PERMEABLE PAVERS NOTES

Permeable Interlocking Concrete Pavement (PICP) plan notes:

1. The contractor shall obtain the concrete paver manufacturer's certification that the paving units supplied to construct the PICP have been approved by City of O'Fallon and meet the requirements in ASTM C936. This certification shall be provided to the City of O'Fallon Inspector. The certification shall include the manufacturer's name, and state that the PICP supplied meets the ASTM C936 specifications, (testing should be current within previous 12 months) and that the paving materials meet all requirements as evaluated under the manufacturer's quality control program.
2. Prior to obtaining a construction permit from the City of O'Fallon to construct the permeable interlocking concrete pavement (PICP) for a given project, the engineer providing the as-built certification shall verify that the installing contractor has:
   A. Past history demonstrating applicable experience.
   B. The PICP installation contractor must have a current Level 1 certificate from the Interlocking Concrete Pavement Institute's concrete paver installer program.
3. The contractor shall prevent and divert sediment from entering the subbase and pavement surface until the tributary areas are deemed stable by the assigned city inspector.
4. Vehicular traffic shall be prohibited on the PICP until the site is stable to prevent mud from being deposited by vehicles.
5. No product or material substitutions are permitted unless previously approved by the City of O'Fallon plan review engineer or by the city field inspector assigned to the project. All substitutions shall be presented to the city through the engineer responsible for the design of the PICP system.
6. Stone should be clean, washed, 90 percent fractured faces with a Los Angeles Abrasion Index of less than 40 and conform to the grading requirements in ASTM D448.
7. Do not clean the paver surface with high-pressure hoses or abrasives. When cleaning is necessary, combination cleaning machines that combine a wet spray and vacuum process have been found to be effective.
8. A permanent sign shall be posted warning that care should be taken during snow plowing; and prohibit the following: resurfacing, the use of sand abrasives for winter tire traction, and the use of power washers.
9. At completion of the project, prior to final dedication, an as-built certification, signed and sealed by a Missouri Professional Engineer, shall be provided. Contractor responsible for coordinating and/or providing certification from Missouri Professional Engineer.
10. The minimum pavement section subject to vehicular traffic shall be (from top to bottom) 3-1/8 inch thick paving units, 2-inch bedding stone (typically ASTM No. 8 or 9 stone), 4-inch thick layer of base stone (ASTM No. 57 or similar size), and a layer of subbase stone (ASTM No. 2 or similar size), all underlain by MSD Type 4 filter fabric. Minimum 12-inch thick subbase will be required for all applications.
11. Observation wells should be provided in low areas within the permeable pavement system, and shall extend to the bottom of the storage bed. The wells shall consist of a six inch schedule 40 PVC pipe with cast iron frame and cover, as shown on the MSD PICP details.
12. Prepared subgrade soil shall be separated from the porous subbase. The prepared subgrade soil shall be dry and covered with MSD Type 4 filter fabric (such as Mirafi 140N or approved equal) on the sides of the typical section. Separation of the prepared subgrade along the bottom of the section may be provided by MSD Type 4 filter fabric or a well graded filter layer.
13. Subgrade should be compacted to a minimum density of 90% to 95% of the theoretical density per AASHTO T 180.

MATERIAL CERTIFICATION:
The contractor shall obtain the concrete paver manufacturer's certification that the paving units supplied to construct the PICP have been approved by the City of O'Fallon and meet the requirements in ASTM C936. This certification shall be provided to the City Inspector. The certification shall include the manufacturer's name, and state that the PICP supplied meets the ASTM C936 specifications, (testing should be current within previous 12 months) and that the paving materials meet all requirements as evaluated under the manufacturer's quality control program.

CONTRACTOR PREQUALIFICATION:
Prior to obtaining a construction permit from the city to construct permeable interlocking concrete pavement (PICP) for a given project, the engineer providing as-built certification shall verify that the installing contractor has:

1. Past history demonstrating application experience
2. The PICP installation contractor must have a current Level 1 certificate from the Interlocking Concrete Pavement Institute's concrete paver installer program.

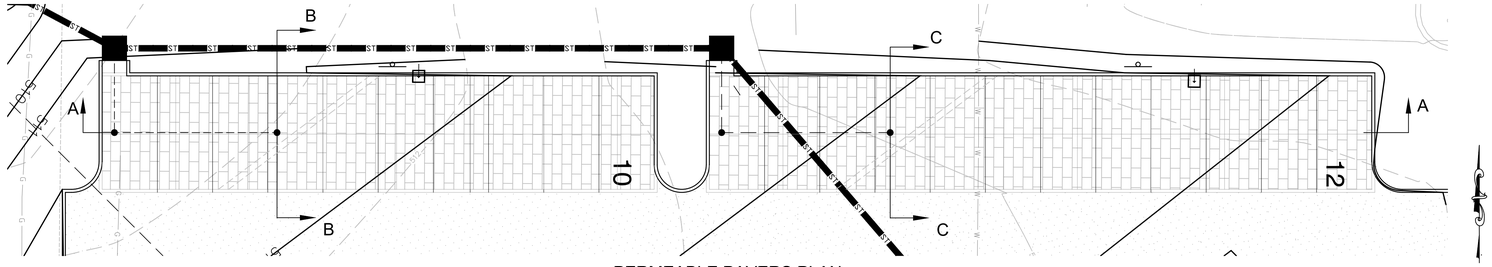
Note: Contractor is responsible for coordinating and/or providing as-built certification from Professional Engineer.

AS-BUILT CERTIFICATION:
At completion of the project, prior to final dedication, an as-built certification, signed and sealed by a Missouri professional Engineer, shall be provided certifying:

1. The PICP system was built in accordance with the details, dimensions, and materials as approved by MSD for this project.
2. The PICP system was installed by a qualified contractor, and has satisfied all applicable quality control and performance tests.
3. The PICP system installation was witnessed by the certifying engineer or a representative under his direct supervision.

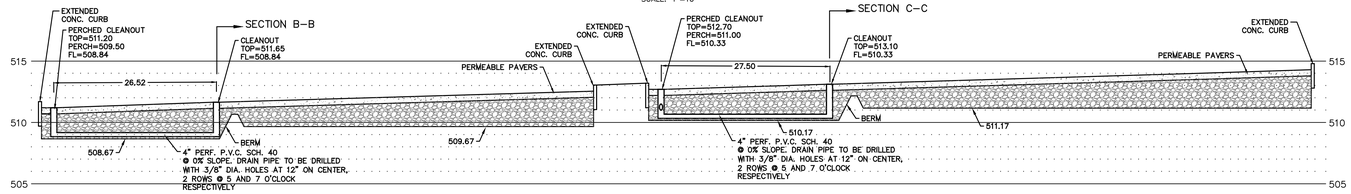
BEST MANAGEMENT PRACTICE (BMP) CONSTRUCTION NOTES

- ALL STORM WATER FLOW TO THE BMP AREAS SHALL BE DIVERTED, PLUGGED OR DISCONNECTED UNTIL THE CONSTRUCTION SITE IS STABLE AND THE CITY INSPECTOR PROVIDES APPROVAL TO PLACE THE BMP ONLINE.
- CONSTRUCTION SITE RUNOFF SHALL NOT FLOW INTO BMP AREAS.
- CONSTRUCT PERMEABLE PAVEMENT LATE IN THE PROJECT SCHEDULE SO THAT ALL OF THE DIRT WORK SUCH AS GRADING AND LANDSCAPING IS COMPLETED FIRST. POROUS PAVEMENT AND THE STONE BED SHALL NOT BE INSTALLED UNTIL ALL AREAS TRIBUTARY TO IT ARE ESTABLISHED.
- PERMEABLE PAVEMENTS MUST BE PROTECTED FROM SEDIMENT DURING AND AFTER THE PAVING PROCESS. AT NO TIME SHALL SEDIMENT OR OTHER MATERIAL CAPABLE OF CLOGGING THE SURFACE BE ALLOWED TO CONTACT THE PAVEMENT.
- SEWER CONTRACTOR SHALL INSTALL MSD TYPE 4 FILTER FABRIC OVER THE TOP OF ALL TRENCHES UNDER PERMEABLE PAVEMENT.
- FILTER FABRIC SHALL BE REMOVED PRIOR TO THE INSTALLATION OF PERMEABLE PAVEMENT.
- AREAS NOT SUBJECT TO IMMEDIATE CONSTRUCTION ACTIVITY SHALL REMAIN VEGETATED AND UNDISTURBED AS LONG AS POSSIBLE.
- CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION AND ASSOCIATED COSTS REQUIRED IN OBTAINING OBSERVATION AND VERIFICATION BY A MISSOURI PROFESSIONAL ENGINEER



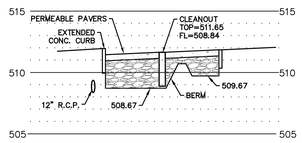
PERMEABLE PAVERS PLAN

SCALE: 1"=10'



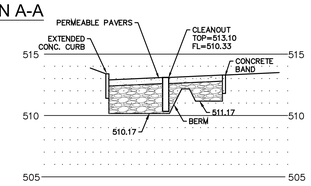
PERMEABLE PAVERS SECTION A-A

SCALE:
HORIZONTAL: 1"=10'
VERTICAL: 1"=5'



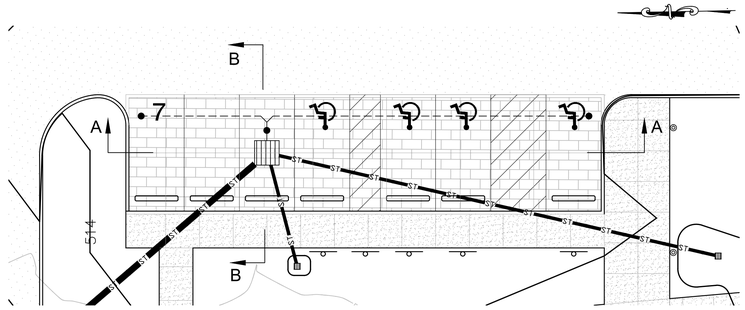
PERMEABLE PAVERS SECTION B-B

SCALE:
HORIZONTAL: 1"=10'
VERTICAL: 1"=5'



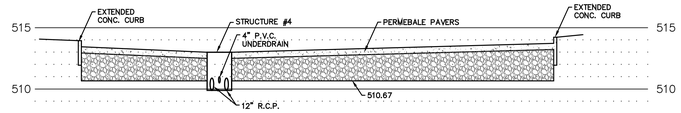
PERMEABLE PAVERS SECTION C-C

SCALE:
HORIZONTAL: 1"=10'
VERTICAL: 1"=5'



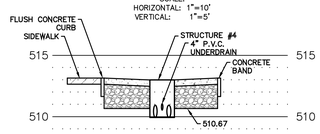
PERMEABLE PAVERS PLAN

SCALE: 1"=10'



PERMEABLE PAVERS SECTION A-A

SCALE:
HORIZONTAL: 1"=10'
VERTICAL: 1"=5'



PERMEABLE PAVERS SECTION B-B

SCALE:
HORIZONTAL: 1"=10'
VERTICAL: 1"=5'

PERMEABLE INTERLOCKING CONCRETE PAVEMENT

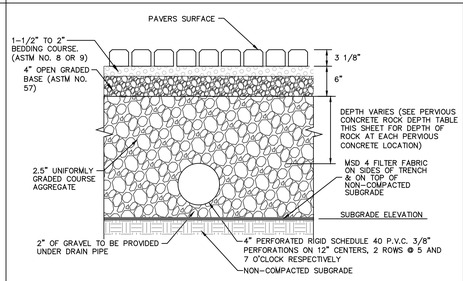
POWER WASHING, RESURFACING, AND THE USE OF SAND OR ASH ABRASIVES FOR WINTER TIRE TRACKING ARE PROHIBITED.

CARE SHALL BE TAKEN DURING SNOW PLOWING.

NOTES:
1. STANDARD 18"x12"X0.080" ALUMINUM SIGN FACE WITH BLACK 0.625" SERIES 2000 STANDARD ALPHABET ON WHITE BACKGROUND.
2. GALVANIZED STEEL POST 9'-6" LONG.
3. SET BOTTOM OF SIGN 5'-0" ABOVE GRADE.
4. SET BOTTOM OF POST 3'-0" BELOW GRADE.

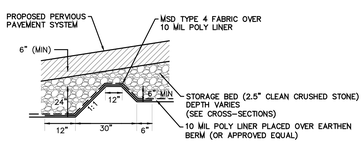
PERMEABLE INTERLOCKING CONCRETE PAVEMENT (PICP) SIGN DETAIL

(n.t.s.)

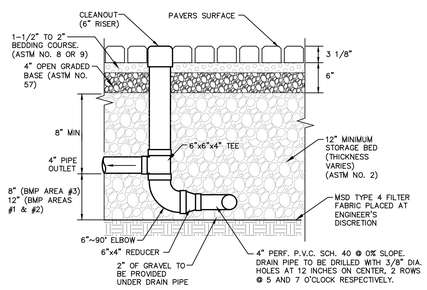


PERMEABLE PAVER SECTION

(WITH UNDERDRAIN)

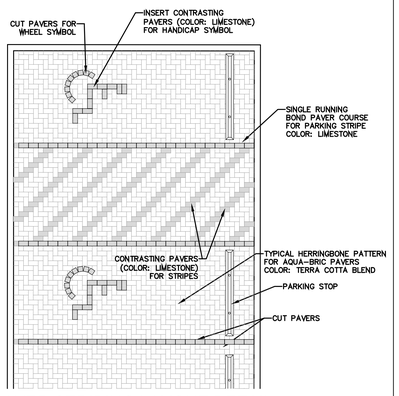


BERM DETAIL FOR PERMEABLE PAVERS



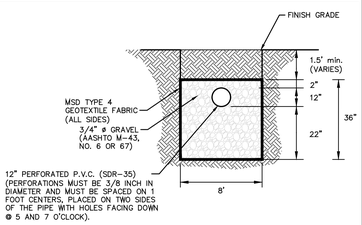
CLEANOUT WITH PERCHED DISCHARGE PIPE PERMEABLE PAVERS

NOTES TO CONTRACTOR:
1. CONTRACTOR SHALL PROVIDE ENGINEER WITH LIST OF PROJECTS DEMONSTRATING PAST EXPERIENCE AND TRAINING IN INSTALLING PERVIOUS CONCRETE.
2. CONTRACTOR SHALL BE REQUIRED TO PROVIDE CERTIFICATION THAT THE PERVIOUS CONCRETE SYSTEM WAS BUILT AS DESIGNED.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATING GEOTECHNICAL OBSERVATION WITH GEOTECHNICAL ENGINEER FOR THE INSTALLATION OF THE FOLLOWING:
   - ALL UNDERDRAINS OF THE PERMEABLE PAVERS
   - ALL UNDERDRAINS WITHIN MSD 1 BACKFILL
   - BACKFILL OF SEWER TRENCHES UNDER PERVIOUS CONCRETE
   - PERMEABLE PAVER INSTALLATION



PAVER STRIPING LAYOUT DETAIL

N.T.S.



FRENCH DRAIN DETAIL

FRENCH DRAIN CALCULATIONS

Water Quality Volume (WQv)
Tributary Area A = 0.28 ac.
Impervious Area = 0.28 ac.
Pervious Area = 0.00 ac.
% Impervious (I) = (0.28 ac. / 0.28 ac.) x 100 = 100%

$WQv = \frac{(P)(Rv)(A)}{12}$ where: P= 1.14 in.
Rv = 0.05 + 0.009(I) = 0.95
A= 0.04

$WQv = \frac{(1.14)(0.95)(0.28)}{12}$

WQv = 0.03 ac-ft. = **1,101 c.f.**

Required to provide 75% of WQv in storage:

Requied WQv = **826** c.f.

VOLUME CALCULATIONS

STORAGE VOLUME OF FRENCH DRAIN

Trench = **96** in. W. X **36** in. D. with **12** in. perforated p.v.c. pipe
Area of Pipe = **0.79** s.f./ l.f.
Area of Granular = **23.21** s.f. / l.f.

STORAGE VOLUME OF AGGREGATE
VOID SPACE CALCULATION FOR AGGREGATE (40%)
VG = **23.21** c.f. x 0.40 / l.f.
= **9.28** c.f. / l.f.
VP = **0.79** c.f. / l.f.

V_{TOTAL} = **10.07** c.f. / l.f.

$V_{REQUIRED}$ = 826 c.f.

$Length_{min}$ = 826 c.f. / 10.07 c.f./l.f.
= 82.03 l.f.

Provide **85** l.f. of French Drain
$V_{PROVIDED}$ = 10.07 c.f./l.f. * x 85 l.f.
$V_{PROVIDED}$ = **856 c.f.** > 826 c.f.

ARCHITECT:
Mitchell and Hugeback Architects, Inc.
D.B.A. M+H Architects
2150 Schuetz Road, Suite 200
St. Louis, Missouri 63146
314-878-3500
www.mha.us.com
Corporate License No.: 000614

CONSULTANTS:

Civil:
Civil Engineering Design Consultants, Inc.
10820 Sunset Office Drive, Suite 200
St. Louis, MO 63127
314-729-1400
Corporate License No.:2003004674

Structural:
SSC Engineering, Inc.
18207 Edison Ave.
St. Louis, MO 63005
636-530-7770
Corporate License No.: 001244

MEP:
(Design - Build)

OFFICE ADDITION & RENOVATIONS FOR:
VSM
1012 E WABASH ST
O'FALLON, MO 63366

STATE OF MISSOURI
PAUL K. BOYER
NUMBER E-28258
REGISTERED PROFESSIONAL ENGINEER
11/27/18

PAUL K. BOYER, P.E. E-28258
CIVIL ENGINEER
CEDC LICENSE NO.: 2003004674

DESCRIPTION:

PROGRESS SET	8-31-18
PERMIT SET	10-5-18
CITY SUBMITTAL	10-30-18
CITY RESUBMITTAL	11-27-18

Issue Date:	10-5-18
Job Number:	1823
Drawn By:	PKB
Checked By:	PKB
Drawing Title:	

Best Management Practice Details

C10