks proposed to be disturbed due to a construction shall be saw cut prior to excavation. Saw cutting shall be included in the price of the sidewalk restoration and no additional compensation will be provided for the saw cutting.
- D. Contraction joints shall be spaced at a minimum of five (5) foot intervals and formed with a device to have the completed joint at least 1/2 inch deep. Expansion joints shall be spaced no more than twenty (20) feet apart and formed with 1/4 inch pre-molded filler to the full depth of the slab. The 1/4 inch pre-molded filler shall also be placed adjacent to curbs, other sidewalks, buildings or pavement. If the sidewalk abuts a curb the joints on the sidewalk shall match the joints in the curb.
- E. Concrete sidewalks shall be reinforced with 6x6 – W2.9 x W2.9 wire mesh with a minimum cover of two (2) inches and three (3) inches respectively.
- F. The surface of the slab shall be brought to a uniform plane surface by means of a wood screed riding on forms. The surface shall then be finished with a wood or magnesium float and fine broom finished. The tool marks for joints and edges shall match the marks in the existing walk. Neither dry cement nor water shall be added to the surface during the finishing process.
- G. On any tooled joints or edges of concrete do not use the jointing or edging tool until the surface water has evaporated from the concrete. Bull float and broom the surface, then finish the joint and edges and use the broom to remove the tool marks on the surface.
- H. After twenty eight (28) days (or as recommended by the manufacturer or directed by the Owner), apply an approved sealer.

- I. The concrete shall be thoroughly vibrated to eliminate voids within the placed concrete.
- J. Sealing of Joints
 - 1. All expansion joints and joints against structures shall be sealed.
 - 2. The sealant shall be “Sikaflex 1A Polyurethane, Elastomeric Sealant/Adhesive” (or Owner approved equal). Sealant color shall be selected from the range of available colors by the Owner prior to application.
 - 3. All joints must be sound, clean, dry and free from oil and grease. Curing compound residues and any foreign material must be thoroughly removed. A roughened surface will also enhance the bond. Install bond breaker tape or back rod to prevent bond at the base of the joint.
 - 4. Apply Sikaflex 1A at a temperature between forty (40) degrees Fahrenheit and one hundred (100) degrees Fahrenheit with a gun using the twenty (20) ounce “uni-pac” sausage.
- K. Insulated protection of the concrete shall be required dependent on weather conditions at the time of pouring and during the curing period. A polyethylene plastic sheeting shall be considered as the adequate minimum protection required for concrete during adverse weather conditions. The Owner reserves the right to require additional protective measures such as blanket-ing. No additional compensation will be considered in the event protective measures above the minimum are required by the Owner.
- L. Replace rain conductors in kind if found under a sidewalk. Place a piece of No. 9 gauge wire mesh reinforcing one (1) foot over the pipe for reinforcement. In addition, a construction joint shall be placed over the rain conductor location. No additional compensation will be considered for the removal and/or replacement of roof or driveway drains under a sidewalk.
- M. Restore and/or raise to grade all gas valves, water valves, sewer vents, or other utility valve boxes encountered during driveway restoration. No additional compensation will be considered for work associated with this requirement.

3.11 CONCRETE CURB RESTORATION

- A. The contractor shall be required to replace damaged concrete straight curb, curb and gutter or roll curb. Straight curb shall be replaced in kind at the same width as was removed. No additional compensation will be granted relative to the width of the curb. The straight curb shall be installed in accordance with the detail provided. All curbs within the City of Pittsburgh right of way shall be replaced according to the applicable approved City of Pittsburgh detail.
- B. Private concrete curb disturbed during construction shall be replaced in kind and in accordance with the detail provided.
- C. Curbs proposed to be disturbed during construction shall be saw cut prior to excavation. Saw cutting shall be included in the price of the curb restoration and no additional compensation will be considered for saw cutting.

- D. Forms shall be of metal or new wood at least ten (10) feet long. Each form shall be braced and staked in at least three (3) places for each ten (10) foot length and closer if necessary to keep from deforming when concrete is placed. They shall be thoroughly cleaned and coated with non-staining oil. Wood forms shall be rigid enough not to bow and deflect when concrete is placed. Worn, broken or distorted forms shall not be used.
- E. Effort shall be made to minimize damage to curbs.
- F. The Contractor shall be responsible for providing AASHTO #57 crushed limestone aggregate for a suitable base for the curb in accordance with the Detail.
- G. A 2 ply tar paper must be placed between the AASHTO base and the concrete curb.
- H. Control joints shall be placed at ten (10) feet on center.
- I. Expansion joints shall be spaced no more than fifty (50) feet apart and formed with 1/4 inch pre-molded filler to the full depth of the slab. The 1/4 inch pre-molded filler shall also be placed adjacent to curbs, other sidewalks, buildings or pavement. If the curb abuts a sidewalk the joints on the curb shall match the joints in the sidewalk.
- J. A four (4") inch minimum diameter PE slotted underdrain may be placed behind the curb in accordance with the Detail and connected to the storm sewer system as directed by the Owner.
- K. The concrete shall be thoroughly vibrated to eliminate voids within the placed concrete.
- L. The finish on the concrete shall match the finish of the existing curb.
- M. Sealing of Joints
 - 1. All expansion joints and joints against structures shall be sealed.
 - 2. The sealant shall be "Sikaflex 1A Polyurethane, Elastomeric Sealant/Adhesive" (or Owner approved equal). Sealant color shall be selected from the range of available colors by the Owner prior to application.
 - 3. All joints must be sound, clean, dry and free from oil and grease. Curing compound residues and any foreign material must be thoroughly removed. A roughened surface will also enhance the bond. Install bond breaker tape or back rod to prevent bond at the base of the joint.
 - 4. Apply Sikaflex 1A at a temperature between forty (40) degrees Fahrenheit and one hundred (100) degrees Fahrenheit with a gun using the twenty (20) ounce "uni-pac" sausage.
- N. After twenty eight (28) days (or as recommended by the manufacturer or directed by the Owner), apply an approved sealer
- O. If any rain conductors exist through the curb, they shall be replaced in kind. No additional compensation will be provided for the restoration of roof/driveway drains through the curb.

- P. Insulated protection of the concrete shall be required dependent on weather conditions at the time of pouring and during the curing period. A polyethylene plastic sheeting shall be considered as the adequate minimum protection required for concrete during adverse weather conditions. The Owner reserves the right to require additional protective measures such as blanketing. No additional compensation will be considered in the event protective measures above the minimum are required by the Owner.

3.12 CONCRETE ENCASEMENT FOR UTILITIES

- A. Under this item the Contractor shall be required, if necessary, and as approved by the Owner in writing to install concrete encasement around utility lines that are exposed within twelve (12) inches of a proposed sewer.
- B. The installation of concrete encasement shall be completed with an eight (8) inch minimum bed of air entrained 4000 psi high early strength concrete placed below an existing utility line. The concrete must then extend up the sides of the utility line and placed to a minimum depth of at least eight (8) inches above the utility line.
- C. The concrete shall be allowed to cure for a minimum of twenty (24) hours prior to backfilling. The Owner reserves the right to extend the curing period until the concrete has cured sufficiently so that the encasement does not become damaged during backfilling. The curing period may vary depending on weather conditions.
- D. The Contractor shall use caution during backfilling to prevent damage to the concrete encasement.
- E. The Contractor shall be required to take all necessary precautions for curing concrete in hot and/or cold weather at no additional cost to the Owner.

3.13 FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations.
- C. The surface of concrete sidewalks shall be brought to a uniform plane surface by means of a wood screed riding on forms. The surface shall then be finished with a wood or magnesium float and stiff textured broom finished perpendicular to line of traffic. The tool marks for joints and edges shall match the marks in the existing walk. Neither dry cement nor water shall be added to the surface during the finishing process.
- D. The portion of the curb to be exposed to the elements shall be finished smooth with a wood or magnesium float. All minor defects shall be filled with cement mortar. No watered brush finish or plastering of the curb will be permitted. All joints and exposed edges shall be tooled to a radius of 1/4" but no tool marks will be permitted to show on the finished curb. Final finish shall be made with a coarse broom.

- E. The surface of the concrete driveway slab shall be brought to a uniform plane surface by means of a wood screed riding on forms. The surface shall then be finished with a wood or magnesium float and fine broom finished. The tool marks for joints and edges shall match the marks in the existing driveway. Neither dry cement nor water shall be added to the surface during the finishing process.
- F. On any tooled joints or edges of concrete do not use the jointing or edging tool until the surface water has evaporated from the concrete. Bull float and broom the surface, then finish the joint and edges and use the broom to remove the tool marks on the surface.

3.14 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot by depth before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

3.15 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
 - 1. Elevation: 1/4 inch.
 - 2. Thickness: Plus 3/8 inch, minus 1/4 inch.
 - 3. Surface: Gap below 10-foot long, unlevelled straightedge not to exceed 1/4 inch.
 - 4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.
 - 5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch.
 - 6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch.
 - 7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches.
 - 8. Contraction Joint Depth: Plus 1/4 inch, no minus.
 - 9. Joint Width: Plus 1/8 inch, no minus.

3.16 BACKFILLING

- A. The Contractor shall not backfill against walks, driveways, curbs, etc. until concrete forms have been removed, concrete cured and written authorization has been given by the Owner. All debris shall be removed from top to bottom of all excavations prior to all backfilling operations. In lawn or ground covers areas, backfilling shall be done with clean earth placed in six (6) inch compacted layers.

3.17 TESTING

- A. The Contractor shall engage a qualified professional to perform concrete testing. All results shall be forwarded to the Owner for review.
- B. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding five (5) cubic yards but less than twenty five (25) cubic yards plus one set for each additional fifty (50) cubic yards or fraction thereof.
 2. Testing Frequency: Obtain at least one composite sample for each one hundred (100) cubic yards or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five (5) compressive-strength tests for each concrete mixture, testing shall be conducted from at least five (5) randomly selected batches or from each batch if fewer than five (5) are used.
 3. Slump: ASTM C 143/C 143M; one (1) test at point of placement for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; (ASTM C 173/C 173M, volumetric method, for structural lightweight concrete) one (1) test for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture.
 5. Concrete Temperature: ASTM C 1064/C 1064M; one test (1) hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one (1) test for each composite sample.
 6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one (1) test for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture.
 7. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two (2) sets of two (2) standard cylinder specimens for each composite sample.
 - b. Cast and field cure two (2) sets of two (2) standard cylinder specimens for each composite sample.
 8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two (2) laboratory-cured specimens at seven (7) days and one set of two (2) specimens at twenty eight (28) days.
 - a. Test one (1) set of two (2) field-cured specimens at seven (7) days and one (1) set of two (2) specimens at twenty eight (28) days.

- b. A compressive-strength test shall be the average compressive strength from a set of two (2) specimens obtained from same composite sample and tested at age indicated.
9. When strength of field-cured cylinders is less than eighty five (85%) percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every average of any three (3) consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than five hundred (500) psi.
11. Test results shall be reported in writing to Owner, concrete manufacturer, and Contractor within forty eight (48) hours of testing. Reports of compressive-strength tests shall contain project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at twenty (28) days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both seven (7)- and twenty eight (28)-day tests.
12. Non-destructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Owner but will not be used as sole basis for approval or rejection of concrete.
13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Owner. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Owner.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work indicated by insufficient results shown by testing and/or inspection at no additional cost to the Owner.

3.18 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- B. Drill test cores, where directed by Owner, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least fourteen (14) days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two (2) days before date scheduled for Substantial Completion inspection or as directed by the Owner.

END OF SECTION 02751

SECTION 02764 - PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Expansion and contraction joints within cement concrete pavement.
 - 2. Joints between cement concrete and asphalt pavement.
- B. Related Sections include the following:
 - 1. Division 2 Section "Hot Mix Asphalt Paving" for constructing joints between concrete and asphalt pavement.
 - 2. Division 2 Section "Cement Concrete Pavement" for constructing joints in concrete pavement.

1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
 - 1. For primers and substrate preparation needed for adhesion.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for sealants.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 degrees F.
 - 2. When joint substrates are wet or covered with frost.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles. Products not listed, but considered as "or equal" by the Contractor, may be submitted for review and approval by the Owner.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

2.3 COLD-APPLIED JOINT SEALANTS

- A. Grade NS Silicone Sealant for Concrete: Moisture-cured, one-component polyurethane-based, non-sag elastomeric sealant meeting Federal Specification TT-S-0023C, Type II, Class A; ASTM C-920, Type 6, Grade NS, Class 35 and certified to the NSF/ANSI Standard 61 for potable water.
- B. Color: White, colonial white, aluminum gray, limestone, black, dark bronze, capitol tan, stone and medium bronze. Owner to select color prior to application.

2.4 HOT-APPLIED JOINT SEALANTS

- A. Sealant for Concrete and Asphalt: Performance graded asphalt cement binder meeting AASHTO M320.

2.5 JOINT-SEALANT BACKER MATERIALS

- A. General: Provide joint-sealant backer materials that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.
- B. Round Backer Rods for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
- C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.
- D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

2.6 PRIMERS

- A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of backer materials.
 - 2. Do not stretch, twist, puncture, or tear backer materials.
 - 3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses provided for each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- E. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealants from surfaces adjacent to joint.
 - 2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions, unless otherwise indicated.
- G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 02764

