PERVIOUS PAVEMENT USE FOR EFFECTIVE DESIGN

Environmental Solutions that can Provide Reduced Costs and Project Footprints

CMT

WHY PERVIOUS PAVEMENTS?

REDUCTION OF STORMWATER RUNOFF

DELAYED PEAK DISCHARGE

IMPROVED WATER QUALITY

REDUCED PROJECT FOOTPRINT

COST SAVINGS

AESTHETIC ENHANCEMENTS

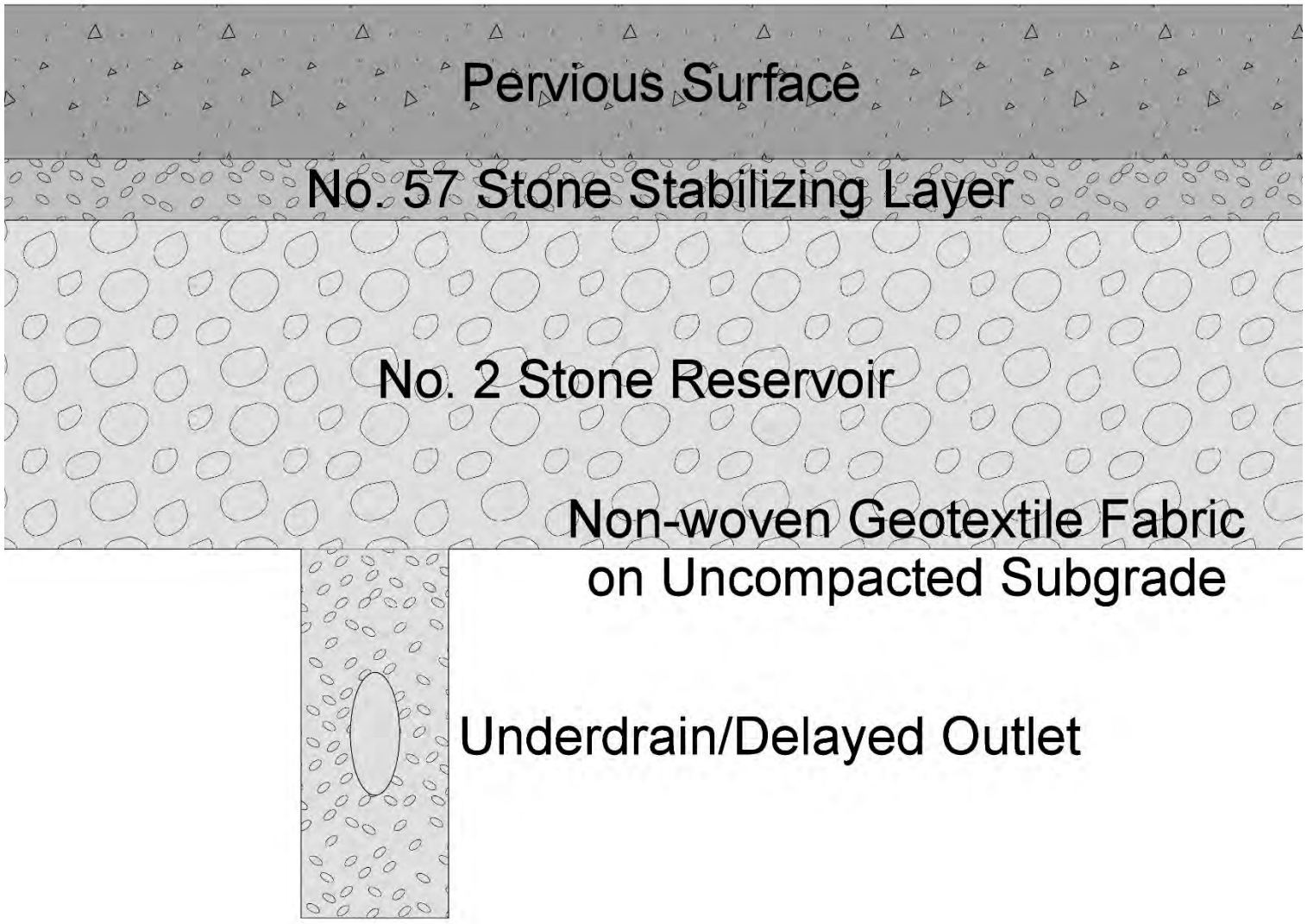
PERVIOUS SURFACES

PERVIOUS CONCRETE

PERMEABLE INTERLOCKING CONCRETE PAVERS (PICP)

POROUS ASPHALT

TYPICAL PERVIOUS PAVEMENT BUILDUP



STONE RESERVOIR BED

40% VOIDS

SERVES AS A STRUCTURAL LAYER

TEMPORARILY STORES STORMWATER

CANDIDATE SITES

LIMITED
RIGHT OF WAY

MINIMAL TREE
COVER

ESTABLISHED
GROUND COVER

MINIMAL SEDIMENT
LADEN AREAS

FAVORABLE
UTILITY
LOCATIONS

PROJECT EXAMPLE

HAGUE AVENUE

POSSIBLE SOLUTIONS

CONSTRUCT **3000'** OF NEW **OVERSIZED STORM SEWER**

INSTALL **MANUFACTURED WATER QUALITY STRUCTURES**

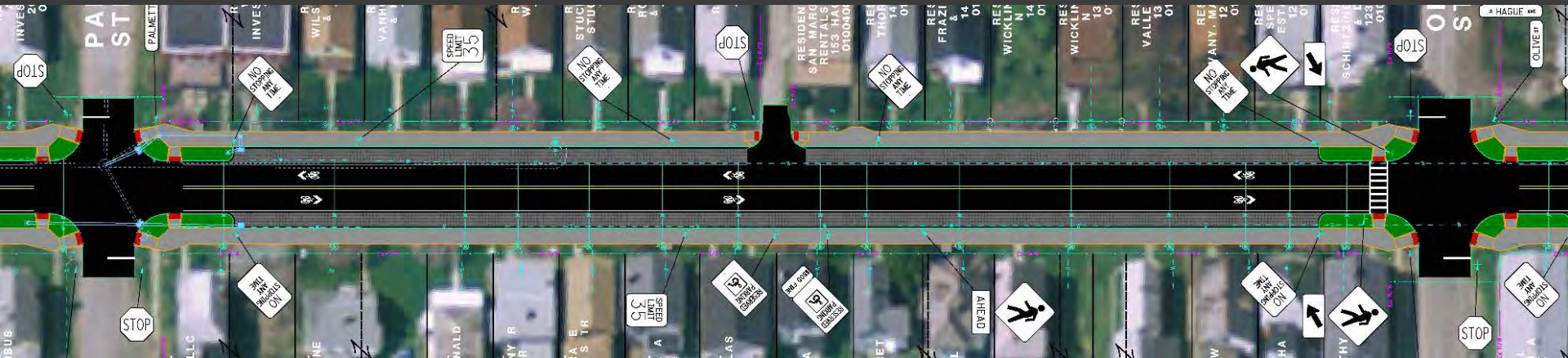
CONSTRUCT **URBAN BIORETENTION FACILITIES**

OPTIONS

PERVIOUS CONCRETE

PERMEABLE INTERLOCKING CONCRETE PAVERS (PICP)

POROUS ASPHALT



PAVEMENT STRUCTURE ANALYSIS

POROUS ASPHALT

Thickness (in)	Description	Void (%)	FT^3 of Voids / FT^2 of Pavement
1.50	Open Graded Asphalt Friction Course (Surface)	16%	0.020
3.50	Open Graded Asphalt Base Course	16%	0.047
2.00	Stabilizing Layer (No. 57 Stone)	40%	0.067
10.50	Stone Recharge Bed/Reservoir (No. 2 Stone)	40%	0.350
-	Geotextile Layer		
17.50	**Total Buildup**		**0.483**

PERVIOUS CONCRETE

Thickness (in)	Description	Void (%)	FT^3 of Voids / FT^2 of Pavement
8.50	Pervious Concrete Surface Course	20%	0.142
10.00	Stone Recharge Bed/Reservoir (No. 57 Stone)	40%	0.333
-	Geotextile Layer		
18.50	**Total Buildup**		**0.475**

PAVEDRAIN - PERMEABLE INTERLOCKING CONCRETE PAVERS

Thickness (in)	Description	Void (%)	FT^3 of Voids / FT^2 of Pavement
5.65	PaveDrain - Permeable Interlocking Concrete Block	20%	0.094
4.00	Stabilizing Layer (No. 57 Stone)	40%	0.133
8.00	Stone Recharge Bed/Reservoir (No. 2 Stone)	40%	0.267
-	Geotextile Layer		
17.65	**Total Buildup**		**0.494**

COST AND SELECTION

POROUS ASPHALT

1.50	in.	$	1.32	/Sq Ft	Open Graded Asphalt Friction Course (Surface)
3.50	in.	$	2.38	/Sq Ft	Open Graded Asphalt Base Course
2.00	in.	$	0.49	/Sq Ft	Stabilizing Layer (No. 57 Stone)
10.50	in.	$	1.62	/Sq Ft	Stone Recharge Bed/Reservoir (No. 2 Stone)
-		$	0.25	/Sq Ft	Geotextile Layer
17.5		**$**	**6.06**		**Total Buildup and Cost Per Square Foot**

PERVIOUS CONCRETE

8.50	in.	$	5.50	/Sq Ft	Pervious Concrete Surface Course
10.00	in.	$	1.25	/Sq Ft	Stone Recharge Bed/Reservoir (No. 57 Stone)
-		$	0.25	/Sq Ft	Geotextile Layer
18.5		**$**	**7.00**		**Total Buildup and Cost Per Square Foot**

PAVEDRAIN - PERMEABLE INTERLOCKING CONCRETE PAVERS (PICP)

5.65	in.	$	9.00	/Sq Ft	PaveDrain (PICP)
4.00	in.	$	0.50	/Sq Ft	Stabilizing Layer (No. 57 Stone)
8.00	in.	$	1.00	/Sq Ft	Stone Recharge Bed/Reservoir (No. 2 Stone)
-		$	0.25	/Sq Ft	Geotextile Layer
17.65		**$**	**10.75**		**Total Buildup and Cost Per Square Foot**

Pavement Type	Thickness (in)	Cost/Sq Ft	Total Sq Ft	Total Cost
Porous Asphalt	17.5	$ 6.06	33000	$ 200,000.00
Pervious Concrete	18.5	$ 7.00	33000	$ 231,000.00
PaveDrain (PICP)	17.65	$ 10.75	33000	$ 355,000.00

WHY POROUS ASPHALT PAVEMENT

PAVEMENT MATERIAL CONSISTENCY

FUNCTIONAL

PRACTICAL

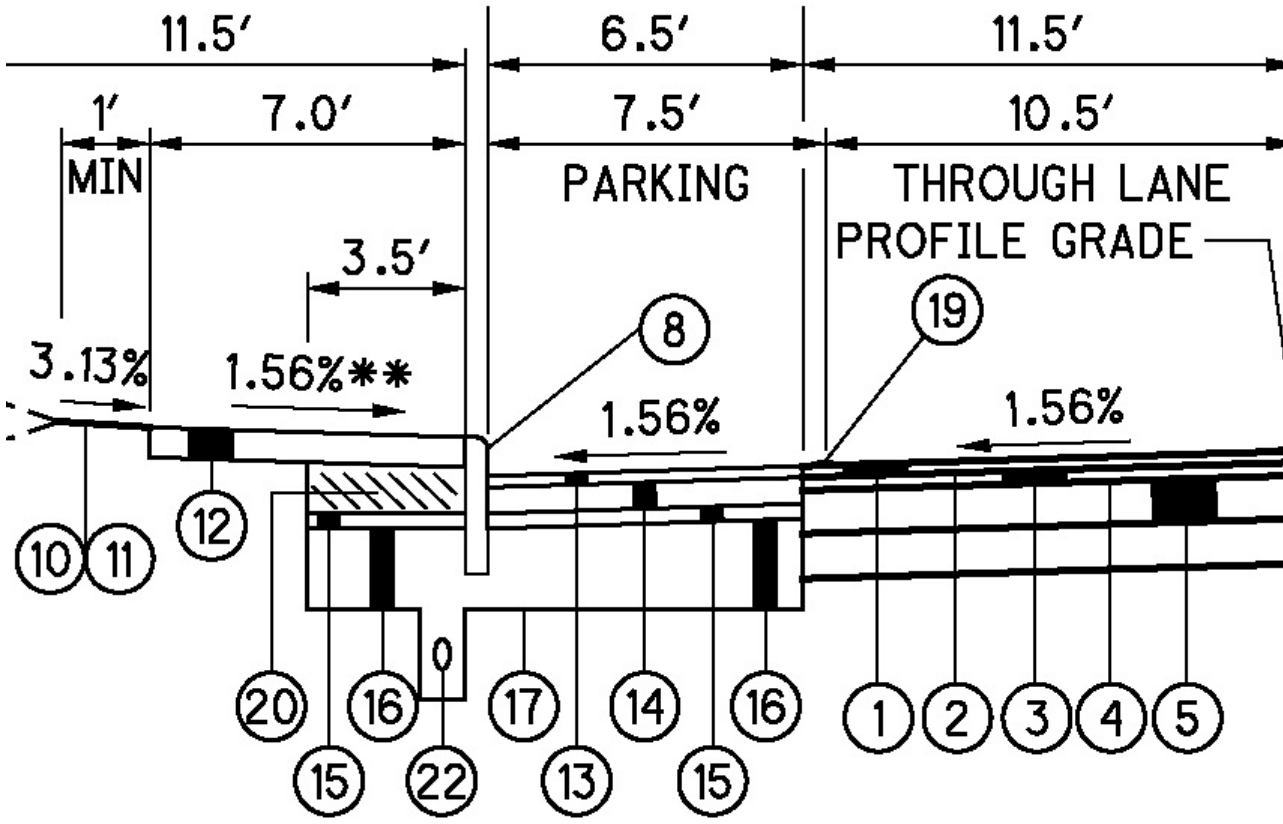
VALUE

TYPICAL SECTION

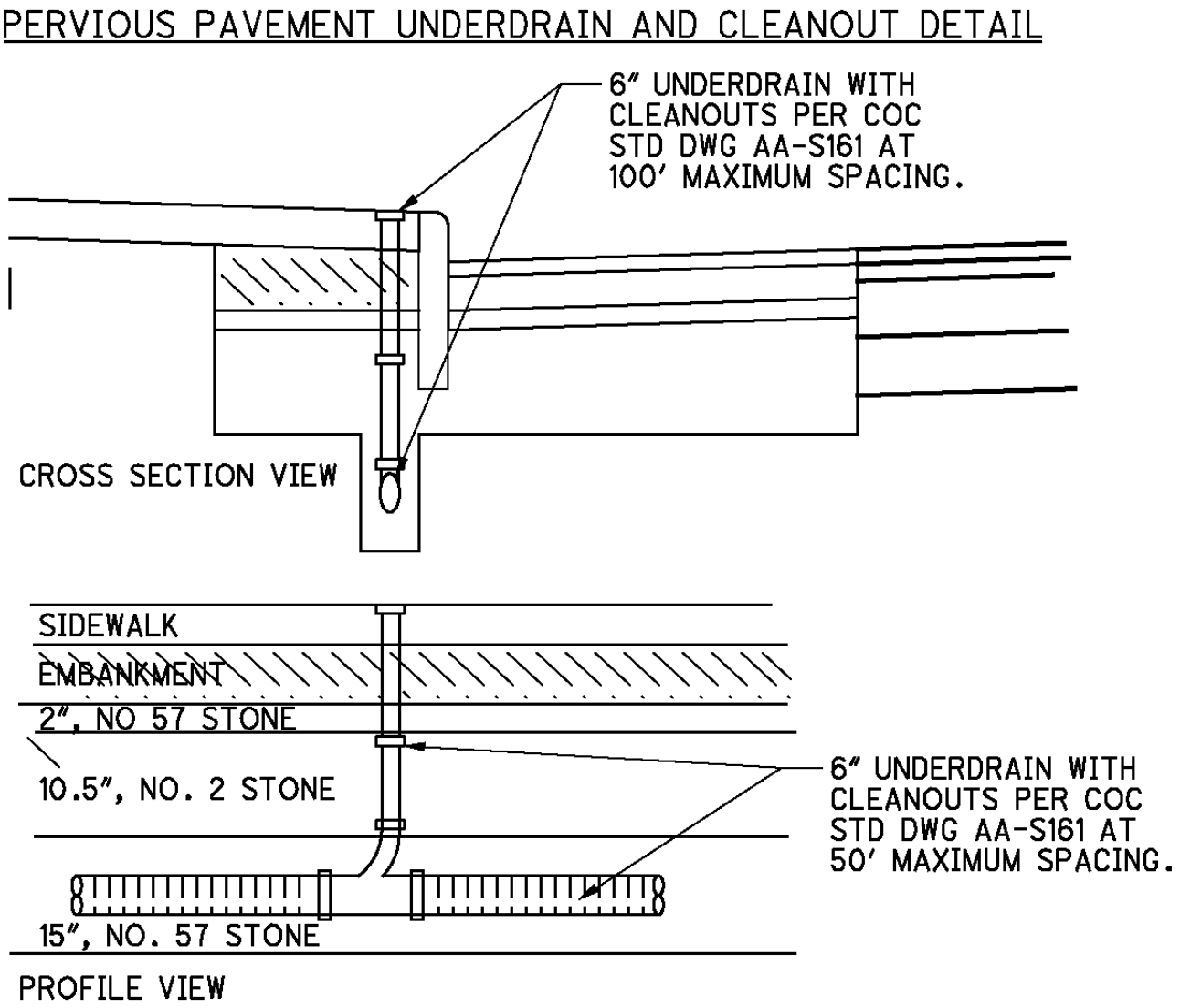
1.5” - POROUS ASPHALT SURFACE COURSE

3.5” - POROUS ASPHALT BASE

2” - NO. 57 STONE with 10.5” - NO. 2 STONE



DELAYED OUTLET



SPECIFICATIONS

DEVELOPED BY FLEXIBLE PAVEMENTS OF OHIO

POROUS ASPHALT PAVEMENT BASE COURSE

(REVISED 09-JUN-2016)

POROUS ASPHALT PAVEMENT SURFACE COURSE

(REVISED 09-JUN-2016)

- NO RAP ALLOWED -

- PG 64-22 MODIFIED WITH 5% PG 76-22M -

- BINDER CONTENT: 3.5% BASE & 6-12% SURFACE -

- FIBER STABILIZER -

- 16 - 22% AIR VOIDS IN SURFACE -

CONSTRUCTION OF TEST STRIP

PERFORM SECTION FOR APPROVAL BY OWNER PRIOR TO MASS PRODUCTION

OWNER RESERVES RIGHT TO HAVE TEST SECTION REMOVED AND ADDITIONAL TEST SECTIONS COMPLETED

BEST PRACTICES

2 PASSES **STATIC COMPACTION** WITH 8-TON ROLLER

< 4 INCH LIFTS

COMPACT IMMEDIATELY DUE TO HEAT LOSS

KEEP OFF AND PROTECT!


PALMETTO ST
ONE
WAY

BENEFITS

DELAYED PEAK DISCHARGE

INFILTRATION/ GROUNDWATER RECHARGE

REDUCED STORMWATER VOLUME

WATER QUALITY

FITS WITHIN SITE FOOTPRINT

LESS DRAINAGE STRUCTURES

SUSTAINABLE

COST EFFECTIVE

MAINTENANCE

CONTRACTOR TEST THROUGHOUT CONSTRUCTION AND BEFORE PROJECT CLOSEOUT

INSPECT EVERY 3 MONTHS FOR 1ST YEAR, THEN YEARLY

INFILTRATION TEST - ASTM C1701 – “STANDARD TEST METHOD OF INFILTRATION RATE IN PERVIOUS CONCRETE”

Or

SIMPLE INFILTRATION TEST

MAINTENANCE

VACUUM SWEEP TWICE PER YEAR

PRESSURE WASH AT 45^{O} ANGLE IF NEEDED

DO NOT USE SAND FOR SNOW OR ICE REMOVAL

REFERENCES

Hansen, Kent (2008). **Porous Asphalt Pavements for Stormwater Management: Design, Construction and Maintenance Guide.**

National Asphalt Pavement Association, Lanham, Maryland.

See **Flexible Pavements of Ohio** website for specifications and additional resources

http://www.flexiblepavements.org/sustainability/porous-asphalt/porous-asphalt

Pictures from CMT, EP Henry, Mississippi Watershed Management Organization, & Ozinga