Maine Department of Transportation

Highway Program

Design Guidance

Title: Structural Pavement Design with a Recycled Layer	Issue Date: July 12, 2018
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Discipline: Pavement Design & Quality	
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Background:

This Guidance simplifies the methods to determine the hot mix asphalt (HMA) thickness needed over all recycled asphalt pavement treatments currently used by MaineDOT. This guidance also includes the hot mix asphalt (HMA) thickness needed over rubblized reinforced concrete pavement.

Guidance:

MaineDOT currently uses Full Depth Reclamation (FDR) of the in-place asphalt pavement (stabilized with Foamed Asphalt, Cement, or Emulsion), Plant Mixed Recycled Asphalt Pavement (PMRAP), and concrete rubbization as recycling treatments. Recycling existing asphalt and concrete pavements can provide many economic benefits for highway rehabilitation projects. Adding the appropriate stabilizer to recycled asphalt pavement can also greatly improve the engineering properties of marginal quality existing HMA mixes.

The treatment types currently used by MaineDOT, treatment thicknesses and associated item numbers are as follows:

1. FDR with Foamed Asphalt
   - 5” (Item #309.35)
   - 6” (Item #309.36)

2. FDR with Cement
   - 5” (Item #308.36)
   - 6” (Item #308.36)

3. FDR with Emulsion
   - 5” (Item #307.332)
   - 6” (Item #307.333)

4. PMRAP
- 3” (Item #310.23)
- 4” (Item #310.24)
- 5” (Item #310.25)
- 6” (Item #310.26)

5. Rubblization
- All Concrete Rubblization projects (Item #311.36)

HMA Layer Thickness Over A Recycled Layer:

The method for determining the HMA thickness over a recycled asphalt pavement layer using the charts included in this guidance requires the following information:

- Recycled layer thickness and stabilizer type
- Future traffic level (ESALs)
- Existing subbase aggregate layer thickness (minimum allowed - 12”)
- Subgrade soil type/types

It is important that an adequate amount of information is collected to determine the in- place HMA thickness, existing subbase aggregate thickness and gradation, and subgrade soil types for all recycling processes. This information is also critical to select the proper type of recycling layer to use on a given project, which is covered in Design Guidance – Selecting the Appropriate Recycling Process. This information should be requested from and provided by the Pavement Design & Quality section prior to designing the pavement structure.

The method for determining the HMA thickness over a rubblized concrete pavement using the charts included in this guidance requires the following information:

- Future traffic level (ESALs)
- Subgrade soil type/types

The chart to determine the HMA needed over a rubblized concrete pavement considers the typical concrete pavement thickness of 7”, and the typical underlying aggregate thickness of 8” (as shown on as-built plans). If a consistent aggregate layer of 20” or more is encountered in subsurface investigations, a Type 1 subgrade may be used to represent this aggregate.

ESAL Calculation:

ESALs are calculated using the 18-kip Equivalent @ $P_{2.5}$ value located on the project traffic data sheet provided by the Traffic Analysis Section in the Bureau of Planning. ESALs are calculated with the following equation:

ESALs = (18-kip Equiv. P 2.5) x (12-yr or 20-yr design life) x (365 days/year)

Subgrade Soil Type:

Subgrade soil type is determined from project subsurface investigations or from the Natural Resources Conservation Service (NRCS) Soil Survey information for the specific project

location. The subgrade soil type is requested from the Pavement Design & Quality section for all Highway Corridor Priority (HCP) 1 projects and all other projects greater than 1 mile in length. The NRCS Soil Survey information can be used on HCP 2, 3, and 4 projects less than 1 mile in length by using the NRCS Web Soil Survey website. See the attached *Using the NRCS Web Soil Survey to Determine Subgrade Soil Type* document for step-by-step instructions on how to use the website. A Type 2 subgrade soil is used for large culvert projects where the subgrade will typically consist of fill.

Using the Tables:

FDR with Foamed Asphalt, Cement, or Emulsion (Tables 1- 3)

1. Calculate ESALs and determine subgrade soil type
2. Select the table (Table 1, 2 or 3) that is based on the subgrade soil type
3. If the ESALs for the project exceed the values provided in the charts, request a pavement design from the Pavement Design & Quality section
4. Select the column within the table that is based on the FDR thickness and stabilizer used
5. Find the range of ESAL values representative of your calculated value starting with the thinnest HMA layer thickness
6. If the existing aggregate is less than what is in the table for the thinnest HMA thickness, move to the next thicker HMA thickness and continue until the aggregate requirements are met

NOTE: Some in-place asphalt pavement recycling projects will have multiple subgrade soil types. If this is the case, keep the HMA constant for the recycled layer thickness you are using and confirm that the aggregate layer will be adequate for each subgrade soil type location. A thicker HMA layer may be necessary to meet structural needs.

Plant Mixed Recycled Asphalt Pavement (PMRAP)(Tables 4 - 6)

1. Calculate ESALs and determine subgrade soil type
2. Select the table (Table 4, 5 or 6) that is based on the subgrade soil type
3. If the ESALs for the project exceed the values provided in the charts, request a pavement design from the Pavement Design & Quality section
4. Select the table with the calculated ESAL range
5. Select the column with the proposed PMRAP layer thickness
6. Find the total aggregate thickness (existing + new, new, existing) that corresponds to the PMRAP layer thickness
7. Determine the HMA needed over the PMRAP layer based on the aggregate layer thickness
8. Repeat 5 and 6 as necessary to optimize the design

NOTE: With the PMRAP process, new aggregate can be added to the existing subbase aggregate as a means to reduce the required HMA thickness needed to meet structural requirements. The vertical alignment will need to be adjusted to account for adding new aggregate.

Rubblized Concrete Pavement (Table 7)

1. Calculate ESALs and determine subgrade soil type
2. Select the table that is based on the subgrade soil type
3. If the ESALs for the project exceed the values provided in the charts, request a pavement design from the Pavement Design & Quality section
4. Select the calculated ESAL range
5. Determine the HMA needed over the rubblized concrete

Design Review and Approval:

All pavement designs using Tables 1-7 for guidance must be reviewed and approved by the Pavement Design & Quality section prior to the Preliminary Design Report (PDR) stage of the project. The pavement design review must contain all supporting documentation including the Pavement Design Review Form, a project location map, the traffic data sheet, the subsurface investigation report if available, and any NRCS soil survey information used for the design. The overall pavement and HMA thicknesses may be adjusted for ease of constructability or other reasons following the review.

All projects not meeting the criteria in Tables 1 -7 shall require a pavement design performed by the Pavement Design and Quality section. All pavement design requests must include the Pavement Design Request Form, the traffic data sheet requested from the Traffic Analysis Section in the Bureau of Planning, and any subsurface information if available.

Related Guidance:

Please refer to 8-2 Structural Pavement Design in Pavement Design and Design Guidance - Selecting the Appropriate Asphalt Recycling Process for additional information on the selection of the recycled layer types, stabilizers, and project/plan development.

Design Examples Using Charts:

Example 1
Determine the HMA thickness needed over 5" of FDR with Cement. The project has a 12-year design life, a 18-kip Equivalent $P_{2.5}$ value of 350, has 15" of existing subbase aggregate, and has a Type 2 subgrade.

SOLUTION:

- *ESALs* = (18-kip Equiv $P_{2.5}$) x (12-yr or 20-yr design life) x (365 days/year)
  Ex. ESALs = (350) x (12 yrs) x (365days/year) = 1,533, 000
- Use Table 2 - Full Depth Recycling (FDR w Emulsion, Foamed Asphalt or Cement) Type 2 Subgrade
- *HMA required* = 3"

Example 2
Determine the HMA thickness needed over 6" of FDR with Emulsion. The project has a 12-year design life, a 18-kip Equivalent $P_{2.5}$ value of 525, has 14" of existing subbase aggregate, and has a Type 3 subgrade.

SOLUTION:

- *ESALs = (525) x (12 yrs) x (365days/year) = 2,299,500*
- Use Table 3 - Full Depth Recycling (FDR w Emulsion, Foamed Asphalt or Cement) Type 3 Subgrade
- *HMA required* = 5"

Example 3

Determine the HMA thickness needed over 4" of PMRAP. The project has a 12-year design life, a 18-kip Equivalent $P_{2.5}$ value of 525, has 14" of existing subbase aggregate, and has a Type 1 subgrade.

SOLUTION:

- *ESALs = (525) x (12 yrs) x (365days/year) = 2,299,500*
- Use Table 4 - Plant Mixed Recycled Asphalt Pavement (PMRAP) – Type 1 Subgrade
- *HMA required* = 4"

(Alternative Solution: Add 5" of ASCG and reduce the HMA thickness required to 3")

Example 4

Determine the HMA thickness needed over rubblized concrete pavement. The project has a 12-year design life, a 18-kip Equivalent $P_{2.5}$ value of 120, and has a Type 2 subgrade.

SOLUTION:

- *ESALs = (120) x (12 yrs) x (365days/year) = 525,600*
- Use Table 7 - HMA Over Rubblized Concrete Pavement
- *HMA required* = 4"

Table 1 - Full Depth Reclamation (FDR w Emulsion, Foamed Asphalt or Cement)

Type 1 Subgrade (0% - 32% passing #200)

3" HMA

ESAL's	5" FDR w/ Emulsion (Item #307.332) Existing Aggregate (in)	6" FDR w/ Emulsion (Item #307.333) Existing Aggregate (in)	5" FDR w/ F.A. or Cement (Item # 309.35, 308.36) Existing Aggregate (in)	6" FDR w/ F.A. or Cement (Item # 309.36, 308.36) Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	14+	13+	13 +	12 min
2,000,001 - 3,000,000	18+	16+	15 +	12 +
3,000,001 - 4,000,000	21+	18+	18 +	15 +
4,000,001 - 5,000,000	xxxxx	20+	20 +	17 +
5,000,001 - 6,000,000	xxxxx	22+	21+	18 +

4" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	13+	13+	12 min	12 min
3,000,001 - 4,000,000	16+	14+	13 +	12 min
4,000,001 - 5,000,000	18+	15+	15 +	12 min
5,000,001 - 6,000,000	20+	17+	17 +	13 +

5" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	12 min	12 min	12 min	12 min
3,000,001 - 4,000,000	13+	12 min	12 min	12 min
4,000,001 - 5,000,000	14+	13+	12 min	12 min
5,000,001 - 6,000,000	16+	14+	13 +	12 min

6" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	12 min	12 min	12 min	12 min
3,000,001 - 4,000,000	12 min	12 min	12 min	12 min
4,000,001 - 5,000,000	12 min	13+	12 min	12 min
5,000,001 - 6,000,000	13+	14+	12 min	12 min

Table 2 - Full Depth Reclamation (FDR w Emulsion, Foamed Asphalt or Cement)

Type 2 Subgrade (32% - 82% passing #200)

3" HMA

ESAL's	5" FDR w/ Emulsion (Item #307.332)	6" FDR w/ Emulsion (Item #307.333)	5" FDR w/ F.A. or Cement (Items # 309.35, 308.36)	6" FDR w/ F.A. or Cement (Items # 309.36, 308.36)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12+	12 min	12 min
1,000,001 - 2,000,000	16+	14+	13 +	12 +
2,000,001 - 3,000,000	21+	19+	18 +	15 +
3,000,001 - 4,000,000	xxxxx	22+	20 +	18 +
4,000,001 - 5,000,000	xxxxx	xxxxx	21+	20 +
5,000,001 - 6,000,000	xxxxx	xxxxx	xxxxx	xxxxx

4" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	13+	13+	12 min	12 min
2,000,001 - 3,000,000	16+	14+	13 +	12 +
3,000,001 - 4,000,000	19+	16+	16 +	13 +
4,000,001 - 5,000,000	21+	19+	18 +	15 +
5,000,001 - 6,000,000	xxxxx	20+	20 +	17 +

5" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	13+	12 min	12 min	12 min
3,000,001 - 4,000,000	15+	13+	12 min	12 min
4,000,001 - 5,000,000	17+	15+	14 +	12 min
5,000,001 - 6,000,000	19+	17+	16 +	13 +

6" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	12 min	12 min	12 min	12 min
3,000,001 - 4,000,000	13+	12 min	12 min	12 min
4,000,001 - 5,000,000	14+	13+	12 min	12 min
5,000,001 - 6,000,000	16+	14+	13 +	12 min

Table 3 - Full Depth Reclamation (FDR w Emulsion, Foamed Asphalt or Cement)

Type 3 Subgrade (82% - 100% passing #200)

3" HMA

ESAL's	5" FDR w/ Emulsion (Item #307.332)	6" FDR w/ Emulsion (Item #307.333)	5" FDR w/ F.A. or Cement (Items # 309.35, 308.36)	6" FDR w/ F.A. or Cement (Items # 309.36, 308.36)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	15+	12+	12 min	12 min
1,000,001 - 2,000,000	20+	17+	16 +	13 +
2,000,001 - 3,000,000	xxxxx	22+	xxxxx	18 +
3,000,001 - 4,000,000	xxxxx	xxxxx	xxxxx	xxxxx
4,000,001 - 5,000,000	xxxxx	xxxxx	xxxxx	xxxxx
5,000,001 - 6,000,000	xxxxx	xxxxx	xxxxx	xxxxx

4" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	15+	13+	12 min	12 min
2,000,001 - 3,000,000	20+	17+	16 +	13 +
3,000,001 - 4,000,000	xxxxx	20+	20 +	16 +
4,000,001 - 5,000,000	xxxxx	xxxxx	xxxxx	19 +
5,000,001 - 6,000,000	xxxxx	xxxxx	xxxxx	xxxxx

5" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	13+	12 min	12 min	12 min
2,000,001 - 3,000,000	16+	14+	13 +	12 min
3,000,001 - 4,000,000	21+	17+	16 +	13 +
4,000,001 - 5,000,000	xxxxx	19+	18 +	15 +
5,000,001 - 6,000,000	xxxxx	21+	20 +	17 +

6" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	13+	12 min	12 min	12 min
3,000,001 - 4,000,000	15+	13+	12 min	12 min
4,000,001 - 5,000,000	18+	15+	14 +	12 min
5,000,001 - 6,000,000	19+	17+	xxxxx	13 +

Table 4 - Plant Recycled Asphalt Pavement (PMRAP)

Type 1 Subgrade (0% - 32% passing #200)

≤ 1,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	13+	12 min	12 min	- - - - -
4" HMA	12+	12 min	- - - - -	- - - - -
5" HMA	- - - - -	- - - - -	- - - - -	- - - - -
6" HMA	- - - - -	- - - - -	- - - - -	- - - - -

1,000,001 - 2,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	17+	14+	14+	12 min
4" HMA	13+	13+	12 min	- - - - -
5" HMA	12 min	- - - - -	- - - - -	- - - - -
6" HMA	- - - - -	- - - - -	- - - - -	- - - - -

2,000,001 - 3,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	22+	19+	16+	13+
4" HMA	17+	14+	13+	- - - - -
5" HMA	13+	12 min	- - - - -	- - - - -
6" HMA	12 min	- - - - -	- - - - -	- - - - -

3,000,001 - 4,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	24+	22+	19+	16+
4" HMA	20+	17+	14+	12 min
5" HMA	16+	13+	12 min	- - - - -
6" HMA	13+	- - - - -	- - - - -	- - - - -

4,000,001 - 5,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	21+	18+
4" HMA	22+	19+	16+	13+
5" HMA	18+	15+	13+	- - - - -
6" HMA	14+	12 min	- - - - -	- - - - -

5,000,001 - 6,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	22+	20+
4" HMA	23+	20+	18+	15+
5" HMA	19+	17+	14+	12 min
6" HMA	16+	13+	- - - - -	- - - - -

Table 5 - Plant Recycled Asphalt Pavement (PMRAP)

Type 2 Subgrade (32% - 82% passing #200)

≤ 1,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	16+	13+	12 min	12 min
4" HMA	15+	12 min	12 min	- - - - -
5" HMA	12 min	- - - - -	- - - - -	- - - - -
6" HMA	- - - - -	- - - - -	- - - - -	- - - - -

1,000,001 - 2,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	20	17	14	14
4" HMA	16	13	13	12 min
5" HMA	14	12 min	- - - - -	- - - - -
6" HMA	12 min	- - - - -	- - - - -	- - - - -

2,000,001 - 3,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	24+	22+	19+	16+
4" HMA	20+	17+	14+	13+
5" HMA	16+	13+	12 min	- - - - -
6" HMA	13+	12 min	- - - - -	- - - - -

3,000,001 - 4,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	22+	19+
4" HMA	22+	20+	17+	14+
5" HMA	19+	16+	13+	12 min
6" HMA	15+	13+	- - - - -	- - - - -

4,000,001 - 5,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	24+	21+
4" HMA		22+	19+	16+
5" HMA	21+	18+	15+	13+
6" HMA	17+	14+	12 min	- - - - -

5,000,001 - 6,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	- - - - -	23+
4" HMA	- - - - -	- - - - -	21+	18+
5" HMA	23+	20+	17+	14+
6" HMA	19+	16+	13+	- - - - -

Table 6 - Plant Recycled Asphalt Pavement (PMRAP)

Type 3 Subgrade (82% - 100% passing #200)

≤ 1,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	18+	15+	13+	12
4" HMA	14+	12 min	12 min	12 min
5" HMA	- - - - -	- - - - -	- - - - -	- - - - -
6" HMA	- - - - -	- - - - -	- - - - -	- - - - -

1,000,001 - 2,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	20+	17+	15+
4" HMA	20+	16+	13+	13+
5" HMA	16+	13+	12 min	12 min
6" HMA	13+	- - - - -	- - - - -	- - - - -

2,000,001 - 3,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	22+	20+
4" HMA	- - - - -	20+	18+	15+
5" HMA	21+	17+	14+	13+
6" HMA	17+	13+	12 min	- - - - -

3,000,001 - 4,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	- - - - -	22+
4" HMA	- - - - -	- - - - -	21+	18+
5" HMA	- - - - -	20+	17+	14+
6" HMA	20+	16+	13+	12 min

4,000,001 - 5,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	- - - - -	- - - - -
4" HMA	- - - - -	- - - - -	23+	20+
5" HMA	- - - - -	22+	19+	16+
6" HMA	- - - - -	18+	15+	13+

5,000,001 - 6,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	- - - - -	- - - - -
4" HMA	- - - - -	- - - - -	- - - - -	- - - - -
5" HMA	- - - - -	- - - - -	21+	18+
6" HMA	- - - - -	20+	17+	14+

Table 7 - HMA over Rubblized Concrete Pavement

Type 1 Subgrade (0% - 32% passing #200)

ESAL's	HMA (in)
≤ 1000000	4
1,00,0001 - 2,000,000	4.5
2,000,001- 3,000,000	5
3,000,001 - 4,000,000	5.5
4,000,001- 6,000,000	6

Type 2 Subgrade (32% - 82% passing #200)

ESAL's	HMA (in)
≤ 1,000,000	4
1,000,001 - 2,000,000	5
2,000,001- 4,000,000	6

Type 3 Subgrade (82% - 100% passing #200)

ESAL's	HMA (in)
≤ 1,000,000	5
1,000,001 - 3,000,000	6

Table 1 - Full Depth Reclamation (FDR w Emulsion, Foamed Asphalt or Cement)

Type 1 Subgrade (0% - 32% passing #200)

3" HMA

ESAL's	5" FDR w/ Emulsion (Item #307.332) Existing Aggregate (in)	6" FDR w/ Emulsion (Item #307.333) Existing Aggregate (in)	5" FDR w/ F.A. or Cement (Item # 309.35, 308.36) Existing Aggregate (in)	6" FDR w/ F.A. or Cement (Item # 309.36, 308.36) Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	14+	13+	13 +	12 min
2,000,001 - 3,000,000	18+	16+	15 +	12 +
3,000,001 - 4,000,000	21+	18+	18 +	15 +
4,000,001 - 5,000,000	xxxxx	20+	20 +	17 +
5,000,001 - 6,000,000	xxxxx	22+	21+	18 +

4" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	13+	13+	12 min	12 min
3,000,001 - 4,000,000	16+	14+	13 +	12 min
4,000,001 - 5,000,000	18+	15+	15 +	12 min
5,000,001 - 6,000,000	20+	17+	17 +	13 +

5" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	12 min	12 min	12 min	12 min
3,000,001 - 4,000,000	13+	12 min	12 min	12 min
4,000,001 - 5,000,000	14+	13+	12 min	12 min
5,000,001 - 6,000,000	16+	14+	13 +	12 min

6" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	12 min	12 min	12 min	12 min
3,000,001 - 4,000,000	12 min	12 min	12 min	12 min
4,000,001 - 5,000,000	12 min	13+	12 min	12 min
5,000,001 - 6,000,000	13+	14+	12 min	12 min

Table 2 - Full Depth Reclamation (FDR w Emulsion, Foamed Asphalt or Cement)

Type 2 Subgrade (32% - 82% passing #200)

3" HMA

ESAL's	5" FDR w/ Emulsion (Item #307.332)	6" FDR w/ Emulsion (Item #307.333)	5" FDR w/ F.A. or Cement (Items # 309.35, 308.36)	6" FDR w/ F.A. or Cement (Items # 309.36, 308.36)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12+	12 min	12 min
1,000,001 - 2,000,000	16+	14+	13 +	12 +
2,000,001 - 3,000,000	21+	19+	18 +	15 +
3,000,001 - 4,000,000	xxxxx	22+	20 +	18 +
4,000,001 - 5,000,000	xxxxx	xxxxx	21+	20 +
5,000,001 - 6,000,000	xxxxx	xxxxx	xxxxx	xxxxx

4" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	13+	13+	12 min	12 min
2,000,001 - 3,000,000	16+	14+	13 +	12 +
3,000,001 - 4,000,000	19+	16+	16 +	13 +
4,000,001 - 5,000,000	21+	19+	18 +	15 +
5,000,001 - 6,000,000	xxxxx	20+	20 +	17 +

5" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	13+	12 min	12 min	12 min
3,000,001 - 4,000,000	15+	13+	12 min	12 min
4,000,001 - 5,000,000	17+	15+	14 +	12 min
5,000,001 - 6,000,000	19+	17+	16 +	13 +

6" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	12 min	12 min	12 min	12 min
3,000,001 - 4,000,000	13+	12 min	12 min	12 min
4,000,001 - 5,000,000	14+	13+	12 min	12 min
5,000,001 - 6,000,000	16+	14+	13 +	12 min

Table 3 - Full Depth Reclamation (FDR w Emulsion, Foamed Asphalt or Cement)

Type 3 Subgrade (82% - 100% passing #200)

3" HMA

ESAL's	5" FDR w/ Emulsion (Item #307.332)	6" FDR w/ Emulsion (Item #307.333)	5" FDR w/ F.A. or Cement (Items # 309.35, 308.36)	6" FDR w/ F.A. or Cement (Items # 309.36, 308.36)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	15+	12+	12 min	12 min
1,000,001 - 2,000,000	20+	17+	16 +	13 +
2,000,001 - 3,000,000	xxxxx	22+	xxxxx	18 +
3,000,001 - 4,000,000	xxxxx	xxxxx	xxxxx	xxxxx
4,000,001 - 5,000,000	xxxxx	xxxxx	xxxxx	xxxxx
5,000,001 - 6,000,000	xxxxx	xxxxx	xxxxx	xxxxx

4" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	15+	13+	12 min	12 min
2,000,001 - 3,000,000	20+	17+	16 +	13 +
3,000,001 - 4,000,000	xxxxx	20+	20 +	16 +
4,000,001 - 5,000,000	xxxxx	xxxxx	xxxxx	19 +
5,000,001 - 6,000,000	xxxxx	xxxxx	xxxxx	xxxxx

5" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	13+	12 min	12 min	12 min
2,000,001 - 3,000,000	16+	14+	13 +	12 min
3,000,001 - 4,000,000	21+	17+	16 +	13 +
4,000,001 - 5,000,000	xxxxx	19+	18 +	15 +
5,000,001 - 6,000,000	xxxxx	21+	20 +	17 +

6" HMA

ESAL's	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
≤ 1,000,000	12 min	12 min	12 min	12 min
1,000,001 - 2,000,000	12 min	12 min	12 min	12 min
2,000,001 - 3,000,000	13+	12 min	12 min	12 min
3,000,001 - 4,000,000	15+	13+	12 min	12 min
4,000,001 - 5,000,000	18+	15+	14 +	12 min
5,000,001 - 6,000,000	19+	17+	xxxxx	13 +

Table 4 - Plant Recycled Asphalt Pavement (PMRAP)

Type 1 Subgrade (0% - 32% passing #200)

≤ 1,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	13+	12 min	12 min	- - - - -
4" HMA	12+	12 min	- - - - -	- - - - -
5" HMA	- - - - -	- - - - -	- - - - -	- - - - -
6" HMA	- - - - -	- - - - -	- - - - -	- - - - -

1,000,001 - 2,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	17+	14+	14+	12 min
4" HMA	13+	13+	12 min	- - - - -
5" HMA	12 min	- - - - -	- - - - -	- - - - -
6" HMA	- - - - -	- - - - -	- - - - -	- - - - -

2,000,001 - 3,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	22+	19+	16+	13+
4" HMA	17+	14+	13+	- - - - -
5" HMA	13+	12 min	- - - - -	- - - - -
6" HMA	12 min	- - - - -	- - - - -	- - - - -

3,000,001 - 4,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	24+	22+	19+	16+
4" HMA	20+	17+	14+	12 min
5" HMA	16+	13+	12 min	- - - - -
6" HMA	13+	- - - - -	- - - - -	- - - - -

4,000,001 - 5,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	21+	18+
4" HMA	22+	19+	16+	13+
5" HMA	18+	15+	13+	- - - - -
6" HMA	14+	12 min	- - - - -	- - - - -

5,000,001 - 6,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	22+	20+
4" HMA	23+	20+	18+	15+
5" HMA	19+	17+	14+	12 min
6" HMA	16+	13+	- - - - -	- - - - -

Table 5 - Plant Recycled Asphalt Pavement (PMRAP)

Type 2 Subgrade (32% - 82% passing #200)

≤ 1,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	16+	13+	12 min	12 min
4" HMA	15+	12 min	12 min	- - - - -
5" HMA	12 min	- - - - -	- - - - -	- - - - -
6" HMA	- - - - -	- - - - -	- - - - -	- - - - -

1,000,001 - 2,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	20	17	14	14
4" HMA	16	13	13	12 min
5" HMA	14	12 min	- - - - -	- - - - -
6" HMA	12 min	- - - - -	- - - - -	- - - - -

2,000,001 - 3,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	24+	22+	19+	16+
4" HMA	20+	17+	14+	13+
5" HMA	16+	13+	12 min	- - - - -
6" HMA	13+	12 min	- - - - -	- - - - -

3,000,001 - 4,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	22+	19+
4" HMA	22+	20+	17+	14+
5" HMA	19+	16+	13+	12 min
6" HMA	15+	13+	- - - - -	- - - - -

4,000,001 - 5,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	24+	21+
4" HMA		22+	19+	16+
5" HMA	21+	18+	15+	13+
6" HMA	17+	14+	12 min	- - - - -

5,000,001 - 6,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	- - - - -	23+
4" HMA	- - - - -	- - - - -	21+	18+
5" HMA	23+	20+	17+	14+
6" HMA	19+	16+	13+	- - - - -

Table 6 - Plant Recycled Asphalt Pavement (PMRAP)

Type 3 Subgrade (82% - 100% passing #200)

≤ 1,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	18+	15+	13+	12
4" HMA	14+	12 min	12 min	12 min
5" HMA	- - - - -	- - - - -	- - - - -	- - - - -
6" HMA	- - - - -	- - - - -	- - - - -	- - - - -

1,000,001 - 2,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	20+	17+	15+
4" HMA	20+	16+	13+	13+
5" HMA	16+	13+	12 min	12 min
6" HMA	13+	- - - - -	- - - - -	- - - - -

2,000,001 - 3,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	22+	20+
4" HMA	- - - - -	20+	18+	15+
5" HMA	21+	17+	14+	13+
6" HMA	17+	13+	12 min	- - - - -

3,000,001 - 4,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	- - - - -	22+
4" HMA	- - - - -	- - - - -	21+	18+
5" HMA	- - - - -	20+	17+	14+
6" HMA	20+	16+	13+	12 min

4,000,001 - 5,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	- - - - -	- - - - -
4" HMA	- - - - -	- - - - -	23+	20+
5" HMA	- - - - -	22+	19+	16+
6" HMA	- - - - -	18+	15+	13+

5,000,001 - 6,000,000 ESAL's

	3" PMRAP (Item #310.23)	4" PMRAP (Item # 310.24)	5" PMRAP (Item #310.25)	6" PMRAP (Item #310.26)
	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)	Existing Aggregate (in)
3" HMA	- - - - -	- - - - -	- - - - -	- - - - -
4" HMA	- - - - -	- - - - -	- - - - -	- - - - -
5" HMA	- - - - -	- - - - -	21+	18+
6" HMA	- - - - -	20+	17+	14+

Table 7 - HMA over Rubblized Concrete Pavement

Type 1 Subgrade (0% - 32% passing #200)	
ESAL's	**HMA (in)**
≤ 1000000	4
1,00,0001 - 2,000,000	4.5
2,000,001- 3,000,000	5
3,000,001 - 4,000,000	5.5
4,000,001- 6,000,000	6

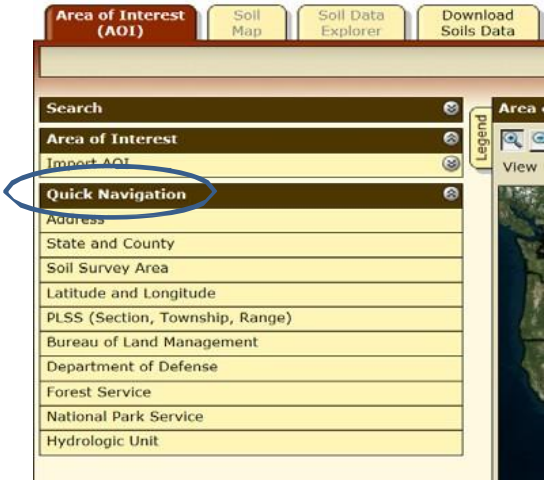
Type 2 Subgrade (32% - 82% passing #200)	
ESAL's	**HMA (in)**
≤ 1,000,000	4
1,000,001 - 2,000,000	5
2,000,001- 4,000,000	6

Type 3 Subgrade (82% - 100% passing #200)	
ESAL's	**HMA (in)**
≤ 1,000,000	5
1,000,001 - 3,000,000	6

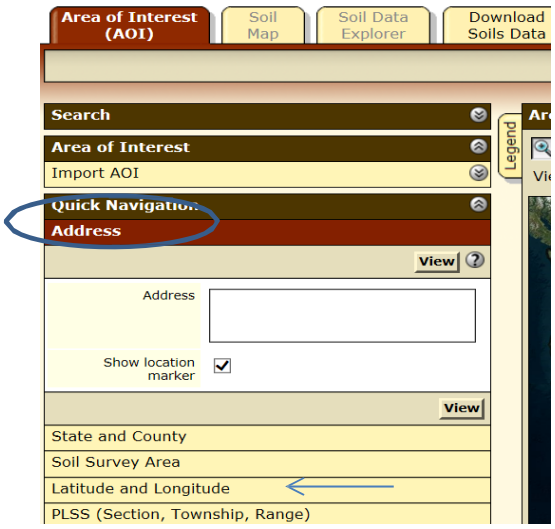
Using the NRCS Web Soil Survey to Determine Subgrade Soil Type:

Use this link: https://websoilsurvey.nrcs.usda.gov/app/. Click the green Start WS button.

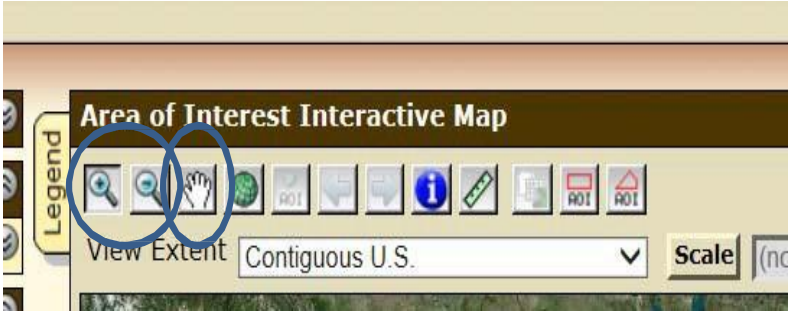
1. Go to the Quick Navigation section.



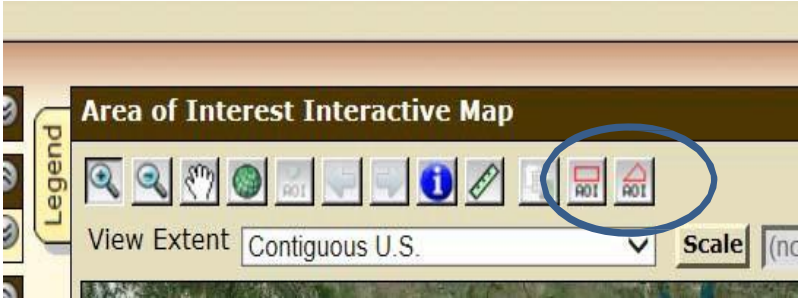
2. Select Address and enter Route, Town, State. Latitude and longitude coordinates may also be used. Click the View button.



3. Use the Hand Tool to navigate to project location. Use the magnifying tool to pinpoint the exact project limits.



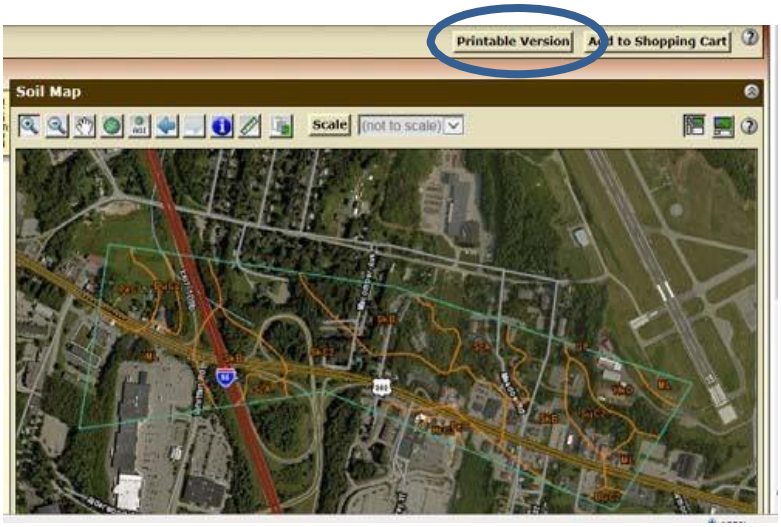
4. Select the Area of Interest Button located just above the map. The choice of area to be drawn is a rectangle or irregular shape. The irregular shape button works the best for roadway projects.



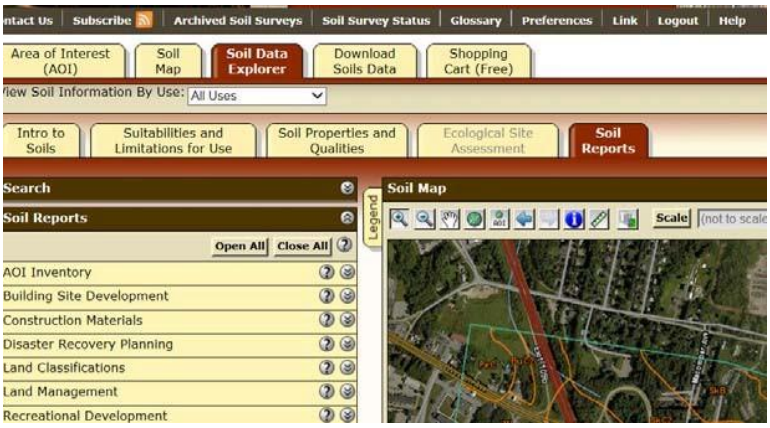
5. Draw the project limits and double click to close the polygon and create the Area of Interest. The square will automatically close. A hatched area will appear when created.

6. Click the Soil Map tab located at top of screen. The soil map will be created.

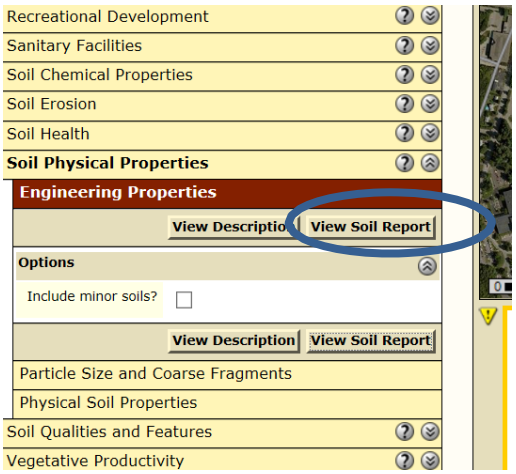
7. Click the Printable Version button and then View. A PDF of the Soil map is created. Save the map and then close the PDF.



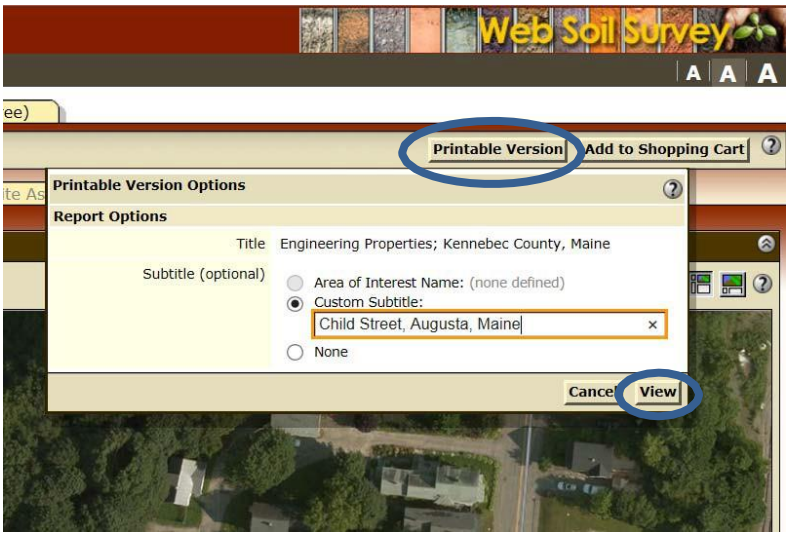
8. Select the Soils Data Explorer tab, and then the Soil Reports tab.



9. Select Soil Physical Properties from the Soils Report list. Select Engineering Properties and then View Soil Report.



10. Select Printable Version and then View. A PDF of the Engineering Properties is created. Save the PDF.



Determine the Subgrade Soil Types:

To determine the subgrade soils type on your project, find all the soils under the roadway along the project using the Soil Map PDF.

The Soil Map PDF includes a chart that shows the percentage of soils in the area of interest. If you used the irregular shape area of interest, select the soils with the highest Percent of AOI on the roadway as representative.

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BuC2	Buxton silt loam, 8 to 15 percent slopes	4.2	3.0%
GP	Gravel pits	0.0	0.0%
HkD	Hinckley gravelly sandy loam, 15 to 30 percent slopes	7.7	5.5%
HrC	Hollis fine sandy loam, 8 to 15 percent slopes	1.2	0.9%
ML	Made land	28.3	20.2%
PeC	Paxton-Charlton very stony fine sandy loams, 8 to 15 percent slopes	10.5	7.5%
ScA	Scantic silt loam, 0 to 3 percent slopes	9.9	7.1%
SkB	Scio very fine sandy loam, 3 to 8 percent slopes	40.0	28.6%
SkC2	Scio very fine sandy loam, 8 to 15 percent slopes, eroded	32.8	23.4%
SuC2	Suffield silt loam, 8 to 15 percent slopes, eroded	5.4	3.9%
Totals for Area of Interest		**140.1**	**100.0%**

Go to the Engineering Properties pdf and the Percent Passing Sieve Number columns, and then the 200 column.

Select the middle value (R value) for the % passing the #200 as determined above for the layers 18" to 36" below the surface.

OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties–Kennebec County, Maine													
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liq lim
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200	
			In				L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R-H	L-R
BuC2—Buxton silt loam, 8 to 15 percent slopes													
Buxton	85	C/D	0-7	Silt loam	ML, MH	A-7-5, A-6, A-7	0- 0- 0	0- 0- 0	96-100-100	91-100-100	85-98-100	77-90-94	35-4 -5
			7-18	Silt loam, silty clay loam	CL	A-6	0- 0- 0	0- 0- 0	96-100-100	91-100-100	85-98-100	78-90-100	30-3 -5
			18-23	Silty clay loam, silt loam, silty clay	CL	A-7-6	0- 0- 0	0- 0- 0	96-100-100	92-100-100	84-98-100	78-91-100	4-4 -5
			23-35	Silty clay loam, silty clay	CL	A-7-6	0- 0- 0	0- 0- 0	96-100-100	93-100-100	85-100-100	79-93-100	9-4 -6
			35-65	Silty clay loam, silty clay	CL, CH	A-7-6	0- 0- 0	0- 0- 0	97-100-100	93-100-100	85-100-100	80-95-100	3-5 -6
GP—Gravel pits													

Selecting Subgrade Type from NRCS Information:

MaineDOT Subgrade soil types are:
Type 1 Subgrade - 0% - 32% passing #200
Type 2 Subgrade - 32% - 82% passing #200
Type 3 Subgrade - 82% - 100% passing #200

From the above Engineering Properties example, the #200 values are 91 and 93, therefore the subgrade is a Type 3 Subgrade.