

2020 ROADWAY IMPROVEMENT PROJECT "CAMBRIDGE DRIVE NEIGHBORHOOD"

PREPARED FOR

Town of East Hartford
Department of Public Works
740 Main Street
East Hartford, CT 06108

PREPARED BY



100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
860-807-4300

February 2020



To: Bill Anderson, PE
VHB/Wethersfield

Date: November 20, 2018

Memorandum

Project #: 42413.00

From: Jose Otero
VHB/Project Manger

Re: Cambridge Drive – East Hartford, CT

Following are the recommendations for the design and construction of Cambridge Drive from Evans Avenue to Sutton Avenue.

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The distress level investigation results indicate there is severe alligator cracking. Moderate pothole patching, transverse/longitudinal and weather/block cracking were noted resulting in a Road Manager Pavement Condition Index (PCI) of 50.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A24 and A3 which are classified as uniformly graded silty sands by the Unified Classification system. The subgrades are fair to good foundations when not subject to frost action, having a moderate to high frost potential and exhibiting fair drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 896 vehicles per day with single unit trucks accounting for 1.4% of the ADT for the section from Evans Avenue to the Route 2 Entrance. From the Route 2 Entrance to Sutton Ave, the ADT used was 1,632 vehicles per day with single unit trucks and buses making up 2.15% of the traffic.

Evans Avenue to Route 2 Entrance:

- The existing pavement structure cross-section consisted of 2.75" to 5.7" (average 4.3") of hot mix asphalt (HMA). The granular base consisted of 1" to 9" (average 5.8") of "fine" processed gravel and well graded silty sand bases which were founded on uniformly graded silty sand subbases/subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a 0.5" overlay to meet the Elastic Layer Design, which is NOT recommended.

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109

P 860.807.4300

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|---|
| #1 | 20-years | RECLAIM the existing HMA, penetrated stone macadam and processed aggregate bases by pulverization and blending methods to a 10" depth. Compact the recycled material to proper lines and grades, leaving 6" to 7" as the new base course prior to placing 2" of Superpave S-0.5" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #2 | 20-years | REMOVE the existing 4.3" of HMA and add 1.3" of medium processed aggregate for fine grading, then compact to proper lines and grades prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| ** | 5-10 years | MILL AND OVERLAY the existing pavement section by milling to a depth of 2". Seal all cracks and repair base failures. Apply tack coat prior to placing 2" of Superpave S-0.5" Level 2 as a surface course. |

***Due to the extent and severity of alligator cracking on this section, this alternative is NOT recommended for constructability reasons.*

Route 2 Entrance to Sutton Ave:

- The existing pavement structure cross-section consisted of 2.75" to 5.7" (average 4.3") of hot mix asphalt (HMA). The granular base consisted of 1" to 9" (average 5.8") of "fine" processed gravel and well graded silty sand bases which were founded on uniformly graded silty sand subbases/subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a 2.0" overlay to meet the Elastic Layer Design, which is NOT recommended.
- MILL AND OVERLAY is not recommended as a treatment alternative due to inadequate support from existing granular soils, requiring milling depth greater than existing pavement thickness.
- REMOVE HMA is not recommended as a treatment alternative due to not enough data on granular base materials in this segment.

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|---|
| #1 | 20-years | RECLAIM the existing HMA and processed aggregate bases by pulverization and blending methods to a 10" depth. Compact the recycled material to proper lines and grades, leaving 5" to 6" as the new base course prior to placing 2.25" of Superpave S-0.5" Level 2 as the intermediate course and 2.25" of Superpave S-0.5" Level 2 as the surface course, with a tack coat between lifts. |

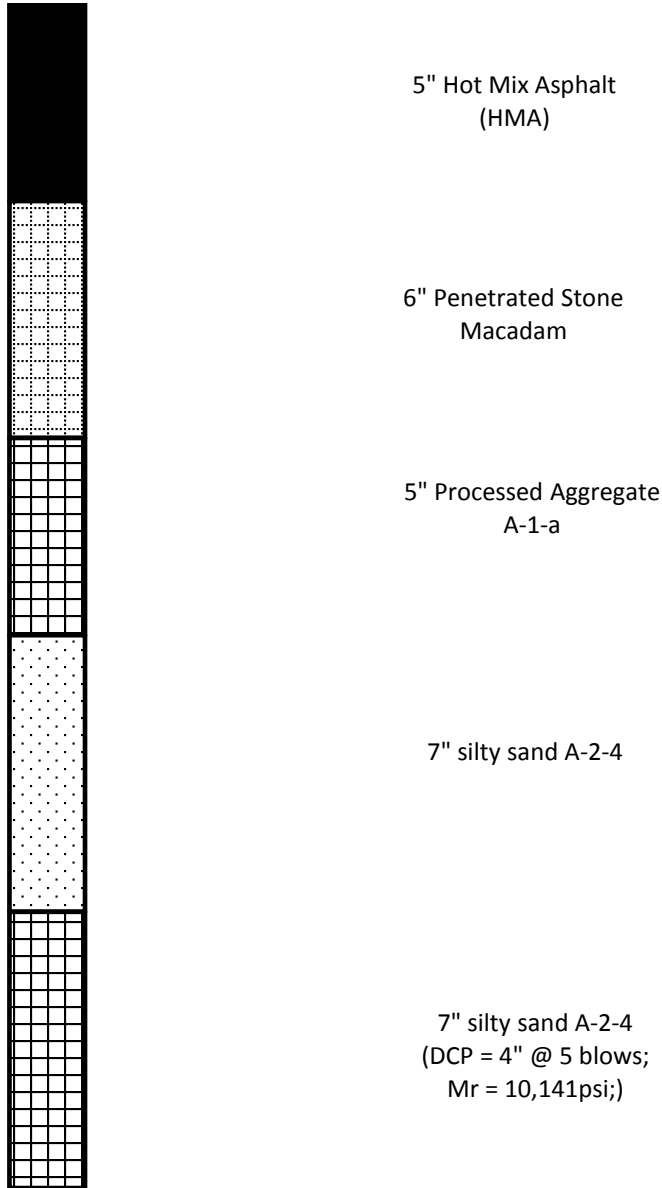


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Cambridge Avenue - Evans Avenue to Route 2 entrance
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP1 - 170' W of Evans Avenue, 11' off WB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

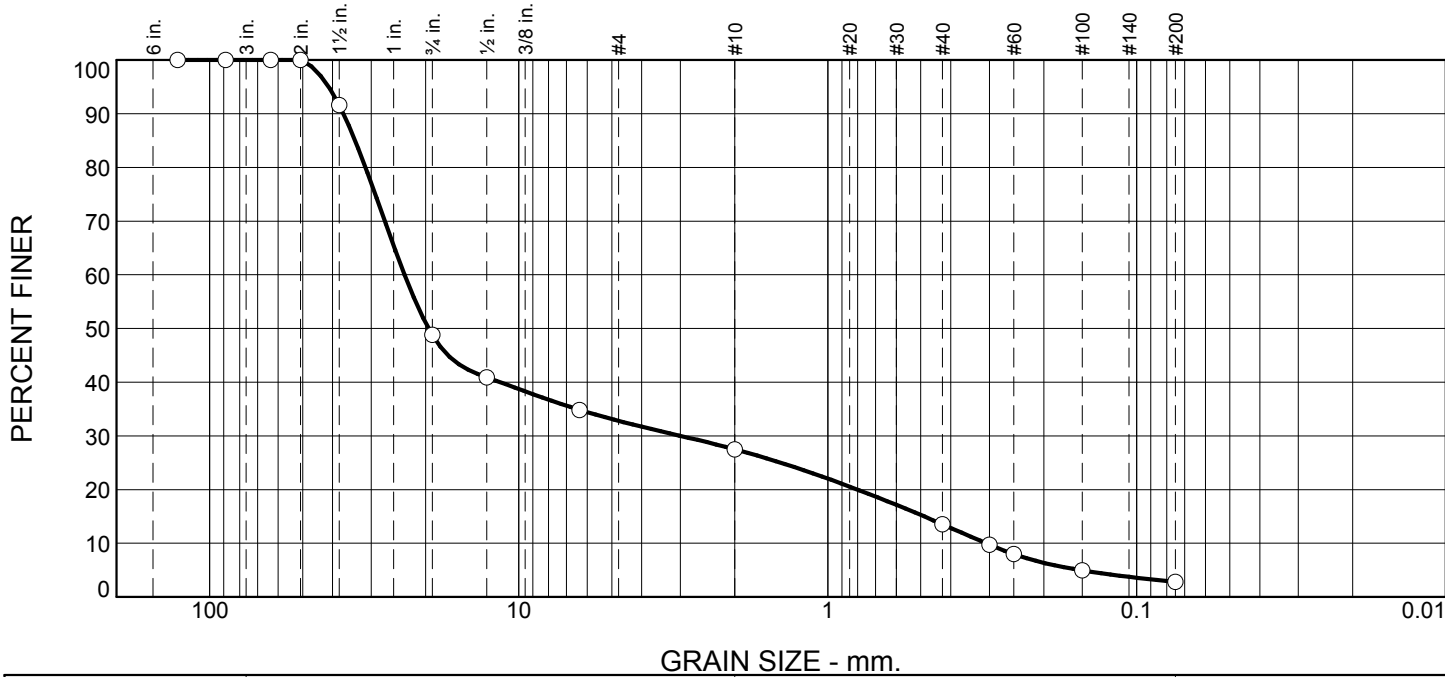
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 170' W of Evans Avenue, 11' off WB lane curb;
Sample Number: SUBBASE

Depth: 5

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 73 | 13 | 11 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 92 | | |
| 3/4" | 49 | 50 - 75 | X |
| 1/2" | 41 | | |
| 1/4" | 35 | 25 - 45 | |
| #10 | 27 | | |
| #40 | 14 | 5 - 20 | |
| #50 | 10 | | |
| #60 | 8 | | |
| #100 | 5 | 2 - 12 | |
| #200 | 2.8 | | |

Material Description

Processed Aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 33.8585 D₆₀= 23.4277 D₅₀= 19.5850
D₃₀= 2.9952 D₁₅= 0.4882 D₁₀= 0.3074
C_u= 76.22 C_c= 1.25

Classification

USCS= GW AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

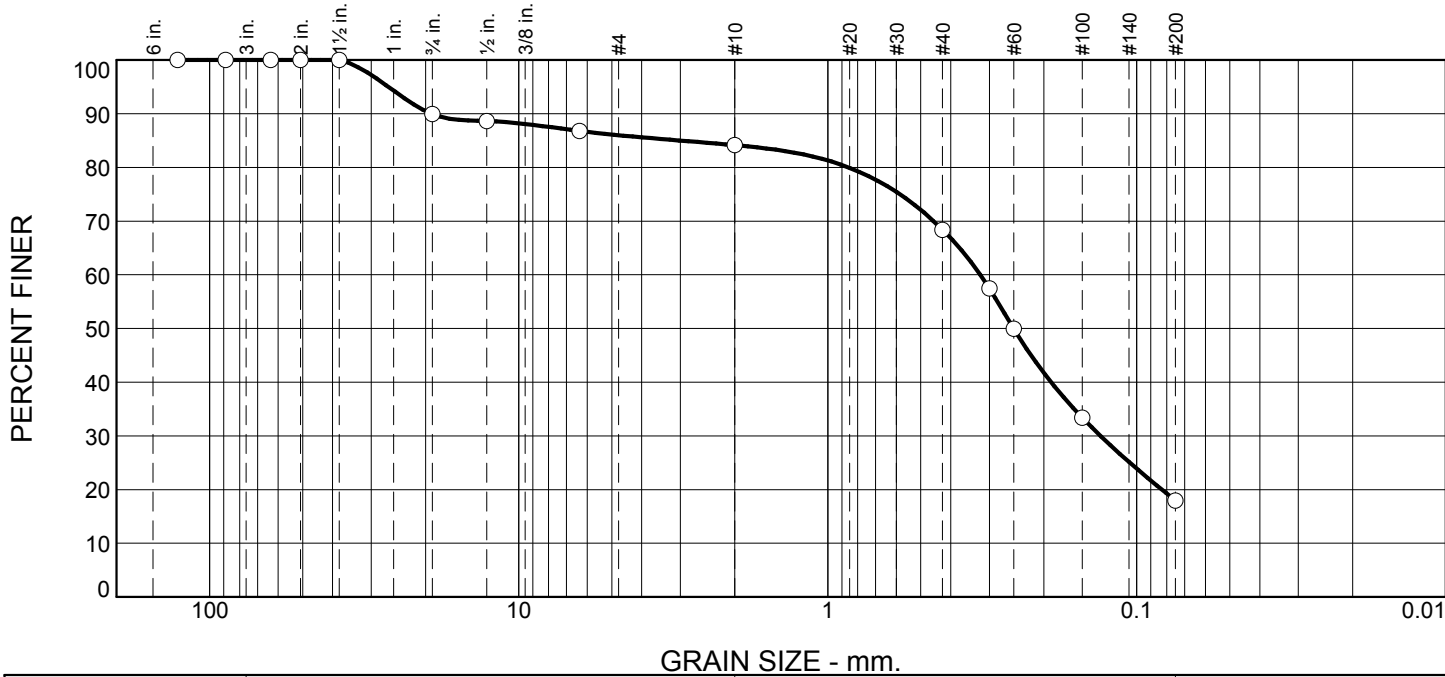
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 170' W of Evans Avenue, 11' off WB lane curb;
Sample Number: SUBBASE 2

Depth: 7

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 16 | 16 | 50 | 18 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 90 | | |
| 1/2" | 89 | | |
| 1/4" | 87 | 25 - 60 | X |
| #10 | 84 | 15 - 45 | X |
| #40 | 68 | 5 - 25 | X |
| #50 | 57 | | |
| #60 | 50 | | |
| #100 | 33 | 0 - 10 | X |
| #200 | 18 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 3.0061 D₆₀= 0.3210 D₅₀= 0.2504
D₃₀= 0.1310 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

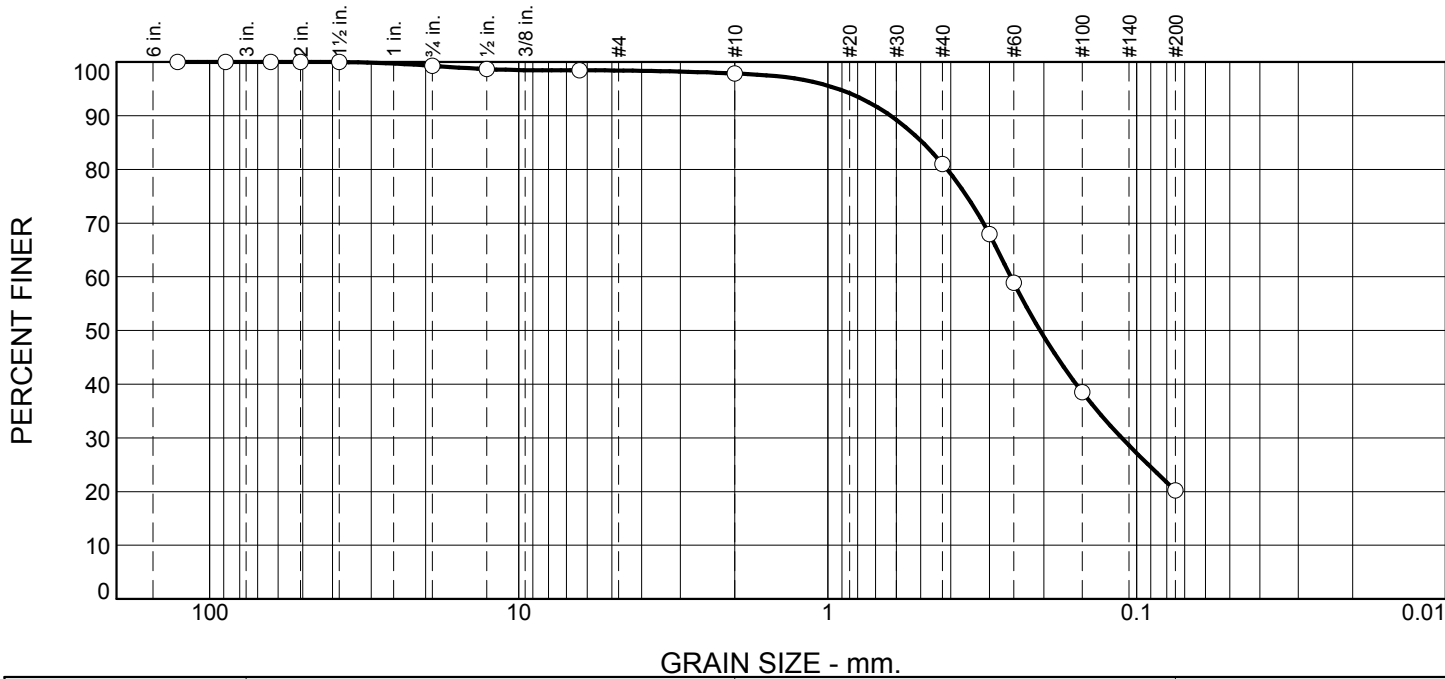
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 170' W of Evans Avenue, 11' off WB lane curb;
Sample Number: SUBGRADE

Depth: 7

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 17 | 61 | 20 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 99 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 81 | 5 - 25 | X |
| #50 | 68 | | |
| #60 | 59 | | |
| #100 | 39 | 0 - 10 | X |
| #200 | 20 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.4929 D₆₀= 0.2556 D₅₀= 0.2054
D₃₀= 0.1118 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 4" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

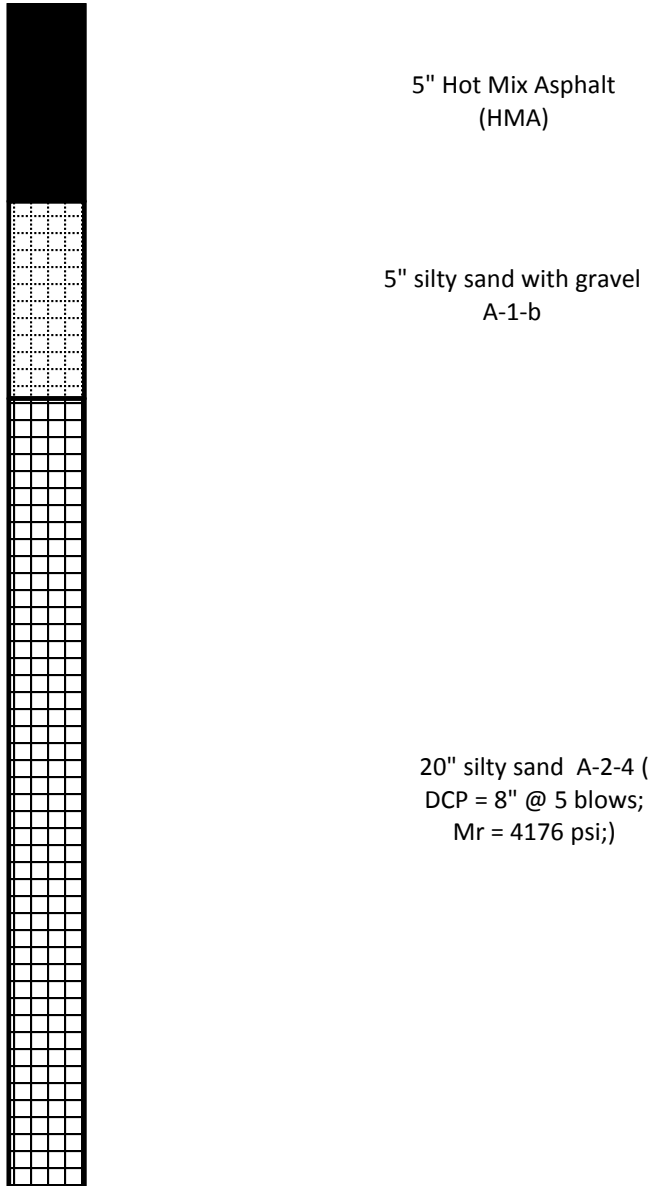


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Cambridge Avenue - Evans Avenue to Route 2 entrance
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP2 - 420' W of Milbrook Drive (E), 4' off EB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

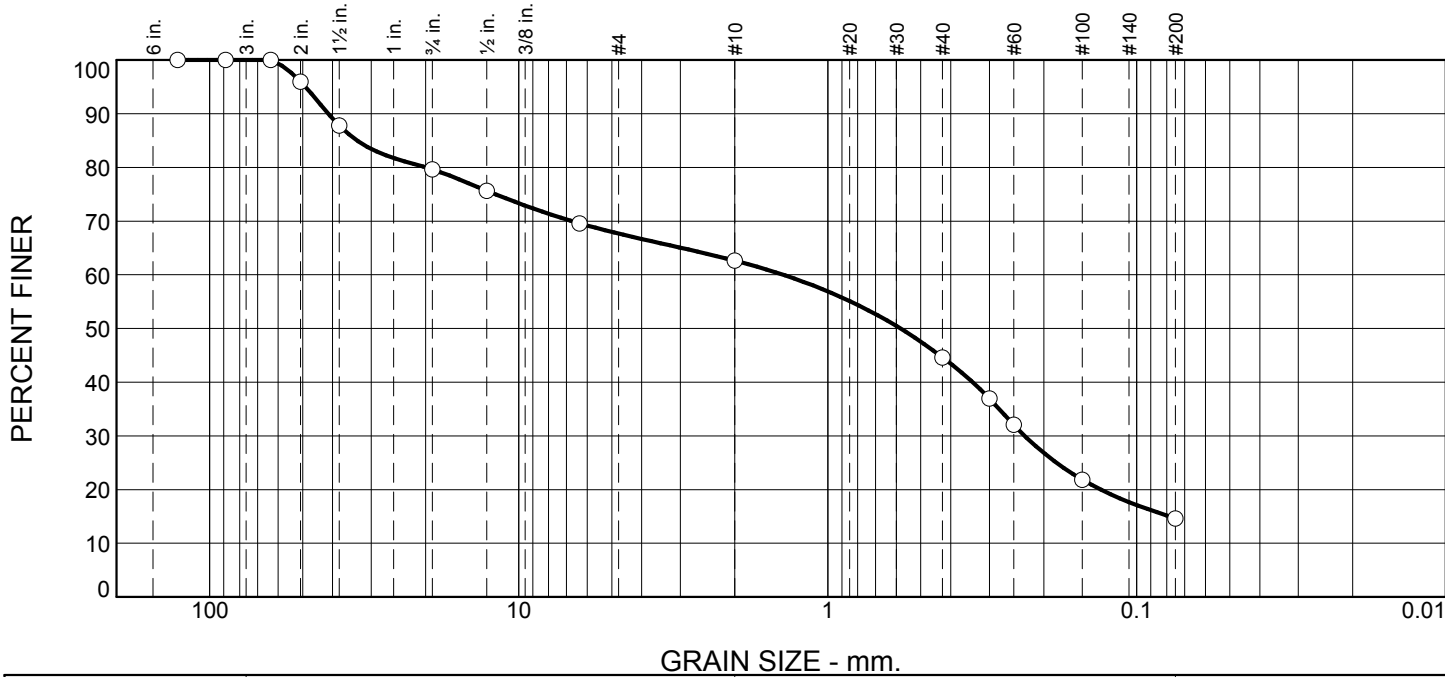
Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 420' W of Milbrook Drive (E), 4' off EB lane curb;
Sample Number: BASE **Depth:** 5

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 37 | 18 | 30 | 15 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 96 | 95 - 100 | |
| 1-1/2" | 88 | | |
| 3/4" | 80 | 50 - 75 | X |
| 1/2" | 76 | | |
| 1/4" | 70 | 25 - 45 | X |
| #10 | 63 | | |
| #40 | 45 | 5 - 20 | X |
| #50 | 37 | | |
| #60 | 32 | | |
| #100 | 22 | 2 - 12 | X |
| #200 | 15 | | |

Material Description

silty sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 33.3069 D₆₀= 1.3947 D₅₀= 0.5822
D₃₀= 0.2304 D₁₅= 0.0786 D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

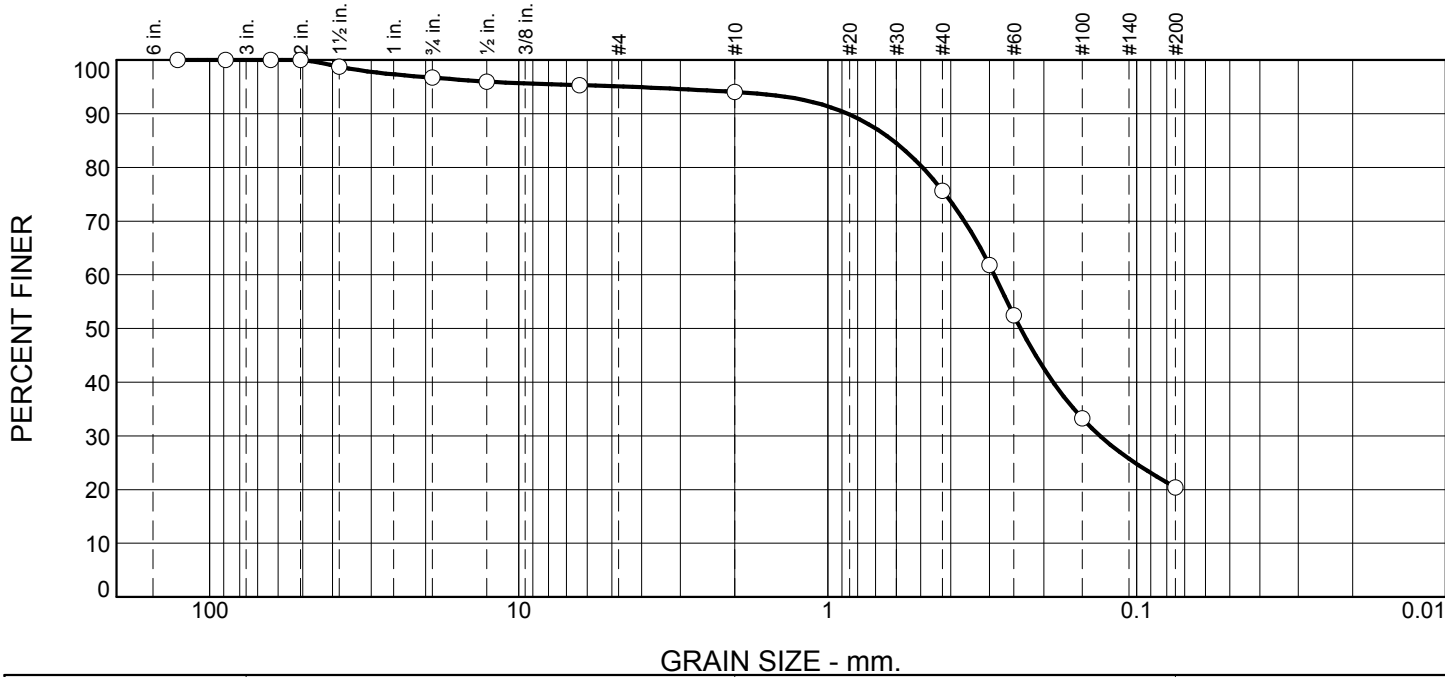
Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 420' W of Milbrook Drive (E), 4' off EB lane curb;
Sample Number: SUBGRADE **Depth:** 20

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 6 | 18 | 56 | 20 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 99 | 55 - 100 | |
| 3/4" | 97 | | |
| 1/2" | 96 | | |
| 1/4" | 95 | 25 - 60 | X |
| #10 | 94 | 15 - 45 | X |
| #40 | 76 | 5 - 25 | X |
| #50 | 62 | | |
| #60 | 52 | | |
| #100 | 33 | 0 - 10 | X |
| #200 | 20 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6158 D₆₀= 0.2893 D₅₀= 0.2376
D₃₀= 0.1314 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 8" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

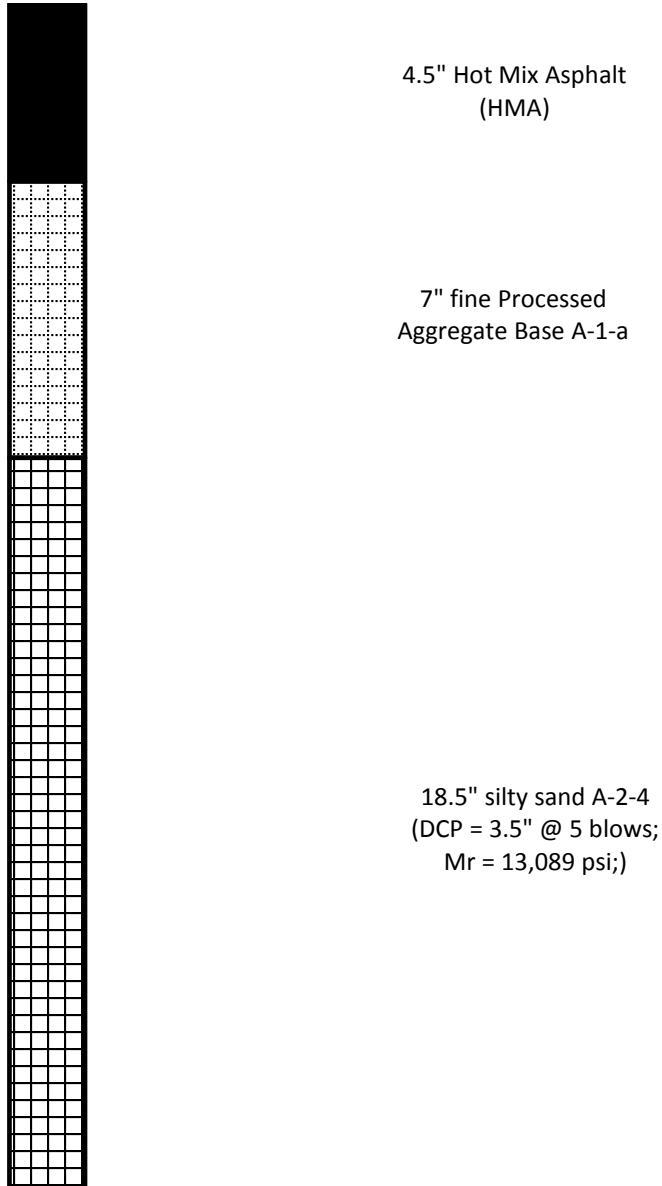


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Cambridge Avenue - Evans Avenue to Route 2 entrance
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP3 - 215' W of Nassau Lane, 6' off WB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

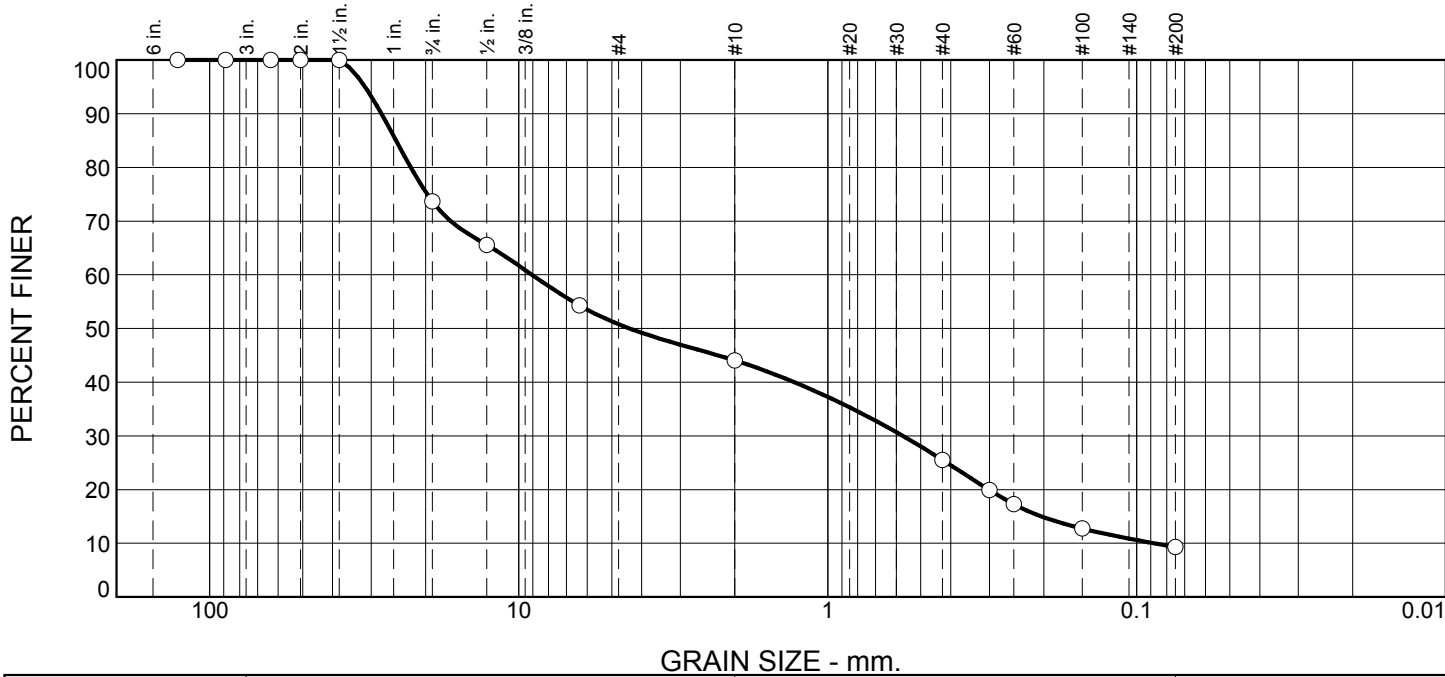
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 215' W of Nassau Lane, 6' off WB lane curb;
Sample Number: BASE

Depth: 7

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 56 | 19 | 16 | 9 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 100 | | |
| 3/4" | 74 | 50 - 75 | |
| 1/2" | 66 | | |
| 1/4" | 54 | 25 - 45 | X |
| #10 | 44 | | |
| #40 | 25 | 5 - 20 | X |
| #50 | 20 | | |
| #60 | 17 | | |
| #100 | 13 | 2 - 12 | X |
| #200 | 9.3 | | |

Material Description

fine Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 24.9498 D₆₀= 9.0564 D₅₀= 4.3747
D₃₀= 0.5727 D₁₅= 0.2032 D₁₀= 0.0878
C_u= 103.17 C_c= 0.41

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

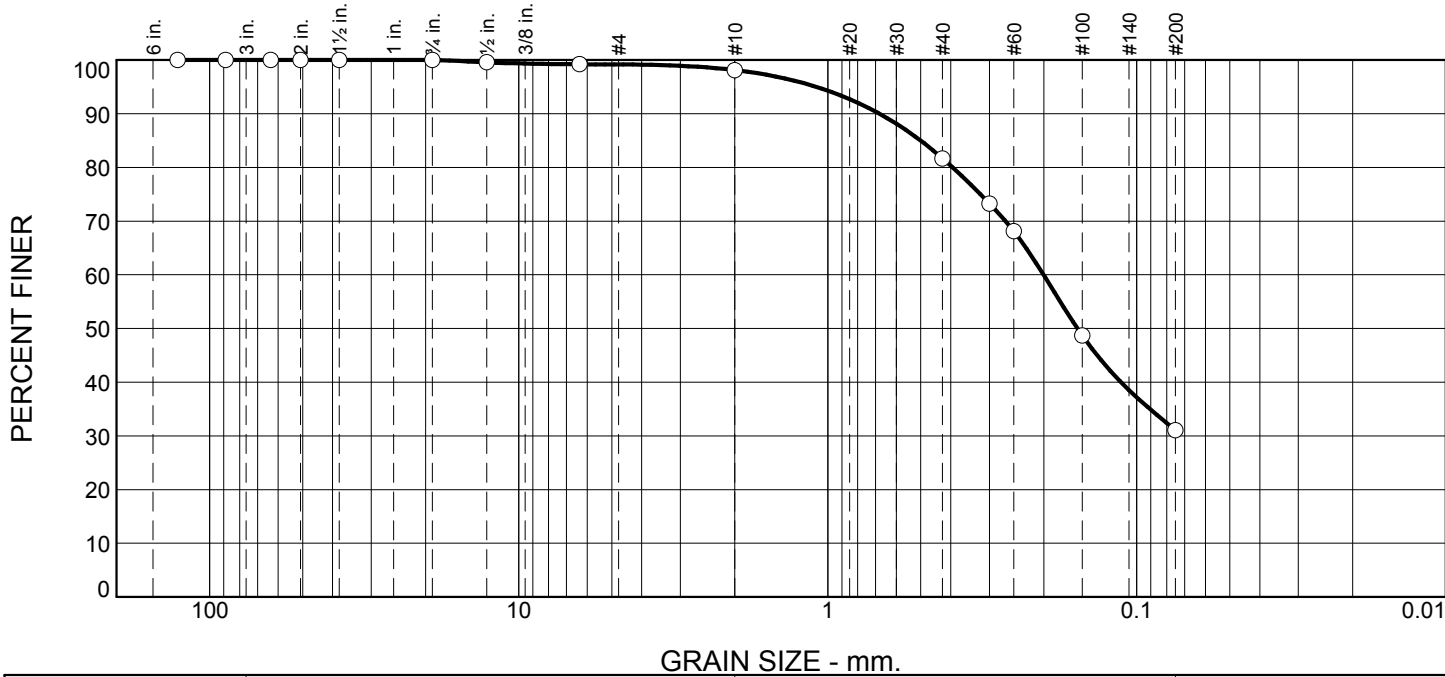
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 215' W of Nassau Lane, 6' off WB lane curb;
Sample Number: SUBGRADE

Depth: 18.5

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 16 | 51 | 31 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 82 | 5 - 25 | X |
| #50 | 73 | | |
| #60 | 68 | | |
| #100 | 49 | 0 - 10 | X |
| #200 | 31 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.5009 D₆₀= 0.2001 D₅₀= 0.1554
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 3.5" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

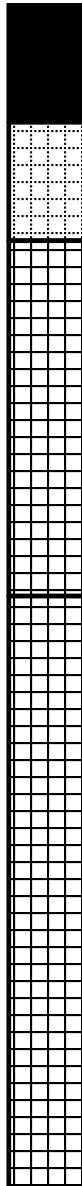


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STREET: Cambridge Avenue - Evans Avenue to Route 2 entrance
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP4 - 170' E of Milbrook Drive (W), 10' off EB lane curb;



3" Hot Mix Asphalt
(HMA)

3" Deteriorated
Penetrated Stone
Macadam

9" coarse Processed
Aggregate Base A-1-a

15" uniformly graded
sand with silt A-3 (
DCP = 5.5" @ 5 blows;
Mr = 6746 psi;)

Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

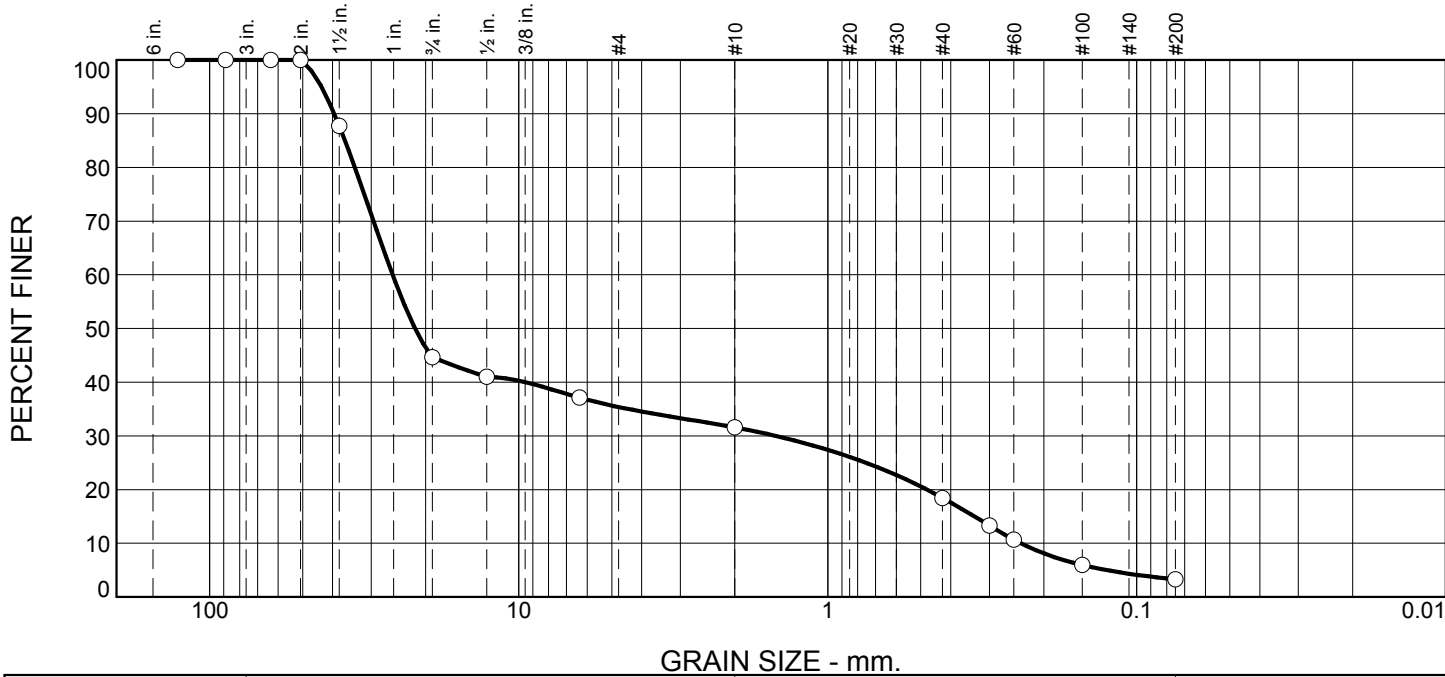
Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 170' E of Milbrook Drive (W), 10' off EB lane curb;
Sample Number: SUBBASE **Depth:** 9

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 68 | 14 | 15 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 88 | | |
| 3/4" | 45 | 50 - 75 | X |
| 1/2" | 41 | | |
| 1/4" | 37 | 25 - 45 | |
| #10 | 32 | | |
| #40 | 18 | 5 - 20 | |
| #50 | 13 | | |
| #60 | 11 | | |
| #100 | 6 | 2 - 12 | |
| #200 | 3.3 | | |

Material Description

coarse Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 36.5039 D₆₀= 25.6003 D₅₀= 21.6647
D₃₀= 1.4773 D₁₅= 0.3358 D₁₀= 0.2375
C_u= 107.78 C_c= 0.36

Classification

USCS= GP AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

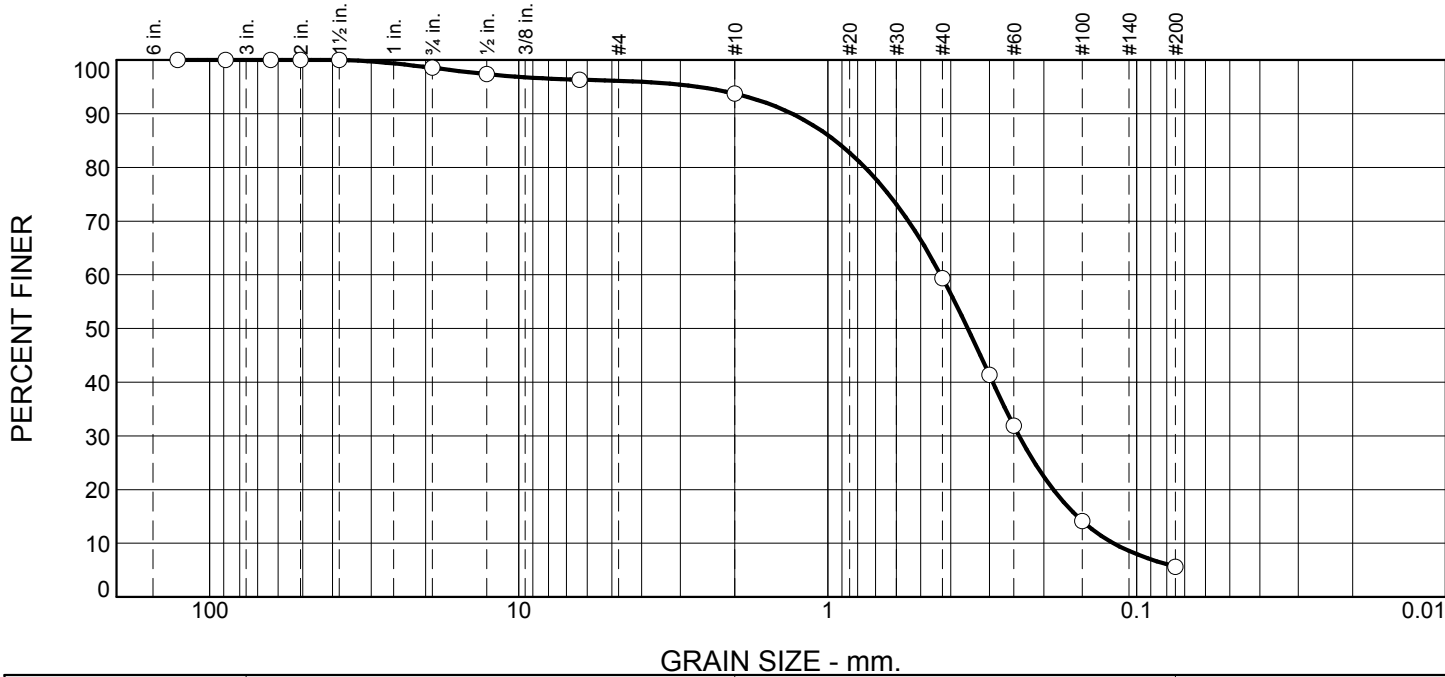
Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 170' E of Milbrook Drive (W), 10' off EB lane curb;
Sample Number: SUBGRADE **Depth:** 15

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 6 | 35 | 53 | 6 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 97 | | |
| 1/4" | 96 | 25 - 60 | X |
| #10 | 94 | 15 - 45 | X |
| #40 | 59 | 5 - 25 | X |
| #50 | 41 | | |
| #60 | 32 | | |
| #100 | 14 | 0 - 10 | X |
| #200 | 5.6 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.9471 D₆₀= 0.4309 D₅₀= 0.3526
D₃₀= 0.2403 D₁₅= 0.1556 D₁₀= 0.1189
C_u= 3.63 C_c= 1.13

Classification

USCS= SP-SM AASHTO= A-3

Remarks

DCP = 5.5" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

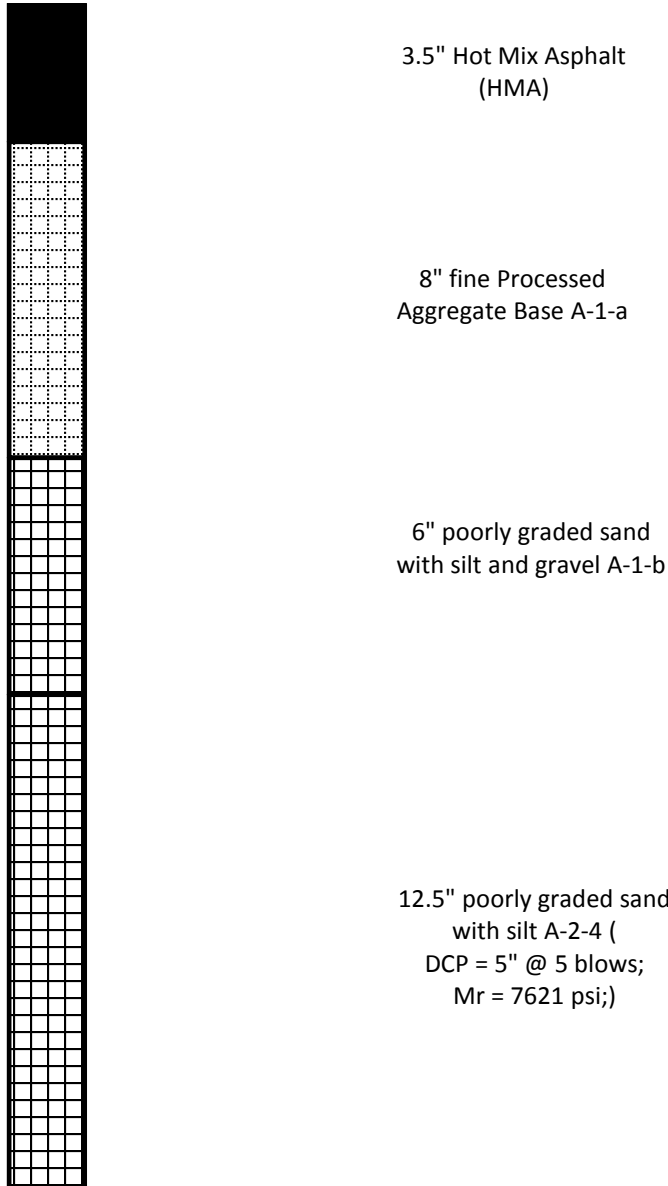


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STREET: Cambridge Avenue - Evans Avenue to Route 2 entrance
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP5 - 130' W of Milbrook Drive (W), 6' off WB lane curb;



Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

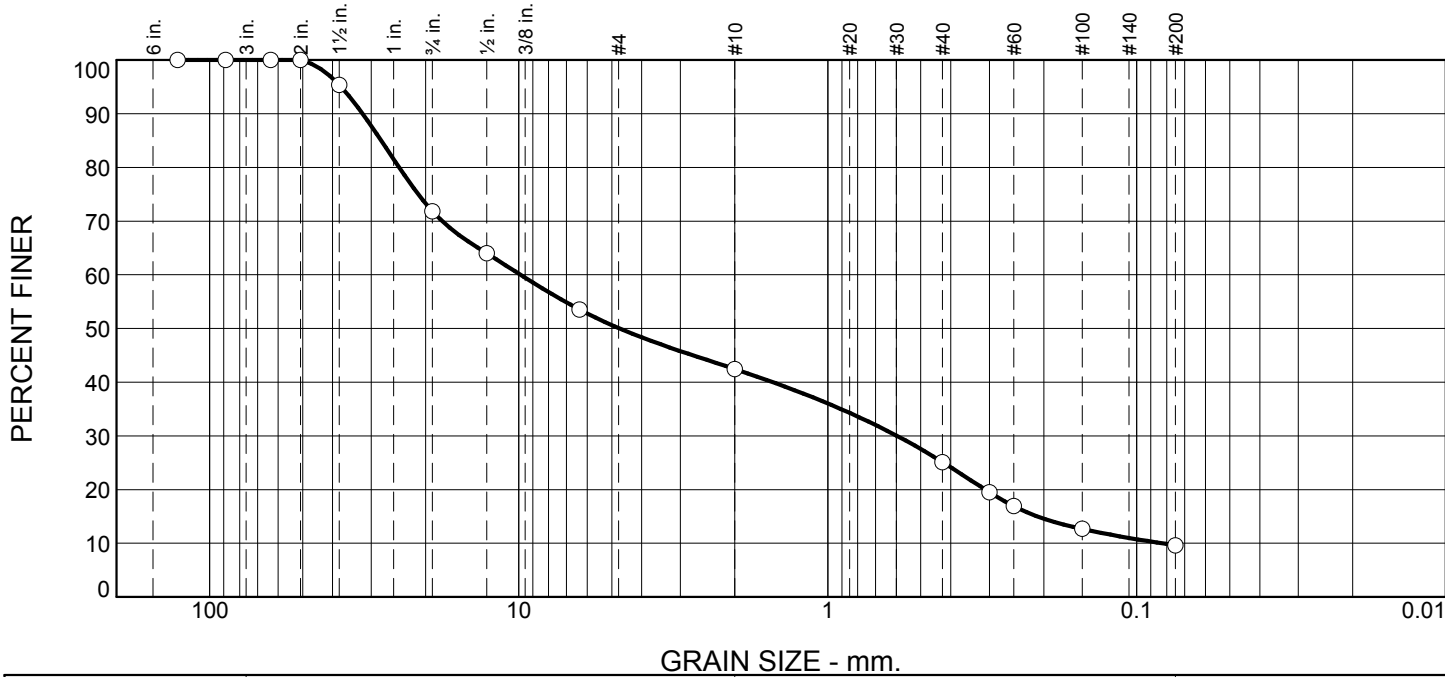
Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 130' W of Milbrook Drive (W), 6' off WB lane curb;
Sample Number: BASE **Depth:** 8

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 58 | 17 | 15 | 10 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 95 | | |
| 3/4" | 72 | 50 - 75 | |
| 1/2" | 64 | | |
| 1/4" | 54 | 25 - 45 | X |
| #10 | 42 | | |
| #40 | 25 | 5 - 20 | X |
| #50 | 20 | | |
| #60 | 17 | | |
| #100 | 13 | 2 - 12 | X |
| #200 | 9.6 | | |

Material Description

fine Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 27.8760 D₆₀= 9.8621 D₅₀= 4.7063
D₃₀= 0.5977 D₁₅= 0.2095 D₁₀= 0.0830
C_u= 118.77 C_c= 0.44

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

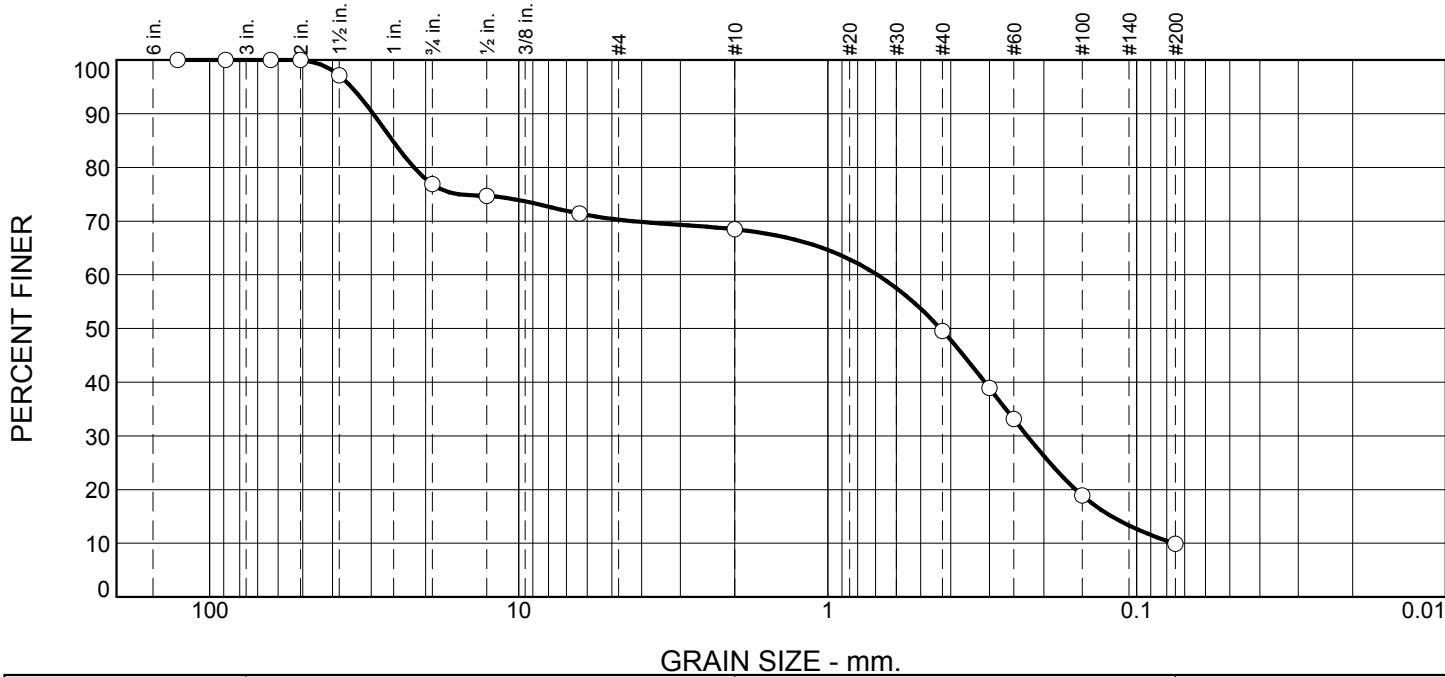
Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 130' W of Milbrook Drive (W), 6' off WB lane curb;
Sample Number: SUBBASE **Depth:** 6

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 32 | 18 | 40 | 10 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 97 | 55 - 100 | |
| 3/4" | 77 | | |
| 1/2" | 75 | | |
| 1/4" | 71 | 25 - 60 | X |
| #10 | 68 | 15 - 45 | X |
| #40 | 50 | 5 - 25 | X |
| #50 | 39 | | |
| #60 | 33 | | |
| #100 | 19 | 0 - 10 | X |
| #200 | 9.9 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 25.5956 D₆₀= 0.6919 D₅₀= 0.4321
D₃₀= 0.2261 D₁₅= 0.1205 D₁₀= 0.0761
C_u= 9.09 C_c= 0.97

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

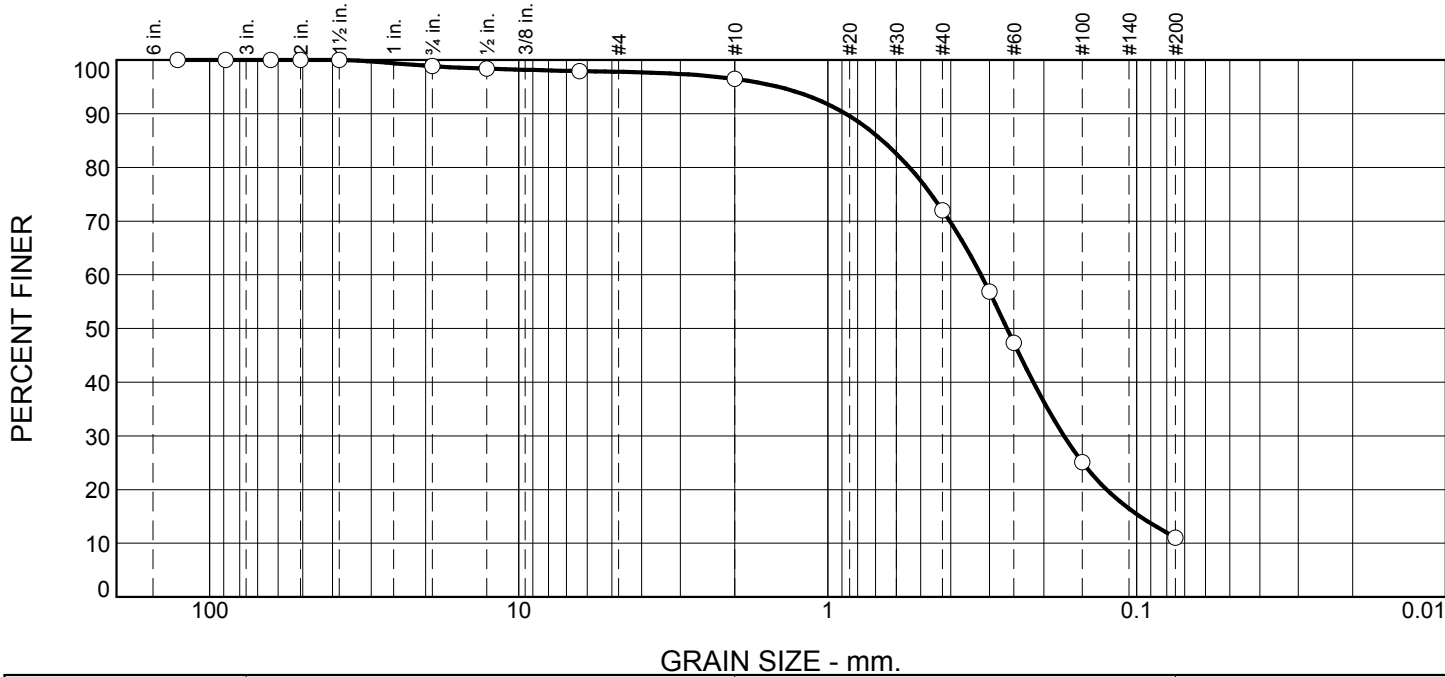
Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 130' W of Milbrook Drive (W), 6' off WB lane curb;
Sample Number: SUBGRADE **Depth:** 12.5

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 4 | 24 | 61 | 11 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 98 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 96 | 15 - 45 | X |
| #40 | 72 | 5 - 25 | X |
| #50 | 57 | | |
| #60 | 47 | | |
| #100 | 25 | 0 - 10 | X |
| #200 | 11 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6659 D₆₀= 0.3197 D₅₀= 0.2629
D₃₀= 0.1720 D₁₅= 0.0976 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-2-4

Remarks

DCP = 5" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

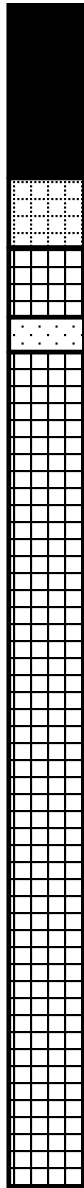


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Cambridge Avenue - Evans Avenue to Route 2 entrance
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP6 - 130' E of Route 2 entrance, 17' off EB lane curb;



5" Hot Mix Asphalt
(HMA)

2" fine Processed
Aggregate Base A-1-a
2" Deteriorated HMA

1" poorly graded sand
with silt and gravel A-1-b

24" silty sand A-2-4 (
DCP = 6" @ 5 blows;
Mr = 6035 psi;)

Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

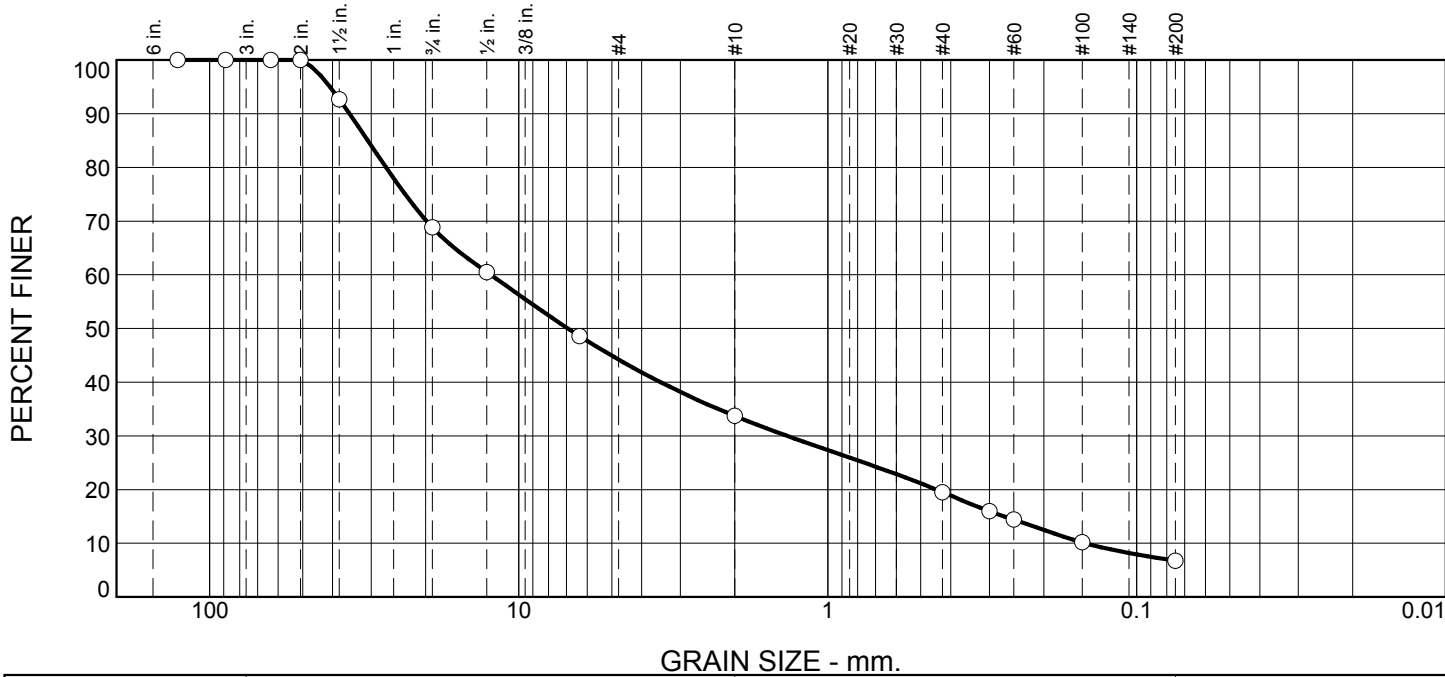
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP6 - 130' E of Route 2 entrance, 17' off EB lane curb;
Sample Number: BASE

Depth: 1

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 66 | 14 | 13 | 7 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 93 | | |
| 3/4" | 69 | 50 - 75 | |
| 1/2" | 61 | | |
| 1/4" | 49 | 25 - 45 | X |
| #10 | 34 | | |
| #40 | 20 | 5 - 20 | |
| #50 | 16 | | |
| #60 | 14 | | |
| #100 | 10 | 2 - 12 | |
| #200 | 6.8 | | |

Material Description

fine Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 30.8074 D₆₀= 12.3331 D₅₀= 6.9210
D₃₀= 1.3533 D₁₅= 0.2681 D₁₀= 0.1464
C_u= 84.22 C_c= 1.01

Classification

USCS= GW-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

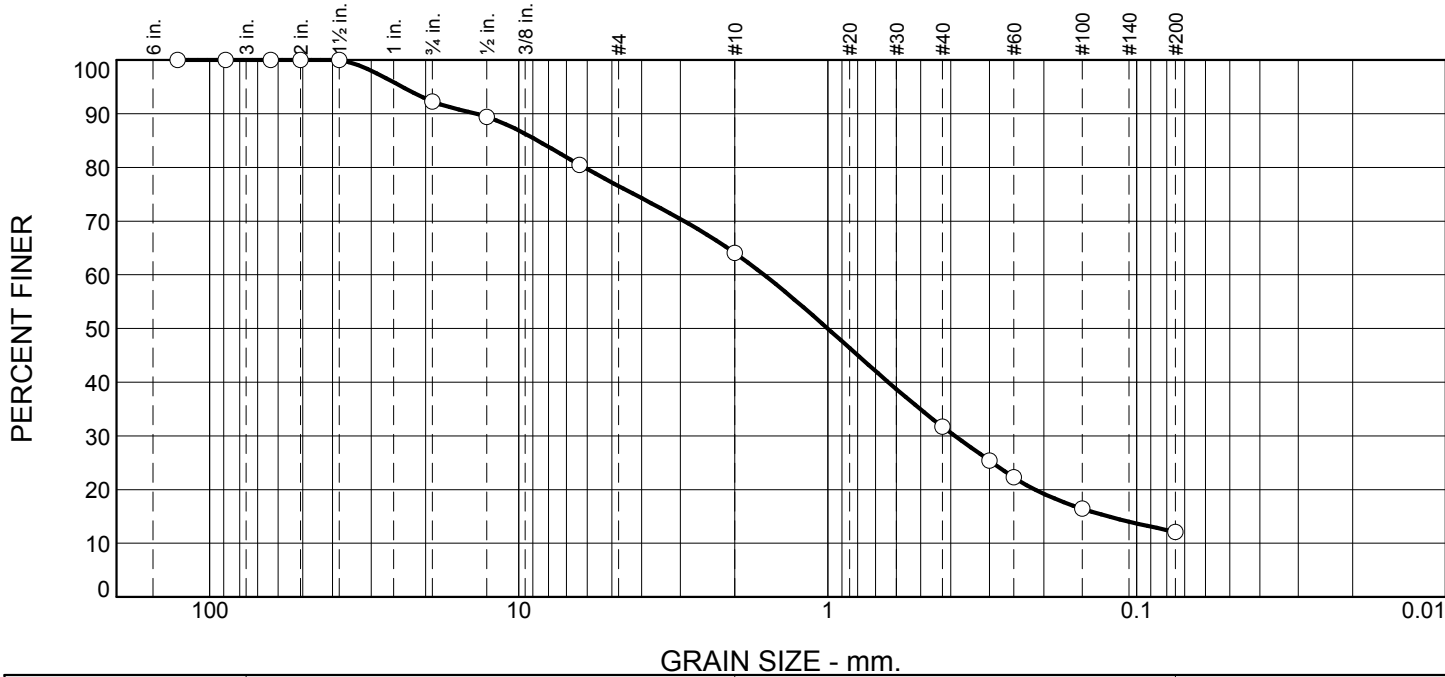
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP6 - 130' E of Route 2 entrance, 17' off EB lane curb;
Sample Number: SUBBASE 2

Depth: 1

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 36 | 32 | 20 | 12 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 92 | | |
| 1/2" | 89 | | |
| 1/4" | 80 | 25 - 60 | X |
| #10 | 64 | 15 - 45 | X |
| #40 | 32 | 5 - 25 | X |
| #50 | 25 | | |
| #60 | 22 | | |
| #100 | 16 | 0 - 10 | X |
| #200 | 12 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 8.6852 D₆₀= 1.6073 D₅₀= 1.0012
D₃₀= 0.3883 D₁₅= 0.1236 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Cambridge Avenue - Evans Avenue to Route 2 entrance

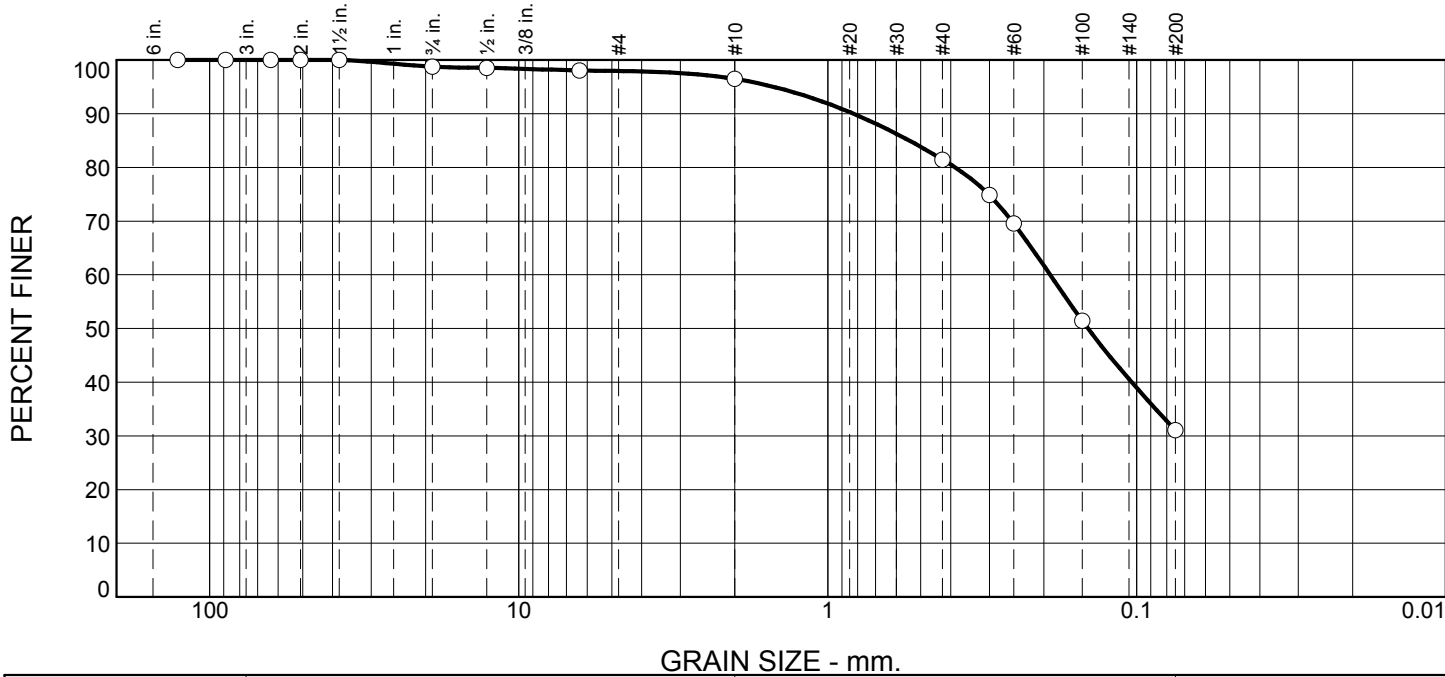
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP6 - 130' E of Route 2 entrance, 17' off EB lane curb;
Sample Number: SUBGRADE

Depth: 24

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 4 | 15 | 50 | 31 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 99 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 96 | 15 - 45 | X |
| #40 | 81 | 5 - 25 | X |
| #50 | 75 | | |
| #60 | 70 | | |
| #100 | 51 | 0 - 10 | X |
| #200 | 31 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.5452 D₆₀= 0.1905 D₅₀= 0.1438
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 6" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

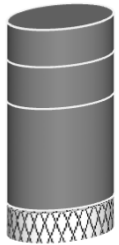
LOCATION: Cambridge Drive, East Hartford, CT

FROM: Evans Avenue

DATE SAMPLED: Thursday, July 26, 2018

TO: Sutton Street

CORE#: 1 **Area:** 80' W of Evans Ave., WB lane 7' off curb;



DEPTH

Layer
1.16"
1.30"
3.18"

DEPTH

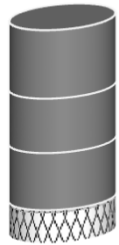
Total
5.64"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 2 **Area:** 170' W of Evans Ave. WB lane 10' off curb;



DEPTH

Layer
1.38"
1.10"
1.16"

DEPTH

Total
3.64"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
Penetrated Stone

Penetrated Stone

CORE#: 3 **Area:** 50' W of Milbrook Dr. (E), EB lane 12' off curb;



DEPTH

Layer
1.16"
1.14"
1.35"
2.03"

DEPTH

Total
5.68"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA
Penetrated Stone
Penetrated Stone

CORE#: 4 **Area:** 150' W of Milbrook Dr. (E), EB lane 6' off curb;



DEPTH

Layer
1.39"
2.15"

DEPTH

Total
3.54"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

Jose R Otero Jr.
Jose R. Otero Jr., Project Manager

100 Great Meadow Road
Suite 200

Engineers | Scientists | Planners | Designers Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570

CORE PROFILE

page 2



LOCATION: Cambridge Drive, East Hartford, CT
DATE SAMPLED: July 26, 2018

FROM: Evans Avenue
TO: Sutton Street

CORE#: 5 **Area:** 230' W of Milbrook Dr. (E), WB lane 4' off curb;



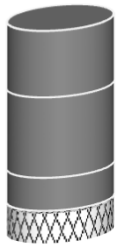
DEPTH
Layer
1.47"
1.65"

DEPTH
Total
3.12"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 6 **Area:** 310' W of Milbrook Dr. (E), WB lane 11' off curb;



DEPTH
Layer
1.48"
1.80"
0.74"

DEPTH
Total
4.02"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 7 **Area:** 390' W of Milbrook Dr. (E), EB lane 13' off curb;



DEPTH
Layer
1.53"
1.11"
0.90"

DEPTH
Total
3.54"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
Penetrated Stone

Penetrated Stone

CORE#: 8 **Area:** 200' E of Nassua Ln., EB lane 5' off curb;



DEPTH
Layer
1.41"
1.40"
1.53"

DEPTH
Total
4.34"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 9 **Area:** 120' E of Nassua Ln., WB lane 7' off curb;



DEPTH
Layer
2.63"

DEPTH
Total
2.63"

CLASSIFICATION
Hot Mix Asphalt (HMA)

Processed Aggregate

CORE PROFILE

page 3



LOCATION: Cambridge Drive, East Hartford, CT
DATE SAMPLED: July 26, 2018

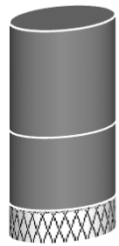
FROM: Evans Avenue
TO: Sutton Street

CORE#: 10 **Area:** 40' E of Nassua Ln., WB lane 12' off curb;



| DEPTH Layer | DEPTH Total | CLASSIFICATION |
|----------------|----------------|-----------------------|
| 1.61" | 4.27" | Hot Mix Asphalt (HMA) |
| 2.66" | | HMA |
| | | Processed Aggregate |

CORE#: 11 **Area:** 40' W of Nassua Ln., EB lane 7' off curb;



| DEPTH Layer | DEPTH Total | CLASSIFICATION |
|----------------|----------------|-----------------------|
| 2.34" | 3.95" | Hot Mix Asphalt (HMA) |
| 1.61" | | HMA |
| | | Penetrated Stone |

Poor bond at 2.34"

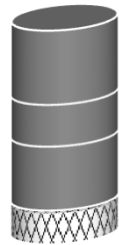
CORE#: 12 **Area:** 120' W of Nassua Ln., EB lane 12' off curb;



| DEPTH Layer | DEPTH Total | CLASSIFICATION |
|----------------|----------------|-----------------------|
| 1.88" | 4.28" | Hot Mix Asphalt (HMA) |
| 2.40" | | Penetrated Stone |
| | | Penetrated Stone |

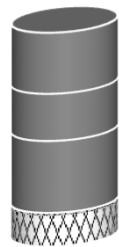
Poor bond at 1.88"

CORE#: 13 **Area:** 200' W of Nassua Ln., WB lane 3' off curb;



| DEPTH inches | DEPTH Total | CLASSIFICATION |
|-----------------|----------------|-----------------------|
| 1.51" | 3.66" | Hot Mix Asphalt (HMA) |
| 0.85" | | HMA |
| 1.30" | | HMA |
| | | Processed Aggregate |

CORE#: 14 **Area:** 280' W of Nassua Ln., WB lane 13' off curb;



| DEPTH Layer | DEPTH Total | CLASSIFICATION |
|----------------|----------------|-----------------------|
| 1.63" | 4.81" | Hot Mix Asphalt (HMA) |
| 1.26" | | HMA |
| 1.92" | | HMA |
| | | Processed Aggregate |

CORE PROFILE

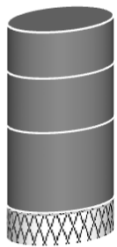
page 4



LOCATION: Cambridge Drive, East Hartford, CT
DATE SAMPLED: July 26, 2018

FROM: Evans Avenue
TO: Sutton Street

CORE#: 15 **Area:** 360' W of Nassua Ln., EB lane 12' off curb;



DEPTH
Layer
1.38"
1.63"
2.40"

DEPTH
Total
5.41"

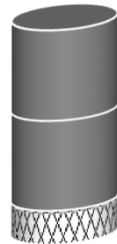
CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
Penetrated Stone

Penetrated Stone

Poor bond at 3.01"

CORE#: 16 **Area:** 440' W of Nassua Ln., EB lane 4' off curb;



DEPTH
Layer
1.38"
1.38"

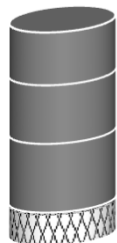
DEPTH
Total
2.76"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 17 **Area:** 520' W of Nassua Ln., WB lane 4' off curb;



DEPTH
Layer
1.07"
1.19"
1.40"

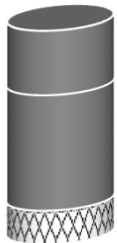
DEPTH
Total
3.66"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 18 **Area:** 600' W of Nassua Ln., WB lane 12' off curb;



DEPTH
inches
1.65"
2.97"

DEPTH
Total
4.62"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 19 **Area:** 200' E of Milbrook Dr. (W), centerline;



DEPTH
Layer
2.11"
2.41"

DEPTH
Total
4.52"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

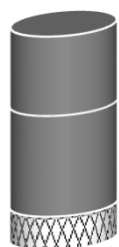
page 5



LOCATION: Cambridge Drive, East Hartford, CT
DATE SAMPLED: July 26, 2018

FROM: Evans Avenue
TO: Sutton Street

CORE#: 20 **Area:** 120' E of Milbrook Dr. (W), EB lane 6' off curb;



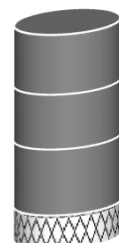
DEPTH
Layer
1.55"
1.98"

DEPTH
Total
3.53"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 21 **Area:** 40' E of Milbrook Dr. (W), WB lane 6' off curb;



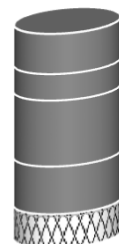
DEPTH
Layer
1.36"
1.25"
1.51"

DEPTH
Total
4.12"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 22 **Area:** 40' W of Milbrook Dr. (W), WB lane 13' off curb;



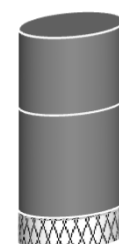
DEPTH
Layer
1.61"
1.06"
2.65"
1.92"

DEPTH
Total
7.24"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA
HMA

Processed Aggregate

CORE#: 23 **Area:** 120' W of Milbrook Dr. (W), EB lane 12' off curb;



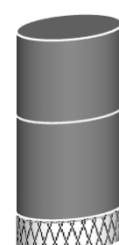
DEPTH
Layer
1.52"
2.02"

DEPTH
Total
3.54"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Deteriorated Penetrated Stone

CORE#: 24 **Area:** 185' W of Milbrook Dr. (W), EB lane 5' off curb;



DEPTH
Layer
1.51"
1.78"

DEPTH
Total
3.29"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

page 6



LOCATION: Cambridge Drive, East Hartford, CT
 DATE SAMPLED: July 26, 2018

FROM: Evans Avenue
 TO: Sutton Street

CORE#: 25 **Area:** 150' E of Rt. 2 entrance ramp, WB lane 5' off curb;



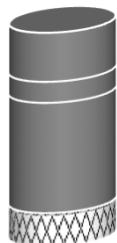
DEPTH
 Layer
 1.85"
 1.99"

DEPTH
 Total
3.84"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 26 **Area:** 80' E of Rt. 2 entrance ramp, WB lane 15' off curb;



DEPTH
 Layer
 1.77"
 0.76"
 4.00"

DEPTH
 Total
6.53"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA
 Penetrated Stone

Penetrated Stone



To: Bill Anderson, PE
VHB/Wethersfield

Date: November 20, 2018

Memorandum

Project #: 42413.00

From: Jose Otero
VHB/Project Manager

Re: Evans Avenue – East Hartford, CT

Following are the recommendations for the design and construction of Evans Avenue from Handel Road (S) to Handel Road (N).

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The 2018 distress level investigation results indicate there is severe weather/block and transverse/longitudinal cracking. There is evidence of moderate alligator cracking and distortions. Minor potholes were also noted, resulting in a Road Manager Pavement Condition Index (PCI) of 49, six points less than the 2014 update.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A3 and A24 which are classified as poorly graded and silty sands by the Unified Classification system. The subgrades are fair to good foundations when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 400 vehicles per day with small trucks and buses accounting for 2% of the ADT. The ADT is based on an average of 10 trips per household per day.

Handel Road (South) to Handel Road (North):

- The existing pavement structure cross-section consisted of 2.4" to 5.4" (average 3.9") of hot mix asphalt (HMA). The granular base consisted of 7.0" to 10.0" (average 8.3") of fine processed gravel base which is founded on silty sand and poorly graded silty sand subbases/subgrades. TP#3, located 250' N. of Cambridge Drive, had processed base material that did not meet typical specifications.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a 1.0" overlay to meet the Elastic Layer Design, which is NOT recommended.

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
P 860.807.4300

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|---|
| #1 | 20-years | RECLAIM the existing HMA and processed aggregate bases by pulverization and blending methods to a 10" depth. Compact the recycled material to proper lines and grades, leaving 6.5" to 7.5" as the new base course prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #2 | 20-years | REMOVE the existing 3.9" of HMA and add 1.0" of medium processed aggregate for fine grading, then compact to proper lines and grades prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #3 | 8-10-years | RESURFACE by milling the existing pavement to a 2.0" depth. Repair any base failures, seal major cracks and apply an emulsified asphalt tack coat prior to placing 2.0" of Superpave S-0.5" Level 2 as the new surface course. |

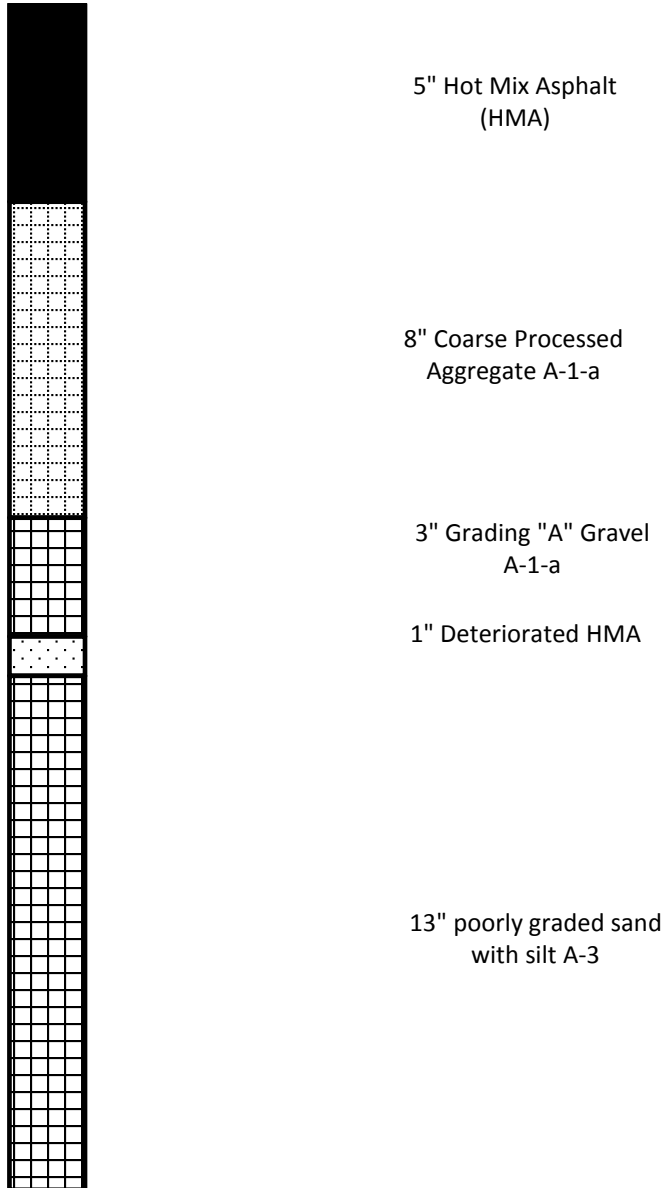


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Evans Avenue - Handel Rd South to Handel Rd North
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP1 - 200' N of Handel Road (S), 10' off NB lane curb;



Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Evans Avenue - Handel Rd South to Handel Rd North

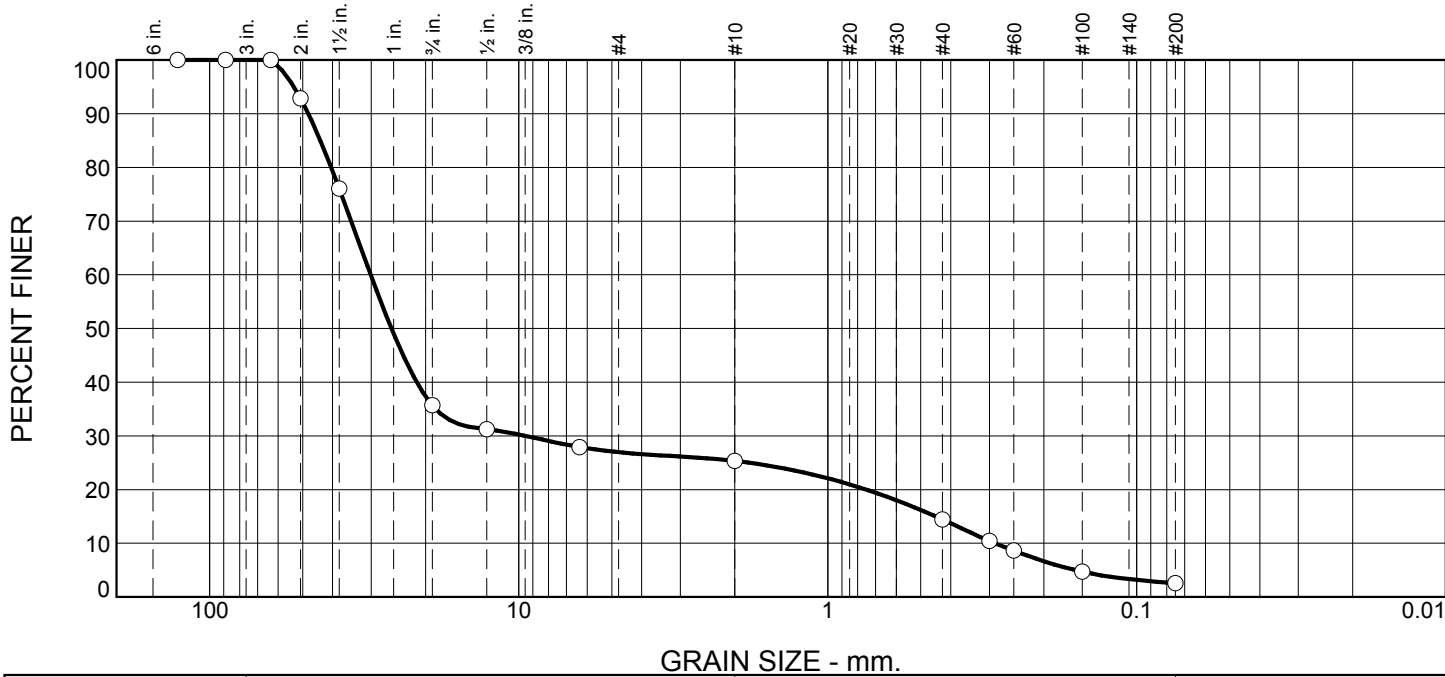
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 200' N of Handel Road (S), 10' off NB lane curb;
Sample Number: BASE

Depth: 8

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 75 | 11 | 11 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 93 | 95 - 100 | X |
| 1-1/2" | 76 | | |
| 3/4" | 36 | 50 - 75 | X |
| 1/2" | 31 | | |
| 1/4" | 28 | 25 - 45 | |
| #10 | 25 | | |
| #40 | 14 | 5 - 20 | |
| #50 | 10 | | |
| #60 | 9 | | |
| #100 | 5 | 2 - 12 | |
| #200 | 2.6 | | |

Material Description

Coarse Processed Aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 43.8584 D₆₀= 30.1456 D₅₀= 25.8306
D₃₀= 9.5208 D₁₅= 0.4479 D₁₀= 0.2881
C_u= 104.64 C_c= 10.44

Classification

USCS= GP AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Evans Avenue - Handel Rd South to Handel Rd North

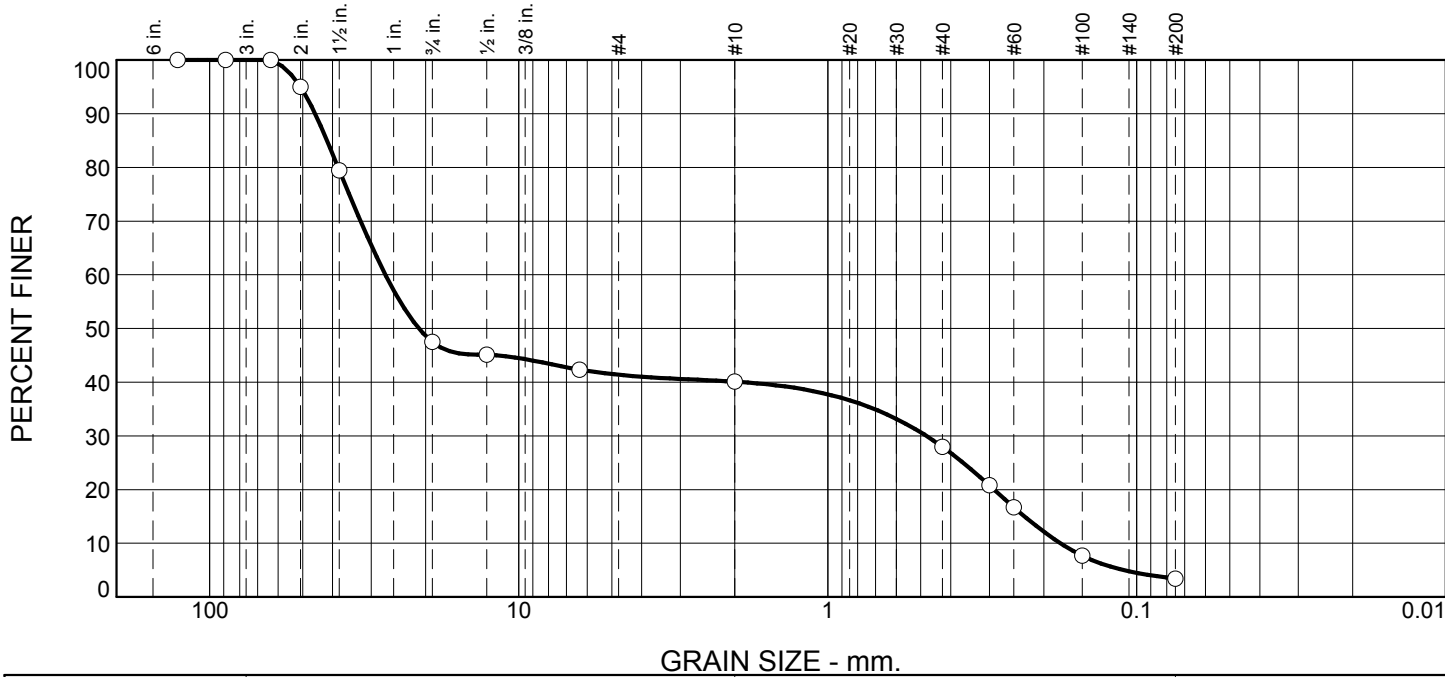
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 200' N of Handel Road (S), 10' off NB lane curb;
Sample Number: SUBBASE

Depth: 3

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 60 | 12 | 25 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 95 | | |
| 1-1/2" | 79 | 55 - 100 | |
| 3/4" | 47 | | |
| 1/2" | 45 | | |
| 1/4" | 42 | 25 - 60 | |
| #10 | 40 | 15 - 45 | |
| #40 | 28 | 5 - 25 | X |
| #50 | 21 | | |
| #60 | 17 | | |
| #100 | 8 | 0 - 10 | |
| #200 | 3.4 | 0.0 - 5.0 | |

Material Description

Grading "A" Gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 41.7235 D₆₀= 27.0121 D₅₀= 21.0750
D₃₀= 0.4797 D₁₅= 0.2307 D₁₀= 0.1763
C_u= 153.18 C_c= 0.05

Classification

USCS= GP AASHTO= A-1-a

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Evans Avenue - Handel Rd South to Handel Rd North

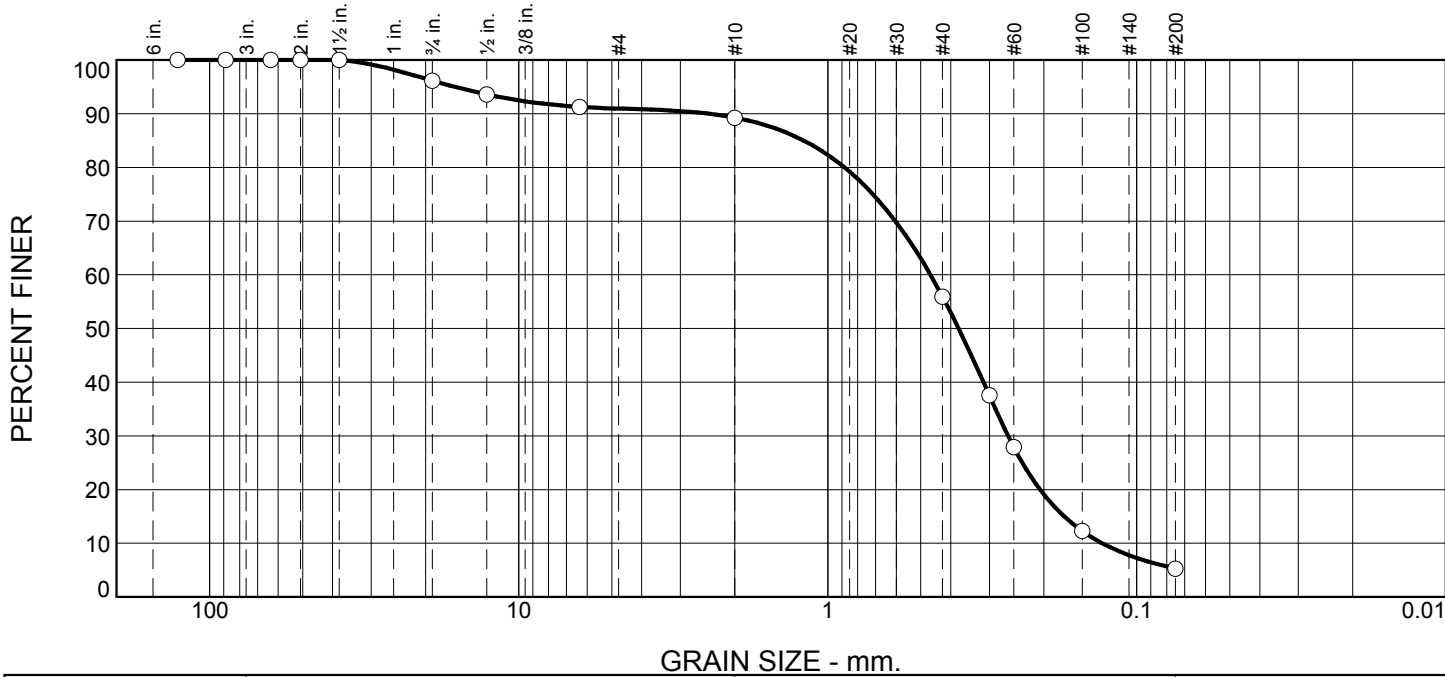
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 200' N of Handel Road (S), 10' off NB lane curb;
Sample Number: SUBGRADE

Depth: 13

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 11 | 33 | 51 | 5 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 96 | | |
| 1/2" | 94 | | |
| 1/4" | 91 | 25 - 60 | X |
| #10 | 89 | 15 - 45 | X |
| #40 | 56 | 5 - 25 | X |
| #50 | 38 | | |
| #60 | 28 | | |
| #100 | 12 | 0 - 10 | X |
| #200 | 5.3 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 1.1962 D₆₀= 0.4651 D₅₀= 0.3776
D₃₀= 0.2609 D₁₅= 0.1715 D₁₀= 0.1293
C_u= 3.60 C_c= 1.13

Classification

USCS= SP-SM AASHTO= A-3

Remarks

DCP = 6" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

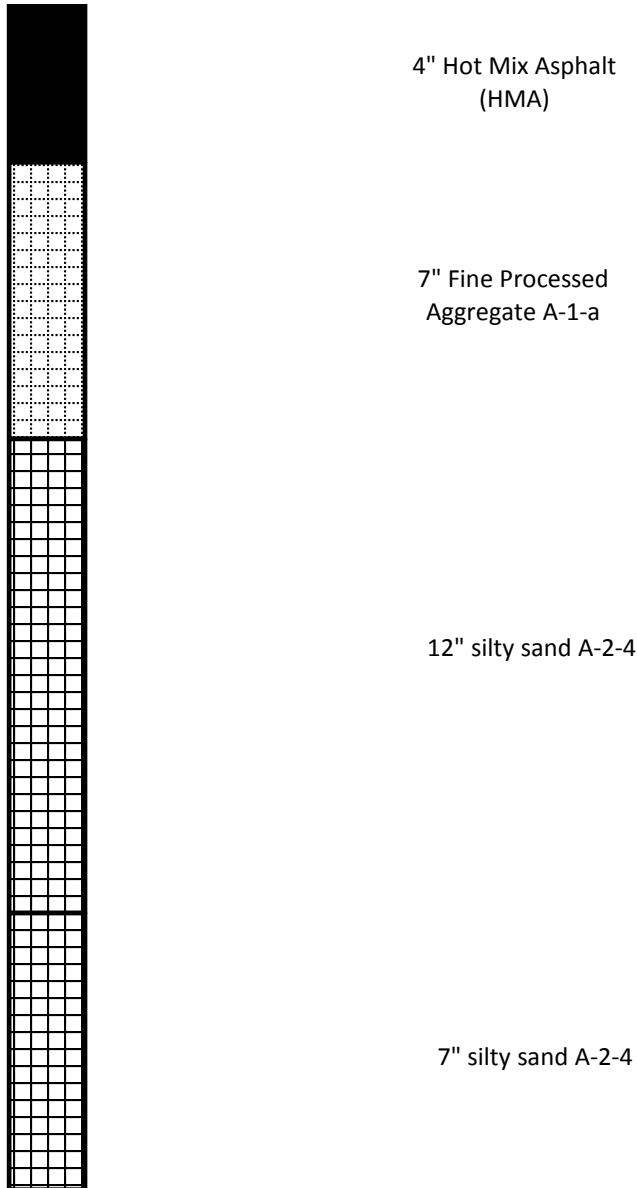


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Evans Avenue - Handel Rd South to Handel Rd North
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP2 - 300' N of Oxford Drive, 6' off SB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Evans Avenue - Handel Rd South to Handel Rd North

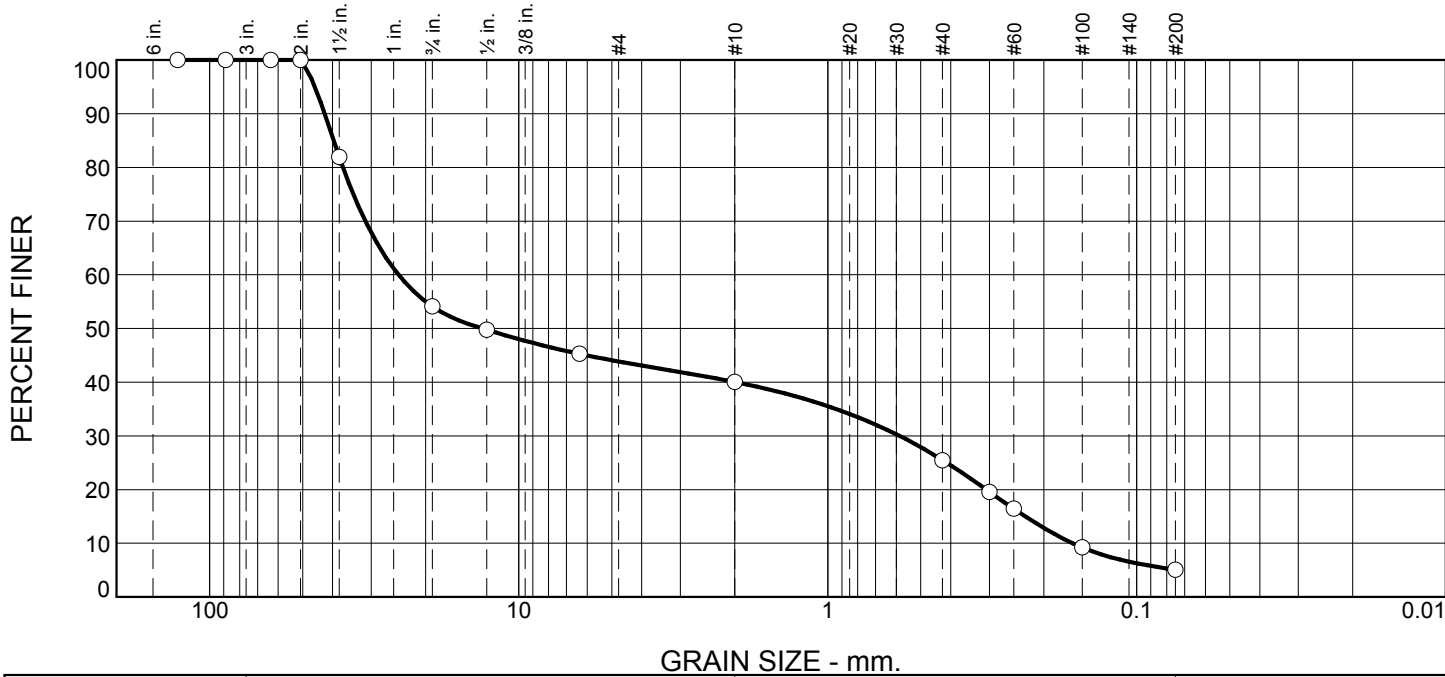
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 300' N of Oxford Drive, 6' off SB lane curb;
Sample Number: BASE

Depth: 7

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 60 | 15 | 20 | 5 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 82 | | |
| 3/4" | 54 | 50 - 75 | |
| 1/2" | 50 | | |
| 1/4" | 45 | 25 - 45 | |
| #10 | 40 | | |
| #40 | 25 | 5 - 20 | X |
| #50 | 20 | | |
| #60 | 16 | | |
| #100 | 9 | 2 - 12 | |
| #200 | 5.1 | | |

Material Description

Fine Processed Aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 39.7205 D₆₀= 24.5078 D₅₀= 13.1168
D₃₀= 0.5864 D₁₅= 0.2293 D₁₀= 0.1611
C_u= 152.12 C_c= 0.09

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Evans Avenue - Handel Rd South to Handel Rd North

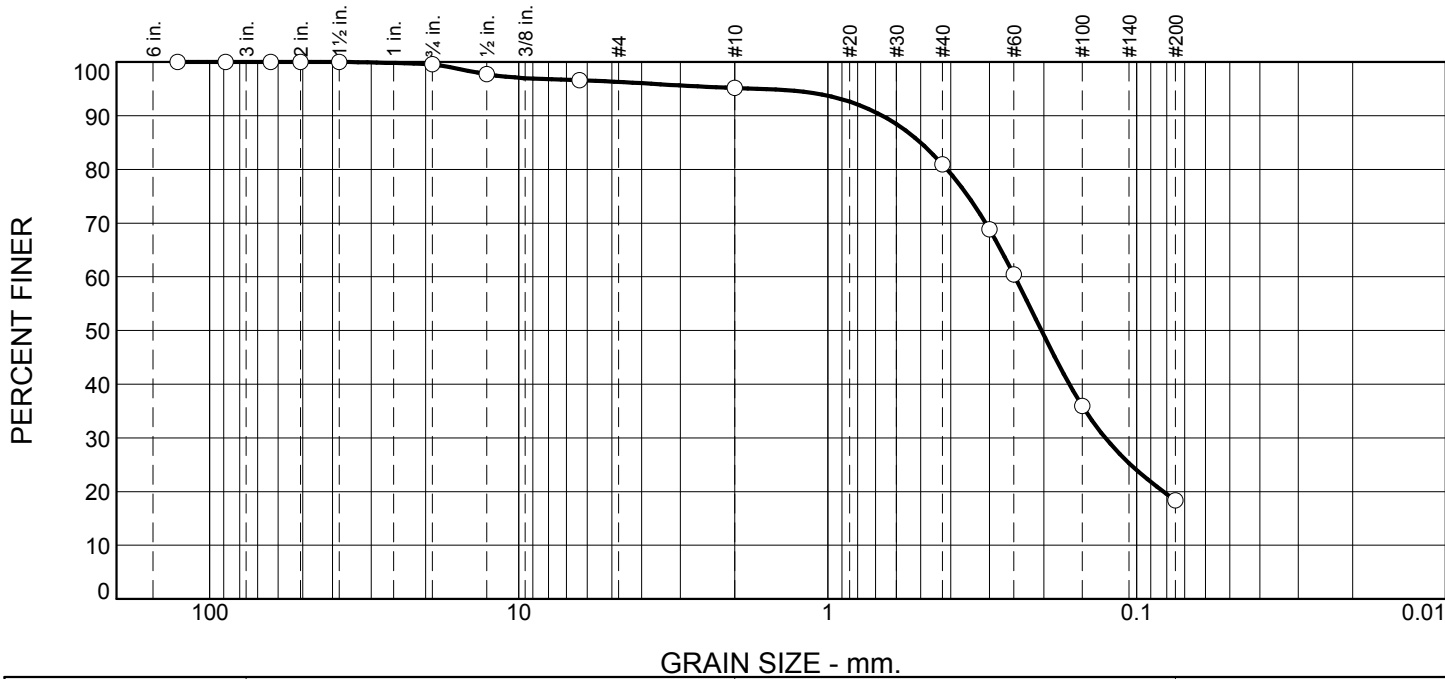
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 300' N of Oxford Drive, 6' off SB lane curb;
Sample Number: SUBBASE

Depth: 12

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 5 | 14 | 63 | 18 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 98 | | |
| 1/4" | 97 | 25 - 60 | X |
| #10 | 95 | 15 - 45 | X |
| #40 | 81 | 5 - 25 | X |
| #50 | 69 | | |
| #60 | 60 | | |
| #100 | 36 | 0 - 10 | X |
| #200 | 18 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.5013 D₆₀= 0.2479 D₅₀= 0.2032
D₃₀= 0.1263 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Evans Avenue - Handel Rd South to Handel Rd North

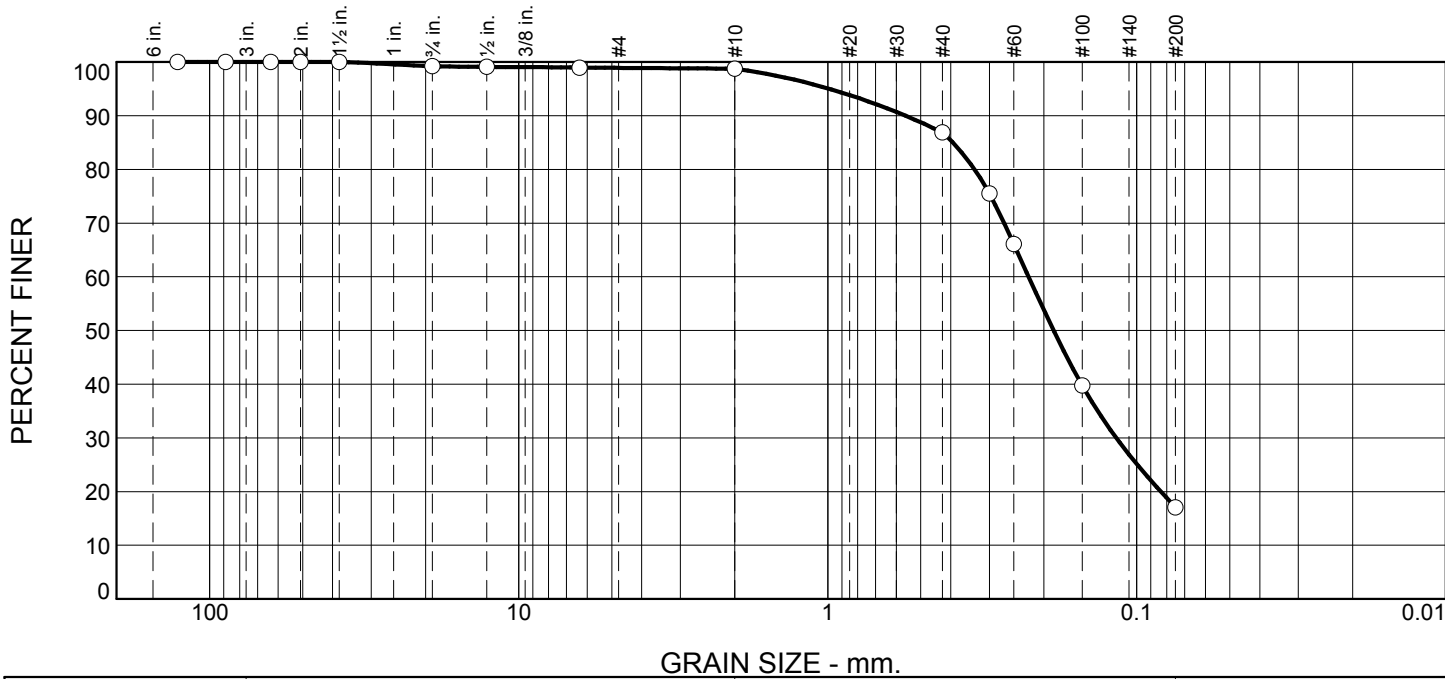
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 300' N of Oxford Drive, 6' off SB lane curb;
Sample Number: SUBGRADE

Depth: 7

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 1 | 12 | 70 | 17 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 99 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 99 | 15 - 45 | X |
| #40 | 87 | 5 - 25 | X |
| #50 | 75 | | |
| #60 | 66 | | |
| #100 | 40 | 0 - 10 | X |
| #200 | 17 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.3939 D₆₀= 0.2237 D₅₀= 0.1856
D₃₀= 0.1165 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 5" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

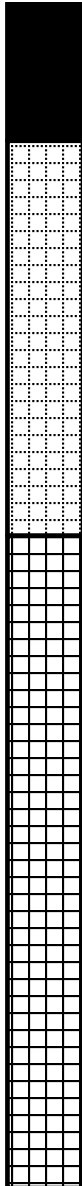


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Evans Avenue - Handel Rd South to Handel Rd North
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP3 - 250' N of Cambridge Drive, 12' off SB lane curb;



3.5" Hot Mix Asphalt
(HMA)

10" poorly graded gravel
with silt and sand A-1-b

16.5" silty sand A-2-4

Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

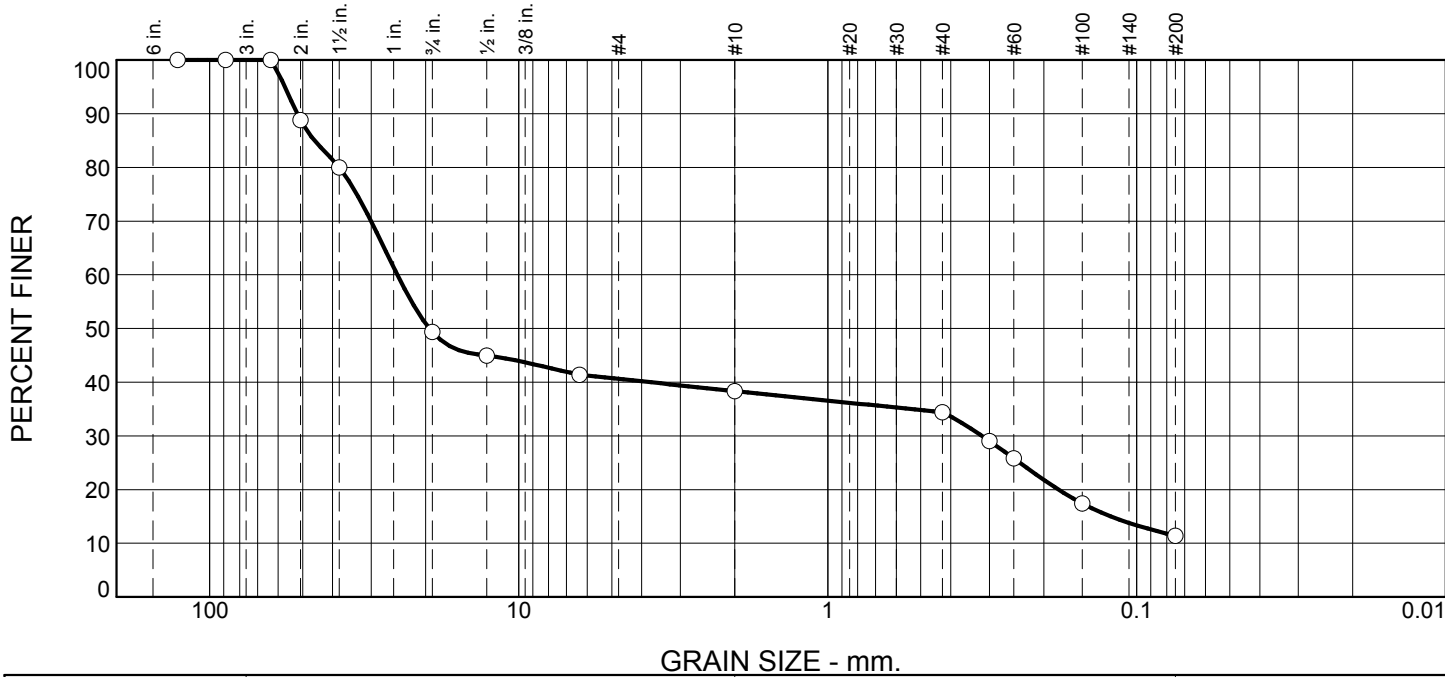
Project: Evans Avenue - Handel Rd South to Handel Rd North

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 250' N of Cambridge Drive, 12' off SB lane curb;
Sample Number: BASE **Depth:** 10

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 62 | 4 | 23 | 11 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 89 | 95 - 100 | X |
| 1-1/2" | 80 | | |
| 3/4" | 49 | 50 - 75 | X |
| 1/2" | 45 | | |
| 1/4" | 41 | 25 - 45 | |
| #10 | 38 | | |
| #40 | 34 | 5 - 20 | X |
| #50 | 29 | | |
| #60 | 26 | | |
| #100 | 17 | 2 - 12 | X |
| #200 | 11 | | |

Material Description

poorly graded gravel with silt and sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 45.8271 D₆₀= 24.7195 D₅₀= 19.4740
D₃₀= 0.3174 D₁₅= 0.1214 D₁₀=
C_u= C_c=

Classification

USCS= GP-GM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

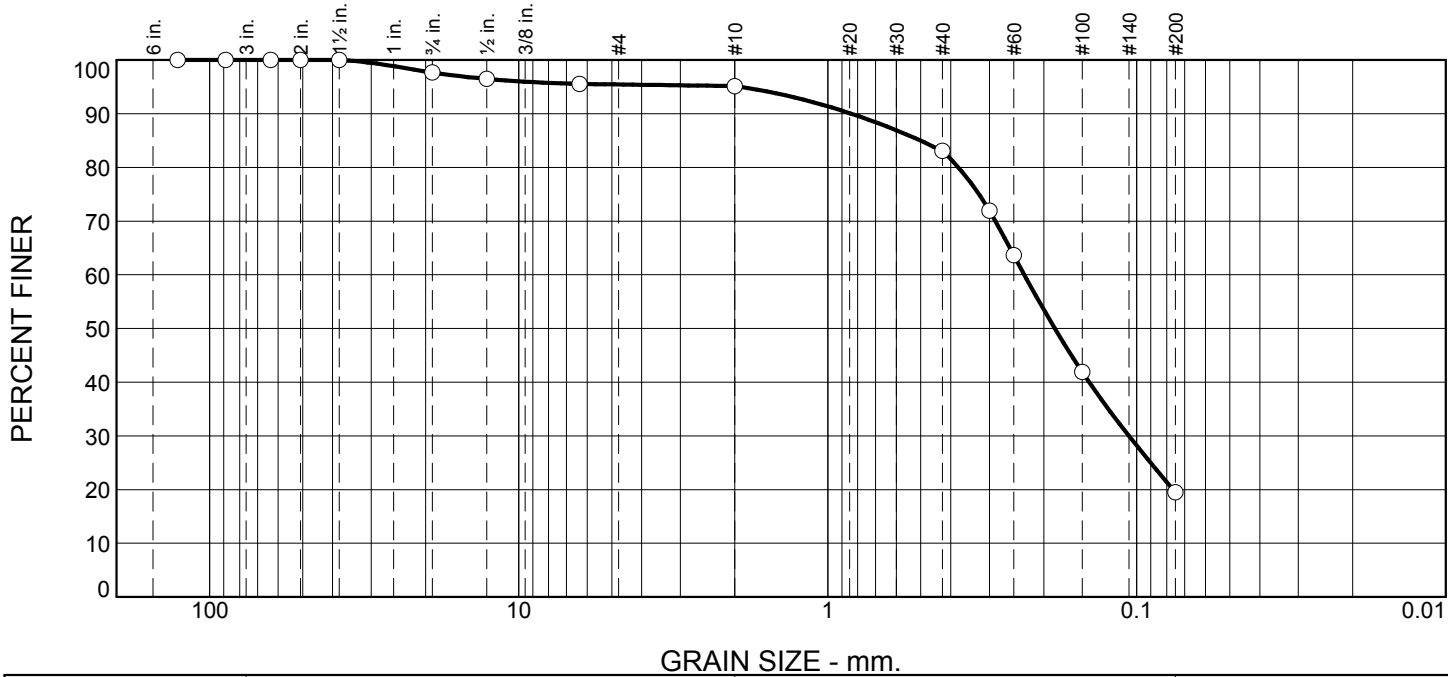
Project: Evans Avenue - Handel Rd South to Handel Rd North

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 250' N of Cambridge Drive, 12' off SB lane curb;
Sample Number: SUBGRADE **Depth:** 16.5

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 5 | 12 | 64 | 19 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 98 | | |
| 1/2" | 96 | | |
| 1/4" | 96 | 25 - 60 | X |
| #10 | 95 | 15 - 45 | X |
| #40 | 83 | 5 - 25 | X |
| #50 | 72 | | |
| #60 | 64 | | |
| #100 | 42 | 0 - 10 | X |
| #200 | 19 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.5019 D₆₀= 0.2310 D₅₀= 0.1839
D₃₀= 0.1060 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 11" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

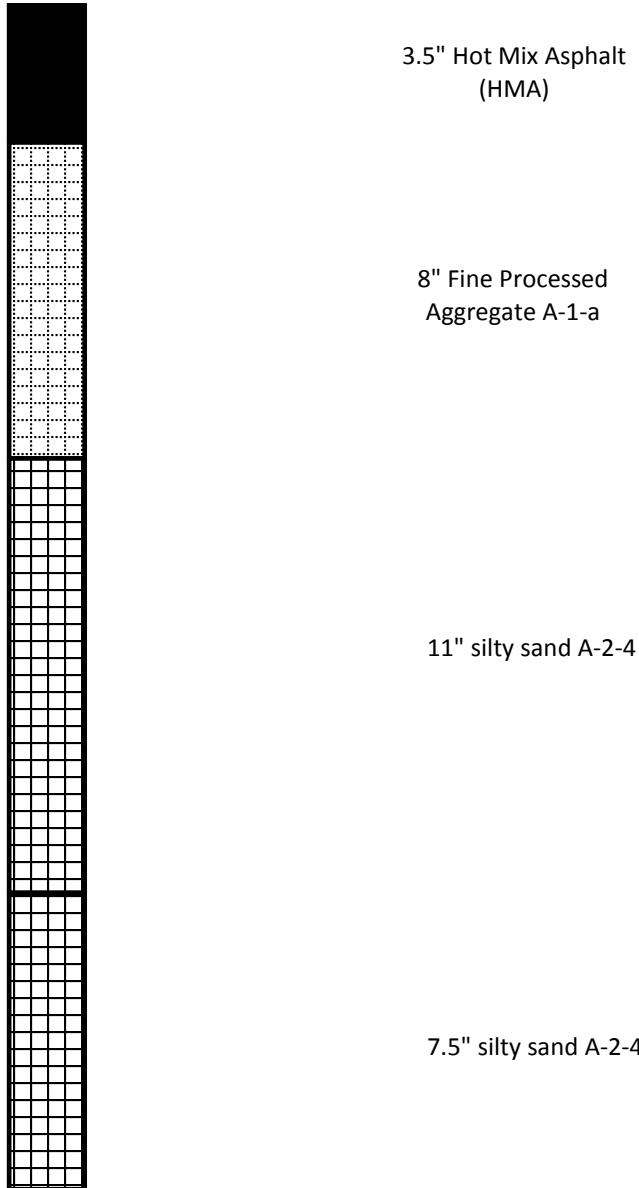


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Evans Avenue - Handel Rd South to Handel Rd North
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP4 - 150' S of Handel Road (N), 7' off NB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Evans Avenue - Handel Rd South to Handel Rd North

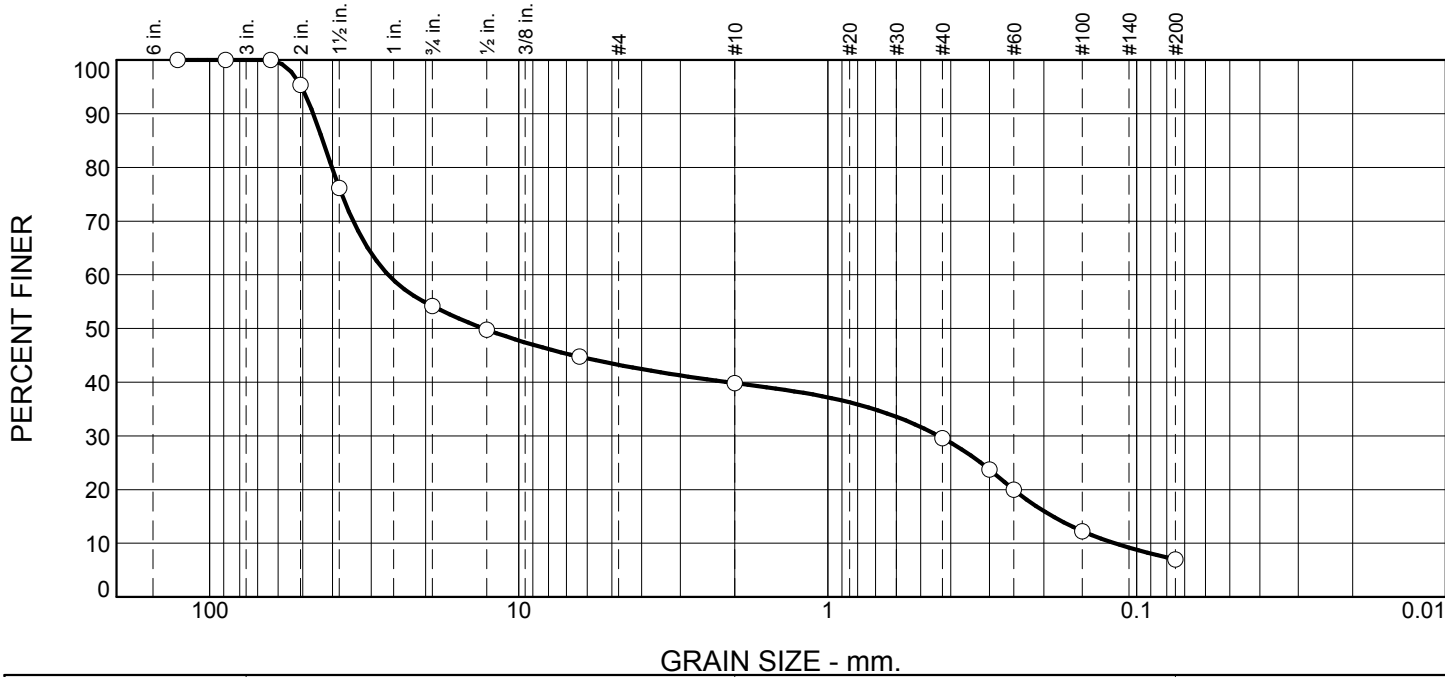
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 150' S of Handel Road (N), 7' off NB lane curb;
Sample Number: BASE

Depth: 8

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 60 | 10 | 23 | 7 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 95 | 95 - 100 | |
| 1-1/2" | 76 | | |
| 3/4" | 54 | 50 - 75 | |
| 1/2" | 50 | | |
| 1/4" | 45 | 25 - 45 | |
| #10 | 40 | | |
| #40 | 30 | 5 - 20 | X |
| #50 | 24 | | |
| #60 | 20 | | |
| #100 | 12 | 2 - 12 | |
| #200 | 7.0 | | |

Material Description

Fine Processed Aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 43.0626 D₆₀= 26.4617 D₅₀= 12.9923
D₃₀= 0.4385 D₁₅= 0.1868 D₁₀= 0.1179
C_u= 224.51 C_c= 0.06

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Evans Avenue - Handel Rd South to Handel Rd North

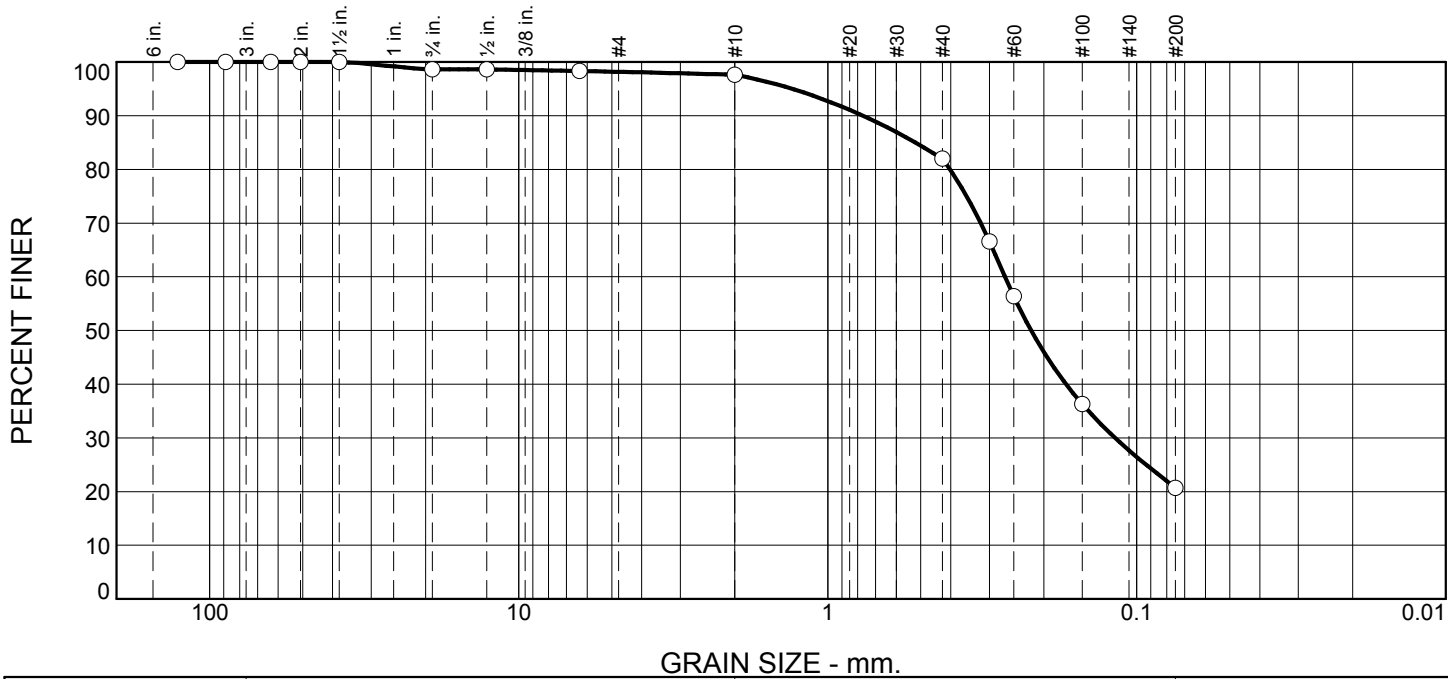
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 150' S of Handel Road (N), 7' off NB lane curb;
Sample Number: SUBBASE

Depth: 11

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 16 | 61 | 21 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 99 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 82 | 5 - 25 | X |
| #50 | 67 | | |
| #60 | 56 | | |
| #100 | 36 | 0 - 10 | X |
| #200 | 21 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.5207 D₆₀= 0.2668 D₅₀= 0.2195
D₃₀= 0.1176 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Evans Avenue - Handel Rd South to Handel Rd North

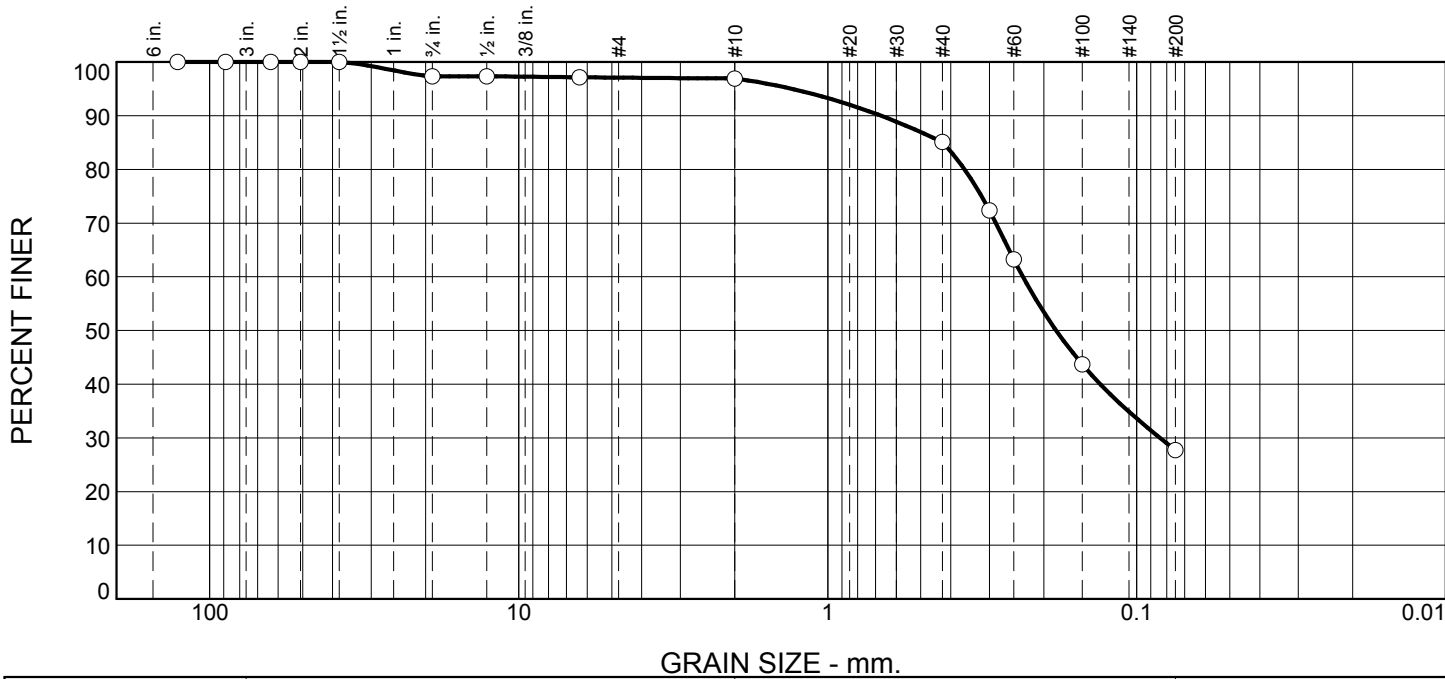
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 150' S of Handel Road (N), 7' off NB lane curb;
Sample Number: SUBGRADE

Depth: 7.5

Date: 7/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 12 | 57 | 28 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 97 | | |
| 1/2" | 97 | | |
| 1/4" | 97 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 85 | 5 - 25 | X |
| #50 | 72 | | |
| #60 | 63 | | |
| #100 | 44 | 0 - 10 | X |
| #200 | 28 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.4236 D₆₀= 0.2334 D₅₀= 0.1822
D₃₀= 0.0841 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 8" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

LOCATION: Evans Avenue, East Hartford, CT

DATE SAMPLED: Wednesday, August 22, 2018

FROM: Handel Road (S)

TO: Handel Road (N)

CORE#: 1 **Area:** 95' N of Handel Rd. (S), NB lane 5' off curb;



DEPTH

Layer
1.56"
1.53"

DEPTH

Total
3.09"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 2 **Area:** 190' N of Handel Rd. (S), NB lane 12' off curb;



DEPTH

Layer
1.26"
2.67"

DEPTH

Total
3.93"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 3 **Area:** 40' S of Oxford Dr., SB lane 13' off curb;



DEPTH

Layer
1.69"
2.89"

DEPTH

Total
4.58"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 4 **Area:** 65' N of Oxford Dr., SB lane 4' off curb;



DEPTH

Layer
1.49"
1.91"

DEPTH

Total
3.40"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

Jose R Otero Jr.
Jose R. Otero Jr., Project Manager

100 Great Meadow Road

Suite 200

Engineers | Scientists | Planners | Designers Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570

CORE PROFILE

page 2



LOCATION: Evans Avenue, East Hartford, CT
 DATE SAMPLED: August 22, 2018

FROM: Handel Road (S)
 TO: Handel Road (N)

CORE#: 5 **Area:** 155' N of Oxford Dr., NB lane 6' off curb;



| DEPTH | DEPTH | CLASSIFICATION |
|-------|-------|-----------------------|
| Layer | Total | |
| 0.73" | 5.37" | Hot Mix Asphalt (HMA) |
| 2.09" | | HMA |
| 2.55" | | HMA |
| | | Penetrated Stone |

CORE#: 6 **Area:** 250' N of Oxford Dr., NB lane 11' off curb;



| DEPTH | DEPTH | CLASSIFICATION |
|-------|-------|-----------------------|
| Layer | Total | |
| 1.90" | 4.08" | Hot Mix Asphalt (HMA) |
| 2.18" | | HMA |
| | | Processed Aggregate |

CORE#: 7 **Area:** 155' S of Cambridge Dr., SB lane 9' off curb;



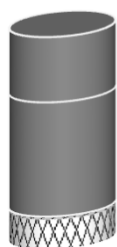
| DEPTH | DEPTH | CLASSIFICATION |
|-------|-------|-----------------------|
| Layer | Total | |
| 2.15" | 4.58" | Hot Mix Asphalt (HMA) |
| 2.43" | | HMA |
| | | Processed Aggregate |

CORE#: 8 **Area:** 60' S of Cambridge Dr., SB lane 6' off curb;



| DEPTH | DEPTH | CLASSIFICATION |
|-------|-------|-----------------------|
| Layer | Total | |
| 1.65" | 3.79" | Hot Mix Asphalt (HMA) |
| 2.14" | | HMA |
| | | Processed Aggregate |

CORE#: 9 **Area:** 35' N of Cambridge Dr., NB lane 5' off curb;



| DEPTH | DEPTH | CLASSIFICATION |
|-------|-------|-----------------------|
| Layer | Total | |
| 1.24" | 3.41" | Hot Mix Asphalt (HMA) |
| 2.17" | | HMA |
| | | Processed Aggregate |

CORE PROFILE

page 3



LOCATION: Evans Avenue, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Handel Road (S)
TO: Handel Road (N)

CORE#: 10 **Area:** 130' N of Cambridge Dr., NB lane 12' off curb;



DEPTH
Layer
1.37"
2.93"

DEPTH
Total
4.30"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 11 **Area:** 225' N of Cambridge Dr., SB lane 5' off curb;



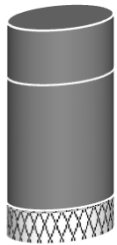
DEPTH
Layer
1.53"
2.28"

DEPTH
Total
3.81"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 12 **Area:** 320' N of Cambridge Dr., SB lane 12' off curb;



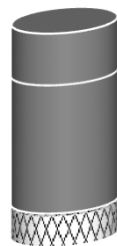
DEPTH
Layer
1.18"
2.71"

DEPTH
Total
3.89"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 13 **Area:** 320' S of Handel Rd. (N), NB lane 4' off curb;



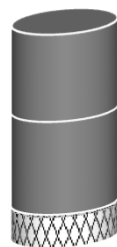
DEPTH
inches
1.10"
2.73"

DEPTH
Total
3.83"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 14 **Area:** 235' S of Handel Rd. (N), NB lane 11' off curb;



DEPTH
Layer
1.94"
2.07"

DEPTH
Total
4.01"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

page 4



LOCATION: Evans Avenue, East Hartford, CT
 DATE SAMPLED: August 22, 2018

FROM: Handel Road (S)
 TO: Handel Road (N)

CORE#: 15 **Area:** 140' S of Handel Rd. (N), SB lane 10' off curb;



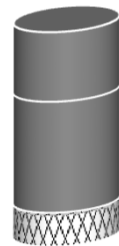
DEPTH
 Layer
 1.08"
 1.36"

DEPTH
 Total
 2.44"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

—————
 Processed Aggregate

CORE#: 16 **Area:** 50' S of Handel Rd. (N), SB lane 5' off curb;



DEPTH
 Layer
 1.30"
 2.07"

DEPTH
 Total
 3.37"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

—————
 Processed Aggregate



To: Bill Anderson, PE
VHB/Wethersfield

Date: November 20, 2018

Memorandum

Project #: 42413.00

From: Jose Otero
VHB/Project Manger

Re: Handel Road – East Hartford, CT

Following are the recommendations for the design and construction of Handel Road from Maple Street to a Cul De Sac.

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The distress level investigation results indicate there is severe alligator cracking. Moderate pothole patching, transverse/longitudinal and weather/block cracking were noted. There is evidence of minor distortions and extensive surface wear, resulting in a Road Manager Pavement Condition Index (PCI) of 48, nine points less than the 2014 update.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A24 which are classified as uniformly graded silty sands by the Unified Classification system. The subgrades are fair to good foundations when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 840 vehicles per day with small trucks and buses accounting for 5.7% of the ADT. The 20-year design Equivalent Single Axle Loads (ESALs) was estimated to be 119,000.

Maple Street to Cul De Sac:

- The existing pavement structure cross-section consisted of 3.4" to 6.4" (average 4.6") of hot mix asphalt (HMA). The granular base consisted of 2" to 10" (average 8.4") of processed gravel bases which were founded on silty sand subbases/subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a 1.5" overlay to meet the Elastic Layer Design, which is NOT recommended.

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
P 860.807.4300

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|---|
| #1 | 20-years | RECLAIM the existing HMA and processed aggregate bases by pulverization and blending methods to a 12" depth. Compact the recycled material to proper lines and grades, leaving 7.5" to 8.5" as the new base course prior to placing 2.0" of Superpave S-0.375" Level 2 as the intermediate course and 2.0" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #2 | 20-years | REMOVE the existing 4.6" of HMA, place 1" of processed aggregate for fine grading, then compact to proper lines and grades, prior to placing 1.75" of Superpave S-0.375" Level 2 as the intermediate course and 1.75" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| ** | 5-10-years | RESURFACE by milling the existing pavement to a 2.5" depth. Repair any base failures, seal major cracks and apply an emulsified asphalt tack coat prior to placing 1" of Superpave S-0.25" Level 2 as a leveling course then 1.5" of Superpave S-0.375" Level 2 as the new surface course with a tack coat between lifts. |

***This treatment is not recommended due to the extent and severity of base related distresses (principally alligator cracking) on this road. The extent of base failure repairs performed as part of this treatment is estimated to be greater than 30% of the total area, making this alternative not cost efficient when compared to Alternative #2.*

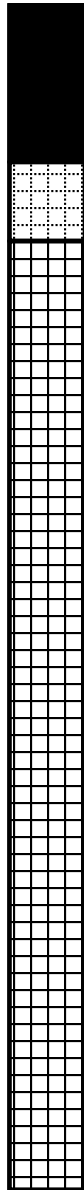


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Handel Road - Maple Street to Cul De Sac
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP1 - 200' N of Maple Street, 11' off SB lane curb;



4" Hot Mix Asphalt
(HMA)

2" Processed Aggregate
Base A-1-a

24" silty sand A-2-4

Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Handel Road - Maple Street to Cul De Sac

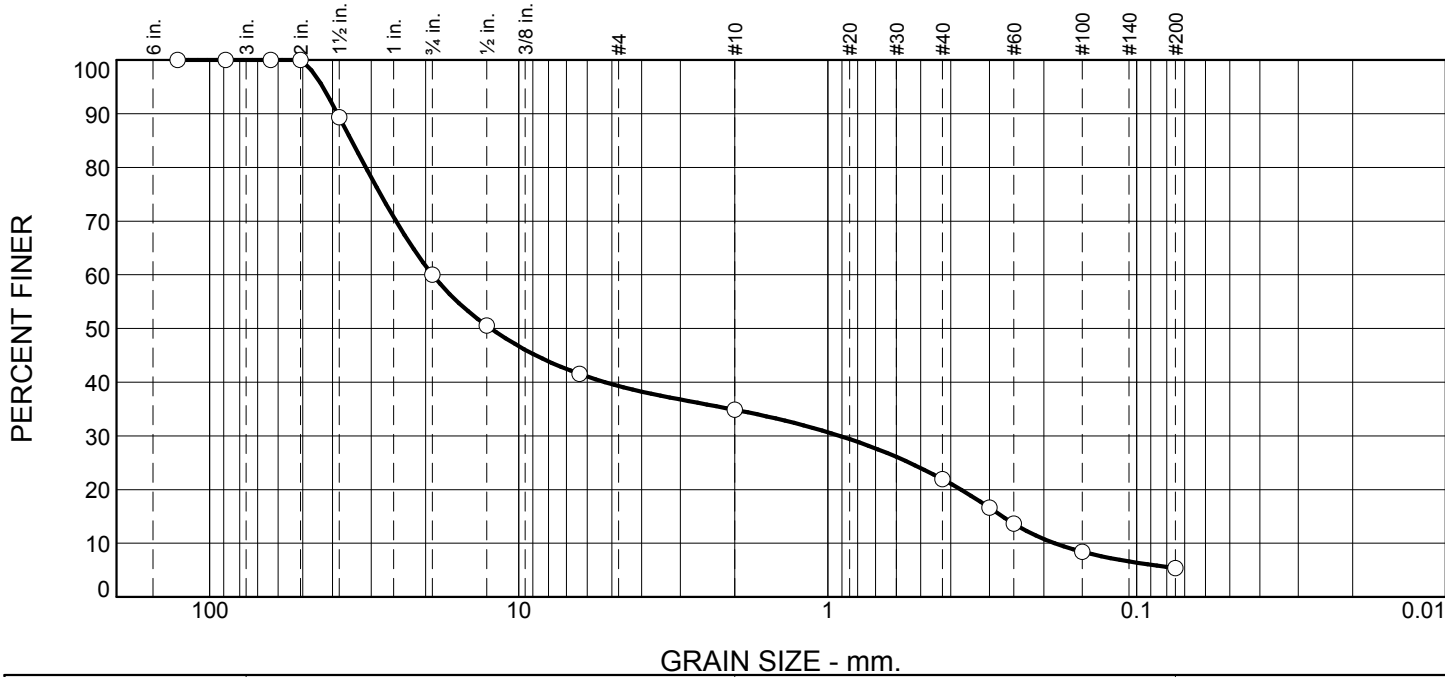
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 200' N of Maple Street, 11' off SB lane curb;
Sample Number: BASE

Depth: 2

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 65 | 13 | 17 | 5 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 89 | | |
| 3/4" | 60 | 50 - 75 | |
| 1/2" | 51 | | |
| 1/4" | 42 | 25 - 45 | |
| #10 | 35 | | |
| #40 | 22 | 5 - 20 | X |
| #50 | 17 | | |
| #60 | 14 | | |
| #100 | 8 | 2 - 12 | |
| #200 | 5.4 | | |

Material Description

Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 34.7726 D₆₀= 19.0186 D₅₀= 12.3255
D₃₀= 0.9149 D₁₅= 0.2719 D₁₀= 0.1841
C_u= 103.31 C_c= 0.24

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Handel Road - Maple Street to Cul De Sac

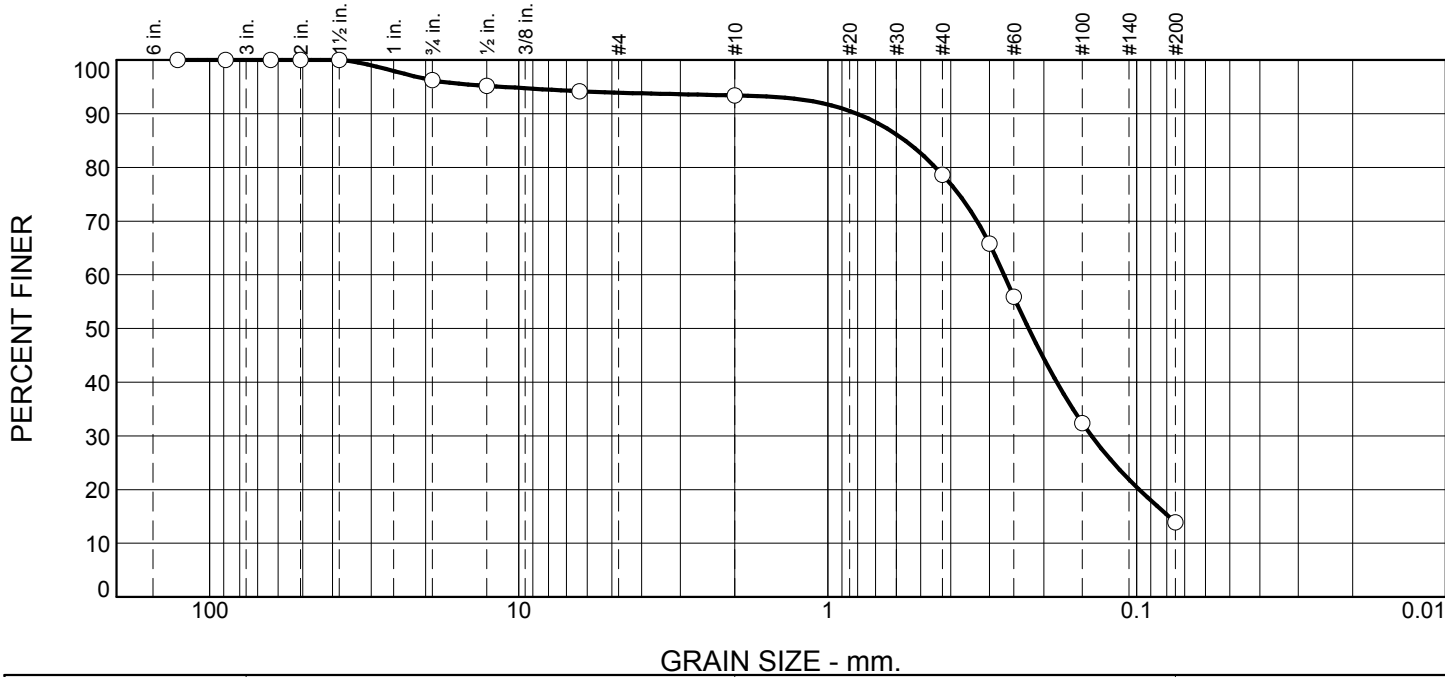
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 200' N of Maple Street, 11' off SB lane curb;
Sample Number: SUBGRADE

Depth: 24

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 7 | 14 | 65 | 14 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 96 | | |
| 1/2" | 95 | | |
| 1/4" | 94 | 25 - 60 | X |
| #10 | 93 | 15 - 45 | X |
| #40 | 79 | 5 - 25 | X |
| #50 | 66 | | |
| #60 | 56 | | |
| #100 | 32 | 0 - 10 | X |
| #200 | 14 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.5628 D₆₀= 0.2689 D₅₀= 0.2236
D₃₀= 0.1400 D₁₅= 0.0788 D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 4" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

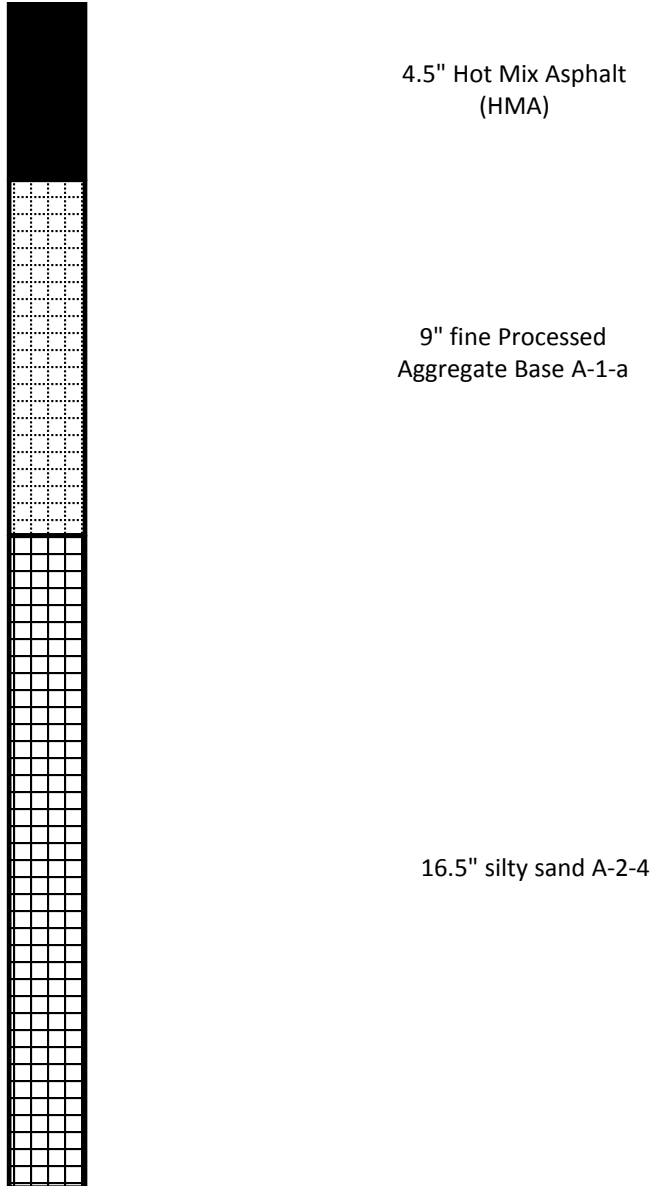


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Handel Road - Maple Street to Cul De Sac
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP2 - 200' S of Canterbury Street, 7' off NB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Handel Road - Maple Street to Cul De Sac

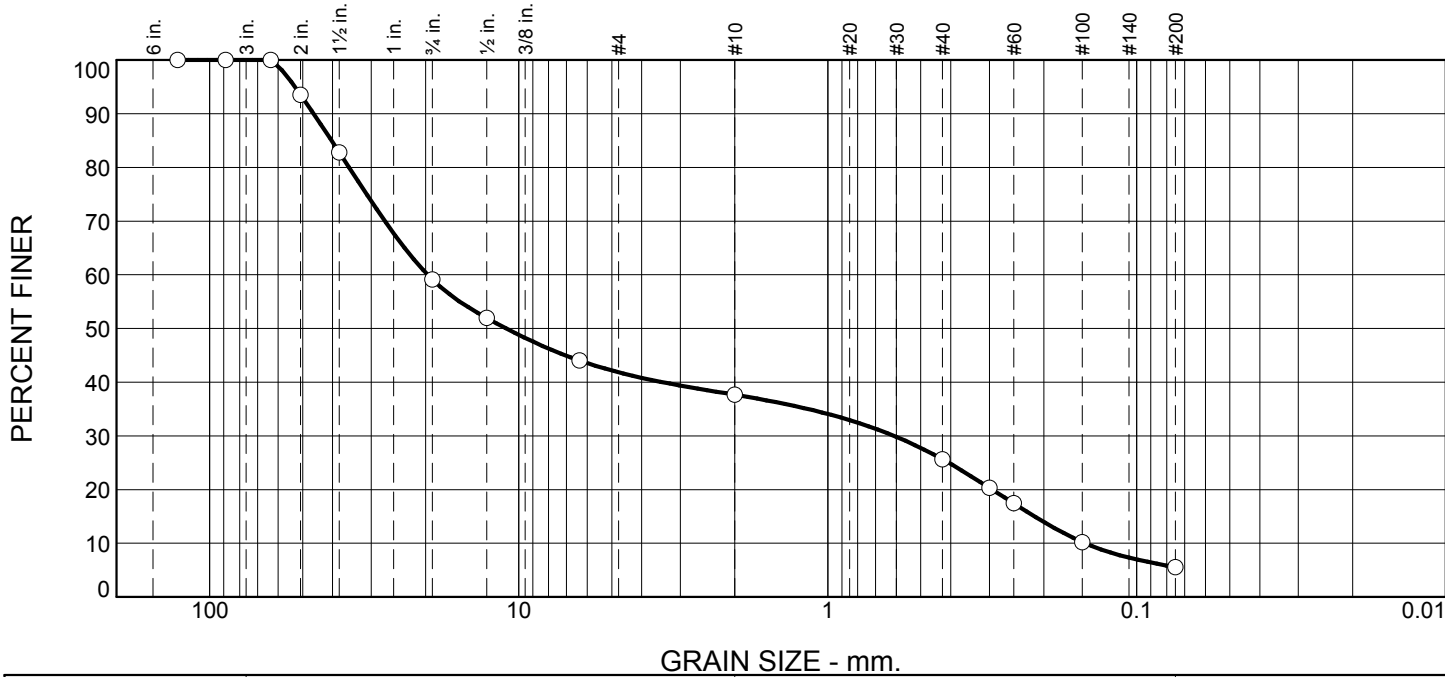
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 200' S of Canterbury Street, 7' off NB lane curb;
Sample Number: BASE

Depth: 9

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 62 | 12 | 20 | 6 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 94 | 95 - 100 | X |
| 1-1/2" | 83 | | |
| 3/4" | 59 | 50 - 75 | |
| 1/2" | 52 | | |
| 1/4" | 44 | 25 - 45 | |
| #10 | 38 | | |
| #40 | 26 | 5 - 20 | X |
| #50 | 20 | | |
| #60 | 17 | | |
| #100 | 10 | 2 - 12 | |
| #200 | 5.5 | | |

Material Description

fine Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 40.3514 D₆₀= 19.7128 D₅₀= 10.9667
D₃₀= 0.6115 D₁₅= 0.2137 D₁₀= 0.1470
C_u= 134.11 C_c= 0.13

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

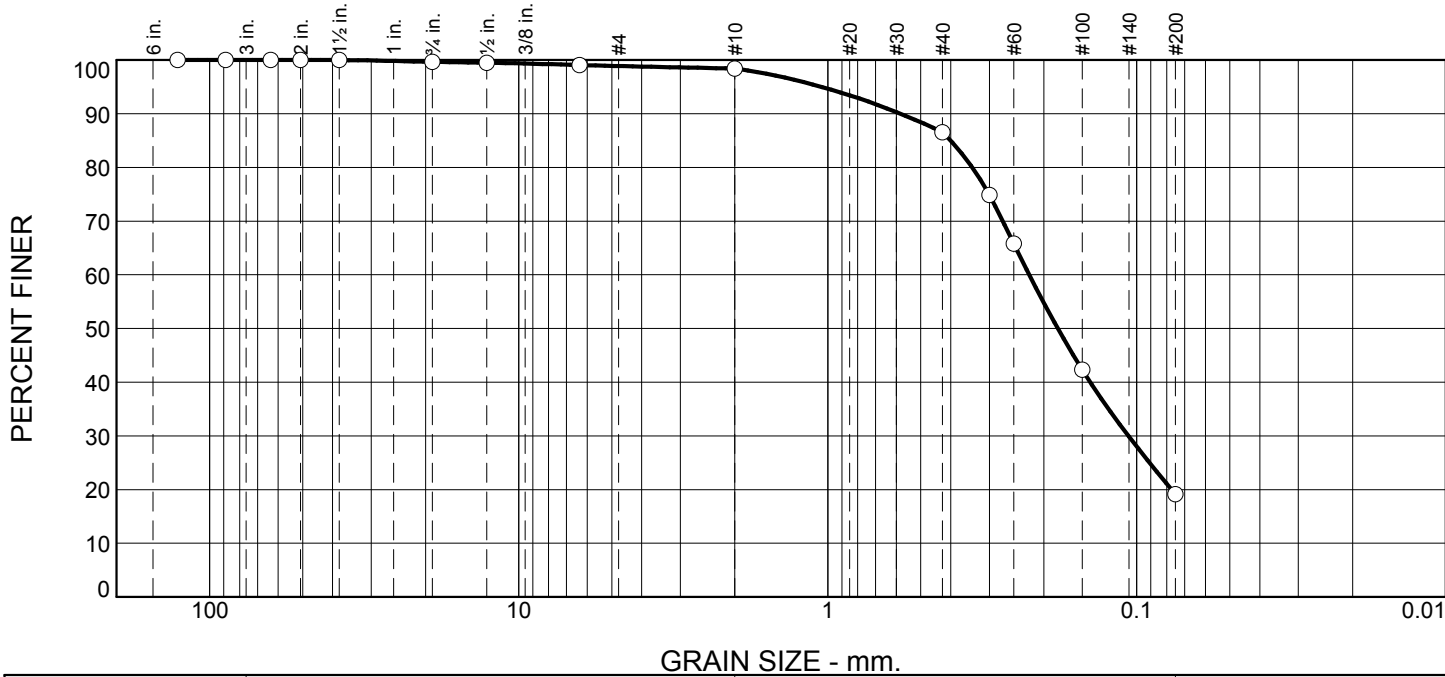
Project: Handel Road - Maple Street to Cul De Sac

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 200' S of Canterbury Street, 7' off NB lane curb;
Sample Number: SUBGRADE **Depth:** 16.5

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 11 | 68 | 19 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 99 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 87 | 5 - 25 | X |
| #50 | 75 | | |
| #60 | 66 | | |
| #100 | 42 | 0 - 10 | X |
| #200 | 19 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.4003 D₆₀= 0.2226 D₅₀= 0.1799
D₃₀= 0.1064 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 3" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

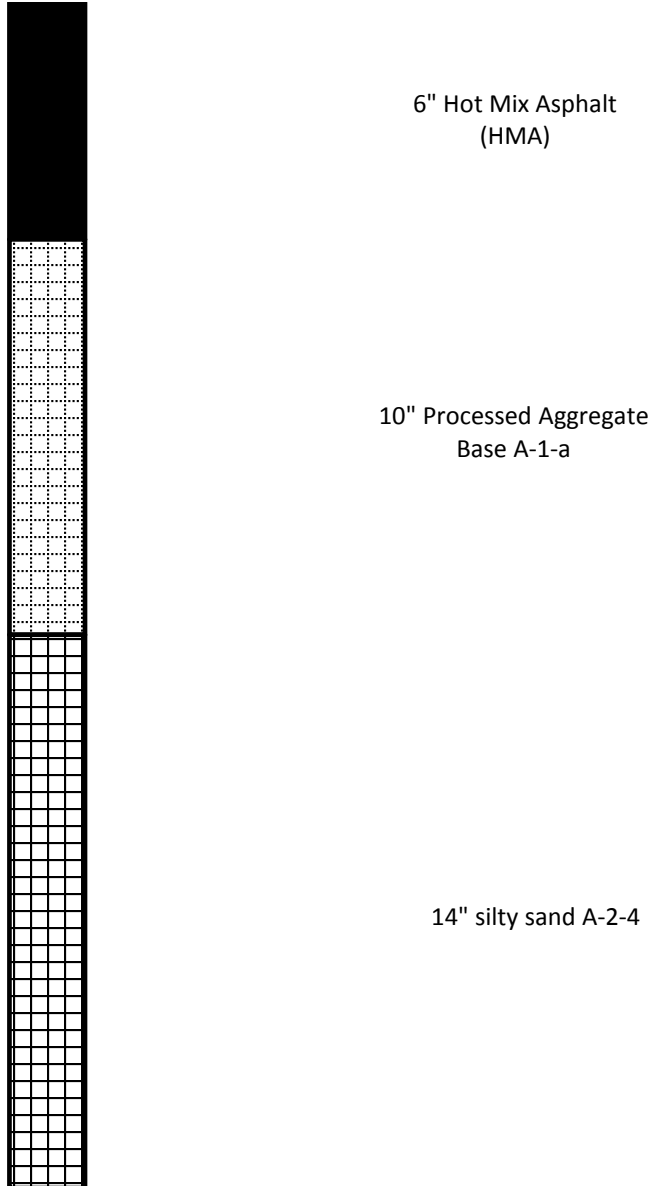


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Handel Road - Maple Street to Cul De Sac
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP3 - 250' N of Canterbury Street, 4' off SB lane curb;



6" Hot Mix Asphalt
(HMA)

10" Processed Aggregate
Base A-1-a

14" silty sand A-2-4

Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Handel Road - Maple Street to Cul De Sac

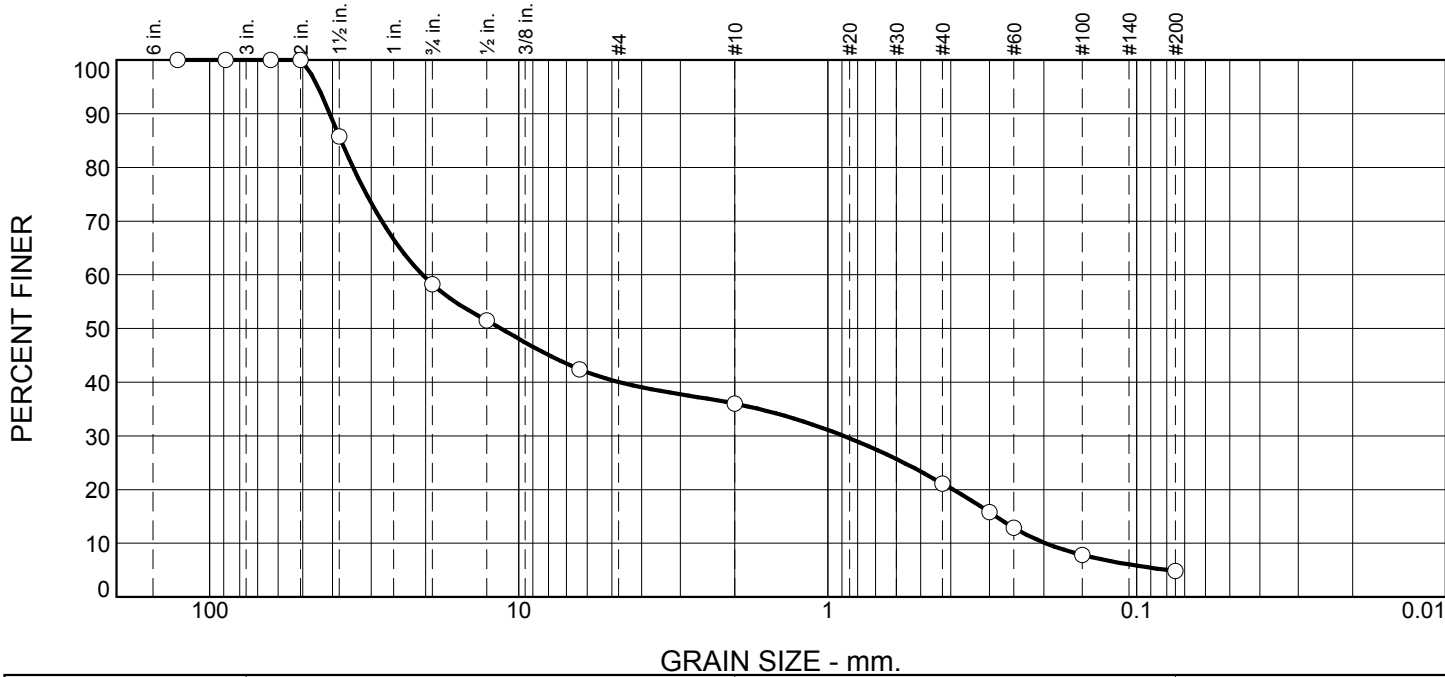
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 250' N of Canterbury Street, 4' off SB lane curb;
Sample Number: BASE

Depth: 10

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 64 | 15 | 16 | 5 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 86 | | |
| 3/4" | 58 | 50 - 75 | |
| 1/2" | 51 | | |
| 1/4" | 42 | 25 - 45 | |
| #10 | 36 | | |
| #40 | 21 | 5 - 20 | X |
| #50 | 16 | | |
| #60 | 13 | | |
| #100 | 8 | 2 - 12 | |
| #200 | 4.8 | | |

Material Description

Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 37.6141 D₆₀= 20.5067 D₅₀= 11.4417
 D₃₀= 0.8900 D₁₅= 0.2857 D₁₀= 0.1970
 C_u= 104.10 C_c= 0.20

Classification

USCS= GP AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Handel Road - Maple Street to Cul De Sac

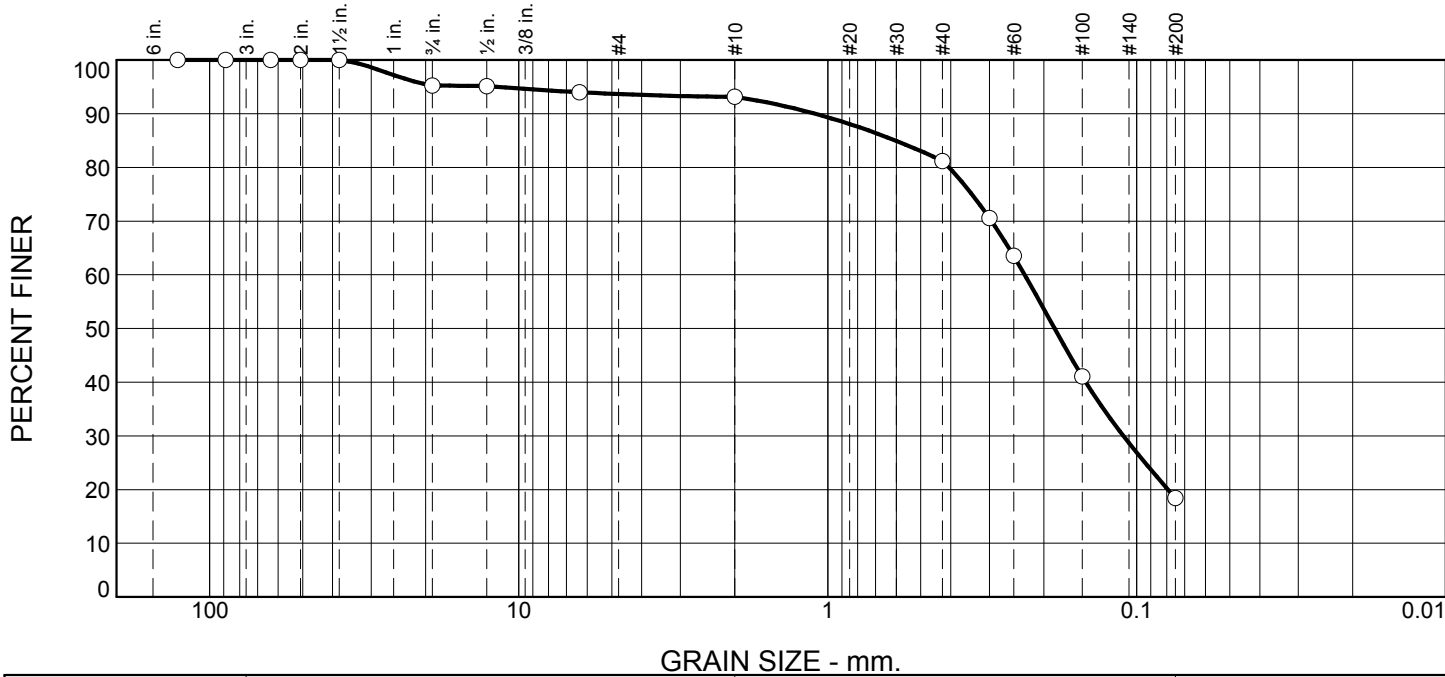
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 250' N of Canterbury Street, 4' off SB lane curb;
Sample Number: SUBGRADE

Depth: 14

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 7 | 12 | 63 | 18 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 95 | | |
| 1/2" | 95 | | |
| 1/4" | 94 | 25 - 60 | X |
| #10 | 93 | 15 - 45 | X |
| #40 | 81 | 5 - 25 | X |
| #50 | 71 | | |
| #60 | 64 | | |
| #100 | 41 | 0 - 10 | X |
| #200 | 18 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6045 D₆₀= 0.2303 D₅₀= 0.1843
D₃₀= 0.1105 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 4" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

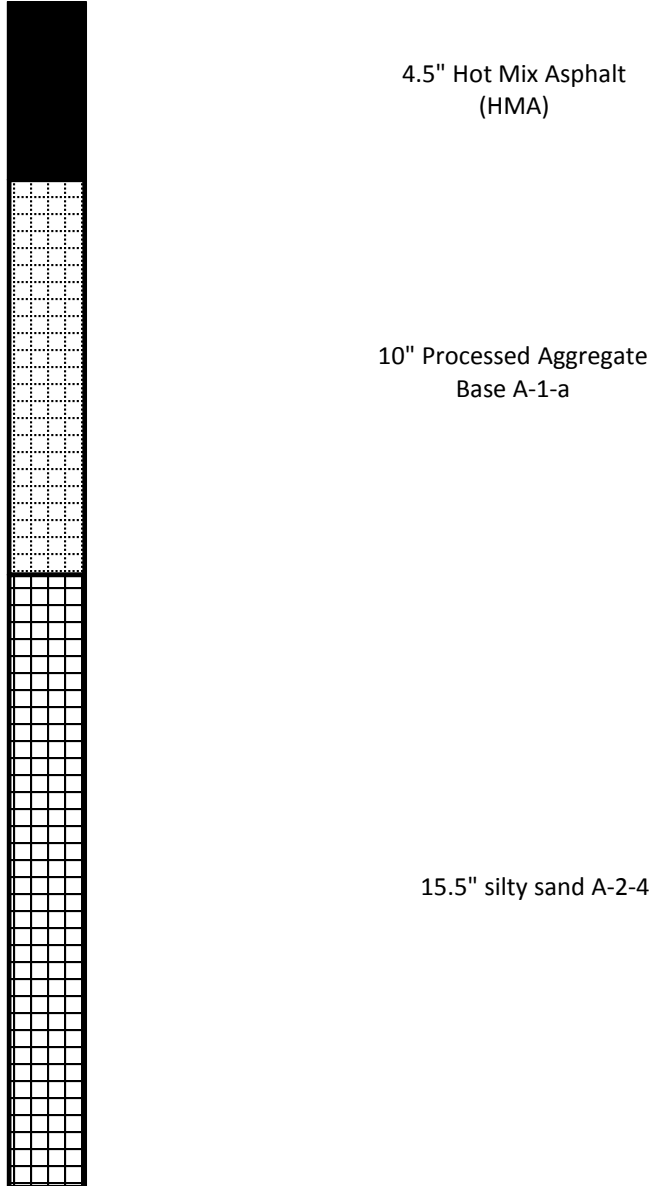


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Handel Road - Maple Street to Cul De Sac
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP4 - 75' N of Evans Avenue (S), 10' off NB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

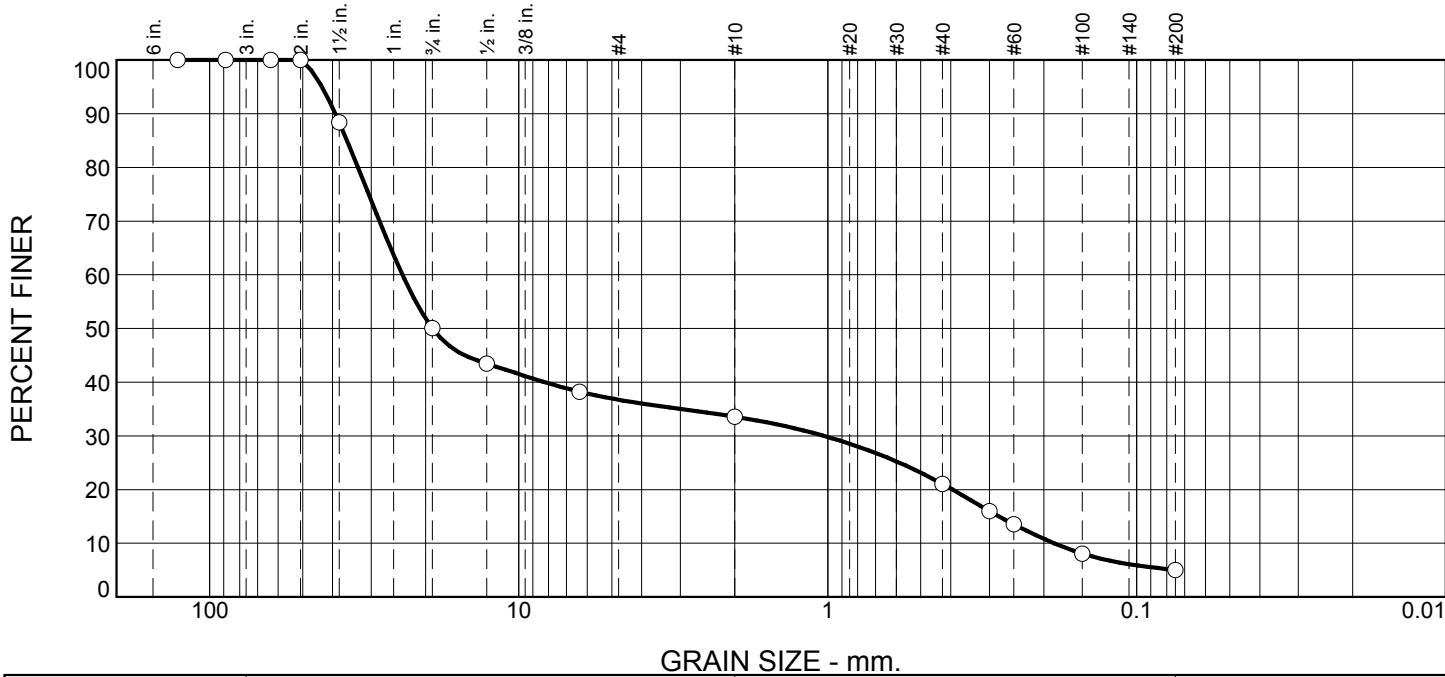
Project: Handel Road - Maple Street to Cul De Sac

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 75' N of Evans Avenue (S), 10' off NB lane curb;
Sample Number: BASE **Depth:** 10

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 66 | 13 | 16 | 5 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 88 | | |
| 3/4" | 50 | 50 - 75 | |
| 1/2" | 43 | | |
| 1/4" | 38 | 25 - 45 | |
| #10 | 34 | | |
| #40 | 21 | 5 - 20 | X |
| #50 | 16 | | |
| #60 | 14 | | |
| #100 | 8 | 2 - 12 | |
| #200 | 5.0 | | |

Material Description

Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 35.9619 D₆₀= 23.8009 D₅₀= 19.0148
D₃₀= 1.0300 D₁₅= 0.2791 D₁₀= 0.1852
C_u= 128.54 C_c= 0.24

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

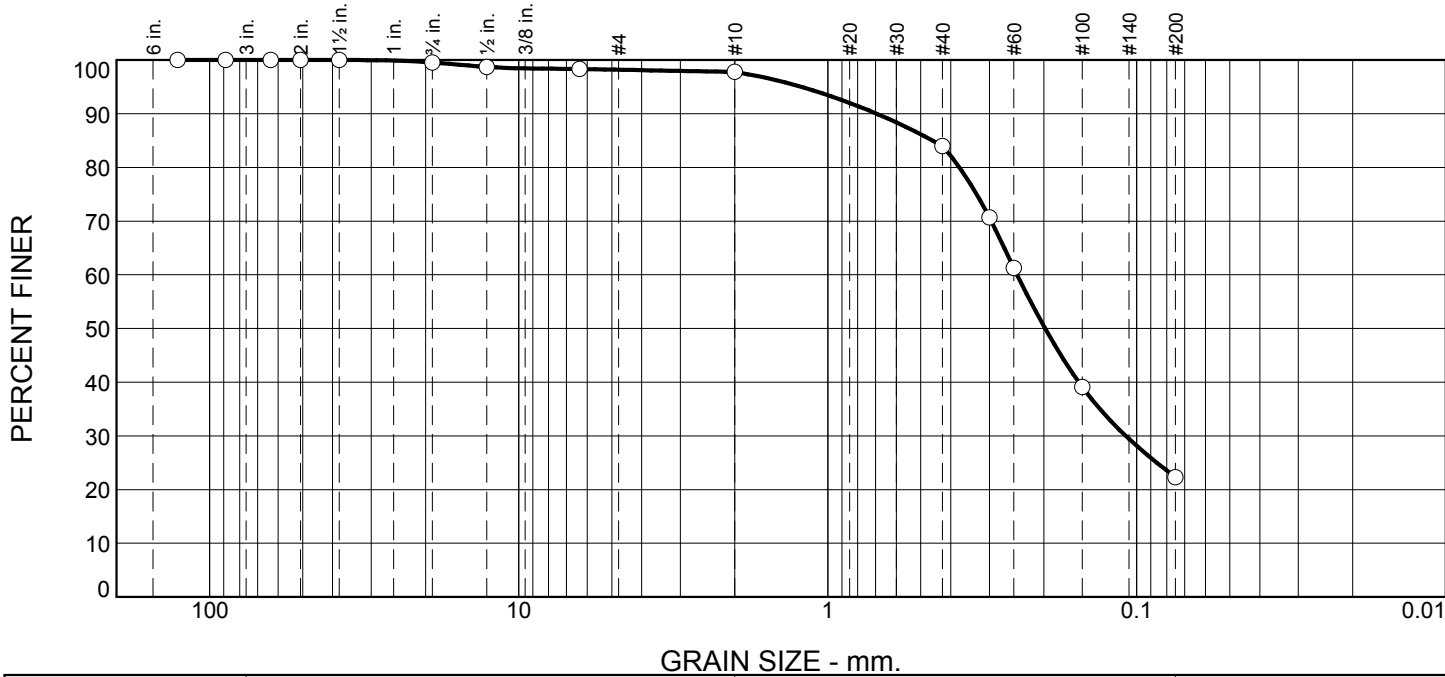
Project: Handel Road - Maple Street to Cul De Sac

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 75' N of Evans Avenue (S), 10' off NB lane curb;
Sample Number: SUBGRADE **Depth:** 15.5

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 14 | 62 | 22 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 99 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 84 | 5 - 25 | X |
| #50 | 71 | | |
| #60 | 61 | | |
| #100 | 39 | 0 - 10 | X |
| #200 | 22 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.4577 D₆₀= 0.2438 D₅₀= 0.1977
D₃₀= 0.1086 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 9" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

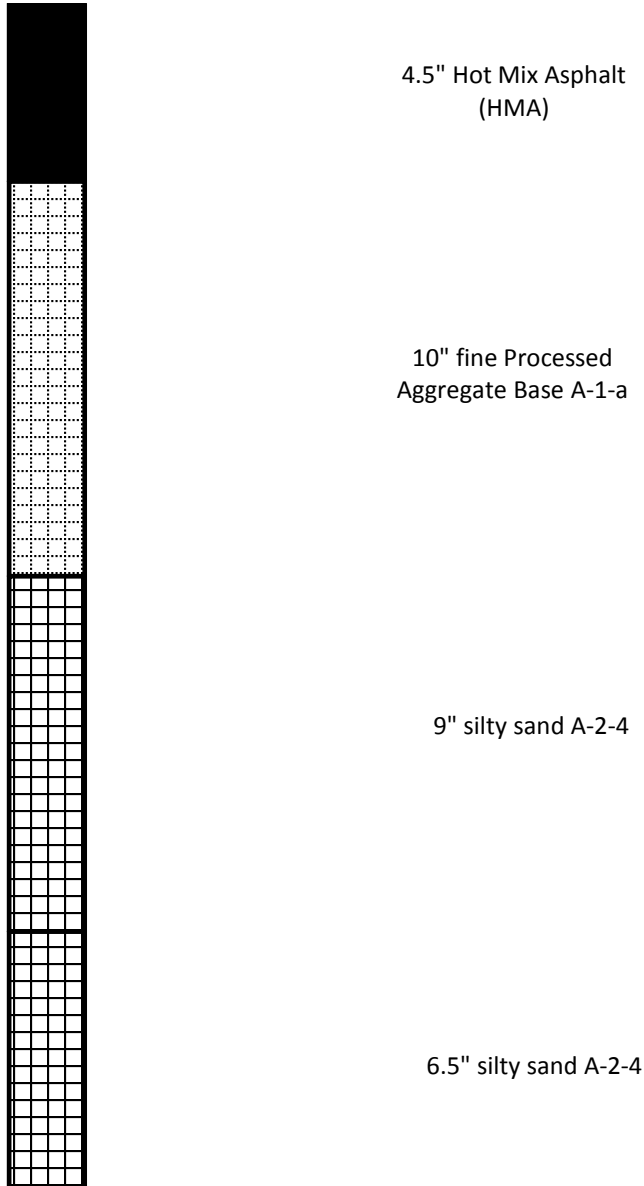


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Handel Road - Maple Street to Cul De Sac
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP5 - 300' S of Woodycrest Drive, 8' off SB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Handel Road - Maple Street to Cul De Sac

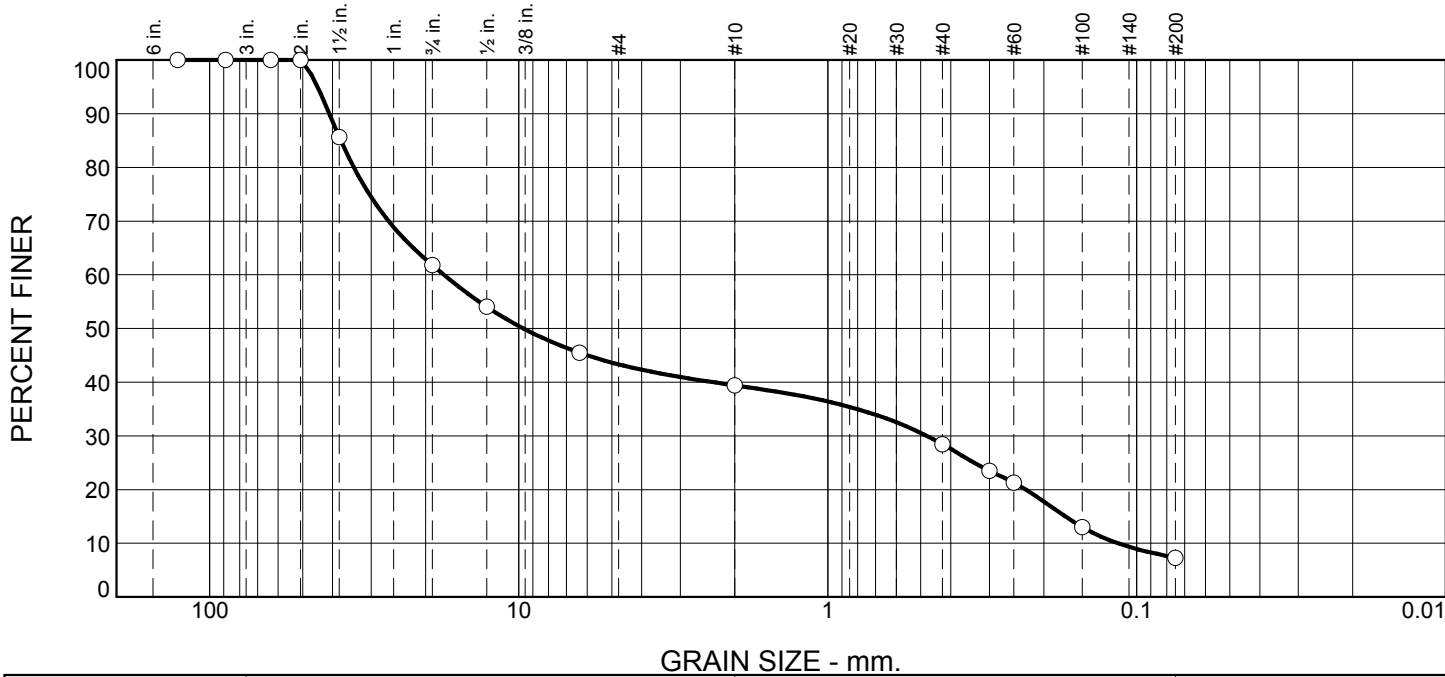
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 300' S of Woodycrest Drive, 8' off SB lane curb;
Sample Number: BASE

Depth: 10

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 61 | 11 | 21 | 7 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 86 | | |
| 3/4" | 62 | 50 - 75 | |
| 1/2" | 54 | | |
| 1/4" | 45 | 25 - 45 | |
| #10 | 39 | | |
| #40 | 28 | 5 - 20 | X |
| #50 | 23 | | |
| #60 | 21 | | |
| #100 | 13 | 2 - 12 | X |
| #200 | 7.3 | | |

Material Description

fine Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 37.6619 D₆₀= 17.4853 D₅₀= 9.6601
D₃₀= 0.4788 D₁₅= 0.1702 D₁₀= 0.1150
C_u= 152.08 C_c= 0.11

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Handel Road - Maple Street to Cul De Sac

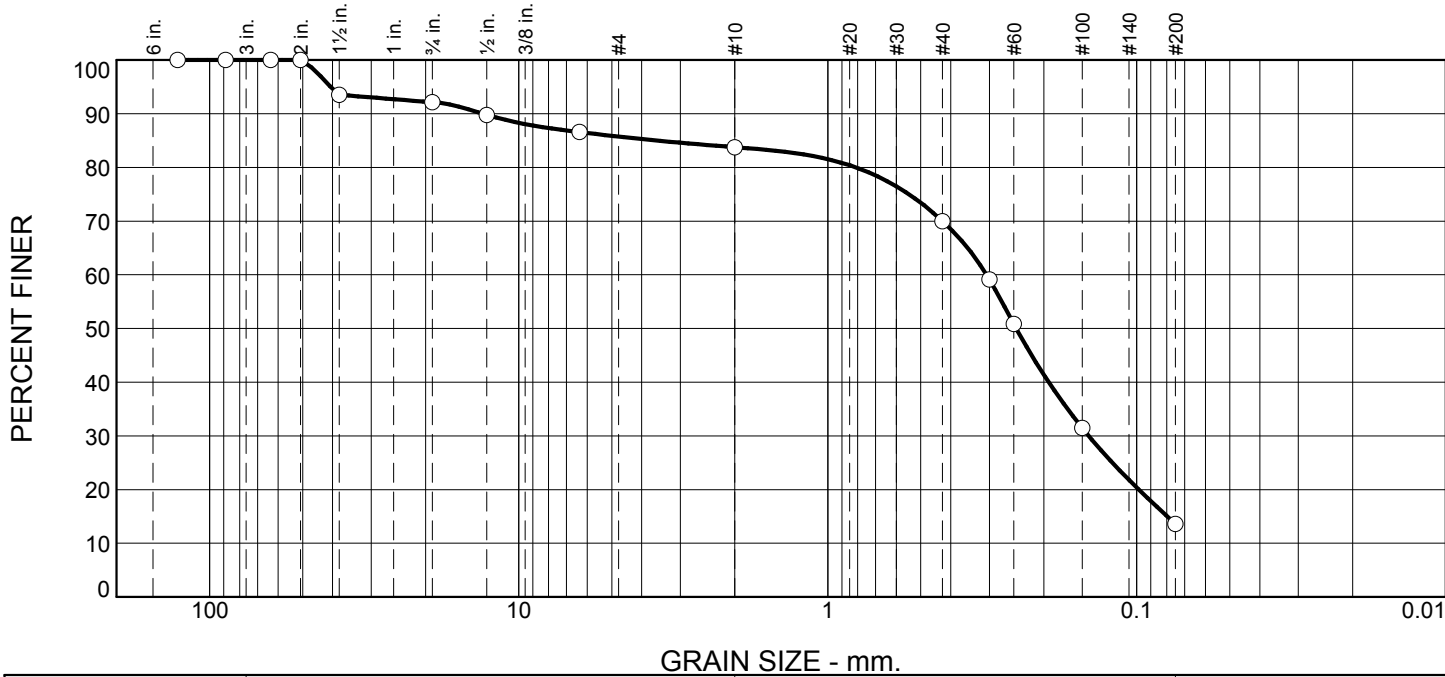
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 300' S of Woodycrest Drive, 8' off SB lane curb;
Sample Number: SUBBASE

Depth: 9

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 16 | 14 | 56 | 14 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 94 | 55 - 100 | |
| 3/4" | 92 | | |
| 1/2" | 90 | | |
| 1/4" | 87 | 25 - 60 | X |
| #10 | 84 | 15 - 45 | X |
| #40 | 70 | 5 - 25 | X |
| #50 | 59 | | |
| #60 | 51 | | |
| #100 | 31 | 0 - 10 | X |
| #200 | 14 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 3.5521 D₆₀= 0.3065 D₅₀= 0.2455
D₃₀= 0.1430 D₁₅= 0.0797 D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Handel Road - Maple Street to Cul De Sac

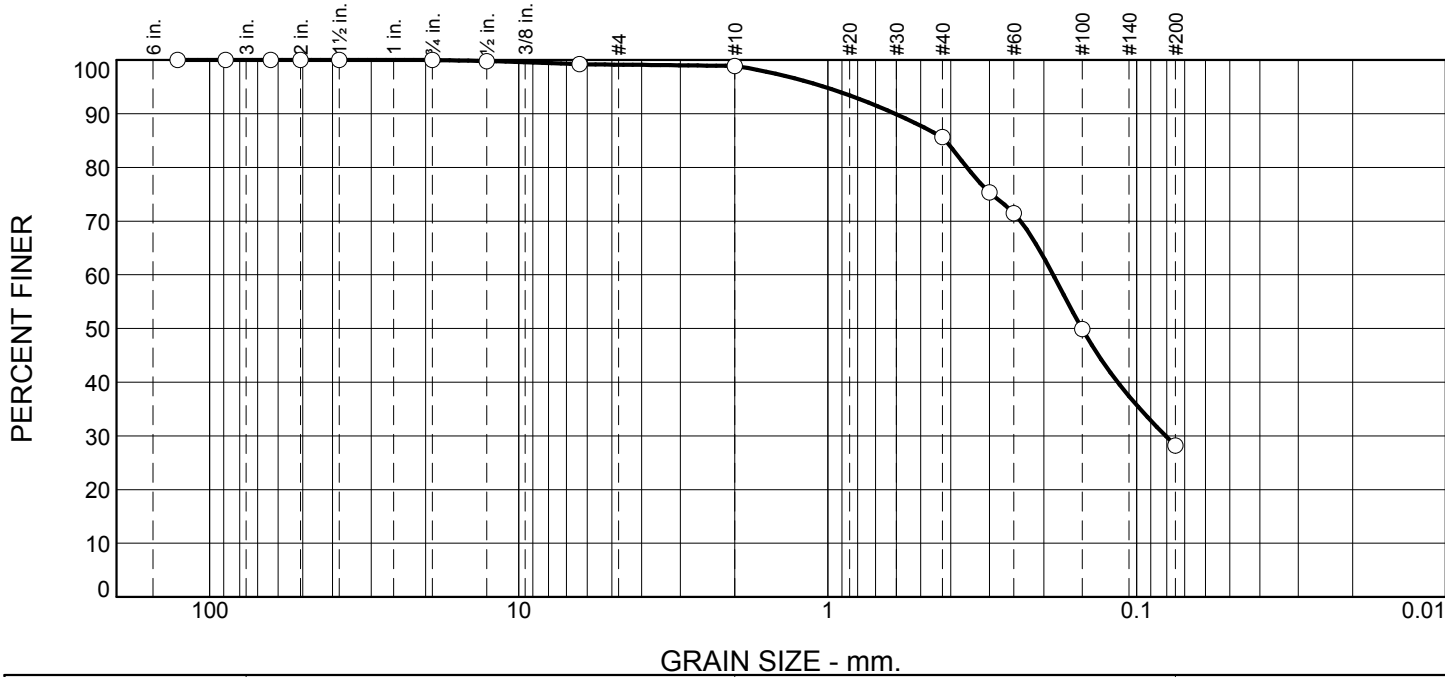
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 300' S of Woodycrest Drive, 8' off SB lane curb;
Sample Number: SUBGRADE

Depth: 6.5

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 1 | 13 | 58 | 28 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 99 | 15 - 45 | X |
| #40 | 86 | 5 - 25 | X |
| #50 | 75 | | |
| #60 | 71 | | |
| #100 | 50 | 0 - 10 | X |
| #200 | 28 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.4157 D₆₀= 0.1863 D₅₀= 0.1504
D₃₀= 0.0806 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 10" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

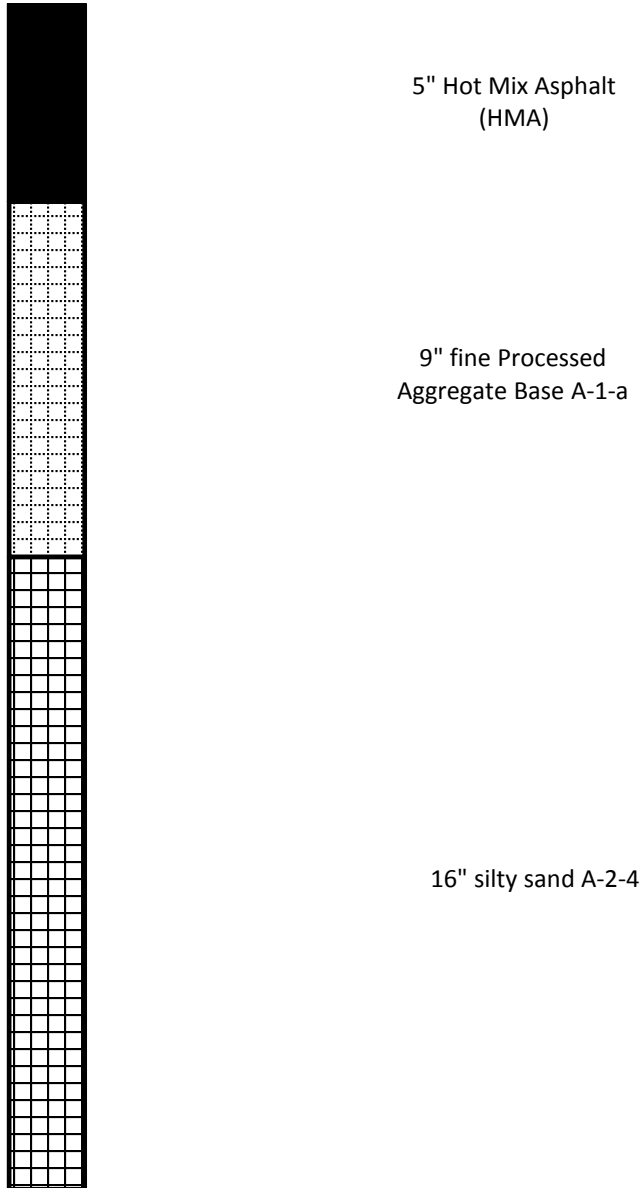


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Handel Road - Maple Street to Cul De Sac
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP6 - 200' N of Woodycrest Drive, 5' off NB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Handel Road - Maple Street to Cul De Sac

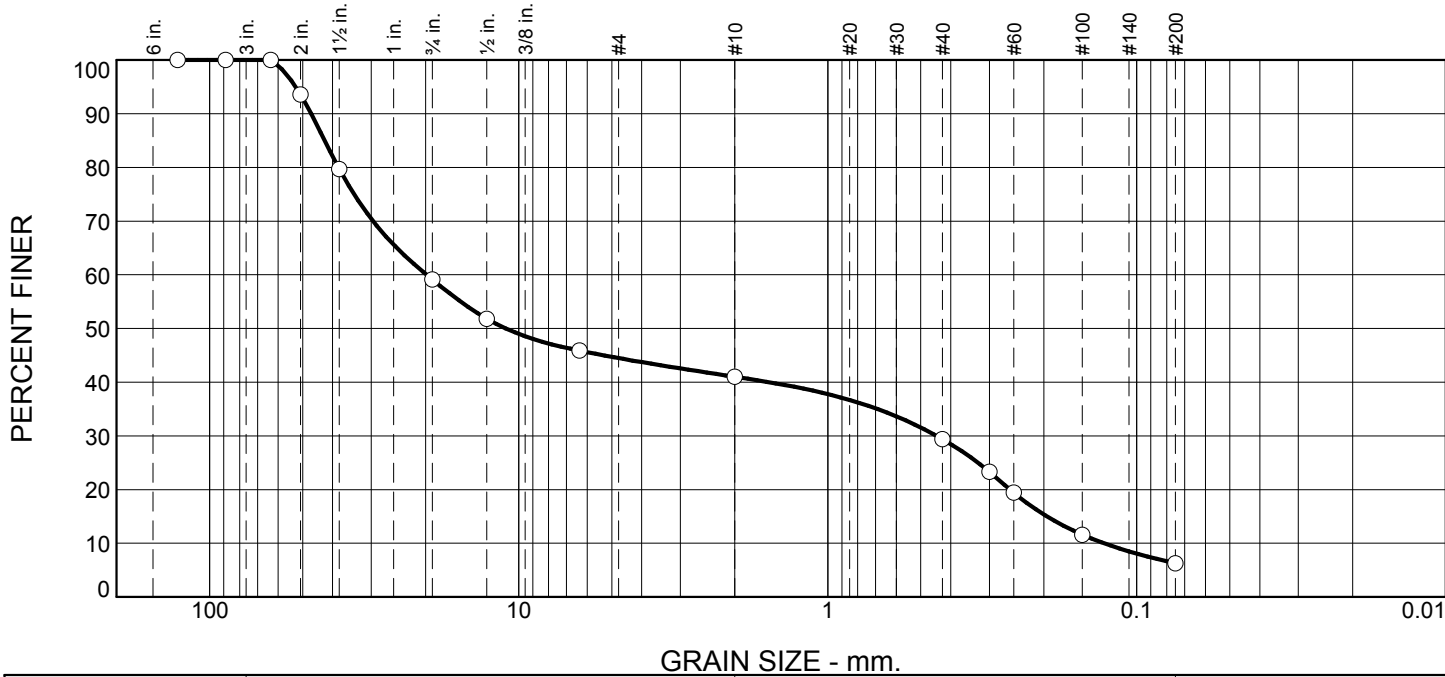
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP6 - 200' N of Woodycrest Drive, 5' off NB lane curb;
Sample Number: BASE

Depth: 9

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 59 | 12 | 23 | 6 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 94 | 95 - 100 | X |
| 1-1/2" | 80 | | |
| 3/4" | 59 | 50 - 75 | |
| 1/2" | 52 | | |
| 1/4" | 46 | 25 - 45 | X |
| #10 | 41 | | |
| #40 | 29 | 5 - 20 | X |
| #50 | 23 | | |
| #60 | 19 | | |
| #100 | 12 | 2 - 12 | |
| #200 | 6.2 | | |

Material Description

fine Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 42.4497 D₆₀= 19.8893 D₅₀= 11.0306
D₃₀= 0.4445 D₁₅= 0.1951 D₁₀= 0.1277
C_u= 155.79 C_c= 0.08

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

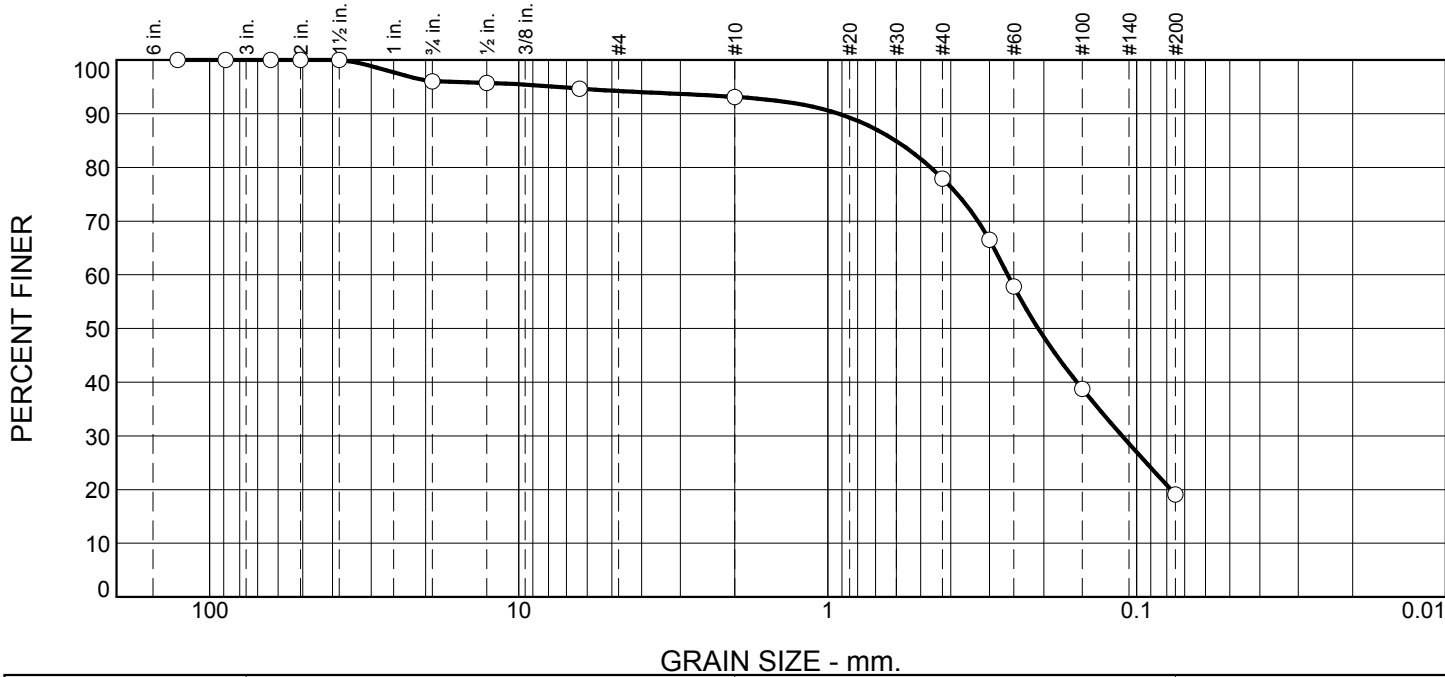
Project: Handel Road - Maple Street to Cul De Sac

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP6 - 200' N of Woodycrest Drive, 5' off NB lane curb;
Sample Number: SUBGRADE **Depth:** 16

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 7 | 15 | 59 | 19 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 96 | | |
| 1/2" | 96 | | |
| 1/4" | 95 | 25 - 60 | X |
| #10 | 93 | 15 - 45 | X |
| #40 | 78 | 5 - 25 | X |
| #50 | 66 | | |
| #60 | 58 | | |
| #100 | 39 | 0 - 10 | X |
| #200 | 19 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6046 D₆₀= 0.2617 D₅₀= 0.2083
D₃₀= 0.1115 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 6" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

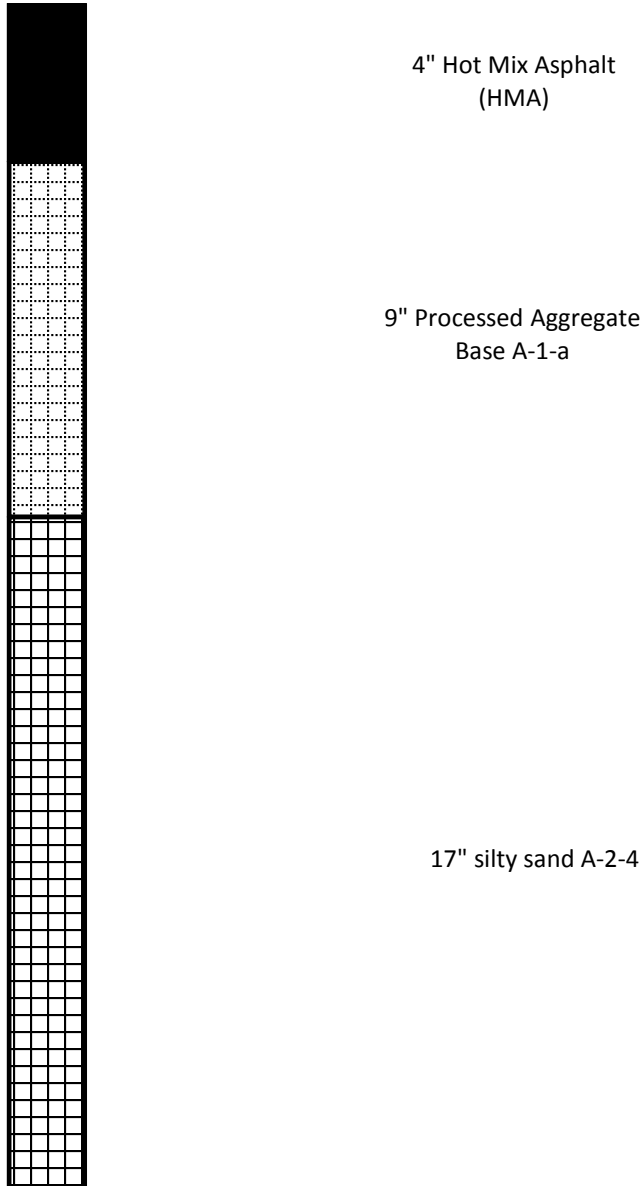


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Handel Road - Maple Street to Cul De Sac
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP7 - 220' N of Evans Avenue (N), 12' off SB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

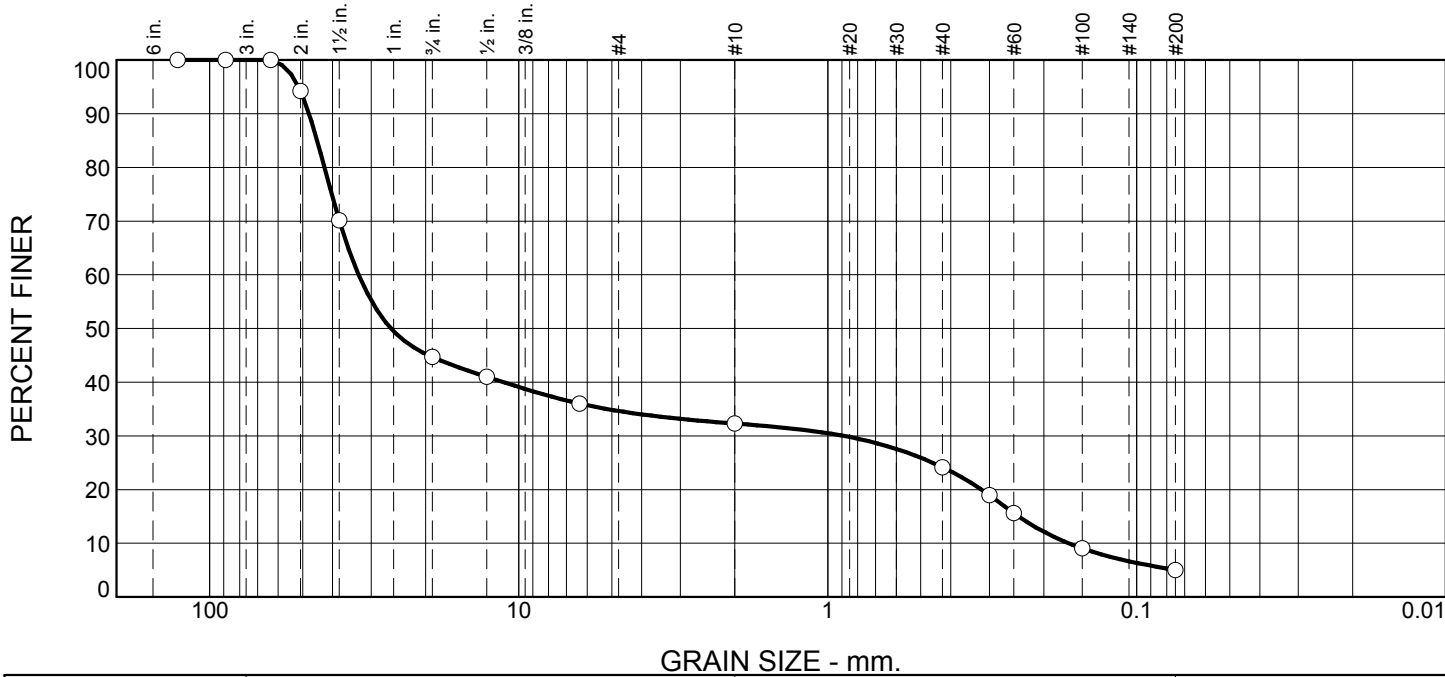
Project: Handel Road - Maple Street to Cul De Sac

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP7 - 220' N of Evans Avenue (N), 12' off SB lane curb;
Sample Number: BASE **Depth:** 9

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 68 | 8 | 19 | 5 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 94 | 95 - 100 | X |
| 1-1/2" | 70 | | |
| 3/4" | 45 | 50 - 75 | X |
| 1/2" | 41 | | |
| 1/4" | 36 | 25 - 45 | |
| #10 | 32 | | |
| #40 | 24 | 5 - 20 | X |
| #50 | 19 | | |
| #60 | 16 | | |
| #100 | 9 | 2 - 12 | |
| #200 | 5.0 | | |

Material Description

Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 44.9163 D₆₀= 32.9784 D₅₀= 25.9117
D₃₀= 0.8885 D₁₅= 0.2414 D₁₀= 0.1659
C_u= 198.75 C_c= 0.14

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

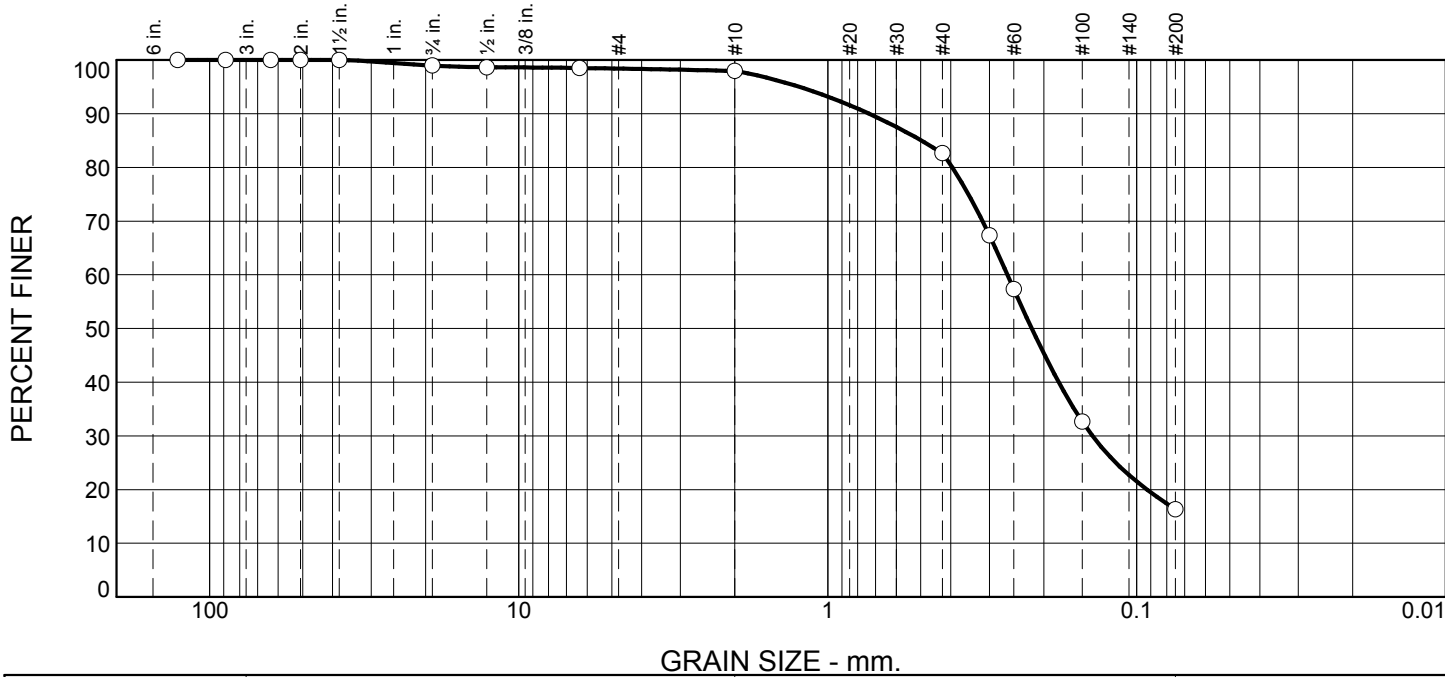
Project: Handel Road - Maple Street to Cul De Sac

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP7 - 220' N of Evans Avenue (N), 12' off SB lane curb;
Sample Number: SUBGRADE **Depth:** 17

Date: 07/30/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 15 | 67 | 16 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 99 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 83 | 5 - 25 | X |
| #50 | 67 | | |
| #60 | 57 | | |
| #100 | 33 | 0 - 10 | X |
| #200 | 16 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.4979 D₆₀= 0.2622 D₅₀= 0.2184
D₃₀= 0.1390 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 9" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

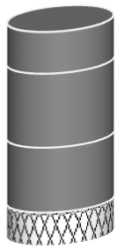
LOCATION: Handel Road, East Hartford, CT

DATE SAMPLED: Thursday, August 02, 2018

FROM: Maple Street

TO: Cul de sac

CORE#: 1 **Area:** 100' N of Maple St., NB lane 5' off curb;



DEPTH

Layer
1.13"
2.01"
1.77"

DEPTH

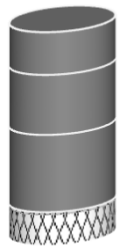
Total
4.91"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 2 **Area:** 200' N of Maple St., NB lane 12' off curb;



DEPTH

Layer
1.25"
1.76"
2.28"

DEPTH

Total
5.29"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 3 **Area:** 50' S of Norwich Ln., SB lane 16' off curb;



DEPTH

Layer
2.05"
2.45"

DEPTH

Total
4.50"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 4 **Area:** 50' N of Norwich Ln., SB lane 4' off curb;



DEPTH

Layer
1.50"
2.44"

DEPTH

Total
3.94"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

Jose R Otero Jr.
Jose R. Otero Jr., Project Manager

100 Great Meadow Road

Suite 200

Engineers | Scientists | Planners | Designers

Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570

CORE PROFILE

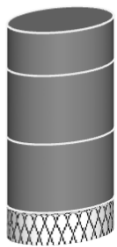
page 2



LOCATION: Handel Road, East Hartford, CT
DATE SAMPLED: August 2, 2018

FROM: Maple Street
TO: Cul de sac

CORE#: 5 **Area:** 50' N of Suffolk Dr., NB lane 7' off curb *in utility patch;



DEPTH
Layer
1.22"
1.95"
1.95"

DEPTH
Total
5.12"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Sandy Gravel

CORE#: 6 **Area:** 150' N of Suffolk Dr., NB lane 13' off curb;



DEPTH
Layer
1.99"
2.15"

DEPTH
Total
4.14"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 7 **Area:** 150' S of Canterbury St., SB lane 15' off curb;



DEPTH
Layer
1.77"
2.44"

DEPTH
Total
4.21"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 8 **Area:** 50' S of Canterbury St., SB lane 6' off curb;



DEPTH
Layer
1.83"
2.64"

DEPTH
Total
4.47"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 9 **Area:** 50' N of Canterbury St., NB lane 7' off curb;



DEPTH
Layer
1.33"
3.52"

DEPTH
Total
4.85"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

page 3



LOCATION: Handel Road, East Hartford, CT
DATE SAMPLED: August 2, 2018

FROM: Maple Street
TO: Cul de sac

CORE#: 10 **Area:** 50' N of Handel Ct., NB lane 14' off curb;



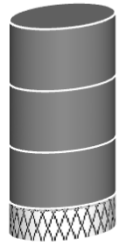
DEPTH
Layer
1.99"
2.48"

DEPTH
Total
4.47"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 11 **Area:** 150' N of Handel Ct., SB lane 12' off curb;



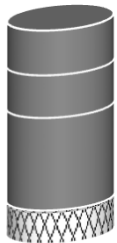
DEPTH
Layer
1.56"
1.55"
1.42"

DEPTH
Total
4.53"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 12 **Area:** 250' N of Handel Ct., SB lane 5' off curb;



DEPTH
Layer
1.22"
1.16"
2.52"

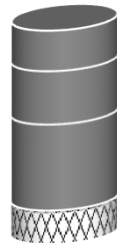
DEPTH
Total
4.90"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Poor bond at 2.38"

Processed Aggregate

CORE#: 13 **Area:** 150' S of Evans Ave. (S), NB lane 5' off curb;



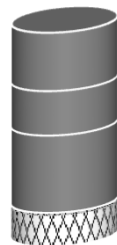
DEPTH
inches
1.33"
1.75"
2.82"

DEPTH
Total
5.90"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 14 **Area:** 50' S of Evans Ave. (S), NB lane 13' off curb;



DEPTH
Layer
1.51"
1.15"
2.00"

DEPTH
Total
4.66"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE PROFILE

page 4



LOCATION: Handel Road, East Hartford, CT
DATE SAMPLED: August 2, 2018

FROM: Maple Street
TO: Cul de sac

CORE#: 15 **Area:** 50' N of Evans Ave. (S), SB lane 14' off curb;



DEPTH
Layer
1.65"
3.32"

DEPTH
Total
4.97"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 16 **Area:** 150' N of Evans Ave. (S), SB lane 5' off curb;



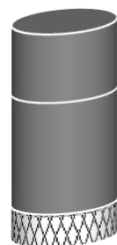
DEPTH
Layer
1.18"
0.87"
3.00"

DEPTH
Total
5.05"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 17 **Area:** 250' N of Evans Ave. (S), NB lane 4' off curb;



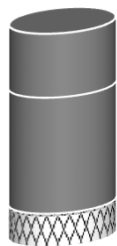
DEPTH
Layer
1.62"
2.65"

DEPTH
Total
4.27"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 18 **Area:** 350' N of Evans Ave. (S), NB lane 11' off curb;



DEPTH
inches
1.43"
2.61"

DEPTH
Total
4.04"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 19 **Area:** 450' N of Evans Ave. (S), SB lane 15' off curb;



DEPTH
Layer
2.13"
2.04"

DEPTH
Total
4.17"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

page 5



LOCATION: Handel Road, East Hartford, CT
DATE SAMPLED: August 2, 2018

FROM: Maple Street
TO: Cul de sac

CORE#: 20 **Area:** 350' S of Woodycrest Dr., SB lane 6' off curb;



DEPTH
Layer
1.86"
2.14"

DEPTH
Total
4.00"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 21 **Area:** 250' S of Woodycrest Dr., NB lane 7' off curb;



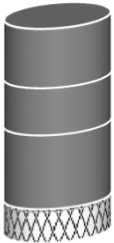
DEPTH
Layer
1.85"
2.28"

DEPTH
Total
4.13"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 22 **Area:** 150' S of Woodycrest Dr., NB lane 16' off curb;



DEPTH
Layer
2.11"
1.68"
2.64"

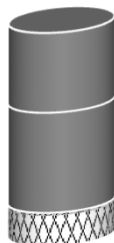
DEPTH
Total
6.43"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Poor bond at 2.11"

Processed Aggregate

CORE#: 23 **Area:** 50' S of Woodycrest Dr., SB lane 13' off curb;



DEPTH
Layer
1.49"
1.88"

DEPTH
Total
3.37"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 24 **Area:** 50' of Woodycrest Dr., SB lane 4' off curb;



DEPTH
Layer
1.65"
2.34"

DEPTH
Total
3.99"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

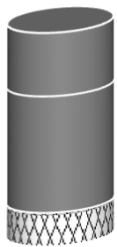
page 6



LOCATION: Handel Road, East Hartford, CT
DATE SAMPLED: August 2, 2018

FROM: Maple Street
TO: Cul de sac

CORE#: 25 **Area:** 150' N of Woodycrest Dr., NB lane 6' off curb;



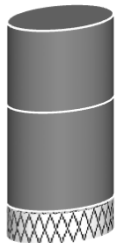
DEPTH
Layer
1.48"
2.73"

DEPTH
Total
4.21"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 26 **Area:** 250' N of Woodycrest Dr., NB lane 16' off curb;



DEPTH
Layer
1.85"
2.25"

DEPTH
Total
4.10"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 27 **Area:** 200' S of Evans Ave. (N), SB lane 12' off curb;



DEPTH
Layer
1.98"
3.10"

DEPTH
Total
5.08"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 28 **Area:** 100' S of Evans Ave. (N), SB lane 10' off curb;



DEPTH
Layer
1.66"
2.63"

DEPTH
Total
4.29"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 29 **Area:** Intersection of Evans Ave. (N), NB lane 7' off curb;



DEPTH
Layer
1.93"
2.67"

DEPTH
Total
4.60"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

page 7



LOCATION: Handel Road, East Hartford, CT
 DATE SAMPLED: August 2, 2018

FROM: Maple Street
 TO: Cul de sac

CORE#: 30 **Area:** 100' N of Evans Ave. (N), NB lane 15' off curb;



DEPTH
 Layer
 2.07"
 2.04"

DEPTH
 Total
 4.11"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 31 **Area:** 200' N of Evans Ave. (N), SB lane 10' off curb;



DEPTH
 Layer
 2.28"
 2.80"

DEPTH
 Total
 5.08"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 32 **Area:** 300' N of Evans Ave. (N), SB lane 5' off curb;



DEPTH
 Layer
 1.95"
 2.93"

DEPTH
 Total
 4.88"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate



To: Bill Anderson, PE
VHB/Wethersfield

Date: November 20, 2018

Memorandum

Project #: 42413.00

From: Josh Aldrich

Re: Hollister Drive #1

Following are the recommendations for the design and construction of Hollister Drive #1 from Jefferson Lane to Nassau Lane

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The July 26, 2018 distress level investigation results indicate there is severe alligator and transverse/longitudinal cracking. Moderate pothole patching, distortions and weather/block cracking were noted. There is evidence of extensive surface wear, resulting in a Road Manager Pavement Condition Index (PCI) of 47, eight points less than the 2014 update.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A3 which are classified as uniformly graded sands by the Unified Classification system. The subgrades are fair foundations when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 1000 vehicles per day with small trucks and buses accounting for 2% of the ADT. The ADT is based on an average of 10 trips per household per day. The 20-year design Equivalent Single Axle Loads (ESALs) was estimated to be 62,600.

Jefferson Lane to Nassau Lane:

- The existing pavement structure cross-section consisted of 3.1" of hot mix asphalt (HMA) on 5" to 12" of "fine" processed aggregate base which is founded on uniformly graded sand subbases/subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a minimum of 1.5" overlay to meet Elastic Layer Design, which is NOT recommended.
- MILL AND OVERLAY is not recommended as a treatment alternative due to severe alligator cracking and inadequate support from the existing pavement.

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
P 860.807.4300

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|---|
| #1 | 20-years | RECLAIM the existing HMA and processed aggregate bases by pulverization and blending methods to a 9" depth. Compact the recycled material to proper lines and grades, leaving a minimum of 6" as the new base course prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #2 | 20-years | REMOVE the existing 3.1" of HMA, fine grade, then compact to proper lines, prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |

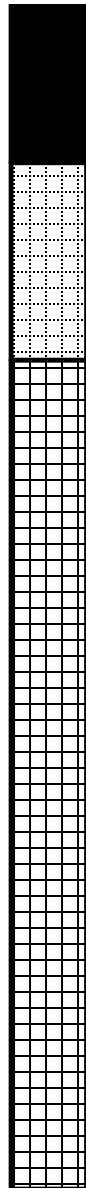


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Hollister Drive (#1) - Jefferson Lane to Nassau Lane
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP#1 - 15' W of Jefferson Lane (S), 15' off WB lane curb;



4" Hot Mix Asphalt
(HMA)

5" silty gravel with sand
A-1-b

21" poorly graded sand
with silt - A-2-4

Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

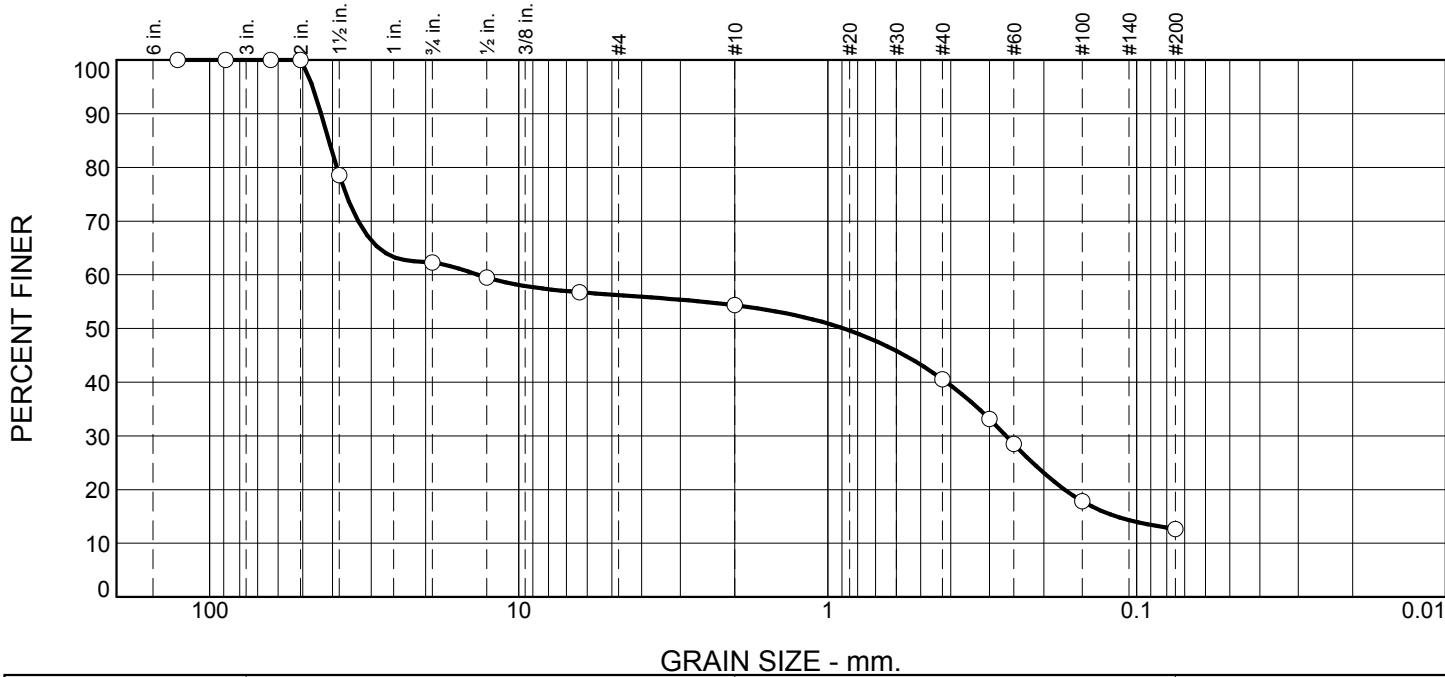
Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#1 - 15' W of Jefferson Lane (S), 15' off WB lane curb;
Sample Number: BASE **Depth:** 5

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 46 | 13 | 28 | 13 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 79 | | |
| 3/4" | 62 | 50 - 75 | |
| 1/2" | 60 | | |
| 1/4" | 57 | 25 - 45 | X |
| #10 | 54 | | |
| #40 | 41 | 5 - 20 | X |
| #50 | 33 | | |
| #60 | 28 | | |
| #100 | 18 | 2 - 12 | X |
| #200 | 13 | | |

Material Description

silty gravel with sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 41.1745 D₆₀= 13.5423 D₅₀= 0.8892
D₃₀= 0.2651 D₁₅= 0.1165 D₁₀=
C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

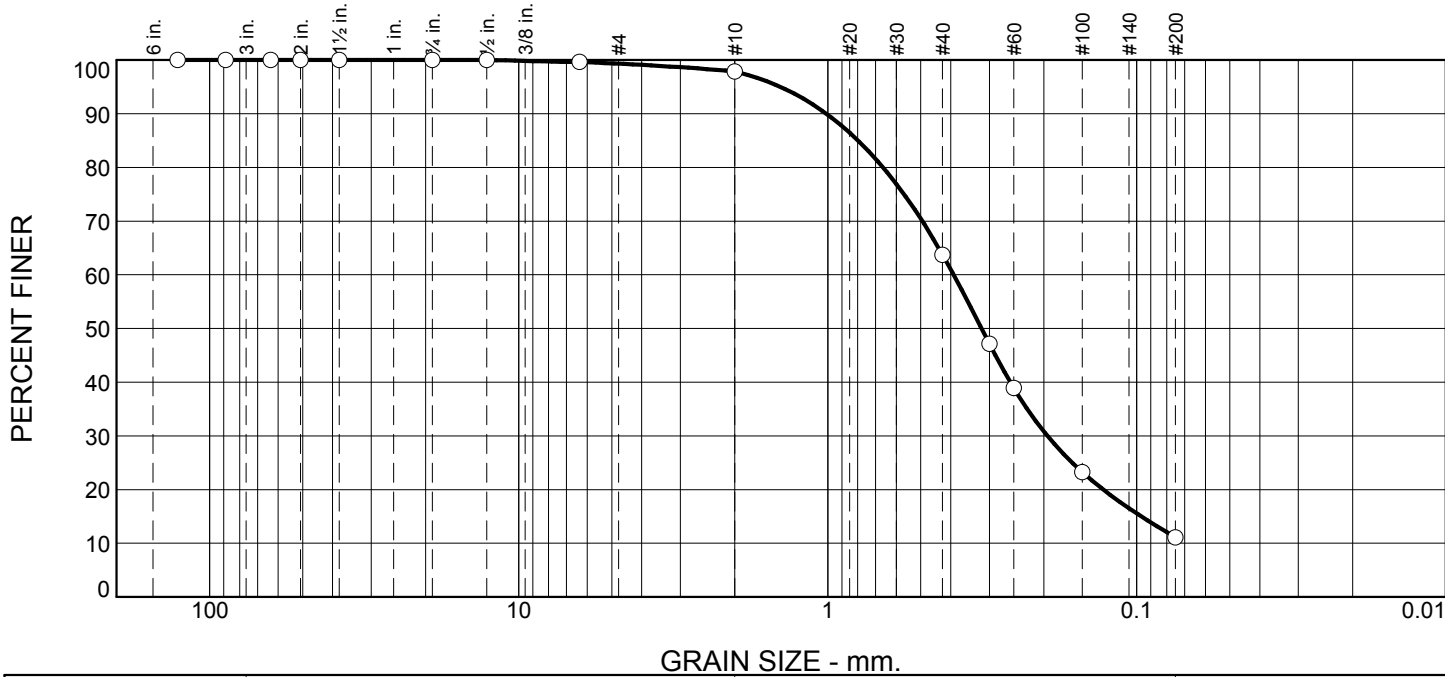
Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#1 - 15' W of Jefferson Lane (S), 15' off WB lane curb;
Sample Number: SUBGRADE **Depth:** 21

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 34 | 53 | 11 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 100 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 64 | 5 - 25 | X |
| #50 | 47 | | |
| #60 | 39 | | |
| #100 | 23 | 0 - 10 | X |
| #200 | 11 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.7990 D₆₀= 0.3917 D₅₀= 0.3182
D₃₀= 0.1945 D₁₅= 0.0966 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-2-4

Remarks

DCP = 5.5" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

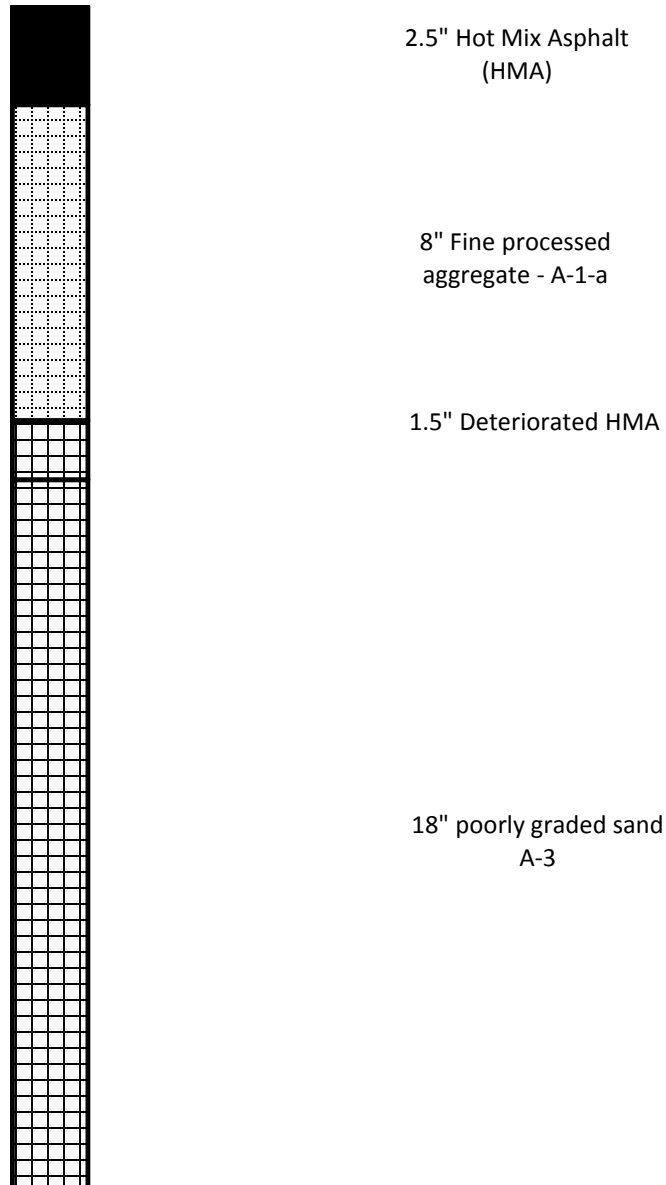


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Hollister Drive (#1) - Jefferson Lane to Nassau Lane
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP#2 - 40' W of Hollister Drive (#2), 5' off EB lane curb;



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

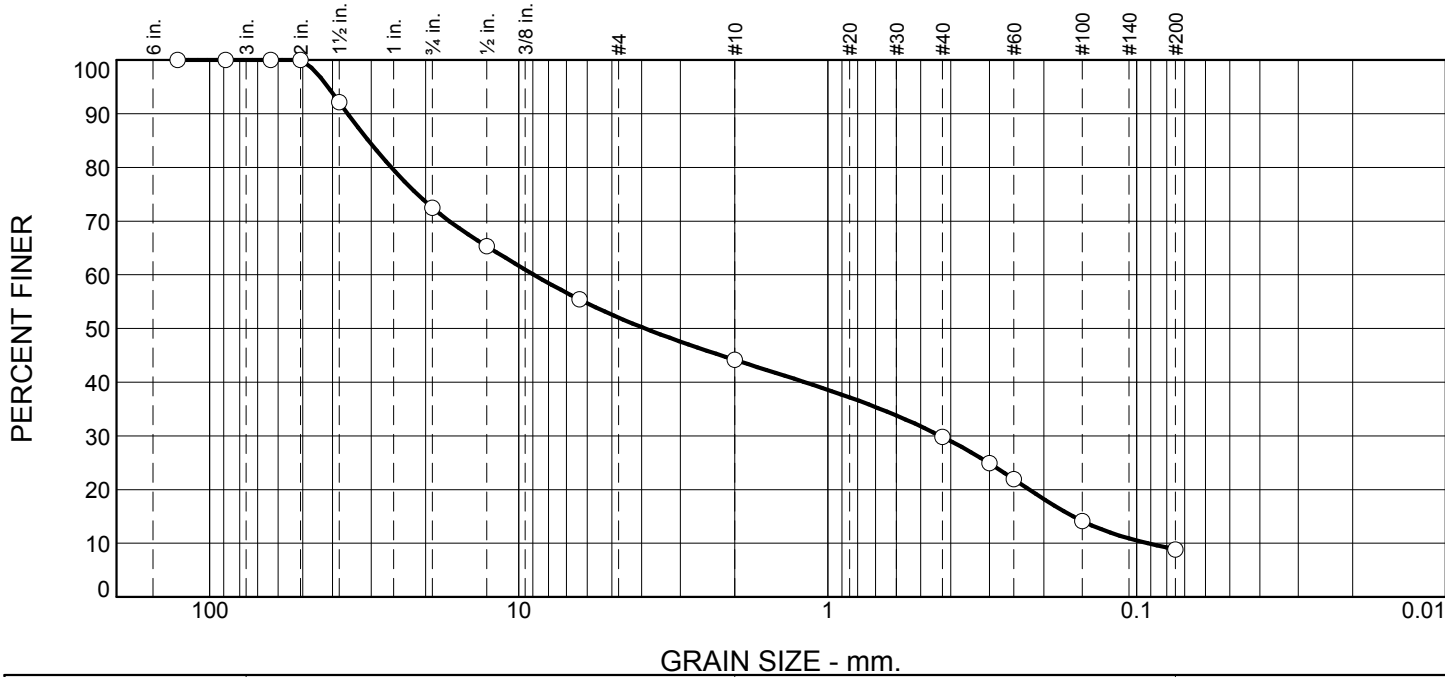
Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#2 - 40' W of Hollister Drive (#2), 5' off EB lane curb;
Sample Number: BASE **Depth:** 8

Date: 7/31/18



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 56 | 14 | 21 | 9 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 92 | | |
| 3/4" | 72 | 50 - 75 | |
| 1/2" | 65 | | |
| 1/4" | 55 | 25 - 45 | X |
| #10 | 44 | | |
| #40 | 30 | 5 - 20 | X |
| #50 | 25 | | |
| #60 | 22 | | |
| #100 | 14 | 2 - 12 | X |
| #200 | 8.8 | | |

Material Description

Fine processed aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 30.6376 D₆₀= 8.9214 D₅₀= 3.8994
D₃₀= 0.4318 D₁₅= 0.1605 D₁₀= 0.0922
C_u= 96.75 C_c= 0.23

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

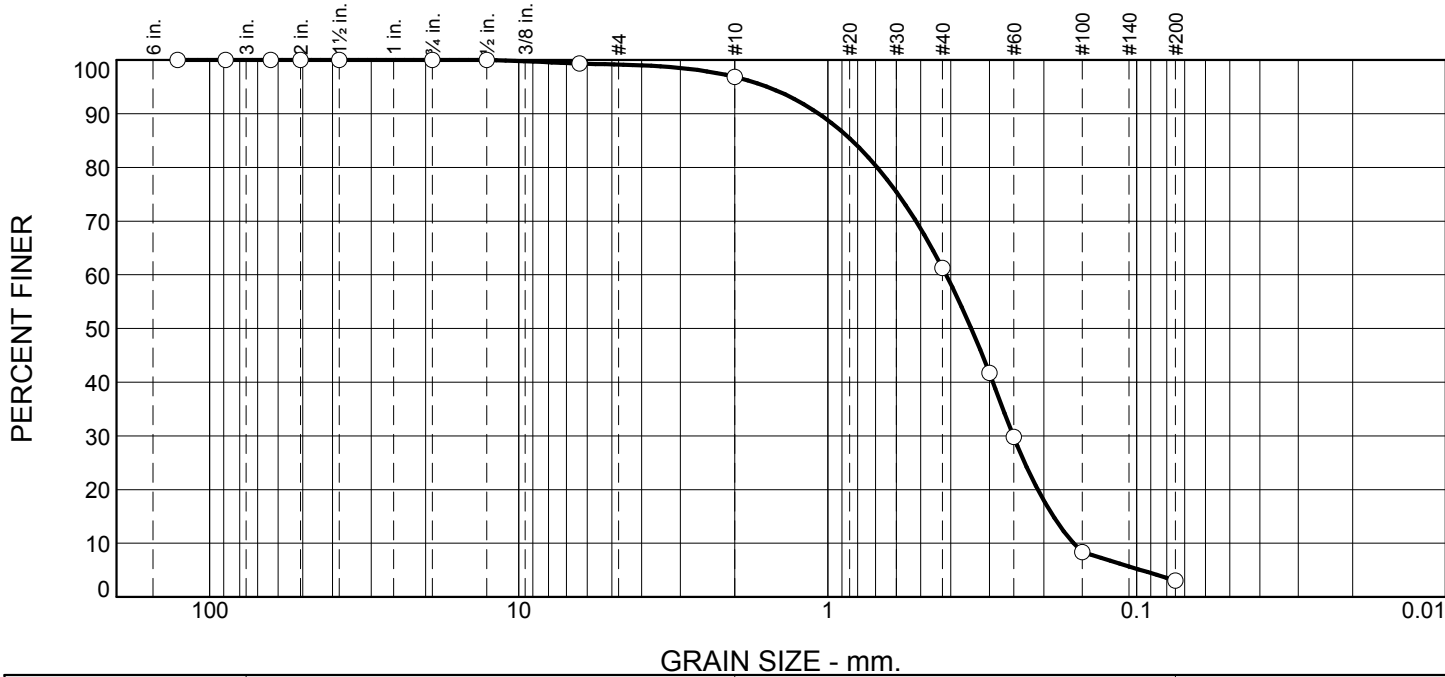
Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#2 - 40' W of Hollister Drive (#2), 5' off EB lane curb;
Sample Number: SUBGRADE **Depth:** 18

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 36 | 58 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 61 | 5 - 25 | X |
| #50 | 42 | | |
| #60 | 30 | | |
| #100 | 8 | 0 - 10 | |
| #200 | 3.0 | 0.0 - 5.0 | |

Material Description

poorly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.8359 D₆₀= 0.4142 D₅₀= 0.3435
D₃₀= 0.2509 D₁₅= 0.1860 D₁₀= 0.1599
C_u= 2.59 C_c= 0.95

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 6" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

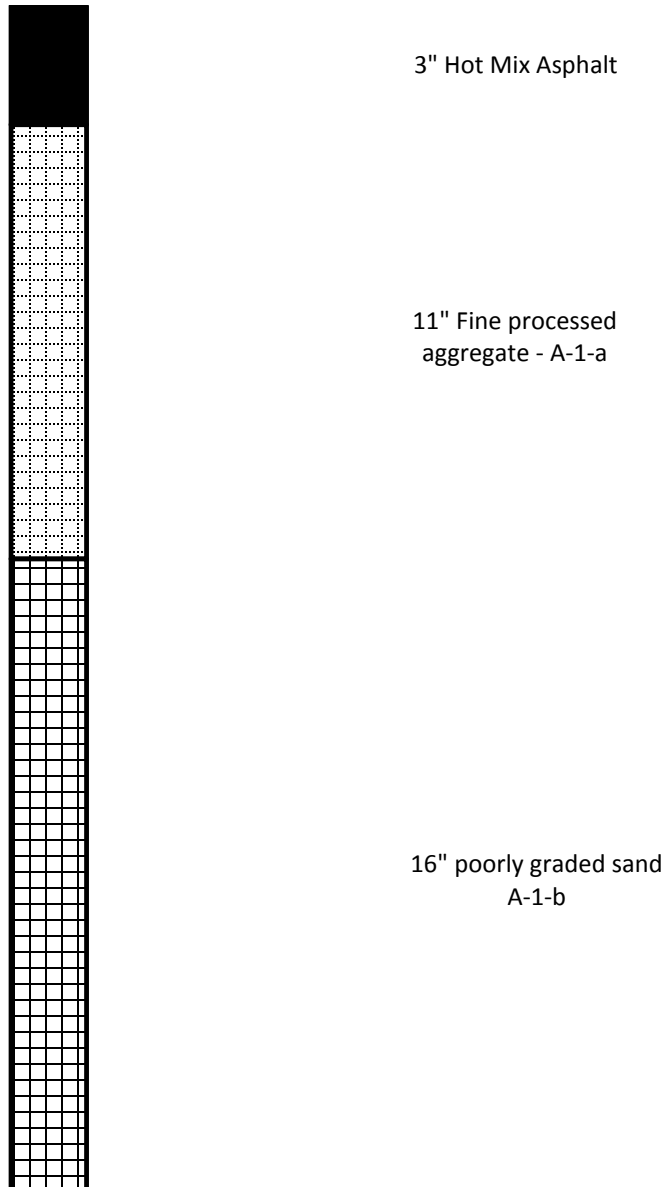


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Hollister Drive (#1) - Jefferson Lane to Nassau Lane
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP#3 - 385' W of Hollister Drive (#2), 6' off WB lane curb;



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

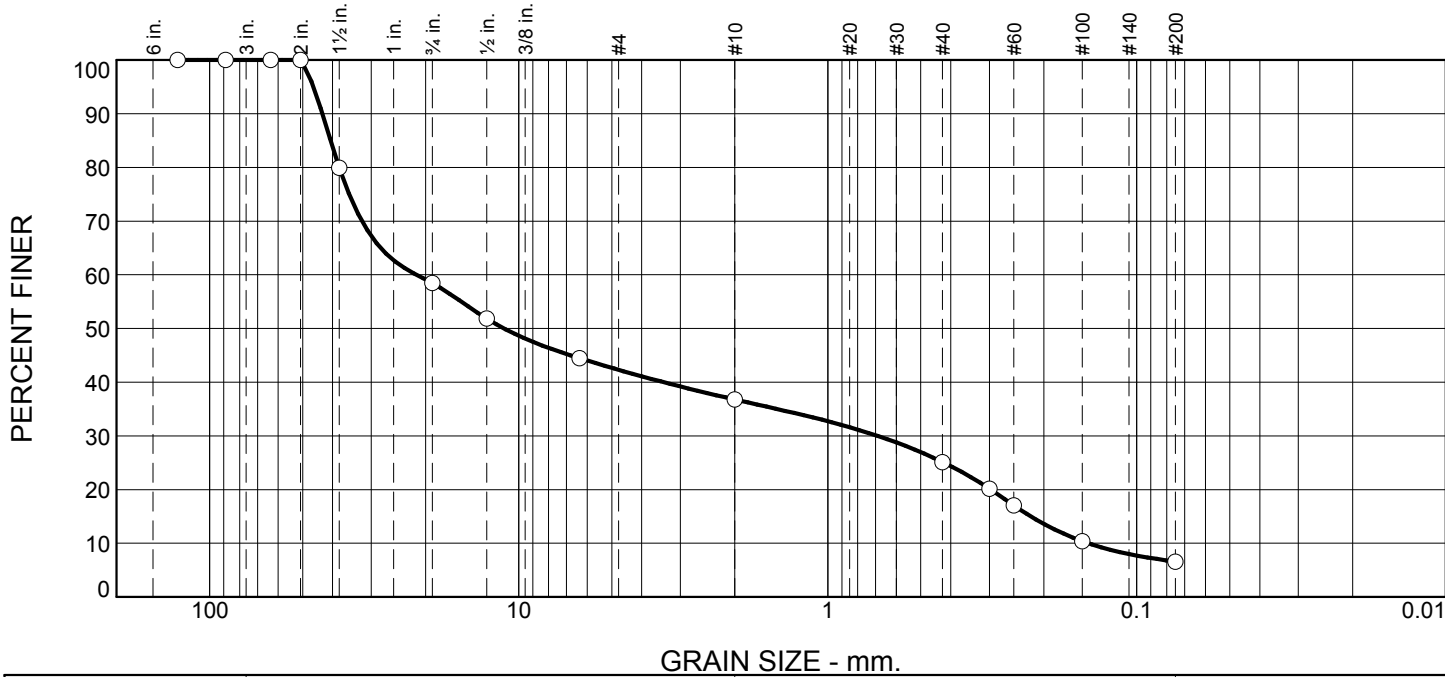
Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#3 - 385' W of Hollister Drive (#2), 6' off WB lane curb;
Sample Number: BASE **Depth:** 11

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 63 | 12 | 18 | 7 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 80 | | |
| 3/4" | 58 | 50 - 75 | |
| 1/2" | 52 | | |
| 1/4" | 44 | 25 - 45 | |
| #10 | 37 | | |
| #40 | 25 | 5 - 20 | X |
| #50 | 20 | | |
| #60 | 17 | | |
| #100 | 10 | 2 - 12 | |
| #200 | 6.5 | | |

Material Description

Fine processed aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 40.6266 D₆₀= 21.4044 D₅₀= 11.1628
D₃₀= 0.6902 D₁₅= 0.2200 D₁₀= 0.1436
C_u= 149.03 C_c= 0.15

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

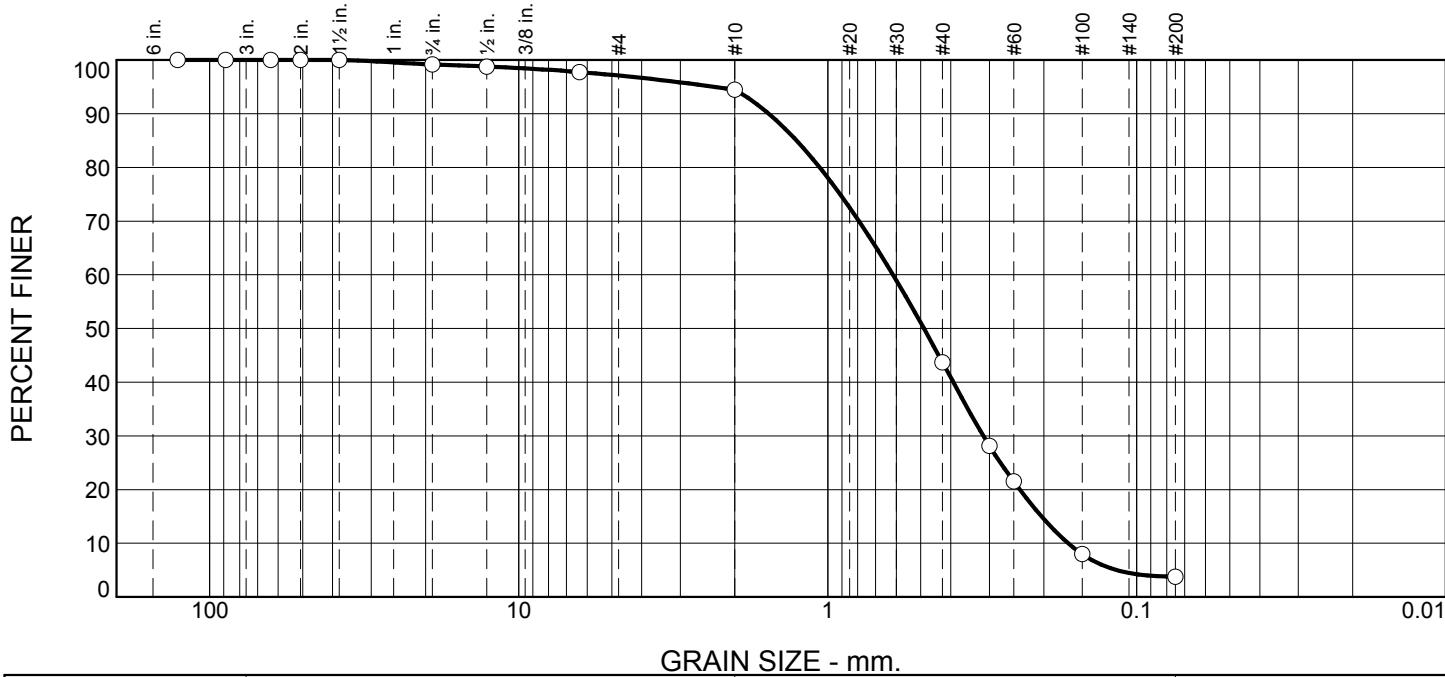
Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#3 - 385' W of Hollister Drive (#2), 6' off WB lane curb;
Sample Number: SUBGRADE **Depth:** 16

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 6 | 50 | 40 | 4 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 99 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 94 | 15 - 45 | X |
| #40 | 44 | 5 - 25 | X |
| #50 | 28 | | |
| #60 | 22 | | |
| #100 | 8 | 0 - 10 | |
| #200 | 3.8 | 0.0 - 5.0 | |

Material Description

poorly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 1.2620 D₆₀= 0.6158 D₅₀= 0.4885
D₃₀= 0.3141 D₁₅= 0.2031 D₁₀= 0.1667
C_u= 3.69 C_c= 0.96

Classification

USCS= SP AASHTO= A-1-b

Remarks

DCP = 4.5" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

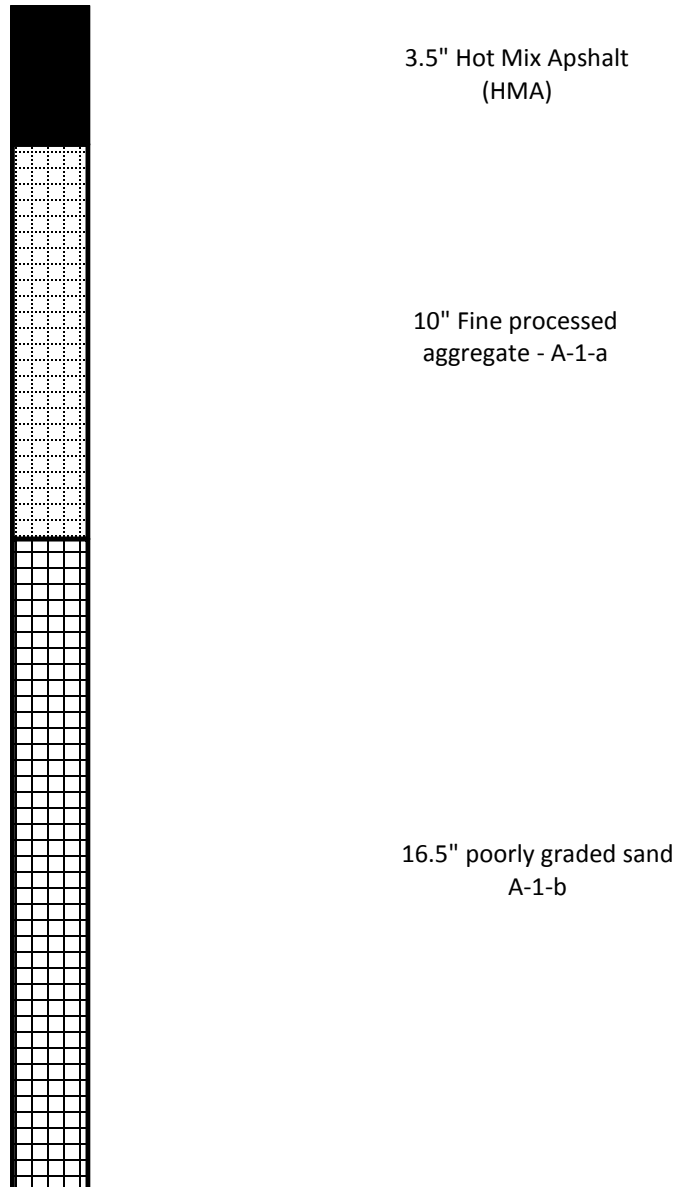


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Hollister Drive (#1) - Jefferson Lane to Nassau Lane
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP#4 - 675' W of Millbrook Drive, 4' off WB lane curb;



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

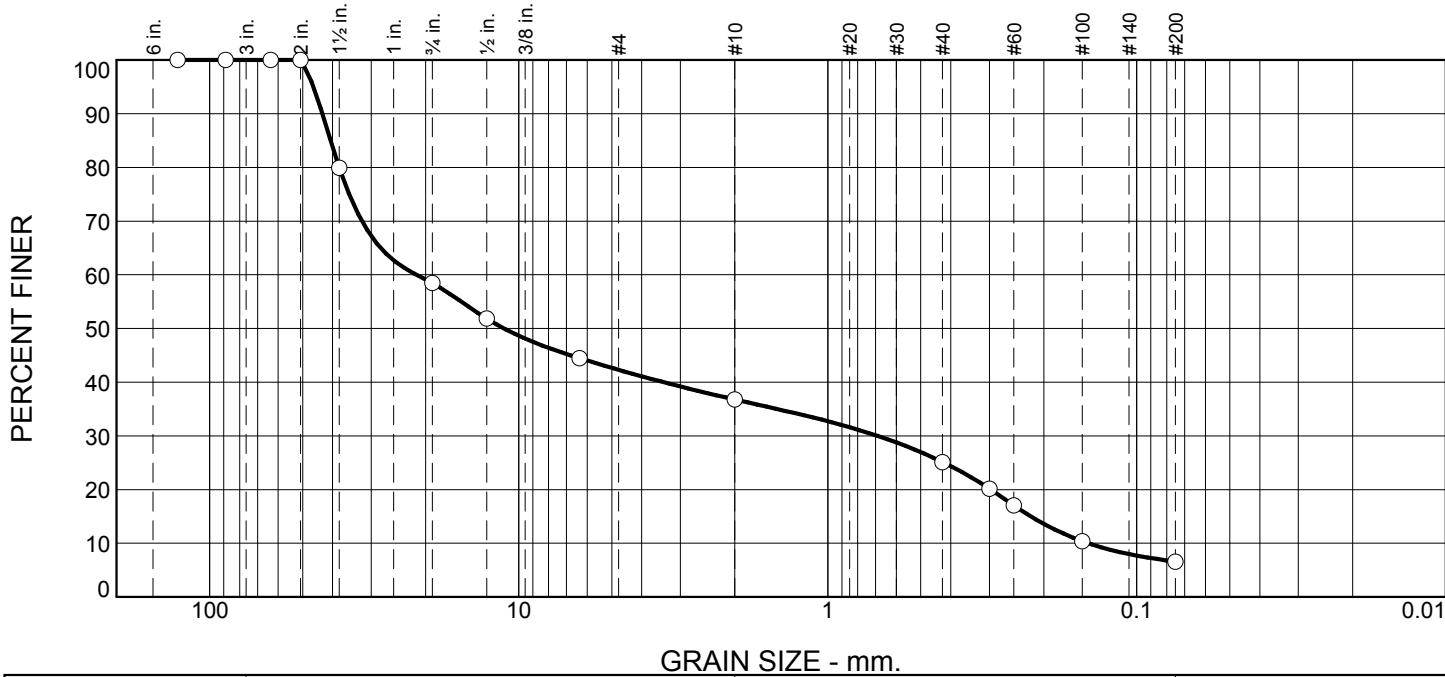
Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#4 - 675' W of Millbrook Drive, 4' off WB lane curb;
Sample Number: BASE **Depth:** 10

Date: 7-31-18



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 63 | 12 | 18 | 7 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 80 | | |
| 3/4" | 58 | 50 - 75 | |
| 1/2" | 52 | | |
| 1/4" | 44 | 25 - 45 | |
| #10 | 37 | | |
| #40 | 25 | 5 - 20 | X |
| #50 | 20 | | |
| #60 | 17 | | |
| #100 | 10 | 2 - 12 | |
| #200 | 6.5 | | |

Material Description

Fine processed aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 40.6266 D₆₀= 21.4044 D₅₀= 11.1628
D₃₀= 0.6902 D₁₅= 0.2200 D₁₀= 0.1436
C_u= 149.03 C_c= 0.15

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

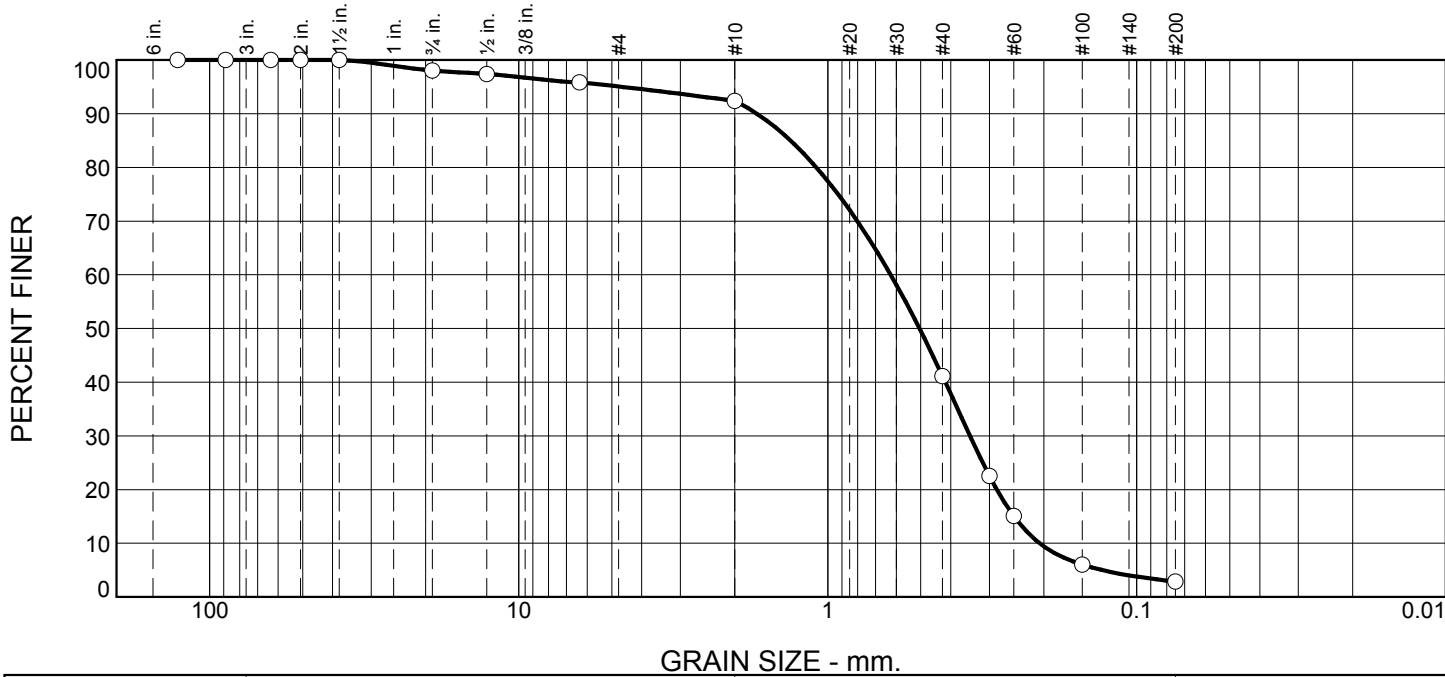
Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#4 - 675' W of Millbrook Drive, 4' off WB lane curb;
Sample Number: SUBGRADE **Depth:** 16.5

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 8 | 51 | 38 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 98 | | |
| 1/2" | 97 | | |
| 1/4" | 96 | 25 - 60 | X |
| #10 | 92 | 15 - 45 | X |
| #40 | 41 | 5 - 25 | X |
| #50 | 23 | | |
| #60 | 15 | | |
| #100 | 6 | 0 - 10 | |
| #200 | 2.9 | 0.0 - 5.0 | |

Material Description

poorly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 1.3201 D₆₀= 0.6262 D₅₀= 0.5049
D₃₀= 0.3470 D₁₅= 0.2495 D₁₀= 0.2061
C_u= 3.04 C_c= 0.93

Classification

USCS= SP AASHTO= A-1-b

Remarks

DCP = 5" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

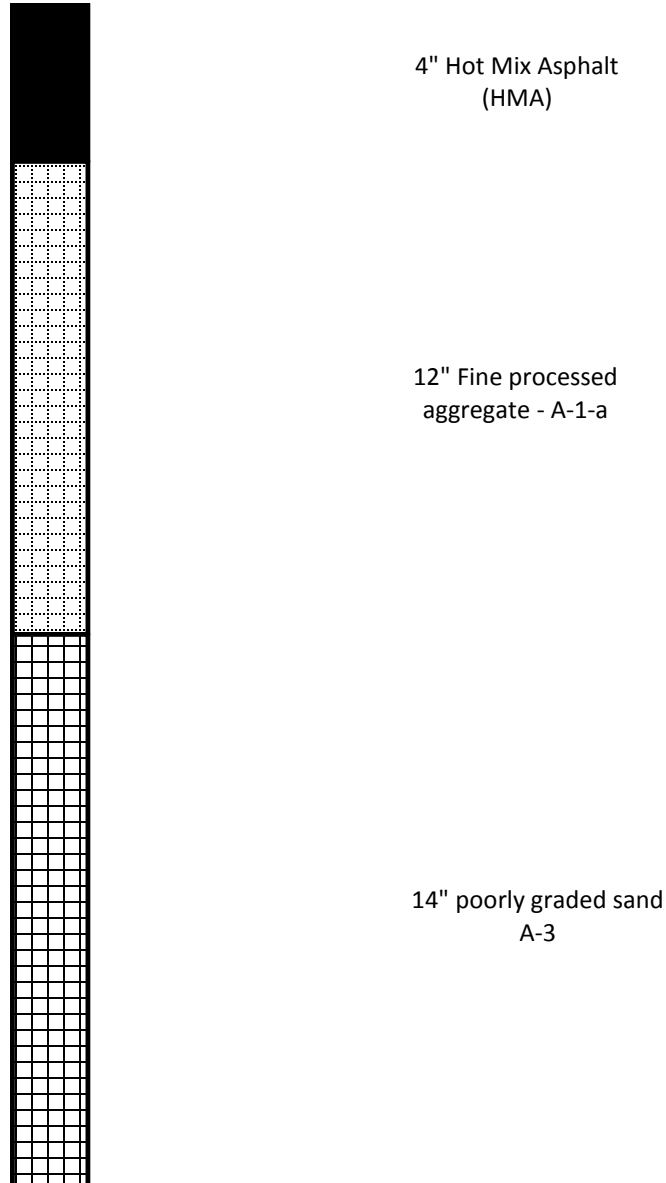


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Hollister Drive (#1) - Jefferson Lane to Nassau Lane
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP#5 - 175' W of Millbrook Drive, 8' off EB lane curb;



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

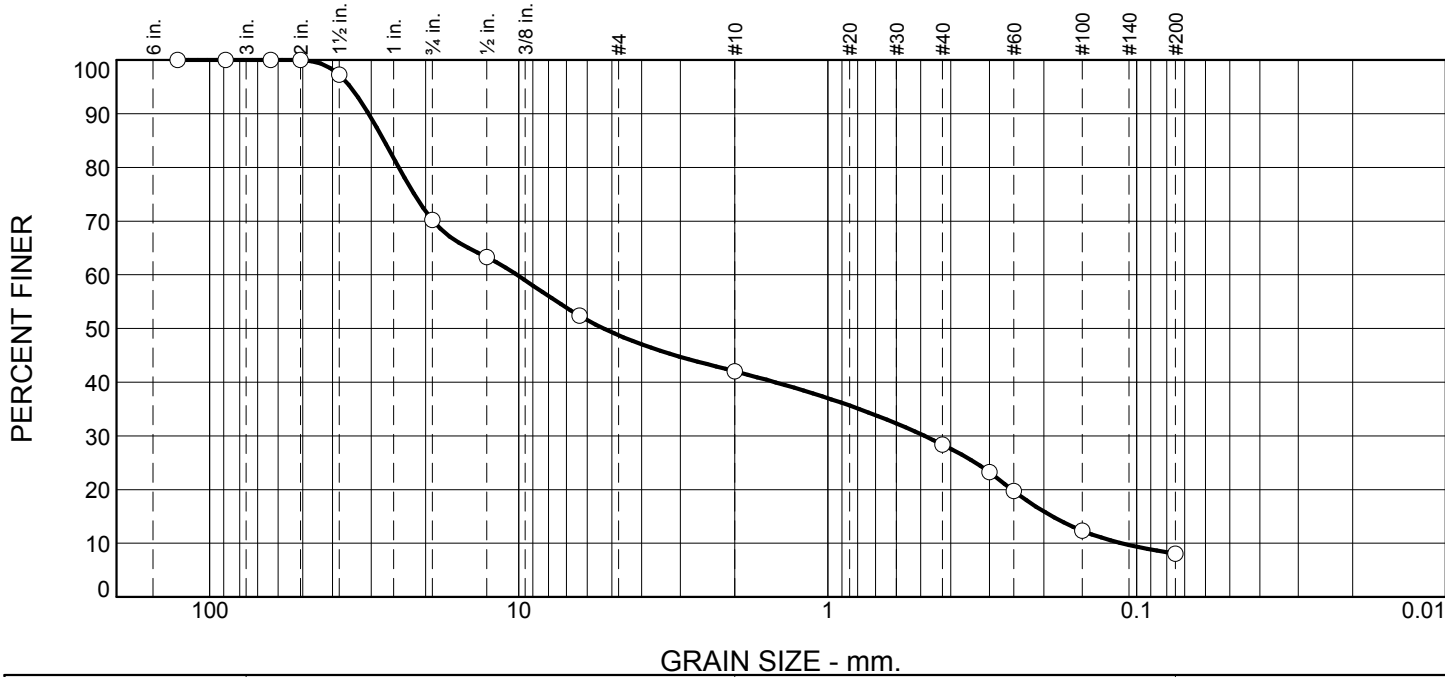
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#5 - 175' W of Millbrook Drive, 8' off EB lane curb;
Sample Number: BASE

Depth: 12

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 58 | 14 | 20 | 8 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 97 | | |
| 3/4" | 70 | 50 - 75 | |
| 1/2" | 63 | | |
| 1/4" | 52 | 25 - 45 | X |
| #10 | 42 | | |
| #40 | 28 | 5 - 20 | X |
| #50 | 23 | | |
| #60 | 20 | | |
| #100 | 12 | 2 - 12 | |
| #200 | 8.0 | | |

Material Description

Fine processed aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 27.3168 D₆₀= 10.1488 D₅₀= 5.3073
D₃₀= 0.4872 D₁₅= 0.1874 D₁₀= 0.1121
C_u= 90.56 C_c= 0.21

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

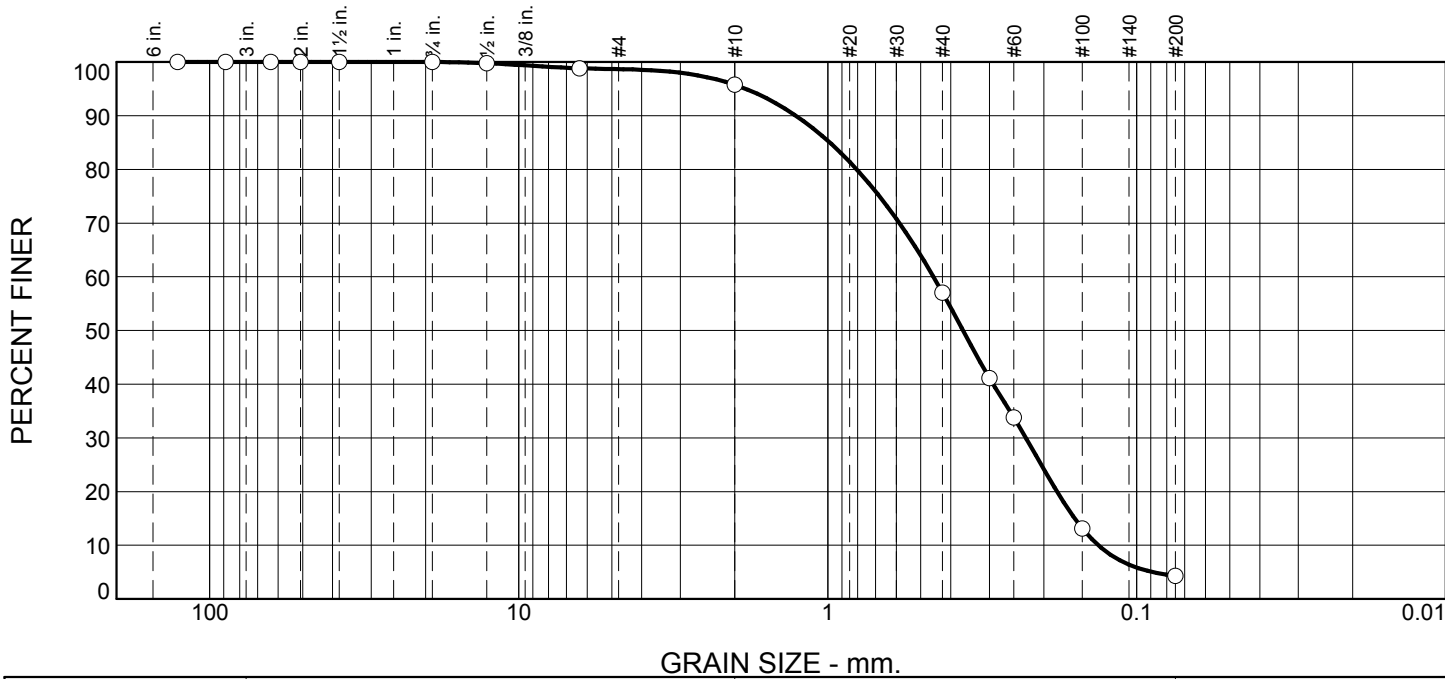
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#5 - 175' W of Millbrook Drive, 8' off EB lane curb;
Sample Number: SUBGRADE

Depth: 14

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 4 | 39 | 53 | 4 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 96 | 15 - 45 | X |
| #40 | 57 | 5 - 25 | X |
| #50 | 41 | | |
| #60 | 34 | | |
| #100 | 13 | 0 - 10 | X |
| #200 | 4.3 | 0.0 - 5.0 | |

Material Description

poorly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.9854 D₆₀= 0.4548 D₅₀= 0.3653
D₃₀= 0.2283 D₁₅= 0.1588 D₁₀= 0.1331
C_u= 3.42 C_c= 0.86

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 3.5" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/VHB

Checked By: VHB

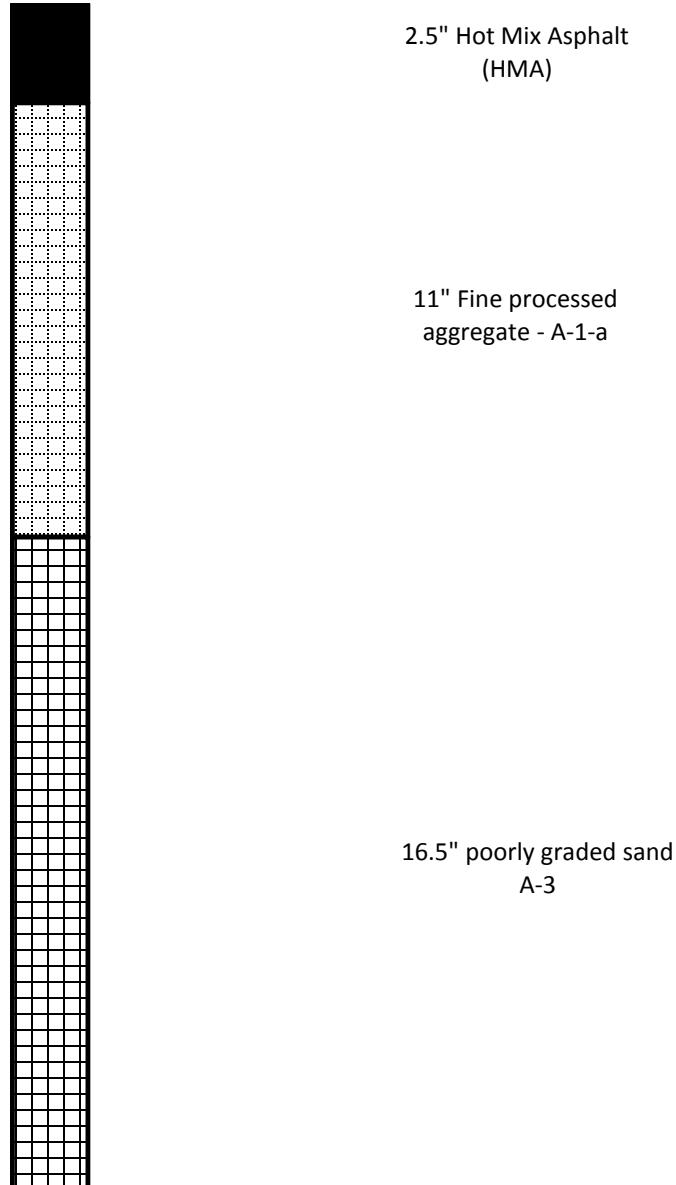


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Hollister Drive (#1) - Jefferson Lane to Nassau Lane
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP#6 - 30' E of Hollister Drive (#3), 6' off WB lane curb;



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

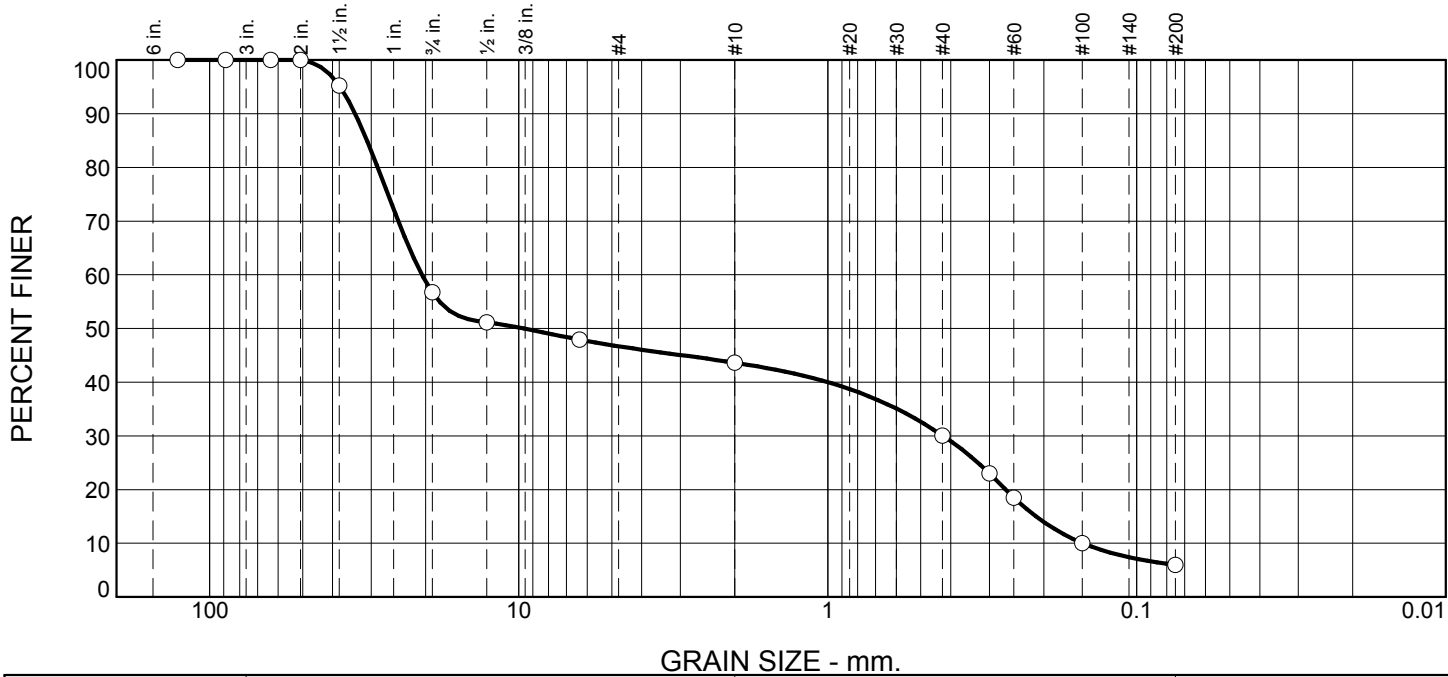
Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#6 - 30' E of Hollister Drive (#3), 6' off WB lane curb;
Sample Number: BASE **Depth:** 11

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 56 | 14 | 24 | 6 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 95 | | |
| 3/4" | 57 | 50 - 75 | |
| 1/2" | 51 | | |
| 1/4" | 48 | 25 - 45 | X |
| #10 | 44 | | |
| #40 | 30 | 5 - 20 | X |
| #50 | 23 | | |
| #60 | 19 | | |
| #100 | 10 | 2 - 12 | |
| #200 | 6.0 | | |

Material Description

Fine processed aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 30.9927 D₆₀= 20.5864 D₅₀= 9.6057
D₃₀= 0.4234 D₁₅= 0.2118 D₁₀= 0.1493
C_u= 137.86 C_c= 0.06

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

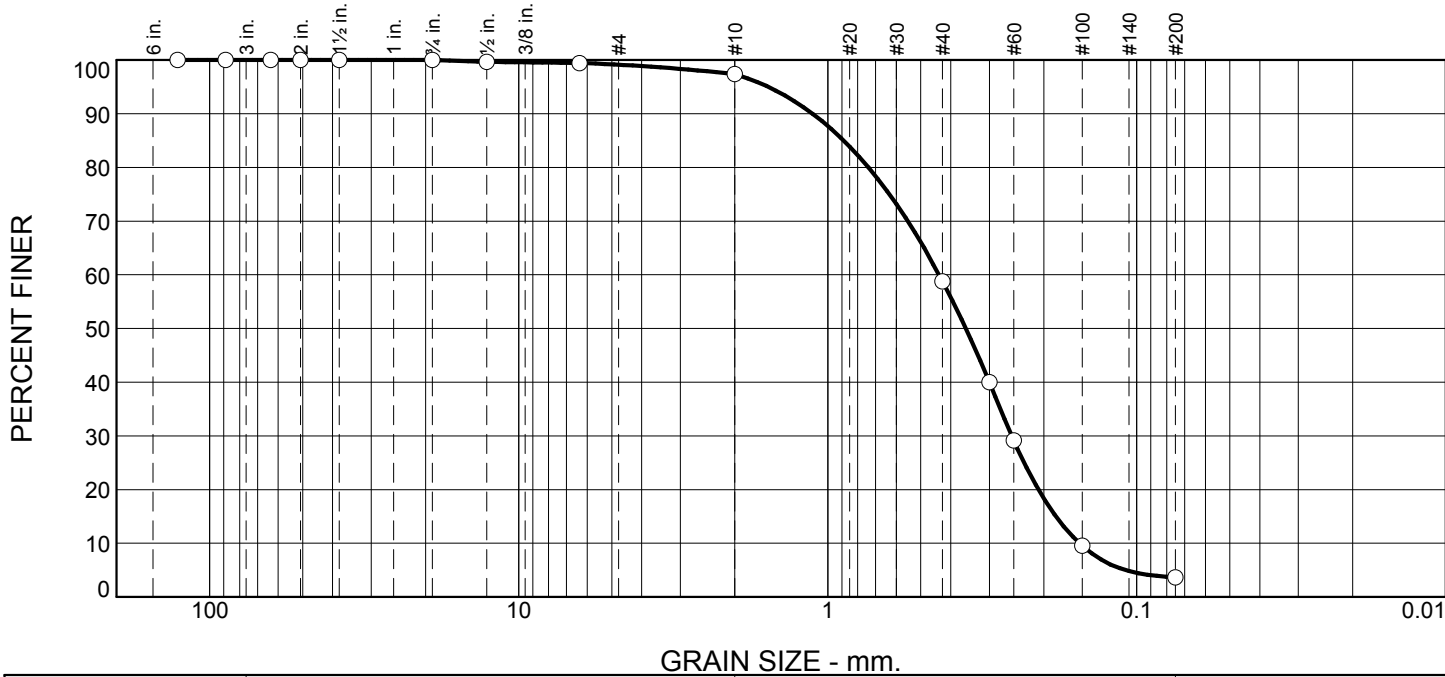
Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#6 - 30' E of Hollister Drive (#3), 6' off WB lane curb;
Sample Number: SUBGRADE **Depth:** 16.5

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 38 | 55 | 4 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 59 | 5 - 25 | X |
| #50 | 40 | | |
| #60 | 29 | | |
| #100 | 10 | 0 - 10 | |
| #200 | 3.6 | 0.0 - 5.0 | |

Material Description

poorly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.8891 D₆₀= 0.4364 D₅₀= 0.3578
D₃₀= 0.2539 D₁₅= 0.1824 D₁₀= 0.1532
C_u= 2.85 C_c= 0.96

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 4" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

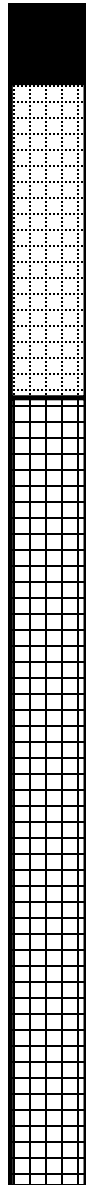


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Hollister Drive (#1) - Jefferson Lane to Nassau Lane
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP#7 - 103' W of Nassau Lane, 14' off EB lane curb;



2" Hot Mix Asphalt
(HMA)

8" Fine processed
aggregate - A-1-a

20" poorly graded sand
A-3

Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

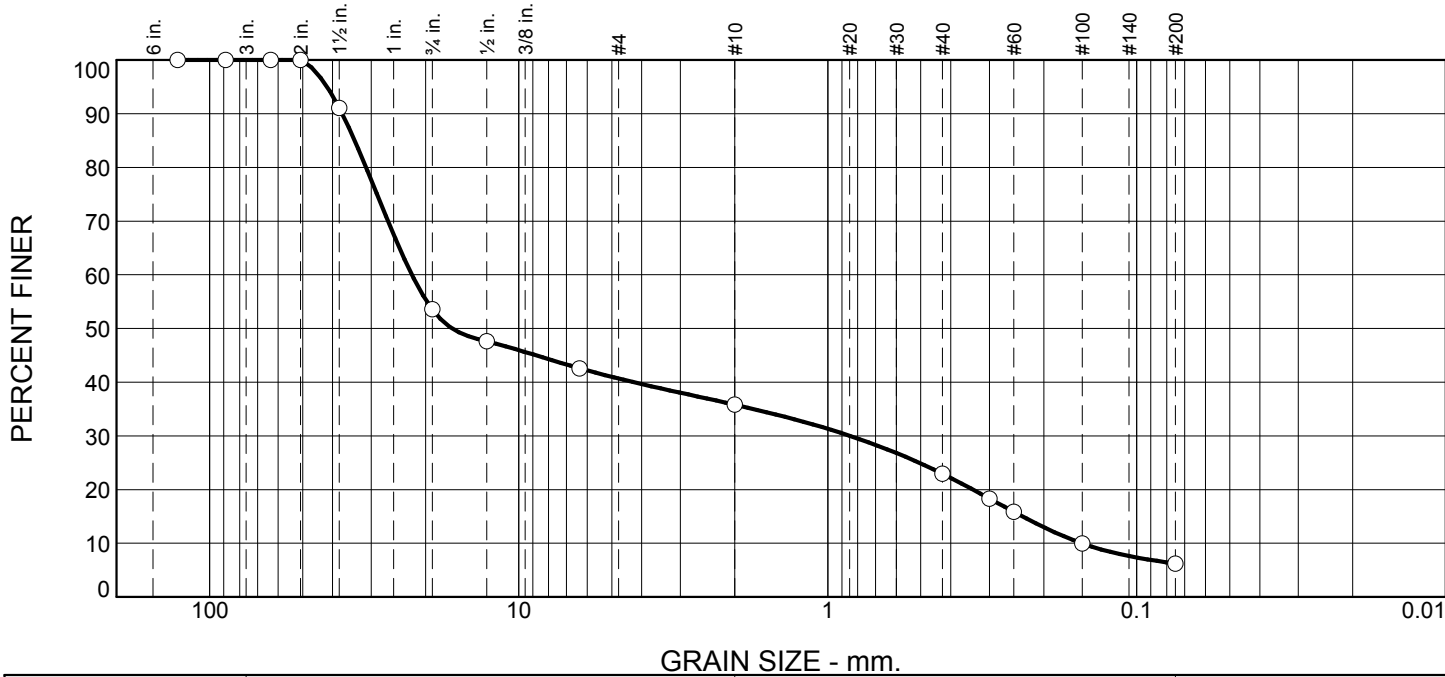
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#7 - 103' W of Nassau Lane, 14' off EB lane curb;
Sample Number: BASE

Depth: 8

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 64 | 13 | 17 | 6 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 91 | | |
| 3/4" | 54 | 50 - 75 | |
| 1/2" | 48 | | |
| 1/4" | 43 | 25 - 45 | |
| #10 | 36 | | |
| #40 | 23 | 5 - 20 | X |
| #50 | 18 | | |
| #60 | 16 | | |
| #100 | 10 | 2 - 12 | |
| #200 | 6.2 | | |

Material Description

Fine processed aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 33.9630 D₆₀= 22.1766 D₅₀= 16.4266
D₃₀= 0.8486 D₁₅= 0.2338 D₁₀= 0.1509
C_u= 146.95 C_c= 0.22

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Hollister Drive (#1) - Jefferson Lane to Nassau Lane

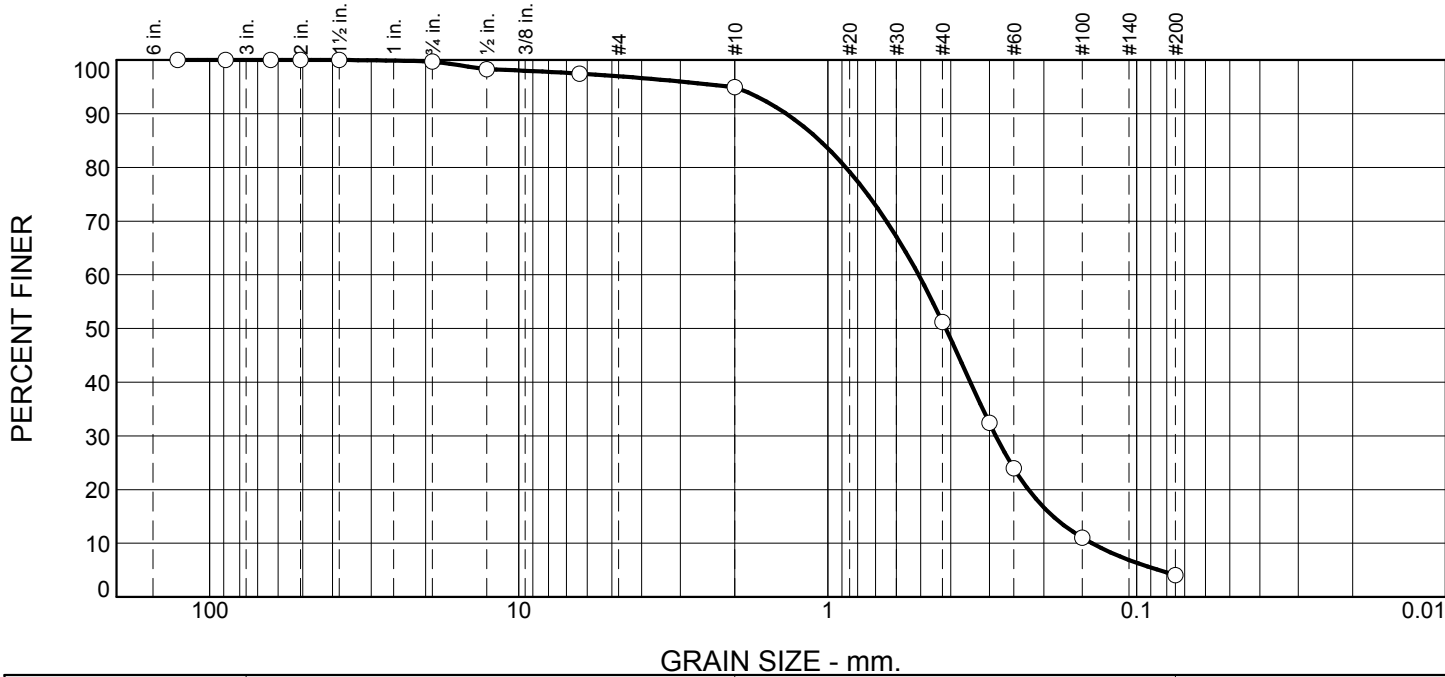
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#7 - 103' W of Nassau Lane, 14' off EB lane curb;
Sample Number: SUBGRADE

Depth: 20

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 5 | 44 | 47 | 4 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 100 | | |
| 3/4" | 100 | 50 - 75 | X |
| 1/2" | 98 | | |
| 1/4" | 97 | 25 - 45 | X |
| #10 | 95 | | |
| #40 | 51 | 5 - 20 | X |
| #50 | 32 | | |
| #60 | 24 | | |
| #100 | 11 | 2 - 12 | |
| #200 | 4.1 | | |

Material Description

poorly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 1.0617 D₆₀= 0.5085 D₅₀= 0.4153
D₃₀= 0.2859 D₁₅= 0.1862 D₁₀= 0.1395
C_u= 3.64 C_c= 1.15

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 10" @ 5 blows

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

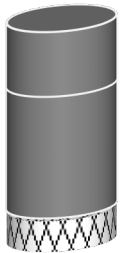
LOCATION: Hollister Drive (1), East Hartford, CT

DATE SAMPLED: Thursday, July 26, 2018

FROM: Jefferson Lane

TO: Nassau Lane

CORE#: 1 **Area:** 100' W of Jefferson Ln. (E), WB lane 3' off curb;



DEPTH

Layer
1.31"
2.48"

DEPTH

Total
3.79"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 2 **Area:** 200' W of Jefferson Ln. (E), WB lane 9' off curb;



DEPTH

Layer
0.89"
1.80"

DEPTH

Total
2.68"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 3 **Area:** 300' W of Jefferson Ln. (E), EB lane 12' off curb;



DEPTH

Layer
0.94"
1.85"

DEPTH

Total
2.79"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 4 **Area:** 90' W of Jefferson Ln. (W), EB lane 6' off curb;



DEPTH

Layer
1.22"
1.63"

DEPTH

Total
2.85"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

Jose R. Otero Jr., Project Manager

100 Great Meadow Road

Suite 200

Engineers | Scientists | Planners | Designers Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570

CORE PROFILE

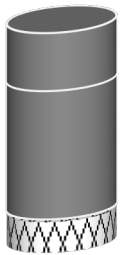
page 2



LOCATION: Hollister Drive (1), East Hartford, CT
DATE SAMPLED: July 26, 2018

FROM: Jefferson Lane
TO: Nassau Lane

CORE#: 5 **Area:** Intersection of Jefferson Ln. (W), WB lane 6' off curb;



DEPTH
Layer
0.87"
1.94"

DEPTH
Total
2.81"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 6 **Area:** 100' W of Jefferson Ln. (W), WB lane 12' off curb;



DEPTH
Layer
1.30"
1.39"

DEPTH
Total
2.68"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 7 **Area:** 75' E of Nassau Ln., EB lane 12' off curb;



DEPTH
Layer
1.07"
1.61"
0.99"

DEPTH
Total
3.67"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 8 **Area:** 25' W of Nassau Ln., EB lane 6' off curb;



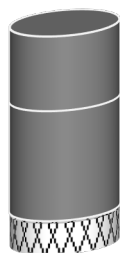
DEPTH
Layer
0.63"
2.40"

DEPTH
Total
3.03"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 9 **Area:** 75' W of Nassau Ln., WB lane 5' off curb;



DEPTH
Layer
1.42"
2.09"

DEPTH
Total
3.51"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

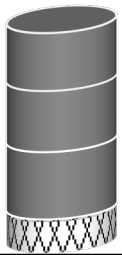
page 3



LOCATION: Hollister Drive (1), East Hartford, CT
 DATE SAMPLED: July 26, 2018

FROM: Jefferson Lane
 TO: Nassau Lane

CORE#: 10 **Area:** 30' E of Hollister Dr. (2E), WB lane 9' off curb;



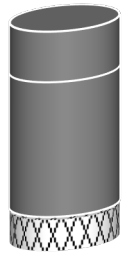
DEPTH
 Layer
 0.73"
 0.78"
 0.86"

DEPTH
 Total
 2.37"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA
 HMA

 Processed Aggregate

CORE#: 11 **Area:** Intersection of Hollister Dr. (2W), EB lane 12' off curb;



DEPTH
 Layer
 0.73"
 1.94"

DEPTH
 Total
 2.66"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

 Processed Aggregate

CORE#: 12 **Area:** 70' W of Hollister Dr. (2W), EB lane 6' off curb;



DEPTH
 Layer
 2.79"

DEPTH
 Total
 2.79"

CLASSIFICATION
 Hot Mix Asphalt (HMA)

 Processed Aggregate

CORE#: 13 **Area:** 170' W of Hollister Dr. (2W), WB lane 6' off curb;



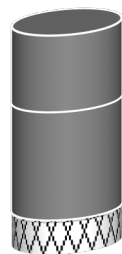
DEPTH
 inches
 1.10"
 1.42"

DEPTH
 Total
 2.52"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

 Processed Aggregate

CORE#: 14 **Area:** 270' W of Hollister Dr. (2W), WB lane 12' off curb;



DEPTH
 Layer
 1.22"
 1.71"

DEPTH
 Total
 2.93"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

 Processed Aggregate

CORE PROFILE

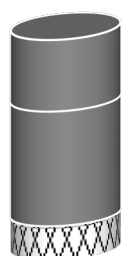
page 4



LOCATION: Hollister Drive (1), East Hartford, CT
DATE SAMPLED: July 26, 2018

FROM: Jefferson Lane
TO: Nassau Lane

CORE#: 15 **Area:** 370' W of Hollister Dr. (2W), EB lane 10' off curb;



DEPTH
Layer
0.87"
1.40"

DEPTH
Total
2.26"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 16 **Area:** 470' W of Hollister Dr. (2W), EB lane 5' off curb;



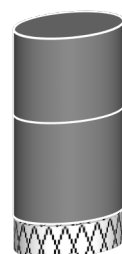
DEPTH
Layer
1.79"

DEPTH
Total
1.79"

CLASSIFICATION
Hot Mix Asphalt (HMA)

Processed Aggregate

CORE#: 17 **Area:** 570' W of Hollister Dr. (2W), WB lane 4' off curb;



DEPTH
Layer
1.67"
1.98"

DEPTH
Total
3.65"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 18 **Area:** 670' W of Hollister Dr. (2W), WB lane 6' off curb;



DEPTH
inches
3.12"

DEPTH
Total
3.12"

CLASSIFICATION
Hot Mix Asphalt (HMA)

Processed Aggregate

CORE#: 19 **Area:** 770' W of Hollister Dr. (2W), EB lane 13' off curb;



DEPTH
Layer
2.59"

DEPTH
Total
2.59"

CLASSIFICATION
Hot Mix Asphalt (HMA)

Processed Aggregate

CORE PROFILE

page 5



LOCATION: Hollister Drive (1), East Hartford, CT
DATE SAMPLED: July 26, 2018

FROM: Jefferson Lane
TO: Nassau Lane

CORE#: 20 **Area:** 870' W of Hollister Dr. (2W), EB lane 4' off curb;



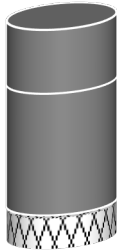
DEPTH
Layer
1.42"
1.50"

DEPTH
Total
2.92"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 21 **Area:** 970' W of Hollister Dr. (2W), WB lane 5' off curb;



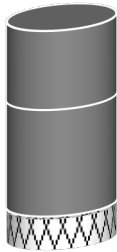
DEPTH
Layer
1.26"
2.41"

DEPTH
Total
3.66"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 22 **Area:** 1070' W of Hollister Dr. (2W), WB lane 11' off curb;



DEPTH
Layer
1.76"
2.38"

DEPTH
Total
4.14"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 23 **Area:** 1170' W of Hollister Dr. (2W), WB lane 13' off curb;



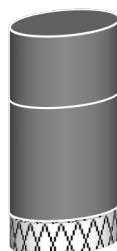
DEPTH
Layer
3.65"

DEPTH
Total
3.65"

CLASSIFICATION
Hot Mix Asphalt (HMA)

Processed Aggregate

CORE#: 24 **Area:** 1270' W of Hollister Dr. (2W), WB lane 7' off curb;



DEPTH
Layer
1.21"
1.91"

DEPTH
Total
3.12"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

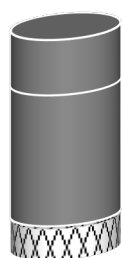
page 6



LOCATION: Hollister Drive (1), East Hartford, CT
DATE SAMPLED: July 26, 2018

FROM: Jefferson Lane
TO: Nassau Lane

CORE#: 25 **Area:** 200' W of Milbrook Dr., EB lane 5' off curb;



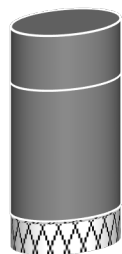
DEPTH
Layer
1.06"
2.52"

DEPTH
Total
3.59"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 26 **Area:** 100' W of Milbrook Dr., EB lane 10' off curb;



DEPTH
Layer
0.76"
1.82"

DEPTH
Total
2.58"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 27 **Area:** Intersection of Milbrook Dr., WB lane 13' off curb;



DEPTH
Layer
2.22"

DEPTH
Total
2.22"

CLASSIFICATION
Hot Mix Asphalt (HMA)

Processed Aggregate

CORE#: 28 **Area:** 100' E of Milbrook Dr., WB lane 5' off curb;



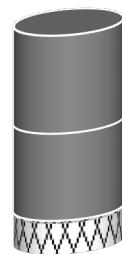
DEPTH
Layer
2.14"

DEPTH
Total
2.14"

CLASSIFICATION
Hot Mix Asphalt (HMA)

Processed Aggregate

CORE#: 29 **Area:** 10' W of Hollister Dr. (3W), EB lane 3' off curb;



DEPTH
Layer
1.68"
1.50"

DEPTH
Total
3.18"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

page 7



LOCATION: Hollister Drive (1), East Hartford, CT
DATE SAMPLED: July 26, 2018

FROM: Jefferson Lane
TO: Nassau Lane

CORE#: 30 **Area:** Intersection of Hollister Dr. (3E), EB lane 9' off curb;



DEPTH
Layer
1.70"
1.27"

DEPTH
Total
2.97"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 31 **Area:** 100' E of Hollister Dr. (3E), WB lane 14' off curb;



DEPTH
Layer
1.00"
1.23"

DEPTH
Total
2.24"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 32 **Area:** 180' E of Hollister Dr. (3E), WB lane 5' off curb;



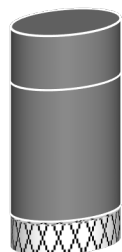
DEPTH
Layer
2.28"

DEPTH
Total
2.28"

CLASSIFICATION
Hot Mix Asphalt (HMA)

Processed Aggregate

CORE#: 33 **Area:** 240' E of Hollister Dr. (3E), EB lane 6' off curb;



DEPTH
Layer
0.66"
1.61"

DEPTH
Total
2.27"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 34 **Area:** 320' E of Hollister Dr. (3E), EB lane 11' off curb;



DEPTH
Layer
2.16"

DEPTH
Total
2.16"

CLASSIFICATION
Hot Mix Asphalt (HMA)

Processed Aggregate

CORE PROFILE

page 8



LOCATION: Hollister Drive (1), East Hartford, CT
 DATE SAMPLED: July 26, 2018

FROM: Jefferson Lane
 TO: Nassau Lane

CORE#: 35 **Area:** 200' W of Nassau Ln., WB lane 14' off curb;



DEPTH
 Layer
 1.28"
 0.86"

DEPTH
 Total
 2.13"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 36 **Area:** 100' W of Nassau Ln., WB lane 5' off curb;



DEPTH
 Layer
 0.96"
 1.42"

DEPTH
 Total
 2.38"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 37 **Area:** 50' W of Nassau Ln., centerline;



DEPTH
 Layer
 1.24"
 1.71"

DEPTH
 Total
 2.95"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate



To: Bill Anderson, PE
VHB/Wethersfield

Date: October 10, 2018

Memorandum

Project #: 42413.00

From: Dan Kosalski

Re: Hollister Drive #2

Following are the recommendations for the design and construction of Hollister Drive #2 from Hollister Dr. #1 (North) to Hollister Dr. #1 (North).

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The July 26, 2018 distress level investigation results indicate there is severe alligator and transverse/longitudinal cracking. Moderate distortions and weather/block cracking were noted. There is evidence of extensive surface wear, resulting in a Road Manager Pavement Condition Index (PCI) of 53, two points less than the 2014 update.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A3 and A24 which are classified as uniformly graded and silty sands by the Unified Classification system. The subgrades are fair to good foundations when not subject to frost action, having a very slight to high frost potential and exhibiting good to poor drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 100 vehicles per day with small trucks and buses accounting for 2% of the ADT. The ADT is based on an average of 10 trips per household per day.

Hollister Drive #1 to Hollister Drive #1:

- The existing pavement structure cross-section consisted of 2.0" to 3.5" (average 2.7") of hot mix asphalt (HMA) on processed aggregate base. The granular base consisted of 10" to 8" (average 9") of "fine" processed aggregate base which is founded on silty sand and uniformly graded sand subbases/subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally adequate.

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Suite 200
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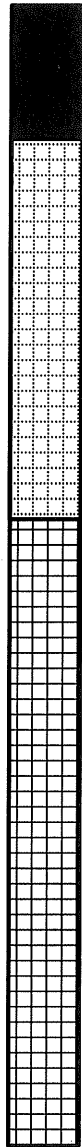
| Alternative | Service Life | Recommendations |
|--------------------|---------------------|--|
| #1 | 20-years | RECLAIM the existing HMA and processed aggregate bases by pulverization and blending methods to a 10" depth. Compact the recycled material to proper lines and grades, leaving a minimum of 6" as the new base course prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #2 | 20-years | REMOVE the existing 2.7" of HMA, fine grade, then compact to proper lines, prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #3 | 8-10 years | RESURFACE by milling the existing pavement to a 1.5" depth. Repair any base failures, seal major cracks and apply an emulsified asphalt tack coat prior to placing 1.5" of Superpave S-0.375" Level 2 as the new surface course, with a tack coat between lifts |



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Wethersfield, Connecticut 06109
860.807.4300

STREET: Hollister Drive #2 - Hollister Dr #1 East to Hollister Dr #1 West PROJECT #: 42413.00
CITY, STATE: East Hartford, CT

TP# / LOCATION: TP1 - 185' S of Hollister Dr #1 East, 6' off SB lane curb;



3.5" Hot Mix Asphalt
(HMA)

10" Processed aggregate
A-1-a

16.5" silty sand A-2-4
(DCP = 6.5" @ 5 blows;
Mr = 5447 psi;)

Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

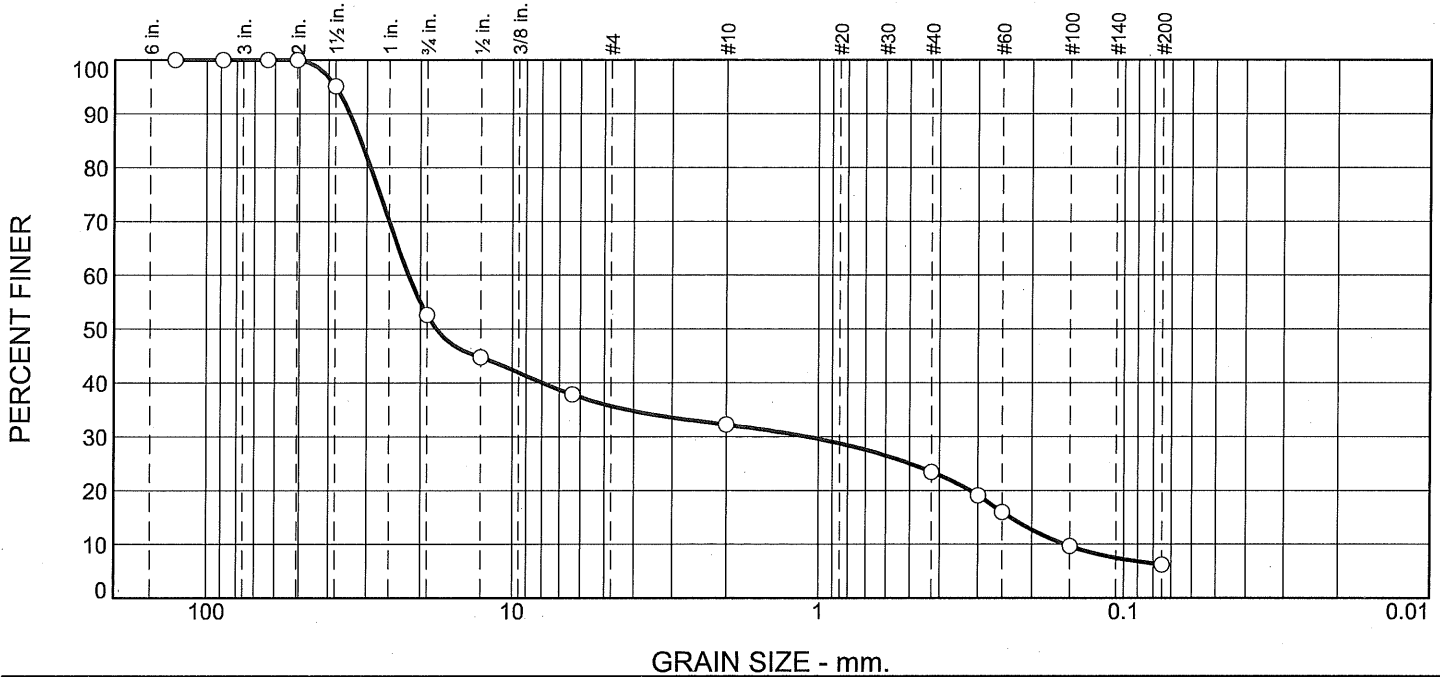
Vanasse Hangen Brustlin, Inc.

Project: Hollister Drive #2 - Hollister Dr #1 East to Hollister Dr #1 West **Project No.:** 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 185' S of Hollister Dr #1 East, 6' off SB lane curb;
Sample Number: BASE **Depth:** 10

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 68 | 9 | 17 | 6 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 95 | | |
| 3/4" | 53 | 50 - 75 | |
| 1/2" | 45 | | |
| 1/4" | 38 | 25 - 45 | |
| #10 | 32 | | |
| #40 | 23 | 5 - 20 | X |
| #50 | 19 | | |
| #60 | 16 | | |
| #100 | 10 | 2 - 12 | |
| #200 | 6.2 | | |

Material Description

Processed aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 31.4389 D₆₀= 21.8892 D₅₀= 17.7365
D₃₀= 1.0896 D₁₅= 0.2349 D₁₀= 0.1564
C_u= 139.98 C_c= 0.35

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

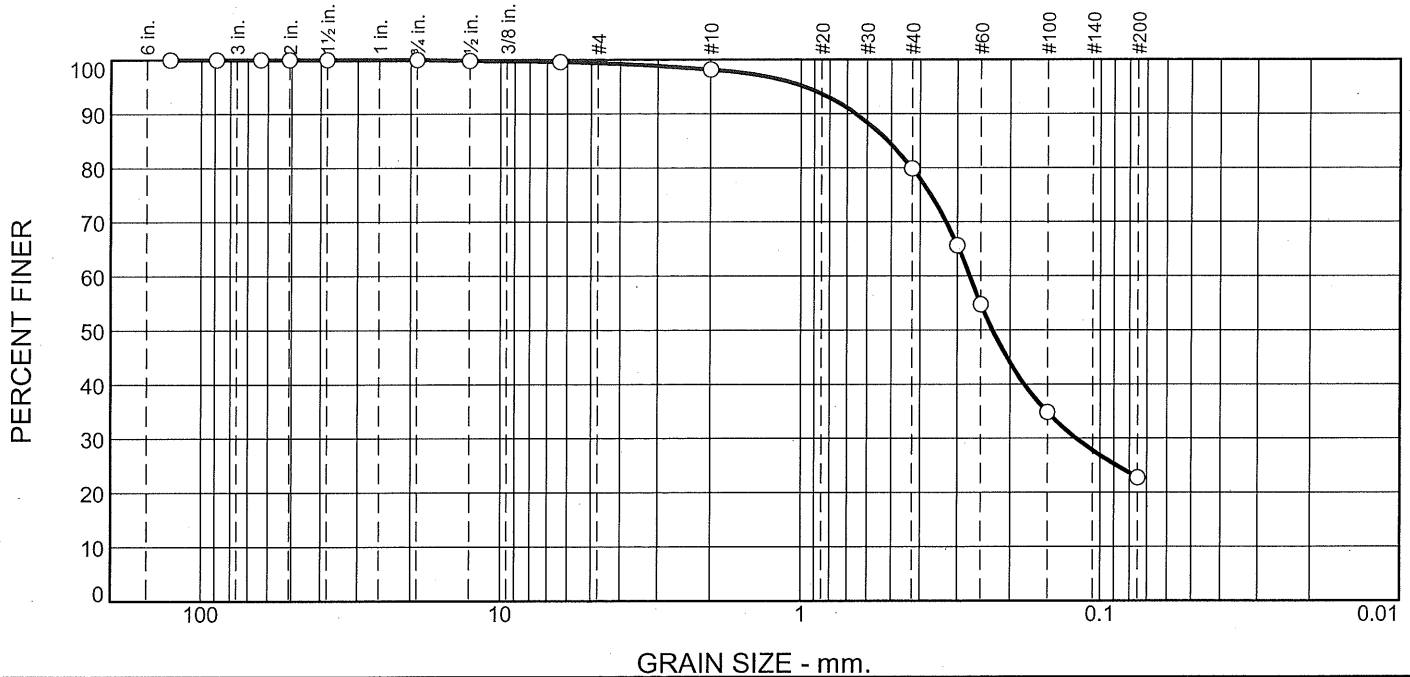
Vanasse Hangen Brustlin, Inc.

Project: Hollister Drive #2 - Hollister Dr #1 East to Hollister Dr #1 West **Project No.:** 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 185' S of Hollister Dr #1 East, 6' off SB lane curb;
Sample Number: SUBGRADE **Depth:** 16.5

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 18 | 57 | 23 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 100 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 80 | 5 - 25 | X |
| #50 | 66 | | |
| #60 | 55 | | |
| #100 | 35 | 0 - 10 | X |
| #200 | 23 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.5139 D₆₀= 0.2729 D₅₀= 0.2288
D₃₀= 0.1203 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 6.5" @ 5 blows;
Mr = 5447 psi;

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

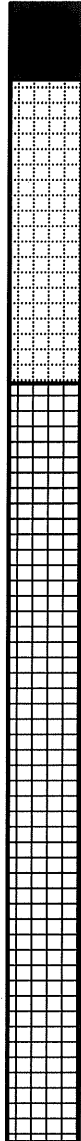


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STREET: Hollister Dr. #2 (N.) - Hollister Dr #1 E. to Hollister Dr #1 W.
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP2 - 84' S of Hollister Dr #1 West, 9' off NB lane curb;



2" Hot Mix Asphalt
(HMA)

8" Fine processed
aggregate - A-1-a

20" uniformly graded sand
A-3
(DCP = 5.5" @ 5 blows;
Mr = 5674 psi;

Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

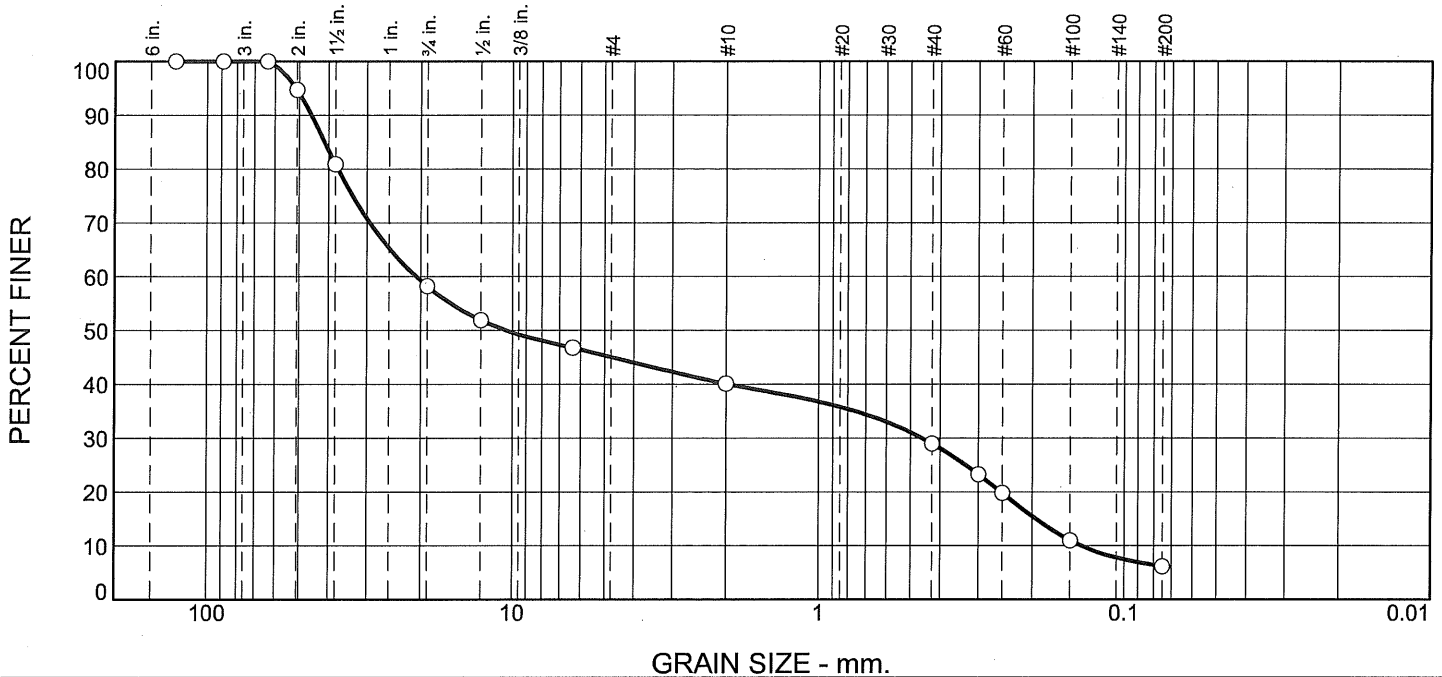
Project: Hollister Drive #2 - Hollister Dr #1 East to Hollister Dr #1 West **Project No.:** 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 84' S of Hollister Dr #1 West, 9' off NB lane curb;
Sample Number: BASE

Depth: 8

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 60 | 11 | 23 | 6 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 95 | 95 - 100 | |
| 1-1/2" | 81 | | |
| 3/4" | 58 | 50 - 75 | |
| 1/2" | 52 | | |
| 1/4" | 47 | 25 - 45 | X |
| #10 | 40 | | |
| #40 | 29 | 5 - 20 | X |
| #50 | 23 | | |
| #60 | 20 | | |
| #100 | 11 | 2 - 12 | |
| #200 | 6.1 | | |

Material Description

Fine processed aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 41.3209 D₆₀= 20.6927 D₅₀= 10.4751
D₃₀= 0.4592 D₁₅= 0.1941 D₁₀= 0.1380
C_u= 149.94 C_c= 0.07

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

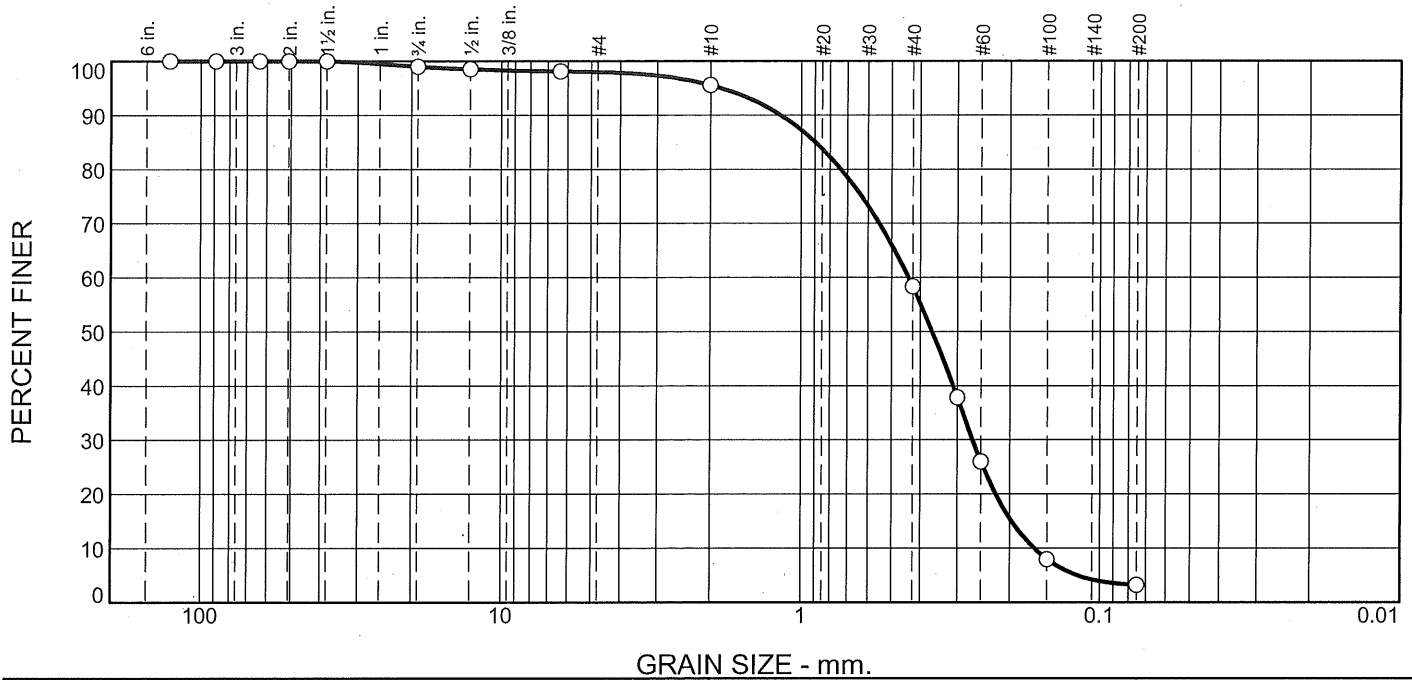
Vanasse Hangen Brustlin, Inc.

Project: Hollister Drive #2 - Hollister Dr #1 East to Hollister Dr #1 West **Project No.:** 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 84' S of Hollister Dr #1 West, 9' off NB lane curb;
Sample Number: SUBGRADE **Depth:** 20

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 4 | 38 | 55 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 99 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 96 | 15 - 45 | X |
| #40 | 58 | 5 - 25 | X |
| #50 | 38 | | |
| #60 | 26 | | |
| #100 | 8 | 0 - 10 | |
| #200 | 3.2 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.8967 D₆₀= 0.4394 D₅₀= 0.3649
D₃₀= 0.2667 D₁₅= 0.1976 D₁₀= 0.1661
C_u= 2.65 C_c= 0.97

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 5.5" @ 5 blows;
Mr = 6746 psi;

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

LOCATION: Hollister Drive (2), East Hartford, CT
 DATE SAMPLED: Thursday, July 26, 2018

FROM: Hollister Drive (1E)
 TO: Hollister Drive (1W)

CORE#: 1 **Area:** 50' S of Hollister Dr. (1E), SB lane 3' off curb;



DEPTH
 Layer
 0.81"
 1.46"

DEPTH
 Total
 2.27"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

 Processed Aggregate

CORE#: 2 **Area:** 150' S of Hollister Dr. (1E), SB lane 6' off curb;



DEPTH
 Layer
 1.19"
 2.05"

DEPTH
 Total
 3.24"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

 Processed Aggregate

CORE#: 3 **Area:** 250' S of Hollister Dr. (1E), centerline;



DEPTH
 Layer
 1.01"
 1.86"

DEPTH
 Total
 2.88"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

 Processed Aggregate

CORE#: 4 **Area:** 350' S of Hollister Dr. (1E), NB lane 3' off curb;



DEPTH
 Layer
 0.84"
 1.52"

DEPTH
 Total
 2.36"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

 Processed Aggregate

Jose R. Otero Jr.
 Jose R. Otero Jr., Project Manager

100 Great Meadow Road
 Suite 200

Engineers | Scientists | Planners | Designers

Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570



To: Bill Anderson, PE
VHB/Wethersfield

Date: October 10, 2018

Memorandum

Project #: 42413.00

From: Dan Kosalski

Re: Hollister Drive #3

Following are the recommendations for the design and construction of Hollister Drive #3 from Hollister Dr. #1 (South) to Hollister Dr. #1 (South).

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The July 26, 2018 distress level investigation results indicate there is severe alligator and transverse/longitudinal cracking. Moderate pothole patching, distortions and weather/block cracking were noted. There is evidence of extensive surface wear, resulting in a Road Manager Pavement Condition Index (PCI) of 46, five points less than the 2014 update.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A3 and A1b which are classified as uniformly graded sands by the Unified Classification system. The subgrades are fair foundations when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 100 vehicles per day with small trucks and buses accounting for 2% of the ADT. The ADT is based on an average of 10 trips per household per day.

Hollister Drive #1 to Hollister Drive #1:

- The existing pavement structure cross-section consisted of 2.9" of hot mix asphalt (HMA) on 11" to 13" of "fine" processed aggregate base which is founded on uniformly graded sand subbases/subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally adequate.

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Suite 200
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P 860.807.4300

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|--|
| #1 | 20-years | RECLAIM the existing HMA and processed aggregate bases by pulverization and blending methods to a 10" depth. Compact the recycled material to proper lines and grades, leaving a minimum of 6" as the new base course prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #2 | 20-years | REMOVE the existing 2.9" of HMA, fine grade, then compact to proper lines, prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #3 | 8-10 years | RESURFACE by milling the existing pavement to a 1.5" depth. Repair any base failures, seal major cracks and apply an emulsified asphalt tack coat prior to placing 1.5" of Superpave S-0.375" Level 2 as the new surface course, with a tack coat between lifts. |

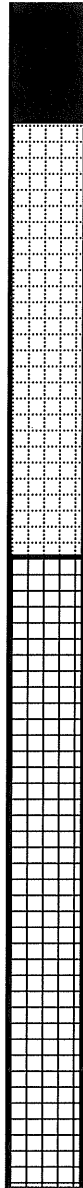


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Hollister Drive (#3) - Hollister Dr #1 W to Hollister Dr #1 E
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP#/LOCATION: TP1 - 125' N of Hollister Dr #1, 8' off NB lane curb



3" Hot Mix Asphalt
(HMA)

11" Fine processed
aggregate A-1-a

16" uniformly graded
sand A-3

Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Hollister Drive (#3) - Hollister Dr #1 W to Hollister Dr #1 E

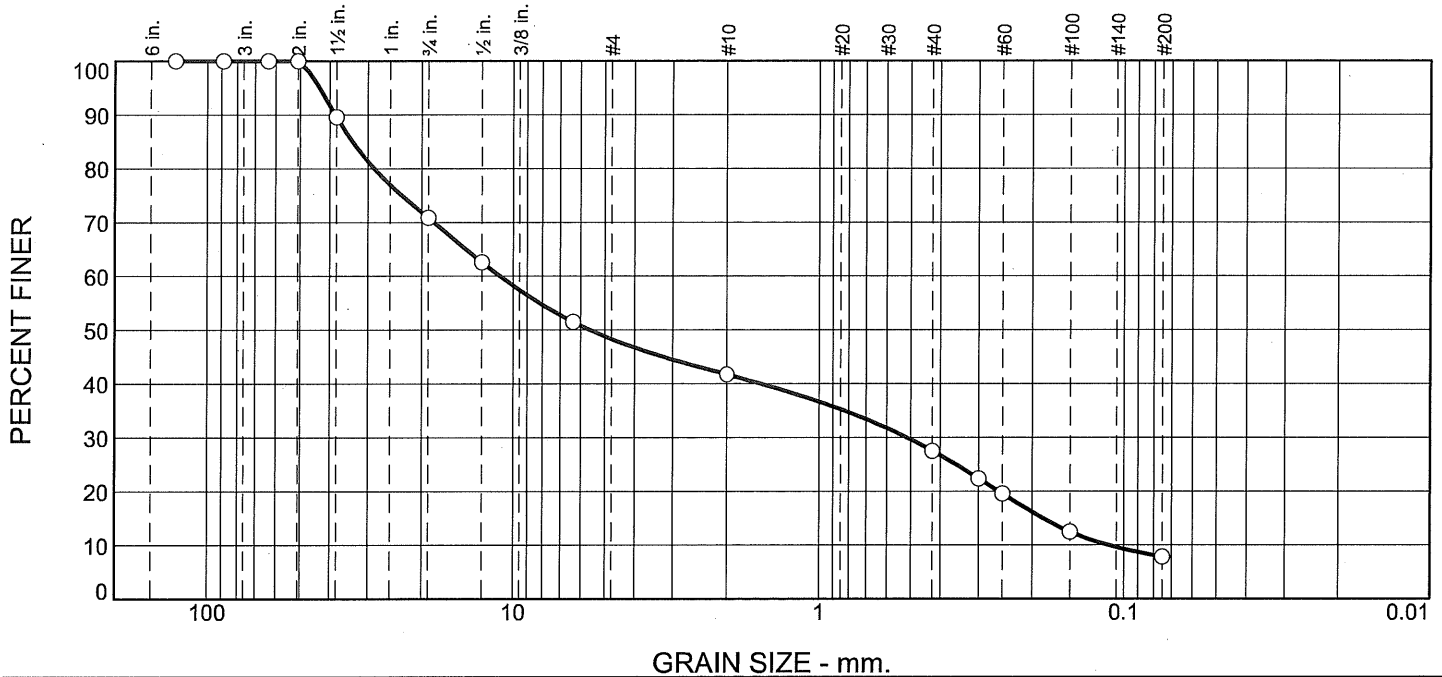
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 125' N of Hollister Dr #1, 8' off NB lane curb
Sample Number: BASE

Depth: 11

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 58 | 14 | 20 | 8 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 90 | | |
| 3/4" | 71 | 50 - 75 | |
| 1/2" | 63 | | |
| 1/4" | 52 | 25 - 45 | X |
| #10 | 42 | | |
| #40 | 28 | 5 - 20 | X |
| #50 | 22 | | |
| #60 | 20 | | |
| #100 | 12 | 2 - 12 | |
| #200 | 7.8 | | |

Material Description

Fine processed aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 33.7326 D₆₀= 11.0547 D₅₀= 5.5912
D₃₀= 0.5158 D₁₅= 0.1840 D₁₀= 0.1127
C_u= 98.08 C_c= 0.21

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Hollister Drive (#3) - Hollister Dr #1 W to Hollister Dr #1 E

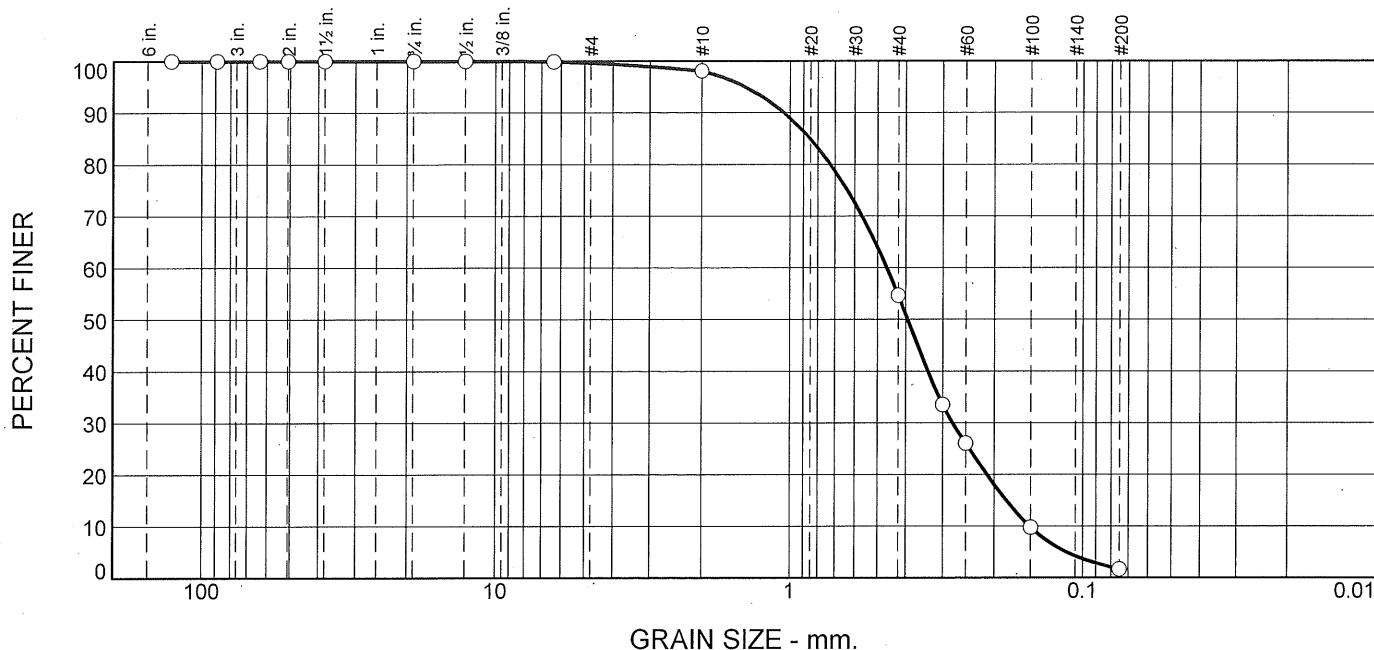
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 125' N of Hollister Dr #1, 8' off NB lane curb
Sample Number: SUBGRADE

Depth: 16

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 43 | 53 | 2 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 100 | | |
| 3/4" | 100 | 50 - 75 | X |
| 1/2" | 100 | | |
| 1/4" | 100 | 25 - 45 | X |
| #10 | 98 | | |
| #40 | 55 | 5 - 20 | X |
| #50 | 34 | | |
| #60 | 26 | | |
| #100 | 10 | 2 - 12 | |
| #200 | 1.7 | | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.8540 D₆₀= 0.4656 D₅₀= 0.3948
D₃₀= 0.2772 D₁₅= 0.1817 D₁₀= 0.1515
C_u= 3.07 C_c= 1.09

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 3.5" @ 5 blows;
Mr = 12,412 psi;

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

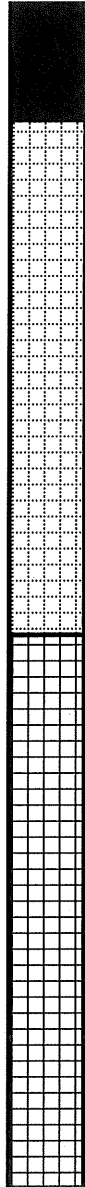


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STREET: Hollister Drive (#3) - Hollister Dr #1 W to Hollister Dr #1 E
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP2 - 265' N of Hollister Dr #1, 11' off SB lane curb



3" Hot Mix Asphalt
(HMA)

13" poorly graded
processed with silt and
sand A-1-b

14" uniformly graded sand
A-1-b

Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Hollister Drive (#3) - Hollister Dr #1 W to Hollister Dr #1 E

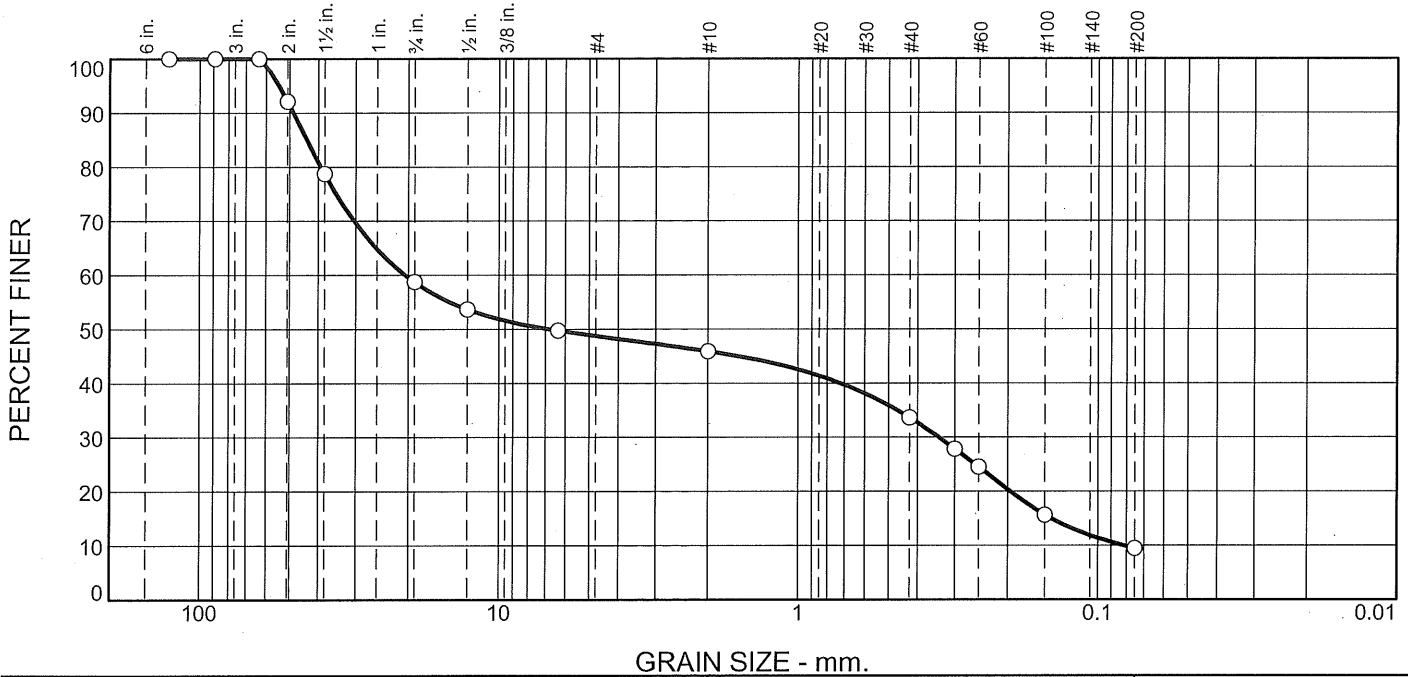
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 265' N of Hollister Dr #1, 11' off SB lane curb
Sample Number: BASE

Depth: 13

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 54 | 12 | 25 | 9 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 92 | 95 - 100 | X |
| 1-1/2" | 79 | | |
| 3/4" | 59 | 50 - 75 | |
| 1/2" | 54 | | |
| 1/4" | 50 | 25 - 45 | X |
| #10 | 46 | | |
| #40 | 34 | 5 - 20 | X |
| #50 | 28 | | |
| #60 | 25 | | |
| #100 | 16 | 2 - 12 | X |
| #200 | 9.4 | | |

Material Description

poorly graded processed with silt and sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 43.6537 D₆₀= 20.4458 D₅₀= 6.7867
D₃₀= 0.3395 D₁₅= 0.1432 D₁₀= 0.0817
C_u= 250.16 C_c= 0.07

Classification

USCS= GP-GM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Hollister Drive (#3) - Hollister Dr #1 W to Hollister Dr #1 E

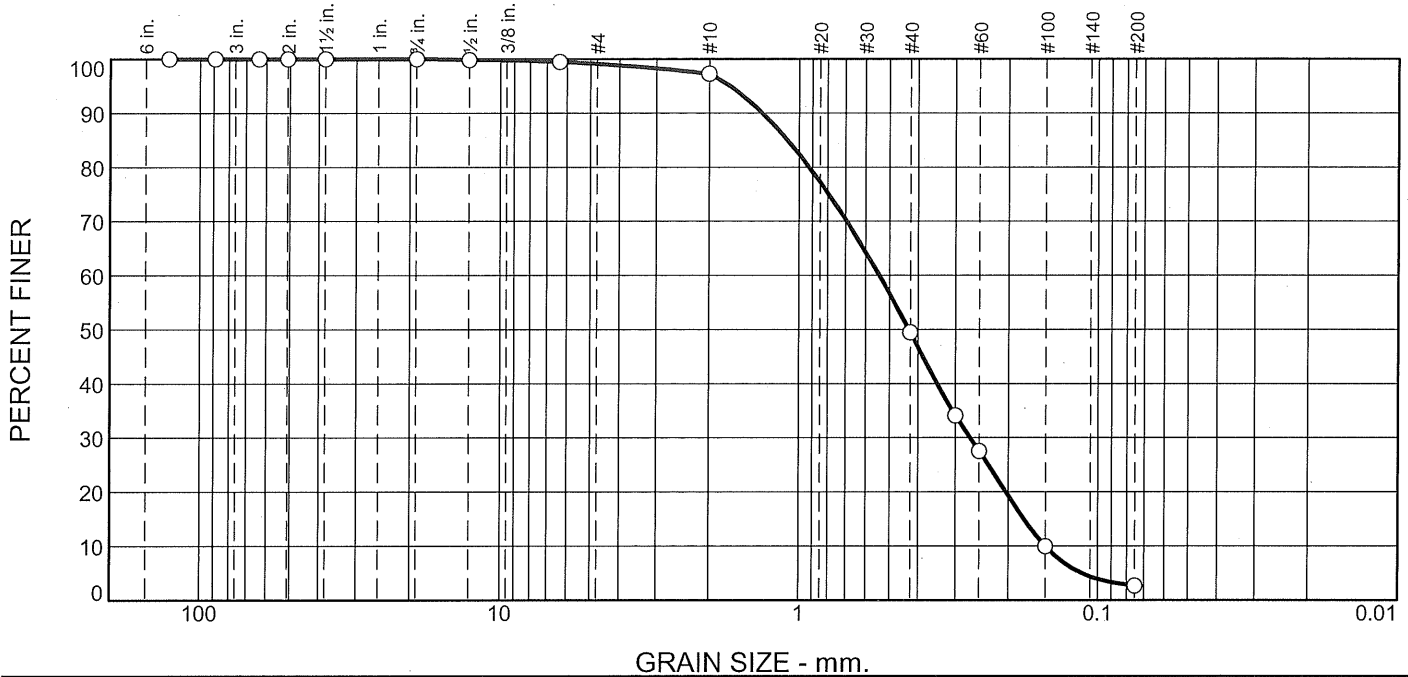
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 265' N of Hollister Dr #1, 11' off SB lane curb
Sample Number: SUBGRADE

Depth: 14

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 48 | 46 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 49 | 5 - 25 | X |
| #50 | 34 | | |
| #60 | 28 | | |
| #100 | 10 | 0 - 10 | |
| #200 | 2.7 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 1.0918 D₆₀= 0.5401 D₅₀= 0.4300
D₃₀= 0.2679 D₁₅= 0.1773 D₁₀= 0.1503
C_u= 3.59 C_c= 0.88

Classification

USCS= SP AASHTO= A-1-b

Remarks

DCP = 3.5" @ 5 blows;
Mr = 12,412 psi;

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

CORE PROFILE

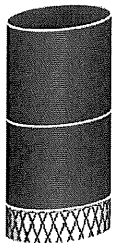


PROJECT NUMBER: 42413.00

LOCATION: Hollister Drive (3), East Hartford, CT
 DATE SAMPLED: Thursday, September 27, 2018

FROM: Hollister Drive (1W)
 TO: Hollister Drive (1E)

CORE#: 1 **Area:** 50' N of Hollister Dr. (1W), NB lane 4' off curb;



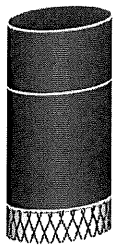
DEPTH
 Layer
 1.55"
 1.37"

DEPTH
 Total
 2.92"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

 Processed Aggregate

CORE#: 2 **Area:** 150' N of Hollister Dr. (1W), NB lane 10' off curb;



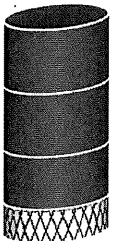
DEPTH
 Layer
 1.02"
 1.90"

DEPTH
 Total
 2.92"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

 Processed Aggregate

CORE#: 3 **Area:** 250' N of Hollister Dr. (1W), SB lane 10' off curb;



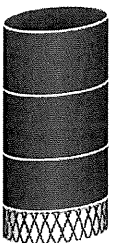
DEPTH
 Layer
 0.97"
 0.95"
 0.80"

DEPTH
 Total
 2.72"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA
 HMA

 Processed Aggregate

CORE#: 4 **Area:** 350' N of Hollister Dr. (1W), SB lane 4' off curb;



DEPTH
 Layer
 1.00"
 1.01"
 0.82"

DEPTH
 Total
 2.83"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA
 HMA

 Processed Aggregate

Jose R. Otero Jr., Project Manager

100 Great Meadow Road
 Suite 200
 Wethersfield, Connecticut 06109
 P 860.807.4300
 F 860.372.4570

Engineers | Scientists | Planners | Designers



To: Bill Anderson, PE
VHB/Wethersfield

Date: November 20, 2018

Memorandum

Project #: 42413.00

From: Jose Otero
VHB/Project Manger

Re: Jefferson Lane – East Hartford, CT

Following are the recommendations for the design and construction of Jefferson Lane from Brewer Street to Hollister Drive (West).

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The distress level investigation results indicate there is severe alligator cracking. Moderate pothole patching, transverse/longitudinal and weather/block cracking were noted. There is evidence of minor distortions and extensive surface wear, resulting in a Road Manager Pavement Condition Index (PCI) of 36, six points less than the 2014 update.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A3 and A24 which are classified as poorly graded sands and silty sands by the Unified Classification system. The subgrades are fair to good foundations when not subject to frost action, having a very moderate to high frost potential and exhibiting fair to poor drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 624 vehicles per day with small trucks and buses accounting for 4.2% of the ADT. The 20-year design Equivalent Single Axle Loads (ESALs) was estimated to be 84,800.

Brewer Street to Hollister Drive (East):

- The existing pavement structure cross-section consisted of 2.0" to 3.9" (average 2.8") of hot mix asphalt (HMA). The granular base consisted of 4" to 12" (average 7.5") of "fine" processed gravel bases which were founded on silty sand subbases/subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a 2.0" overlay to meet the Elastic Layer Design, which is NOT recommended.
- MILL AND OVERLAY is not recommended as a treatment alternative due to inadequate support from existing granular soils, requiring milling depth greater than existing pavement thickness.

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
P 860.807.4300

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|---|
| #1 | 20-years | RECLAIM the existing HMA and processed aggregate bases by pulverization and blending methods to a 10" depth. Compact the recycled material to proper lines and grades, leaving 5.5" to 6.5" as the new base course prior to placing 2.0" of Superpave S-0.375" Level 2 as the intermediate course and 2.0" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #2 | 20-years | REMOVE 3.5" of existing HMA and base materials, then compact to proper lines and grades prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 2.0" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |

Hollister Drive (East) to Hollister Drive (West):

- The existing pavement structure cross-section consisted of 2.2" to 3.6" (average 2.8") of hot mix asphalt (HMA). The granular base consisted of 6" to 8" (average 7") of "fine" processed gravel and silty sand bases which were founded on silty sand subbases/subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a 4.0" overlay to meet the Elastic Layer Design, which is NOT recommended.
- MILL AND OVERLAY is not recommended as a treatment alternative due to inadequate support from existing granular soils, requiring milling depth greater than existing pavement thickness.
- REMOVE HMA is not recommended as a treatment alternative due to no structural base present in >= 50% of test pits.

| Service Life | Recommendation |
|---------------------|---|
| 20-years | RECLAIM the existing HMA and processed aggregate bases by pulverization and blending methods to a 10" depth. Compact the recycled material to proper lines and grades, leaving 5" to 6" as the new base course prior to placing 2.0" of Superpave S-0.375" Level 2 as the intermediate course and 2.0" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |

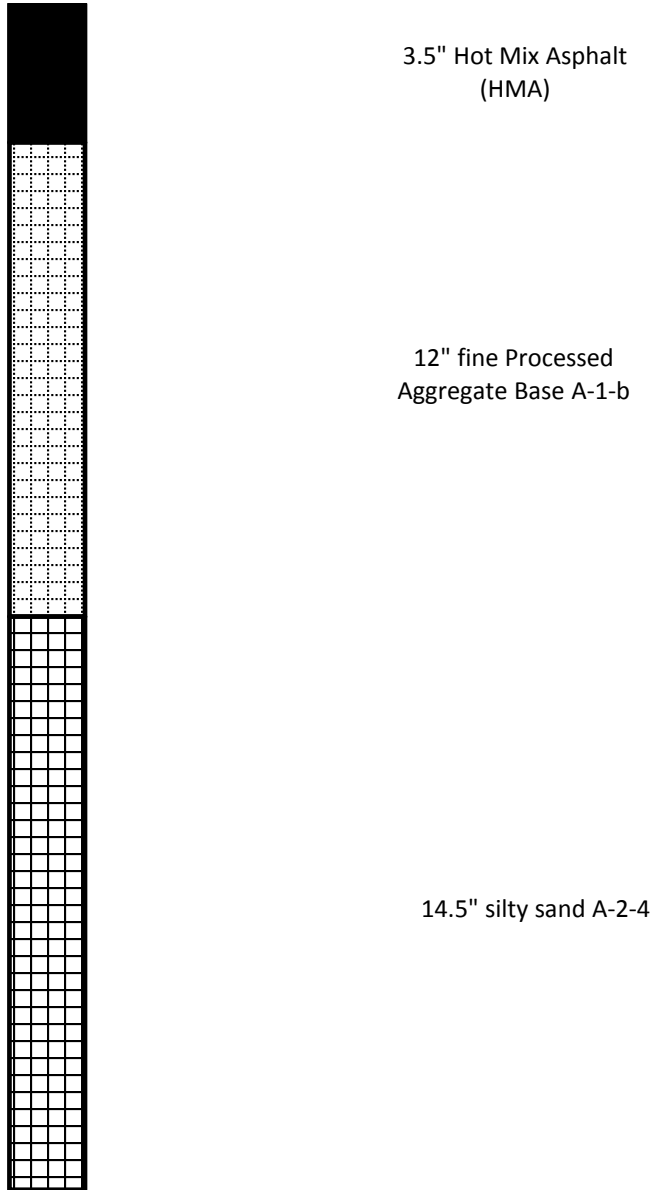


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Jefferson Lane - Brewer Street to Hollister Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP1 - 470' S of Brewer Street, 5' off SB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Jefferson Lane - Brewer Street to Hollister Drive

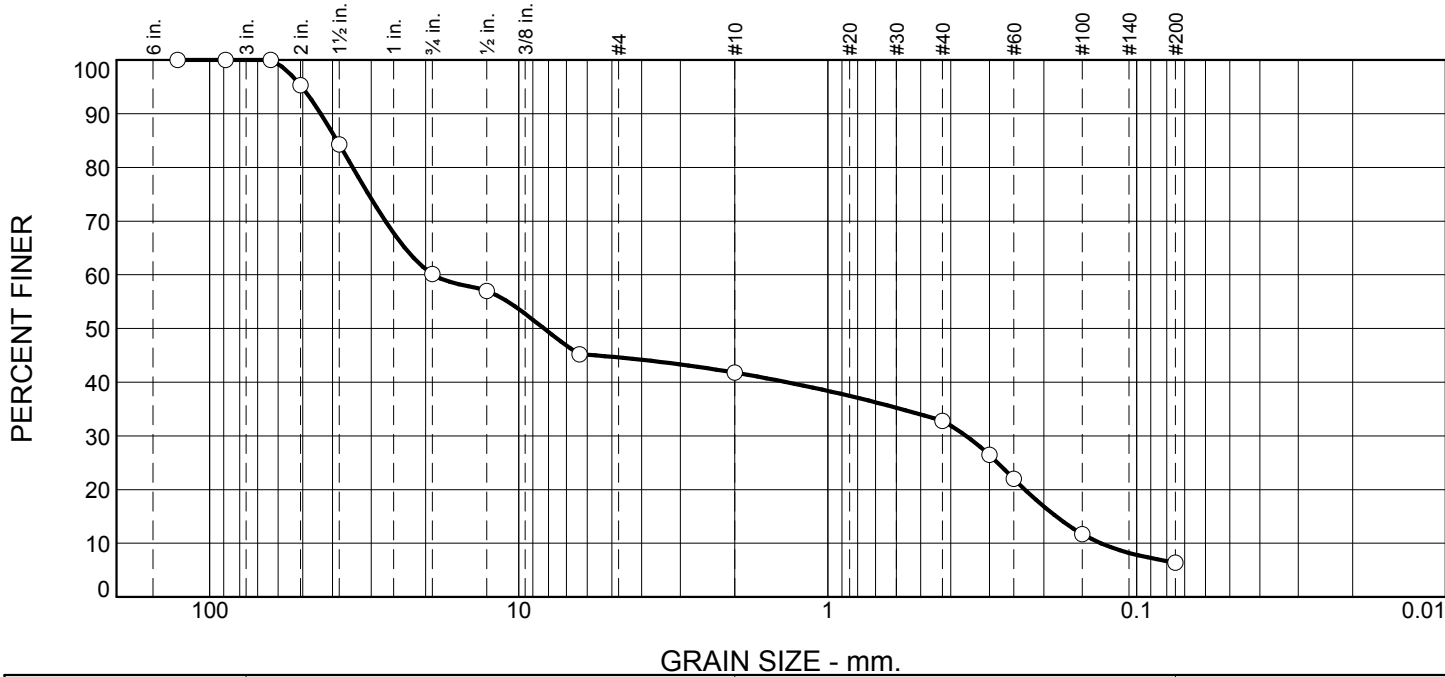
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 470' S of Brewer Street, 5' off SB lane curb;
Sample Number: BASE

Depth: 12

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 58 | 9 | 27 | 6 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 95 | 95 - 100 | |
| 1-1/2" | 84 | | |
| 3/4" | 60 | 50 - 75 | |
| 1/2" | 57 | | |
| 1/4" | 45 | 25 - 45 | |
| #10 | 42 | | |
| #40 | 33 | 5 - 20 | X |
| #50 | 26 | | |
| #60 | 22 | | |
| #100 | 12 | 2 - 12 | |
| #200 | 6.4 | | |

Material Description

fine Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 38.7292 D₆₀= 18.8684 D₅₀= 8.2765
D₃₀= 0.3577 D₁₅= 0.1823 D₁₀= 0.1307
C_u= 144.38 C_c= 0.05

Classification

USCS= GP-GM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Jefferson Lane - Brewer Street to Hollister Drive

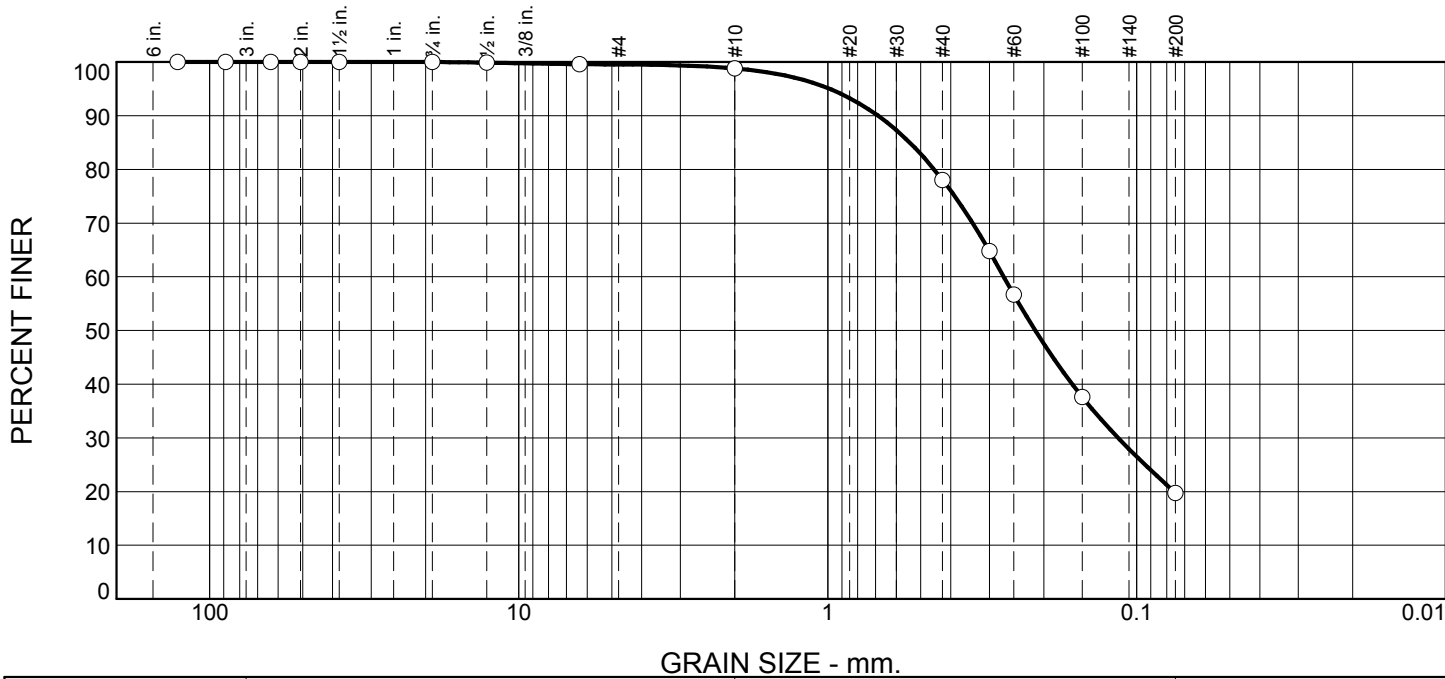
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 470' S of Brewer Street, 5' off SB lane curb;
Sample Number: SUBGRADE

Depth: 14.5

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 1 | 21 | 58 | 20 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 100 | 25 - 60 | X |
| #10 | 99 | 15 - 45 | X |
| #40 | 78 | 5 - 25 | X |
| #50 | 65 | | |
| #60 | 57 | | |
| #100 | 38 | 0 - 10 | X |
| #200 | 20 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.5433 D₆₀= 0.2694 D₅₀= 0.2129
D₃₀= 0.1149 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 11" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

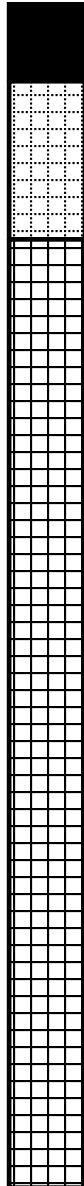


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860.807.4300

STREET: Jefferson Lane - Brewer Street to Hollister Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP2 - 660' S of Brewer Street, 12' off SB lane curb;



2" Hot Mix Asphalt
(HMA)

4" fine Processed
Aggregate Base A-1-b

24" poorly graded sand
with silt A-3

Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Jefferson Lane - Brewer Street to Hollister Drive

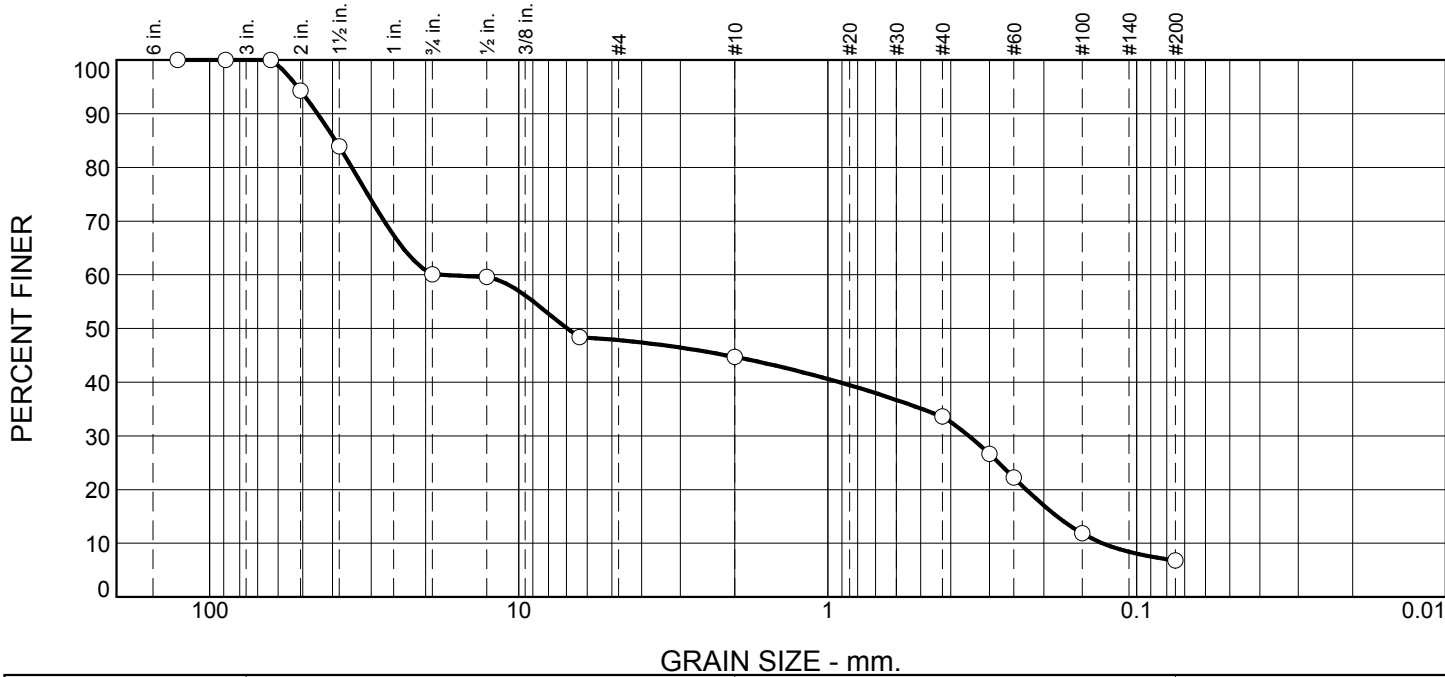
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 660' S of Brewer Street, 12' off SB lane curb;
Sample Number: BASE

Depth: 4

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 55 | 11 | 27 | 7 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 94 | 95 - 100 | X |
| 1-1/2" | 84 | | |
| 3/4" | 60 | 50 - 75 | |
| 1/2" | 60 | | |
| 1/4" | 48 | 25 - 45 | X |
| #10 | 45 | | |
| #40 | 34 | 5 - 20 | X |
| #50 | 27 | | |
| #60 | 22 | | |
| #100 | 12 | 2 - 12 | |
| #200 | 6.8 | | |

Material Description

fine Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 39.1693 D₆₀= 17.9237 D₅₀= 6.9627
D₃₀= 0.3499 D₁₅= 0.1807 D₁₀= 0.1291
C_u= 138.87 C_c= 0.05

Classification

USCS= GP-GM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Jefferson Lane - Brewer Street to Hollister Drive

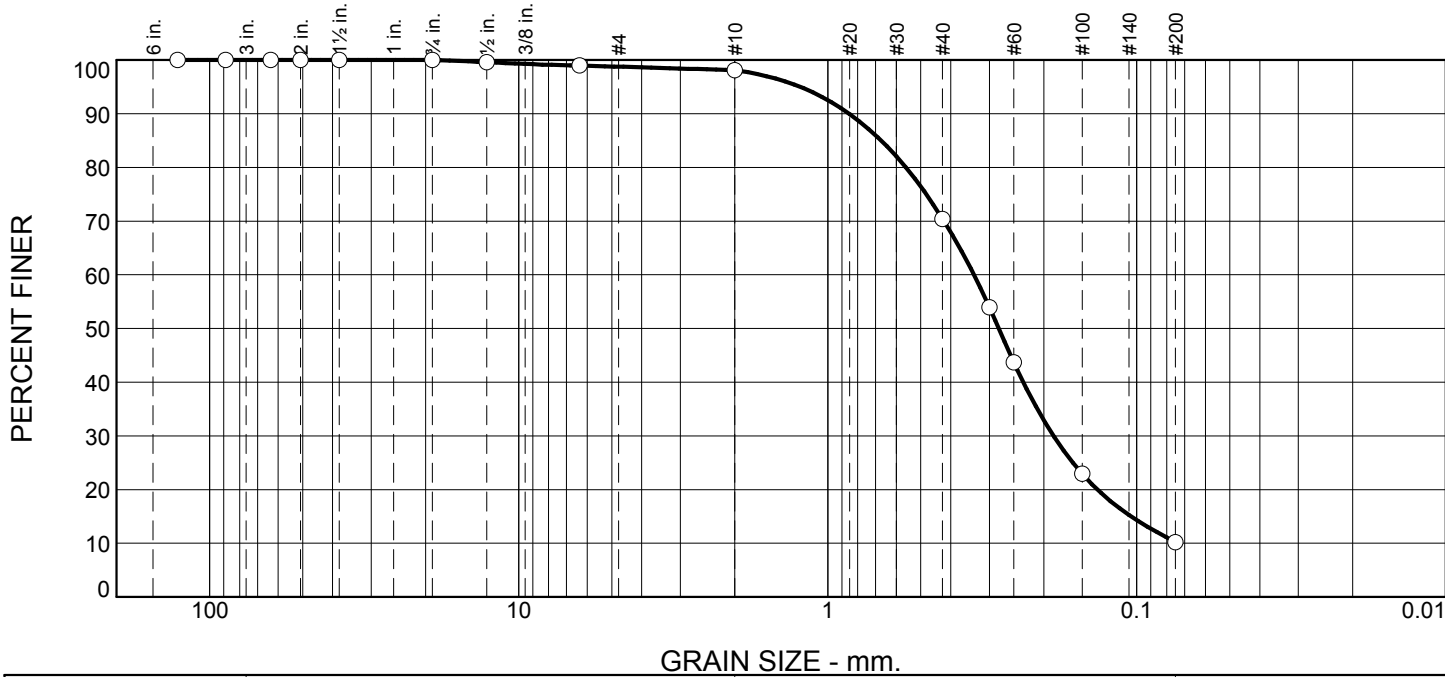
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 660' S of Brewer Street, 12' off SB lane curb;
Sample Number: SUBGRADE

Depth: 24

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 28 | 60 | 10 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 70 | 5 - 25 | X |
| #50 | 54 | | |
| #60 | 44 | | |
| #100 | 23 | 0 - 10 | X |
| #200 | 10 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6724 D₆₀= 0.3366 D₅₀= 0.2796
D₃₀= 0.1856 D₁₅= 0.1044 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-3

Remarks

DCP = 5" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

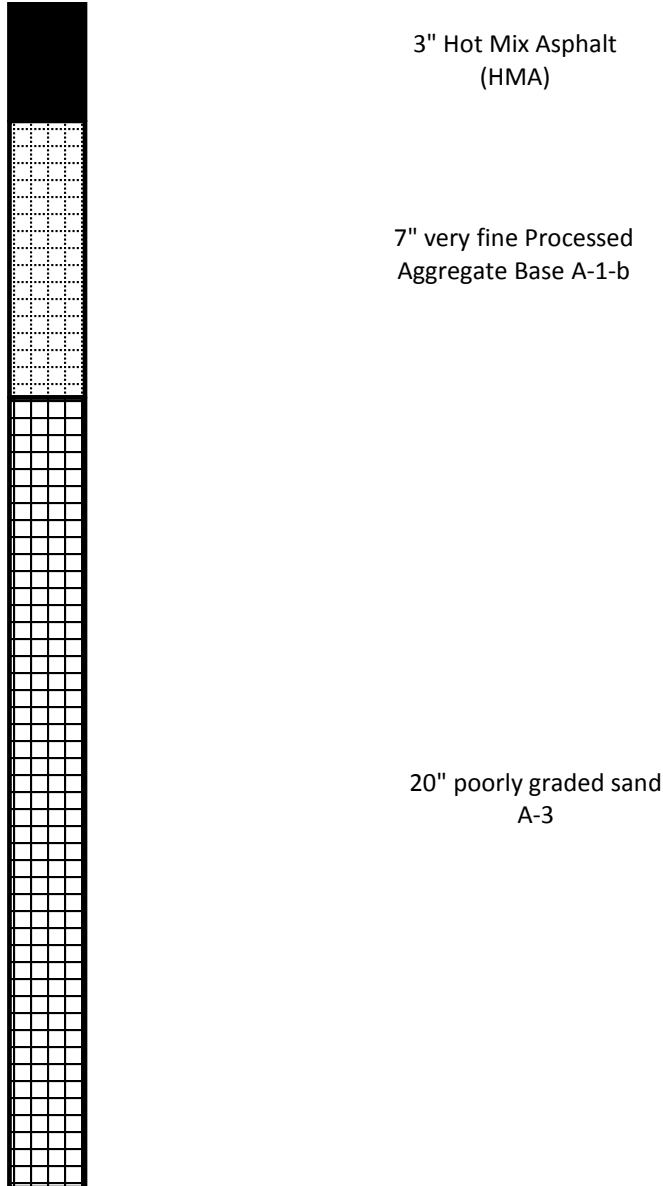


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Jefferson Lane - Brewer Street to Hollister Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP3 - 140' N of Hollister Drive (#1), 15' off NB lane curb;



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

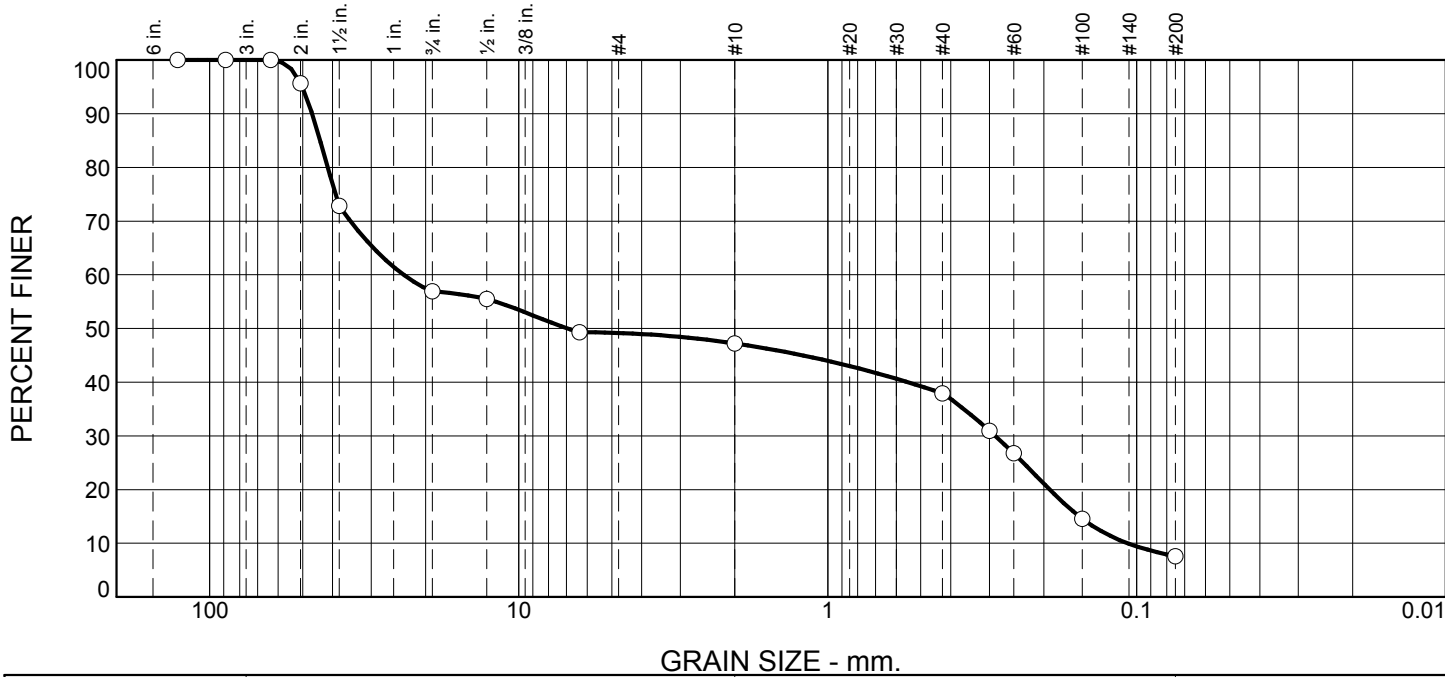
Project: Jefferson Lane - Brewer Street to Hollister Drive

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 140' N of Hollister Drive (#1), 15' off NB lane curb;
Sample Number: BASE **Depth:** 7

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 53 | 9 | 30 | 8 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 96 | 95 - 100 | |
| 1-1/2" | 73 | | |
| 3/4" | 57 | 50 - 75 | |
| 1/2" | 55 | | |
| 1/4" | 49 | 25 - 45 | X |
| #10 | 47 | | |
| #40 | 38 | 5 - 20 | X |
| #50 | 31 | | |
| #60 | 27 | | |
| #100 | 15 | 2 - 12 | X |
| #200 | 7.6 | | |

Material Description

very fine Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 43.9131 D₆₀= 23.5954 D₅₀= 6.9307
D₃₀= 0.2874 D₁₅= 0.1534 D₁₀= 0.1070
C_u= 220.59 C_c= 0.03

Classification

USCS= GP-GM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

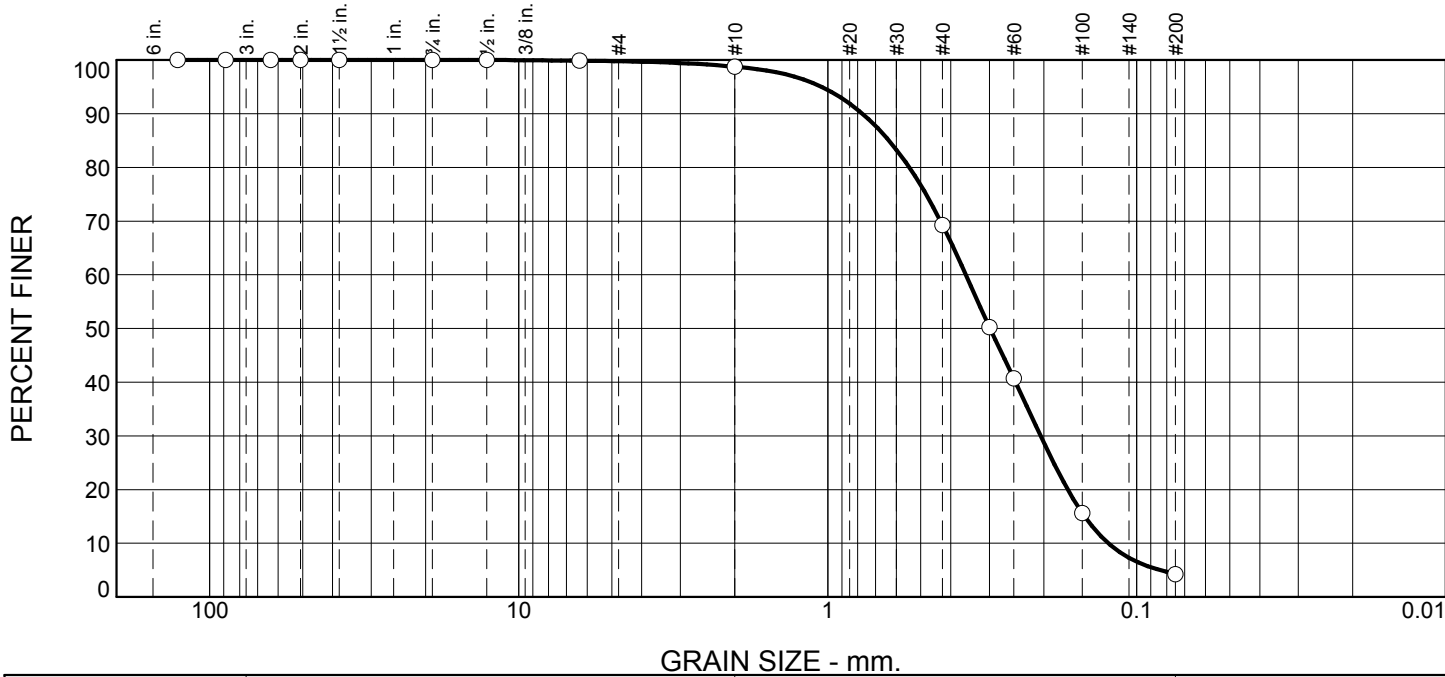
Project: Jefferson Lane - Brewer Street to Hollister Drive

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 140' N of Hollister Drive (#1), 15' off NB lane curb;
Sample Number: SUBGRADE **Depth:** 20

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 1 | 30 | 65 | 4 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 100 | 25 - 60 | X |
| #10 | 99 | 15 - 45 | X |
| #40 | 69 | 5 - 25 | X |
| #50 | 50 | | |
| #60 | 41 | | |
| #100 | 16 | 0 - 10 | X |
| #200 | 4.2 | 0.0 - 5.0 | |

Material Description

poorly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6346 D₆₀= 0.3577 D₅₀= 0.2987
D₃₀= 0.2045 D₁₅= 0.1475 D₁₀= 0.1235
C_u= 2.90 C_c= 0.95

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 4" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

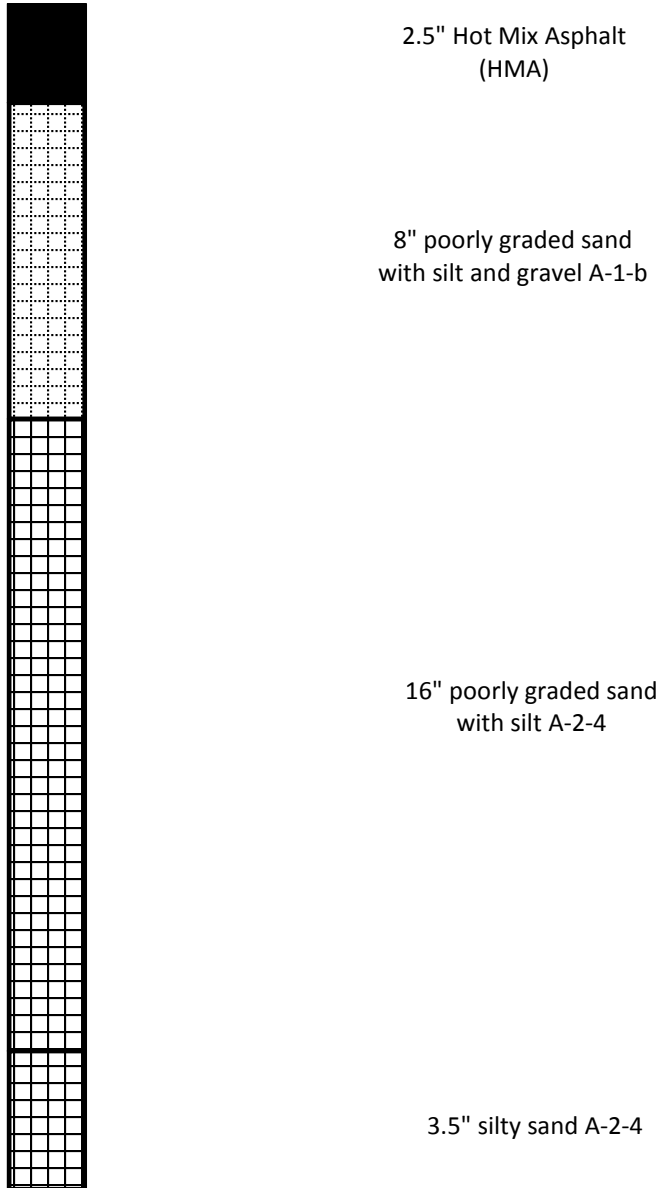


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860.807.4300

STREET: Jefferson Lane - Brewer Street to Hollister Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP4 - 255' S of Hollister Drive (#1), 12' off NB lane curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

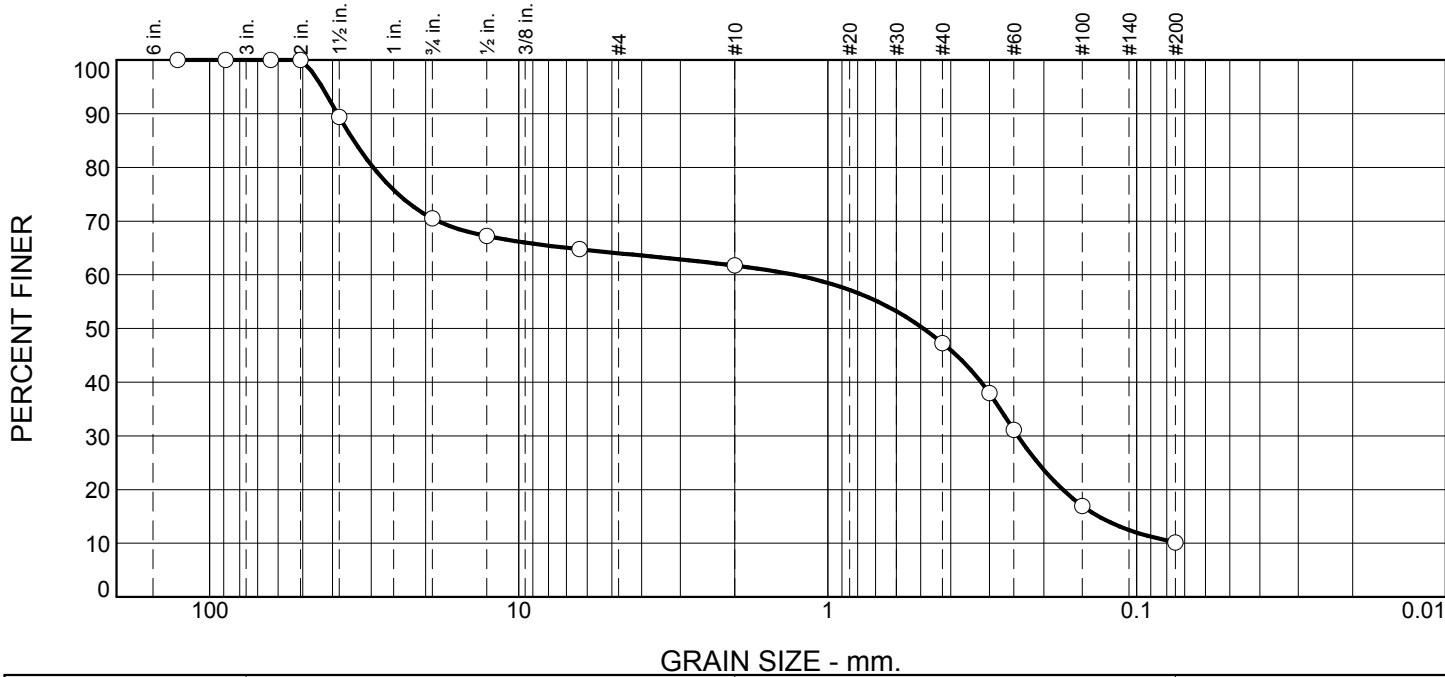
Project: Jefferson Lane - Brewer Street to Hollister Drive

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 255' S of Hollister Drive (#1), 12' off NB lane curb;
Sample Number: BASE **Depth:** 8

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 38 | 15 | 37 | 10 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 89 | | |
| 3/4" | 70 | 50 - 75 | |
| 1/2" | 67 | | |
| 1/4" | 65 | 25 - 45 | X |
| #10 | 62 | | |
| #40 | 47 | 5 - 20 | X |
| #50 | 38 | | |
| #60 | 31 | | |
| #100 | 17 | 2 - 12 | X |
| #200 | 10 | | |

Material Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 34.2116 D₆₀= 1.2800 D₅₀= 0.4905
D₃₀= 0.2427 D₁₅= 0.1328 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

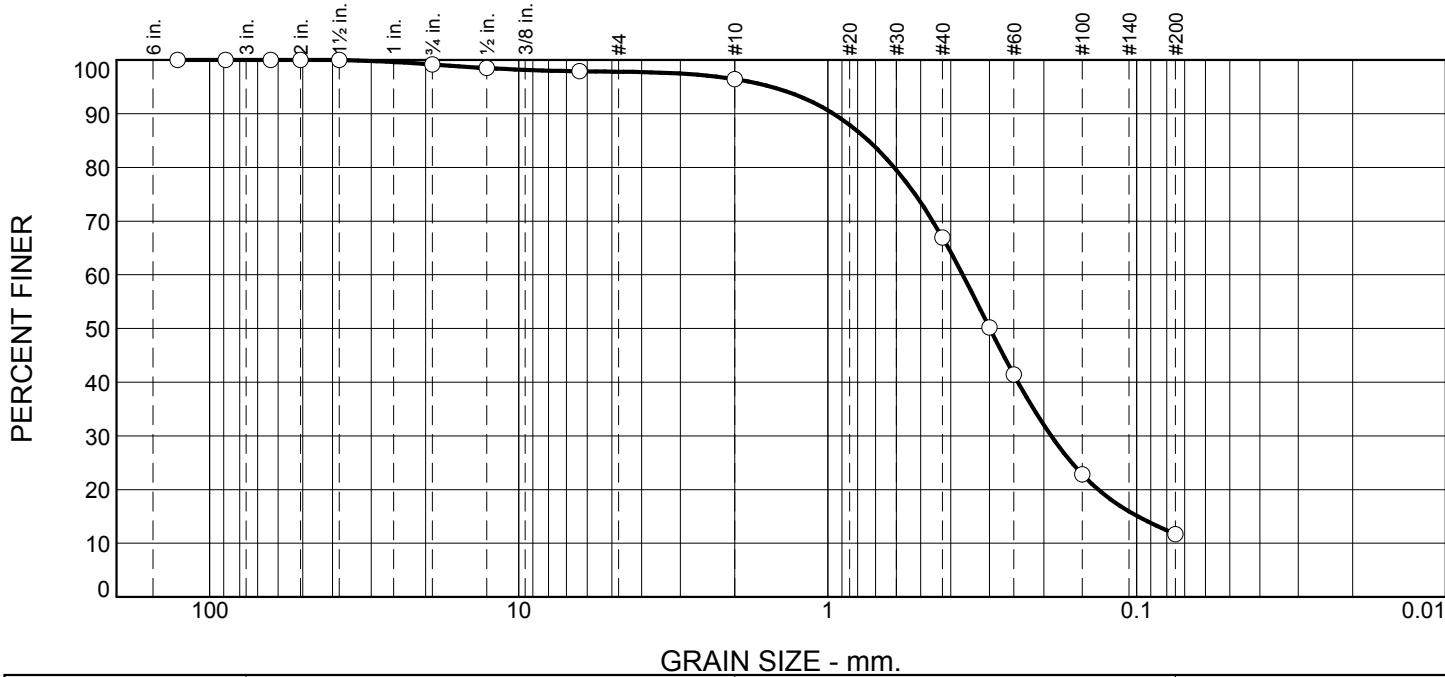
Project: Jefferson Lane - Brewer Street to Hollister Drive

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 255' S of Hollister Drive (#1), 12' off NB lane curb;
Sample Number: SUBBASE **Depth:** 16

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 4 | 29 | 55 | 12 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 99 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 96 | 15 - 45 | X |
| #40 | 67 | 5 - 25 | X |
| #50 | 50 | | |
| #60 | 41 | | |
| #100 | 23 | 0 - 10 | X |
| #200 | 12 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.7392 D₆₀= 0.3660 D₅₀= 0.2990
D₃₀= 0.1890 D₁₅= 0.0993 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-2-4

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

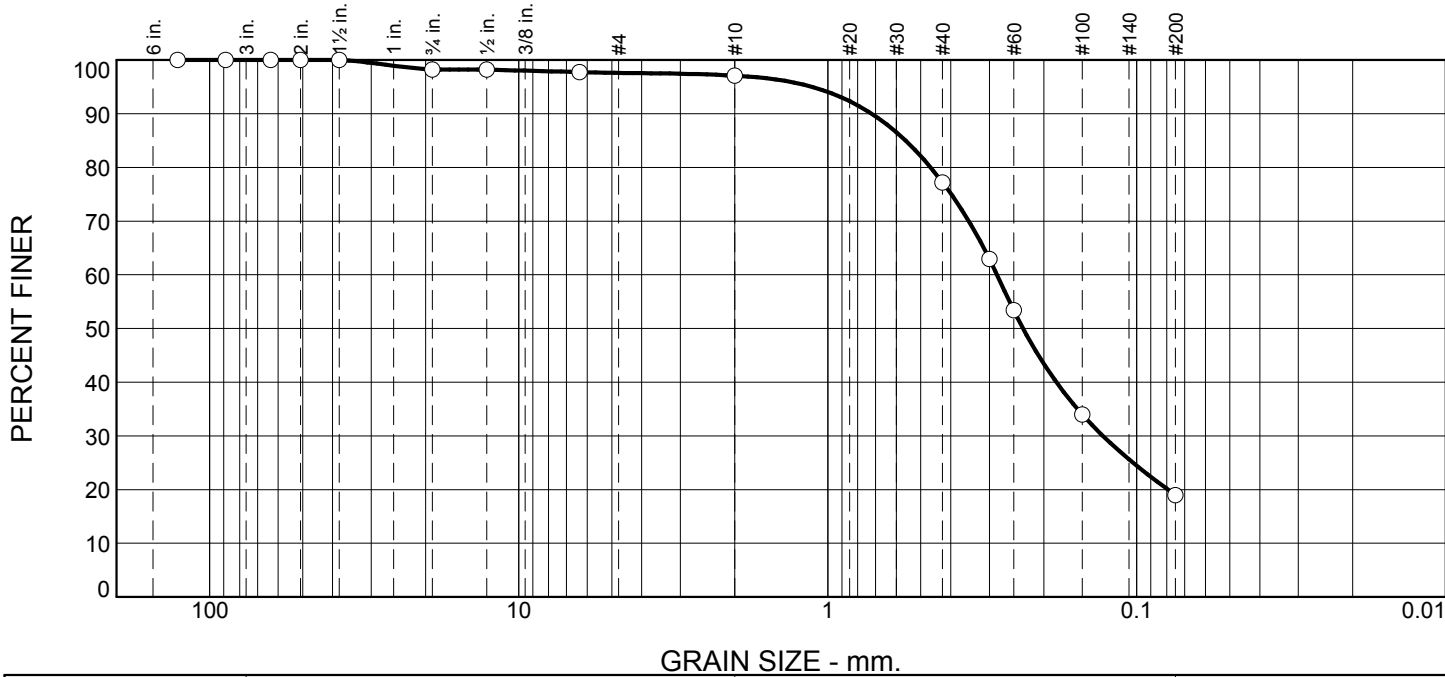
Project: Jefferson Lane - Brewer Street to Hollister Drive

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 255' S of Hollister Drive (#1), 12' off NB lane curb;
Sample Number: SUBGRADE **Depth:** 3.5

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 20 | 58 | 19 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 98 | | |
| 1/2" | 98 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 77 | 5 - 25 | X |
| #50 | 63 | | |
| #60 | 53 | | |
| #100 | 34 | 0 - 10 | X |
| #200 | 19 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.5604 D₆₀= 0.2835 D₅₀= 0.2332
D₃₀= 0.1287 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 4" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

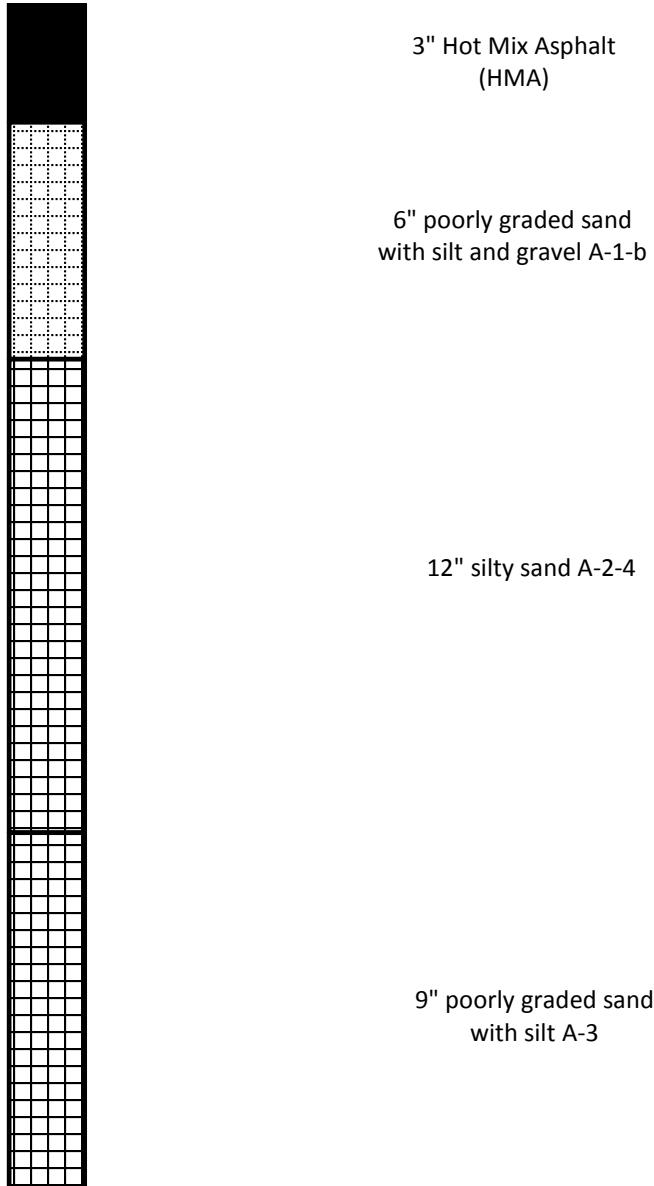


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860.807.4300

STREET: Jefferson Lane - Brewer Street to Hollister Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP5 - 650' SE of Hollister Drive (#2), 5' off SB lane curb;



Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

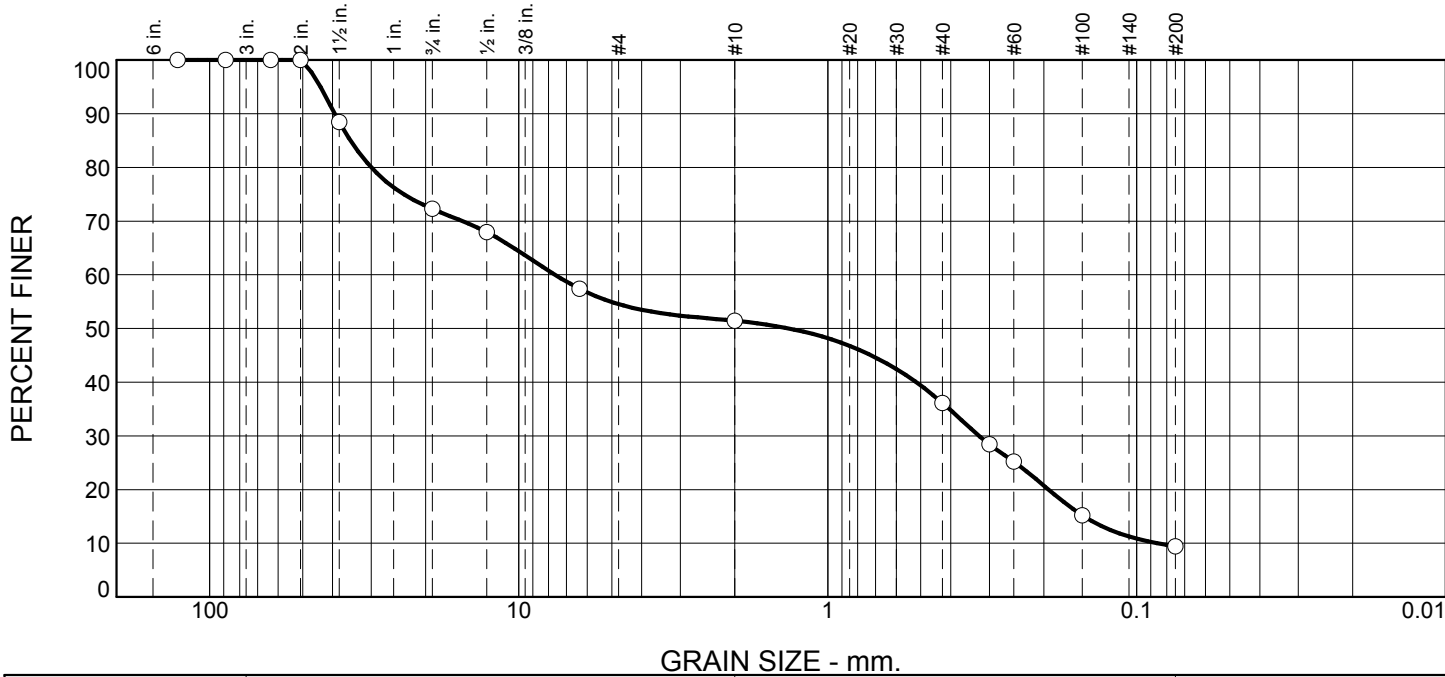
Project: Jefferson Lane - Brewer Street to Hollister Drive

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 650' SE of Hollister Drive (#2), 5' off SB lane curb;
Sample Number: BASE **Depth:** 6

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 49 | 15 | 27 | 9 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 88 | | |
| 3/4" | 72 | 50 - 75 | |
| 1/2" | 68 | | |
| 1/4" | 57 | 25 - 45 | X |
| #10 | 51 | | |
| #40 | 36 | 5 - 20 | X |
| #50 | 28 | | |
| #60 | 25 | | |
| #100 | 15 | 2 - 12 | X |
| #200 | 9.4 | | |

Material Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 35.0355 D₆₀= 7.6161 D₅₀= 1.3362
D₃₀= 0.3241 D₁₅= 0.1483 D₁₀= 0.0855
C_u= 89.07 C_c= 0.16

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

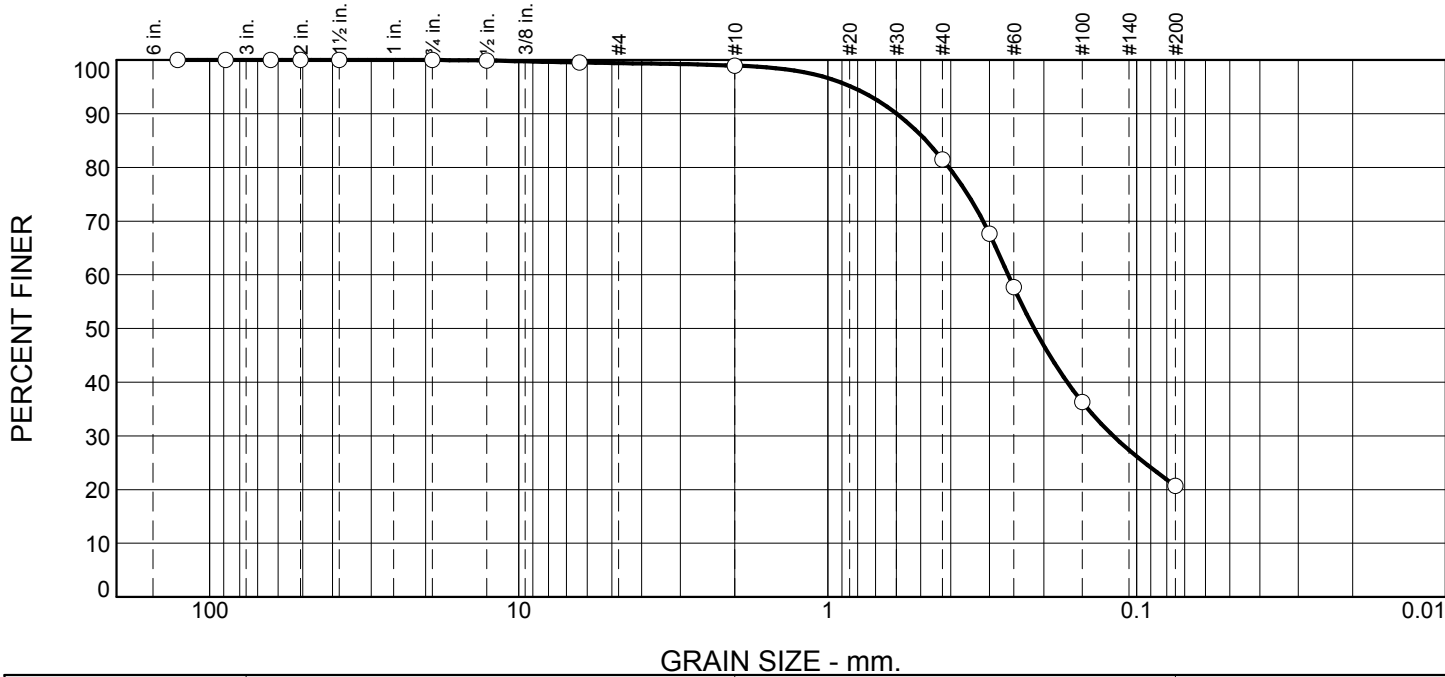
Project: Jefferson Lane - Brewer Street to Hollister Drive

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 650' SE of Hollister Drive (#2), 5' off SB lane curb;
Sample Number: SUBBASE **Depth:** 12

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 1 | 18 | 60 | 21 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 100 | 25 - 60 | X |
| #10 | 99 | 15 - 45 | X |
| #40 | 81 | 5 - 25 | X |
| #50 | 68 | | |
| #60 | 58 | | |
| #100 | 36 | 0 - 10 | X |
| #200 | 21 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.4808 D₆₀= 0.2608 D₅₀= 0.2145
D₃₀= 0.1191 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

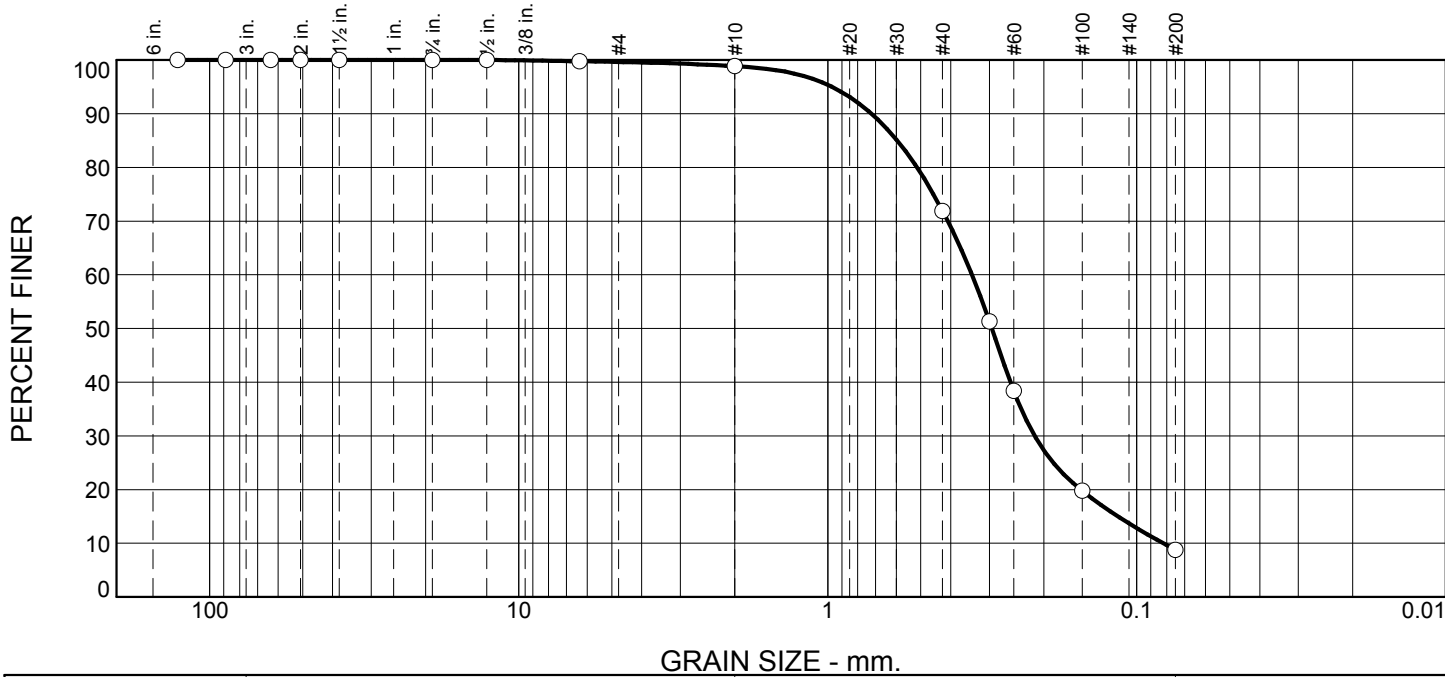
Project: Jefferson Lane - Brewer Street to Hollister Drive

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 650' SE of Hollister Drive (#2), 5' off SB lane curb;
Sample Number: SUBGRADE **Depth:** 9

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 1 | 27 | 63 | 9 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 100 | 25 - 60 | X |
| #10 | 99 | 15 - 45 | X |
| #40 | 72 | 5 - 25 | X |
| #50 | 51 | | |
| #60 | 38 | | |
| #100 | 20 | 0 - 10 | X |
| #200 | 8.8 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.5966 D₆₀= 0.3418 D₅₀= 0.2944
D₃₀= 0.2136 D₁₅= 0.1151 D₁₀= 0.0820
C_u= 4.17 C_c= 1.63

Classification

USCS= SP-SM AASHTO= A-3

Remarks

DCP = 5" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

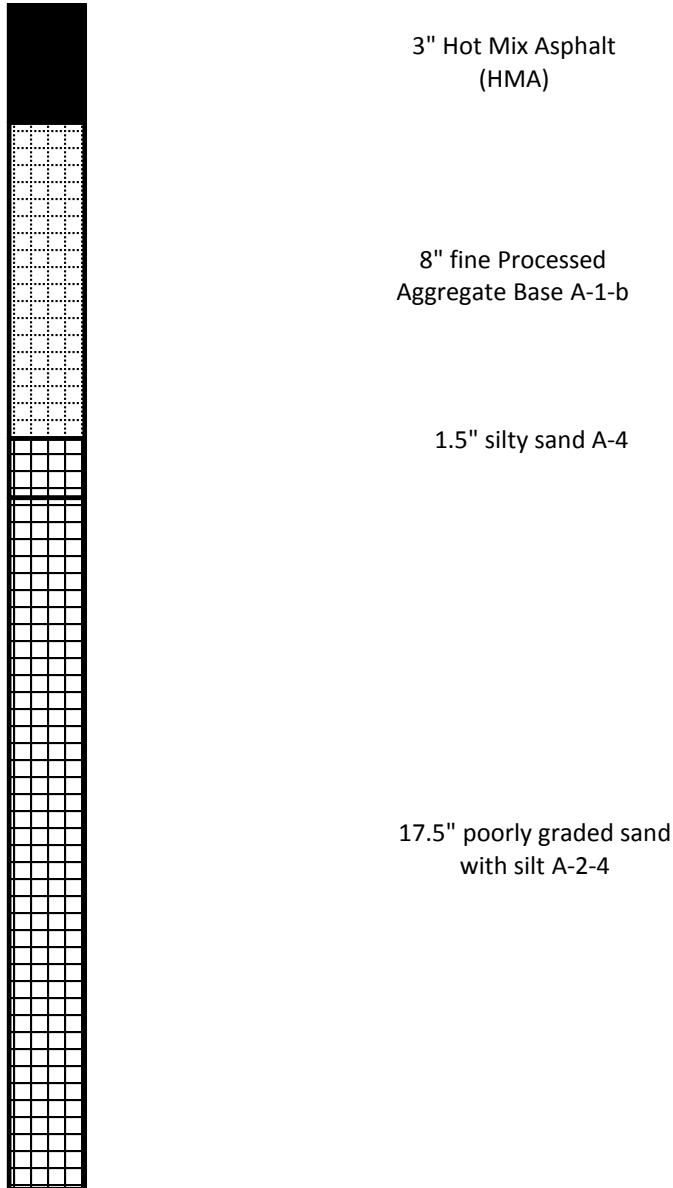


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Wethersfield, Connecticut 06109
860.807.4300

STREET: Jefferson Lane - Brewer Street to Hollister Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP6 - 265' S of Hollister Drive (#2), 6' off EB lane curb;



Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Jefferson Lane - Brewer Street to Hollister Drive

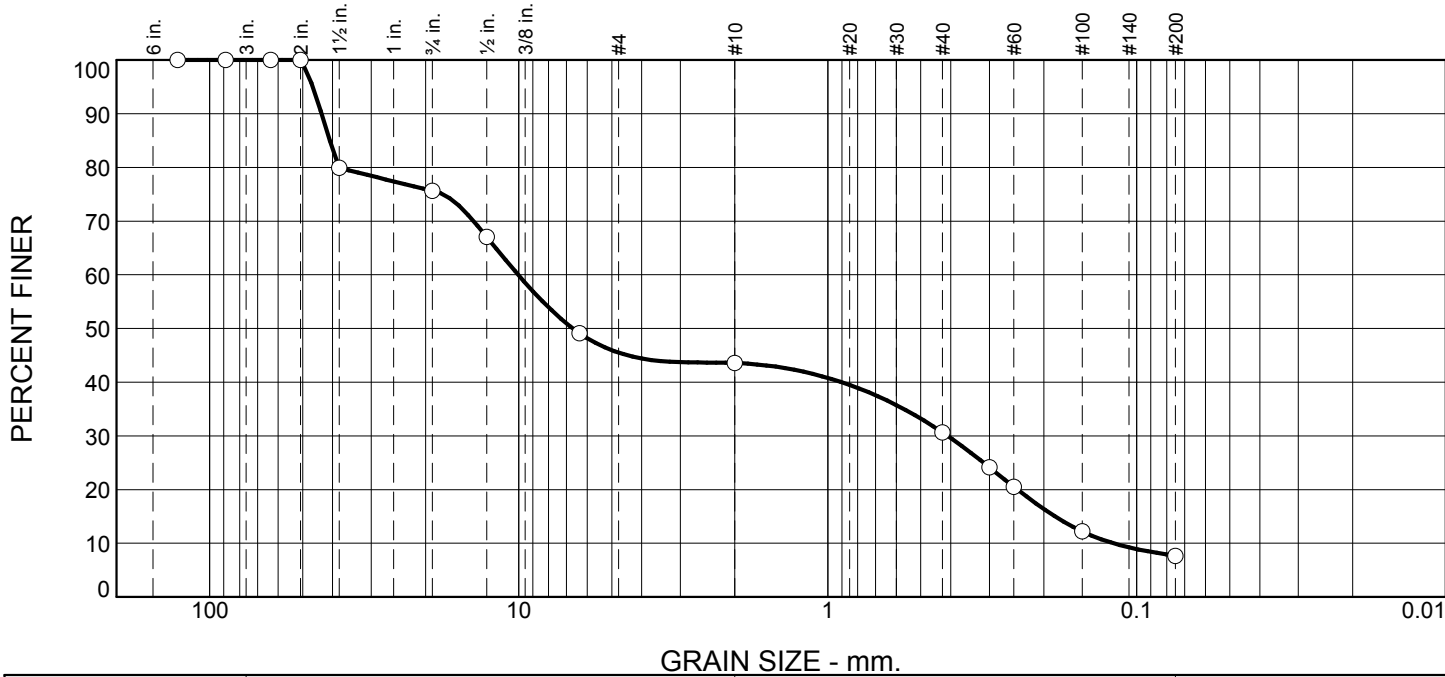
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP6 - 265' S of Hollister Drive (#2), 6' off EB lane curb;
Sample Number: BASE

Depth: 8

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 56 | 13 | 23 | 8 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 80 | | |
| 3/4" | 76 | 50 - 75 | X |
| 1/2" | 67 | | |
| 1/4" | 49 | 25 - 45 | X |
| #10 | 44 | | |
| #40 | 31 | 5 - 20 | X |
| #50 | 24 | | |
| #60 | 21 | | |
| #100 | 12 | 2 - 12 | |
| #200 | 7.6 | | |

Material Description

fine Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 40.8545 D₆₀= 10.0337 D₅₀= 6.6656
D₃₀= 0.4099 D₁₅= 0.1835 D₁₀= 0.1189
C_u= 84.38 C_c= 0.14

Classification

USCS= GP-GM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

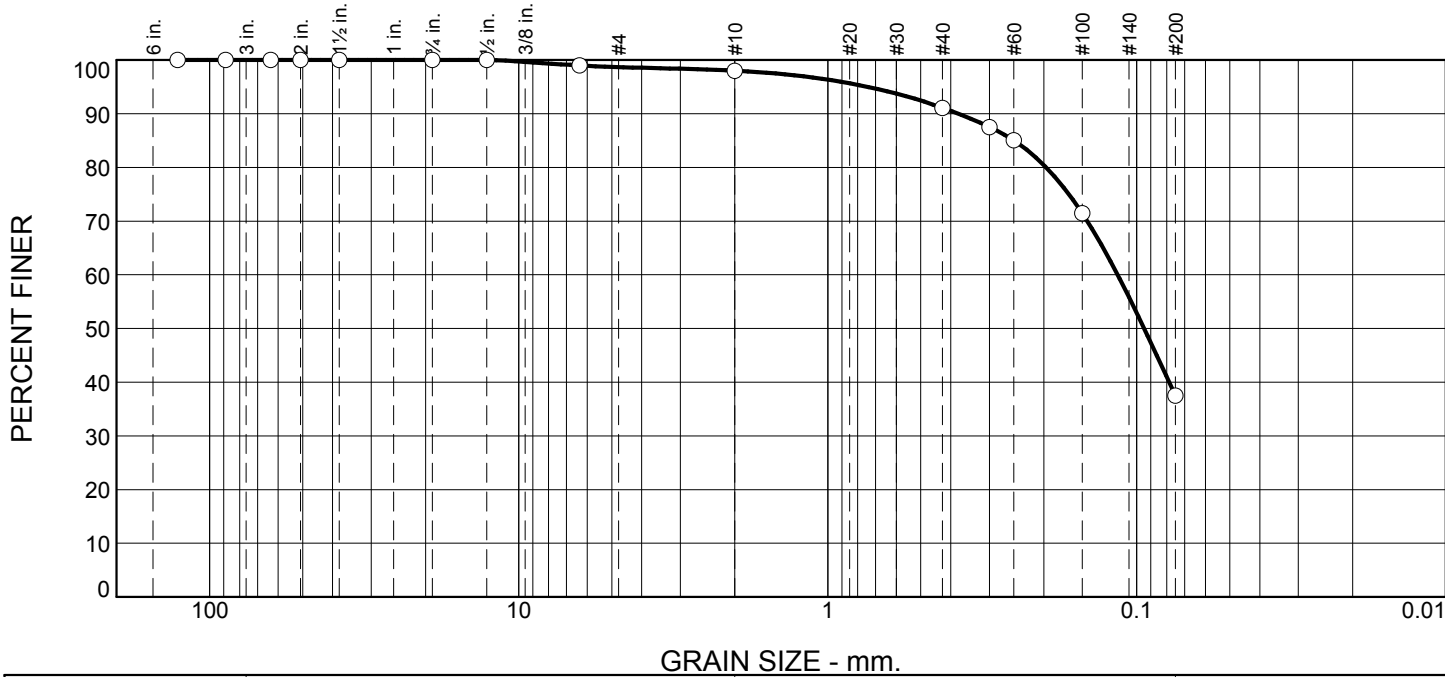
Project: Jefferson Lane - Brewer Street to Hollister Drive

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP6 - 265' S of Hollister Drive (#2), 6' off EB lane curb;
Sample Number: SUBBASE **Depth:** 1.5

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 7 | 54 | 37 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 91 | 5 - 25 | X |
| #50 | 88 | | |
| #60 | 85 | | |
| #100 | 71 | 0 - 10 | X |
| #200 | 37 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.2491 D₆₀= 0.1153 D₅₀= 0.0946
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-4

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

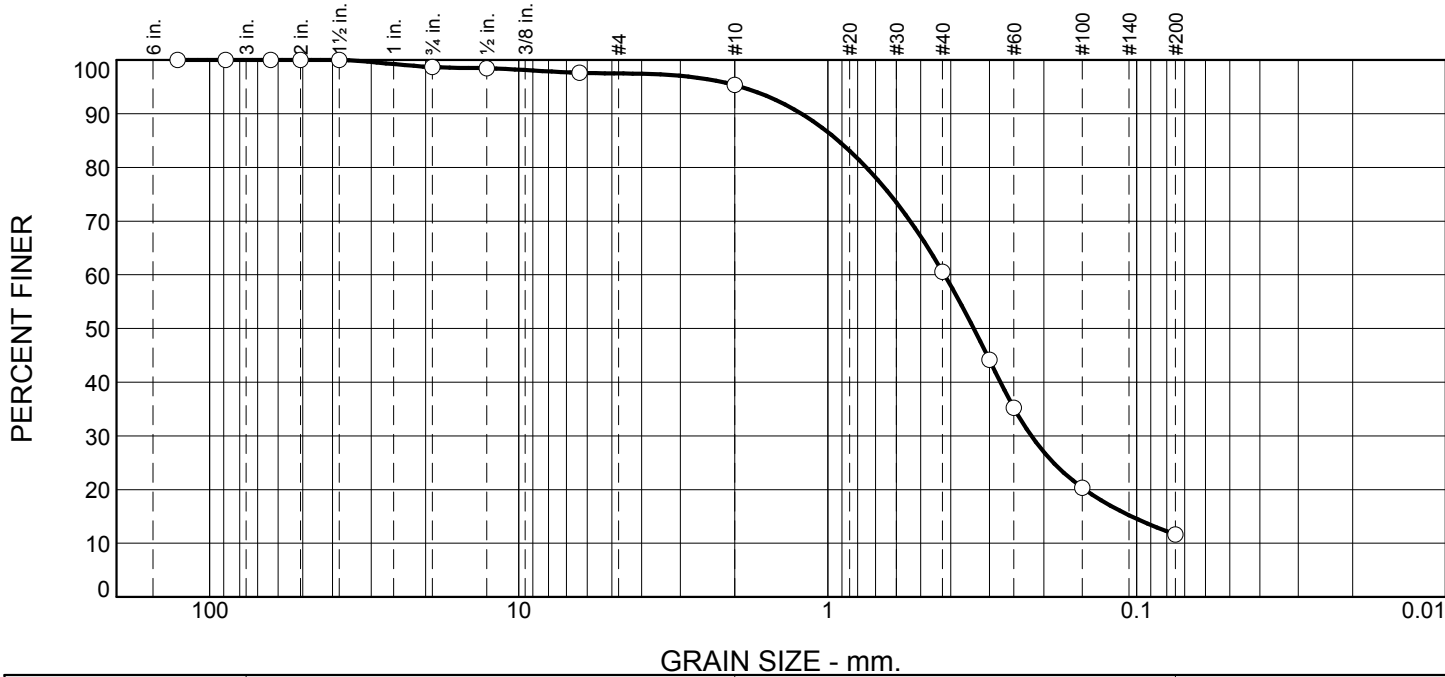
Project: Jefferson Lane - Brewer Street to Hollister Drive

Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP6 - 265' S of Hollister Drive (#2), 6' off EB lane curb;
Sample Number: SUBGRADE **Depth:** 17.5

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 5 | 34 | 49 | 12 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 98 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 95 | 15 - 45 | X |
| #40 | 61 | 5 - 25 | X |
| #50 | 44 | | |
| #60 | 35 | | |
| #100 | 20 | 0 - 10 | X |
| #200 | 12 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.9257 D₆₀= 0.4193 D₅₀= 0.3374
D₃₀= 0.2191 D₁₅= 0.1040 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-2-4

Remarks

DCP = 8" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

LOCATION: Jefferson Lane, East Hartford, CT

DATE SAMPLED: Wednesday, August 22, 2018

FROM: Brewer Street

TO: Hollister Drive (W)

CORE#: 1 **Area:** 110' S of Brewer St., SB lane 5' off curb;



DEPTH

Layer
1.15"
1.26"

DEPTH

Total
2.41"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 2 **Area:** 190' S of Brewer St., SB lane 8' off curb;



DEPTH

Layer
1.04"
1.53"

DEPTH

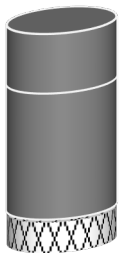
Total
2.57"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 3 **Area:** 305' S of Brewer St., NB lane 11' off curb;



DEPTH

Layer
0.95"
2.02"

DEPTH

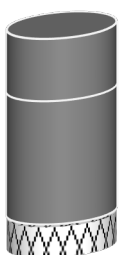
Total
2.97"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 4 **Area:** 400' S of Brewer St., NB lane 5' off curb;



DEPTH

Layer
1.18"
2.34"

DEPTH

Total
3.52"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

Jose R. Otero Jr., Project Manager

100 Great Meadow Road

Suite 200

Engineers | Scientists | Planners | Designers Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570

CORE PROFILE

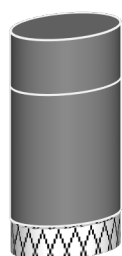
page 2



LOCATION: Jefferson Lane, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Brewer Street
TO: Hollister Drive (W)

CORE#: 5 **Area:** 500' S of Brewer St., SB lane 9' off curb;



DEPTH
Layer
0.75"
1.81"

DEPTH
Total
2.56"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 6 **Area:** 590' S of Brewer St., SB lane 4' off curb;



DEPTH
Layer
1.63"
2.30"

DEPTH
Total
3.93"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 7 **Area:** 500' N of Hollister Dr. (E), NB lane 9' off curb;



DEPTH
Layer
1.18"
1.64"

DEPTH
Total
2.82"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 8 **Area:** 420' N of Hollister Dr. (E), NB lane 4' off curb;



DEPTH
Layer
1.27"
1.89"

DEPTH
Total
3.16"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 9 **Area:** 325' N of Hollister Dr. (E), SB lane 4' off pavement edge;



DEPTH
Layer
0.78"
1.44"

DEPTH
Total
2.22"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

page 3



LOCATION: Jefferson Lane, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Brewer Street
TO: Hollister Drive (W)

CORE#: 10 **Area:** 216' N of Hollister Dr. (E), SB lane 10' off curb;



DEPTH
Layer
1.27"
1.87"

DEPTH
Total
3.14"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 11 **Area:** 120' N of Hollister Dr. (E), NB lane 9' off curb;



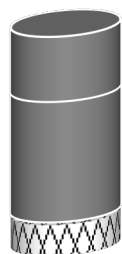
DEPTH
Layer
1.05"
1.84"

DEPTH
Total
2.89"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 12 **Area:** Intersection of Hollister Dr. (E), NB lane 4' off curb;



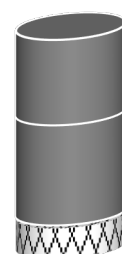
DEPTH
Layer
0.90"
1.67"

DEPTH
Total
2.57"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 13 **Area:** 100' S of Hollister Dr. (E), SB lane 5' off curb;



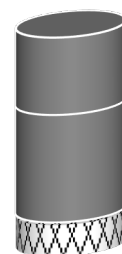
DEPTH
inches
1.25"
1.47"

DEPTH
Total
2.72"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 14 **Area:** 185' S of Hollister Dr. (E), SB lane 9' off curb;



DEPTH
Layer
1.09"
1.51"

DEPTH
Total
2.60"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

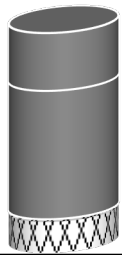
page 4



LOCATION: Jefferson Lane, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Brewer Street
TO: Hollister Drive (W)

CORE#: 15 **Area:** 290' S of Hollister Dr. (E), NB lane 5' off curb;



DEPTH
Layer
0.79"
1.76"

DEPTH
Total
2.55"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 16 **Area:** 380' S of Hollister Dr. (E), NB lane 8' off curb;



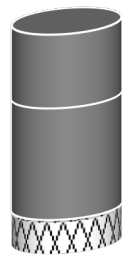
DEPTH
Layer
1.06"
2.06"

DEPTH
Total
3.12"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 17 **Area:** 470' S of Hollister Dr. (E), SB lane 5' off curb;



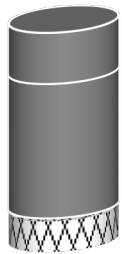
DEPTH
Layer
1.18"
1.78"

DEPTH
Total
2.96"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 18 **Area:** 560' S of Hollister Dr. (E), SB lane 9' off curb;



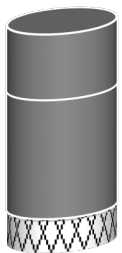
DEPTH
inches
0.63"
1.66"

DEPTH
Total
2.29"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 19 **Area:** 623' S of Hollister Dr. (W), NB lane 9' off curb;



DEPTH
Layer
0.91"
1.64"

DEPTH
Total
2.55"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

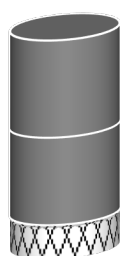
page 5



LOCATION: Jefferson Lane, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Brewer Street
TO: Hollister Drive (W)

CORE#: 20 **Area:** 533' S of Hollister Dr. (W), NB lane 4' off curb;



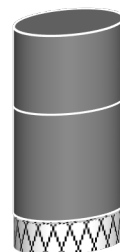
DEPTH
Layer
1.16"
1.04"

DEPTH
Total
2.20"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 21 **Area:** 440' S of Hollister Dr. (W), SB lane 5' off curb;



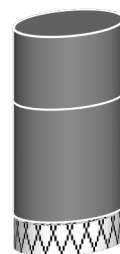
DEPTH
Layer
1.06"
1.44"

DEPTH
Total
2.50"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 22 **Area:** 361' S of Hollister Dr. (W), SB lane 8' off curb;



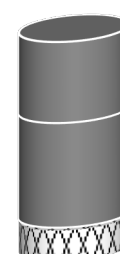
DEPTH
Layer
1.41"
2.20"

DEPTH
Total
3.61"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 23 **Area:** 272' S of Hollister Dr. (W), NB lane 8' off curb;



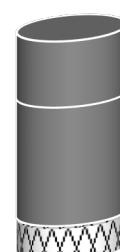
DEPTH
Layer
1.37"
1.78"

DEPTH
Total
3.15"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 24 **Area:** 200' S of Hollister Dr. (W), NB lane 5' off curb;



DEPTH
Layer
0.99"
1.77"

DEPTH
Total
2.76"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

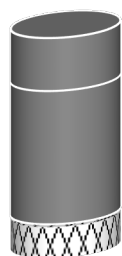
page 6



LOCATION: Jefferson Lane, East Hartford, CT
 DATE SAMPLED: August 22, 2018

FROM: Brewer Street
 TO: Hollister Drive (W)

CORE#: 25 **Area:** 125' S of Hollister Dr. (W), SB lane 8' off curb;



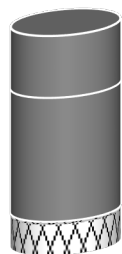
DEPTH
 Layer
 0.84"
 2.12"

DEPTH
 Total
 2.96"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 26 **Area:** 60' S of Hollister Dr. (W), NB lane 8' off curb;



DEPTH
 Layer
 0.94"
 1.89"

DEPTH
 Total
 2.83"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate



To: Bill Anderson, PE
VHB/Wethersfield

Date: November 20, 2018

Memorandum

Project #: 42413.00

From: Jose Otero
VHB/Project Manager

Re: Milbrook Drive – East Hartford, CT

Following are the recommendations for the design and construction of Milbrook Drive from Hollister Drive to its eastern-most intersection with Cambridge Drive.

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The distress level investigation results indicate there is severe alligator cracking and transverse/longitudinal cracking. There is evidence of minor block cracking and moderate distortion resulting in a Road Manager Pavement Condition Index (PCI) of 55.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A3 and A24 which are classified as uniformly graded sands and silty sands by the Unified Classification system. The subgrades are fair to good foundations when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 100 vehicles per day with small trucks and buses accounting for 2% of the ADT. The ADT is based on an average of 10 trips per household per day.

Hollister Drive to Princeton Lane:

- The existing pavement structure cross-section consisted of 1.7" to 7.2" (average 4.2") of hot mix asphalt (HMA). The granular bases consisted of 1" to 6" of fine processed aggregate founded on uniformly graded sand subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally adequate.

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
P 860.807.4300

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|---|
| #1 | 20-years | RECLAIM the existing HMA and processed aggregate bases by pulverization and blending methods to a 9" depth. Compact the recycled material to proper lines and grades, leaving a minimum of 6" as the new base course prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #2 | 20-years | REMOVE the existing 4.2" of HMA, then place 1.2" of processed aggregate for fine grading. Compact to proper lines, prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #3 | 8-10 years | RESURFACE by milling the existing pavement to a 1.5" depth. Repair any base failures, seal major cracks and apply an emulsified asphalt tack coat prior to placing 1.5" of Superpave S-0.375" Level 2 as the new surface course, with a tack coat between lifts |

Princeton Lane to Cambridge Drive:

- The existing pavement structure cross-section consisted of 3.7" to 7.2" (average 5.3") of hot mix asphalt (HMA) directly on silty sand subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a 2.0" overlay to meet the Elastic Layer Design, which is NOT recommended.
- MILL AND OVERLAY is not recommended as a treatment alternative due to inadequate support from existing granular soils, requiring milling depth approximately equal to existing pavement thickness.

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|---|
| #1 | 20-years | RECONSTRUCT the pavement section by removing the existing HMA and processed aggregate bases to a 9" depth. Place 6" of processed aggregate as a base. Compact to proper lines and grades prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #2 | 20-years | REMOVE the existing 5.3" of HMA, place ~0.3" of processed aggregate for fine grading. Compact to proper lines prior to placing 2.5" of Superpave S-0.5" Level 2 as the intermediate course and 2.25" of Superpave S-0.5" Level 2 as the surface course, with a tack coat between lifts. |

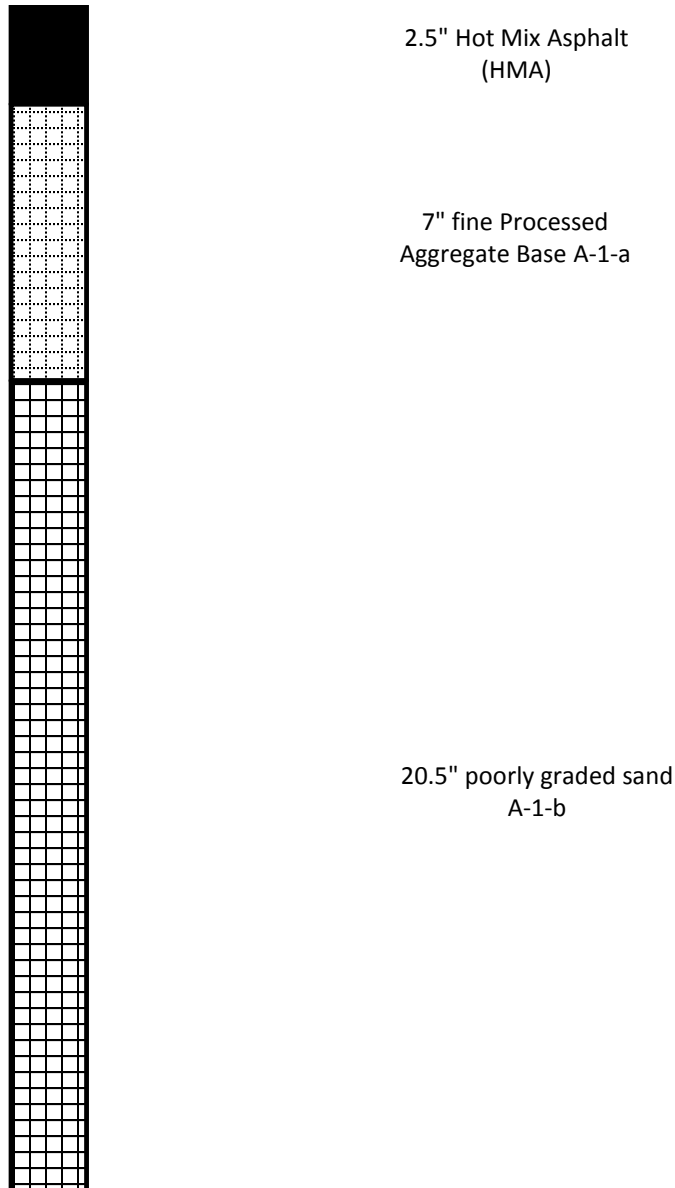


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Milbrook Drive - Hollister Drive to Cambridge Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP1 - 155' S of Hollister Drive, 5' off SB lane curb;



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Milbrook Drive - Hollister Drive to Cambridge Drive

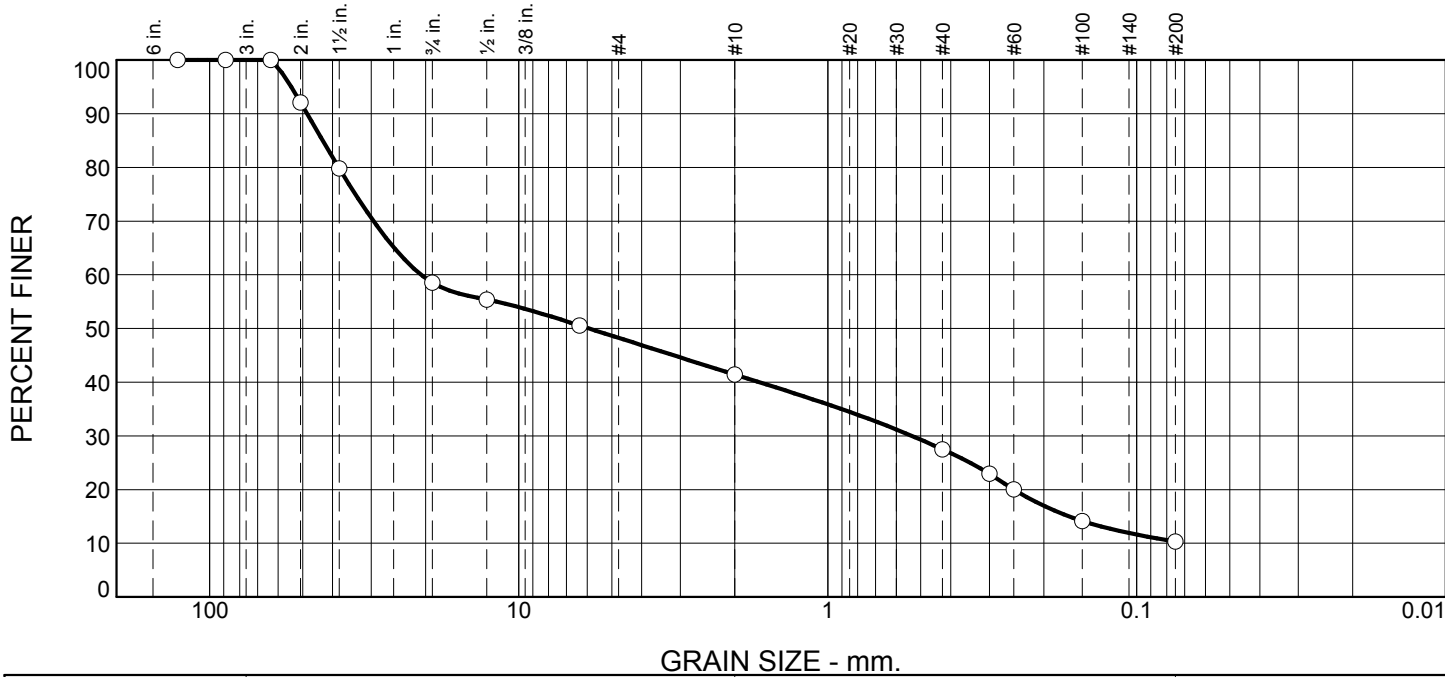
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 155' S of Hollister Drive, 5' off SB lane curb;
Sample Number: BASE

Depth: 7

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 59 | 14 | 17 | 10 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 92 | 95 - 100 | X |
| 1-1/2" | 80 | | |
| 3/4" | 59 | 50 - 75 | |
| 1/2" | 55 | | |
| 1/4" | 51 | 25 - 45 | X |
| #10 | 41 | | |
| #40 | 27 | 5 - 20 | X |
| #50 | 23 | | |
| #60 | 20 | | |
| #100 | 14 | 2 - 12 | X |
| #200 | 10 | | |

Material Description

fine Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 43.0859 D₆₀= 20.6972 D₅₀= 5.9177
D₃₀= 0.5344 D₁₅= 0.1655 D₁₀=
C_u= C_c=

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Milbrook Drive - Hollister Drive to Cambridge Drive

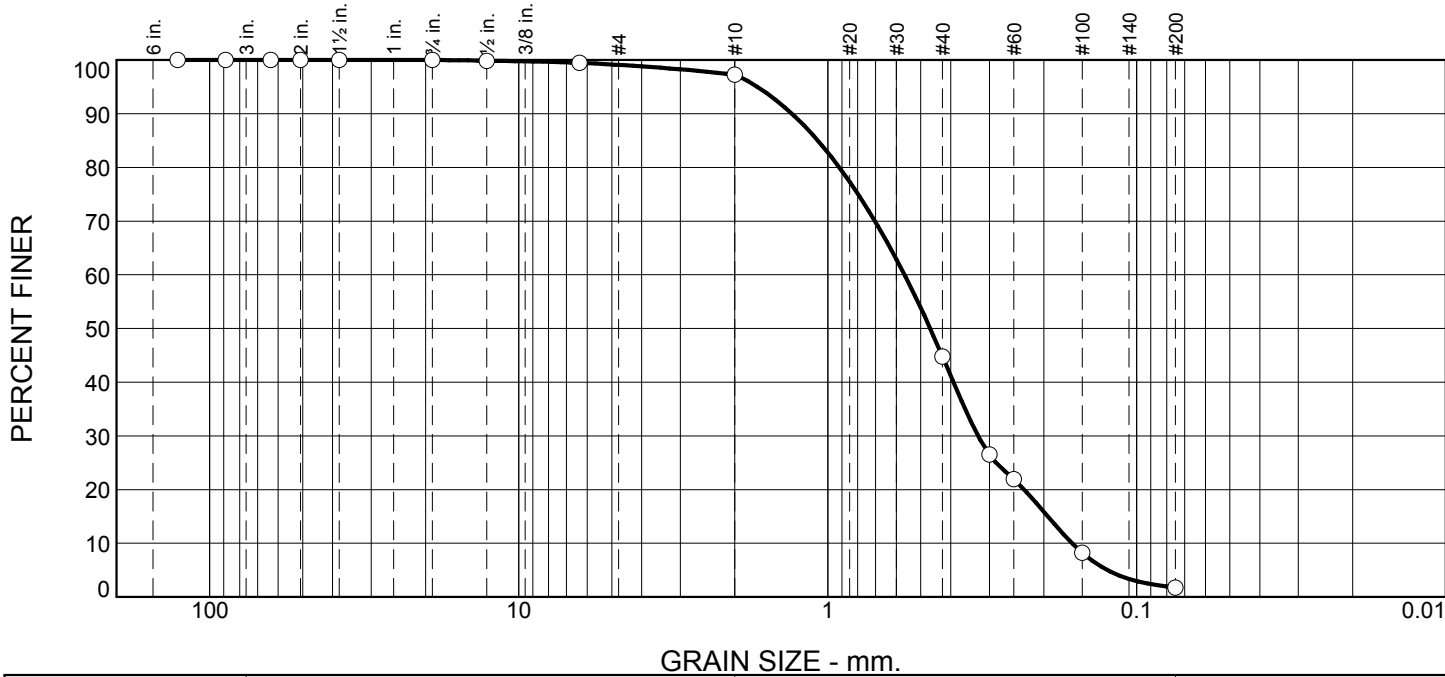
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 155' S of Hollister Drive, 5' off SB lane curb;
Sample Number: SUBGRADE

Depth: 20.5

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 52 | 43 | 2 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 45 | 5 - 25 | X |
| #50 | 27 | | |
| #60 | 22 | | |
| #100 | 8 | 0 - 10 | |
| #200 | 1.7 | 0.0 - 5.0 | |

Material Description

poorly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 1.0773 D₆₀= 0.5650 D₅₀= 0.4662
D₃₀= 0.3264 D₁₅= 0.1938 D₁₀= 0.1618
C_u= 3.49 C_c= 1.17

Classification

USCS= SP AASHTO= A-1-b

Remarks

DCP = 4" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

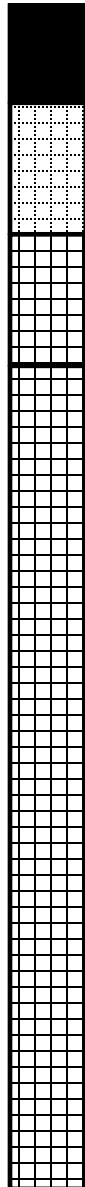


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Milbrook Drive - Hollister Drive to Cambridge Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP2 - 240' E of Cambridge Drive, 8' off WB lane curb;



3" Hot Mix Asphalt
(HMA)

1" Penetrated Stone
Macadam

1" Processed Aggregate
Base A-1-a

25" poorly graded sand
A-3

Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Milbrook Drive - Hollister Drive to Cambridge Drive

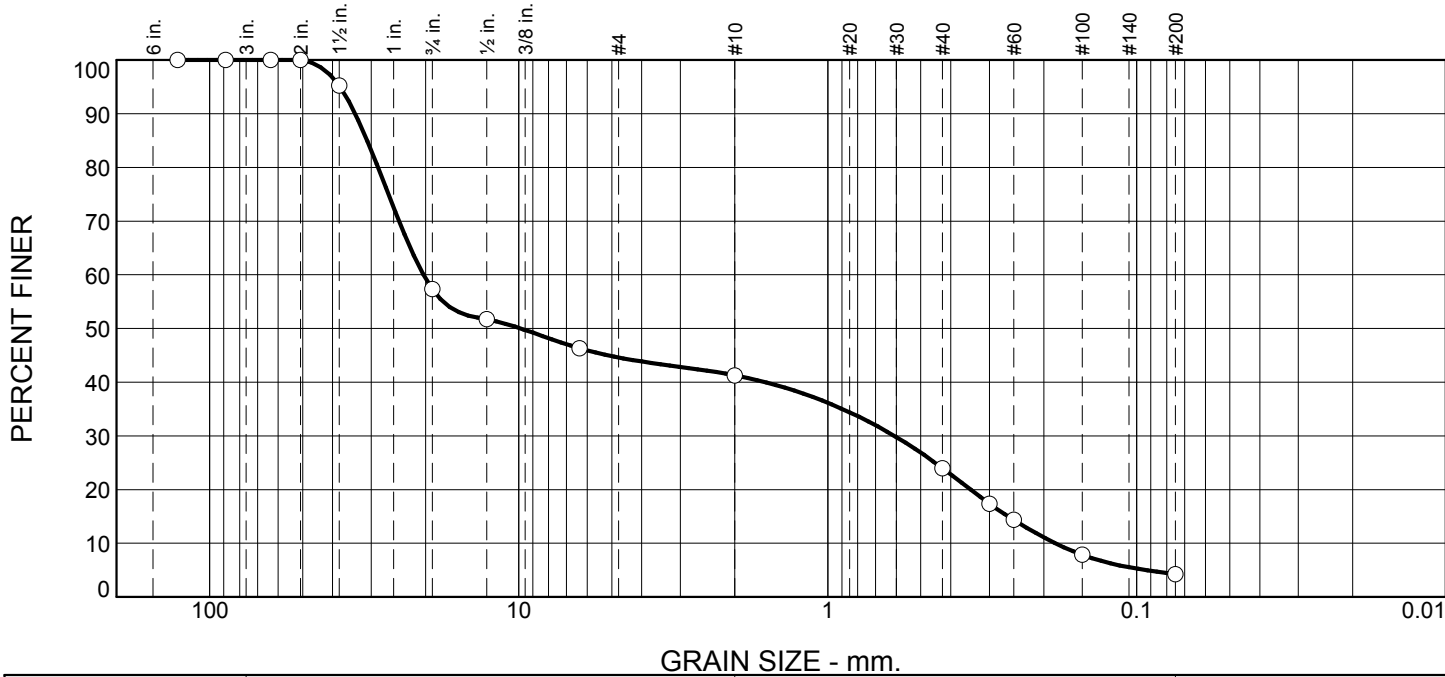
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 240' E of Cambridge Drive, 8' off WB lane curb;
Sample Number: SUBBASE

Depth: 1

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 59 | 17 | 20 | 4 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 95 | | |
| 3/4" | 57 | 50 - 75 | |
| 1/2" | 52 | | |
| 1/4" | 46 | 25 - 45 | X |
| #10 | 41 | | |
| #40 | 24 | 5 - 20 | X |
| #50 | 17 | | |
| #60 | 14 | | |
| #100 | 8 | 2 - 12 | |
| #200 | 4.2 | | |

Material Description

Processed Aggregate Base

| | | | |
|---------------------------|---------------------------|--------------------------|--------|
| PL= NP | Atterberg Limits | LL= NV | PI= NP |
| | Coefficients | | |
| D ₈₅ = 30.9517 | D ₆₀ = 20.3472 | D ₅₀ = 9.8572 | |
| D ₃₀ = 0.6095 | D ₁₅ = 0.2604 | D ₁₀ = 0.1833 | |
| C _u = 111.03 | C _c = 0.10 | | |

USCS= GP

AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Milbrook Drive - Hollister Drive to Cambridge Drive

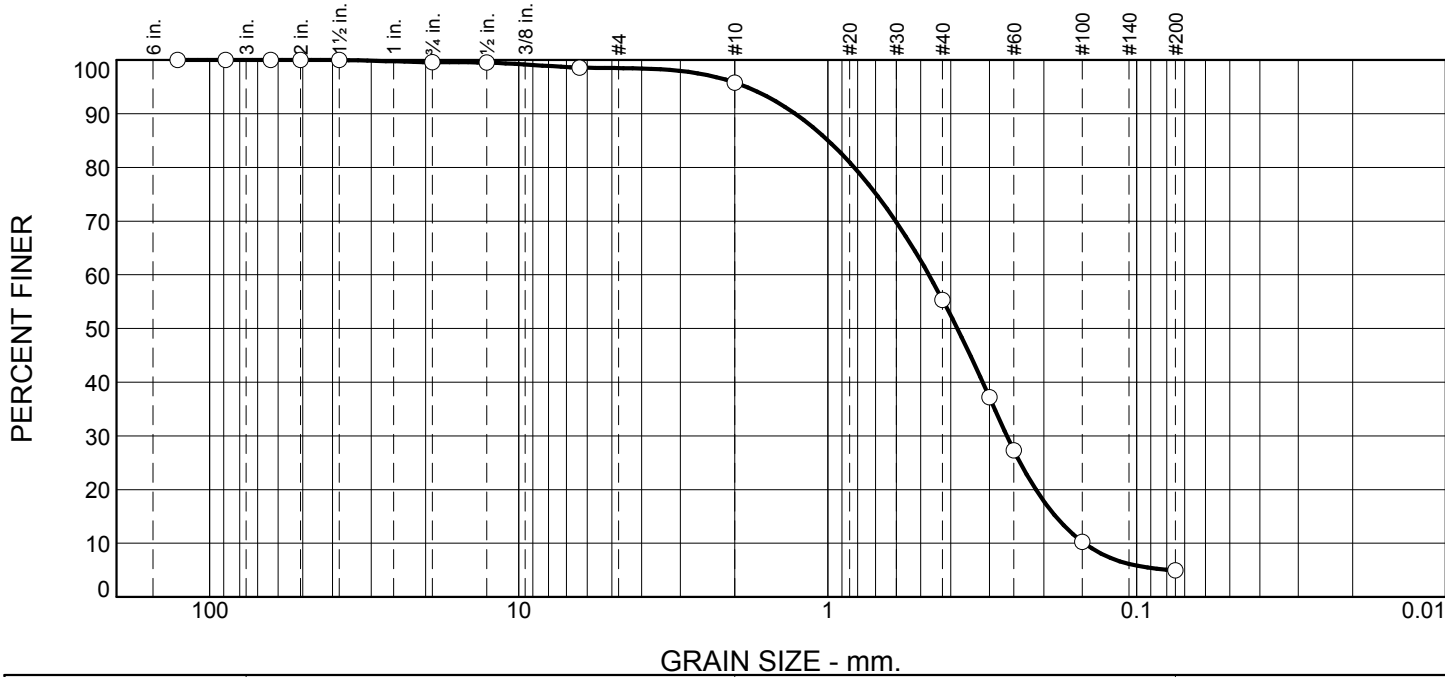
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 240' E of Cambridge Drive, 8' off WB lane curb;
Sample Number: SUBGRADE

Depth: 25

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 4 | 41 | 50 | 5 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 96 | 15 - 45 | X |
| #40 | 55 | 5 - 25 | X |
| #50 | 37 | | |
| #60 | 27 | | |
| #100 | 10 | 0 - 10 | |
| #200 | 4.9 | 0.0 - 5.0 | |

Material Description

poorly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.9980 D₆₀= 0.4709 D₅₀= 0.3813
D₃₀= 0.2632 D₁₅= 0.1828 D₁₀= 0.1479
C_u= 3.18 C_c= 0.99

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 4" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

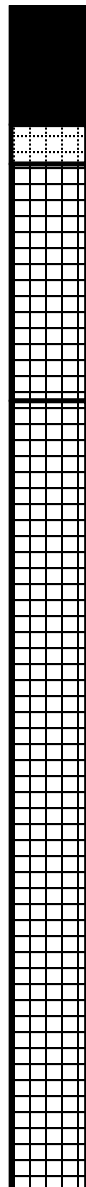


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Milbrook Drive - Hollister Drive to Cambridge Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP3 - 115' W of Princeton Lane, 5' off WB lane curb;



3" Hot Mix Asphalt
(HMA)
1" Deteriorated
Penetrated Stone
Macadam A-1-a

6" Processed Aggregate
Base A-1-a

20" silty sand A-2-4

Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Milbrook Drive - Hollister Drive to Cambridge Drive

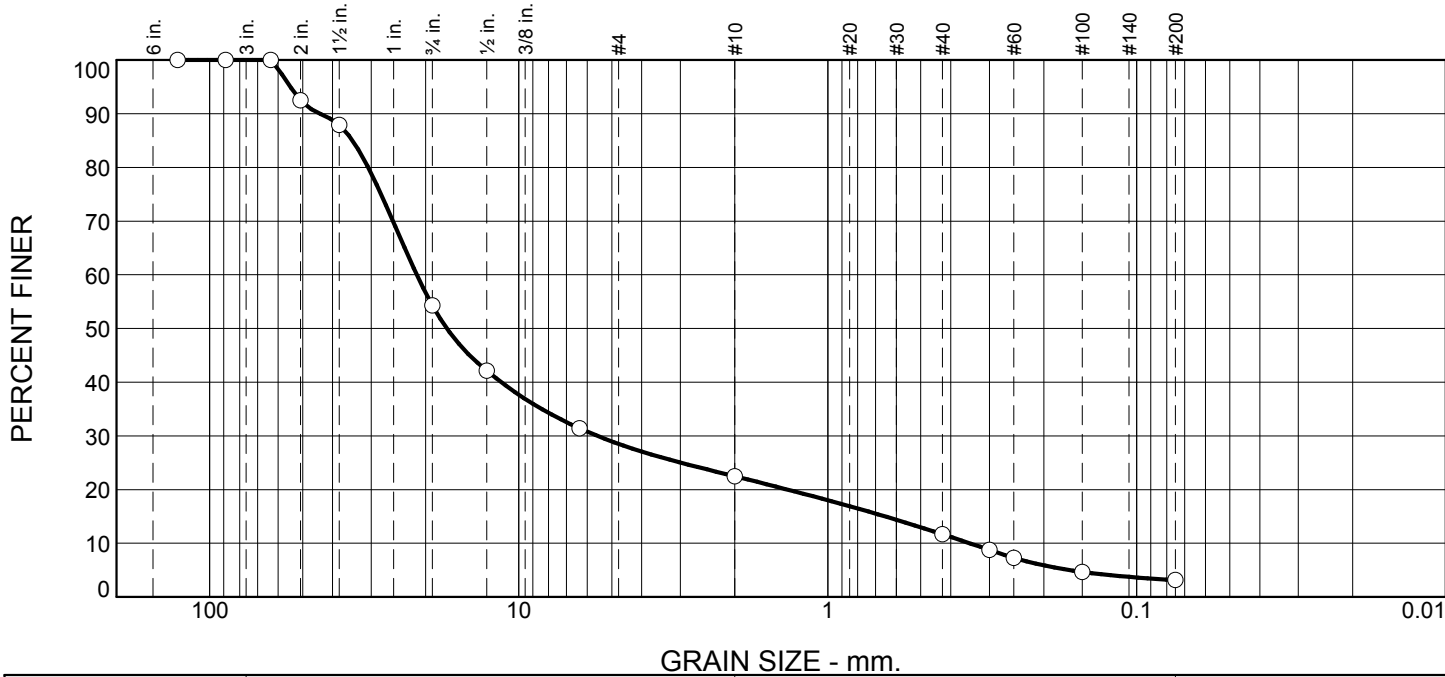
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 115' W of Princeton Lane, 5' off WB lane curb;
Sample Number: BASE

Depth: 1

Date: 08/01/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 78 | 10 | 9 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 92 | 95 - 100 | X |
| 1-1/2" | 88 | | |
| 3/4" | 54 | 50 - 75 | |
| 1/2" | 42 | | |
| 1/4" | 31 | 25 - 45 | |
| #10 | 22 | | |
| #40 | 12 | 5 - 20 | |
| #50 | 9 | | |
| #60 | 7 | | |
| #100 | 5 | 2 - 12 | |
| #200 | 3.1 | | |

Material Description

Deteriorated Penetrated Stone Macadam

| | | | |
|---------------------------|---------------------------|---------------------------|--------|
| PL= NP | Atterberg Limits | LL= NV | PI= NP |
| | Coefficients | | |
| D ₈₅ = 34.5309 | D ₆₀ = 21.3842 | D ₅₀ = 17.0985 | |
| D ₃₀ = 5.5560 | D ₁₅ = 0.6530 | D ₁₀ = 0.3476 | |
| C _u = 61.52 | C _c = 4.15 | | |

USCS= GP

AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Milbrook Drive - Hollister Drive to Cambridge Drive

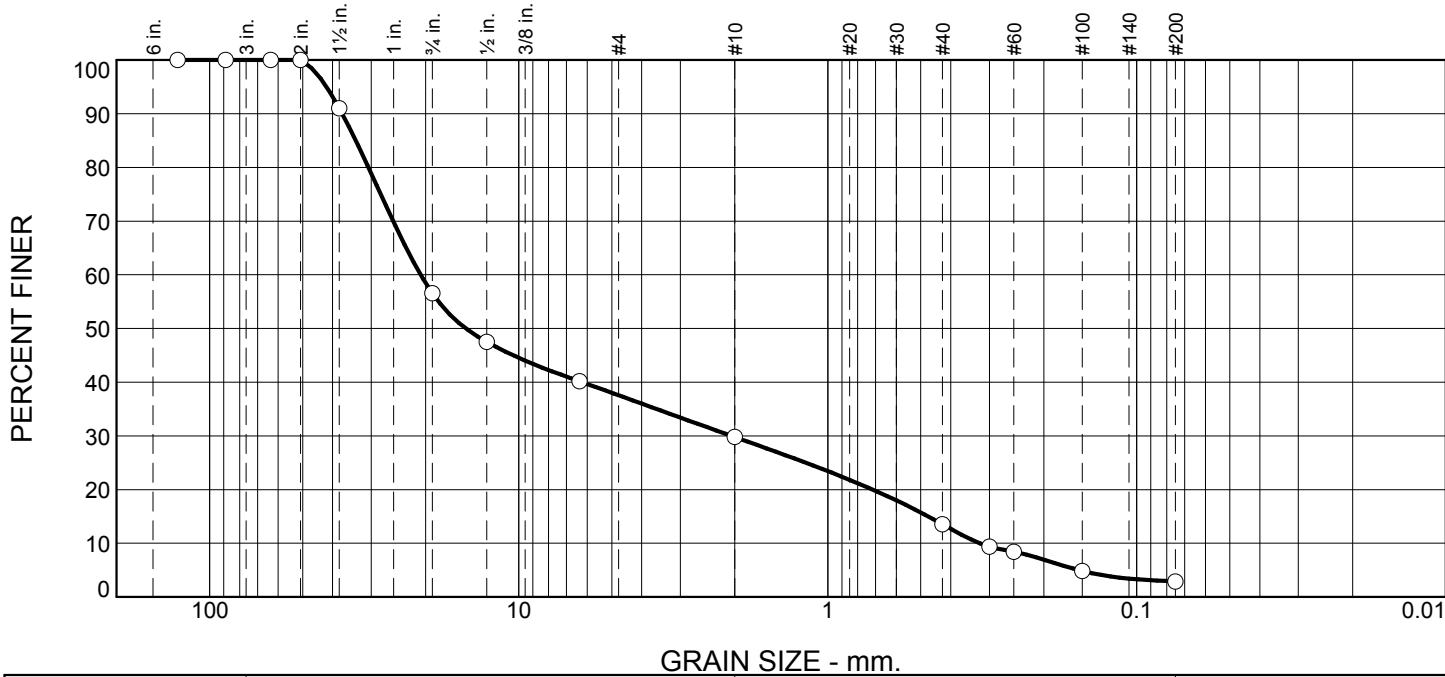
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 115' W of Princeton Lane, 5' off WB lane curb;
Sample Number: SUBBASE

Depth: 6

Date: 08/01/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 70 | 16 | 11 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 91 | | |
| 3/4" | 57 | 50 - 75 | |
| 1/2" | 48 | | |
| 1/4" | 40 | 25 - 45 | |
| #10 | 30 | | |
| #40 | 14 | 5 - 20 | |
| #50 | 9 | | |
| #60 | 8 | | |
| #100 | 5 | 2 - 12 | |
| #200 | 2.9 | | |

Material Description

Processed Aggregate Base

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 33.6986 D₆₀= 20.7772 D₅₀= 14.8325
D₃₀= 2.0507 D₁₅= 0.4730 D₁₀= 0.3231
C_u= 64.30 C_c= 0.63

Classification

USCS= GP AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Milbrook Drive - Hollister Drive to Cambridge Drive

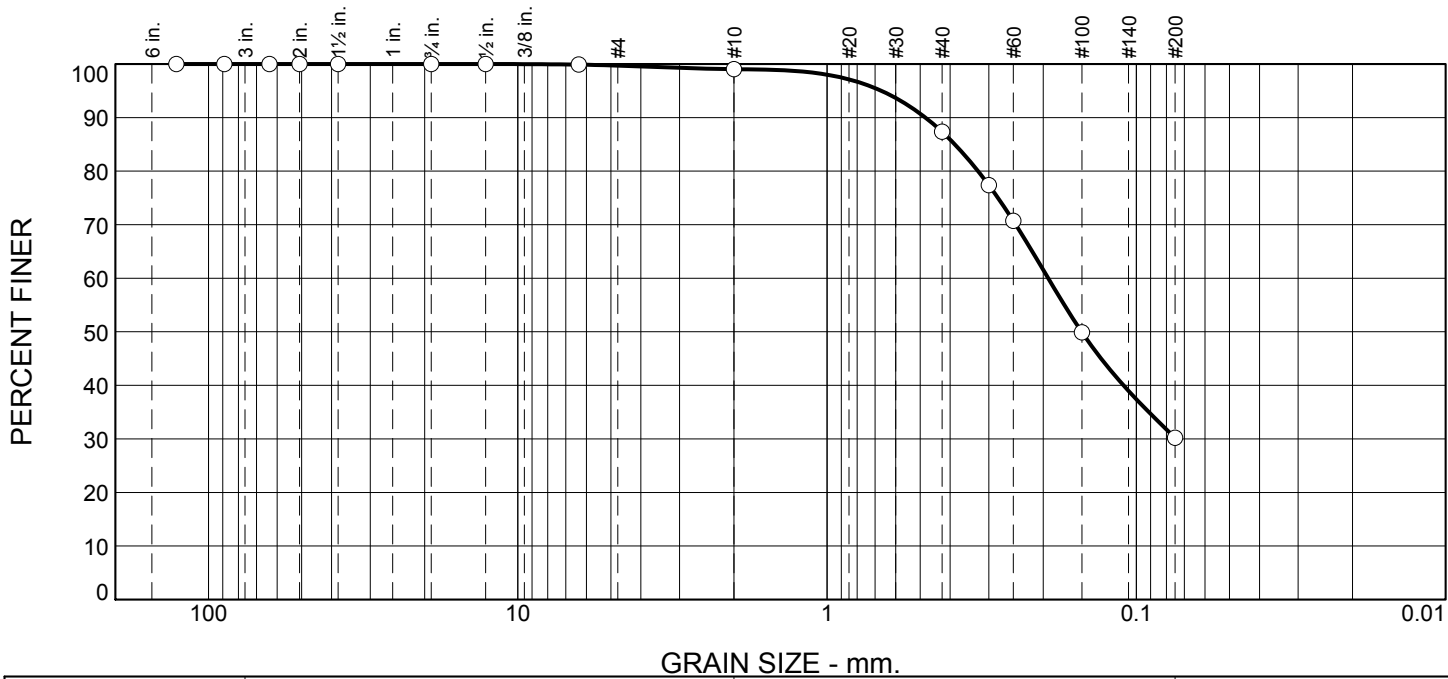
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 115' W of Princeton Lane, 5' off WB lane curb;
Sample Number: SUBGRADE

Depth: 20

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 1 | 12 | 57 | 30 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 100 | 25 - 60 | X |
| #10 | 99 | 15 - 45 | X |
| #40 | 87 | 5 - 25 | X |
| #50 | 77 | | |
| #60 | 71 | | |
| #100 | 50 | 0 - 10 | X |
| #200 | 30 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.3866 D₆₀= 0.1929 D₅₀= 0.1504
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 4.0" @ 5 blows;
Mr = 10,141 psi;

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

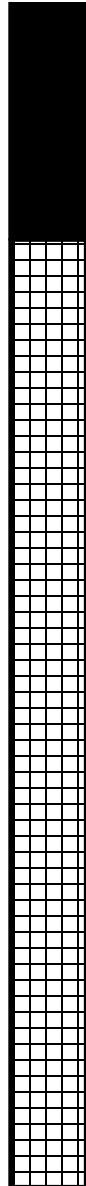


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Milbrook Drive - Hollister Drive to Cambridge Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP4 - 138' E of Princeton Lane, 4' off WB lane curb;



6" Hot Mix Asphalt
(HMA)

24" poorly graded sand
with silt A-2-4

Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Milbrook Drive - Hollister Drive to Cambridge Drive

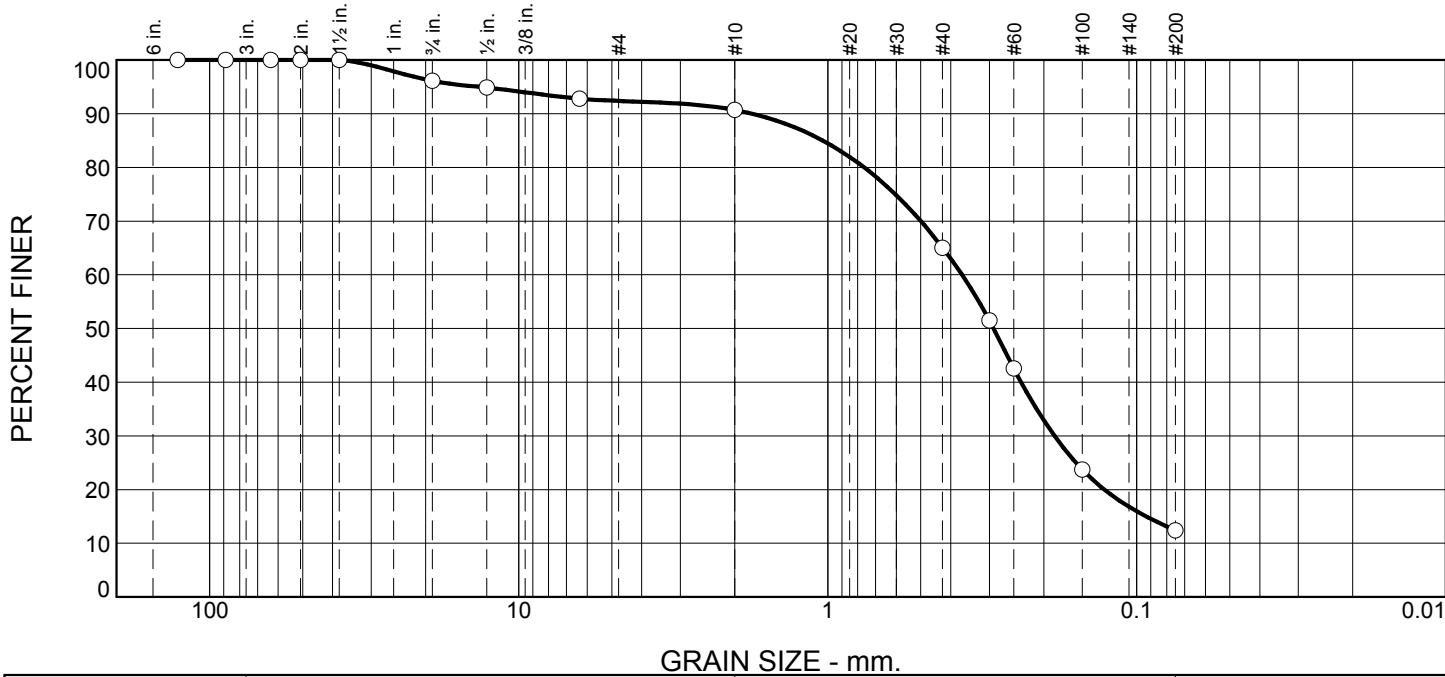
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 138' E of Princeton Lane, 4' off WB lane curb;
Sample Number: BASE

Depth: 24

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 9 | 26 | 53 | 12 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 96 | | |
| 1/2" | 95 | | |
| 1/4" | 93 | 25 - 60 | X |
| #10 | 91 | 15 - 45 | X |
| #40 | 65 | 5 - 25 | X |
| #50 | 51 | | |
| #60 | 43 | | |
| #100 | 24 | 0 - 10 | X |
| #200 | 12 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 1.0379 D₆₀= 0.3678 D₅₀= 0.2908
D₃₀= 0.1844 D₁₅= 0.0932 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-2-4

Remarks

DCP = 10" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

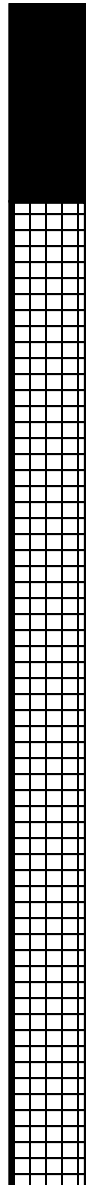


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Milbrook Drive - Hollister Drive to Cambridge Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP5 - 300' W of Cambridge Drive, 3' off EB lane curb;



5" Hot Mix Asphalt
(HMA)

25" silty sand A-2-4

Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Milbrook Drive - Hollister Drive to Cambridge Drive

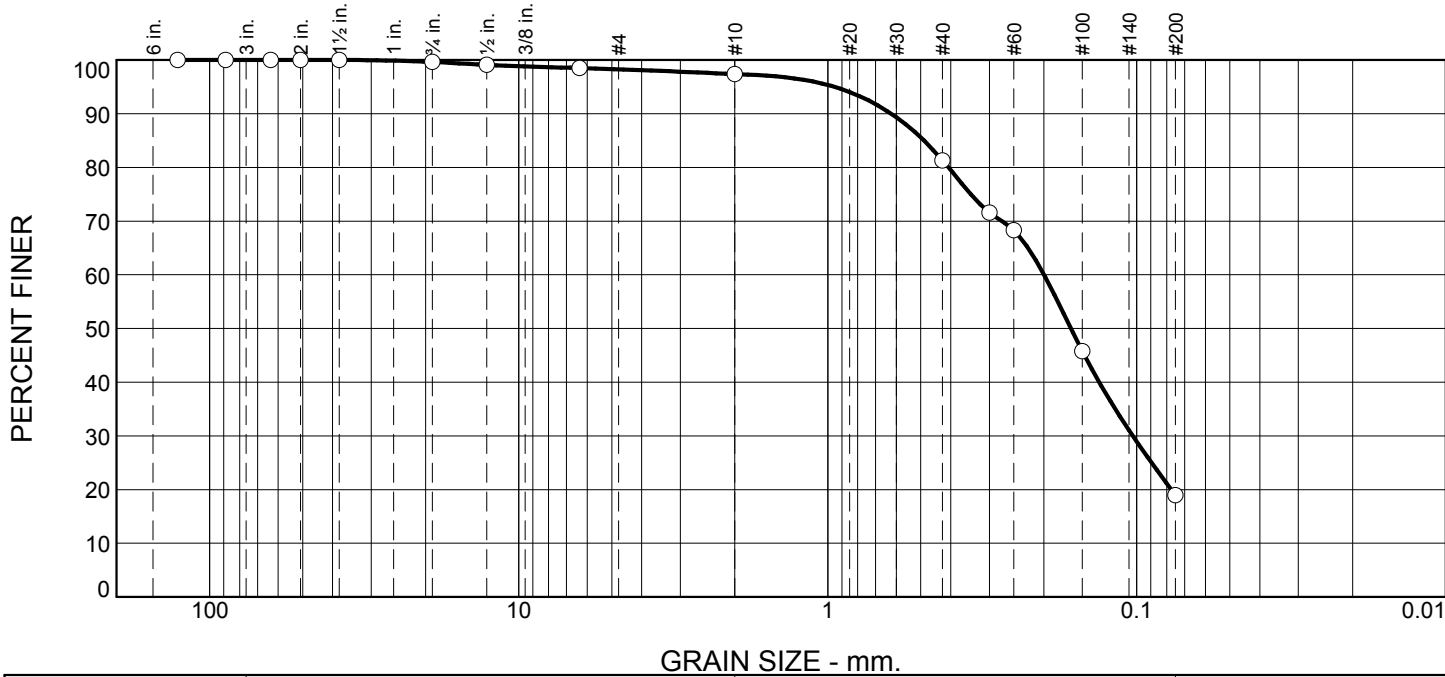
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 300' W of Cambridge Drive, 3' off EB lane curb;
Sample Number: BASE

Depth: 25

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 16 | 62 | 19 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 99 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 81 | 5 - 25 | X |
| #50 | 72 | | |
| #60 | 68 | | |
| #100 | 46 | 0 - 10 | X |
| #200 | 19 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.4884 D₆₀= 0.1994 D₅₀= 0.1632
D₃₀= 0.1030 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 6" @ 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

LOCATION: Milbrook Drive, East Hartford, CT

DATE SAMPLED: Wednesday, August 22, 2018

FROM: Hollister Drive

TO: Cambridge Drive (E)

CORE#: 1 **Area:** 95' S of Hollister Dr., EB lane 4' off curb;



DEPTH
Layer
1.10"
0.97"

DEPTH
Total
2.07"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 2 **Area:** 70' N of Cambridge Dr. (W), EB lane 9' off curb;



DEPTH
Layer
0.80"
0.91"

DEPTH
Total
1.71"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 3 **Area:** 20' E of Cambridge Dr. (W), WB lane 9' off curb;



DEPTH
Layer
2.13"
1.21"

DEPTH
Total
3.34"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 4 **Area:** 70' E of Cambridge Dr. (W), WB lane 5' off curb;



DEPTH
Layer
1.89"
1.16"

DEPTH
Total
3.05"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

Jose R. Otero Jr.
Jose R. Otero Jr., Project Manager

100 Great Meadow Road

Suite 200

Engineers | Scientists | Planners | Designers Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570

CORE PROFILE

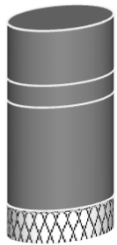
page 2



LOCATION: Milbrook Drive, East Hartford, CT
DATE SAMPLED: August 22, 2018

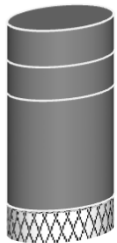
FROM: Hollister Drive
TO: Cambridge Drive (E)

CORE#: 5 **Area:** 140' E of Cambridge Dr. (W), EB lane 5' off curb;



| DEPTH Layer | DEPTH Total | CLASSIFICATION |
|----------------|----------------|-----------------------|
| 1.51" | 4.97" | Hot Mix Asphalt (HMA) |
| 0.60" | | HMA |
| 2.86" | | Penetrated Stone |
| | | Penetrated Stone |

CORE#: 6 **Area:** 250' E of Cambridge Dr. (W), EB lane 10' off curb;



| DEPTH Layer | DEPTH Total | CLASSIFICATION |
|----------------|----------------|-----------------------|
| 1.46" | 7.24" | Hot Mix Asphalt (HMA) |
| 1.34" | | HMA |
| 4.44" | | Penetrated Stone |
| | | Penetrated Stone |

Poor bond at 2.80"

CORE#: 7 **Area:** 340' E of Cambridge Dr. (W), WB lane 8' off curb;



| DEPTH Layer | DEPTH Total | CLASSIFICATION |
|----------------|----------------|-------------------------------|
| 1.80" | 5.26" | Hot Mix Asphalt (HMA) |
| 1.02" | | HMA |
| 2.44" | | Deteriorated Penetrated Stone |
| | | Processed Aggregate |

CORE#: 8 **Area:** 500' W of Princeton Ln., WB lane 4' off curb;



| DEPTH Layer | DEPTH Total | CLASSIFICATION |
|----------------|----------------|-------------------------------|
| 1.80" | 5.37" | Hot Mix Asphalt (HMA) |
| 2.14" | | HMA |
| 1.43" | | Deteriorated Penetrated Stone |
| | | Penetrated Stone |

CORE#: 9 **Area:** 415' W of Princeton Ln., EB lane 3' off curb;



| DEPTH Layer | DEPTH Total | CLASSIFICATION |
|----------------|----------------|-----------------------|
| 1.59" | 2.23" | Hot Mix Asphalt (HMA) |
| 0.64" | | HMA |
| | | Processed Aggregate |

CORE PROFILE

page 3



LOCATION: Milbrook Drive, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Hollister Drive
TO: Cambridge Drive (E)

CORE#: 10 **Area:** 315' W of Princeton Ln., EB lane 8' off curb;



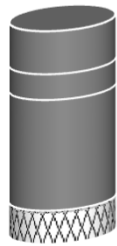
DEPTH
Layer
1.49"
1.88"

DEPTH
Total
3.37"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 11 **Area:** 210' W of Princeton Ln., WB lane curb 10' off curb;



DEPTH
Layer
1.59"
0.95"
4.11"

DEPTH
Total
6.65"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Penetrated Stone
Penetrated Stone

CORE#: 12 **Area:** 130' W of Princeton Ln., WB lane 4' off curb;



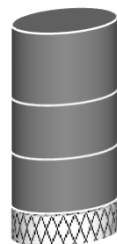
DEPTH
Layer
1.59"
1.72"
2.25"

DEPTH
Total
5.56"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Penetrated Stone
Penetrated Stone

CORE#: 13 **Area:** 30' W of Princeton Ln., EB lane 3' off curb;



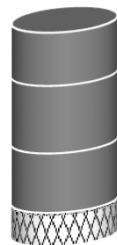
DEPTH
inches
1.38"
1.04"
1.04"

DEPTH
Total
3.46"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 14 **Area:** 75' E of Princeton Ln., EB lane 9' off curb;



DEPTH
Layer
1.10"
1.40"
1.23"

DEPTH
Total
3.73"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Sandy Gravel

CORE PROFILE

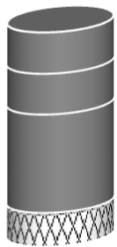
page 4



LOCATION: Milbrook Drive, East Hartford, CT
DATE SAMPLED: August 22, 2018

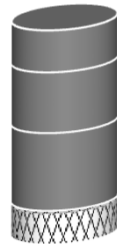
FROM: Hollister Drive
TO: Cambridge Drive (E)

CORE#: 15 **Area:** 180' E of Princeton Ln., WB lane 9' off curb;



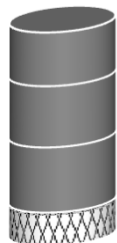
| DEPTH | DEPTH | CLASSIFICATION |
|--------------|--------------|-----------------------|
| Layer | Total | |
| 1.50" | 6.57" | Hot Mix Asphalt (HMA) |
| 1.48" | | HMA |
| 3.59" | | Penetrated Stone |
| | | Penetrated Stone |

CORE#: 16 **Area:** 270' E of Princeton Ln., WB lane 4' off curb;



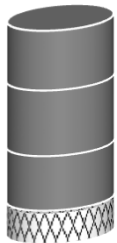
| DEPTH | DEPTH | CLASSIFICATION |
|--------------|--------------|-------------------------------|
| Layer | Total | |
| 1.47" | 6.34" | Hot Mix Asphalt (HMA) |
| 2.13" | | HMA |
| 2.74" | | Deteriorated Penetrated Stone |
| | | Penetrated Stone |

CORE#: 17 **Area:** 340' E of Princeton Ln., EB lane 3' off curb;



| DEPTH | DEPTH | CLASSIFICATION |
|--------------|--------------|-----------------------|
| Layer | Total | |
| 1.40" | 4.71" | Hot Mix Asphalt (HMA) |
| 1.60" | | HMA |
| 1.71" | | Penetrated Stone |
| | | Penetrated Stone |

CORE#: 18 **Area:** 430' E of Princeton Ln., EB lane 7' off curb;



| DEPTH | DEPTH | CLASSIFICATION |
|--------------|--------------|-----------------------|
| inches | Total | |
| 1.36" | 4.11" | Hot Mix Asphalt (HMA) |
| 1.50" | | HMA |
| 1.25" | | HMA |
| | | Processed Aggregate |

CORE#: 19 **Area:** 470' W of Cambridge Dr. (E), WB lane 9' off curb;



| DEPTH | DEPTH | CLASSIFICATION |
|--------------|--------------|-----------------------|
| Layer | Total | |
| 1.25" | 7.21" | Hot Mix Asphalt (HMA) |
| 1.74" | | HMA |
| 4.22" | | Penetrated Stone |
| | | Penetrated Stone |

CORE PROFILE

page 5



LOCATION: Milbrook Drive, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Hollister Drive
TO: Cambridge Drive (E)

CORE#: 20 **Area:** 360' W of Cambridge Dr. (E), WB lane 3' off curb;



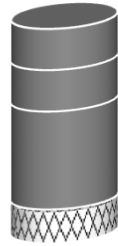
DEPTH
Layer
1.56"
0.95"
1.45"

DEPTH
Total
3.96"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
Deteriorated Penetrated Stone

Penetrated Stone

CORE#: 21 **Area:** 270' W of Cambridge Dr. (E), EB lane 3' off curb;



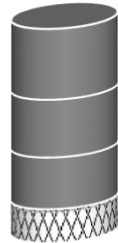
DEPTH
Layer
1.47"
1.48"
3.52"

DEPTH
Total
6.47"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
Penetrated Stone

Penetrated Stone

CORE#: 22 **Area:** 190' W of Cambridge Dr. (E), EB lane 8' off curb;



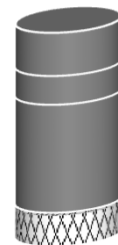
DEPTH
Layer
1.76"
1.44"
1.29"

DEPTH
Total
4.49"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 23 **Area:** 75' W of Cambridge Dr. (E), WB lane 9' off curb;



DEPTH
Layer
1.41"
0.94"
3.52"

DEPTH
Total
5.87"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
Penetrated Stone

Penetrated Stone



To: Bill Anderson, PE
VHB/Wethersfield

Date: November 20, 2018

Memorandum

Project #: 42413.00

From: Jose Otero
VHB/Project Manager

Re: Nassau Lane – East Hartford, CT

Following are the recommendations for the design and construction of Nassau Lane from Cambridge Drive to Hollister Drive.

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The distress level investigation results indicate there is severe alligator and transverse/longitudinal cracking. Moderate distortions, pothole patching and weather/block cracking were noted, resulting in a Road Manager Pavement Condition Index (PCI) of 49, two points less than the 2014 update.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A3 and A1b which are classified as uniformly graded silty sands by the Unified Classification system. The subgrades are fair to good foundations when not subject to frost action, having a very slight to moderate frost potential and exhibiting excellent to fair drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 576 vehicles per day with small trucks and buses accounting for 1% of the ADT. The 20-year design Equivalent Single Axle Loads (ESALs) was estimated to be 19,000.

Cambridge Drive to Hollister Drive:

- The existing pavement structure cross-section consisted of 2.2" to 3.5" (average 2.7") of hot mix asphalt (HMA). The granular base consisted of 7" of poorly graded silty sand bases which were founded on uniformly graded silty sand subgrades. TP#2 has an 8" layer of silty sand subbase between the base and subgrade.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a 3.00" overlay to meet the Elastic Layer Design, which is NOT recommended.
- MILL AND OVERLAY is not recommended as a treatment alternative due to inadequate support from existing granular soils, requiring milling depth greater than existing pavement thickness.
- RECLAIM is not recommended as a treatment alternative because the resulting material blend does not meet specification.

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
P 860.807.4300

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|---|
| #1 | 20-years | RECONSTRUCT the existing roadway by excavating to a 9" depth, then prepare the existing uniformly graded sand subgrade. Place 6" of processed aggregate base and compact the material to proper lines and grades, as the new base course prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #2 | 20-years | REMOVE the existing HMA and granular base material to a depth of 4.5", then compact to proper lines and grades, prior to placing 2.5" of Superpave S-0.5" Level 2 as the intermediate course and 2.0" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts |

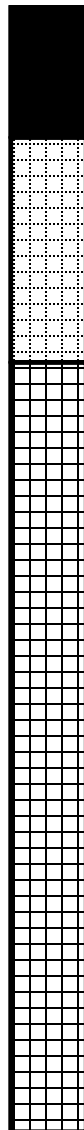


Vanasse Hangen Brustlin, Inc.

STREET: Nassau Lane - Cambridge Drive to Hollister Drive (N)
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP1 - 88' E of Cambridge Drive, 4' off EB lane curb;



3.5" Hot Mix Asphalt
(HMA)

6" poorly graded sand
with silt and gravel A-1-b

20.5" uniformly graded
sand with silt A-3

Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Nassau Lane - Cambridge Drive to Hollister Drive (N)

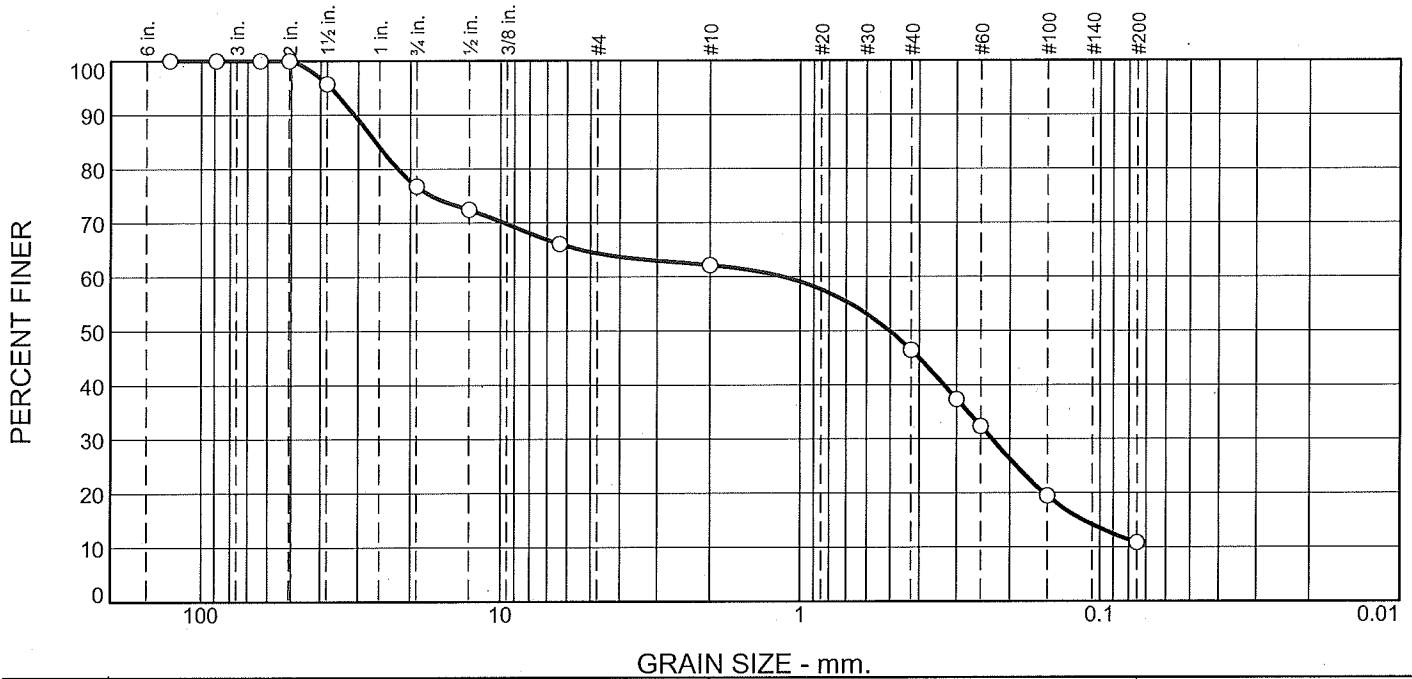
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 88' E of Cambridge Drive, 4' off EB lane curb;
Sample Number: BASE

Depth: 6

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 38 | 16 | 35 | 11 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 96 | | |
| 3/4" | 77 | 50 - 75 | X |
| 1/2" | 72 | | |
| 1/4" | 66 | 25 - 45 | X |
| #10 | 62 | | |
| #40 | 46 | 5 - 20 | X |
| #50 | 37 | | |
| #60 | 32 | | |
| #100 | 19 | 2 - 12 | X |
| #200 | 11 | | |

Material Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 26.2032 D₆₀= 1.1423 D₅₀= 0.5018
D₃₀= 0.2294 D₁₅= 0.1137 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Nassau Lane - Cambridge Drive to Hollister Drive (N)

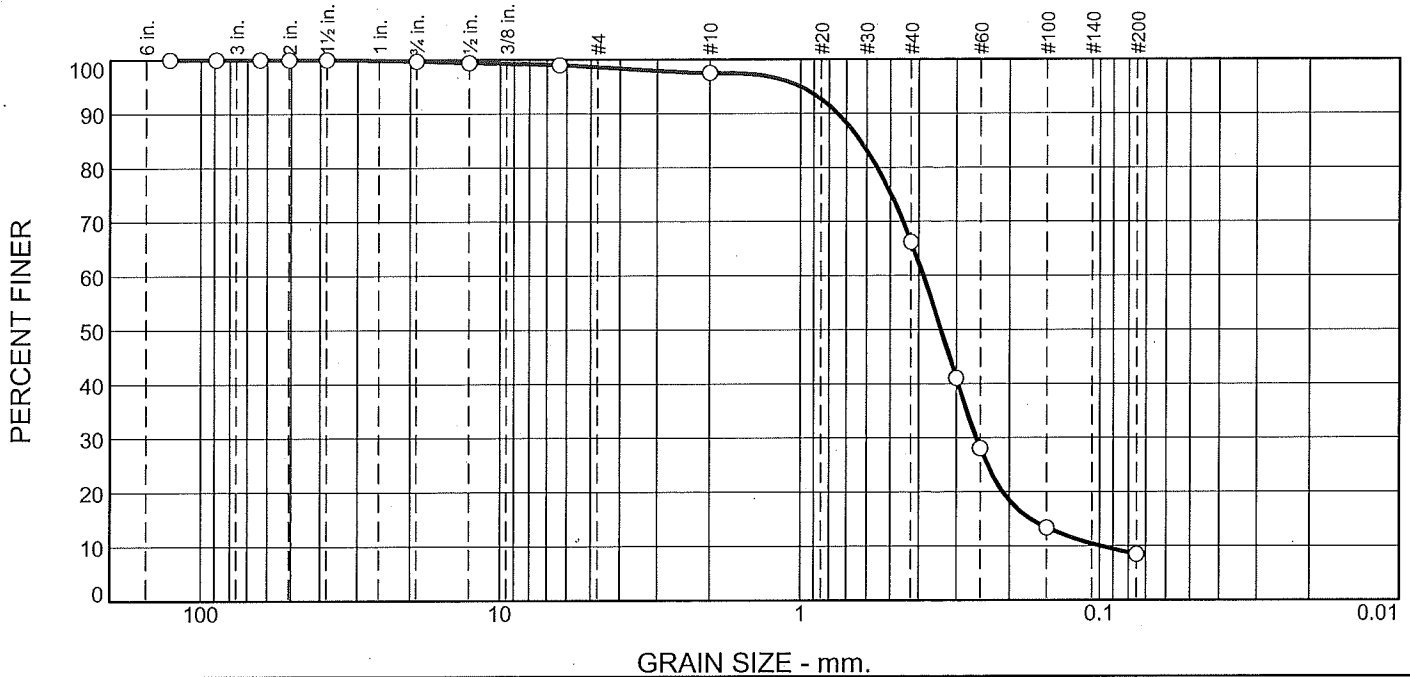
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 88' E of Cambridge Drive, 4' off EB lane curb;
Sample Number: SUBGRADE

Depth: 20.5

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 32 | 58 | 8 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 99 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 66 | 5 - 25 | X |
| #50 | 41 | | |
| #60 | 28 | | |
| #100 | 13 | 0 - 10 | X |
| #200 | 8.5 | 0.0 - 5.0 | X |

Material Description

uniformly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6307 D₆₀= 0.3870 D₅₀= 0.3374
D₃₀= 0.2577 D₁₅= 0.1702 D₁₀= 0.0992
C_u= 3.90 C_c= 1.73

Classification

USCS= SP-SM AASHTO= A-3

Remarks

DCP = 3" @ 5 blows; Mr = 13,862psi

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

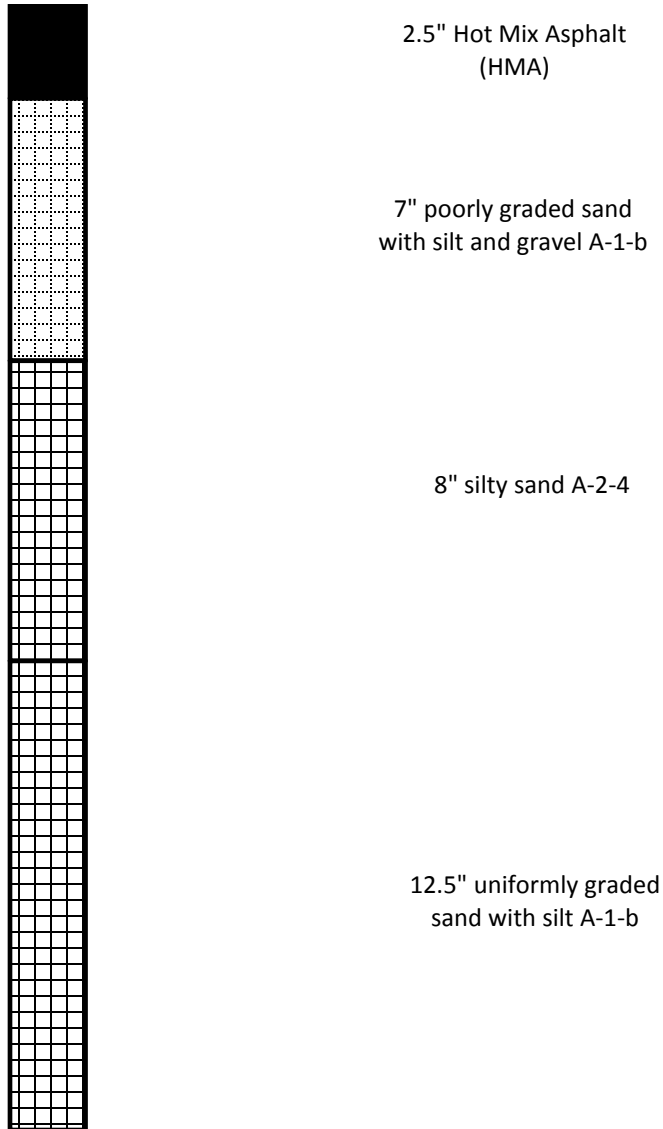


Vanasse Hangen Brustlin, Inc.

STREET: Nassau Lane - Cambridge Drive to Hollister Drive (N)
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP2 - 153' E of Hollister Dr #1, 8' off WB lane curb;



Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Nassau Lane - Cambridge Drive to Hollister Drive (N)

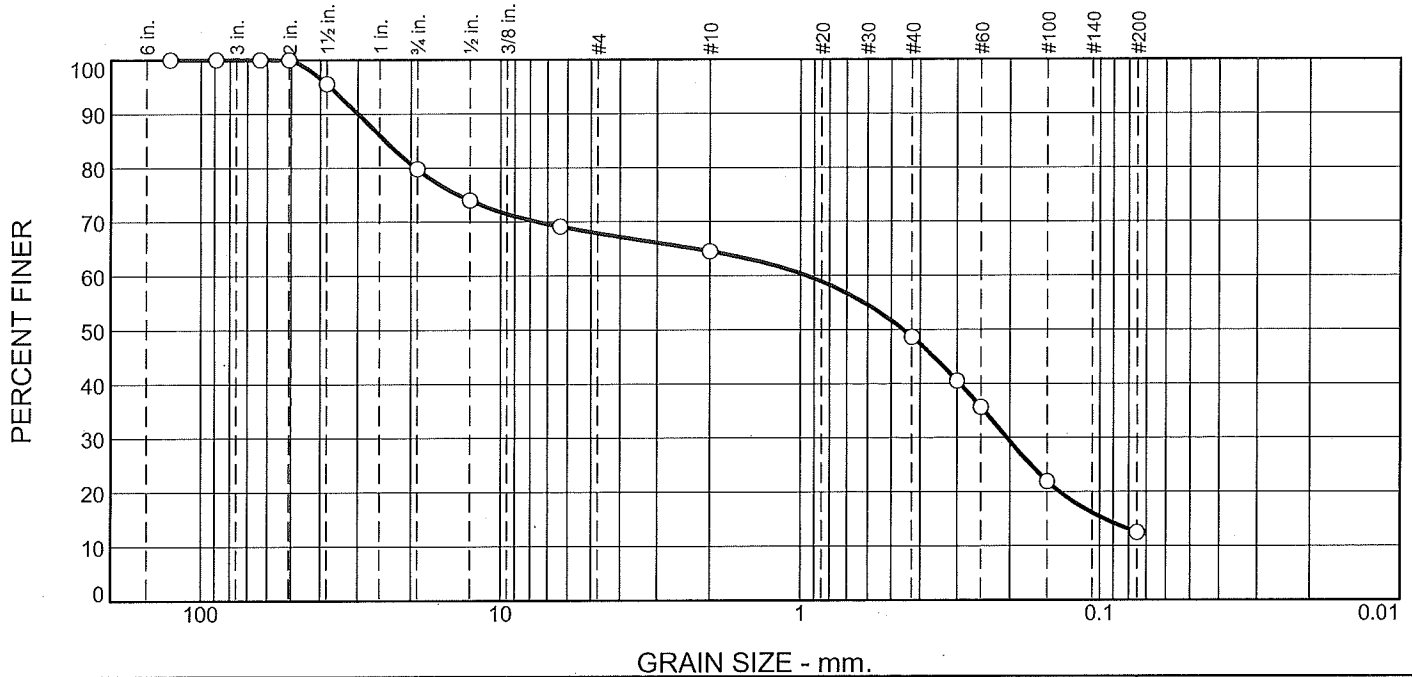
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 153' E of Hollister Dr #1, 8' off WB lane curb;
Sample Number: BASE

Depth: 7

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 35 | 16 | 37 | 12 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 96 | | |
| 3/4" | 80 | 50 - 75 | X |
| 1/2" | 74 | | |
| 1/4" | 69 | 25 - 45 | X |
| #10 | 65 | | |
| #40 | 49 | 5 - 20 | X |
| #50 | 41 | | |
| #60 | 36 | | |
| #100 | 22 | 2 - 12 | X |
| #200 | 12 | | |

Material Description

poorly graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 24.3162 D₆₀= 0.9542 D₅₀= 0.4560
D₃₀= 0.2049 D₁₅= 0.0964 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Nassau Lane - Cambridge Drive to Hollister Drive (N)

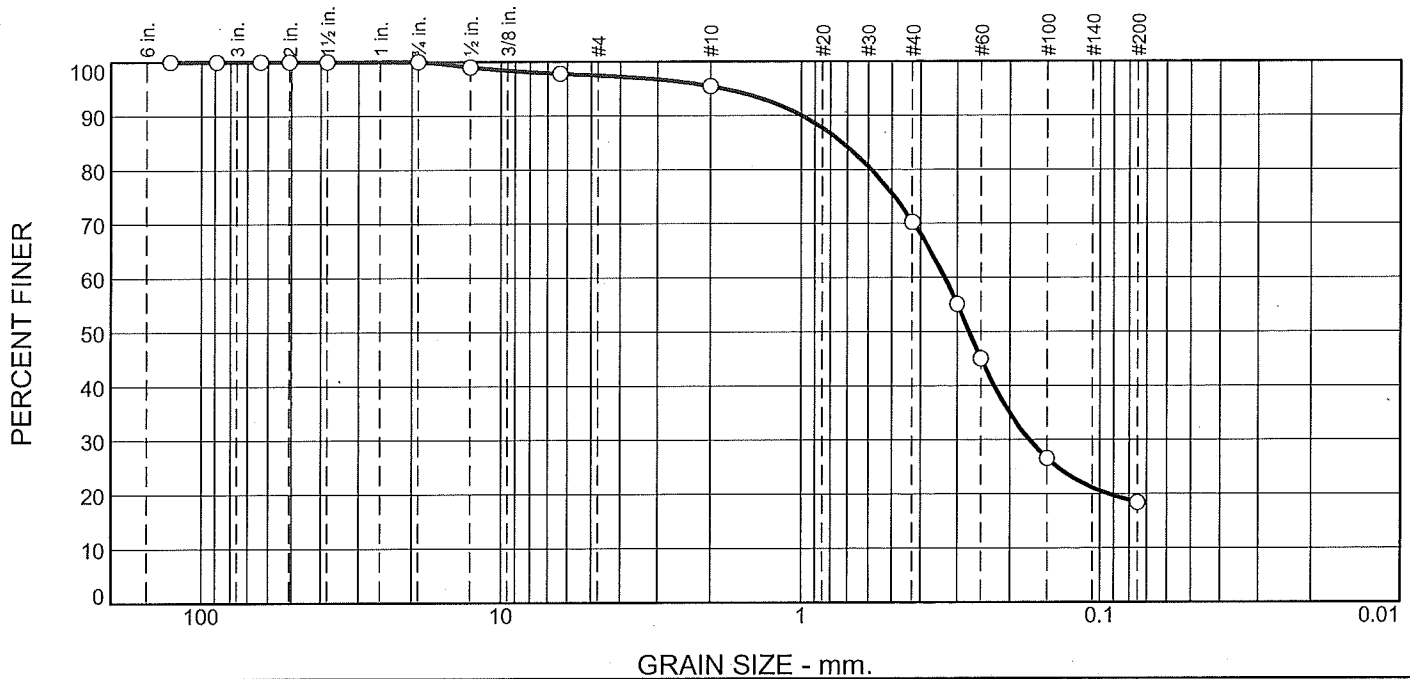
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 153' E of Hollister Dr #1, 8' off WB lane curb;
Sample Number: SUBBASE

Depth: 8

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 5 | 25 | 52 | 18 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 99 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 95 | 15 - 45 | X |
| #40 | 70 | 5 - 25 | X |
| #50 | 55 | | |
| #60 | 45 | | |
| #100 | 27 | 0 - 10 | X |
| #200 | 18 | 0.0 - 5.0 | X |

Material Description

silty sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.7309 D₆₀= 0.3306 D₅₀= 0.2737
D₃₀= 0.1719 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Nassau Lane - Cambridge Drive to Hollister Drive (N)

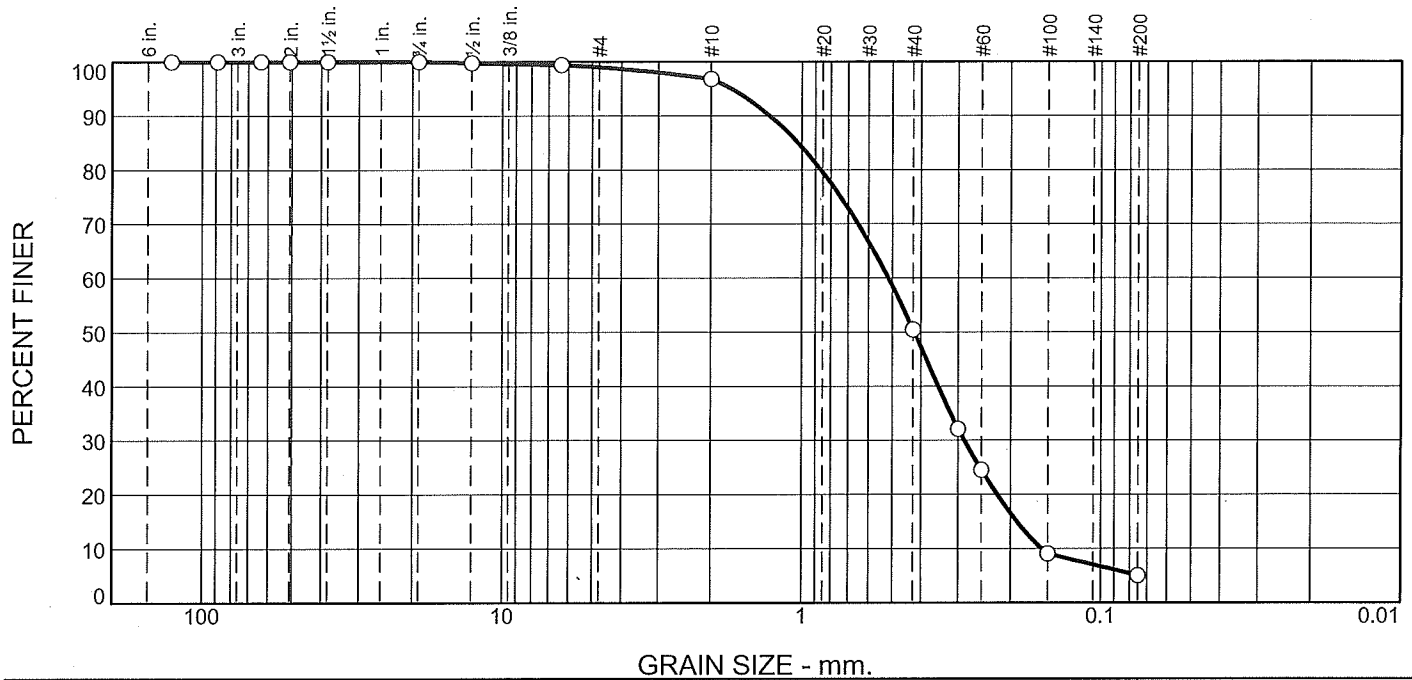
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 153' E of Hollister Dr #1, 8' off WB lane curb;
Sample Number: SUBGRADE

Depth: 12.5

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 47 | 45 | 5 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 50 | 5 - 25 | X |
| #50 | 32 | | |
| #60 | 25 | | |
| #100 | 9 | 0 - 10 | |
| #200 | 5.0 | 0.0 - 5.0 | |

Material Description

uniformly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 1.0294 D₆₀= 0.5147 D₅₀= 0.4211
D₃₀= 0.2862 D₁₅= 0.1904 D₁₀= 0.1572
C_u= 3.27 C_c= 1.01

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

DCP = 3" @ 5 blows; Mr = 13,862psi;

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

LOCATION: Nassau Lane

DATE SAMPLED: Wednesday, August 22, 2018

FROM: Cambridge Drive

TO: Hollister Drive (N)

CORE#: 1 **Area:** 80' S of Hollister Dr. (N), SB lane 5' off curb;



DEPTH

Layer
1.15"
1.64"

DEPTH

Total
2.79"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 2 **Area:** 160' S of Hollister Dr. (N), SB lane 8' off curb;



DEPTH

Layer
0.64"
2.20"

DEPTH

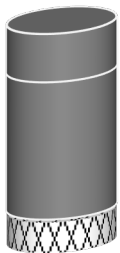
Total
2.84"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 3 **Area:** 240' S of Hollister Dr. (N), NB lane 9' off curb;



DEPTH

Layer
0.56"
1.60"

DEPTH

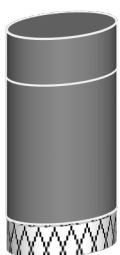
Total
2.16"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 4 **Area:** 47' N of Hollister Dr. (S), NB lane 4' off curb;



DEPTH

Layer
0.61"
1.82"

DEPTH

Total
2.43"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

Jose R. Otero Jr., Project Manager

100 Great Meadow Road

Suite 200

Engineers | Scientists | Planners | Designers Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570

CORE PROFILE

page 2



LOCATION: Nassau Lane
DATE SAMPLED: August 22, 2018

FROM: Cambridge Drive
TO: Hollister Drive (N)

CORE#: 5 **Area:** Intersection of Hollister Dr. (S), NB lane 8' off curb;



DEPTH
Layer
1.24"
2.02"

DEPTH
Total
3.26"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 6 **Area:** 80' S of Hollister Dr. (S), SB lane 5' off curb;



DEPTH
Layer
2.34"

DEPTH
Total
2.34"

CLASSIFICATION
Hot Mix Asphalt (HMA)

Processed Aggregate

CORE#: 7 **Area:** 140' S of Hollister Dr. (S), SB lane 9' off curb;



DEPTH
Layer
1.08"
1.45"

DEPTH
Total
2.53"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 8 **Area:** 48' N of Cambridge Dr., NB lane 4' off curb;



DEPTH
Layer
0.75"
1.43"

DEPTH
Total
2.18"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate



To: Bill Anderson, PE
VHB/Wethersfield

Date: November 20, 2018

Memorandum

Project #: 42413.00

From: Jose Otero
VHB/Project Manger

Re: Oxford Drive – East Hartford, CT

Following are the recommendations for the design and construction of Oxford Drive from Evans Avenue to Sutton Avenue

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The distress level investigation results indicate there is severe alligator cracking. Moderate pothole patching, distortion, transverse/longitudinal and weather/block cracking were noted. There is evidence extensive surface wear, resulting in a Road Manager Pavement Condition Index (PCI) of 50, three points less than the 2014 update.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A3 which are classified as uniformly graded sands by the Unified Classification system. The subgrades are fair to good foundations when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 400 vehicles per day with small trucks and buses accounting for 2% of the ADT.

Evans Avenue to Sutton Avenue:

- The existing pavement structure cross-section consisted of 2.3" to 6.5" (average 3.7") of hot mix asphalt (HMA). The granular base consisted of 4" to 6" (average 5.3") of poorly graded sand bases which were founded on uniformly graded sand subbases/subgrades. Test pit 3 has 3" of deteriorated penetrated stone macadam base and test pit 5 had no identifiable base, being directly paved over uniformly graded sandy subgrade.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a 2.0" overlay to meet the Elastic Layer Design, which is NOT recommended.
- MILL AND OVERLAY is not recommended as a treatment alternative due to inadequate support from existing granular soils, requiring milling depth greater than existing pavement thickness.
- REMOVE HMA is not recommended as a treatment alternative due to no structural base present in $\geq 50\%$ of test pits.

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
P 860.807.4300

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|--|
| #1 | 20-years | RECONSTRUCT the pavement section by removing the existing HMA and poorly graded sand bases to a 9" depth. Place 6" of processed aggregate as a base. Compact to proper lines and grades prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |

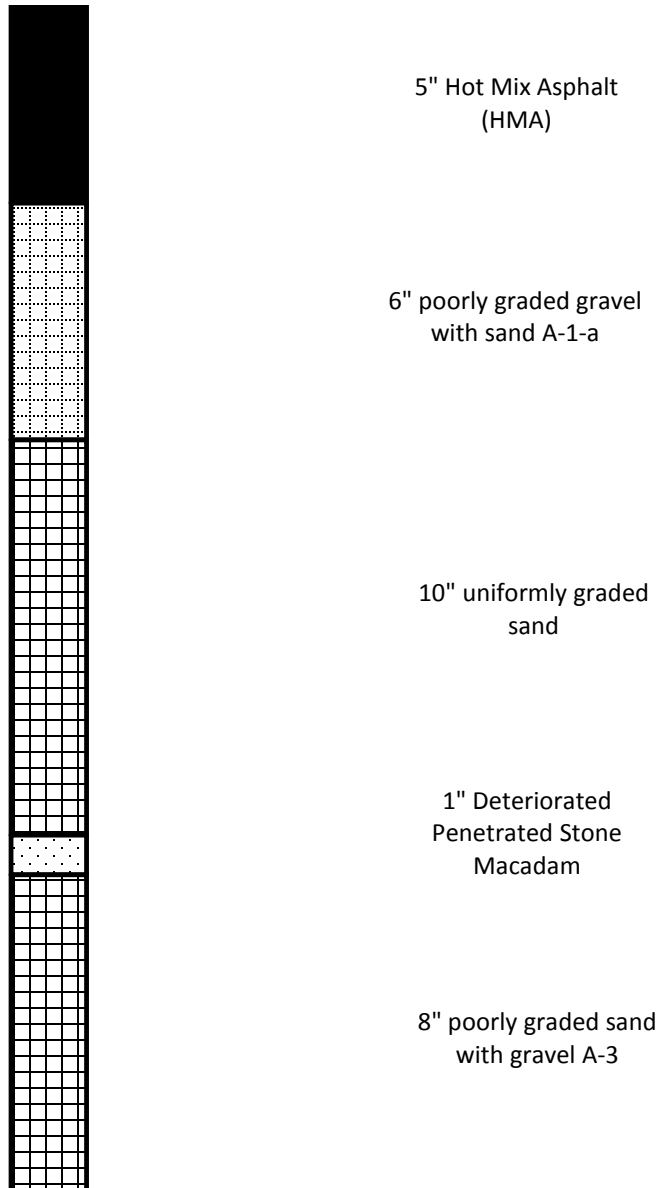


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Oxford Drive - Evans Avenue to Sutton Avenue
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP1 - 18' W of Washington Avenue, 6' off WBLC



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

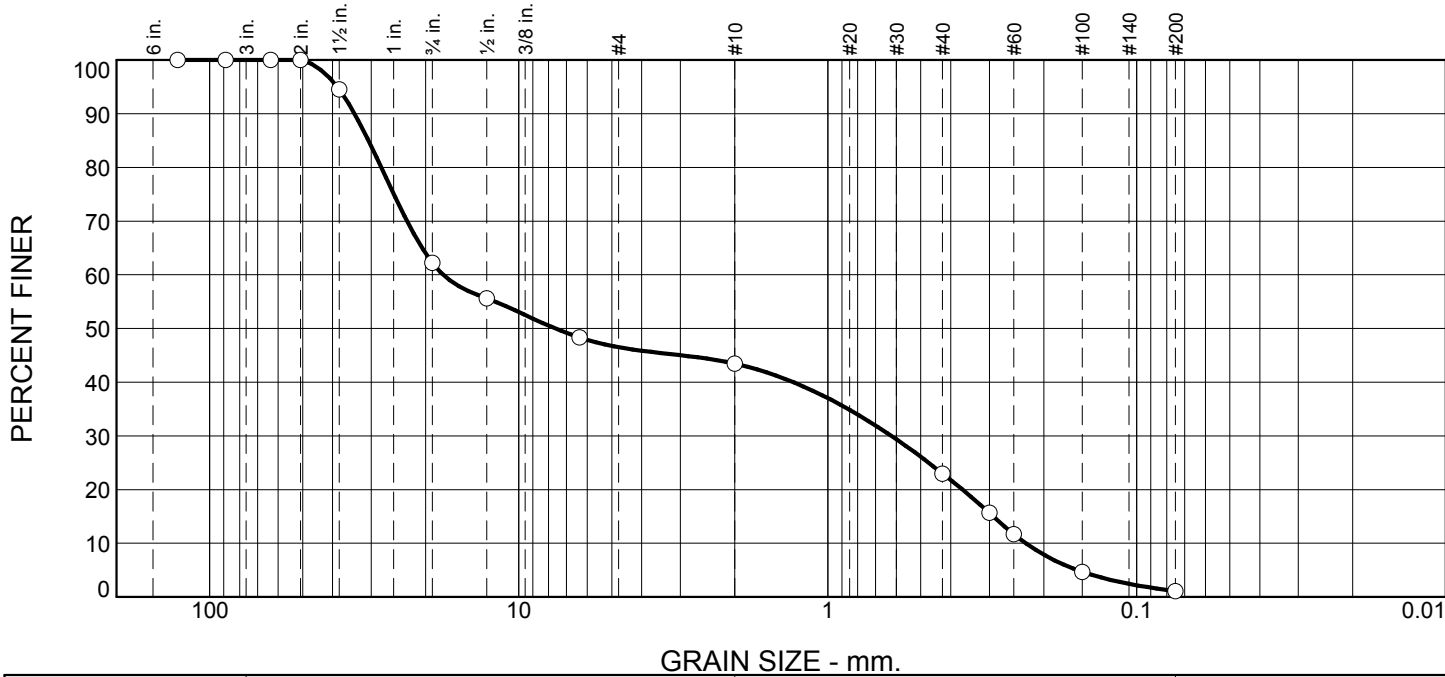
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 18' W of Washington Avenue, 6' off WBLC
Sample Number: BASE

Depth: 6

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 57 | 20 | 22 | 1 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 95 | | |
| 3/4" | 62 | 50 - 75 | |
| 1/2" | 56 | | |
| 1/4" | 48 | 25 - 45 | X |
| #10 | 43 | | |
| #40 | 23 | 5 - 20 | X |
| #50 | 16 | | |
| #60 | 12 | | |
| #100 | 5 | 2 - 12 | |
| #200 | 1.1 | | |

Material Description

poorly graded gravel with sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 30.6542 D₆₀= 17.5516 D₅₀= 7.5956
D₃₀= 0.6232 D₁₅= 0.2911 D₁₀= 0.2287
C_u= 76.76 C_c= 0.10

Classification

USCS= GP AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

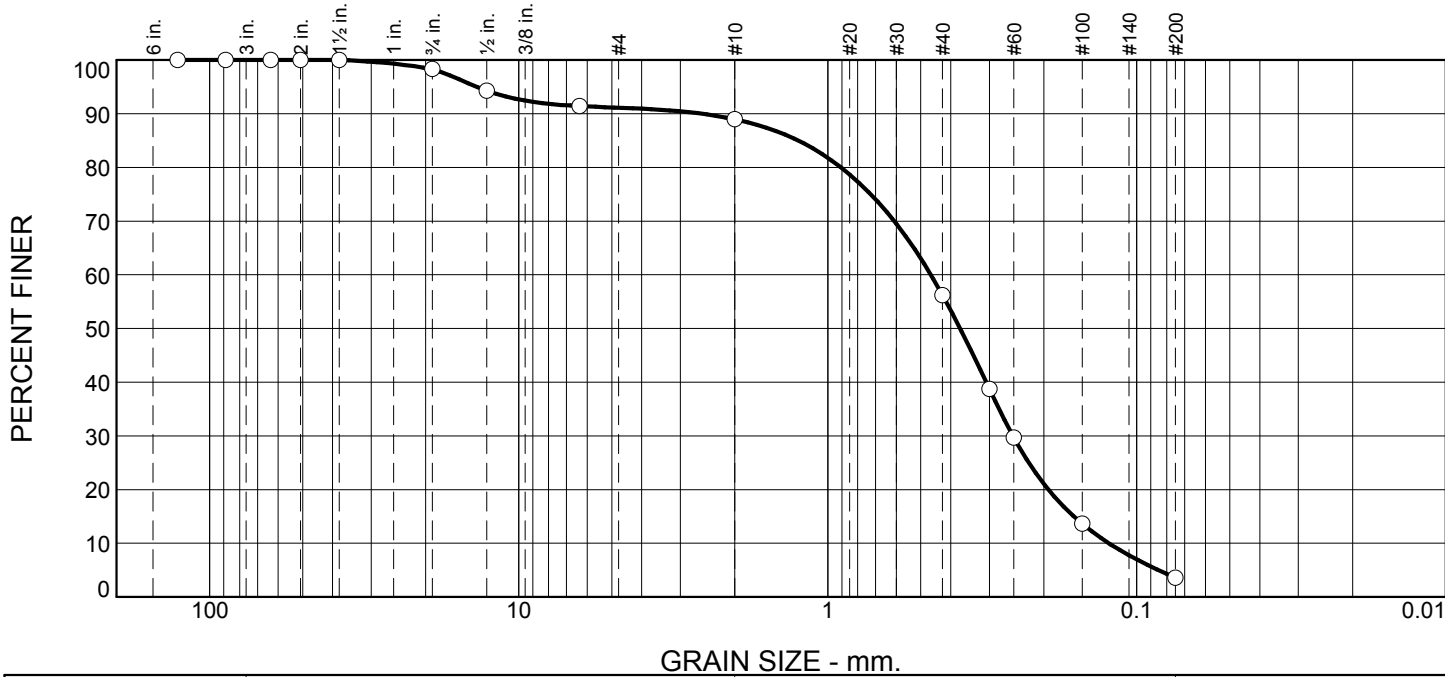
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 18' W of Washington Avenue, 6' off WBLC
Sample Number: SUBBASE

Depth: 10

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 11 | 33 | 52 | 4 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 98 | | |
| 1/2" | 94 | | |
| 1/4" | 91 | 25 - 60 | X |
| #10 | 89 | 15 - 45 | X |
| #40 | 56 | 5 - 25 | X |
| #50 | 39 | | |
| #60 | 30 | | |
| #100 | 14 | 0 - 10 | X |
| #200 | 3.6 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= PI=

Coefficients

D₈₅= 1.2470 D₆₀= 0.4639 D₅₀= 0.3733
D₃₀= 0.2517 D₁₅= 0.1597 D₁₀= 0.1231
C_u= 3.77 C_c= 1.11

Classification

USCS= SP AASHTO=

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

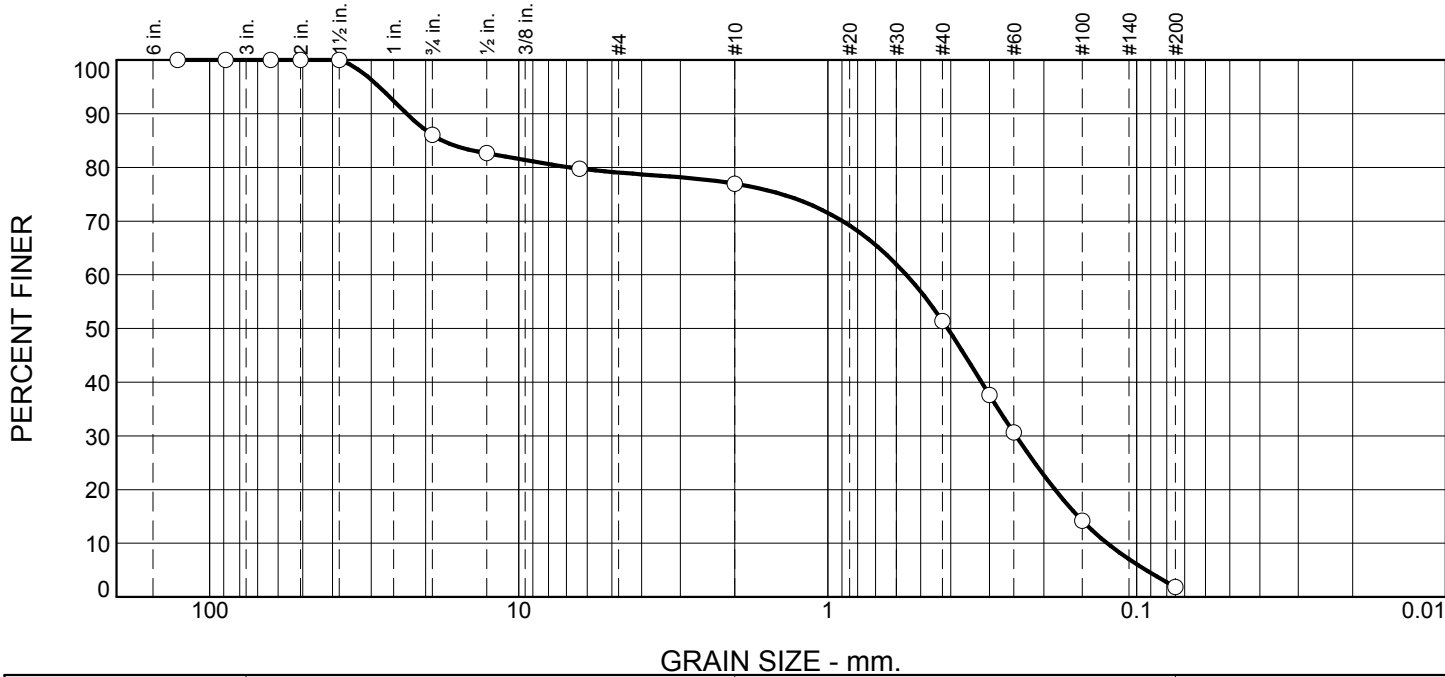
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 18' W of Washington Avenue, 6' off WBLC
Sample Number: SUBGRADE

Depth: 8

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 23 | 26 | 49 | 2 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 86 | | |
| 1/2" | 83 | | |
| 1/4" | 80 | 25 - 60 | X |
| #10 | 77 | 15 - 45 | X |
| #40 | 51 | 5 - 25 | X |
| #50 | 38 | | |
| #60 | 31 | | |
| #100 | 14 | 0 - 10 | X |
| #200 | 1.8 | 0.0 - 5.0 | |

Material Description

poorly graded sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 17.7090 D₆₀= 0.5574 D₅₀= 0.4095
D₃₀= 0.2458 D₁₅= 0.1547 D₁₀= 0.1246
C_u= 4.47 C_c= 0.87

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 8" at 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

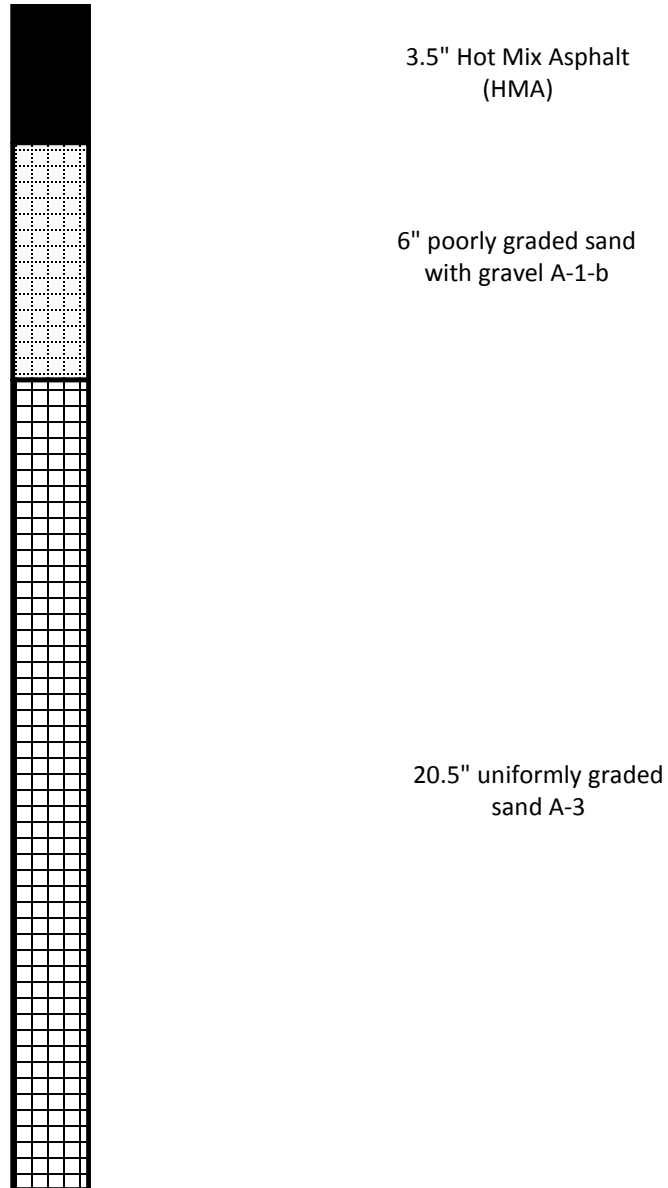


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Oxford Drive - Evans Avenue to Sutton Avenue
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP2 - 440' E of Princeton Lane, 6' off EBLC



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

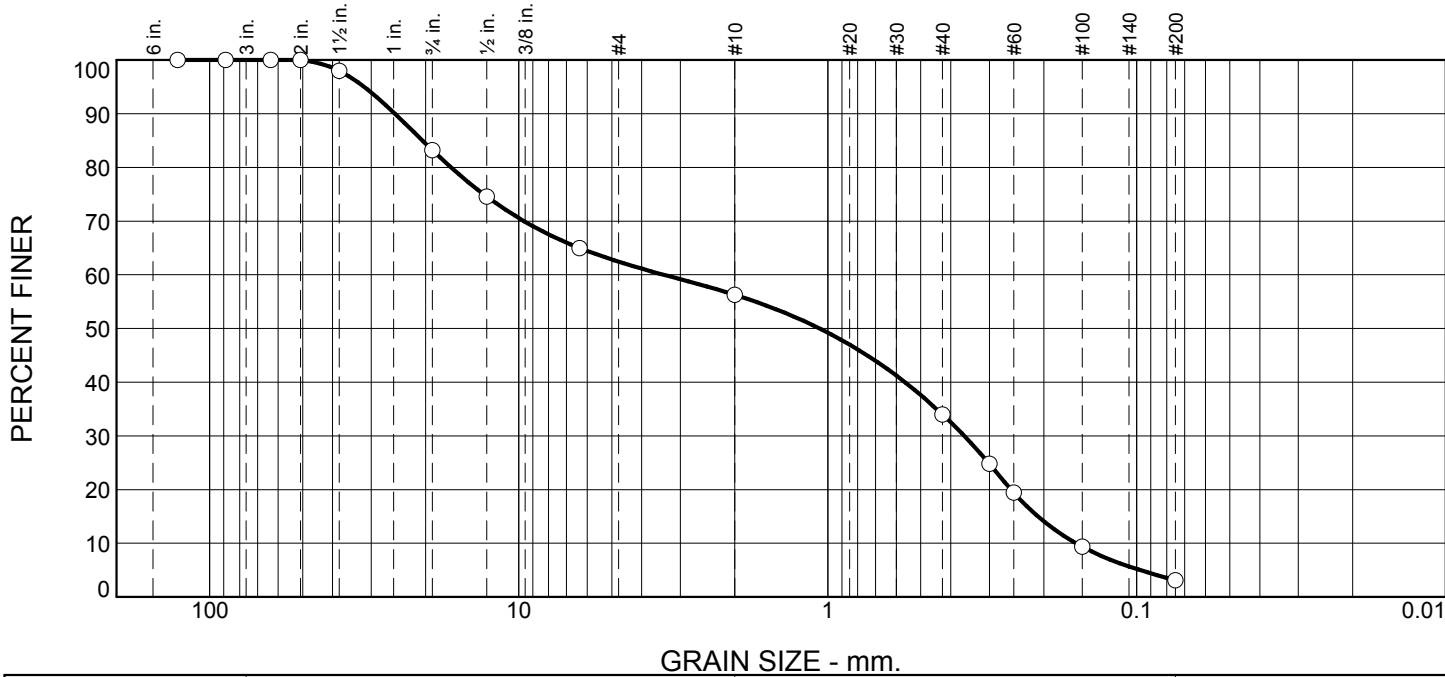
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 440' E of Princeton Lane, 6' off EBLC
Sample Number: BASE

Depth: 6

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 44 | 22 | 31 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 98 | | |
| 3/4" | 83 | 50 - 75 | X |
| 1/2" | 75 | | |
| 1/4" | 65 | 25 - 45 | X |
| #10 | 56 | | |
| #40 | 34 | 5 - 20 | X |
| #50 | 25 | | |
| #60 | 19 | | |
| #100 | 9 | 2 - 12 | |
| #200 | 3.1 | | |

Material Description

poorly graded sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 20.5062 D₆₀= 3.3929 D₅₀= 1.0630
D₃₀= 0.3620 D₁₅= 0.2089 D₁₀= 0.1573
C_u= 21.57 C_c= 0.25

Classification

USCS= SP AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

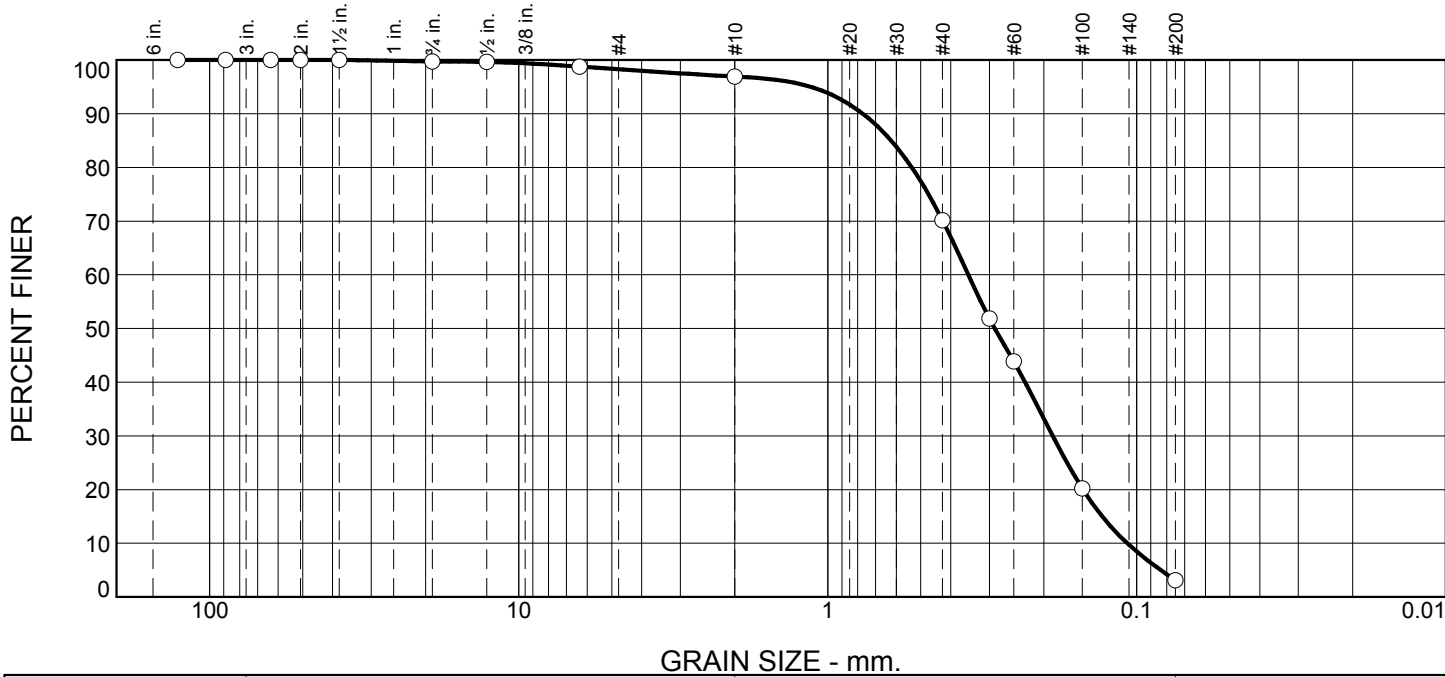
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 440' E of Princeton Lane, 6' off EBLC
Sample Number: SUBGRADE

Depth: 20.5

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 27 | 67 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 70 | 5 - 25 | X |
| #50 | 52 | | |
| #60 | 44 | | |
| #100 | 20 | 0 - 10 | X |
| #200 | 3.1 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6244 D₆₀= 0.3514 D₅₀= 0.2882
D₃₀= 0.1869 D₁₅= 0.1293 D₁₀= 0.1073
C_u= 3.27 C_c= 0.93

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 4" at 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

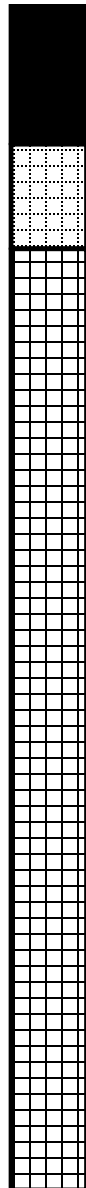


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Oxford Drive - Evans Avenue to Sutton Avenue
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP3 - 37' E of Princeton Lane, 14' off WBLC



4" Hot Mix Asphalt
(HMA)

3" Penetrated Stone
Macadam

27" uniformly graded
sand A-3

Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

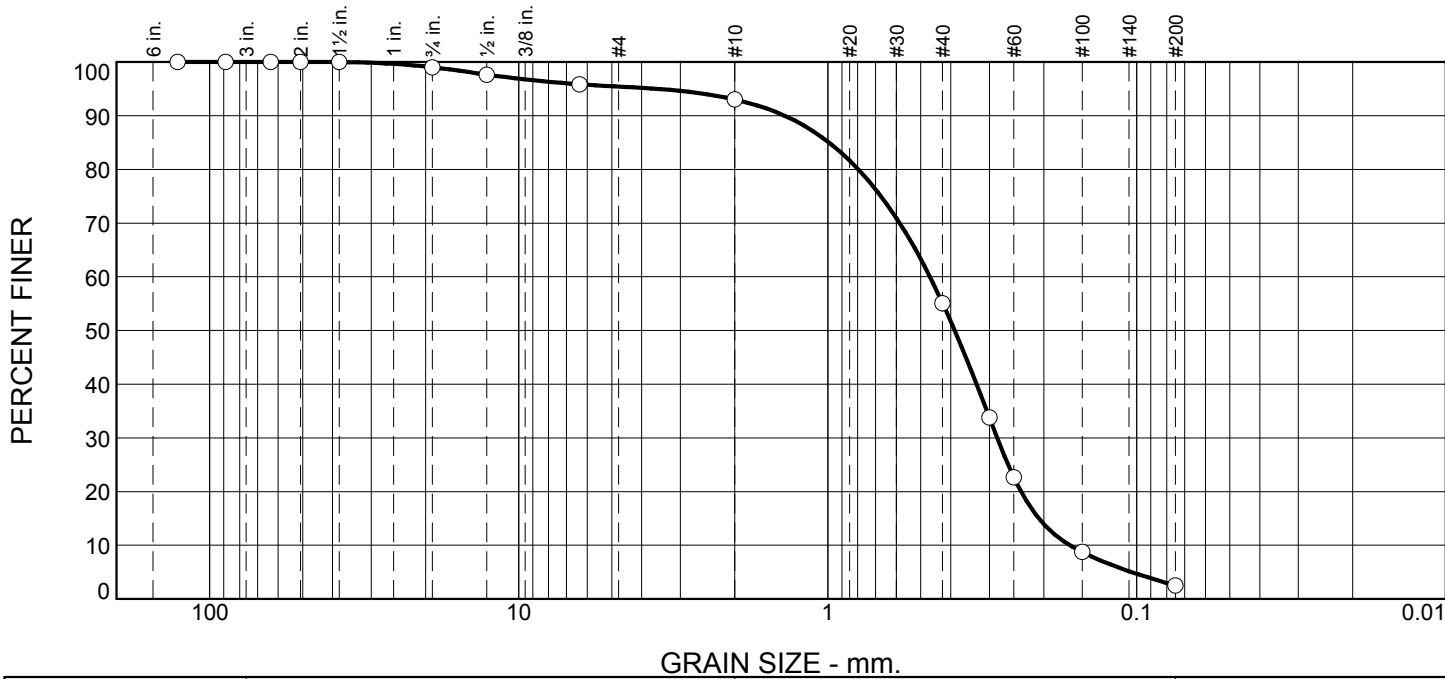
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 37' E of Princeton Lane, 14' off WBLC
Sample Number: SUBGRADE

Depth: 27

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 7 | 38 | 52 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 98 | | |
| 1/4" | 96 | 25 - 60 | X |
| #10 | 93 | 15 - 45 | X |
| #40 | 55 | 5 - 25 | X |
| #50 | 34 | | |
| #60 | 23 | | |
| #100 | 9 | 0 - 10 | |
| #200 | 2.5 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.9906 D₆₀= 0.4669 D₅₀= 0.3885
D₃₀= 0.2828 D₁₅= 0.2072 D₁₀= 0.1645
C_u= 2.84 C_c= 1.04

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 6" at 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

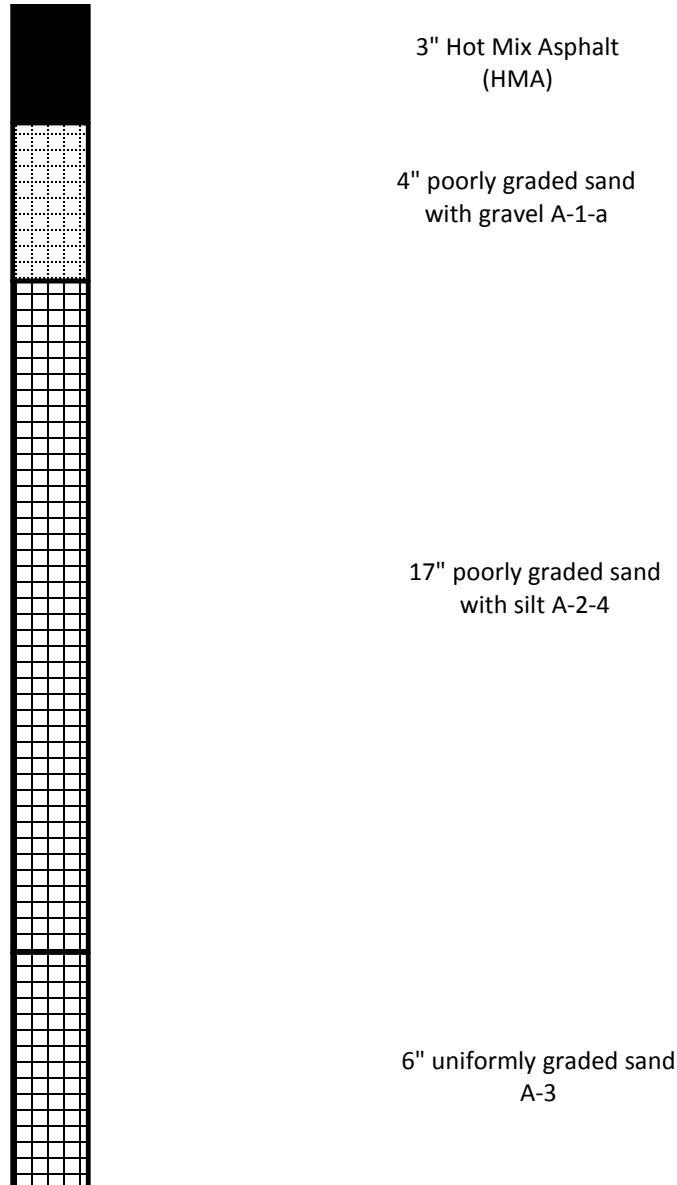


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Oxford Drive - Evans Avenue to Sutton Avenue
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP4 - 370' W of Princeton Avenue, 8' off EBLC



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

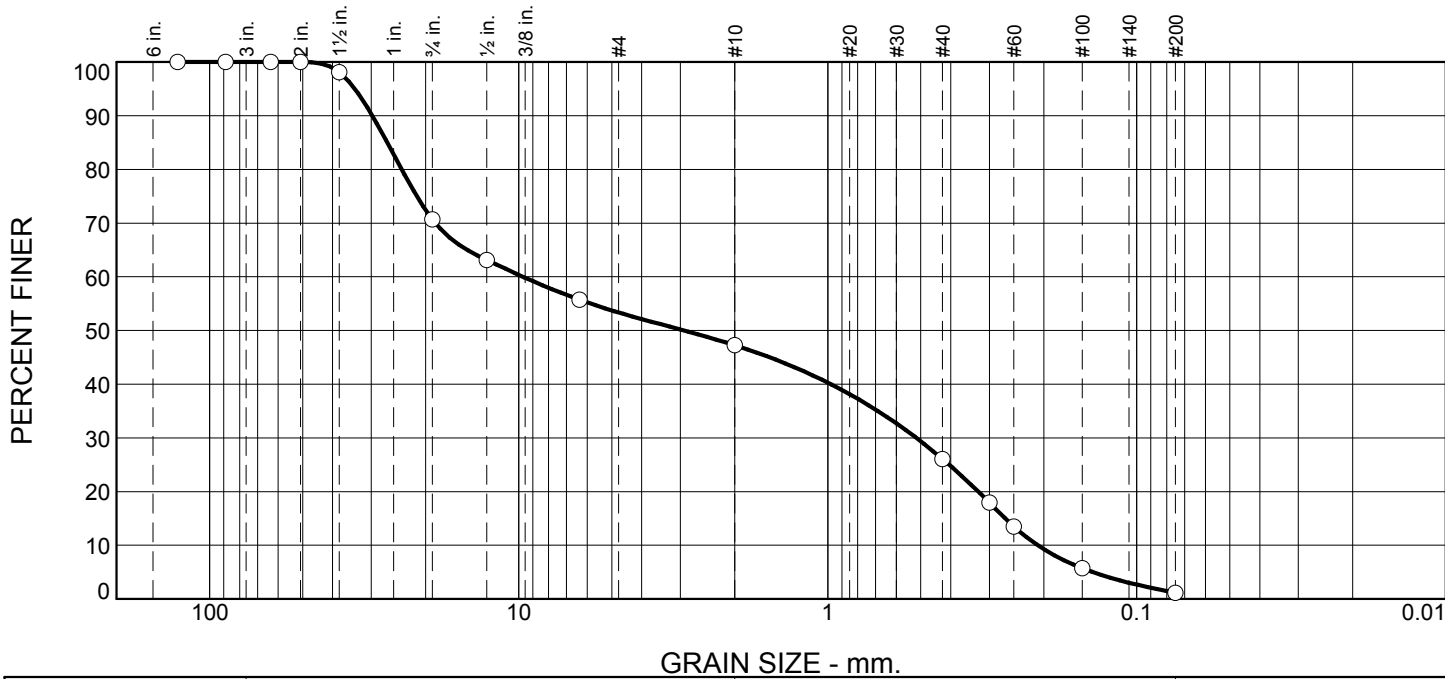
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 370' W of Princeton Avenue, 8' off EBLC
Sample Number: BASE

Depth: 4

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 53 | 21 | 25 | 1 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 98 | 55 - 100 | |
| 3/4" | 71 | | |
| 1/2" | 63 | | |
| 1/4" | 56 | 25 - 60 | |
| #10 | 47 | 15 - 45 | X |
| #40 | 26 | 5 - 25 | X |
| #50 | 18 | | |
| #60 | 13 | | |
| #100 | 6 | 0 - 10 | |
| #200 | 1.2 | 0.0 - 5.0 | |

Material Description

poorly graded sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 26.6485 D₆₀= 9.6696 D₅₀= 2.9205
D₃₀= 0.5174 D₁₅= 0.2665 D₁₀= 0.2090
C_u= 46.27 C_c= 0.13

Classification

USCS= SP AASHTO= A-1-a

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

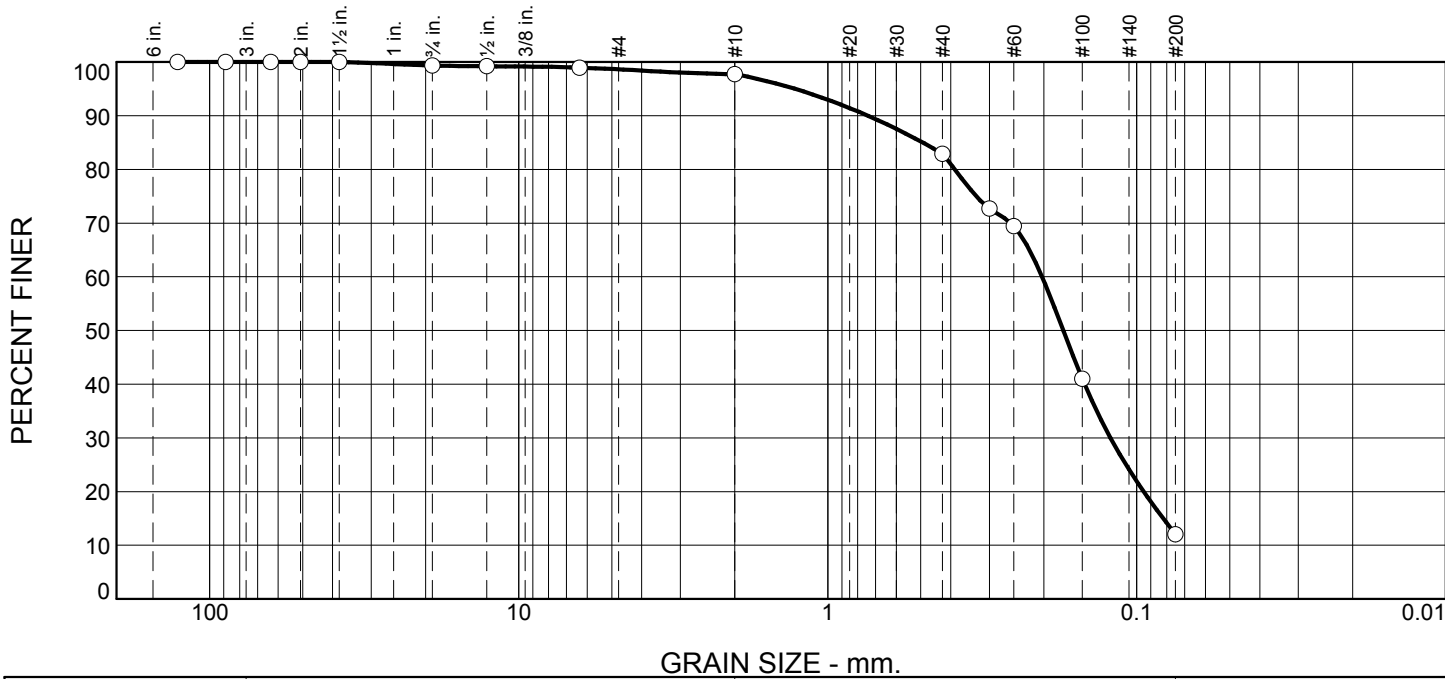
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 370' W of Princeton Avenue, 8' off EBLC
Sample Number: SUBBASE

Depth: 17

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 15 | 71 | 12 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 99 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 83 | 5 - 25 | X |
| #50 | 73 | | |
| #60 | 69 | | |
| #100 | 41 | 0 - 10 | X |
| #200 | 12 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.4934 D₆₀= 0.2024 D₅₀= 0.1727
D₃₀= 0.1216 D₁₅= 0.0821 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-2-4(0)

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

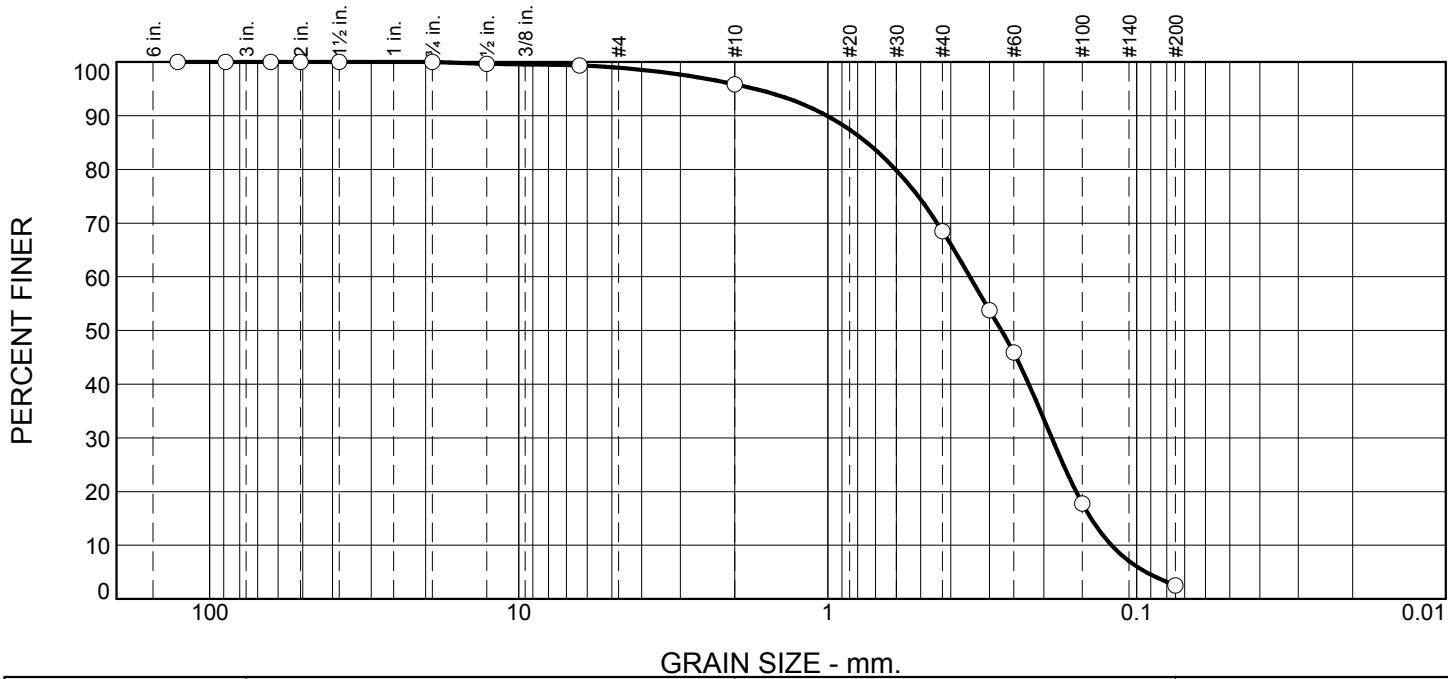
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 370' W of Princeton Avenue, 8' off EBLC
Sample Number: SUBGRADE

Depth: 6

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 4 | 28 | 65 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 96 | 15 - 45 | X |
| #40 | 68 | 5 - 25 | X |
| #50 | 54 | | |
| #60 | 46 | | |
| #100 | 18 | 0 - 10 | X |
| #200 | 2.5 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.7478 D₆₀= 0.3471 D₅₀= 0.2741
D₃₀= 0.1882 D₁₅= 0.1405 D₁₀= 0.1207
C_u= 2.88 C_c= 0.85

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 4" at 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

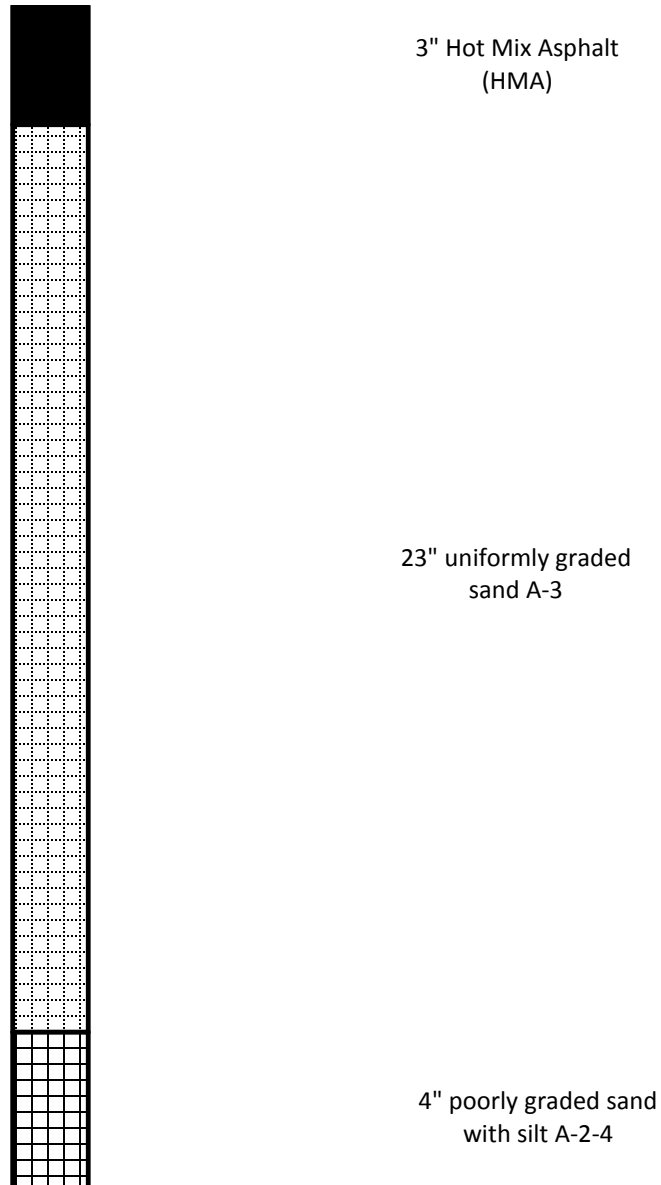


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Oxford Drive - Evans Avenue to Sutton Avenue
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP5 - 430' E of Sutton Avenue, 12' off WBLC



Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

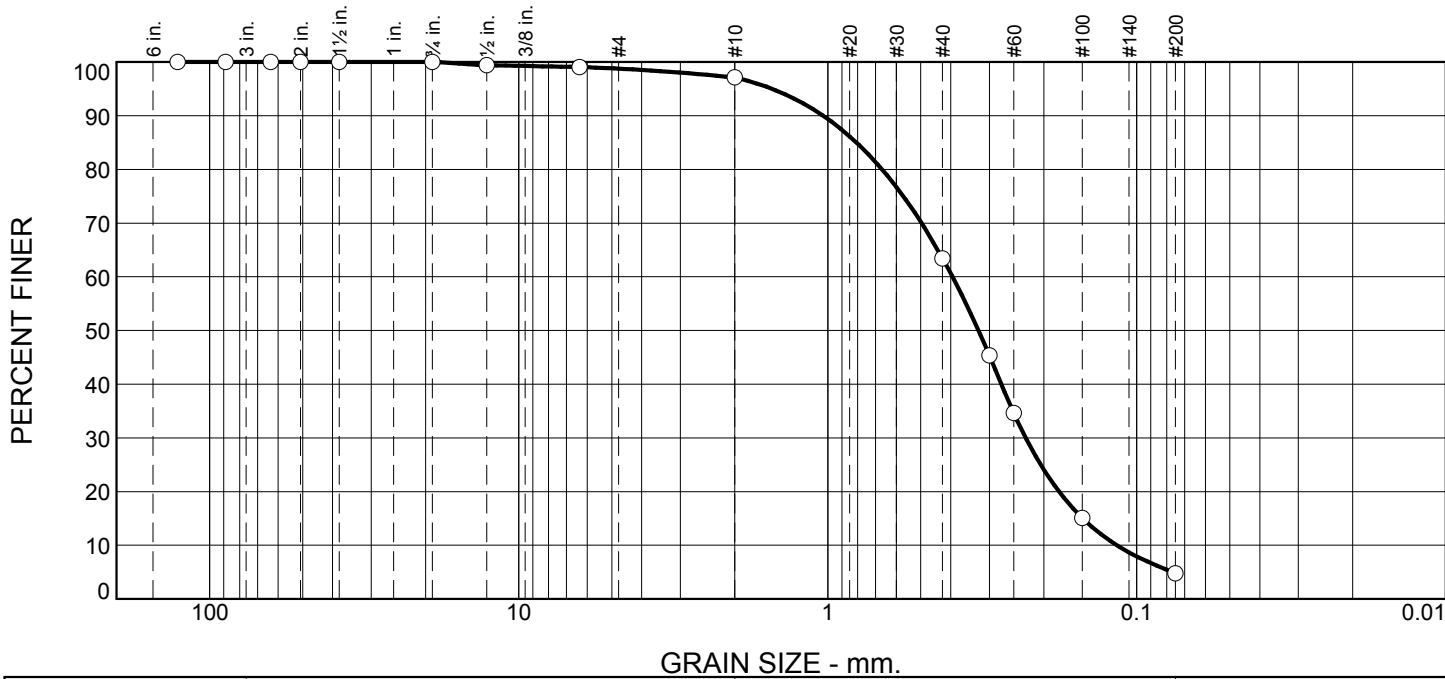
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 430' E of Sutton Avenue, 12' off WBLC
Sample Number: BASE

Depth: 23

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 34 | 58 | 5 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 99 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 63 | 5 - 25 | X |
| #50 | 45 | | |
| #60 | 35 | | |
| #100 | 15 | 0 - 10 | X |
| #200 | 4.8 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.8083 D₆₀= 0.3950 D₅₀= 0.3255
D₃₀= 0.2286 D₁₅= 0.1495 D₁₀= 0.1160
C_u= 3.40 C_c= 1.14

Classification

USCS= SP AASHTO= A-3

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

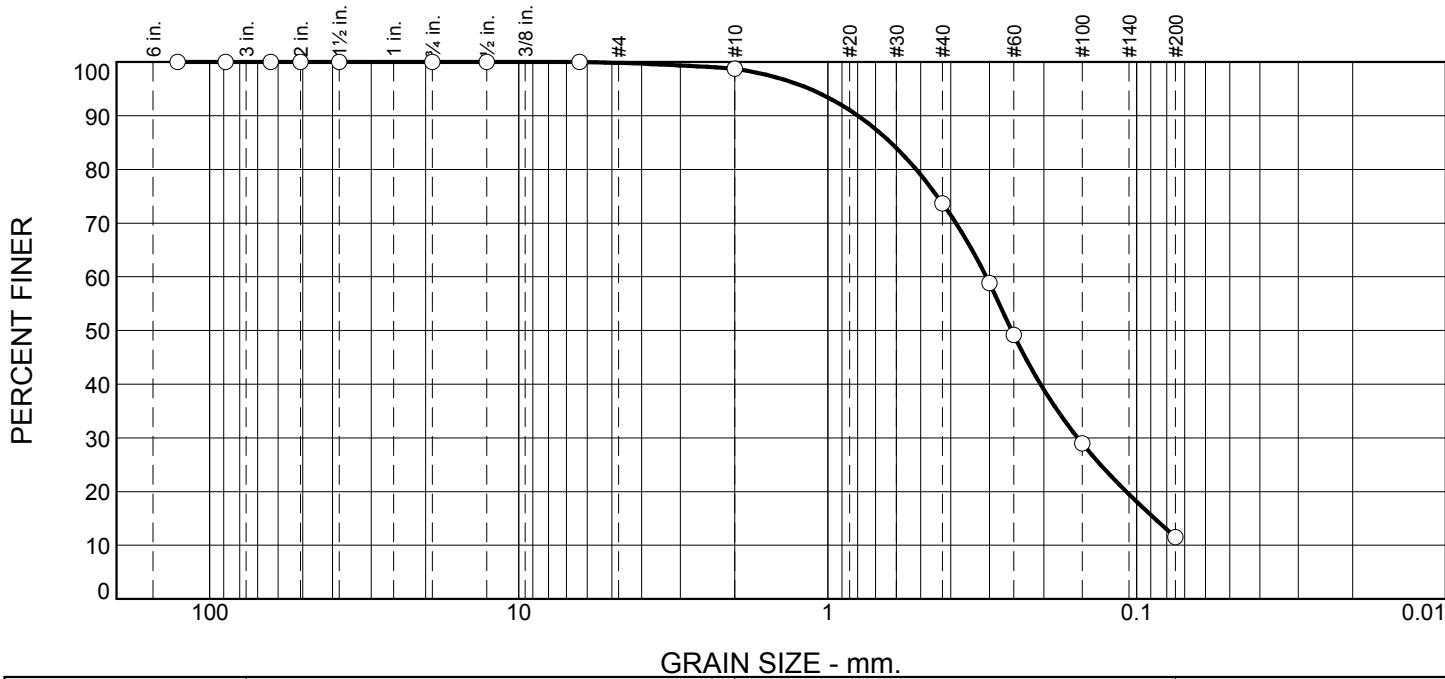
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 430' E of Sutton Avenue, 12' off WBLC
Sample Number: SUBGRADE

Depth: 4

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 1 | 25 | 62 | 12 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 100 | 25 - 60 | X |
| #10 | 99 | 15 - 45 | X |
| #40 | 74 | 5 - 25 | X |
| #50 | 59 | | |
| #60 | 49 | | |
| #100 | 29 | 0 - 10 | X |
| #200 | 12 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6262 D₆₀= 0.3069 D₅₀= 0.2540
D₃₀= 0.1551 D₁₅= 0.0875 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-2-4(0)

Remarks

DCP = 6" at 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

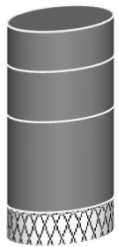
LOCATION: Oxford Drive, East Hartford, CT

DATE SAMPLED: Wednesday, August 22, 2018

FROM: Evans Avenue

TO: Sutton Avenue

CORE#: 1 **Area:** 95' W of Evans Ave., WB lane 4' off curb;



DEPTH

Layer
1.19"
1.50"
2.71"

DEPTH

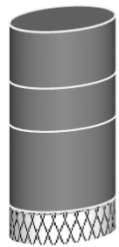
Total
3.40"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 2 **Area:** 123' E of Washington Ave., WB lane 9' off curb;



DEPTH

Layer
1.24"
0.95"
1.78"

DEPTH

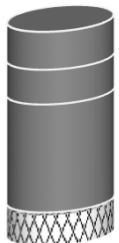
Total
3.97"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 3 **Area:** 27' E of Washington Ave., EB lane 8' off curb;



DEPTH

Layer
0.97"
0.89"
2.78"

DEPTH

Total
4.64"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 4 **Area:** 65' W of Washington Ave., EB lane 3' off curb;



DEPTH

Layer
1.25"
0.99"
1.52"

DEPTH

Total
3.76"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

Jose R Otero Jr.
Jose R. Otero Jr., Project Manager

100 Great Meadow Road

Suite 200

Engineers | Scientists | Planners | Designers Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570

CORE PROFILE

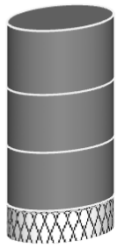
page 2



LOCATION: Oxford Drive, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Evans Avenue
TO: Sutton Avenue

CORE#: 5 **Area:** 170' W of Washington Ave., WB lane 4' off curb;



DEPTH
Layer
1.41"
1.28"
1.29"

DEPTH
Total
3.98"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 6 **Area:** 260' W of Washington Ave., WB lane 8' off curb;



DEPTH
Layer
1.31"
1.44"

DEPTH
Total
2.75"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Penetrated Stone

CORE#: 7 **Area:** 350' W of Washington Ave., EB lane 8' off curb;



DEPTH
Layer
1.35"
0.91"

DEPTH
Total
2.26"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 8 **Area:** 330' E of Princeton Ln., EB lane 5' off curb;



DEPTH
Layer
1.36"
0.94"

DEPTH
Total
2.30"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 9 **Area:** 250' E of Princeton Ln., WB lane 4' off curb;



DEPTH
Layer
1.20"
2.62"

DEPTH
Total
3.82"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

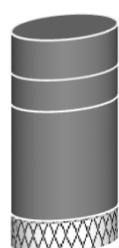
page 3



LOCATION: Oxford Drive, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Evans Avenue
TO: Sutton Avenue

CORE#: 10 **Area:** 150' E of Princeton Ln., WB lane curb;



DEPTH
Layer
1.43"
1.13"
3.93"

DEPTH
Total
6.49"

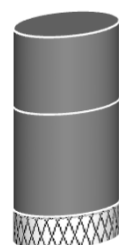
CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
Penetrated Stone

Processed Aggregate

Poor bond at 2.56"

CORE#: 11 **Area:** 50' E of Princeton Ln., EB lane 9' off curb;



DEPTH
Layer
1.22"
1.62"

DEPTH
Total
2.84"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 12 **Area:** 65' W of Princeton Ln., EB lane 5' off curb;



DEPTH
Layer
1.48"
2.06"

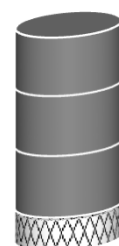
DEPTH
Total
3.54"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 13 **Area:** 140' W of Princeton Ln., WB lane 4' off curb;



DEPTH
inches
1.50"
1.54"
1.58"

DEPTH
Total
4.62"

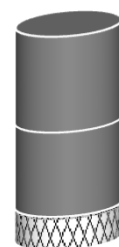
CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

Poor bond at 1.50"

CORE#: 14 **Area:** 245' W of Princeton Ln., WB lane 9' off curb;



DEPTH
Layer
1.66"
1.46"

DEPTH
Total
3.12"

CLASSIFICATION

Hot Mix Asphalt (HMA)
Penetrated Stone

Penetrated Stone

CORE PROFILE

page 4



LOCATION: Oxford Drive, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Evans Avenue
TO: Sutton Avenue

CORE#: 15 **Area:** 330' W of Princeton Ln., EB lane 5' off curb;



DEPTH
Layer
1.17"
2.19"

DEPTH
Total
3.36"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 16 **Area:** 415' W of Princeton Ln., EB lane 8' off curb;



DEPTH
Layer
1.14"
2.21"

DEPTH
Total
3.35"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 17 **Area:** 540' W of Princeton Ln., WB lane 5' off curb;



DEPTH
Layer
1.08"
2.01"

DEPTH
Total
3.09"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 18 **Area:** 580' E of Princeton Ln., WB lane 8' off curb;



DEPTH
inches
1.22"
2.24"

DEPTH
Total
3.46"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 19 **Area:** 520' E of Sutton St., EB lane 9' off curb;



DEPTH
Layer
1.40"
2.33"

DEPTH
Total
3.73"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

page 5



LOCATION: Oxford Drive, East Hartford, CT
 DATE SAMPLED: August 22, 2018

FROM: Evans Avenue
 TO: Sutton Avenue

CORE#: 20 **Area:** 375' E of Sutton St., EB lane 5' off curb;



DEPTH
 Layer
 1.36"
 3.23"

DEPTH
 Total
 4.59"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 21 **Area:** 280' E of Sutton St., WB lane 8' off curb;



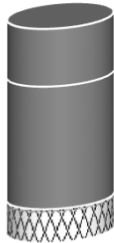
DEPTH
 Layer
 1.41"
 2.36"

DEPTH
 Total
 3.77"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 22 **Area:** 180' E of Sutton St., EB lane 8' off curb;



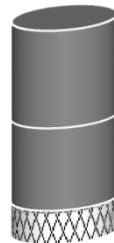
DEPTH
 Layer
 1.22"
 2.60"

DEPTH
 Total
 3.82"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 23 **Area:** 62' E of Sutton St., WB lane 11' off curb;



DEPTH
 Layer
 1.60"
 1.35"

DEPTH
 Total
 2.95"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Deteriorated Penetrated Stone



To: Bill Anderson, PE
VHB/Wethersfield

Date: November 20, 2018

Memorandum

Project #: 42413.00

From: Jose Otero
VHB/Project Manger

Re: Oxford Drive – East Hartford, CT

Following are the recommendations for the design and construction of Oxford Drive from Evans Avenue to Sutton Avenue

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The distress level investigation results indicate there is severe alligator cracking. Moderate pothole patching, distortion, transverse/longitudinal and weather/block cracking were noted. There is evidence extensive surface wear, resulting in a Road Manager Pavement Condition Index (PCI) of 50, three points less than the 2014 update.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A3 which are classified as uniformly graded sands by the Unified Classification system. The subgrades are fair to good foundations when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 400 vehicles per day with small trucks and buses accounting for 2% of the ADT.

Evans Avenue to Sutton Avenue:

- The existing pavement structure cross-section consisted of 2.3" to 6.5" (average 3.7") of hot mix asphalt (HMA). The granular base consisted of 4" to 6" (average 5.3") of poorly graded sand bases which were founded on uniformly graded sand subbases/subgrades. Test pit 3 has 3" of deteriorated penetrated stone macadam base and test pit 5 had no identifiable base, being directly paved over uniformly graded sandy subgrade.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a 2.0" overlay to meet the Elastic Layer Design, which is NOT recommended.
- MILL AND OVERLAY is not recommended as a treatment alternative due to inadequate support from existing granular soils, requiring milling depth greater than existing pavement thickness.
- REMOVE HMA is not recommended as a treatment alternative due to no structural base present in $\geq 50\%$ of test pits.

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
P 860.807.4300

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|--|
| #1 | 20-years | RECONSTRUCT the pavement section by removing the existing HMA and poorly graded sand bases to a 9" depth. Place 6" of processed aggregate as a base. Compact to proper lines and grades prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |

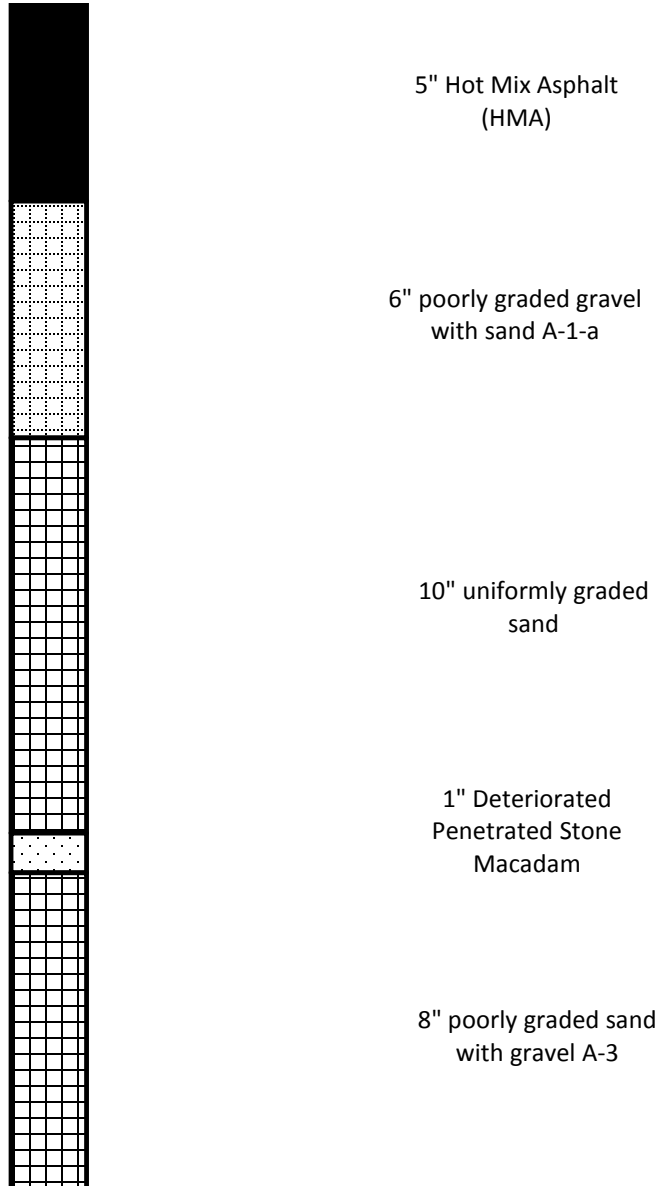


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Oxford Drive - Evans Avenue to Sutton Avenue
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP1 - 18' W of Washington Avenue, 6' off WBLC



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

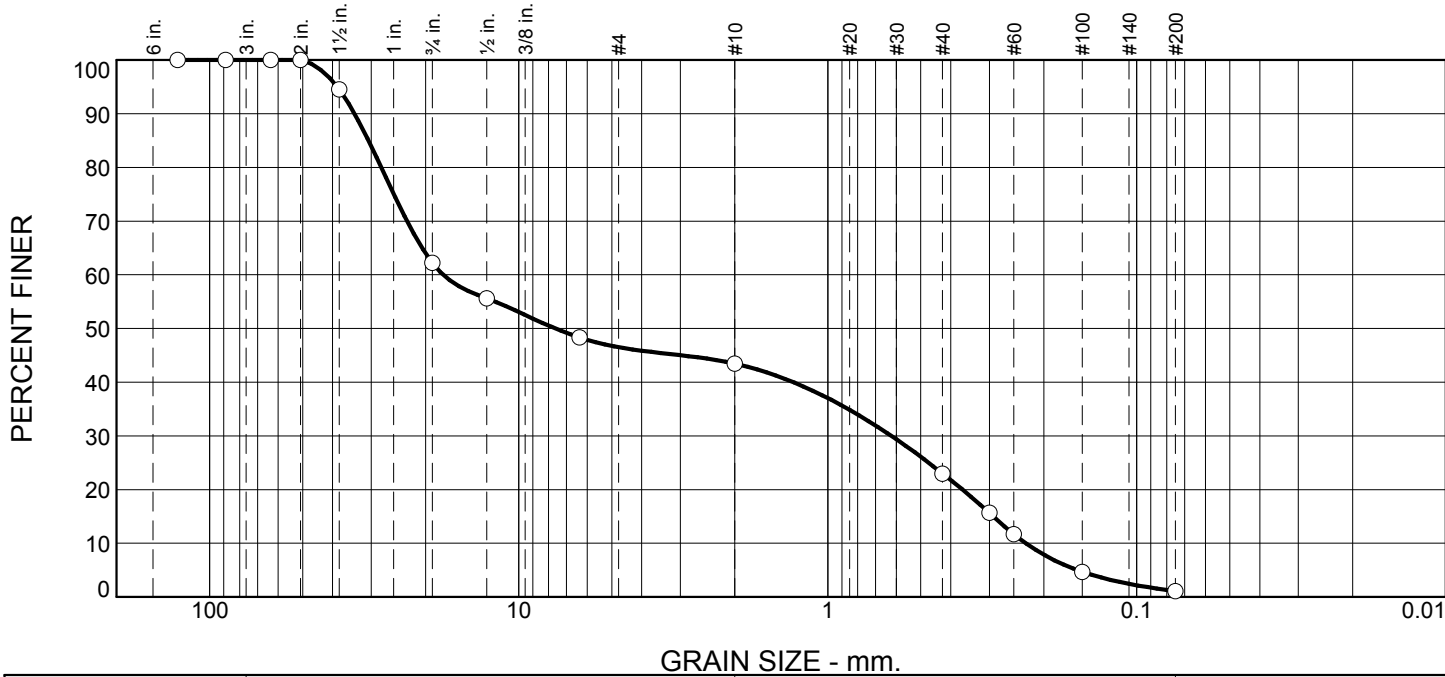
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 18' W of Washington Avenue, 6' off WBLC
Sample Number: BASE

Depth: 6

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 57 | 20 | 22 | 1 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 95 | | |
| 3/4" | 62 | 50 - 75 | |
| 1/2" | 56 | | |
| 1/4" | 48 | 25 - 45 | X |
| #10 | 43 | | |
| #40 | 23 | 5 - 20 | X |
| #50 | 16 | | |
| #60 | 12 | | |
| #100 | 5 | 2 - 12 | |
| #200 | 1.1 | | |

Material Description

poorly graded gravel with sand

| | | |
|---------------|-----------------------------------|--------|
| PL= NP | Atterberg Limits LL= NV | PI= NP |
|---------------|-----------------------------------|--------|

| | | |
|---------------------------|---------------------------|--------------------------|
| D ₈₅ = 30.6542 | Coefficients | D ₅₀ = 7.5956 |
| D ₃₀ = 0.6232 | D ₆₀ = 17.5516 | D ₁₅ = 0.2911 |
| C _u = 76.76 | C _c = 0.10 | D ₁₀ = 0.2287 |

| | |
|----------|--|
| USCS= GP | Classification AASHTO= A-1-a |
|----------|--|

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

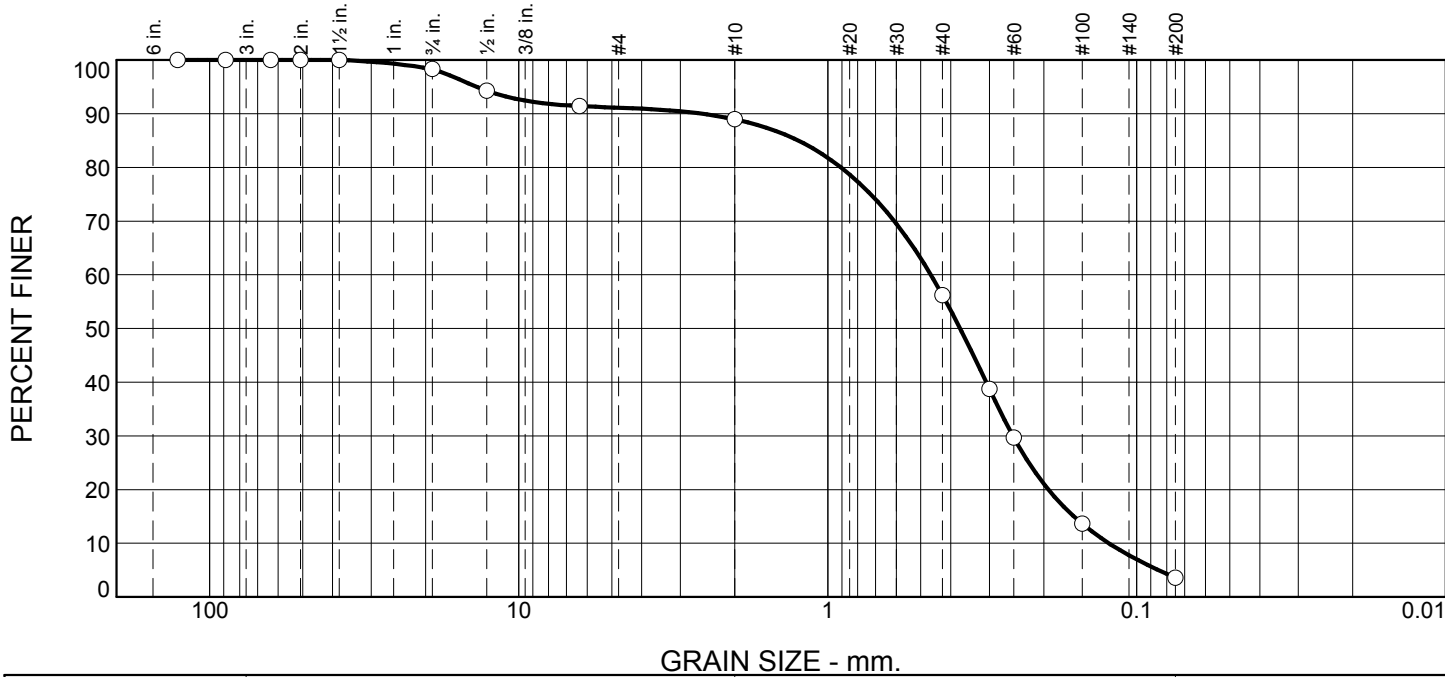
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 18' W of Washington Avenue, 6' off WBLC
Sample Number: SUBBASE

Depth: 10

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 11 | 33 | 52 | 4 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 98 | | |
| 1/2" | 94 | | |
| 1/4" | 91 | 25 - 60 | X |
| #10 | 89 | 15 - 45 | X |
| #40 | 56 | 5 - 25 | X |
| #50 | 39 | | |
| #60 | 30 | | |
| #100 | 14 | 0 - 10 | X |
| #200 | 3.6 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= PI=

Coefficients

D₈₅= 1.2470 D₆₀= 0.4639 D₅₀= 0.3733
D₃₀= 0.2517 D₁₅= 0.1597 D₁₀= 0.1231
C_u= 3.77 C_c= 1.11

Classification

USCS= SP AASHTO=

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

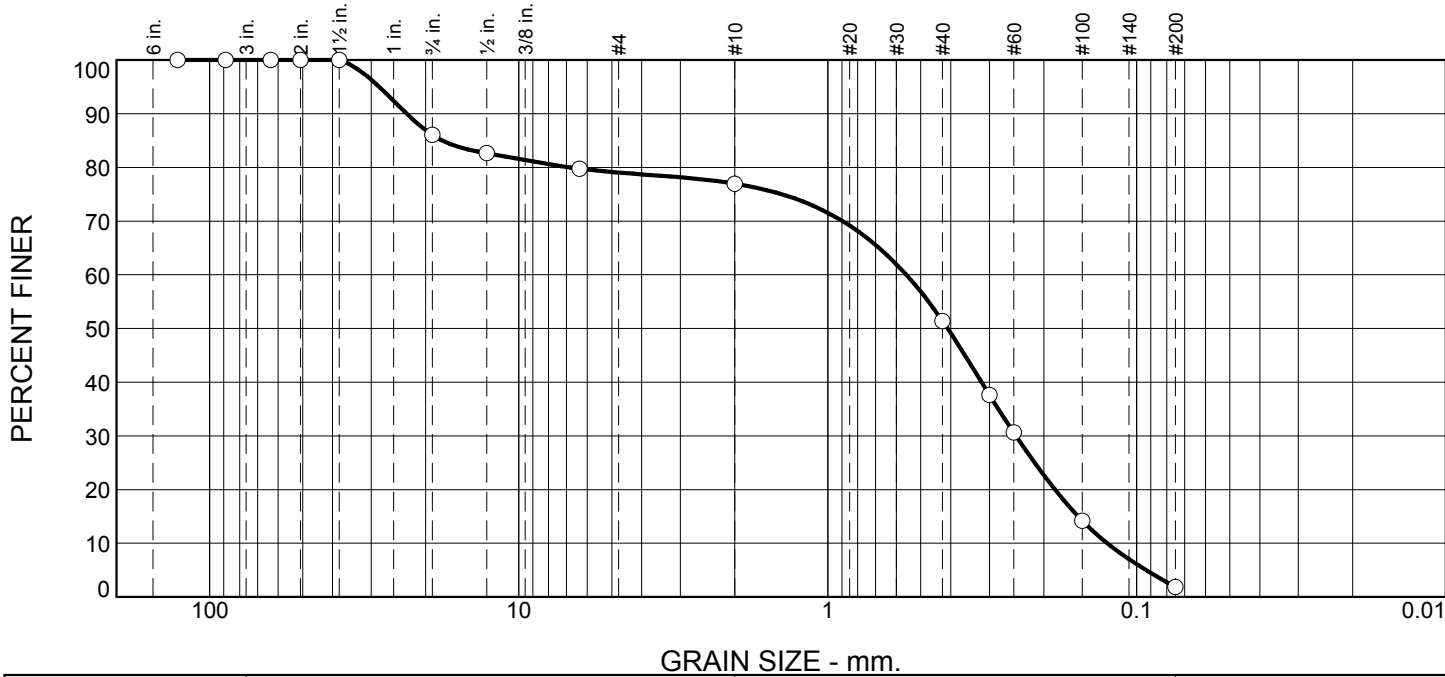
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 18' W of Washington Avenue, 6' off WBLC
Sample Number: SUBGRADE

Depth: 8

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 23 | 26 | 49 | 2 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 86 | | |
| 1/2" | 83 | | |
| 1/4" | 80 | 25 - 60 | X |
| #10 | 77 | 15 - 45 | X |
| #40 | 51 | 5 - 25 | X |
| #50 | 38 | | |
| #60 | 31 | | |
| #100 | 14 | 0 - 10 | X |
| #200 | 1.8 | 0.0 - 5.0 | |

Material Description

poorly graded sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 17.7090 D₆₀= 0.5574 D₅₀= 0.4095
D₃₀= 0.2458 D₁₅= 0.1547 D₁₀= 0.1246
C_u= 4.47 C_c= 0.87

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 8" at 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

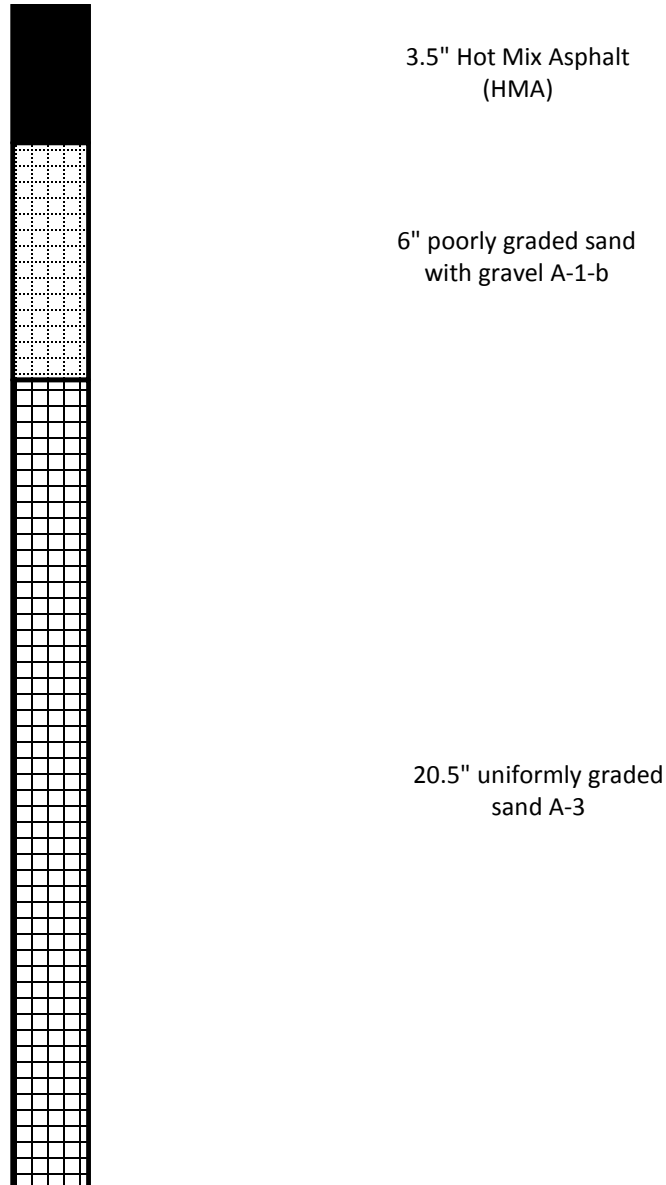


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Oxford Drive - Evans Avenue to Sutton Avenue
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP2 - 440' E of Princeton Lane, 6' off EBLC



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

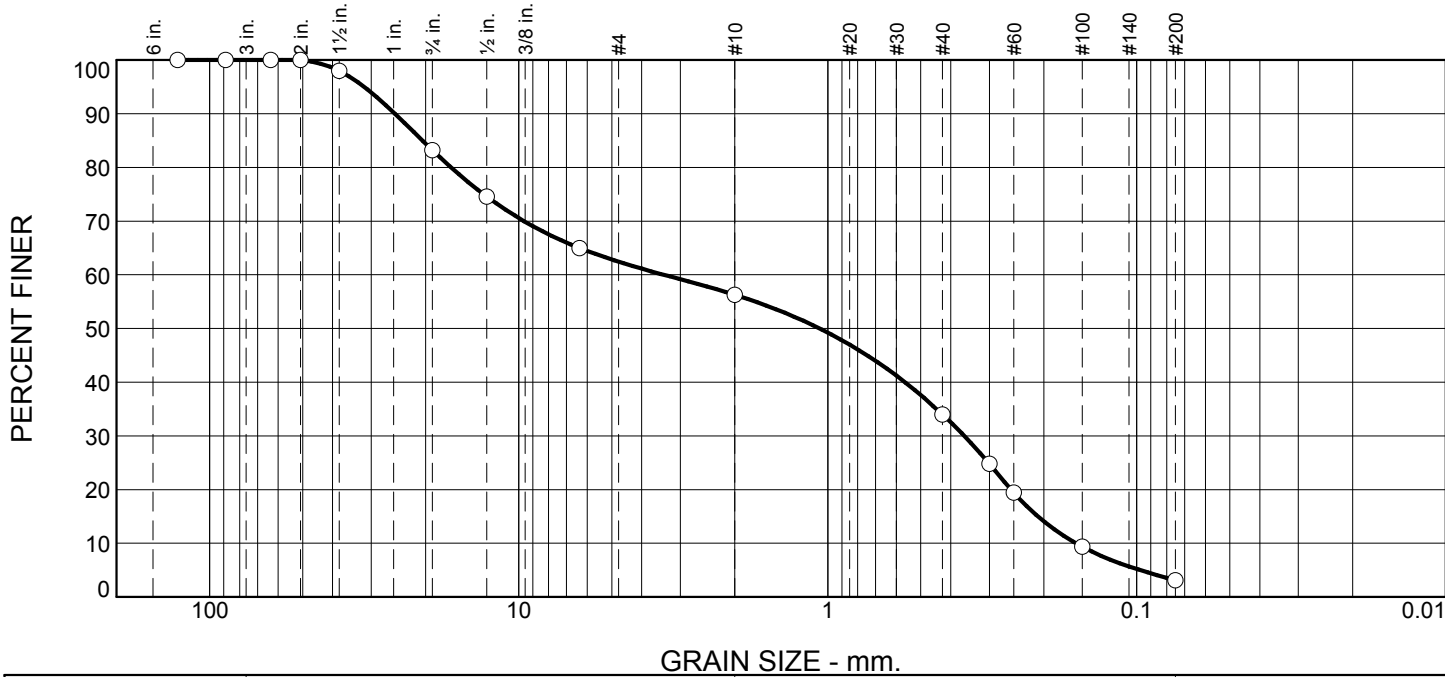
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 440' E of Princeton Lane, 6' off EBLC
Sample Number: BASE

Depth: 6

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 44 | 22 | 31 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 98 | | |
| 3/4" | 83 | 50 - 75 | X |
| 1/2" | 75 | | |
| 1/4" | 65 | 25 - 45 | X |
| #10 | 56 | | |
| #40 | 34 | 5 - 20 | X |
| #50 | 25 | | |
| #60 | 19 | | |
| #100 | 9 | 2 - 12 | |
| #200 | 3.1 | | |

Material Description

poorly graded sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 20.5062 D₆₀= 3.3929 D₅₀= 1.0630
D₃₀= 0.3620 D₁₅= 0.2089 D₁₀= 0.1573
C_u= 21.57 C_c= 0.25

Classification

USCS= SP AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

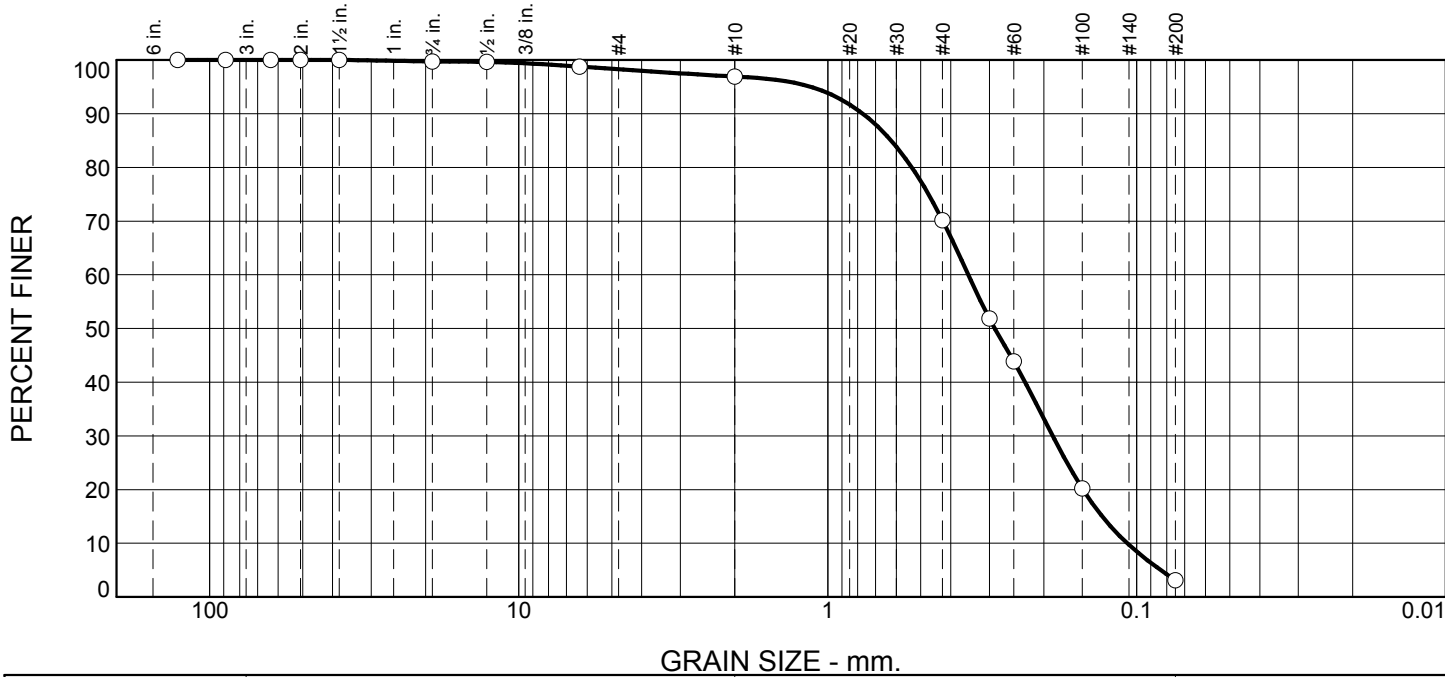
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 440' E of Princeton Lane, 6' off EBLC
Sample Number: SUBGRADE

Depth: 20.5

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 27 | 67 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 70 | 5 - 25 | X |
| #50 | 52 | | |
| #60 | 44 | | |
| #100 | 20 | 0 - 10 | X |
| #200 | 3.1 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6244 D₆₀= 0.3514 D₅₀= 0.2882
D₃₀= 0.1869 D₁₅= 0.1293 D₁₀= 0.1073
C_u= 3.27 C_c= 0.93

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 4" at 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

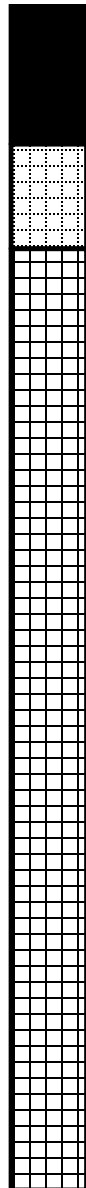


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Wethersfield, Connecticut 06109
860.807.4300

STREET: Oxford Drive - Evans Avenue to Sutton Avenue
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP3 - 37' E of Princeton Lane, 14' off WBLC



4" Hot Mix Asphalt
(HMA)

3" Penetrated Stone
Macadam

27" uniformly graded
sand A-3

Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

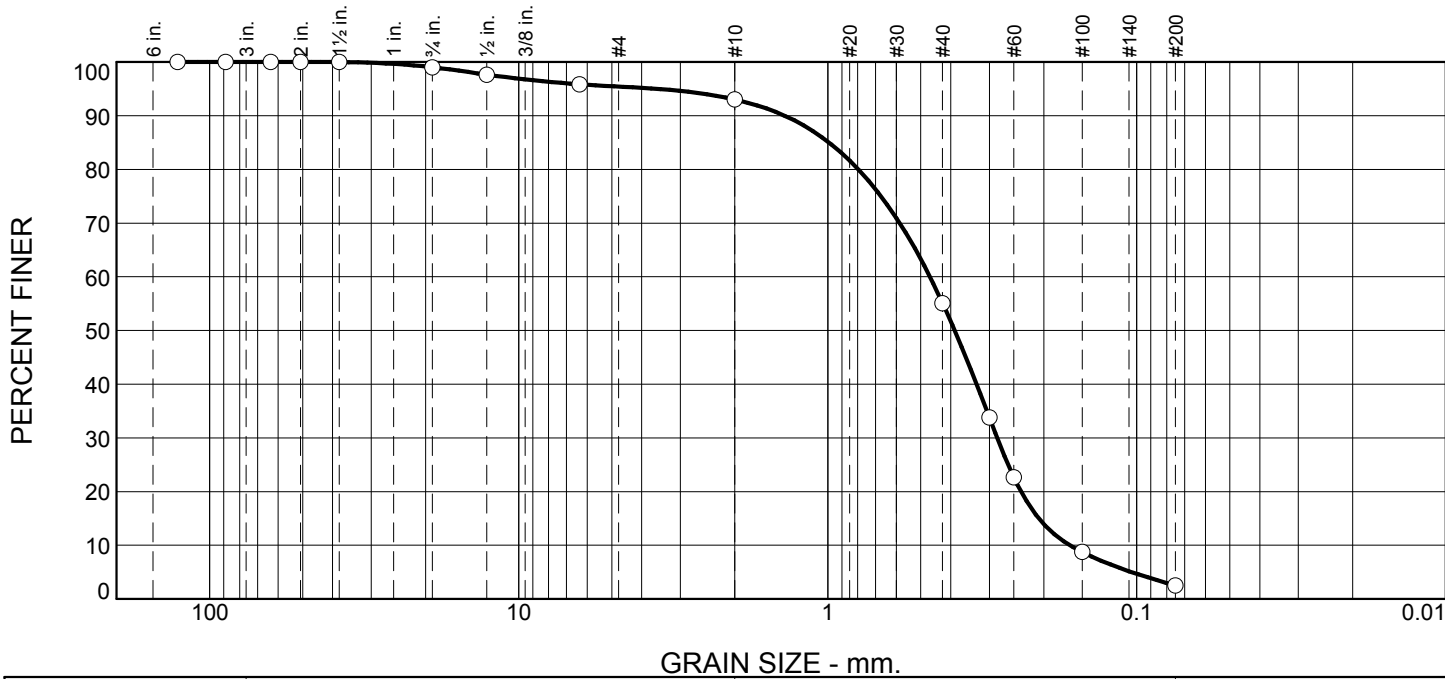
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP3 - 37' E of Princeton Lane, 14' off WBLC
Sample Number: SUBGRADE

Depth: 27

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 7 | 38 | 52 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 98 | | |
| 1/4" | 96 | 25 - 60 | X |
| #10 | 93 | 15 - 45 | X |
| #40 | 55 | 5 - 25 | X |
| #50 | 34 | | |
| #60 | 23 | | |
| #100 | 9 | 0 - 10 | |
| #200 | 2.5 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.9906 D₆₀= 0.4669 D₅₀= 0.3885
D₃₀= 0.2828 D₁₅= 0.2072 D₁₀= 0.1645
C_u= 2.84 C_c= 1.04

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 6" at 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

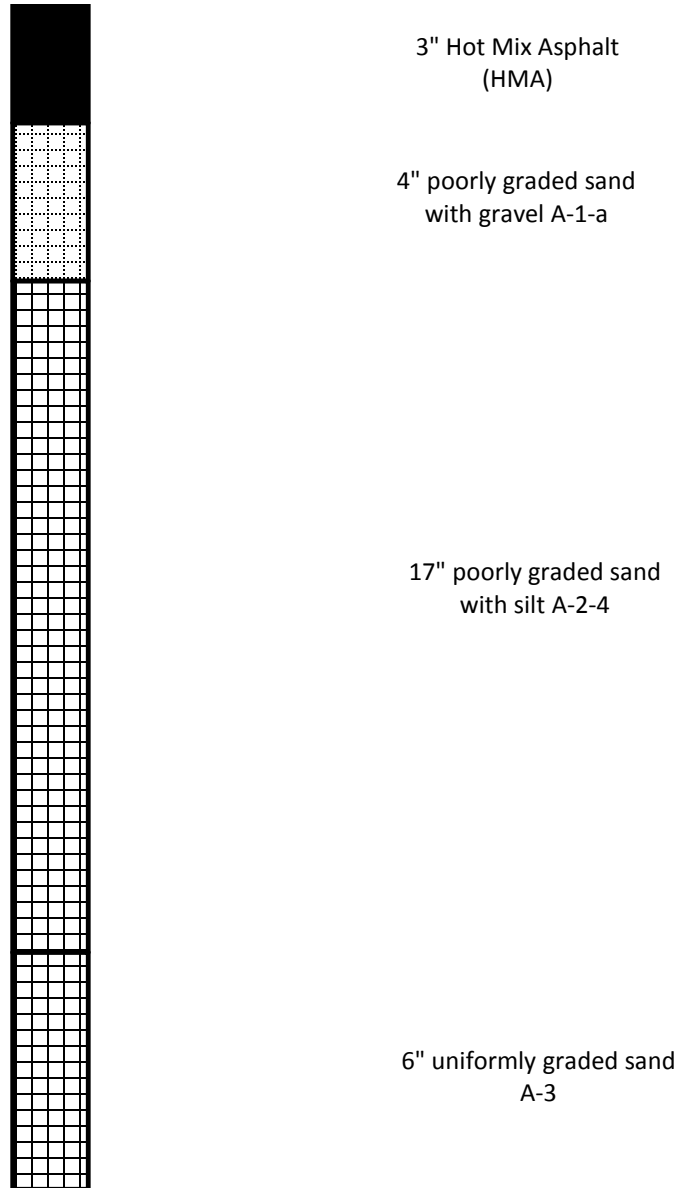


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860.807.4300

STREET: Oxford Drive - Evans Avenue to Sutton Avenue
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP4 - 370' W of Princeton Avenue, 8' off EBLC



Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

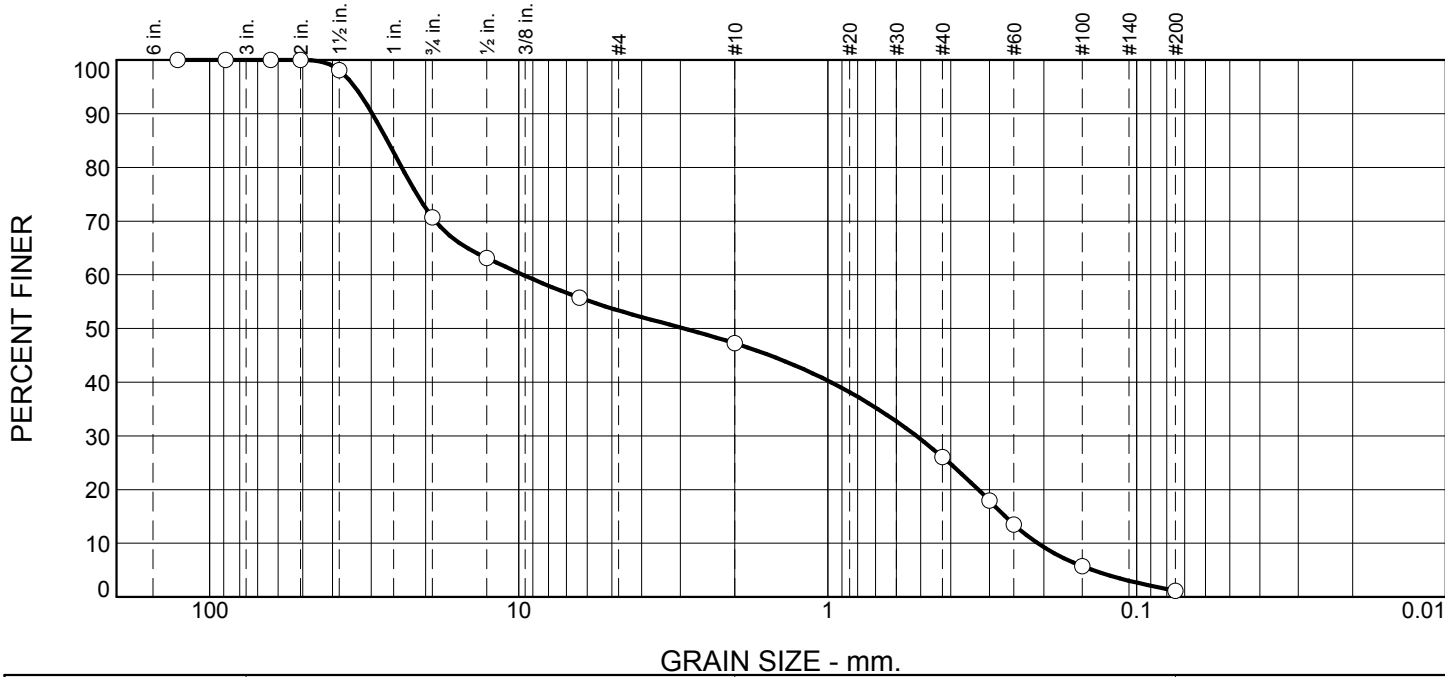
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 370' W of Princeton Avenue, 8' off EBLC
Sample Number: BASE

Depth: 4

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 53 | 21 | 25 | 1 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 98 | 55 - 100 | |
| 3/4" | 71 | | |
| 1/2" | 63 | | |
| 1/4" | 56 | 25 - 60 | |
| #10 | 47 | 15 - 45 | X |
| #40 | 26 | 5 - 25 | X |
| #50 | 18 | | |
| #60 | 13 | | |
| #100 | 6 | 0 - 10 | |
| #200 | 1.2 | 0.0 - 5.0 | |

Material Description

poorly graded sand with gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 26.6485 D₆₀= 9.6696 D₅₀= 2.9205
D₃₀= 0.5174 D₁₅= 0.2665 D₁₀= 0.2090
C_u= 46.27 C_c= 0.13

Classification

USCS= SP AASHTO= A-1-a

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

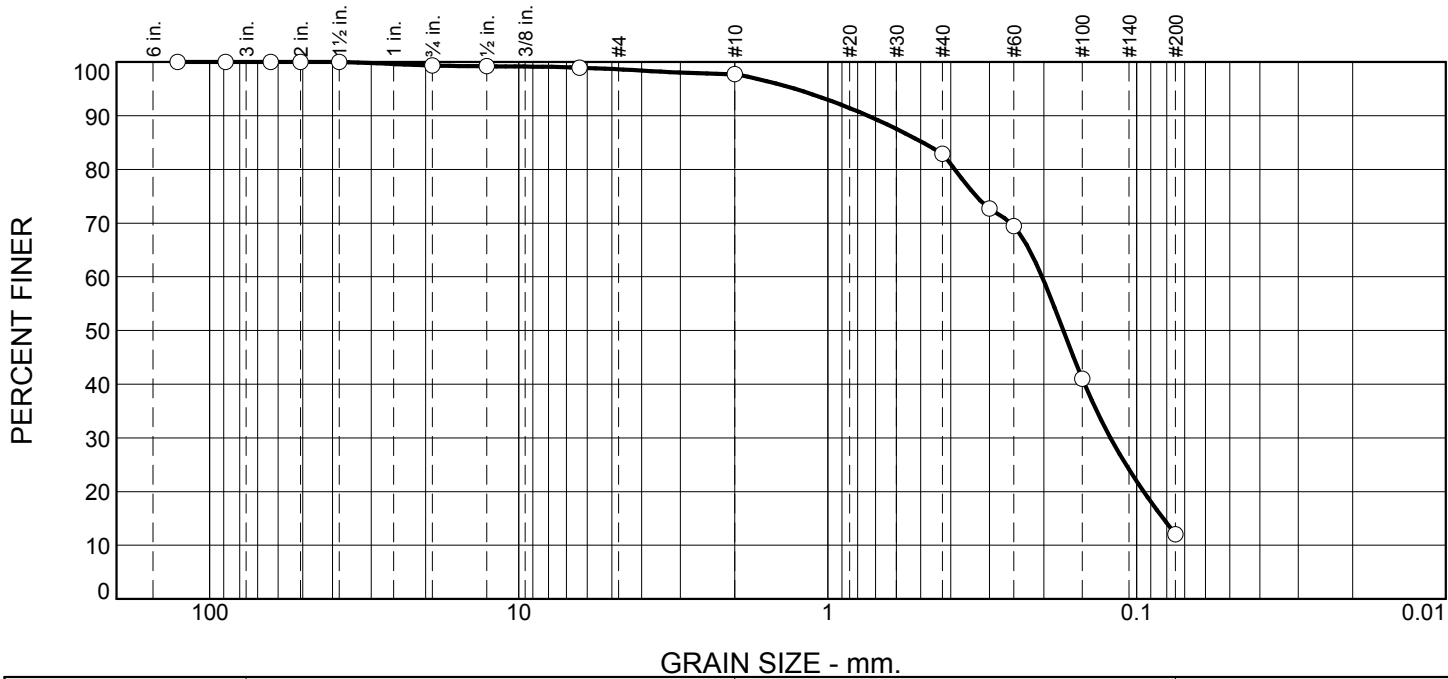
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 370' W of Princeton Avenue, 8' off EBLC
Sample Number: SUBBASE

Depth: 17

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 2 | 15 | 71 | 12 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 99 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 98 | 15 - 45 | X |
| #40 | 83 | 5 - 25 | X |
| #50 | 73 | | |
| #60 | 69 | | |
| #100 | 41 | 0 - 10 | X |
| #200 | 12 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.4934 D₆₀= 0.2024 D₅₀= 0.1727
D₃₀= 0.1216 D₁₅= 0.0821 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-2-4(0)

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

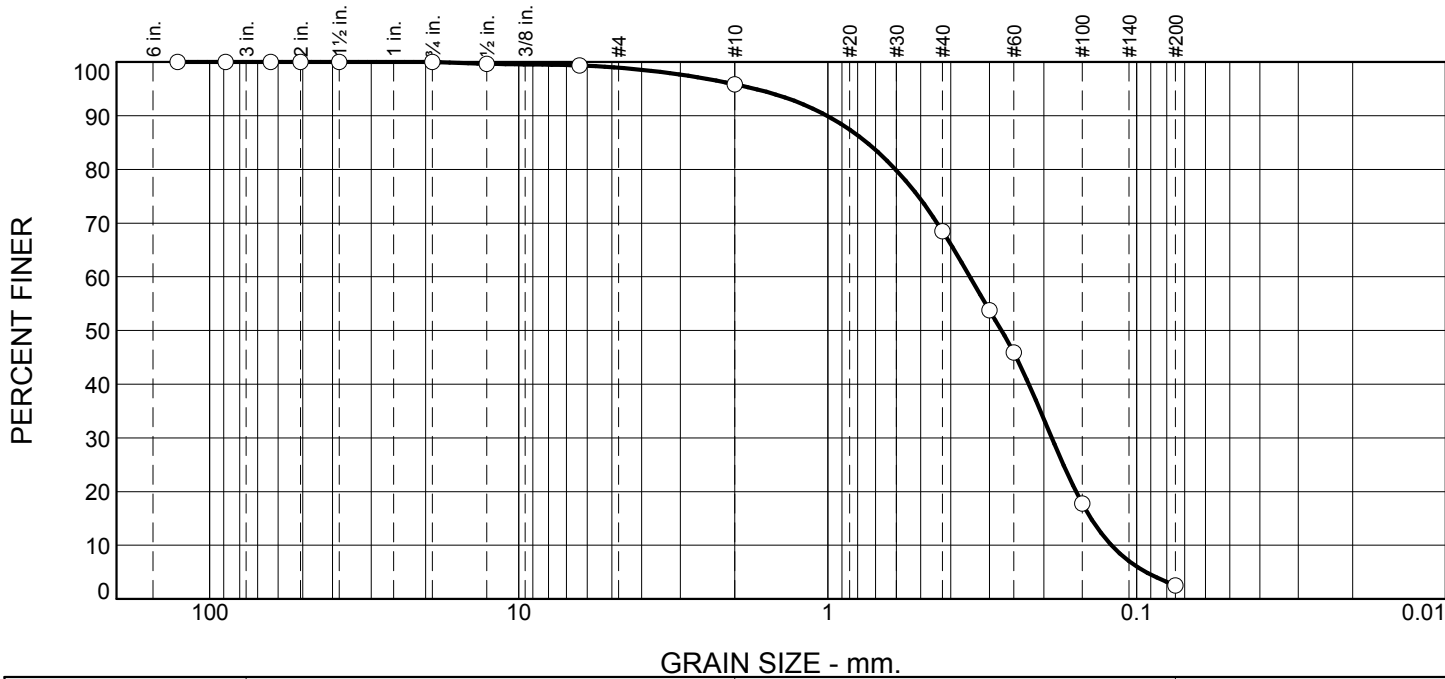
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP4 - 370' W of Princeton Avenue, 8' off EBLC
Sample Number: SUBGRADE

Depth: 6

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 4 | 28 | 65 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 96 | 15 - 45 | X |
| #40 | 68 | 5 - 25 | X |
| #50 | 54 | | |
| #60 | 46 | | |
| #100 | 18 | 0 - 10 | X |
| #200 | 2.5 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.7478 D₆₀= 0.3471 D₅₀= 0.2741
D₃₀= 0.1882 D₁₅= 0.1405 D₁₀= 0.1207
C_u= 2.88 C_c= 0.85

Classification

USCS= SP AASHTO= A-3

Remarks

DCP = 4" at 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

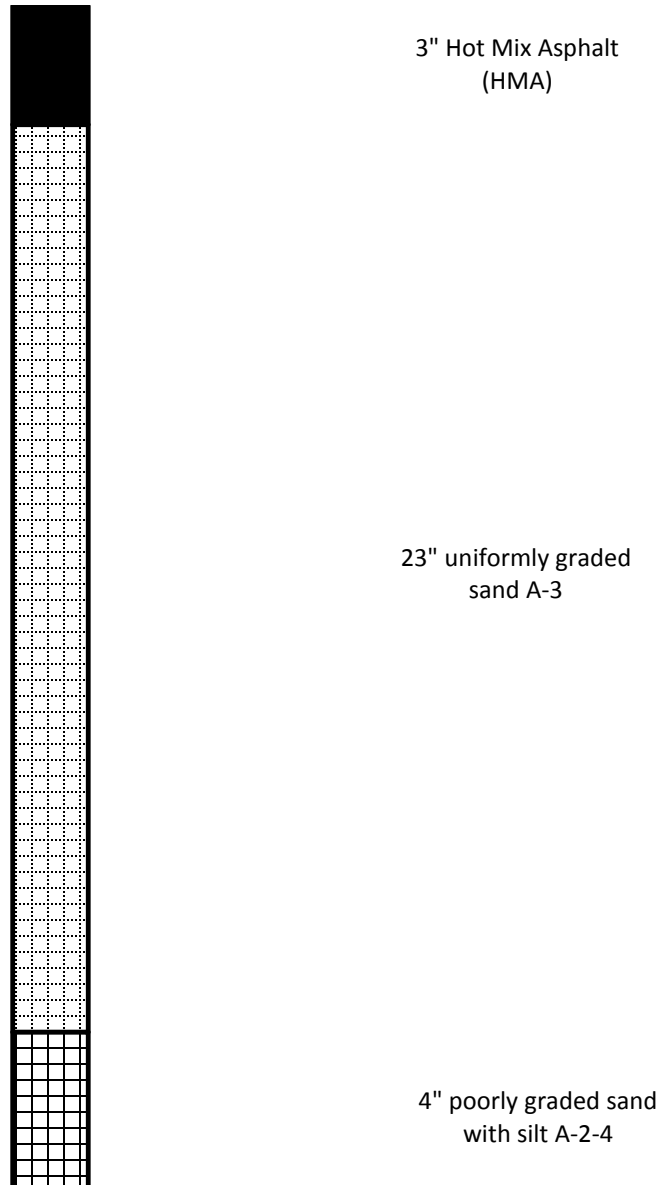


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Oxford Drive - Evans Avenue to Sutton Avenue
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP5 - 430' E of Sutton Avenue, 12' off WBLC



Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

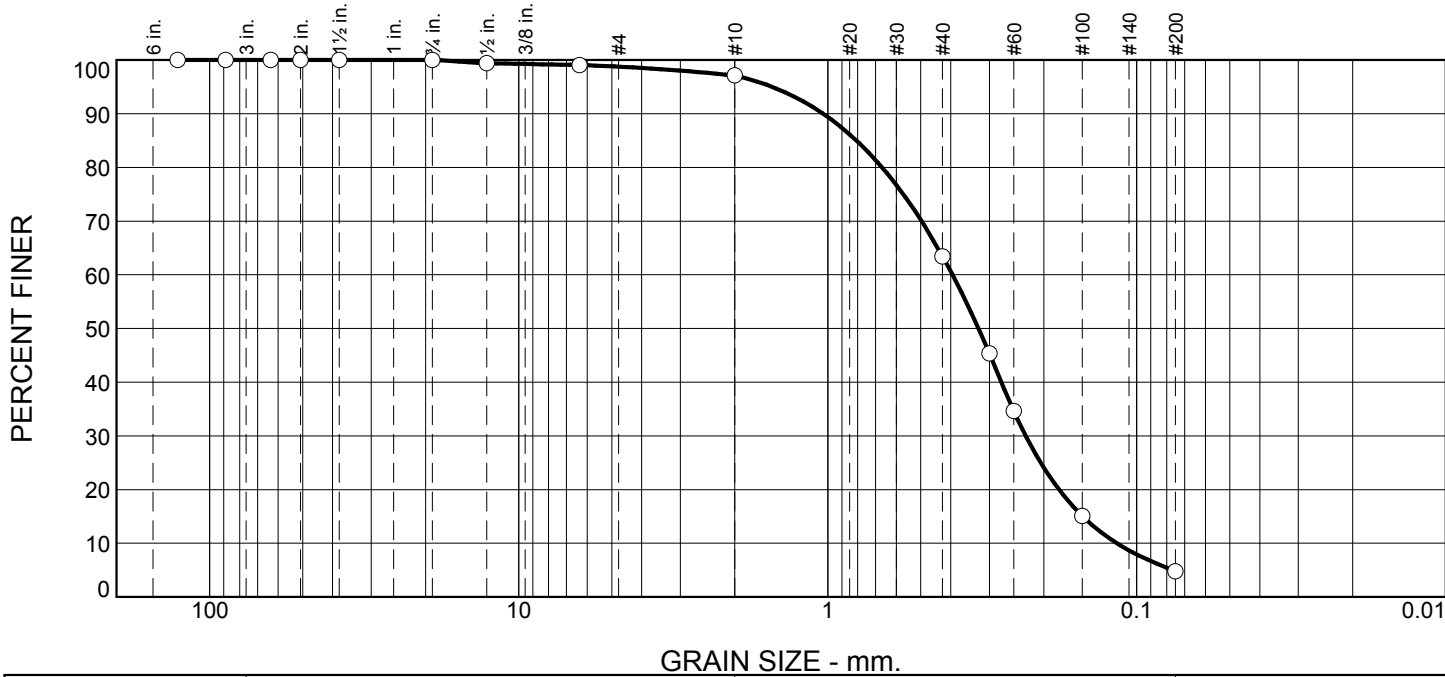
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 430' E of Sutton Avenue, 12' off WBLC
Sample Number: BASE

Depth: 23

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 34 | 58 | 5 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 99 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 63 | 5 - 25 | X |
| #50 | 45 | | |
| #60 | 35 | | |
| #100 | 15 | 0 - 10 | X |
| #200 | 4.8 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.8083 D₆₀= 0.3950 D₅₀= 0.3255
D₃₀= 0.2286 D₁₅= 0.1495 D₁₀= 0.1160
C_u= 3.40 C_c= 1.14

Classification

USCS= SP AASHTO= A-3

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Oxford Drive - Evans Avenue to Sutton Avenue

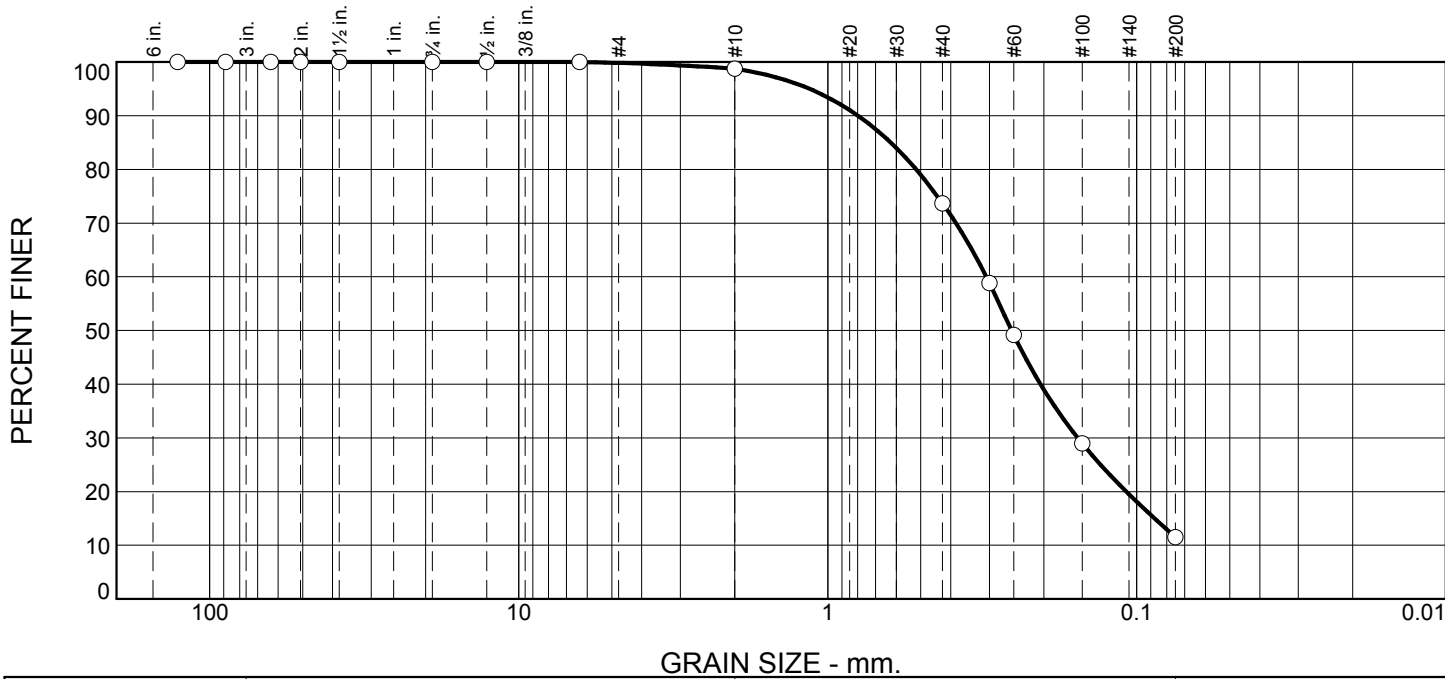
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP5 - 430' E of Sutton Avenue, 12' off WBLC
Sample Number: SUBGRADE

Depth: 4

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 1 | 25 | 62 | 12 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 100 | | |
| 1/4" | 100 | 25 - 60 | X |
| #10 | 99 | 15 - 45 | X |
| #40 | 74 | 5 - 25 | X |
| #50 | 59 | | |
| #60 | 49 | | |
| #100 | 29 | 0 - 10 | X |
| #200 | 12 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6262 D₆₀= 0.3069 D₅₀= 0.2540
D₃₀= 0.1551 D₁₅= 0.0875 D₁₀=
C_u= C_c=

Classification

USCS= SP-SM AASHTO= A-2-4(0)

Remarks

DCP = 6" at 5 blows

* CT - M.02.06 Gravels "A"

Figure

Tested By: TT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

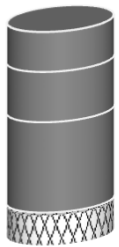
LOCATION: Oxford Drive, East Hartford, CT

DATE SAMPLED: Wednesday, August 22, 2018

FROM: Evans Avenue

TO: Sutton Avenue

CORE#: 1 **Area:** 95' W of Evans Ave., WB lane 4' off curb;



DEPTH

Layer
1.19"
1.50"
2.71"

DEPTH

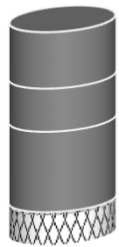
Total
3.40"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 2 **Area:** 123' E of Washington Ave., WB lane 9' off curb;



DEPTH

Layer
1.24"
0.95"
1.78"

DEPTH

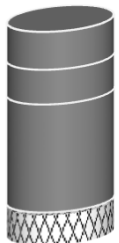
Total
3.97"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 3 **Area:** 27' E of Washington Ave., EB lane 8' off curb;



DEPTH

Layer
0.97"
0.89"
2.78"

DEPTH

Total
4.64"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 4 **Area:** 65' W of Washington Ave., EB lane 3' off curb;



DEPTH

Layer
1.25"
0.99"
1.52"

DEPTH

Total
3.76"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

Jose R Otero Jr.
Jose R. Otero Jr., Project Manager

100 Great Meadow Road

Suite 200

Engineers | Scientists | Planners | Designers Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570

CORE PROFILE

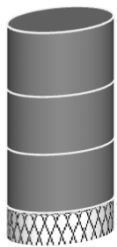
page 2



LOCATION: Oxford Drive, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Evans Avenue
TO: Sutton Avenue

CORE#: 5 **Area:** 170' W of Washington Ave., WB lane 4' off curb;



DEPTH
Layer
1.41"
1.28"
1.29"

DEPTH
Total
3.98"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 6 **Area:** 260' W of Washington Ave., WB lane 8' off curb;



DEPTH
Layer
1.31"
1.44"

DEPTH
Total
2.75"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Penetrated Stone

CORE#: 7 **Area:** 350' W of Washington Ave., EB lane 8' off curb;



DEPTH
Layer
1.35"
0.91"

DEPTH
Total
2.26"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 8 **Area:** 330' E of Princeton Ln., EB lane 5' off curb;



DEPTH
Layer
1.36"
0.94"

DEPTH
Total
2.30"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 9 **Area:** 250' E of Princeton Ln., WB lane 4' off curb;



DEPTH
Layer
1.20"
2.62"

DEPTH
Total
3.82"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

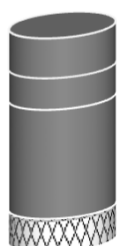
page 3



LOCATION: Oxford Drive, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Evans Avenue
TO: Sutton Avenue

CORE#: 10 **Area:** 150' E of Princeton Ln., WB lane curb;



DEPTH
Layer
1.43"
1.13"
3.93"

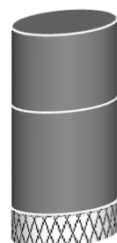
DEPTH
Total
6.49"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
Penetrated Stone

Processed Aggregate

Poor bond at 2.56"

CORE#: 11 **Area:** 50' E of Princeton Ln., EB lane 9' off curb;



DEPTH
Layer
1.22"
1.62"

DEPTH
Total
2.84"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 12 **Area:** 65' W of Princeton Ln., EB lane 5' off curb;



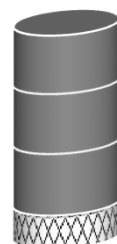
DEPTH
Layer
1.48"
2.06"

DEPTH
Total
3.54"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 13 **Area:** 140' W of Princeton Ln., WB lane 4' off curb;



DEPTH
inches
1.50"
1.54"
1.58"

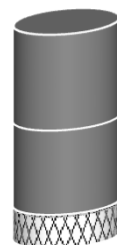
DEPTH
Total
4.62"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

Poor bond at 1.50"

CORE#: 14 **Area:** 245' W of Princeton Ln., WB lane 9' off curb;



DEPTH
Layer
1.66"
1.46"

DEPTH
Total
3.12"

CLASSIFICATION
Hot Mix Asphalt (HMA)
Penetrated Stone

Penetrated Stone

CORE PROFILE

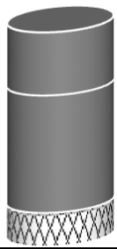
page 4



LOCATION: Oxford Drive, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Evans Avenue
TO: Sutton Avenue

CORE#: 15 **Area:** 330' W of Princeton Ln., EB lane 5' off curb;



DEPTH
Layer
1.17"
2.19"

DEPTH
Total
3.36"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 16 **Area:** 415' W of Princeton Ln., EB lane 8' off curb;



DEPTH
Layer
1.14"
2.21"

DEPTH
Total
3.35"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 17 **Area:** 540' W of Princeton Ln., WB lane 5' off curb;



DEPTH
Layer
1.08"
2.01"

DEPTH
Total
3.09"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 18 **Area:** 580' E of Princeton Ln., WB lane 8' off curb;



DEPTH
inches
1.22"
2.24"

DEPTH
Total
3.46"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 19 **Area:** 520' E of Sutton St., EB lane 9' off curb;



DEPTH
Layer
1.40"
2.33"

DEPTH
Total
3.73"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE PROFILE

page 5



LOCATION: Oxford Drive, East Hartford, CT
 DATE SAMPLED: August 22, 2018

FROM: Evans Avenue
 TO: Sutton Avenue

CORE#: 20 **Area:** 375' E of Sutton St., EB lane 5' off curb;



DEPTH
 Layer
 1.36"
 3.23"

DEPTH
 Total
 4.59"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 21 **Area:** 280' E of Sutton St., WB lane 8' off curb;



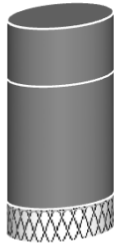
DEPTH
 Layer
 1.41"
 2.36"

DEPTH
 Total
 3.77"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 22 **Area:** 180' E of Sutton St., EB lane 8' off curb;



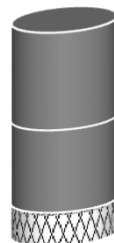
DEPTH
 Layer
 1.22"
 2.60"

DEPTH
 Total
 3.82"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Processed Aggregate

CORE#: 23 **Area:** 62' E of Sutton St., WB lane 11' off curb;



DEPTH
 Layer
 1.60"
 1.35"

DEPTH
 Total
 2.95"

CLASSIFICATION
 Hot Mix Asphalt (HMA)
 HMA

Deteriorated Penetrated Stone



To: Bill Anderson, PE
VHB/Wethersfield

Date: November 20, 2018

Memorandum

Project #: 42413.00

From: Jose Otero
VHB/Project Manager

Re: Princeton Lane – East Hartford, CT

Following are the recommendations for the design and construction of Princeton Lane from Oxford Drive to Milbrook Drive.

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The distress level investigation results indicate there is severe weather/block cracking. There is evidence of moderate alligator and transverse/longitudinal cracking. Minor pothole patching, distortions and localized raveling were noted, resulting in a Road Manager Pavement Condition Index (PCI) of 53, twelve points less than the 2014 update.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A24 which are classified as silty sands by the Unified Classification system. The subgrades are fair to good foundations when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 100 vehicles per day with small trucks and buses accounting for 2% of the ADT. The ADT is based on an average of 10 trips per household per day, using 100 as a minimum.

Oxford Drive to Milbrook Drive:

- The existing pavement structure cross-section consisted of 2" to 4" (average 2.9") of hot mix asphalt (HMA) on 2" of deteriorated penetrated stone. The granular bases consisted of 6" of Grading "A" gravel and 8" of silty sand founded on silty sand subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally adequate.
- REMOVE HMA is not recommended as a treatment alternative due to no structural base present in $\geq 50\%$ of test pits.
- RECLAIM is not recommended as a treatment alternative because the resulting material blend does not meet specification.

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
P 860.807.4300

| Alternative | Service Life | Recommendations |
|--------------------|---------------------|--|
| #1 | 20-years | RECONSTRUCT the existing roadway by excavating to a 9" depth, then prepare the existing silty sand subgrade. Place 6" of processed aggregate base and compact the material to proper lines and grades, as the new base course prior to placing 1.5" of Superpave S-0.375" Level 2 as the intermediate course and 1.5" of Superpave S-0.375" Level 2 as the surface course, with a tack coat between lifts. |
| #2 | 8-10-years | RESURFACE by milling the existing pavement to a 1.5" depth. Repair any base failures, seal major cracks and apply an emulsified asphalt tack coat prior to placing 1.5" of Superpave S-0.375" Level 2 as the new surface course. |

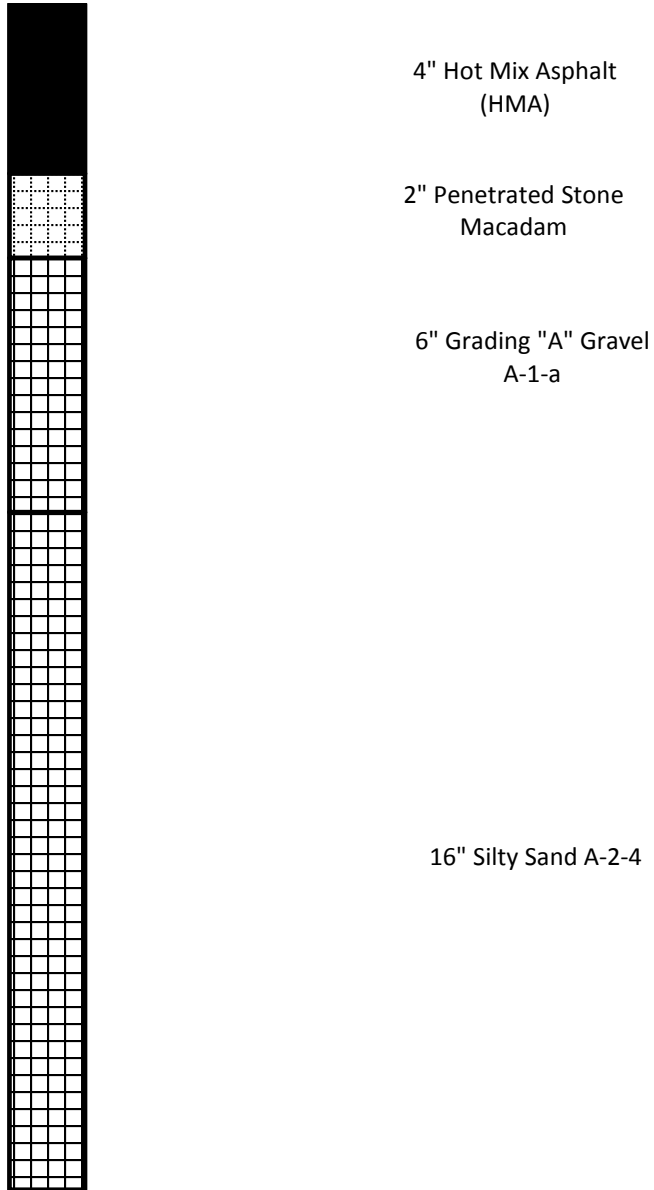


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Princeton Lane - Oxford Drive to Milbrook Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP#1 - 100' S. of Milbrook Dr., NBL 6' off curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Princeton Lane - Oxford Drive to Milbrook Drive

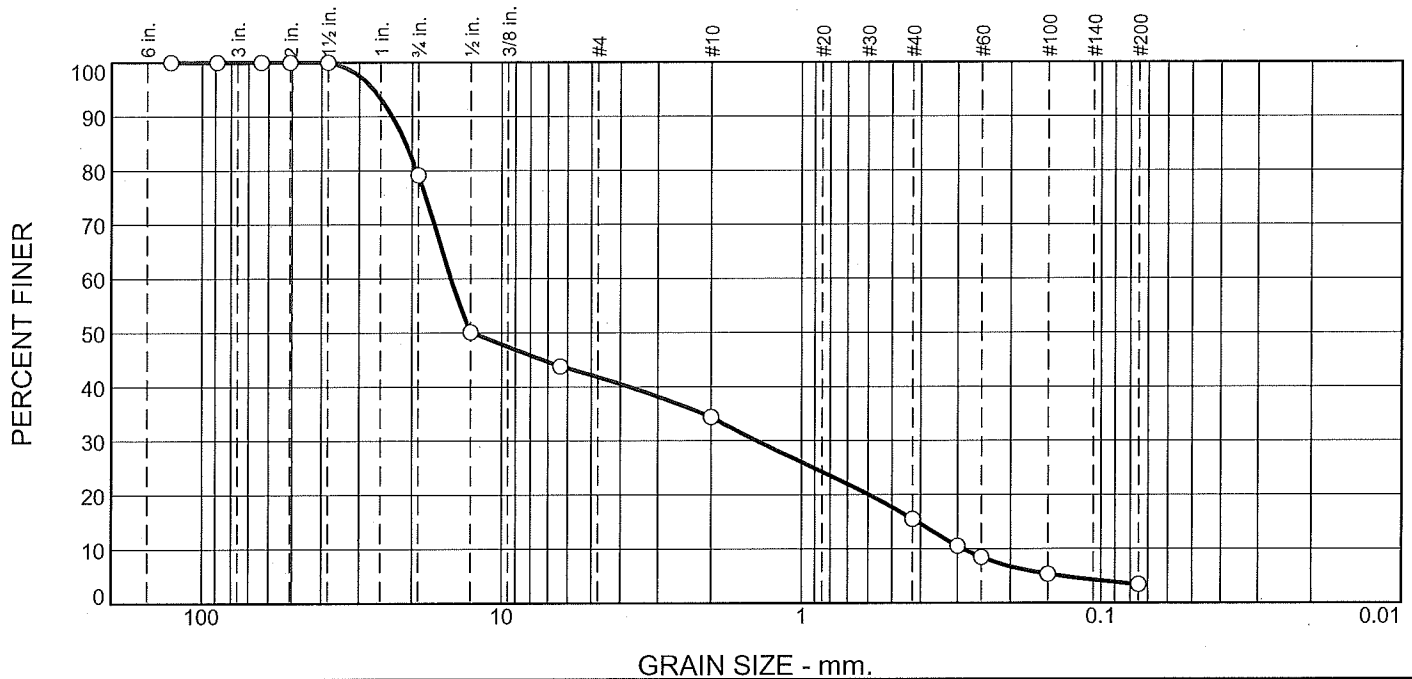
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#1 - 100' S. of Milbrook Dr., NBL 6' off curb;
Sample Number: SUBBASE

Depth: 6

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 66 | 18 | 13 | 3 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 79 | | |
| 1/2" | 50 | | |
| 1/4" | 44 | 25 - 60 | |
| #10 | 34 | 15 - 45 | |
| #40 | 16 | 5 - 25 | |
| #50 | 11 | | |
| #60 | 8 | | |
| #100 | 5 | 0 - 10 | |
| #200 | 3.4 | 0.0 - 5.0 | |

Material Description

Grading "A" Gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 20.9743 D₆₀= 14.7741 D₅₀= 12.5290
D₃₀= 1.4049 D₁₅= 0.4105 D₁₀= 0.2879
C_u= 51.32 C_c= 0.46

Classification

USCS= GP AASHTO= A-1-a

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: Anasldi/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Princeton Lane - Oxford Drive to Milbrook Drive

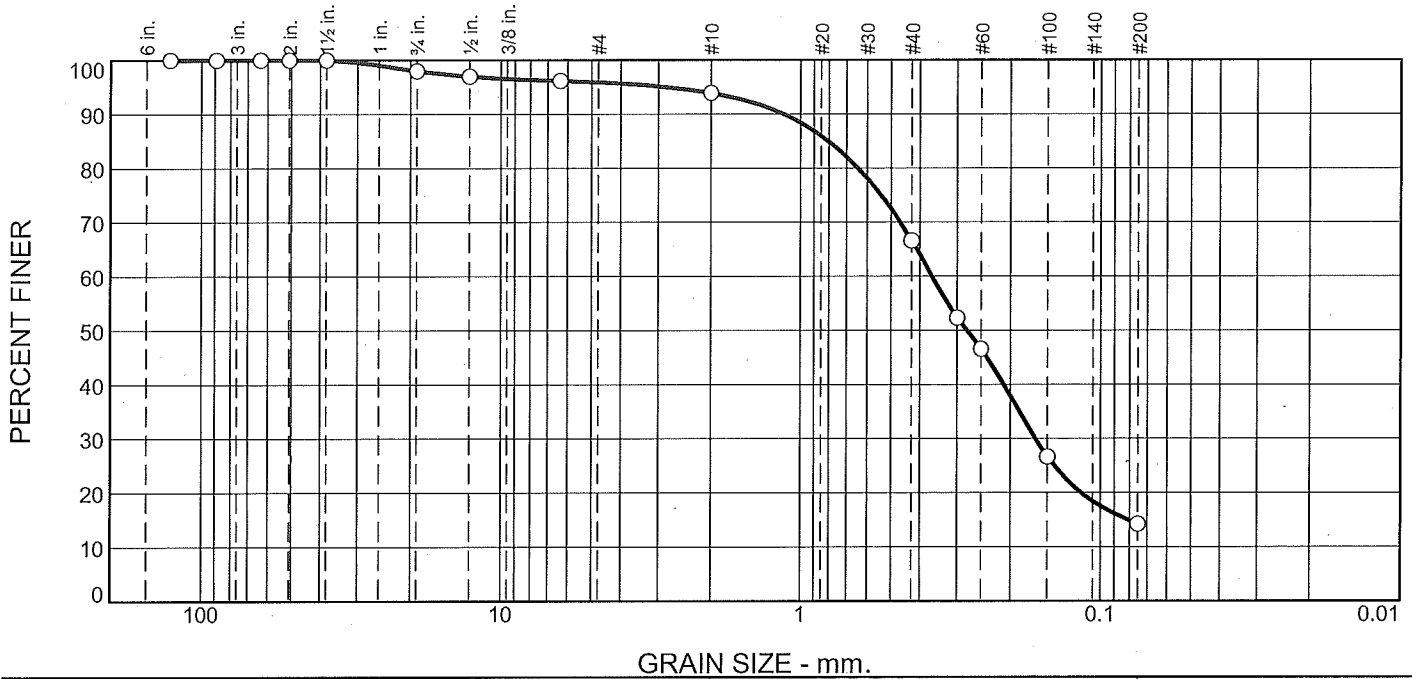
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#1 - 100' S. of Milbrook Dr., NBL 6' off curb;
Sample Number: SUBGRADE

Depth: 16

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 6 | 27 | 53 | 14 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 98 | | |
| 1/2" | 97 | | |
| 1/4" | 96 | 25 - 60 | X |
| #10 | 94 | 15 - 45 | X |
| #40 | 67 | 5 - 25 | X |
| #50 | 52 | | |
| #60 | 47 | | |
| #100 | 27 | 0 - 10 | X |
| #200 | 14 | 0.0 - 5.0 | X |

Material Description

Silty Sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.8068 D₆₀= 0.3640 D₅₀= 0.2791
D₃₀= 0.1647 D₁₅= 0.0809 D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 6" @ 5 blows;
Mr = 6,035 psi;

* CT - M.02.06 Gravels "A"

Figure

Tested By: AnsalDI/DT

Checked By: VHB

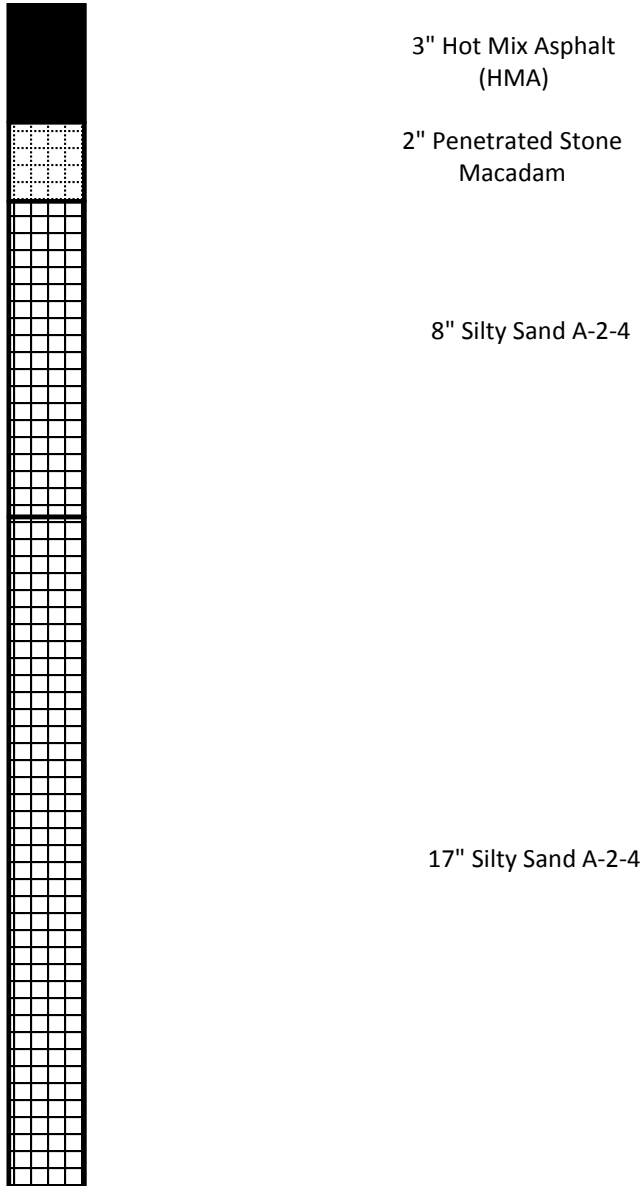


100 Great Meadow Road
Wethersfield, Connecticut 06109
860.807.4300

STREET: Princeton Lane - Oxford Drive to Milbrook Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP# / LOCATION: TP#2 - 80' N. of Oxford Dr., SBL 7' off curb;



Frost Potential: moderate to high

Description: This silty sand is a fair to good foundation when not subject to frost action, having a moderate to high frost potential and exhibiting fair to poor drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Princeton Lane - Oxford Drive to Milbrook Drive

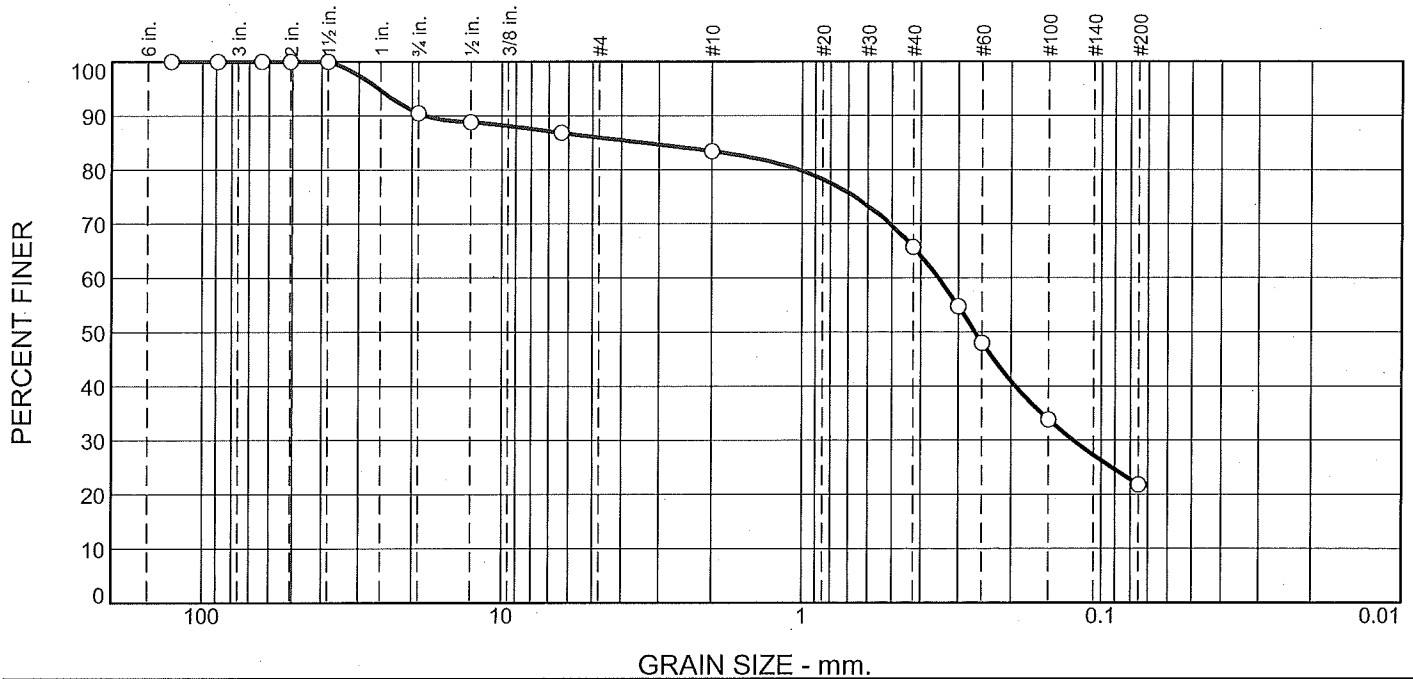
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#2 - 80' N. of Oxford Dr., SBL 7' off curb;
Sample Number: SUBBASE

Depth: 8

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 17 | 17 | 44 | 22 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 90 | | |
| 1/2" | 89 | | |
| 1/4" | 87 | 25 - 60 | X |
| #10 | 83 | 15 - 45 | X |
| #40 | 66 | 5 - 25 | X |
| #50 | 55 | | |
| #60 | 48 | | |
| #100 | 34 | 0 - 10 | X |
| #200 | 22 | 0.0 - 5.0 | X |

Material Description

Silty Sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 3.3824 D₆₀= 0.3499 D₅₀= 0.2643
D₃₀= 0.1238 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

* CT - M.02.06 Gravels "A"

Figure

Tested By: Ansalidi/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Princeton Lane - Oxford Drive to Milbrook Drive

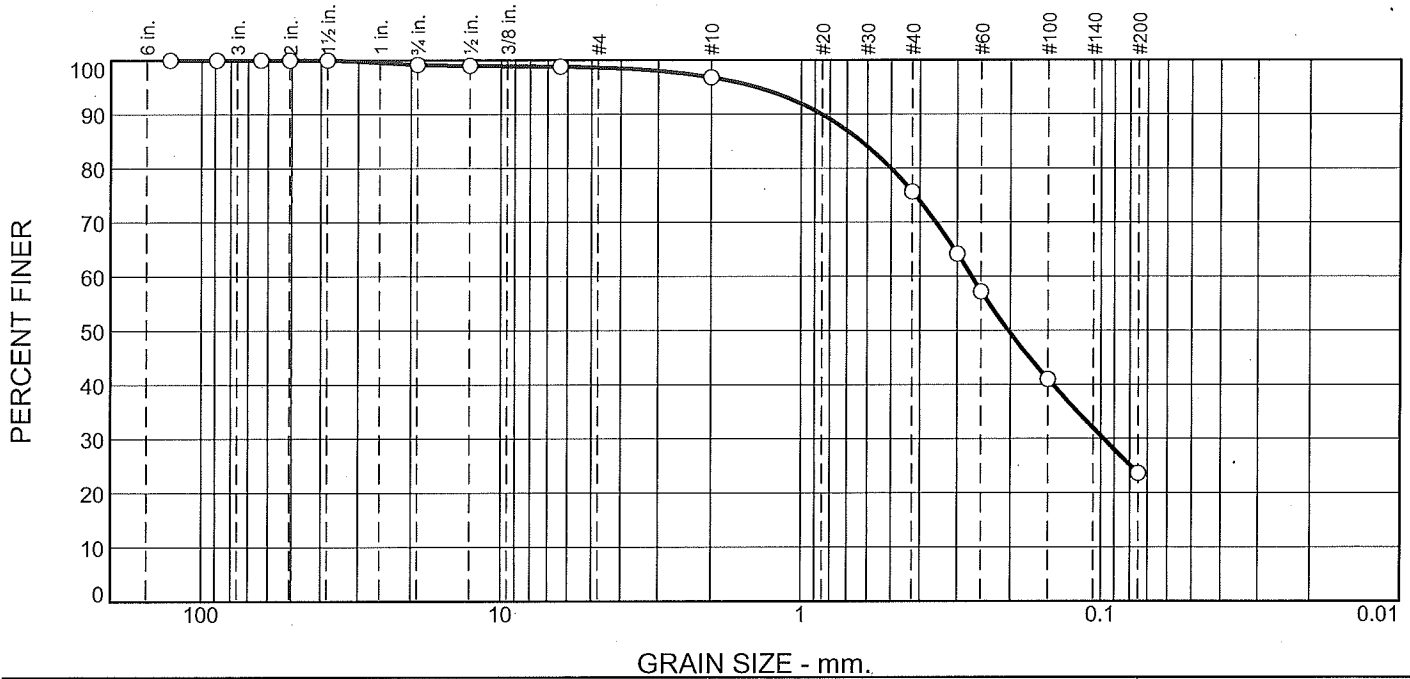
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP#2 - 80' N. of Oxford Dr., SBL 7' off curb;
Sample Number: SUBGRADE

Depth: 17

Date: 7/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 3 | 21 | 52 | 24 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 99 | | |
| 1/2" | 99 | | |
| 1/4" | 99 | 25 - 60 | X |
| #10 | 97 | 15 - 45 | X |
| #40 | 76 | 5 - 25 | X |
| #50 | 64 | | |
| #60 | 57 | | |
| #100 | 41 | 0 - 10 | X |
| #200 | 24 | 0.0 - 5.0 | X |

Material Description

Silty Sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 0.6293 D₆₀= 0.2691 D₅₀= 0.2031
D₃₀= 0.0978 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4

Remarks

DCP = 3" @ 5 blows;
Mr = 13,862 psi;

* CT - M.02.06 Gravels "A"

Figure

Tested By: Ansaldo/DT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

LOCATION: Princeton Lane, East Hartford, CT

DATE SAMPLED: Wednesday, August 22, 2018

FROM: Oxford Drive

TO: Milbrook Drive

CORE#: 1 **Area:** 65' S of Milbrook Dr., SB lane 8' off curb;



DEPTH

Layer
2.07"
1.08"

DEPTH

Total
3.16"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
2.41" Penetrated Stone

Processed Aggregate

CORE#: 2 **Area:** 130' S of Milbrook Dr., SB lane 4' off curb;



DEPTH

Layer
1.62"
0.84"

DEPTH

Total
2.45"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
1.43" Penetrated Stone

Processed Aggregate

CORE#: 3 **Area:** 60' N of Oxford Dr., NB lane 7' off curb;



DEPTH

Layer
1.31"
0.74"

DEPTH

Total
2.05"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
1.64" Penetrated Stone

Processed Aggregate

Jose R. Otero Jr., Project Manager

100 Great Meadow Road
Suite 200

Engineers | Scientists | Planners | Designers Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570



To: Bill Anderson, PE
VHB/Wethersfield

Date: November 20, 2018

Memorandum

Project #: 42413.00

From: Jose Otero
VHB/Project Manger

Re: Sutton Avenue – East Hartford, CT

Following are the recommendations for the design and construction of Sutton Avenue from Main Street to Oxford Drive.

Pavement designs were conducted utilizing American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures, 1993", design criteria using the "Layered Analysis Thickness Design" method of component thickness of the pavement structure, traffic loadings, magnitude and frequency of loadings, material relationships, environmental considerations, soil support and the AASHTO design assumptions.

Basic design assumptions incorporated into the structural analysis were:

1. The initial serviceability will have a Road Manager Index of 96, or an AASHTO (P_0) = 4.8;
2. The terminal serviceability will be a Road Manager Index of 65, or an AASHTO (P_t) = 2.5;
3. The distress level investigation results indicate there is severe alligator cracking. Moderate pothole patching, transverse/longitudinal and weather/block cracking were noted. There is evidence of minor distortions and extensive surface wear, resulting in a Road Manager Pavement Condition Index (PCI) of 46, eight points less than the 2014 update.
4. A PCI of 0 indicates nearly impassible extremely poor pavement condition index, while a newly paved, perfect pavement would exhibit a condition of 100.
5. The reliability levels used for the pavement design will be 75%.
6. Roadbed soils are AASHTO A3 and A1b which are classified as uniformly graded silty sands by the Unified Classification system. The subgrades are fair to good foundations when not subject to frost action, having a very slight to moderate frost potential and exhibiting excellent to fair drainage characteristics. The roadbed soils will provide some level of structural support.
7. The Average Daily Traffic (ADT) used for this design was estimated to be 1552 vehicles per day with small trucks and buses accounting for 5.4% of the ADT. The 20-year design Equivalent Single Axle Loads (ESALs) was estimated to be 184,000.

Main Street to Oxford Drive:

- The existing pavement structure cross-section consisted of 2.5" to 4.0" (average 3.0") of hot mix asphalt (HMA). The granular base consisted of 9" to 16" (average 12.5") of "fine" processed gravel and well graded silty sand bases which were founded on uniformly graded silty sand subbases/subgrades.
- Based on the materials evaluation and traffic, this section was found to be structurally inadequate, requiring a 2.0" overlay to meet the Elastic Layer Design, which is NOT recommended.
- MILL AND OVERLAY is not recommended as a treatment alternative due to inadequate support from existing granular soils, requiring milling depth greater than existing pavement thickness.
- REMOVE HMA is not recommended as a treatment alternative due to no structural base present in $\geq 50\%$ of test pits.

100 Great Meadow Road
Suite 200
Wethersfield, CT 06109
P 860.807.4300

| Service Life | Recommendation |
|---------------------|---|
| 20-years | RECLAIM the existing HMA and processed aggregate bases by pulverization and blending methods to a 12" depth. Compact the recycled material to proper lines and grades, leaving 7" to 8" as the new base course prior to placing 2.0" of Superpave S-0.5" Level 2 as the intermediate course and 2.0" of Superpave S-0.5" Level 2 as the surface course, with a tack coat between lifts. |

Transportation
Land Development
Environmental
Services

54 Tuttle Place
Middletown Connecticut 06457
860.632.1500
FAX 860.632.7879

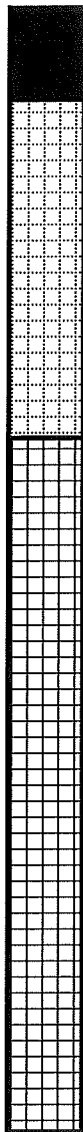


Vanasse Hangen Brustlin, Inc.

STREET: Sutton Avenue - Main Street to Oxford Drive
CITY, STATE: East Hartford, CT

PROJECT #: 42413.00

TP#/LOCATION: TP1 - 160' W of Oxford Drive, 5' off EB lane curb;



2.5" Hot Mix Asphalt
(HMA)

9" well-graded sand with
silt and gravel A-1-b

18.5" poorly graded sand
with silt A-3

Frost Potential: moderate

Description: This poorly graded silty sand is a fair to good foundation when not subject to frost action, having a moderate frost potential and exhibiting fair drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Sutton Avenue - Main Street to Oxford Drive

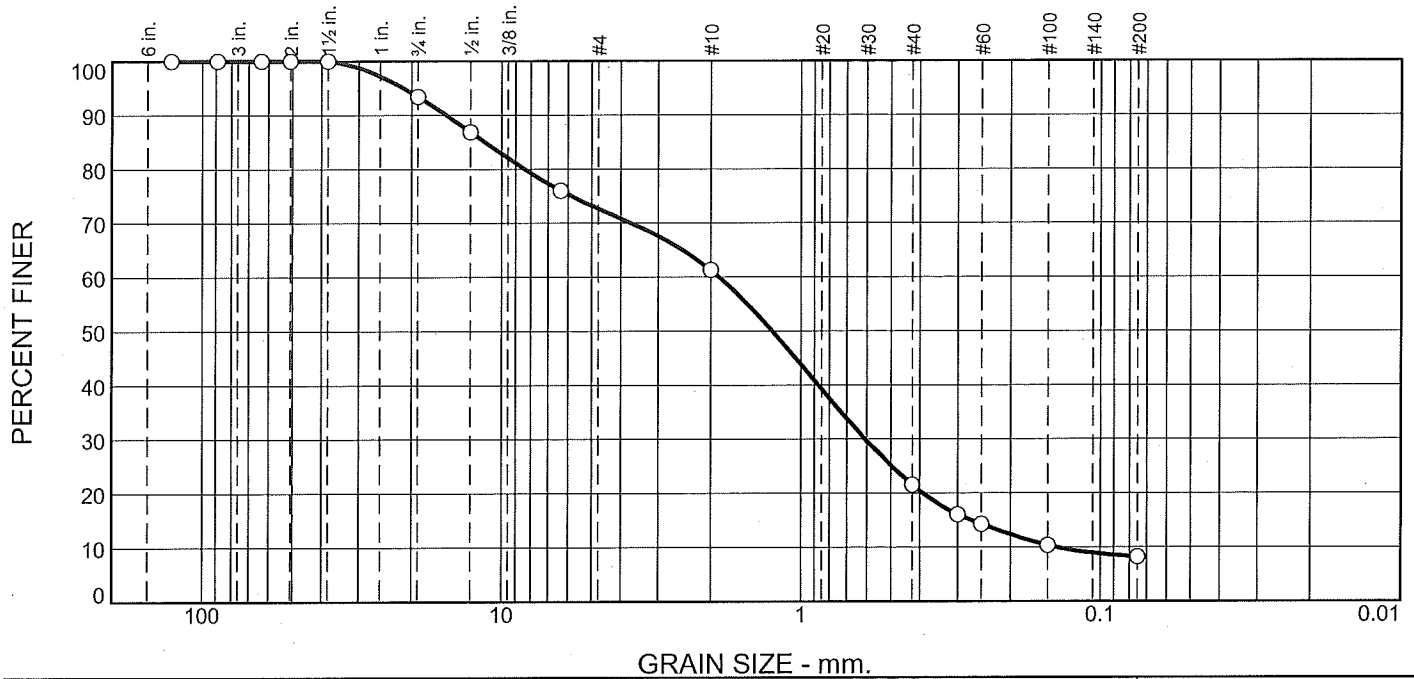
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 160' W of Oxford Drive, 5' off EB lane curb;
Sample Number: BASE

Depth: 9

Date: 08/01/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 39 | 39 | 14 | 8 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 100 | | |
| 3/4" | 93 | 50 - 75 | X |
| 1/2" | 87 | | |
| 1/4" | 76 | 25 - 45 | X |
| #10 | 61 | | |
| #40 | 22 | 5 - 20 | X |
| #50 | 16 | | |
| #60 | 14 | | |
| #100 | 10 | 2 - 12 | |
| #200 | 8.2 | | |

Material Description

well-graded sand with silt and gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 11.3708 D₆₀= 1.8760 D₅₀= 1.2448
D₃₀= 0.6083 D₁₅= 0.2711 D₁₀= 0.1409
C_u= 13.31 C_c= 1.40

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Sutton Avenue - Main Street to Oxford Drive

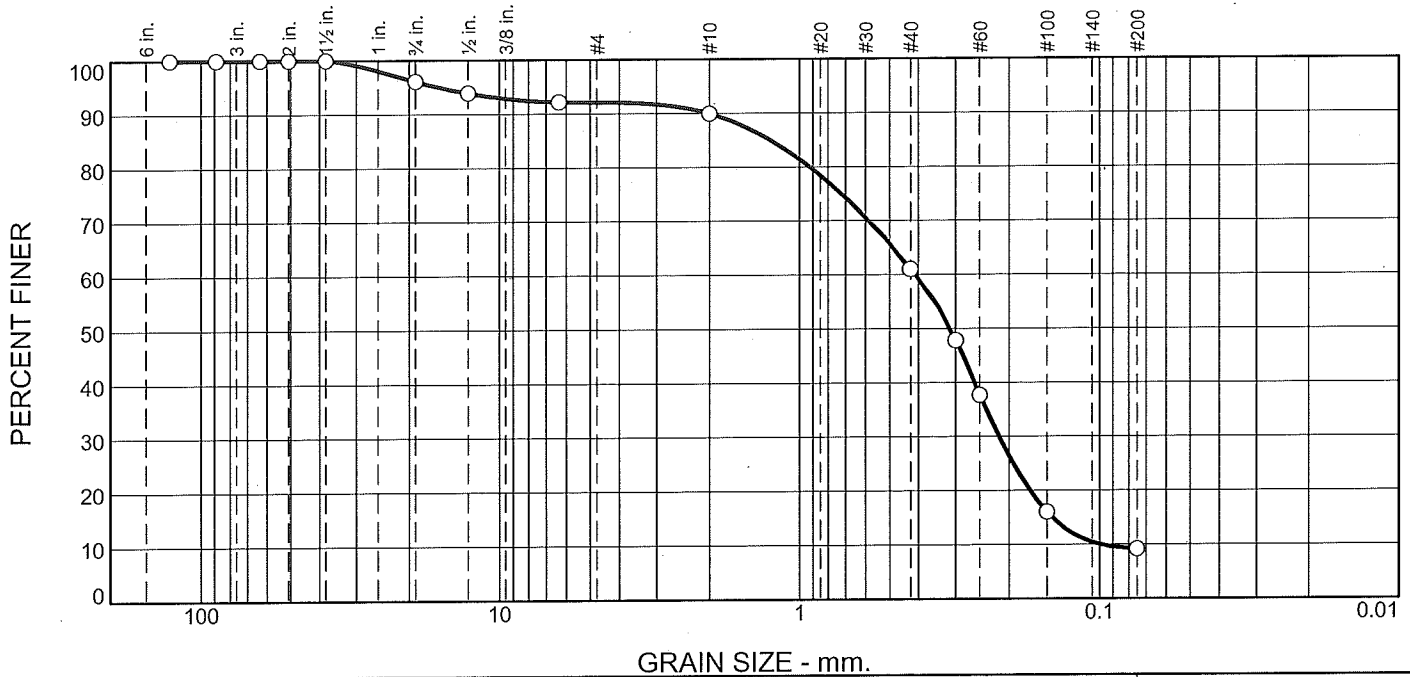
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP1 - 160' W of Oxford Drive, 5' off EB lane curb;
Sample Number: SUBGRADE

Depth: 18.5

Date: 08/01/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 10 | 29 | 52 | 9 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 96 | | |
| 1/2" | 94 | | |
| 1/4" | 92 | 25 - 60 | X |
| #10 | 90 | 15 - 45 | X |
| #40 | 61 | 5 - 25 | X |
| #50 | 48 | | |
| #60 | 38 | | |
| #100 | 16 | 0 - 10 | X |
| #200 | 9.2 | 0.0 - 5.0 | X |

Material Description

poorly graded sand with silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 1.2506 D₆₀= 0.4110 D₅₀= 0.3138
D₃₀= 0.2159 D₁₅= 0.1439 D₁₀= 0.0992
C_u= 4.14 C_c= 1.14

Classification

USCS= SP-SM AASHTO= A-3

Remarks

DCP = 4.5" @ 5 blows; Mr = 8,722psi

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Transportation
Land Development
Environmental
Services

54 Tuttle Place
Middletown Connecticut 06457
860.632.1500
FAX 860.632.7879



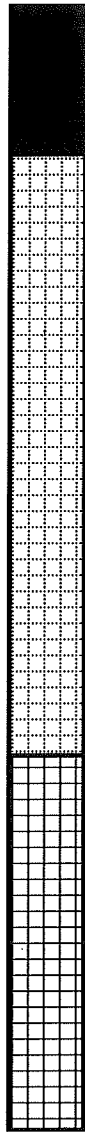
Vanasse Hangen Brustlin, Inc.

STREET: Sutton Avenue - Main Street to Oxford Drive

PROJECT #: 42413.00

CITY, STATE: East Hartford, CT

TP#/LOCATION: TP2 - 100' E of Main Street, 9' off WB lane curb;



4" Hot Mix Asphalt
(HMA)

16" fine Processed
Aggregate A-1-a

10" uniformly graded
sand A-1-b

Frost Potential: none to very slight

Description: This poorly graded sand is a fair to good foundation when not subject to frost action, having a very slight frost potential and exhibiting excellent drainage characteristics.

Vanasse Hangen Brustlin, Inc.

Project: Sutton Avenue - Main Street to Oxford Drive

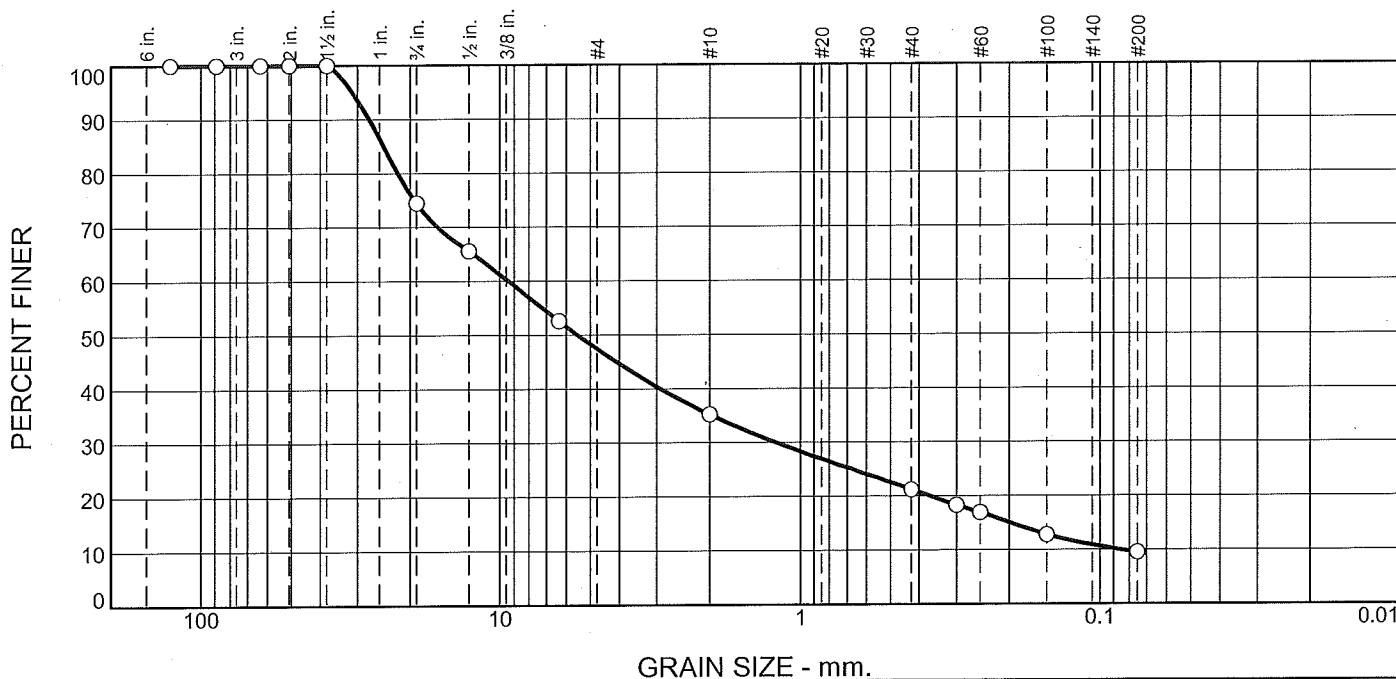
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 100' E of Main Street, 9' off WB lane curb;
Sample Number: BASE

Depth: 16

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 65 | 14 | 11 | 10 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | | |
| 2-1/2" | 100 | 100 | |
| 2" | 100 | 95 - 100 | |
| 1-1/2" | 100 | | |
| 3/4" | 74 | 50 - 75 | |
| 1/2" | 66 | | |
| 1/4" | 53 | 25 - 45 | X |
| #10 | 35 | | |
| #40 | 21 | 5 - 20 | X |
| #50 | 18 | | |
| #60 | 17 | | |
| #100 | 13 | 2 - 12 | X |
| #200 | 9.5 | | |

Material Description

fine Processed Aggregate

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 24.5982 D₆₀= 9.3673 D₅₀= 5.5012
D₃₀= 1.2051 D₁₅= 0.1980 D₁₀= 0.0855
C_u= 109.58 C_c= 1.81

Classification

USCS= GW-GM AASHTO= A-1-a

Remarks

* CT - M.05.01 Processed Aggregate Base

Figure

Tested By: ANSALDI/DT

Checked By: VHB

Vanasse Hangen Brustlin, Inc.

Project: Sutton Avenue - Main Street to Oxford Drive

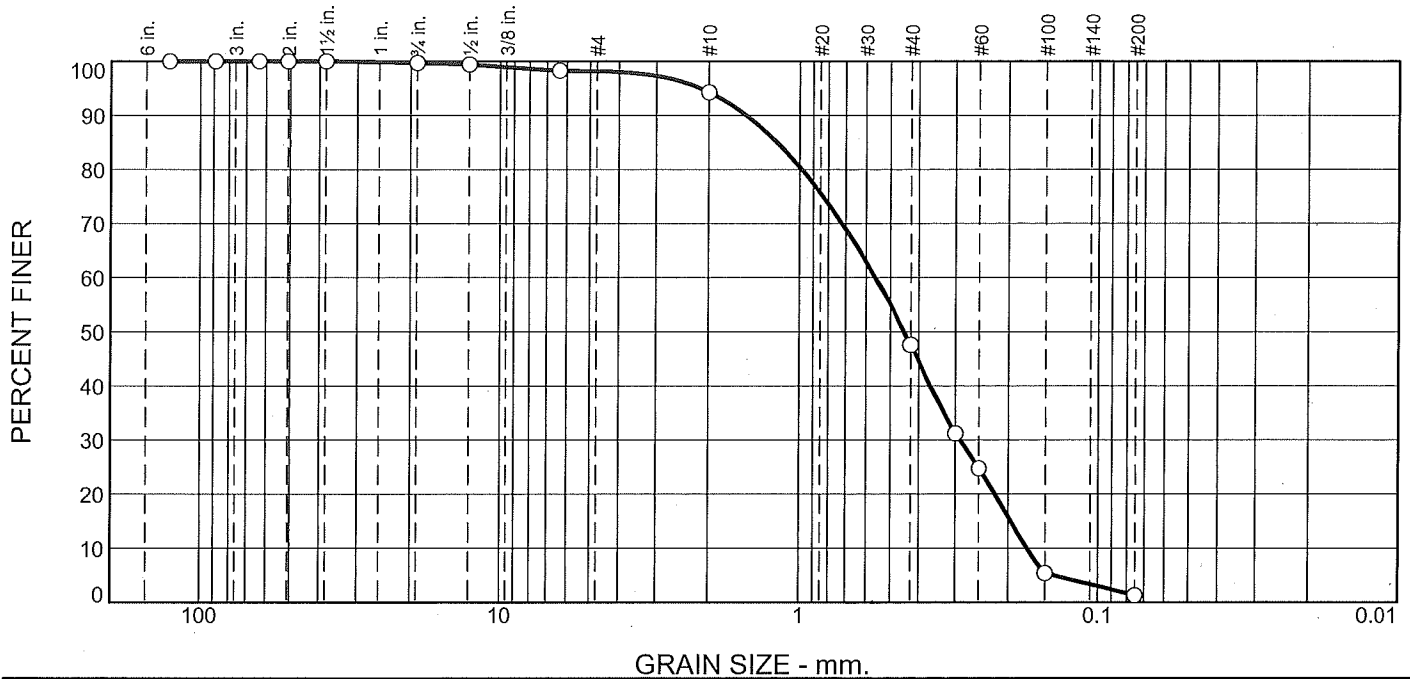
Project No.: 42413.00

Client: East Hartford, CT

Source of Sample: TP2 - 100' E of Main Street, 9' off WB lane curb;
Sample Number: SUBGRADE

Depth: 10

Date: 07/31/2018



| % +3" | % Gravel | % Sand | | % Fines |
|-------|----------|--------|------|---------|
| | | Coarse | Fine | Silt |
| 0 | 6 | 46 | 47 | 1 |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|------------|---------------|----------------|--------------|
| 5" | 100 | | |
| 3-1/2" | 100 | 100 | |
| 2-1/2" | 100 | | |
| 2" | 100 | | |
| 1-1/2" | 100 | 55 - 100 | |
| 3/4" | 100 | | |
| 1/2" | 99 | | |
| 1/4" | 98 | 25 - 60 | X |
| #10 | 94 | 15 - 45 | X |
| #40 | 48 | 5 - 25 | X |
| #50 | 31 | | |
| #60 | 25 | | |
| #100 | 5 | 0 - 10 | |
| #200 | 1.3 | 0.0 - 5.0 | |

Material Description

uniformly graded sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₈₅= 1.1885 D₆₀= 0.5584 D₅₀= 0.4469
D₃₀= 0.2903 D₁₅= 0.1961 D₁₀= 0.1728
C_u= 3.23 C_c= 0.87

Classification

USCS= SP AASHTO= A-1-b

Remarks

DCP = 6" @ 5 blows; Mr = 6,035psi;

* CT - M.02.06 Gravels "A"

Figure

Tested By: ANSALDI/DT

Checked By: VHB

CORE PROFILE



PROJECT NUMBER: 42413.00

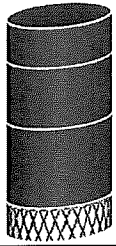
LOCATION: Sutton Avenue, East Hartford, CT

FROM: Main Street

DATE SAMPLED: Wednesday, August 22, 2018

TO: Oxford Drive

CORE#: 1 **Area:** 77' W of Oxford Dr., WB lane 4' off curb;



DEPTH

Layer
0.56"
0.86"
1.12"

DEPTH

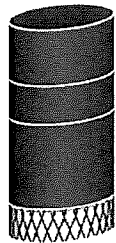
Total
2.54"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 2 **Area:** 150' W of Oxford Dr., WB lane 9' off curb;



DEPTH

Layer
0.84"
0.58"
1.28"

DEPTH

Total
2.70"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA
HMA

Processed Aggregate

CORE#: 3 **Area:** 205' E of Main St., WB lane 12' off curb;



DEPTH

Layer
1.06"
2.82"

DEPTH

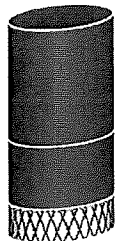
Total
3.88"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

CORE#: 4 **Area:** 145' E of Main St., EB lane 10' off curb;



DEPTH

Layer
1.80"
0.98"

DEPTH

Total
2.78"

CLASSIFICATION

Hot Mix Asphalt (HMA)
HMA

Processed Aggregate

Jose R. Otero Jr., Project Manager

100 Great Meadow Road
Suite 200

Engineers | Scientists | Planners | Designers

Wethersfield, Connecticut 06109

P 860.807.4300

F 860.372.4570

CORE PROFILE

page 2



LOCATION: Sutton Avenue, East Hartford, CT
DATE SAMPLED: August 22, 2018

FROM: Main Street
TO: Oxford Drive

CORE#: 5 **Area:** 90' E of Main St., EB lane 5' off curb;



DEPTH
Layer
1.24"
1.75"

DEPTH
Total
2.99"

CLASSIFICATION
Hot Mix Asphalt (HMA)
HMA

Processed Aggregate