

CLASSIFICATION	NO. OF LANES	A	B	C	CURB TYPE	MIN. C RADIUS	NOTES
ARTERIAL, MAJOR	5	90'	60'	10'	COMB C&G "C"	500**	SIDEWALKS BY APPROVAL
ARTERIAL, MINOR	3-4	70'-80'	38'-48'	10'	COMB C&G "C"	500**	SIDEWALKS BY APPROVAL
COLLECTOR	2-3	60'	38'	5'	COMB C&G	200**	SIDEWALKS REQUIRED
LOCAL	2	50'	28'	5'	COMB C&G "A"	200**	SIDEWALKS REQUIRED
SERVICE DRIVE *	2	40'	30'	N/A	N/A	40'	NO SIDEWALK
ALLEY	1	14'	10'	N/A	N/A	N/A	NO SIDEWALK

* MINIMUM ACCESSIBLE PAVEMENT WIDTH FOR INDUSTRIAL SUBDIVISIONS.

** MINIMUM TANGENT OF 100' SHALL SEPARATE ALL REVERSE CURVES.

CLASSIFICATION	MIN. GRADE	MAX. GRADE	MIN. SIGHT DISTANCE
ARTERIAL	0.5%	5.0%	600'
SECONDARY	0.5%	5.0%	300'
COLLECTOR STREET	0.5%	7.0%	300'
LOCAL STREET	0.5%	10.0%	300'
SERVICE DRIVE			
ALLEY	0.5%	10.0%	

CLASSIFICATION	MINIMUM PAVEMENT THICKNESS				
	HMA SURFACE, 9.5mm	HMA INT., 19.0mm	HMA BASE, 25.0mm***	COMP AGG., NO.53, AS REQ.	PORT. CEM CON. PAV'T.
ARTERIAL, MAJOR	1.5"	2.5"	9"	6"	12"
ARTERIAL, MINOR	1.5"	2.5"	7"	6"	10"
COLLECTOR STREET	1.5"	2.5"	6"	6"	8"
LOCAL STREET	1.5"	2.5"	4"	6"	6"
SERVICE DRIVE *	1.5"	2.5"	7"	6"	10"
ALLEY **	1.5"		3"	6"	

* MINIMUM PAVEMENT THICKNESS FOR INDUSTRIAL SUBDIVISION.

** NEW CONSTRUCTION. IF PAVING OVER EX. AGG. ALLEY, SHALL BE 2" MIN. HMA SURFACE

*** COMPACTED THICKNESS RANGE FOR HMA BASE IS 3"-6".

NOTES:

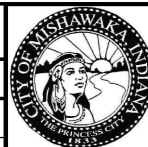
- ALL HMA MIXES SHALL BE TYPE C IN ACCORDANCE WITH INDOT SPECIFICATION 402.
- ALL HMA PAVEMENTS SHALL BE IN ACCORDANCE WITH THE LATEST ASPHALT PAVEMENT ASSOCIATION OF INDIANA, INC. (APAI) RECOMMENDED GUIDE SPECIFICATION FOR LOCAL GOVERNMENTS.
- OTHER PAVEMENT SECTIONS WILL BE CONSIDERED PROVIDING THEY ARE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA, AND ARE BASED ON TRAFFIC NEEDS AND EXISTING SOIL CONDITIONS.
- ALL RIGHT OF WAY IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE INDIANA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, LATEST EDITION.
- THE DEVELOPER SHALL INSTALL ALL SANITARY SEWER TAPS TO EACH PLATTED LOT AT THE TIME THAT THE MAIN SEWER IS INSTALLED. SEE DETAIL ON SHEET V-8.
- FOR COMPACTION REQUIREMENTS PLEASE SEE STANDARD SPECIFICATIONS SECTION 1-9.
- IF UNSUITABLE SUBGRADE MATERIAL IS FOUND, IT SHALL BE REMOVED AND REPLACED WITH MINIMUM OF 6" COMPACTED AGGREGATE, NO. 53.

PREPARED BY: DLZ INDIANA, LLC



Brian M. Smith
2/1/2022

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CITY OF MISHAWAKA, INDIANA

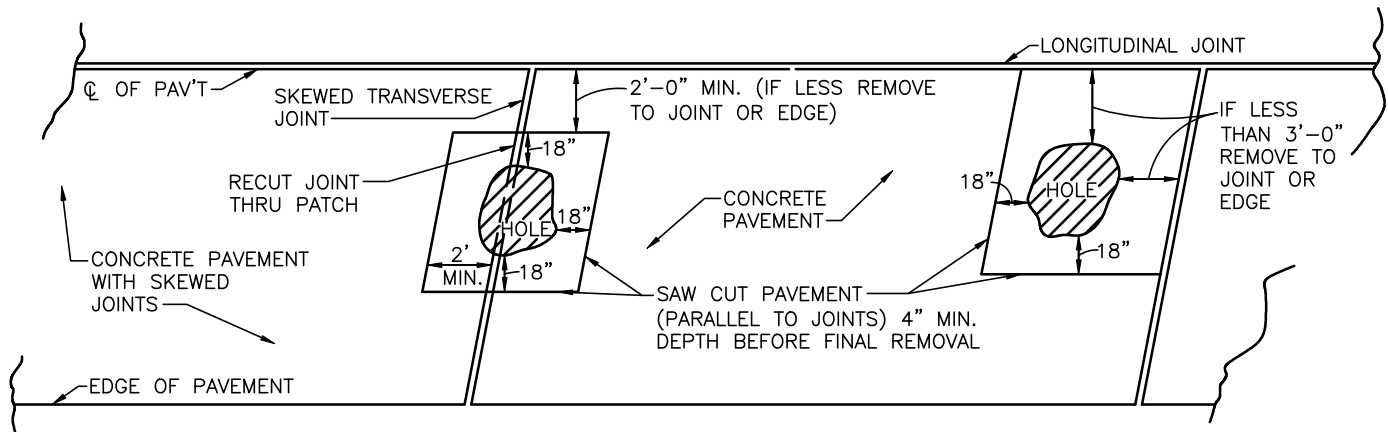
ENGINEERING STANDARDS

ITEM	REVISION	APPROVED DATE
	EFFECTIVE	APRIL 2007
	REVISED	FEBRUARY 2008
	REVISED	FEBRUARY 2022

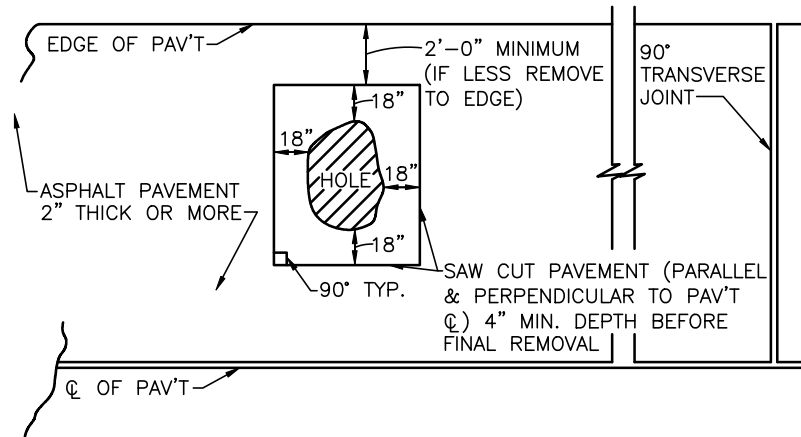
TYPICAL SECTIONS

SHT. NO.

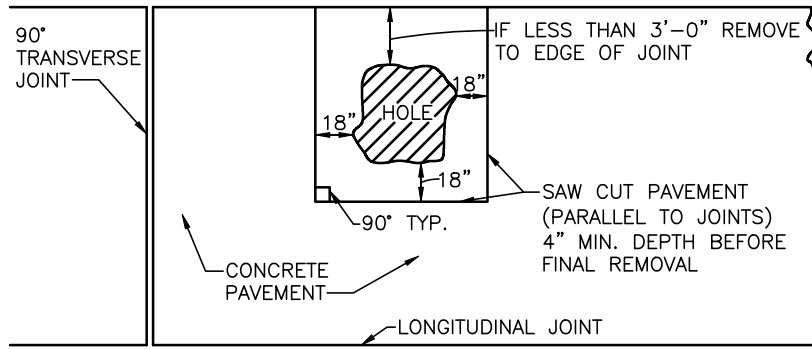
IV-1



CONCRETE PATCH IN CONCRETE PAVEMENT (WITH OR WITHOUT SKEWED JOINTS)



CONCRETE PATCH IN ASPHALT PAVEMENT



CONCRETE PATCH IN CONCRETE PAVEMENT

NOTES:

1. ALL FINISHED CONCRETE IN CONCRETE ROADS SHALL HAVE A TINED FINISH, IN ACCORDANCE WITH INDOT SPECIFICATIONS, PERPENDICULAR TO TRAFFIC DIRECTION.
2. ALL FINISHED CONCRETE IN ASPHALT ROADS SHALL HAVE A ROUGH BROOM FINISH PERPENDICULAR TO TRAFFIC DIRECTION.
3. FINAL FINISH SHALL BE SPRAYED WITH CURING-SEALING COMPOUND TO PREVENT CONCRETE SPALDING.

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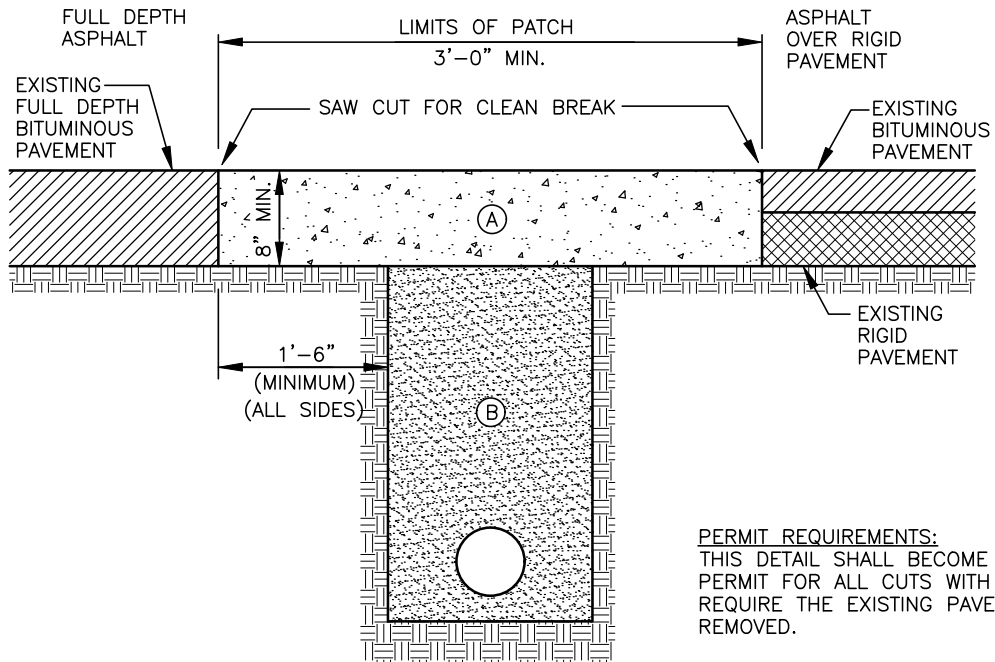
CITY OF MISHAWAKA, INDIANA

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ENGINEERING STANDARDS

PAVEMENT PATCH PLAN

SHT. NO.
IV-2



PERMIT REQUIREMENTS:
 THIS DETAIL SHALL BECOME PART OF THE PERMIT FOR ALL CUTS WITH ROADS THAT REQUIRE THE EXISTING PAVEMENT TO BE REMOVED.

LEGEND

- (A) PLAIN CONCRETE IS TO BE FINISHED FLUSH TO THE EXISTING RIGID PAVEMENT.
 8" MIN. CONCRETE OR MATCH EXISTING PAVEMENT DEPTH, WHICHEVER IS GREATER. 12" CONCRETE ON HIGH VOLUME OR MAJOR ARTERIAL ROAD.
 IF CONCRETE IS PLACED AS PATCH IN EXISTING ASPHALT PAVEMENT, IT SHALL BE INTEGRAL DYED WITH LAMP BLACK DYE.
- (B) PATCH AREAS ≤ 8 FT. X 8 FT. (64 SQ FT) – REMOVABLE FLOWABLE BACKFILL IN ACCORDANCE SECTION IV OF THE MISHAWAKA STANDARD SPECIFICATIONS OR ALTERNATE METHOD AS DIRECTED BY THE ENGINEER.
 PATCH AREAS > 8 FT. X 8 FT. (64 SQ FT) – MAY UTILIZE CONVENTIONAL BACKFILLING METHODS SATISFYING THE COMPACTION REQUIREMENTS OF SECTION I OF THE MISHAWAKA STANDARD SPECIFICATIONS OR FLOWABLE BACKFILL AS DIRECTED BY THE ENGINEER.

DETAIL FOR CUT ROAD PATCHING

NOTES:

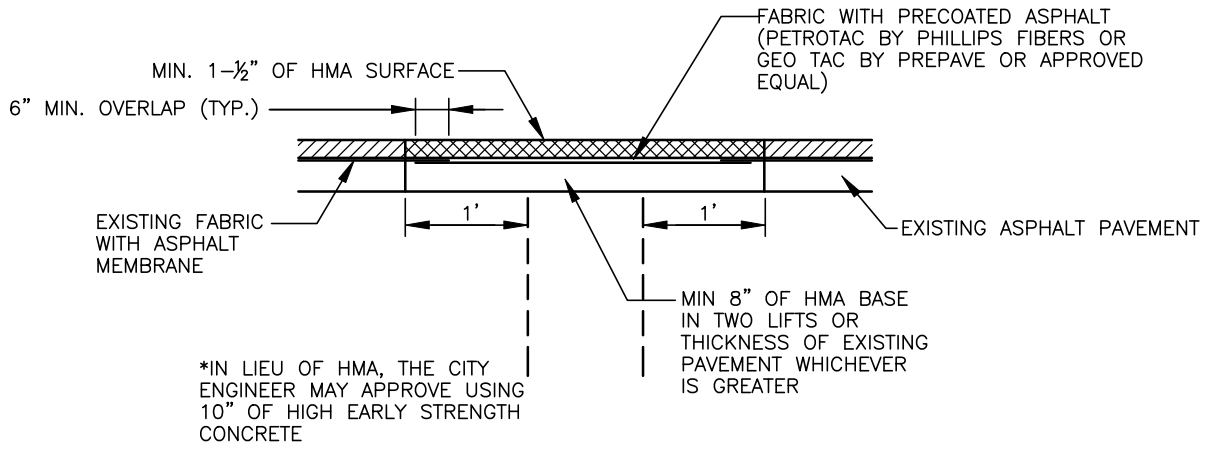
1. EXISTING PAVEMENT IS TO BE SAW CUT FOR A CLEAN BREAK PER DETAIL IV-2. ALL JOINTS SHALL BE SAW CUT TO A DEPTH OF 4 INCHES (4") MINIMUM. BEFORE FINAL REMOVAL IS PERFORMED.
2. ALL SAW CUTS SHALL BE A MIN. 18" AWAY FROM ANY CASTING EDGE.
3. FLOWABLE BACKFILL:
 - DO NOT PLACE ON FROZEN GROUND.
 - PROTECT FROM FREEZING UNTIL MATERIAL HAS SET.
 - DO NOT PLACE INTO OR THROUGH STANDING WATER, UNLESS APPROVED BY THE ENGINEER.
 - PROPERLY ATTACH OR ANCHOR ALL PARTS AND MATERIALS THAT ARE TO REMAIN IN THE EXCAVATION TO PREVENT OBJECTS FROM FLOATING.
4. HI-EARLY CLASS A (SLAG) CONCRETE WITH 6%-8% AIR ENTRAINMENT SHALL BE USED.
5. NEW SURFACE IS TO BE SLOPED AT THE SAME RATE AS THE EXISTING SURFACE.
6. ALL JOINTS BETWEEN EXISTING PAVEMENT AND NEW CONCRETE SHALL BE SMOOTH AND STRAIGHT.
7. PAVEMENT PATCH SHALL BE SMOOTH AND LEVEL. NO MORE THAN ¼" VARIATION FROM A STRAIGHT EDGE 5'-0" IN LENGTH SHALL BE ALLOWED. SMOOTH RIDEABILITY MUST BE MAINTAINED.

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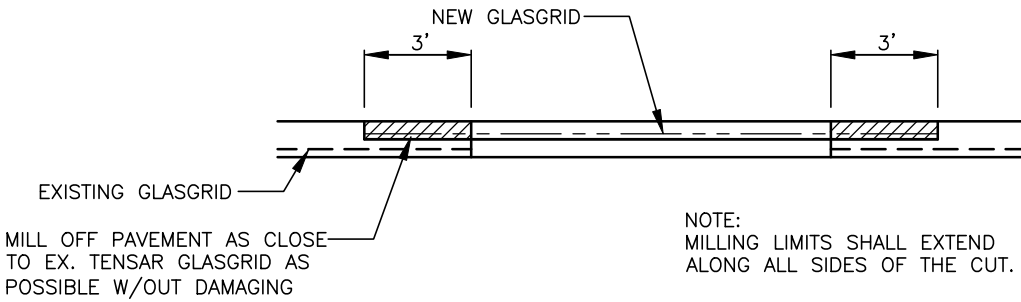
Brian M. Smith
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ITEM	REVISION	APPROVED DATE		ENGINEERING STANDARDS		
	EFFECTIVE		APRIL 2007	PAVEMENT PATCH DETAIL		
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				IV-3		

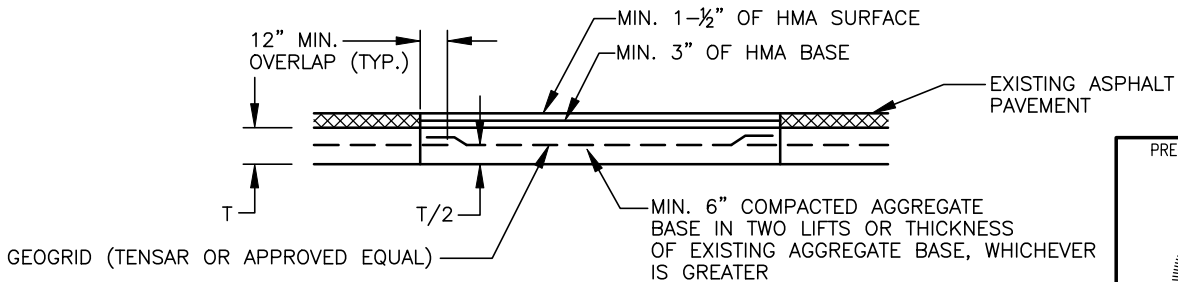


NOTE: WHEN CONTRACTOR ENCOUNTERS EXISTING FABRIC MEMBRANE OR GEOGRID FABRIC DURING EXCAVATION, PATCH SHALL CONFORM TO THE ABOVE STANDARD.

TYPICAL SECTION FOR REPAIR TO STREET WITH FABRIC MEMBRANE



TYPICAL SECTION FOR REPAIR TO STREET WITH GLASGRID



TYPICAL SECTION FOR REPAIR TO STREET WITH GEOGRID

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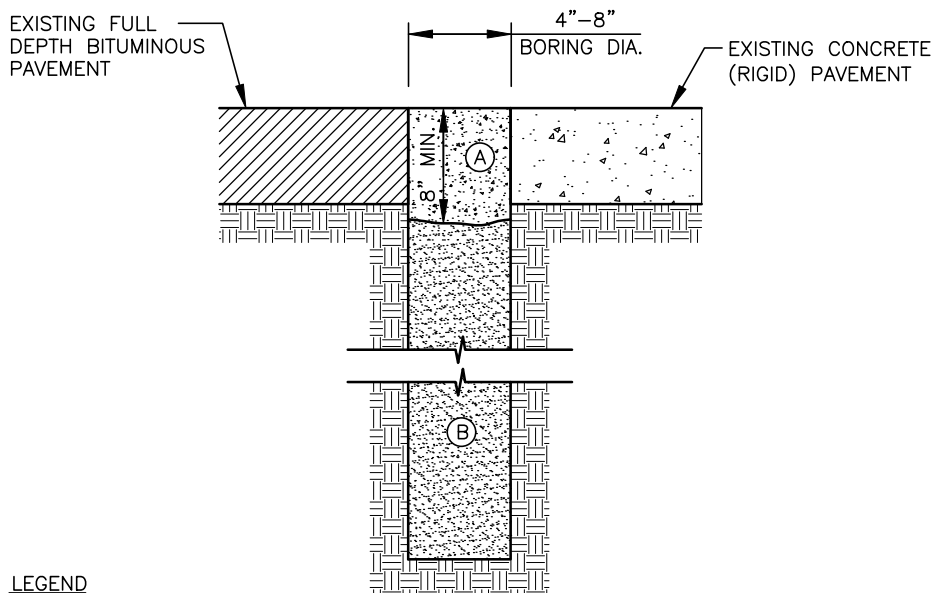
CITY OF MISHAWAKA, INDIANA

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ENGINEERING STANDARDS

PAV'T PATCH W/FABRIC MEMBRANE OR GEOGRID

SHT. NO.
IV-4



LEGEND

- (A) RAPID SET CONCRETE PATCHING MATERIAL, *SET 45 CHEMICAL ACTION REPAIR MORTAR* (RECOMMENDED), OR APPROVED EQUAL. SEE SPECIFICATIONS BELOW.
 FINISH FLUSH TO THE EXISTING PAVEMENT.
 8" MIN. OR MATCH EXISTING PAVEMENT DEPTH, WHICHEVER IS GREATER.
 12" MIN ON HIGH VOLUME OR MAJOR ARTERIAL ROADS.
- (B) BACKFILL BORE HOLES IN ACCORDANCE WITH STANDARD INDIANA DEPARTMENT OF TRANSPORTATION PROCEDURES.

RAPID SET CONCRETE PATCHING MATERIAL

DESCRIPTION: ONE-COMPONENT, RAPID-SETTING, CEMENTITIOUS CONCRETE REPAIR AND ANCHORING MATERIAL. THE MATERIAL SHALL BE CAPABLE OF FILLING A ½ INCH TO FULL DEPTH REPAIR AND REQUIRE NO BONDING AGENT.

SPECIFICATIONS: THE CONCRETE PATCHING MATERIAL SHALL COMPLY WITH ASTM C928 STANDARD SPECIFICATIONS FOR PACKAGED, DRY, RAPID-HARDENING CEMENTITIOUS MATERIALS FOR CONCRETE REPAIRS.

IT SHALL BE RESISTANT TO FREEZE/THAW CYCLES AND DEICING CHEMICALS.

WHEN PREPARED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS, THE PATCHING MATERIAL SHALL MEET THE FOLLOWING REQUIREMENTS:

SET TIMES		ASTM C266
INITIAL	10 MINUTES (MIN.)	
FINAL	45 MINUTES (MAX.)	
COMPRESSIVE STRENGTH		ASTM C109 (MOD.)
1 HOUR	2000 PSI	
3 HOUR	3000 PSI	
7 DAY	4000 PSI	
BOND STRENGTH		ASTM C882
24 HOUR	1000 PSI	

NOTES:

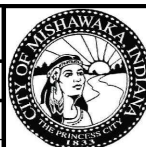
1. THIS BOREHOLE PAVEMENT PATCH DETAIL IS ONLY ACCEPTABLE IF THE ROADWAY BEING REPAIRED IS GOING TO BE RECONSTRUCTED WITHIN 1-2 YEARS, OTHERWISE, THE STANDARD PAVEMENT PATCH DETAIL IV-3 SHALL BE USED.

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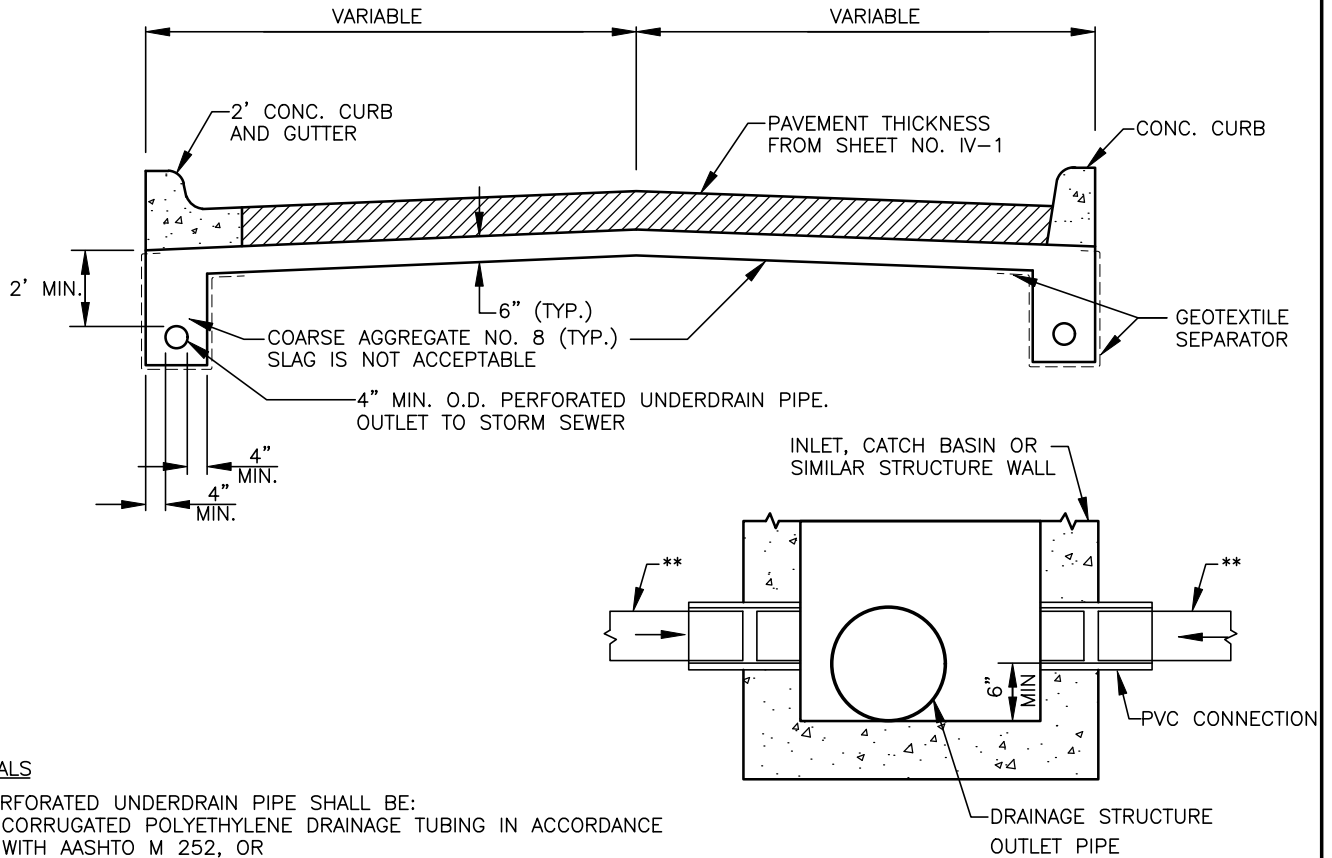
CITY OF MISHAWAKA, INDIANA

ENGINEERING STANDARDS

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**BORE HOLE PAVEMENT
PATCH DETAIL**

SHT. NO.
IV-5



MATERIALS

1. PERFORATED UNDERDRAIN PIPE SHALL BE:
 - CORRUGATED POLYETHYLENE DRAINAGE TUBING IN ACCORDANCE WITH AASHTO M 252, OR
 - POLYVINYL CHLORIDE PIPE IN ACCORDANCE WITH AASHTO M 304.
2. GEOTEXTILE SEPARATOR SHALL BE A NON-WOVEN GEOTEXTILE:
 - CARTHAGE MILLS 30%
 - OR APPROVED EQUAL

**4" MIN O.D. PERFORATED UNDERDRAIN PIPE

DRAINAGE STRUCTURE OUTLET DETAIL
N.T.S.

PRIOR TO PLACING ANY CURBING, PAVEMENT OR UNDERDRAINS IN THE BELOW SOIL CLASSIFICATIONS, THE COMPACTED SUBGRADE SHALL BE PROOF-ROLLED BY A LOADED SINGLE AXLE OR TANDEM AXLE DUMP TRUCK IN THE PRESENCE OF A REPRESENTATIVE OF THE ENGINEER. ANY SOFT OR YIELDING SUBGRADE SHALL BE UNDERCUT, BACKFILLED WITH GRANULAR BORROW MATERIAL, COMPACTED AND REPROOF-ROLLED IN THE PRESENCE OF A REPRESENTATIVE OF THE ENGINEER. PIPE UNDERDRAINS ARE REQUIRED TO BE INSTALLED IN THE FOLLOWING U.S.D.A. SOIL CONSERVATION SERVICE SOIL CLASSIFICATIONS:

ADRIAN	CROSIER	MARTINSVILLE	PALMS	TROXEL
ALIDA	DEL REY	MAUMEE	QUINN	WALLKILL
AUBBEENAUBBEE	EDWARDS	METEA	RENSSELAER	WASHTEWAW
BLOUNT	GILFORD	MIAMI	RIDDLES	WHITAKER
BRADY	HOUGHTON	MILFORD	TEDROW	
BROOKSTON	LANDES	MORLEY	TRACY	

NOTE: IF ANY OF THE ABOVE U.S.D.A. SOIL CONSERVATION SERVICE SOIL CLASSIFICATIONS ARE ENCOUNTERED DURING THE COURSE OF INSTALLING UTILITIES, THE TRENCH REQUIRED FOR INSTALLATION OF SAID UTILITIES SHALL BE BACKFILLED WITH COARSE AGGREGATE NO. 53 TO A DEPTH OF 6" BELOW THE BOTTOM OF PAVEMENT ELEVATIONS. NONE OF THE ABOVE LISTED SOILS CLASSIFICATIONS SHALL BE USED FOR TRENCH BACKFILL.

UTILITY NOTE:

ANY UTILITY ENCOUNTERING AN AGGREGATE UNDERDRAIN SYSTEM SHALL CONTACT THE MISHAWAKA DEPARTMENT OF ENGINEERING AND SHALL REPAIR THE SYSTEM IN ACCORDANCE WITH THIS DETAIL.

PREPARED BY: DLZ INDIANA, LLC

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2/1/2022

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	EFFECTIVE	APRIL 2007	UNDERDRAIN TYPICAL SECTION			SHT. NO. IV-6
	REVISED: ADDED STR OUTLET DETAIL	MARCH 2013				
	REVISED	FEBRUARY 2022				