DESIGNER NOTES FOR PERVIOUS PAVING

It is important to note that with the limited exception of sidewalks, pervious pavements are not to be used on FHWA financed projects or within the Washington State Highway System. These notes and associated APWA GSPs are intended for locally financed projects within locally owned right of way.

APWA Porous Hot Mix and Warm Mix Asphalt (PHMA and PWMA)

Use of Porous Hot Mix and Warm Mix Asphalt is becoming common in Washington State but we haven't had a "standardized" specification for the product until now. This specification, along with its companion specifications, was developed specifically to save local agencies the time and resources necessary to write their own versions.

When utilizing porous asphalt we recommend that the designer begin with the subgrade and base then follow with the right mix.

You can begin by building a good subgrade according to **APWA GSP 2-06.3(3) - Subgrade for Permeable Pavements.** Add **APWA GSP 2-06.5 – Measurement and Payment.**

Follow a good subgrade with a course of a Permeable Ballast Base Course with or without a Crushed Surfacing Choker Course. (Depending on agency preference)

Use APWA GSP 4-04.2(9-03.9(2)) - Permeable Ballast and, if desired, **APWA GSP 4-04.2(9-03.9(5)) - Crushed Surfacing Choker Course**. Additionally, use **APWA GSP 4-04.3(5) - Shaping and Compaction**. If a choker course is used, add **APWA GSP 4-04.4 - Measurement** and **APWA GSP 4-04.5 – Payment.**

Finish your PHMA/PWMA project with the following set of GSPs:

APWA GSP 5-04.SA - Hot Mix Asphalt
APWA GSP 5-04.1 – Description
APWA GSP 5-04.2(2) – Mix Design
APWA GSP 5-04.3(3)A – Mixing Plant
APWA GSP 5-04.3(3)E – Rollers
APWA GSP 5-04.3(9) – General
APWA GSP 5-04.3(9)D – Commercial Evaluation
APWA GSP 5-04.3(11)H – Rejection – PHMA/PWMA Infiltration Test
APWA GSP 5-04.4 – Measurement
APWA GSP 5-04.5 – Payment
APWA GSP 9-03.8(6) – HMA Proportions of Materials

Notes for these specifications are as follows:

5-04.3(6) Temperature-viscosity curves are developed for dense graded HMA mixing and compaction applications and should be used as references only. Porous HMA should typically be mixed at the bottom of the temp.-viscosity curve temperature range or cooler to minimize draindown. Porous WMA

(PWMA) is typically mixed and compacted approximately 25 to 35°F below the bottom of the temperature-viscosity curve temperature ranges. Typical temperature ranges would be 250-275°F for Warm Mix Asphalt (WMA) or 275-300°F for Hot Mix Asphalt (HMA).

5-04.3(7) Typical temperature range for placement would be 225-250°F for WMA and 250-275°F for HMA.

5-04.3(10)A Prior successful projects have incorporated one initial low amplitude vibratory roller pass to seat and orient the PHMA/PWMA aggregate matrix followed by static rolling to create a final surface without roller marks.

General The use of warm mix asphalt technology is encouraged as it minimizes issues related to asphalt drain down during production, hauling and testing of the PHMA.

APWA Asphalt Treated Permeable Base (ATPB)

Asphalt Treated Permeable Base (ATPB) may also provide a base course. If used, you do not need the Permeable Ballast or the Crushed Surfacing Choker Course.

Use **APWA GSP 4-SA2 Asphalt Treated Permeable Base**

Notes for this section are as follows:

4-05.3(4) A typical temperature range for ATPB manufacturing would be 260-300°F for Warm Mix Asphalt (WMA) processes or 315-325°F for Hot Mix Asphalt (HMA) processing for PG 58V-22 binders. Temperature-viscosity curves are developed for dense graded HMA mixing and compaction applications and should be used as references only. ATPB should typically be mixed at the bottom of the temp.- viscosity curve temperature range or cooler to minimize over compaction during the placement process. WMA processing for ATPB is typically mixed and compacted approximately 30 to 60°F below the bottom of the temperature-viscosity curve temperature ranges shown for dense graded HMA applications. The typical temperature range during initial placement would be approximately 225-250°F for WMA ATPB and approximately 250-275°F for HMA ATPB.

4-07.3(7) Prior successful projects have incorporated two initial low amplitude vibratory roller passes to seat and orient the ATPB aggregate matrix followed by static rolling to create a final smooth surface without roller marks.

General The use of warm mix asphalt technology is encouraged as it generally minimizes issues related to over consolidation of the ATPB during placement. Tack coats are generally not necessary between ATPB and surface courses unless the surface cleanliness has been compromised. In that case a light tack coat.

APWA Pervious Concrete Pavement

Use of permeable concrete is one tool Washington State local agencies can utilize to help meet the Low Impact Development (LID) requirements in areas where they apply. This specification, with its companion specifications, was developed to save local agencies the time and resources necessary to write their own versions.

When utilizing Pervious Concrete it is recommended that the designer use the following set of GSPs and that you indicate clearly these specifications apply ONLY to the work by the name of "Pervious Concrete" and not to other concrete items that may be called for in the contract documents.

APWA GSP 2-06.3(3) SUBGRADE FOR PERMEABLE PAVEMENTS
Used for specifying subgrade preparation and compaction.

APWA GSP 2-06.5 MEASURMENT AND PAYMENT
Use for payment of permeable pavement subgrade under 2-06.3(3)

APWA GSP 4-04.2(9-03.9(2)) PERMEABLE BALLAST
Use for reservoir layer under the permeable surface.

Specifier's Note: If a more robust base layer is needed, Asphalt Treated Permeable Base (ATPB) can be used. For ATPB, see **APWA GSP 4-SA2 Asphalt Treated Permeable Base.**

APWA GSP 4-04.2(9-03.9(5)) CRUSHED SURFACING CHOKER COURSE
This GSP is optional at the Engineer's discretion when using 4-04.2(9-03.9(2)).

APWA GSP 5-06.SA PERVIOUS CONCRETE PAVEMENT
Specifications 5-06.1 through 5-06.5

Fiber reinforcement (Section 5-06.2) has been built into this specification. However, it is included as an Engineer's option and is not required.

Additionally, the committee recommends that the Contracting Agency pay close attention to the following "*Specifier's Notes*" that are sorted by specification for you.

5-06.3(3) Submittals
Specifier's Note: For small rural sidewalk or small yardage installations, specifier may modify submittal requirements such as deleting NRMCA batch plant certification and NRMCA truck certifications.

Specifier may request that Ready Mix trucks that supply material to a pervious project be prepared to discharge pervious concrete. Trucks should have clean fins and minimal buildup in the drum. It is recommended that these requirements be reviewed at the preconstruction meeting for pervious pavement.

Specifier's Note: For small installations (such as sidewalks, single family residential driveway or similar applications) in lieu of Certificate of Compliance, batch tickets with weights may be sufficient documentation for materials as delivered. Review which elements to require for each truckload and modify section 6-02.3(5)B (or replace "Certificate of Compliance" referenced in the specification with "batch tickets with weights") as needed through special provision. The intent is to confirm material delivered

is consistent with what was submitted.

5-06.3(10)A Contractor Qualifications
Specifier's Note: Depending upon size of job and type of job (foot paths, walks, parking lots, road), modify qualifications accordingly. For example 10'x20' pervious concrete pad would not require the ACI recommended 3 NRMCA Installers; however, it is recommended that the crew members have experience placing pervious concrete. For parking lots and roadway applications it is recommended to have installers with NRMCA Installer certification. For large scale installations, such as ½ acre of pervious concrete, may want to consider increasing the number of NRMCA Installers to four.

Other options to consider: Contracting Agency may pay for testing, select testing agency and/or conduct the testing in lieu of Contractor doing the testing. It is recommended that you modify specification accordingly.

Specifier's Note: Depending upon size of job, the test panel size could be modified. For example, on small jobs the test panel may be same size as the permanent pour so you could consider using the crews past projects in lieu of the test panel or note that the placement at the permanent location is the "test panel" and if it does not meet spec it will need to be removed.

At the preconstruction meeting for pervious concrete, note that the test panel is intended to represent what the permanent pour would be and will be used as the "referee" section for subjective measurements such as surface finish.

5-06.3(11)C Isolation Joints
Specifier's Note: Isolation joints should not be used in pervious concrete as "expansion" joints such as interior pervious concrete paving joints in a parking lot, or in a sidewalk. Pervious concrete will be on one side only of an isolation joint. The specification text reflects this.