Lake George Sustainability Projects, Stormwater Treatment, Porous Asphalt & Advancing the Technologies

17th Annual Southeast NY Stormwater Conference & Tradeshow

October 18, 2017

Beach Road and the NYSDEC Lake George Beach

Roadway & Parking Facility Previously Drained Directly to the Lake

Impaired Waterbody– Chlorides, Road Pollutants, Silt, Urban Runoff

Roadway & Parking Facility Previously Drained Directly to the Lake

Impaired Waterbody – Chlorides, Road Pollutants, Silt, Urban Runoff

Targeted Pollutants and Their Sources

Automobile By-Products
Chlorides - Salt

Sediment

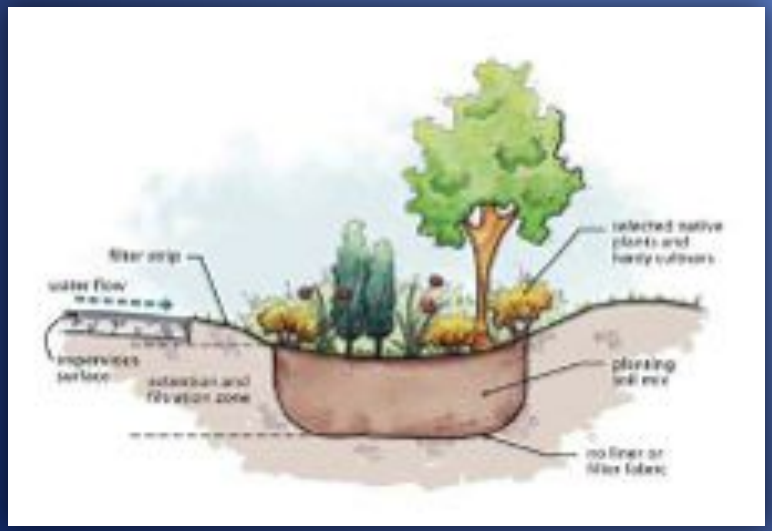
Three Segments of the Corridor

Vegetated Swales

Pre-Treatment
Helps Preserve Primary System
Turf Lined or Planted

Rain Gardens

Provide Filtration
Reduce Runoff Volumes
Aesthetically Pleasing

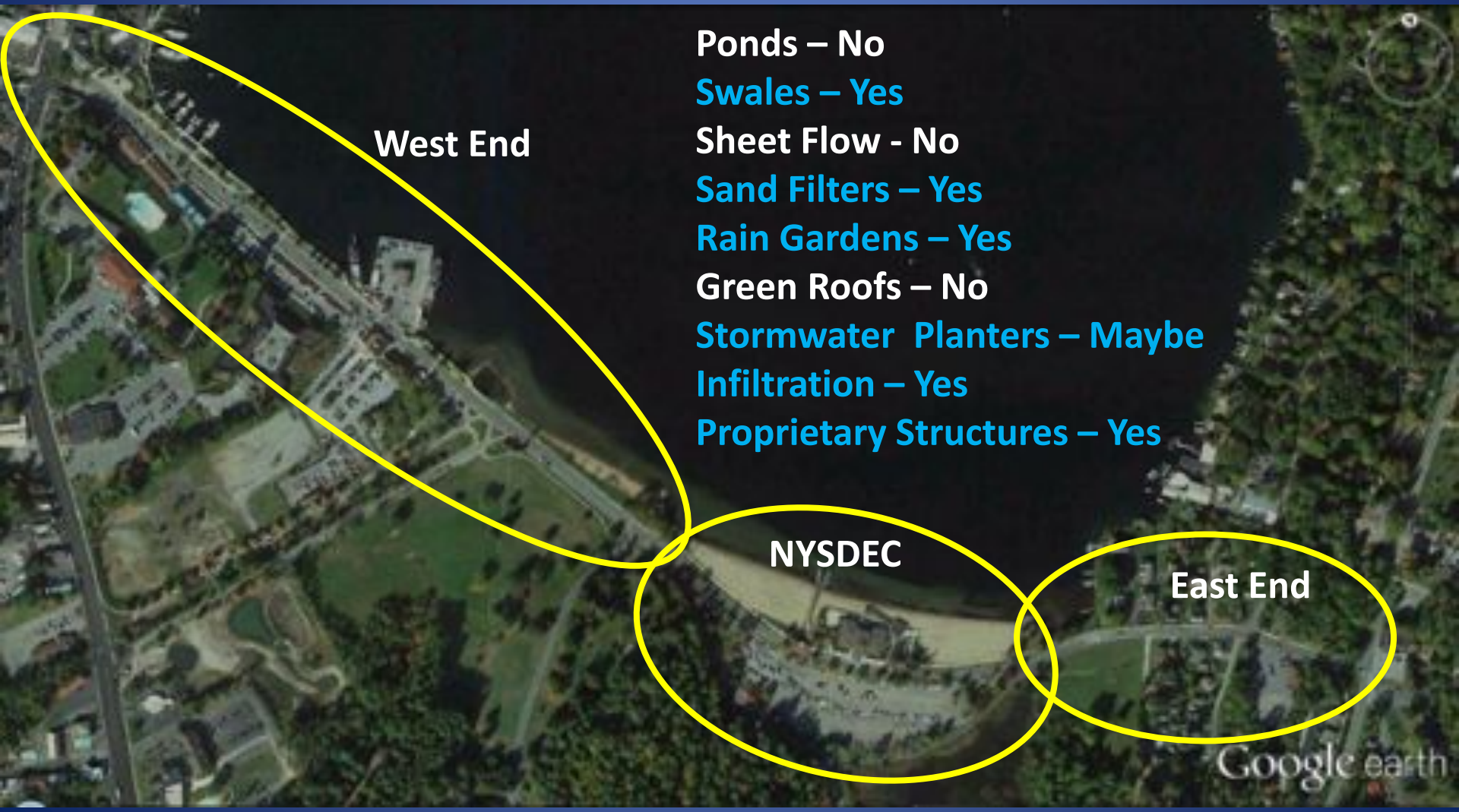


Stormwater Planters

Green Roofs

Maintenance

Three Segments of the Corridor



Porous Pavements

- Parking areas, access roads, walkways, driveways, cul-de-sacs, urban and suburban Lower Speed roads (30 mph), …….No Contaminated sites

Porous Asphalt

Porous Asphalt

Porous Pavements

- Parking areas, access roads, walkways, driveways, cul-de-sacs, urban and suburban Lower Speed roads
  No Contaminated sites

Pre-Cast Porous Concrete

Poured in Place Porous Concrete

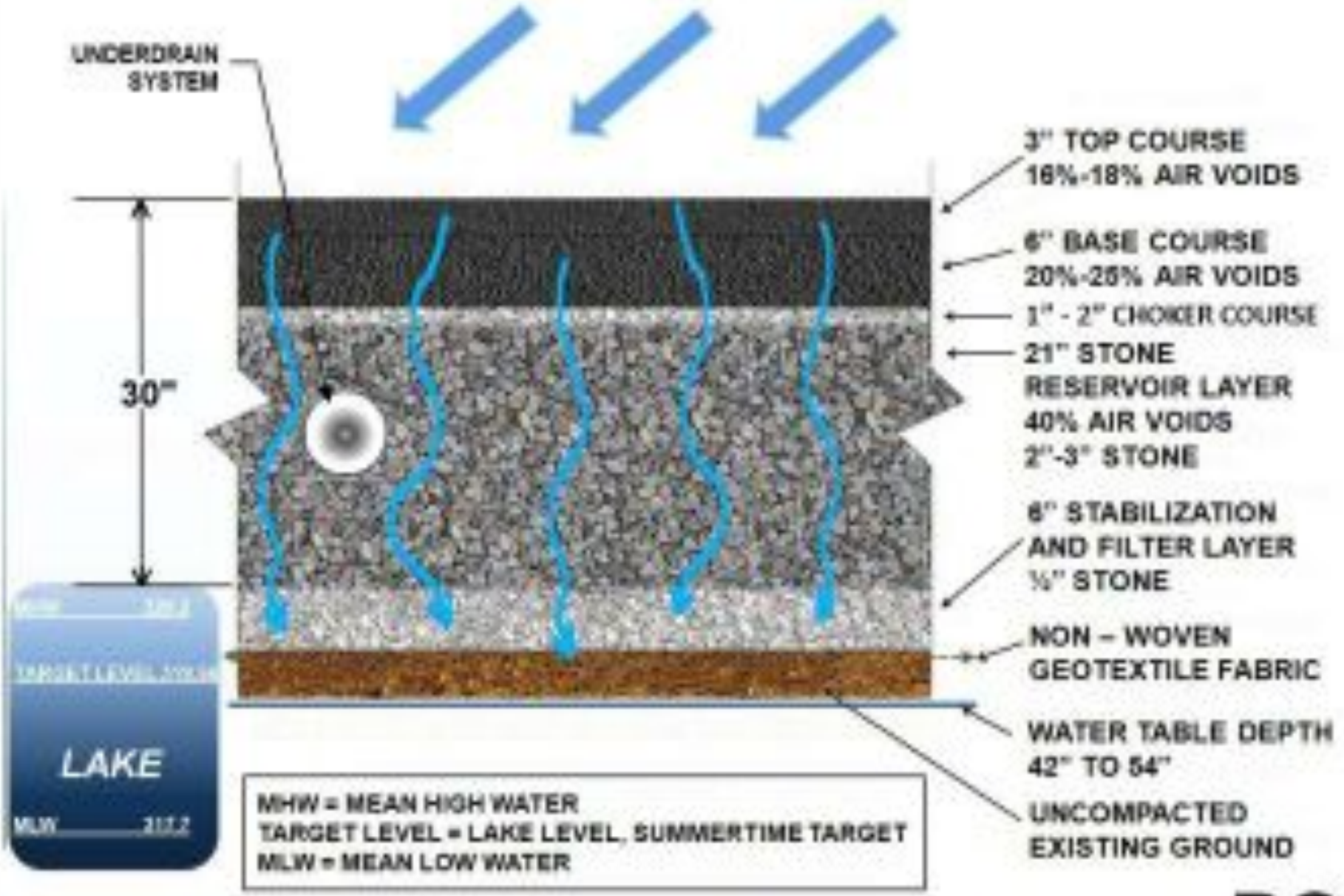
Precast Porous Paver Systems

Rennselaer City Hall
Pave Drain

Porous Asphalt Pavement - Why ??

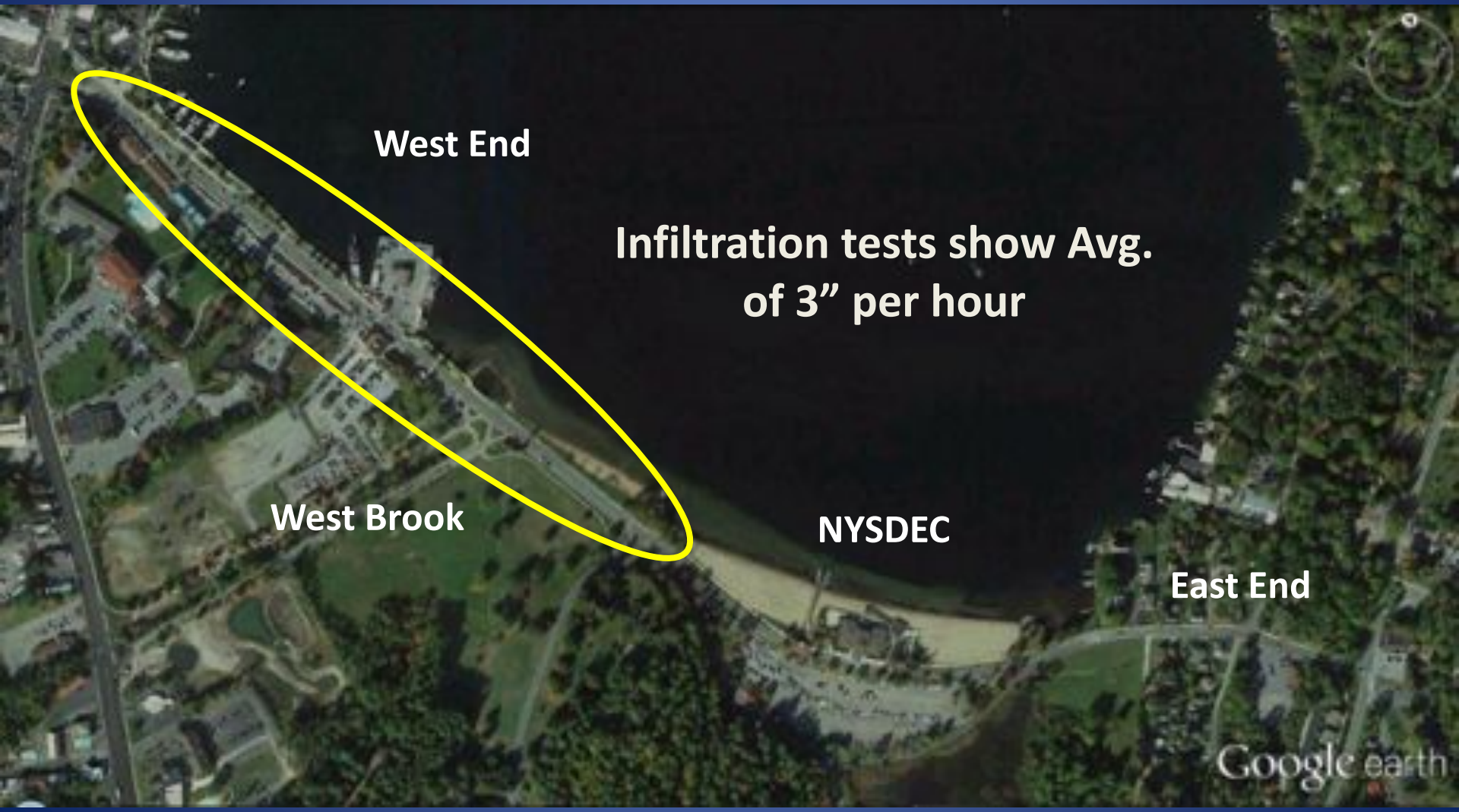
- Groundwater recharge augmentation
- Runoff Reduction
- Effective pollutant treatment for solids, metals, nutrients, and hydrocarbons
- Little to No Closed Drainage System Needed
- Safety Improvements – Glare, Road Spray
- Reduced Hydroplaning – ↑ Friction When wet
- Reduced de-icing Materials – Reduced Black Ice
- Less Susceptible to Frost – No Capillary Action
- Noise Reduction

Beach Road / DEC Facility Section



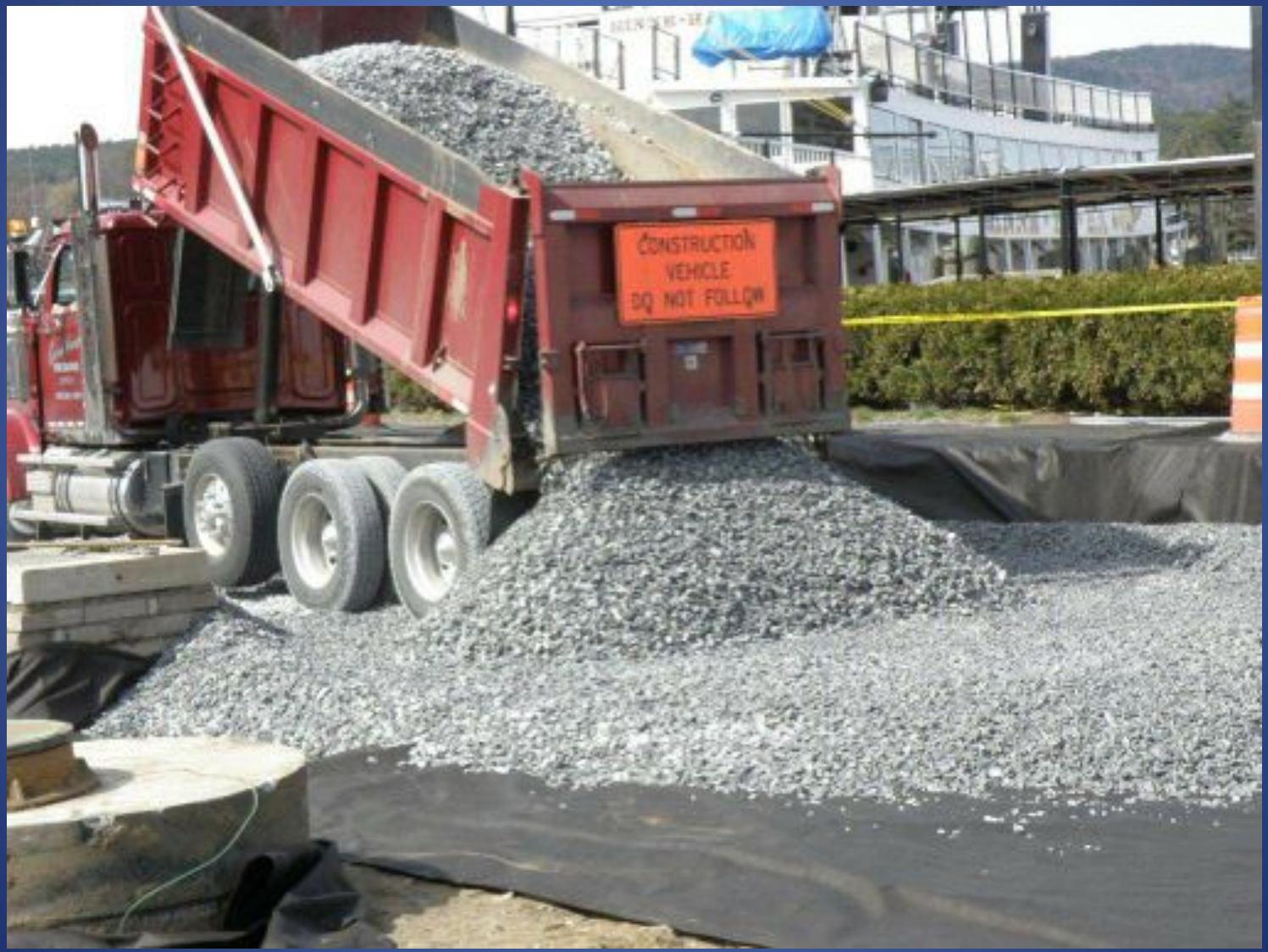
Beach Road System

West End - Porous Pavement



Beach Road Section

Stone Courses



Begin with the Foundation

100%
Fractured
4A's
2" to 3"

Reservoir Course

Specifications

ITEM 623.120100WR – POROUS ASPHALT CRUSHED STONE STABILIZATION COURSE (CY)
ITEM 623.120200WR – POROUS ASPHALT CRUSHED STONE RESERVOIR COURSE (CY)

GRADATION:

Material shall be graded in accordance with size designations shown in Table 703-4 from the NYSDOT Standard Specifications.

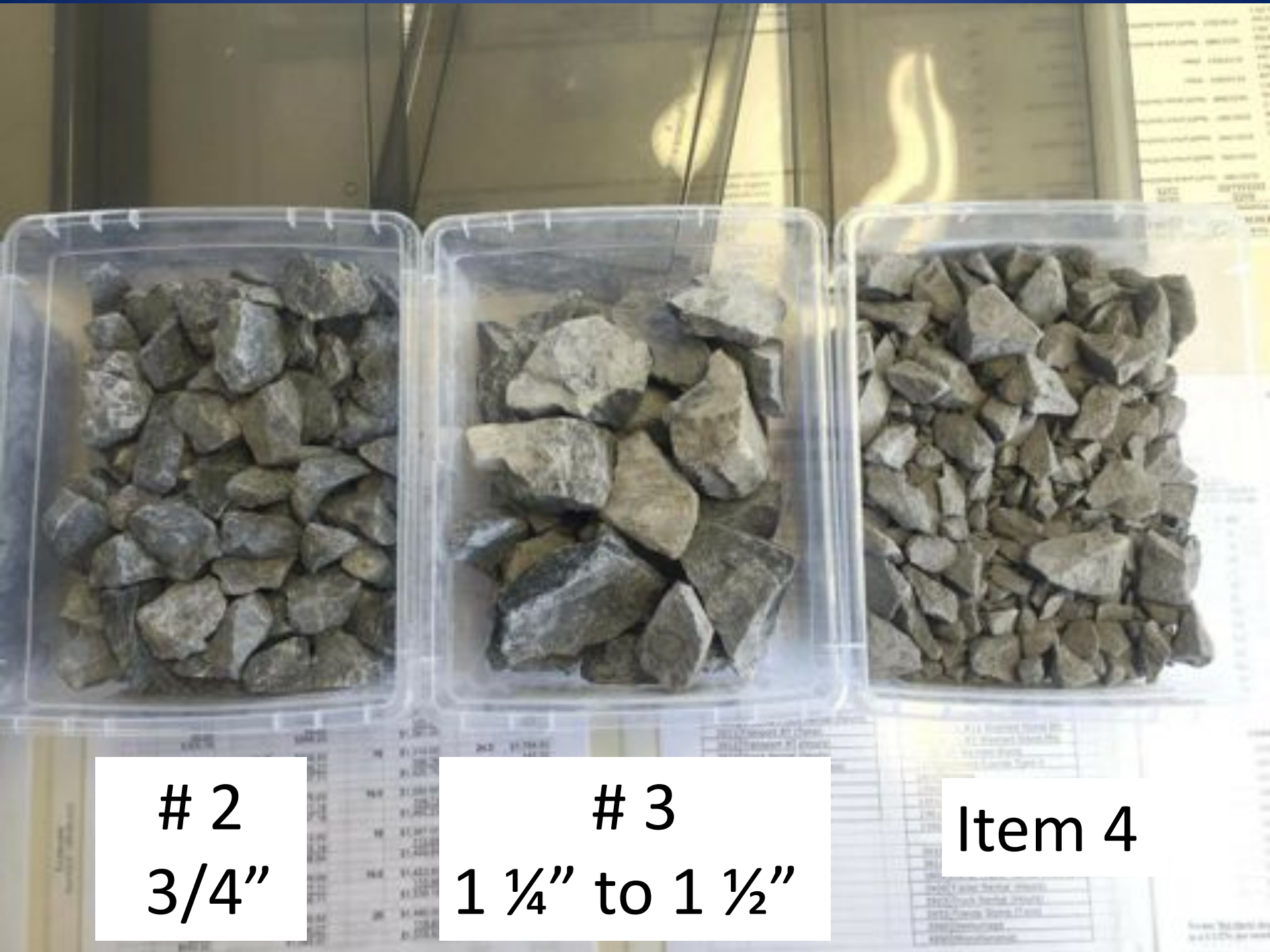
Stabilization Course – Size Designation No. 2

Reservoir Course - Size Designation No. 4A

TABLE 703-4[1] SIZES OF STONE, GRAVEL AND SLAG

	Screen Sizes										
Size Designation	4 in	3 in	2 1/2 in	2 in	1 1/2 in	1 in	1/2 in	1/4 in	1/8 in	# 80	#200[3]
Screenings[2]	-	-	-	-	-	-	100	90-100	-	-	0-1.0
1B	-	-	-	-	-	-	-	100	90-100	0-15	0-1.0
1A	-	-	-	-	-	-	100	90-100	0-15	-	0-1.0
1ST	-	-	-	-	-	-	100	0-15	-	-	0-1.0
1	-	-	-	-	-	100	90-100	0-15	-	-	0-1.0
2	-	-	-	-	100	90-100	0-15	-	-	-	0-1.0
3A	-	-	-	100	90-100	0-15	-	-	-	-	0-0.7
3	-	-	100	90-100	35-70	0-15	-	-	-	-	0-0.7
4A	-	100	90-100	-	0-20	-	-	-	-	-	0-0.7
4	100	90-100	-	0-15 ~~0-15~~	-	-	-	-	-	-	0-0.7
5	90-100	0-15	-	-	-	-	-	-	-	-	0-0.7


1 A
1/4”
1
3/8”
2
3/4”


2
3/4”
3
1 ¼” to 1 ½”
Item 4

Stone Courses

Test Panel #1 - August 2012

4A Gradation - OK

Since a Test Section.. the Gravel was Allowed to Remain

Placed Choker Course on One Half

Test Panel #1 - August 2012

Stone Courses

Test Panel #1 - August 2012

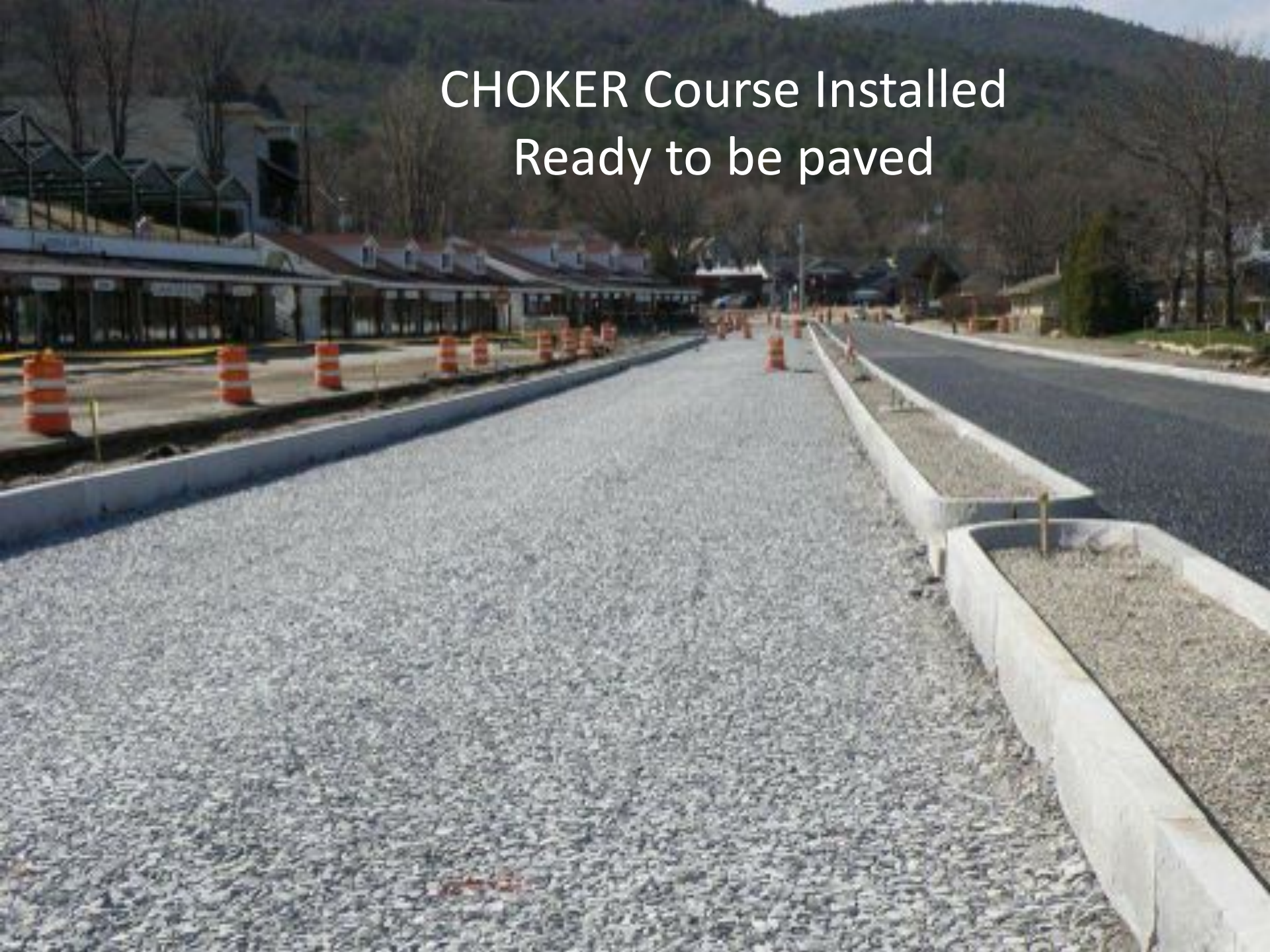
Test Panel #2 - April 2013

No Choker Course – Contractors Option

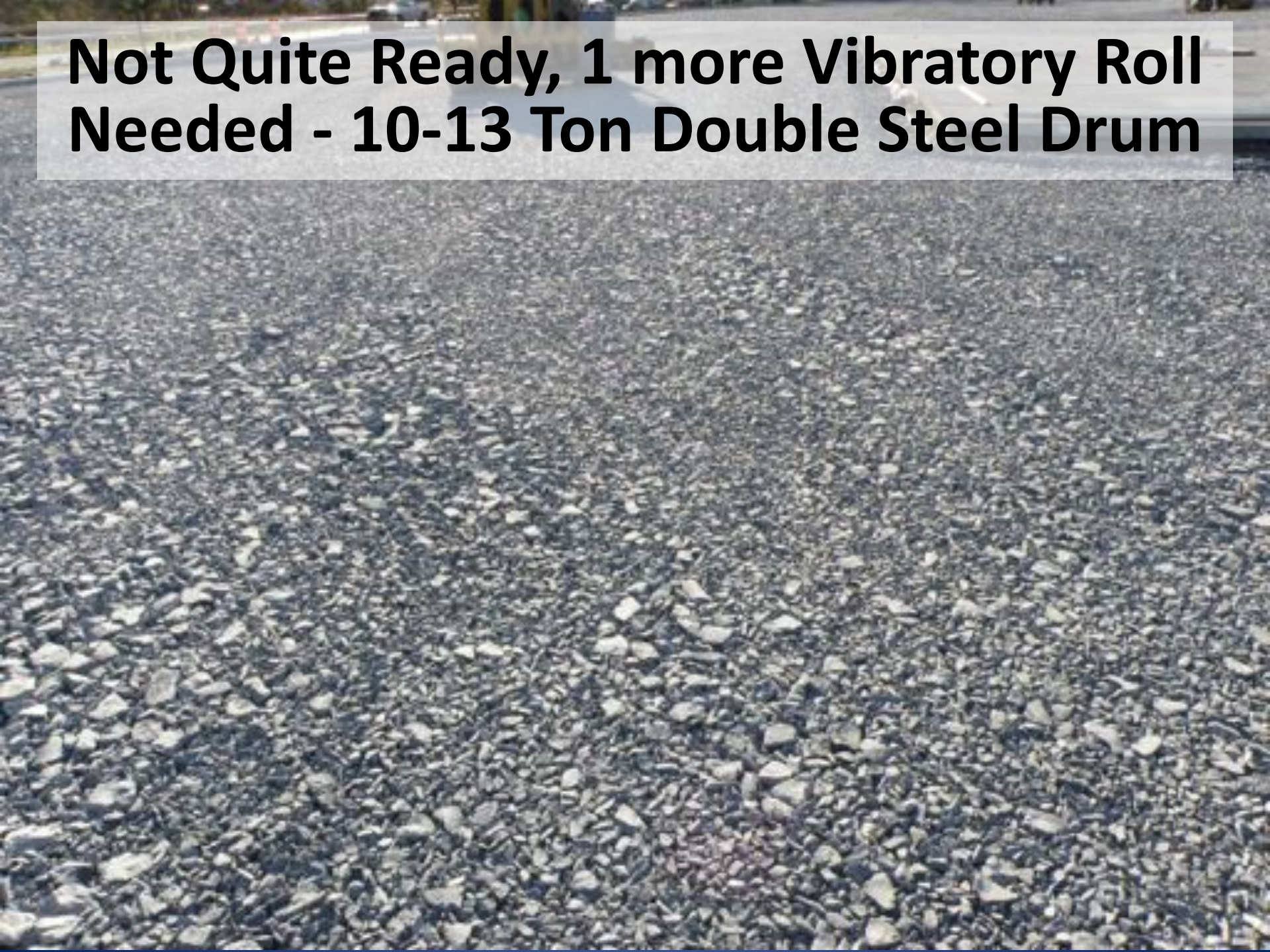
Test Panel #2 - April 2013

No Choker Course – Contractors Option

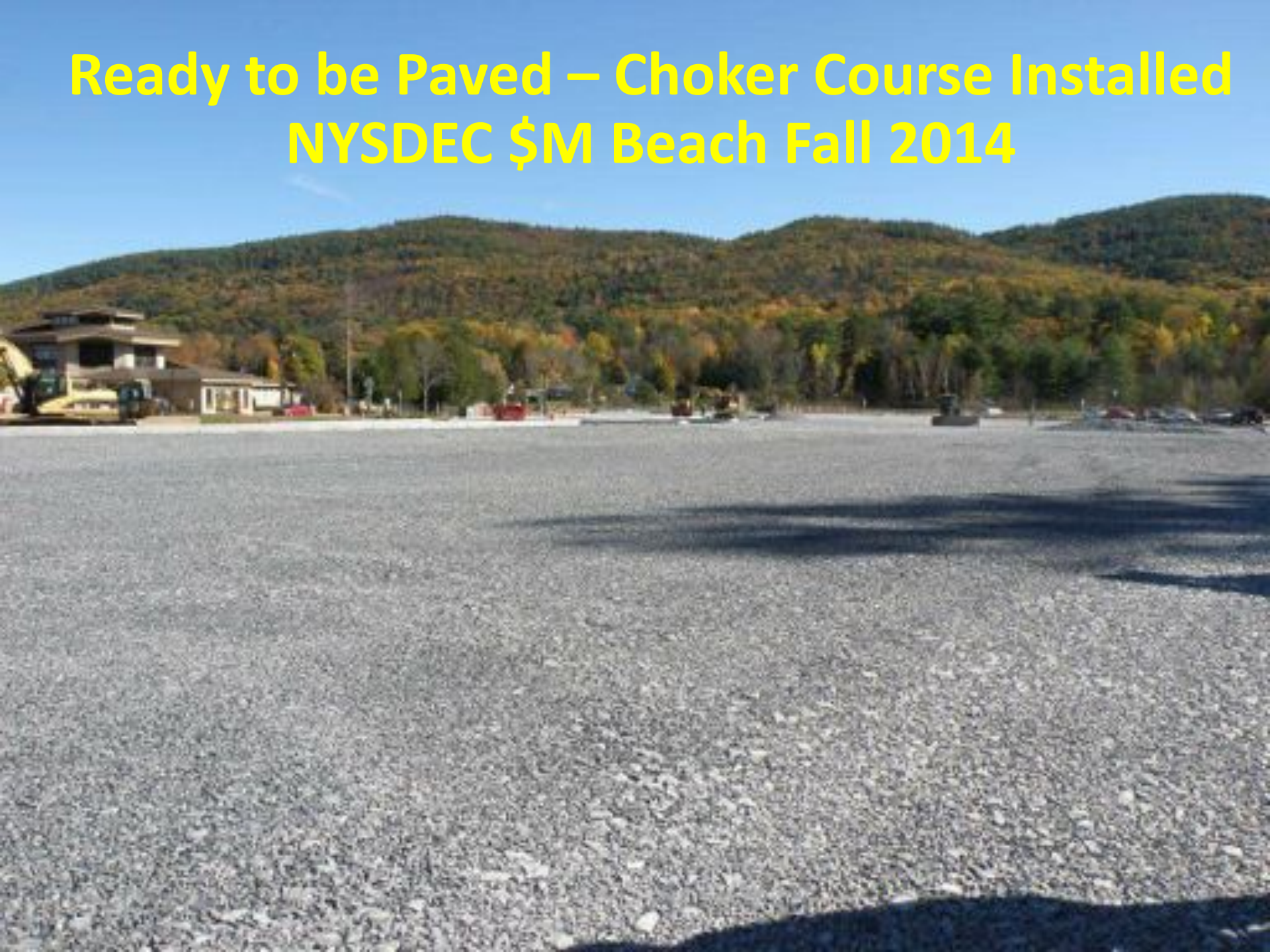
NYSDEC $M Beach Facility Reservoir Course - October 2014


CHOKER Course Installed
Ready to be paved

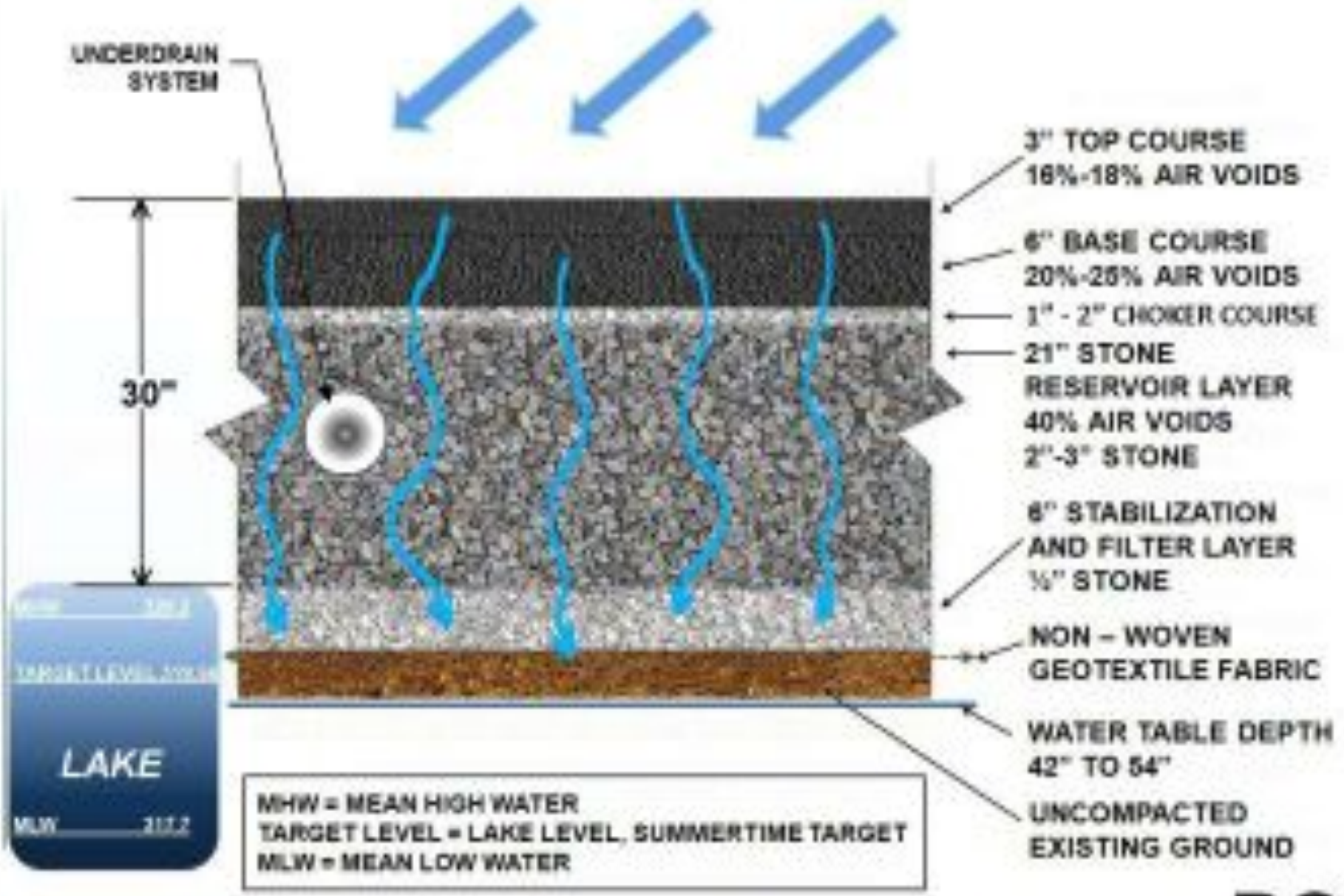
NYSDEC - $M Beach Reservoir Stone – October 2014


Not Quite Ready, 1 more Vibratory Roll Needed - 10-13 Ton Double Steel Drum

Ready to be Paved – Choker Course Installed
NYSDEC $M Beach Fall 2014



Choker Course / Reservoir Stone Change




70 % to 80% - Choker Course
30% to 20% - Reservoir


Choker Course Too Thick

Project where Choker Course was 4” Thick – Not Desirable

Rutting of Choker Course Installed Too Thick (i.e. 4”)

ITEM 623.12010070 –CRUSHED STONE STABILIZATION COURSE (CY)
ITEM 623.12020070 –CRUSHED STONE RESERVOIR COURSE (CY)

DESCRIPTION:

The work shall consist of providing and placing, in accordance with the contract documents, clean, washed, uniformly graded crushed stone.

MATERIALS:

Materials shall consist of Crushed Stone that meets the requirements for crushed stone in Section 703-02 COARSE AGGREGATE in the NYSDOT Standard Specifications. The source must be listed under "stone" on the current Approved List of Fine and Coarse Aggregates, which is published on the NYSDOT web site. Material shall consist of clean, washed, durable, sharp-angled fragments of rock of uniform quality and size. Granite, Crushed gravel, screened gravel, or crushed air-cooled blast furnace slag is not acceptable. Material must be washed and clean.

In addition to the testing and acceptance criteria of Section 703-02:

Washed is defined as the removal of materials from the surface and crevices of the stone including soil, dust, organic materials or anything else that is not part of the base material, in this case the crushed stone. Washing procedure shall be completed by pressurized spray washing of the stone while under mechanical agitation and/or on a conveyor belt with sufficient volume and pressure to remove all debris, soil, stone dust, etc… and fall away from the clean stone, unless otherwise approved by the Engineer. The soiled wash water must not re-contact the clean stone.

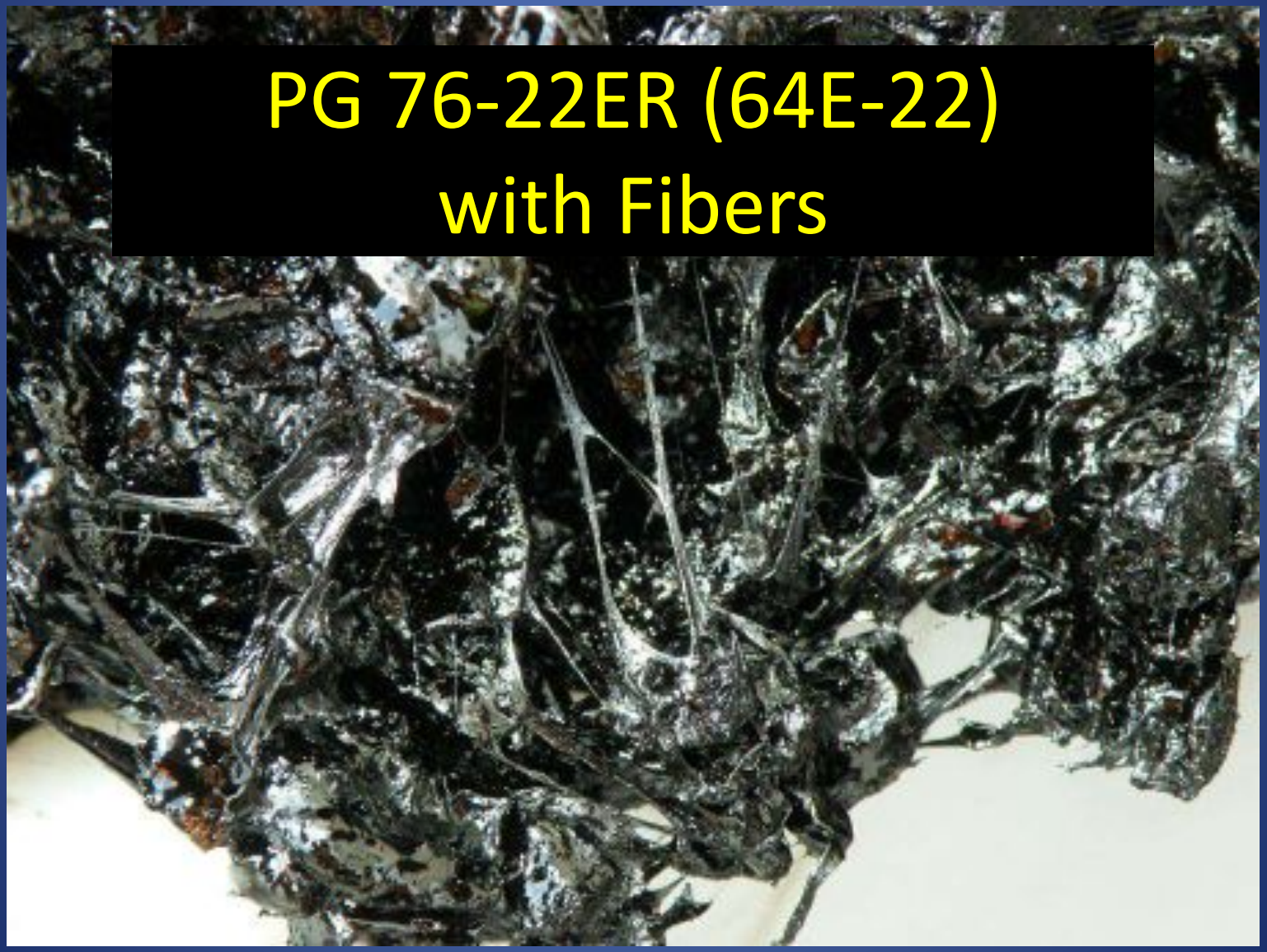
Clean is defined as: The material shall not include more than 0.20% by weight of material passing the #200 sieve, following the washing procedure.

Air void ratio of the reservoir course shall be no less than 38% and typically no greater than 42%. Air void ratio of the stabilization course shall be in the range of 38% to 42%.

The stabilization course can be either the bottom layer that the reservoir course is founded on and/or the top layer that sits between the reservoir course and the asphalt layer (aka "choker course").

At least two weeks prior to placement of material, the contractor shall submit to the engineer for approval the proposed method of washing, material source, stockpile location, and five (5) gallon samples. A minimum of three (3) samples from each stockpile shall be taken at random sections within the pile as ordered by the engineer. At least one sample will come from the bottom of the stockpile. The engineer reserves the right to reject stockpiles, require re-washing, and/or approve a portion of a stockpile (such as the top two-thirds).

ASPHALT



ASPHALT

NYSDEC Beach Porous Asphalt

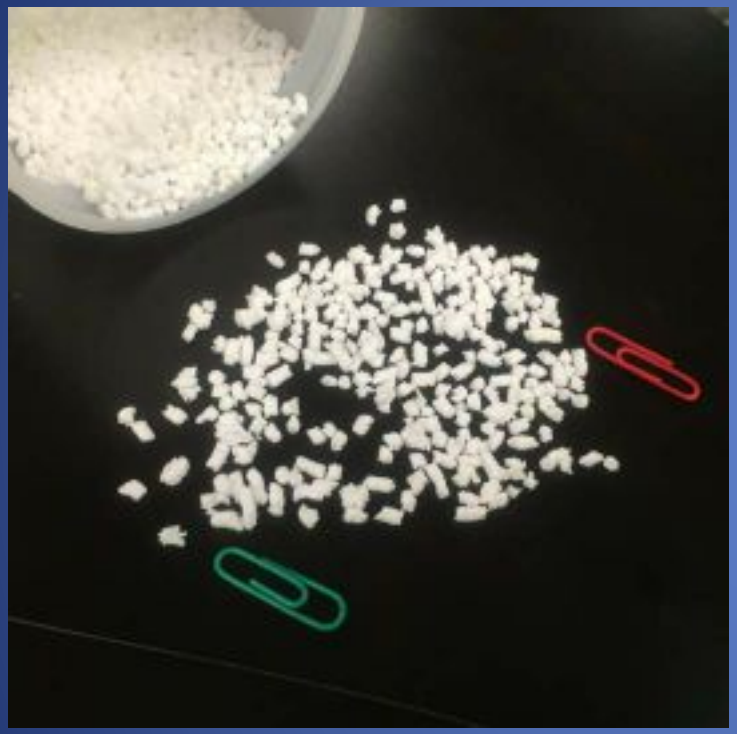
2,500 Tons Top
4,700 Tons Binder (Base)

Beach Road Porous Asphalt

2,100 Tons Top
3,800 Tons Binder (Base)

Polymer Additive / Fibers

Styrene – Butadiene – Styrene (SBS)



2 - 6% by Weight Added to Asphalt Binder

Mineral Fibers – basalt, sometimes Cellulose is used. Control Drain Down – 0.3% to 0.6% by Weight Added at Dry Mix Stage

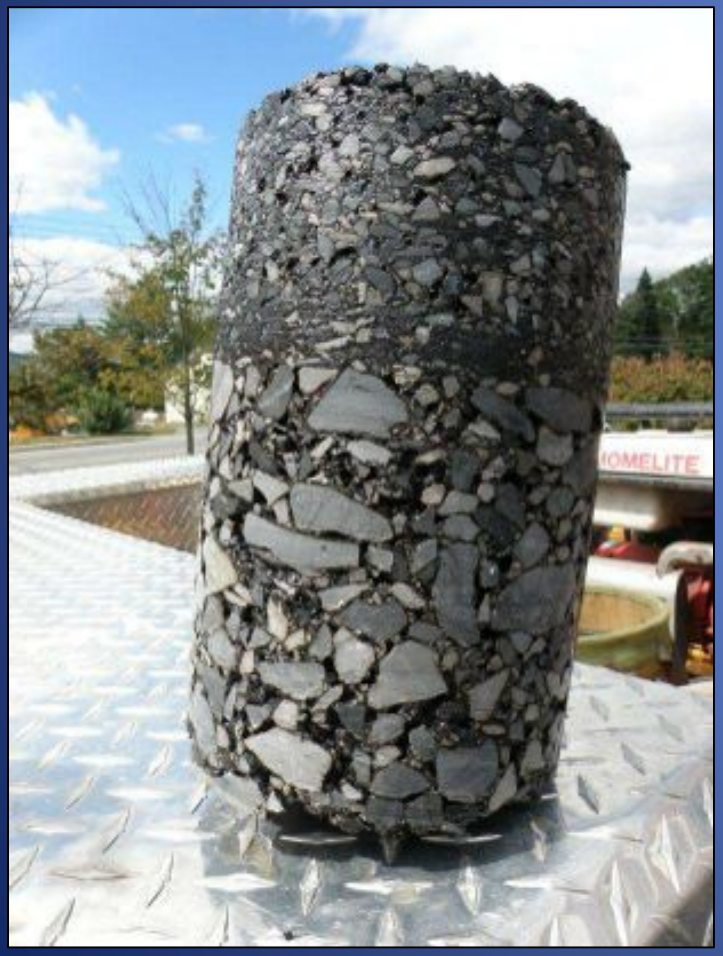
Initial Testing

Warren County, August 2012 for Beach Road

Test Sections

For NYSDEC Lake George Beach, October 2014

Sample Cores



6” Cores should be taken so there is enough material for lab testing on individual cores

Warren County, August 2012 for Beach Road


Tek, Inc.


NELSON COMPANY, INC.

Specific Gravity

Air Void % = (G_{max} - G_{test}) / G_{max}

G_{max} = Theoretical Maximum Specific Gravity

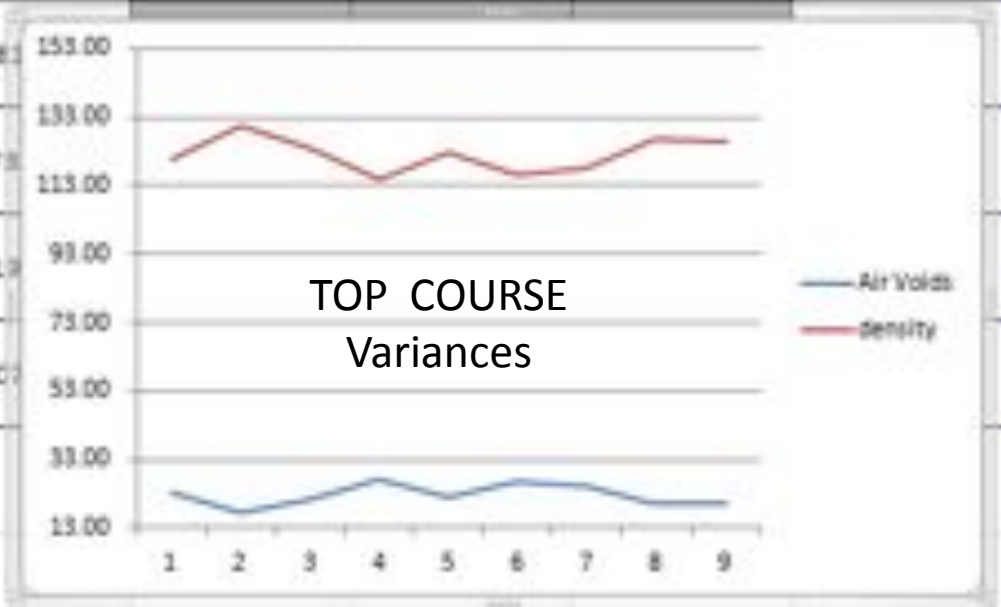
- **Based on Laboratory Test of Mix – Max Density**
- **Rice Number (named after James Rice)**

G_{test} = Test Specimen Specific Gravity

- **Lab test of Cores**

Used to Verify In-place Mix and Calibrate Density Meters

mass of ecimen emoval aled bag, g	E - Mass of the sealed specimen underwater, g	Ratio of mass of dry to to the mass of the bag	F - Apparent specific gravity of the plastic bag, provided by the manufacturer	Specimen bulk specific gravity, Gmb **Gtest**	**RICE #** Maximum specfic gravity of the mixture, Gmm **Gmax**	Specimen air voids, %	Comments	Density pounds/cf divided by factor of 1
41.4	1403.7	52.2451	0.7729	1.9337	2.529	23.54	None	120.7
01.6	1602	119.2885	0.6616	2.0867	2.529	17.49	None	130.2
53.7	1694.3	60.2740	0.7595	1.9834	2.529	21.57	None	123.8
73.6	937.6	79.4444	0.7277	1.8411	2.529	27.20	None	114.9
57.6	1571.1	57.1996	0.7646	1.9652	2.529	22.37	None	122.5
66.8	181					26.35	None	116.3
86.8	73					25.29	None	117.9
69.6	19					19.88	None	126.4
61.1	20					20.36	None	125.7



TOP COURSE
Variances

TOP COURSE

Air Voids = (Gmax-Gtest) / Gmax

Specific Gravity

Results of First Test Panel

Inconsistency in Asphalt Content

15.5%, 10.1%, 7.6%, 8.6%
Others Correct at 5.9% - 6.2%

Aggregate Gradation Variations

Data = Unreliable

mass of ecimen emoval aled bag, g	E - Mass of the sealed specimen underwater, g	Ratio of mass of dry to to the mass of the bag	F - Apparent specific gravity of the plastic bag, provided by the manufacturer	Specimen bulk specific gravity, Gmb	Maximum specfic gravity of the mixture, Gmm	Specimen air voids, %	Comments	Density pounds/cf divided by factor of 1
41.4	1403.7	52.2451	0.7729	1.9337	2.529	23.54	None	120.7
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66.8	18					26.33	None	116.3
86.8	7					25.29	None	117.9
69.6	1					19.88	None	126.4
61.1	20					20.36	None	125.7

Solution - Increase Dry Mix Time by 10 to 15 seconds during Production to Avoid Asphalt Clumping on Fibers

Improperly Mixed Fibers

Improperly Mixed Fibers

2nd Test Panel - Gauge Calibration

Specimen number	Lab Results: Specimen bulk specific gravity, Gtest	Specimen Density, lbs/ft³	Troxler Model 3430 Serial Number 23531 — Field Tests: Gauge Reading, lbs/ft³	Correction Factors: Correction Factor, lbs/ft³
Core 1 - Top	1.9535	121.90	117.7	4.20
Core 2 - Top	2.0140	125.67	122.3	3.37
Core 3 - Top	1.9616	122.40	117.5	4.90
Core 4 - Top	1.9358	120.80	117.2	3.60
Core 5 - Top	1.9849	123.86	121.2	2.66
Core 6 - Top	1.9443	121.33	116.8	4.53
Core 7 - Top	2.0032	125.00	122.4	2.60
Core 8 - Top	1.9914	124.26	120.8	3.46
Core 9 - Top	1.9779	123.42	117.5	5.92
			Ave Correction Factor	3.91
			Project Target Density, lbs/ft³	**123.5**

1 **x 62.4 =** **Minus Gauge** **=**

Gmax = 2.52 for Mix (from Plant)

Gtarget = 2.52 – (19% x 2.52) x 62.4
Minus the Correction Factor =

Asphalt Drain Down

Production, Transit and Placement Temperature

Production, Transit and Placement Temperature

Asphalt Drain Down

Video Asphalt Drain Down

Production, Transit and Placement Temperature


Out

Asphalt Drain Down

PG 64-22 P
w/ ER 60%

4/8/2013
LOT 1-A
TEST STRIP

POROUS BINDER FOR BEACH ROAD

BINDER

	@ 290 DEG. F	@ 327 DEG F.
wt of sample =	1051.3	1447.2
tare wt of pan =	395.4	395.2
end wt of pan =	396.4	397.5
$\frac{\text{end wt of pan - start wt of pan}}{\text{wt of sample}}$ =	0.10	0.20

AVE DRAINDOWN 0.15

BLEND 1 - POROUS TOP

TOP

TEST STRIP FOR BEACH ROAD (#2)
4/9/2013

0.6% FIBERS

Fibers Spec
=0.4% +/-

DRAIN DOWN TEST

	@290deg f	@ 327 deg f
wt of sample =	1113.7	1108.1
tare wt of pan =	395.2	395.4
end wt of pan =	395.5	396.3
$\frac{\text{end wt of pan - start wt of pan}}{\text{wt of sample}}$ =	0.03	0.08

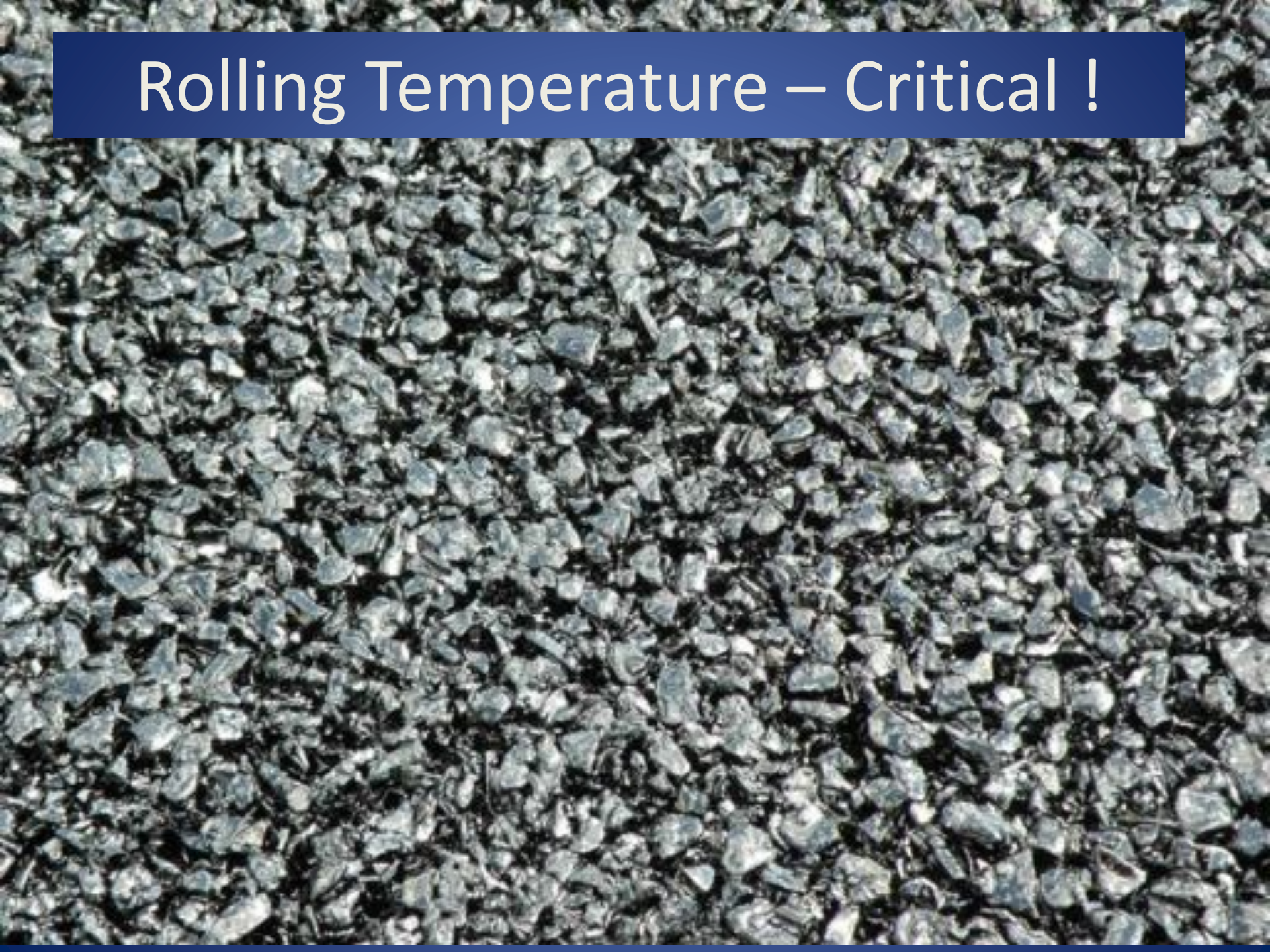
0.05

PG 76-22 P
w/ ER 60%

Production, Transit and Placement Temperature

Compaction

Rolling Temperature – Critical !



Rolling Temperature – Critical !

- **Ambient Temperature 50 to 70 degrees F.**
- **Ideally - Wind – 0 to 3 mph**
- **Beware - Asphalt surface cooling to quick**
- **No Paving Top Course under 50 degrees F.**
- **Cooling time to Finish Rolling = Approx. 2 hours**

Rolling Temperature – Critical !

- Binder Course – 200 - 245 F.
- Top Course – 200 - 220 F.
- Finish Rolling - 110 - 140 F. - Top,
  - 140 – 150 F. - Binder

- 4 to 6 Passes with 10 to 13 Ton Roller OK (Static)
- Increases in Density of 1 to 2 lbs/CF up to 5 passes
  - Density Spike of 4 to 5 lbs/CF at 140 F.
- 1 to 3 Passes with 3.5 to 5 Ton Roller to Finish

Rolling Temperature – Critical !

Rolling Temperature – Critical !

Quality Control

BEACH ROAD PAVING INFORMATION SHEET

Revised April 26, 2013

- Binder Course - 40* to 70* F. - Ambient Temp **(must have 50* Min Surface Temp)**
- Top Course - 50* to 70* F. **No Paving Top Course w/ Ambient Temp under 50* F.**
- Wind – up to 10 mph Pave @ 50* F. - Up to 20 mph pave @ above 60* F.
- In-Truck as delivered Temps – 250*-300* Binder, 240*- 280* for Top
- Contact Tom Baird - If temps over 300* F. in Truck

NO VIBRATORY Rolling – Only STATIC Rolling

- Roll Binder Course – 200 to 245* F…. Six (6) Passes 10 -13 Ton
- **Binder Course Finish Rolling -> 10 - 13 Ton, 140* – 150* F. to Target Density**
- Roll Top Course – 200 to 220*F. – Expect Three (3) Passes 10 -13 Ton
- **Top Course Finish Rolling -> 110* to 140* F. to achieve Target Density**
- Centerline Joint – Meet previously paved edge with Hot Asphalt
  Wait until temps on edges equalize (min. 140*) Roll to Pinch Joint
- Item 402.7903WR (GlasGrid #8512) over Culvert and Transverse Joints

Project Target, Gauge Read, Densities per Meter – Note Serial Numbers

Gauge	TOP	BINDER	
	Batch Plant Only Top Course Project Target Density (PTD), lbs/ft^3	DRUM Plant Binder Course Project Target Density (PTD), lbs/ft^3	BATCH Plant Binder Course Project Target Density (PTD), lbs/ft^3
Troxler Model 3430 Serial Number 23531	123.5	122.5	124.1
Instrotek Xplorer Serial Number 720	122.8	122.0	123.5
PQI Model 301 Serial Number 002792, Programmed Offset Value 16.0	139.6	138.9	140.4

B&L_REV1_ 4/26/2013, TCB

BEACH ROAD PAVING INFORMATION SHEET

Revised April 26, 2013

- Binder Course - 40* to 70* F. - Ambient Temp **(must have 50* Min Surface Temp)**
- Top Course - 50* to 70* F. **No Paving Top Course w/ Ambient Temp under 50* F.**
- Wind – up to 10 mph Pave @ 50* F. - Up to 20 mph pave @ above 60* F.
- In-Truck as delivered Temps – 250*-300* Binder, 240*- 280* for Top
- Contact Tom Baird - If temps over 300* F. in Truck

NO VIBRATORY Rolling – Only STATIC Rolling

- Roll Binder Course – 200 to 245* F.... Six (6) Passes 10 -13 Ton
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Troxler Model 3430 Serial Number 23531	123.5	122.5	124.1
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PQI Model 301 Serial Number 002792, Programmed Offset Value 16.0	139.6	138.9	140.4

B&L_REV1_ 4/26/2013, TCB

G_{max} = 2.xx for Mix (From Plant each day)

G_{target} = 2.xx – (19% x 2.xx) x 62.4 lb/cf - Correction Factor for Each Meter

Porous Paving Information Sheet

Revised March 27, 2016

- Binder Course - 40° to 70° F. - Ambient Temp **(Must have 45° Min Surface Temp)**
- Top Course - 50° to 70° F. **No Paving Top Course w/ Ambient or Surface under 50° F.**
- Wind – up to 10 mph Pave @ 50° F. - Up to 20 mph pave @ above 60° F.
- In-Truck as delivered Temps ---- Binder = 250°-290°, TOP = 260°- 280°
- Contact _____ - **If Temps over 300° F.** in Truck or After exiting the Screed –

Use Internal Temperature Probe if Surface Temps Are At Limit to Verify

NO VIBRATORY Rolling – Only STATIC Rolling

- Roll Binder Course – 200 to 245° F.... Six (6) Passes 10 -13 Ton
- **Binder Course Finish Rolling -> 10 - 13 Ton – Roll 120° – 150° F. to Target Density**

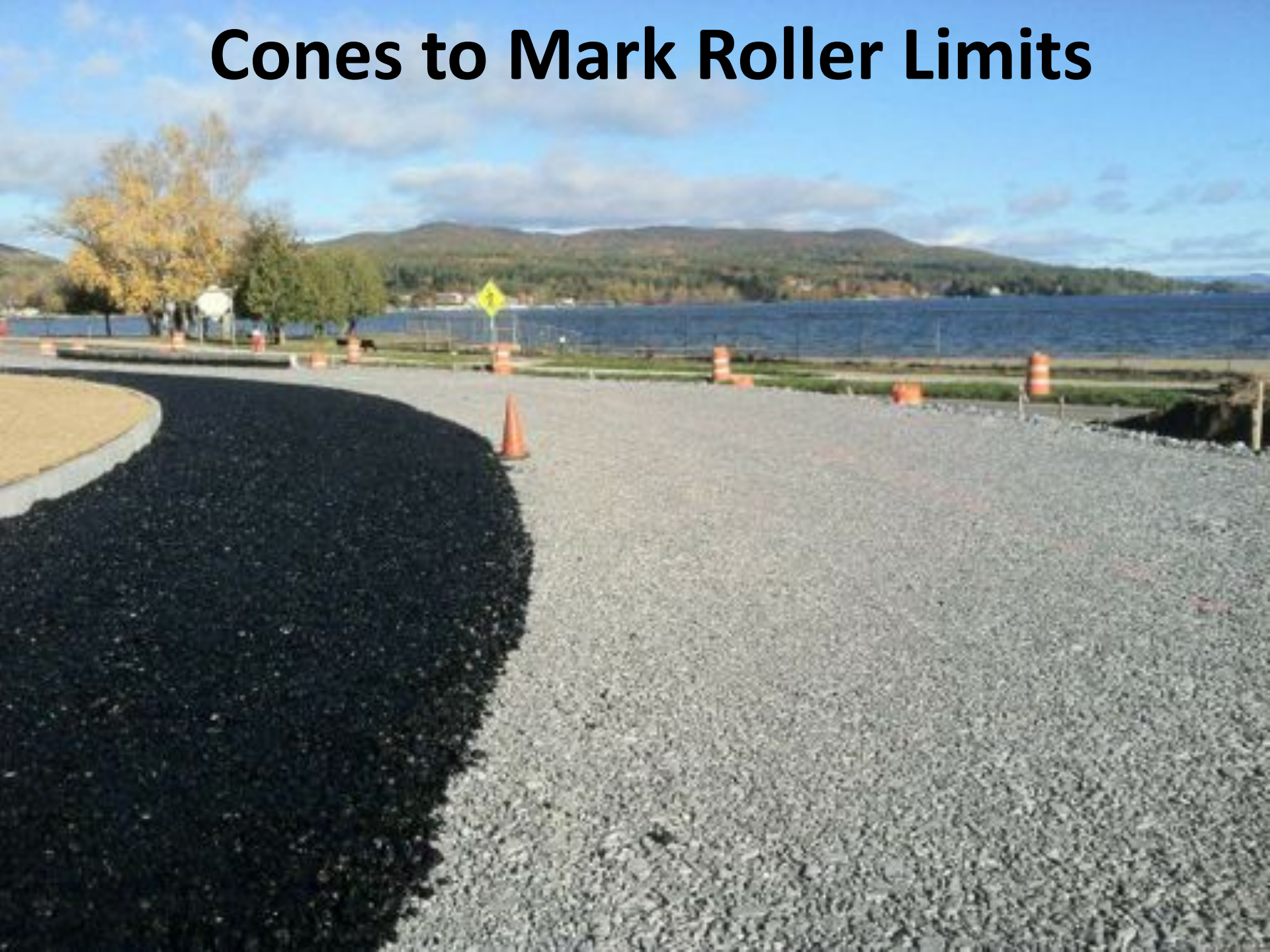
- Roll Top Course – 200 to 220°F. – Expect Three (3) Passes 10 -13 Ton
- **Top Course Finish Rolling -> Surface Temperature - 120° to 150° F. to Target Density**

- **Top Course Must Be Rolled with 10 – 13 Ton BETWEEN 120° and 140° F**
- Centerline or Cold Joint – Meet previously paved edge with Fresh Hot Asphalt. Roll to Pinch Joint when Temps Equalize.

Project Target Density (PTD), Gauge Read, Densities Shall Be per Specific Meter

Pavement Density Gauge	TOP	BINDER	
	Batch Plant Only Top Course Project Target Density (PTD), lbs/ft³	DRUM Plant Binder Course Project Target Density (PTD), lbs/ft³	BATCH Plant Binder Course Project Target Density (PTD), lbs/ft³
Rice Number from Plant	2._____	2._____	2._____
Model_____ SN_____ Correction Factor _____	Target	Target	Target
Model_____ SN_____ Correction Factor _____	Target	Target	Target

Cones to Mark Roller Limits



Permeability

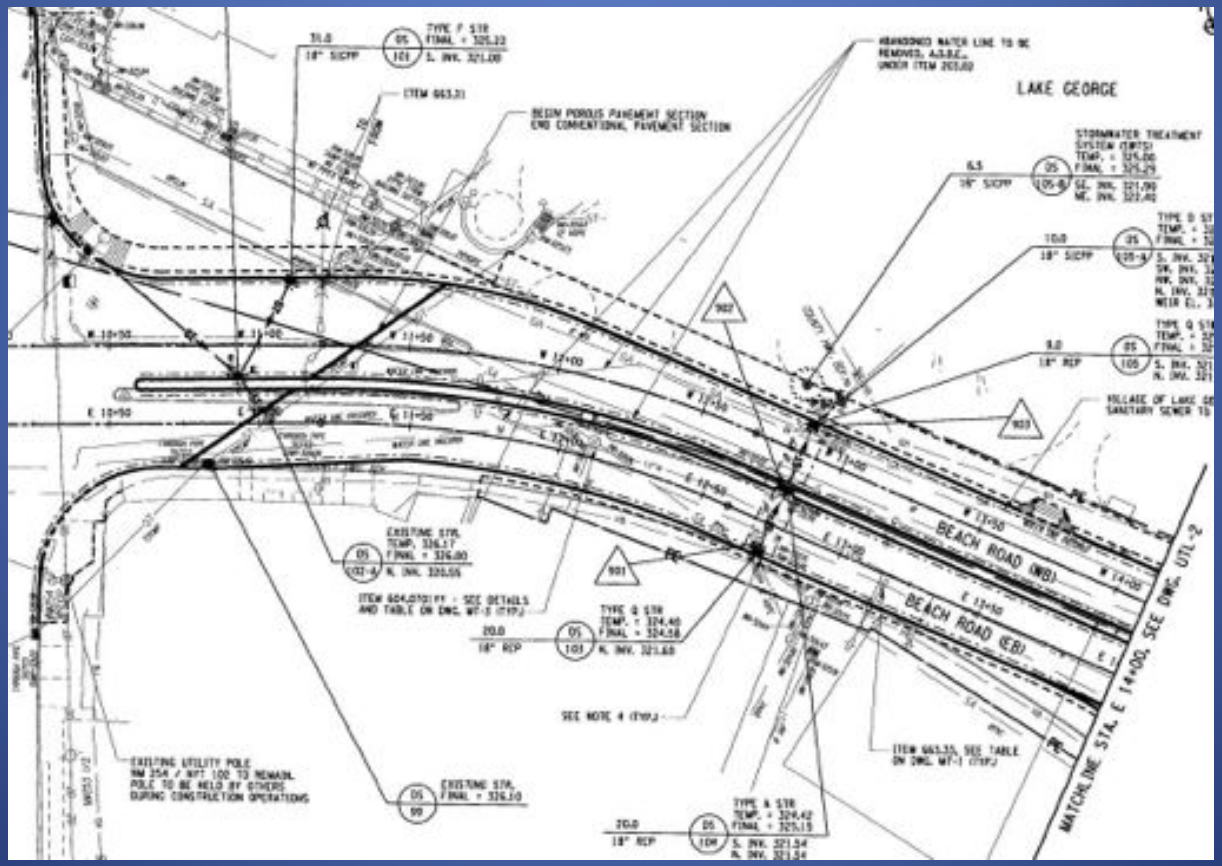
Protect your Investment

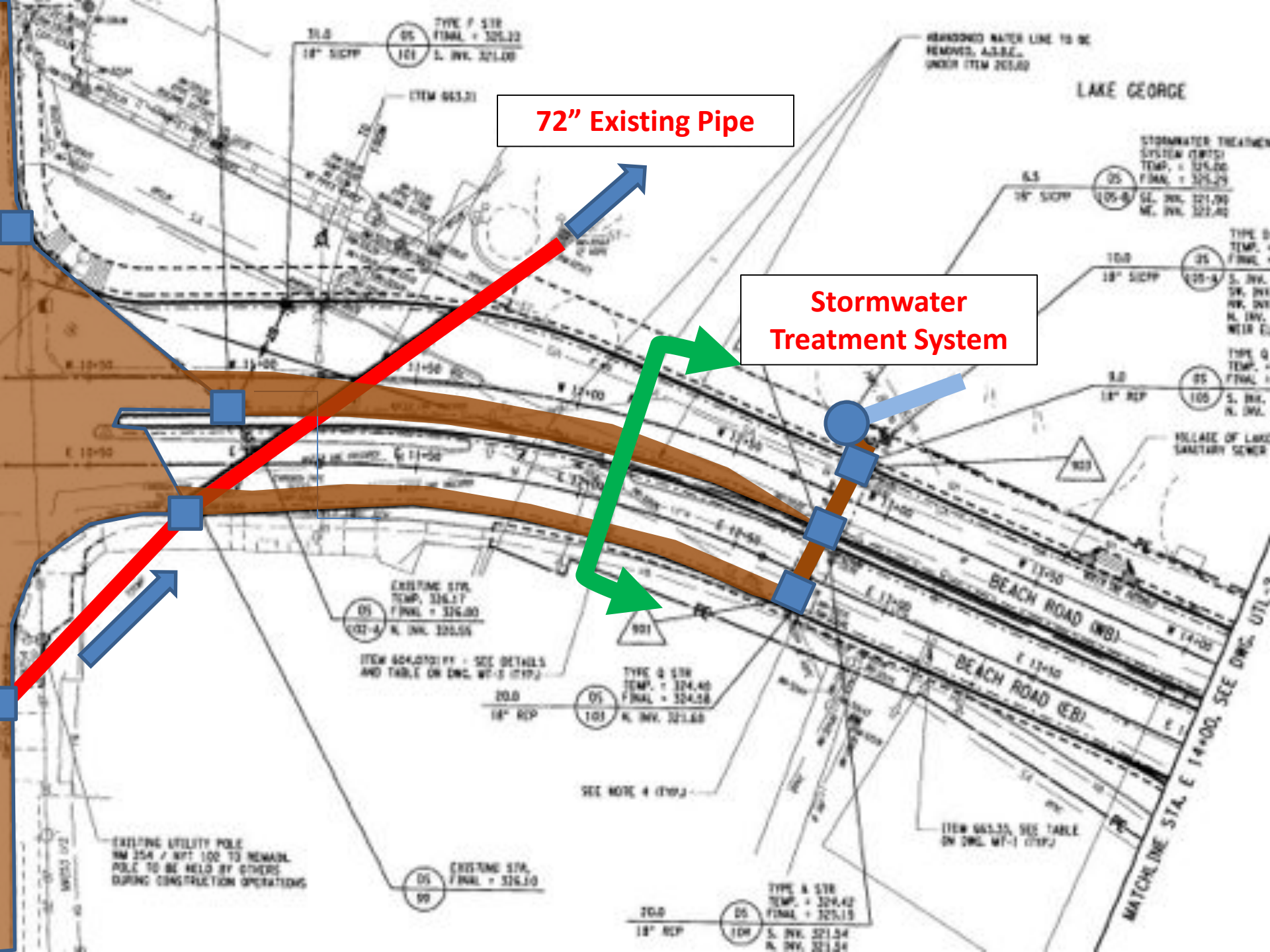
Beach Road System Safeguards

Beach Road System Safeguards

Beach Road System Safeguards

Offsite Contamination Protection
Flanking Structures




72” Existing Pipe
Stormwater Treatment System
LAKE GEORGE
BEACH ROAD (NB)
BEACH ROAD (EB)

Lateral “Support”

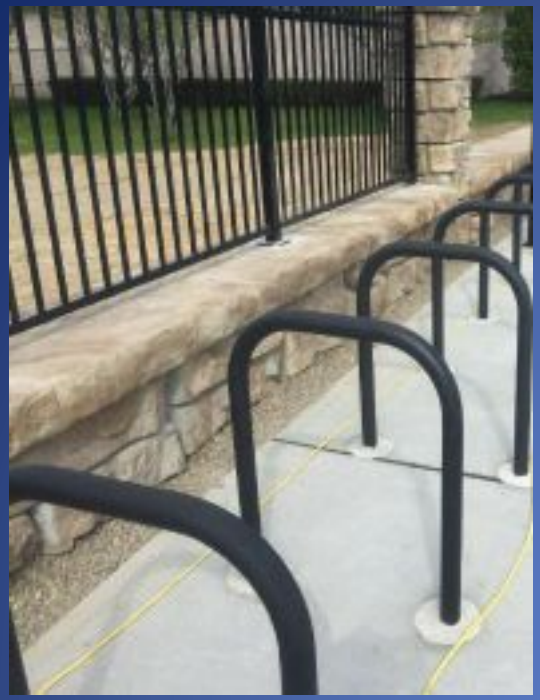

LAKE GEORGE
DAY USE AREA
State of New York
STOP

Protection
Walls, Buffers, Windbreaks

Limit Access to Beach
“Sand Break”
Aesthetics
Limit Access to Lake

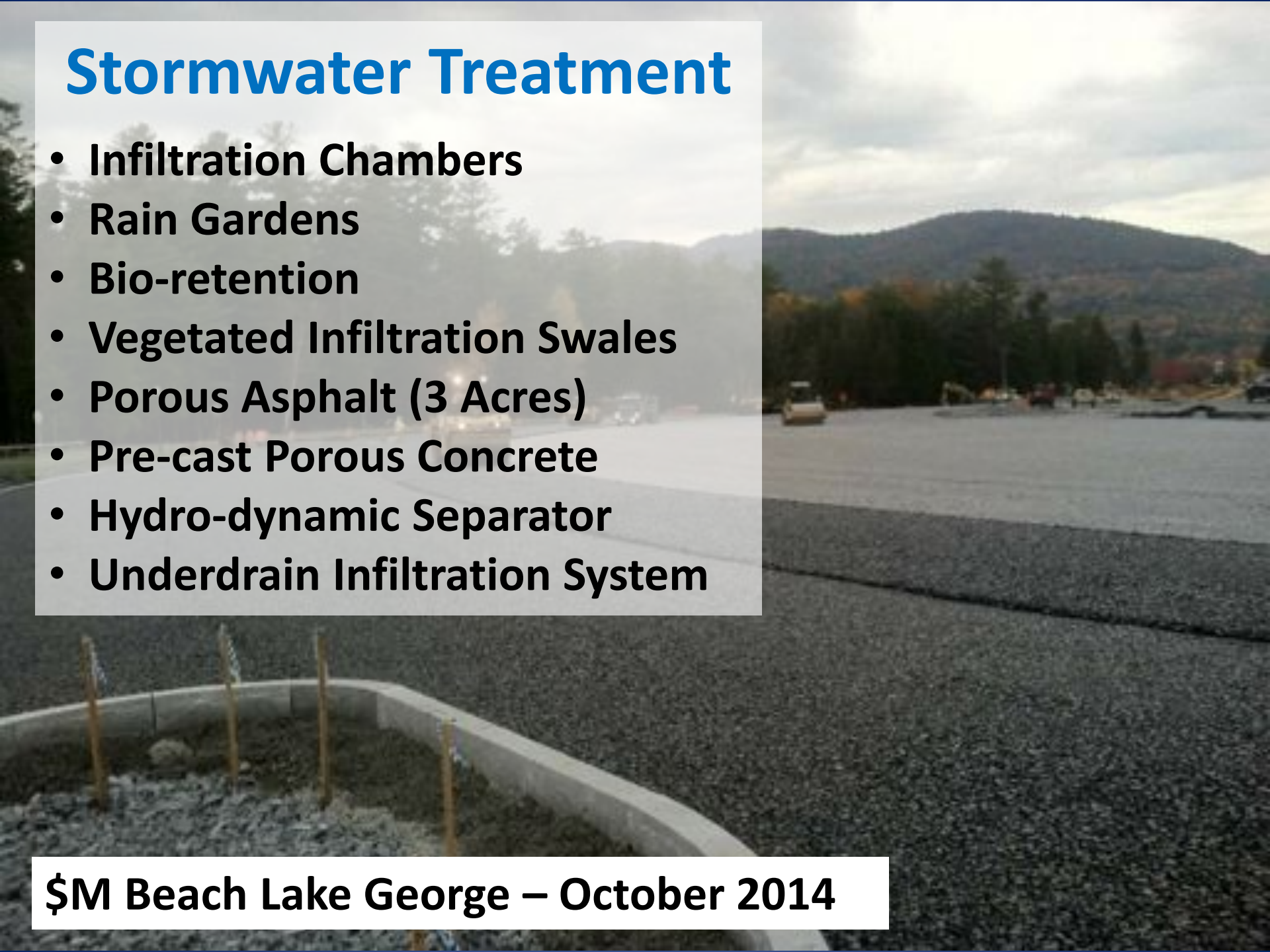

Protection
Walls, Buffers, Windbreaks

Coatings



Stormwater Treatment

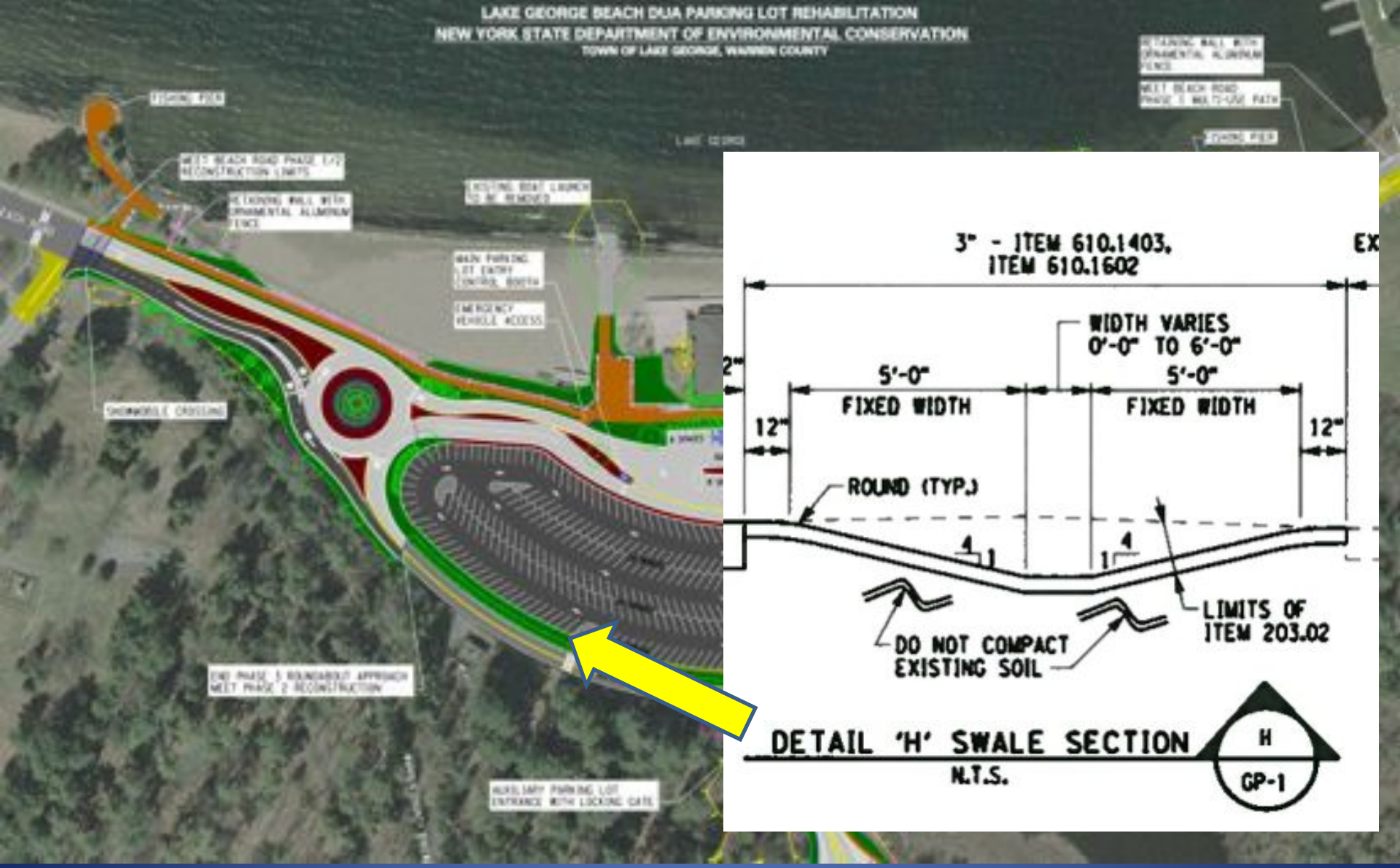
- Infiltration Chambers
- Rain Gardens
- Bio-retention
- Vegetated Infiltration Swales
- Porous Asphalt (3 Acres)
- Pre-cast Porous Concrete
- Hydro-dynamic Separator
- Underdrain Infiltration System



$M Beach Lake George – October 2014

Drain from Impervious Areas to Linear Raingardens and Infiltration Chambers

Primary Treatment to Underground Infiltration → **Overflow goes to Reservoir Layer Under Pavement**

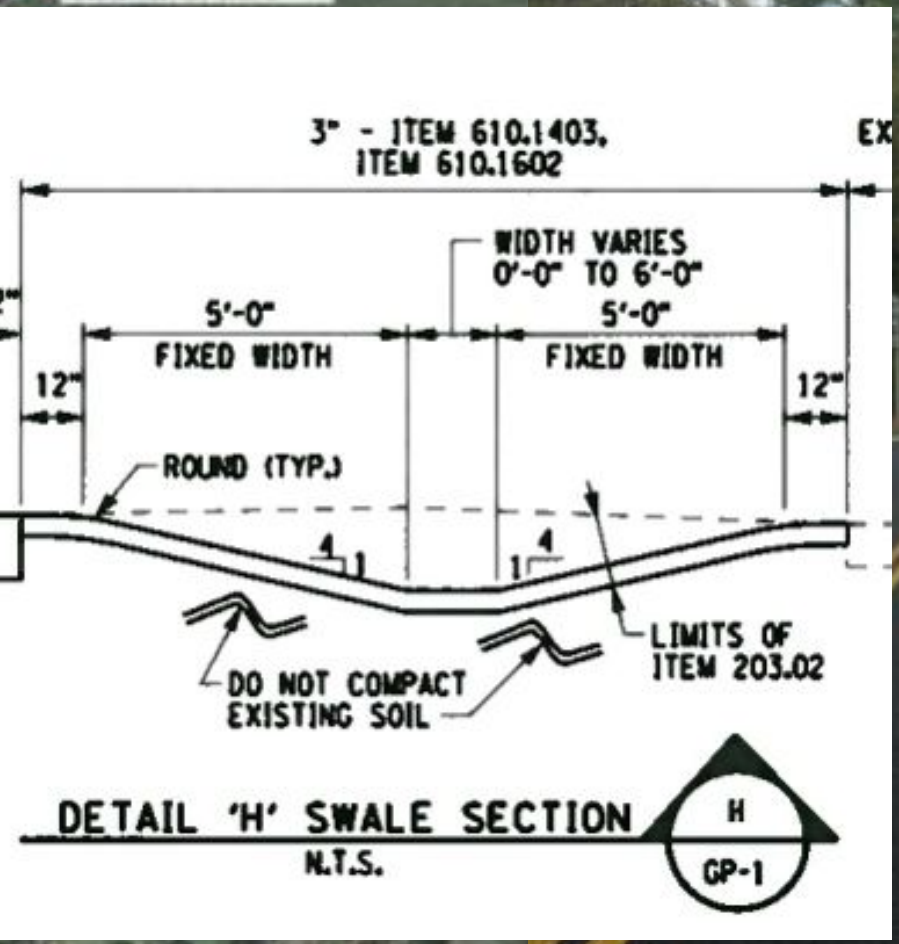


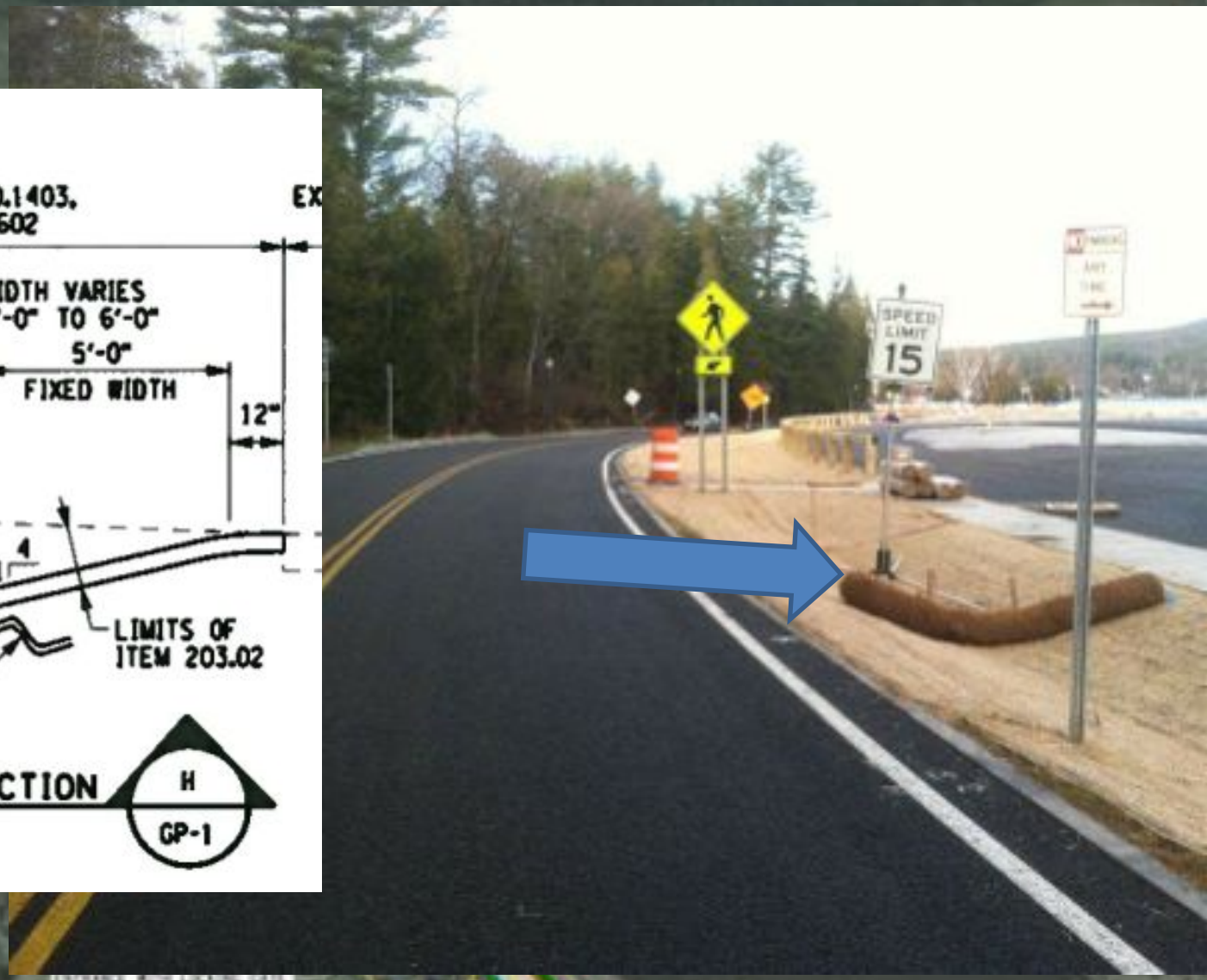
"Vegetated Infiltration Swale"

"Existing Soil" was placed a year earlier – Sandy Organic Mixture


Backup Systems to
Porous Asphalt

LAKE GEORGE BEACH DUA PARKING LOT REHABILITATION
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
TOWN OF LAKE GEORGE, WARREN COUNTY



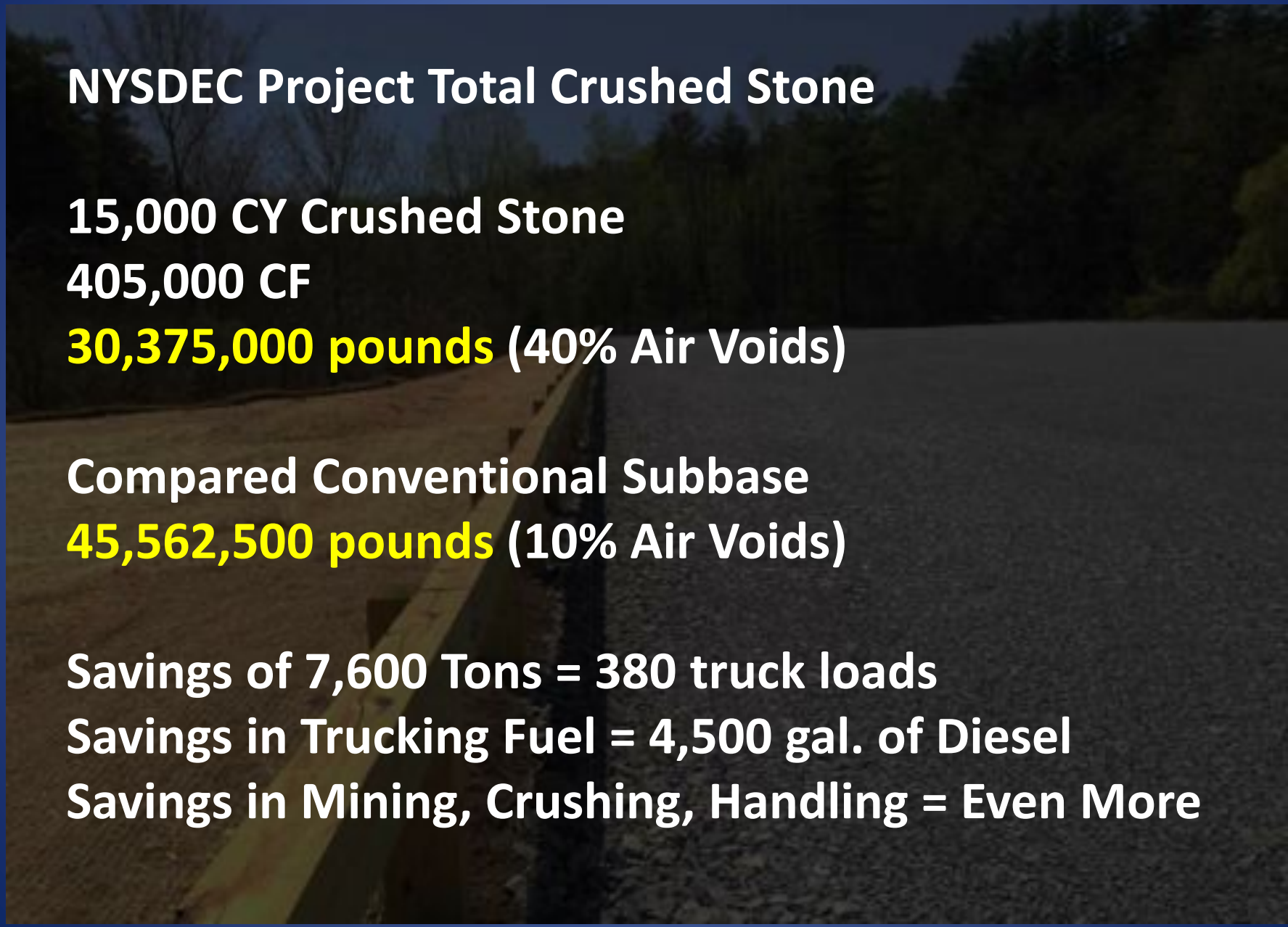


Auxiliary Parking Area

Auxiliary Parking Area

Auxiliary Parking Area

Auxiliary Parking Area



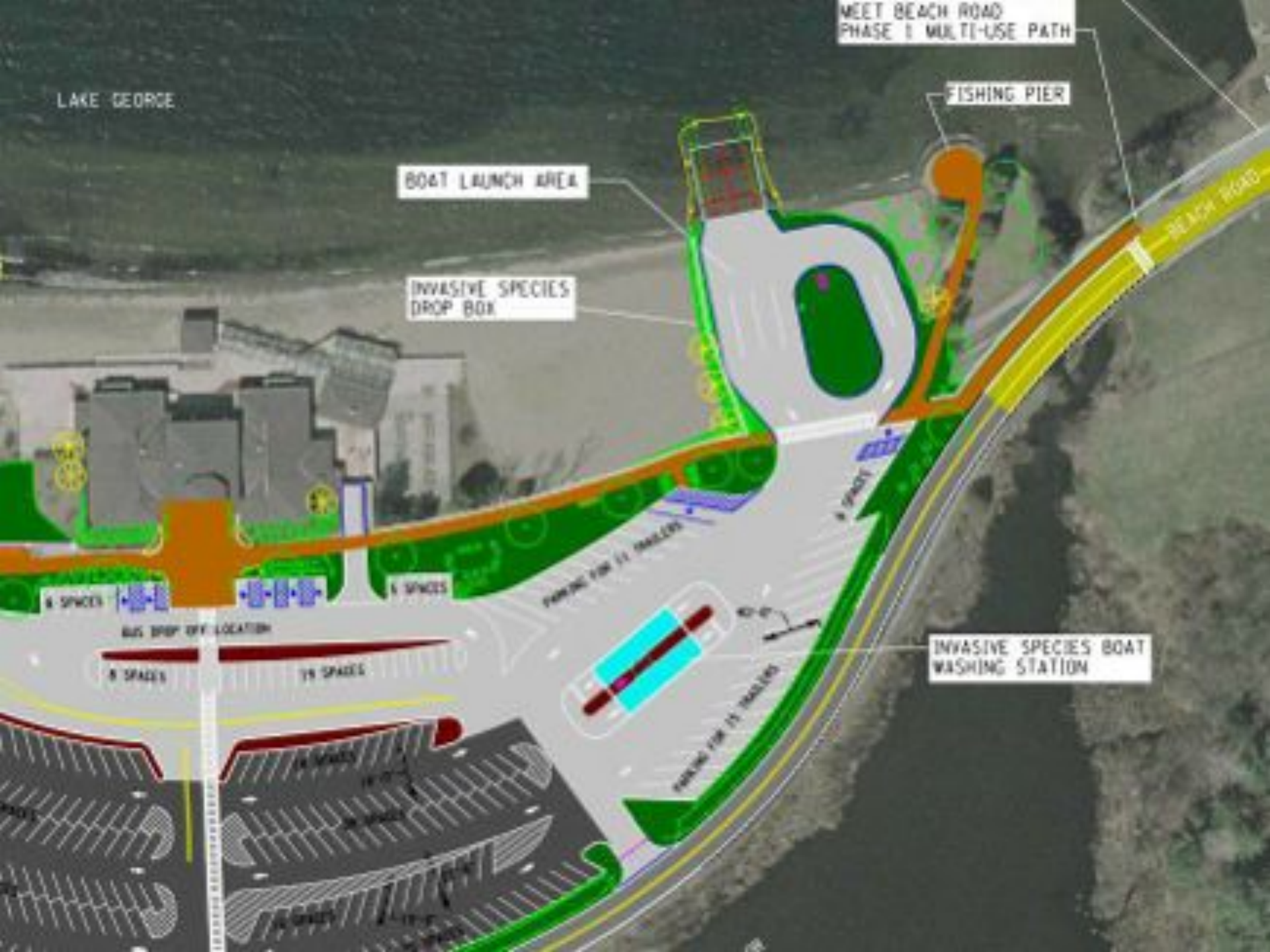
NYSDEC Project Total Crushed Stone

15,000 CY Crushed Stone
405,000 CF
30,375,000 pounds (40% Air Voids)

Compared Conventional Subbase
45,562,500 pounds (10% Air Voids)

Savings of 7,600 Tons = 380 truck loads
Savings in Trucking Fuel = 4,500 gal. of Diesel
Savings in Mining, Crushing, Handling = Even More

Invasive Species Washing & Inspection Station


MEET BEACH ROAD
PHASE I MULTI-USE PATH
LAKE GEORGE
FISHING PIER
BOAT LAUNCH AREA
BEACH ROAD
INVASIVE SPECIES
DROP BOX
6 SPACES
6 SPACES
BUS DROP OFF LOCATION
8 SPACES
19 SPACES
INVASIVE SPECIES BOAT
WASHING STATION

Invasive Species

Zebra Mussels

Also:

Chinese Mystery Snail
Spiny Water Flea

A34 STATE

Fighting a clam threat

Environmentalists trying to stop growth of polluting Asian mollusks

BY MARY ESCH
The Associated Press

ALBANY — Dive teams that spread underwater mats to smother invasive Asian clams in an Adirondack lake this spring are now sifting the sandy bottom of a lake in New York's Finger Lakes wine country to determine how widely the water-befouling mollusks have spread there.

An interim report released last week on a $475,000 effort to eradicate Asian clams in Lake George said plastic mats spread on five acres of lake bottom have killed more than 97 percent of the clams. But it recommended additional work, such as suction harvesting, that could bring the cost to nearly $1 million.

A plan also is being developed to eradicate a new 5-acre colony of Asian clams discovered last month in another bay of 32-mile-long Lake George, where the clear, cold water, sandy beaches and mountain scenery have long made it popular for vacations and second homes.

The Asian clam, Corbicula fluminea, is known as the "good luck clam" in its native Southeast Asia. The thumbnail-size clams multiply rapidly because of their ability to self-fertilize and release up to 2,000 juveniles a day during breeding seasons in May and August.

Infestations of the clams usually occur when someone dumps a bait bucket or aquarium into a body of water. The mollusk's excretions feed algal blooms and the sharp shells from dead clams wash up on beaches in large numbers.

The tiny clams multiply rapidly because they can self-fertilize.

In Lake Tahoe, where a $1.4-million eradication effort was launched last summer, they have been blamed for algal blooms that have turned clear, blue bays a murky green.

Albany-based InnerSpace Scientific Diving, which is involved in the Lake George clam project, is now working to determine the extent of an infestation in Owasco Lake, about 25 miles southwest of Syracuse.

Divers plot their findings on a map, using GPS to pinpoint the location of clams. Populations also have been discovered in Cayuga and Seneca lakes.

In April, divers unrolled 825 50-foot-long plastic mats to cover the bottom of a five-acre bay of Lake George where the clams were discovered last fall.

Sandra Nierzwicki-Bauer, director of the Rensselaer Polytechnic Institute Darrin Fresh Water Institute on Lake George, said last week that more than 97 percent of clams were dead in areas where mats had been removed.

It is estimated that an additional $200,000 to $400,000 will be needed to finish work and pay for suctioning clams out of areas where mats can't be used.

In April, divers plastered the bottom of a 5-acre bay area of Lake George to kill the invasive clams.

Asian Clams

Courtesy Lake George Association

NYSDEC Lake George Beach Facility

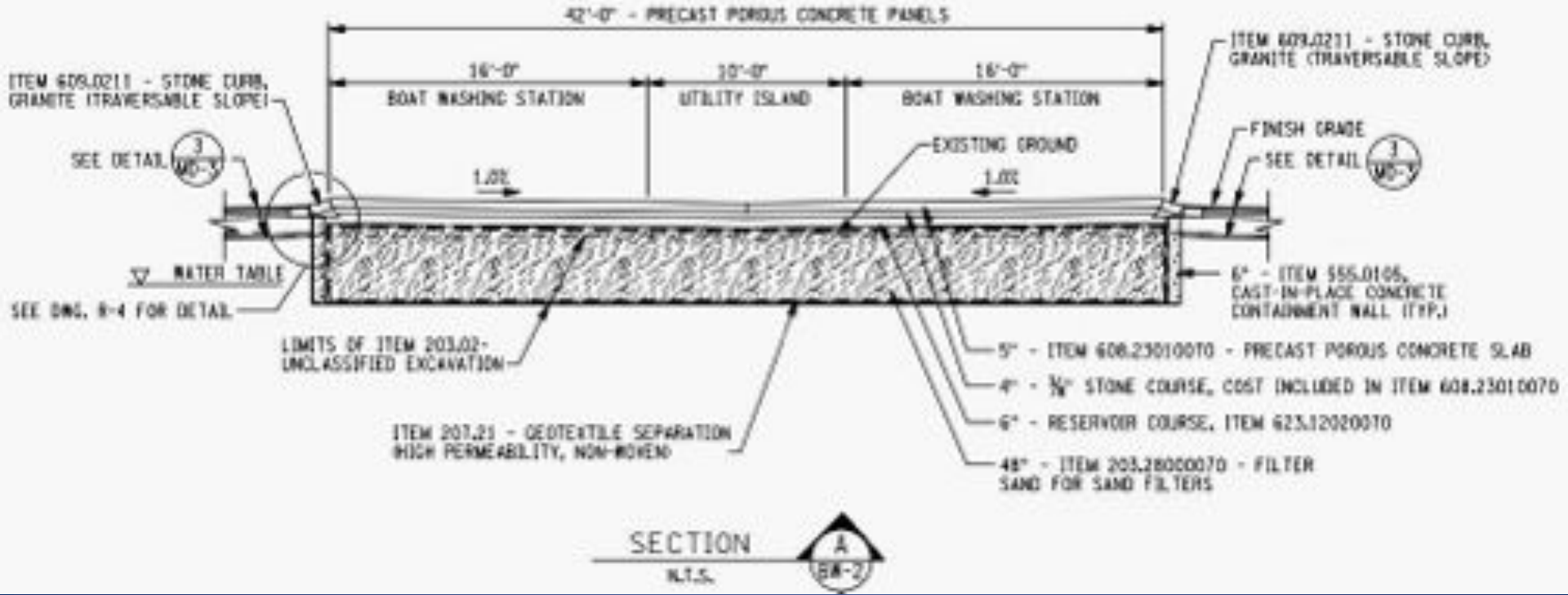
Invasive Species Washing / Inspection Station

NYSDEC Lake George Beach Facility

NYSDEC Lake George Beach Facility

Invasive Species Washing / Inspection Station

NYSDEC Lake George Beach Facility



NYSDEC Lake George Beach Facility

NYSDEC Lake George Beach Facility

NYSDEC Lake George Beach Facility

NYSDEC Lake George Beach Facility

Environmental Challenges

Historic and Cultural Resources

Impact Avoidance – Spanning the Resource

A spear Point displayed at New York State Museum where some of the dozens of findings are displayed with some dating back to approximately 8,000 B.C.

According to museum officials, this Spear Point artifact is estimated to be 8,000 years old.


PLAN of FORT WILLIAM HENRY and
Camp at
LAKE GEORGE.
Scale of One Yard

Environmental Challenges

Historic and Cultural Resources

Impact Avoidance – Spanning the Resource

Build Going Forward and Sides

NO Machinery

NO Machinery

Porous Asphalt Road Section

Artifact Zone

Artifact Zone

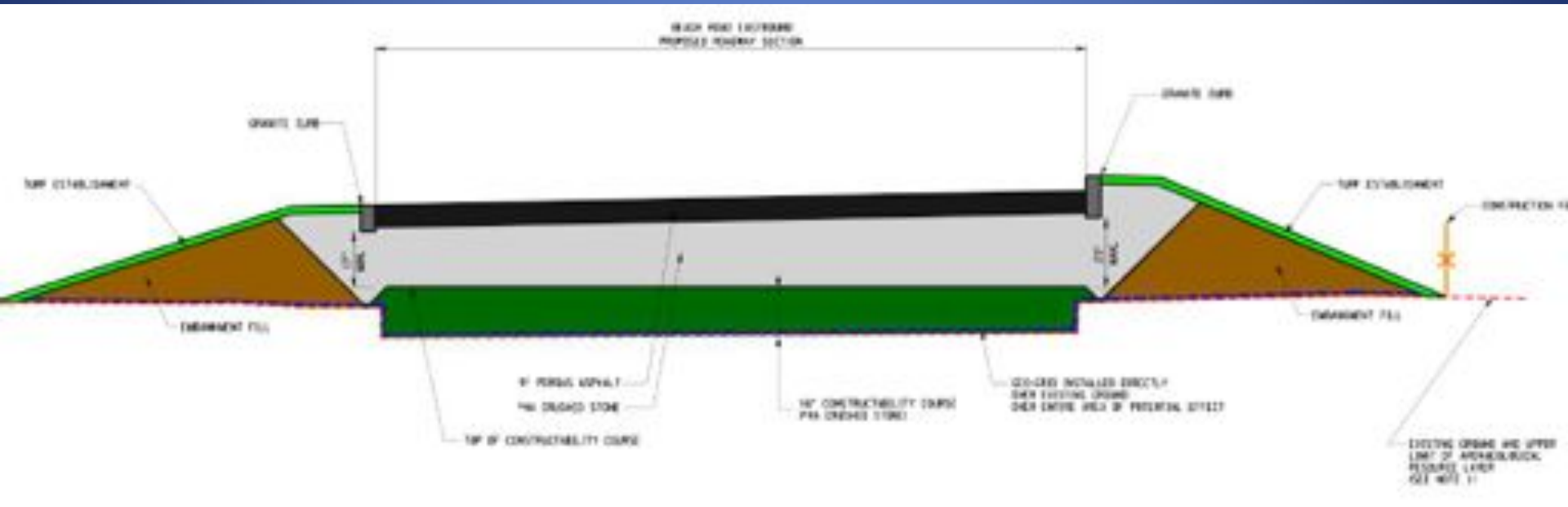
Geo-Grid

Environmental Challenges

Historic and Cultural Resources

Impact Avoidance – Spanning the Resource

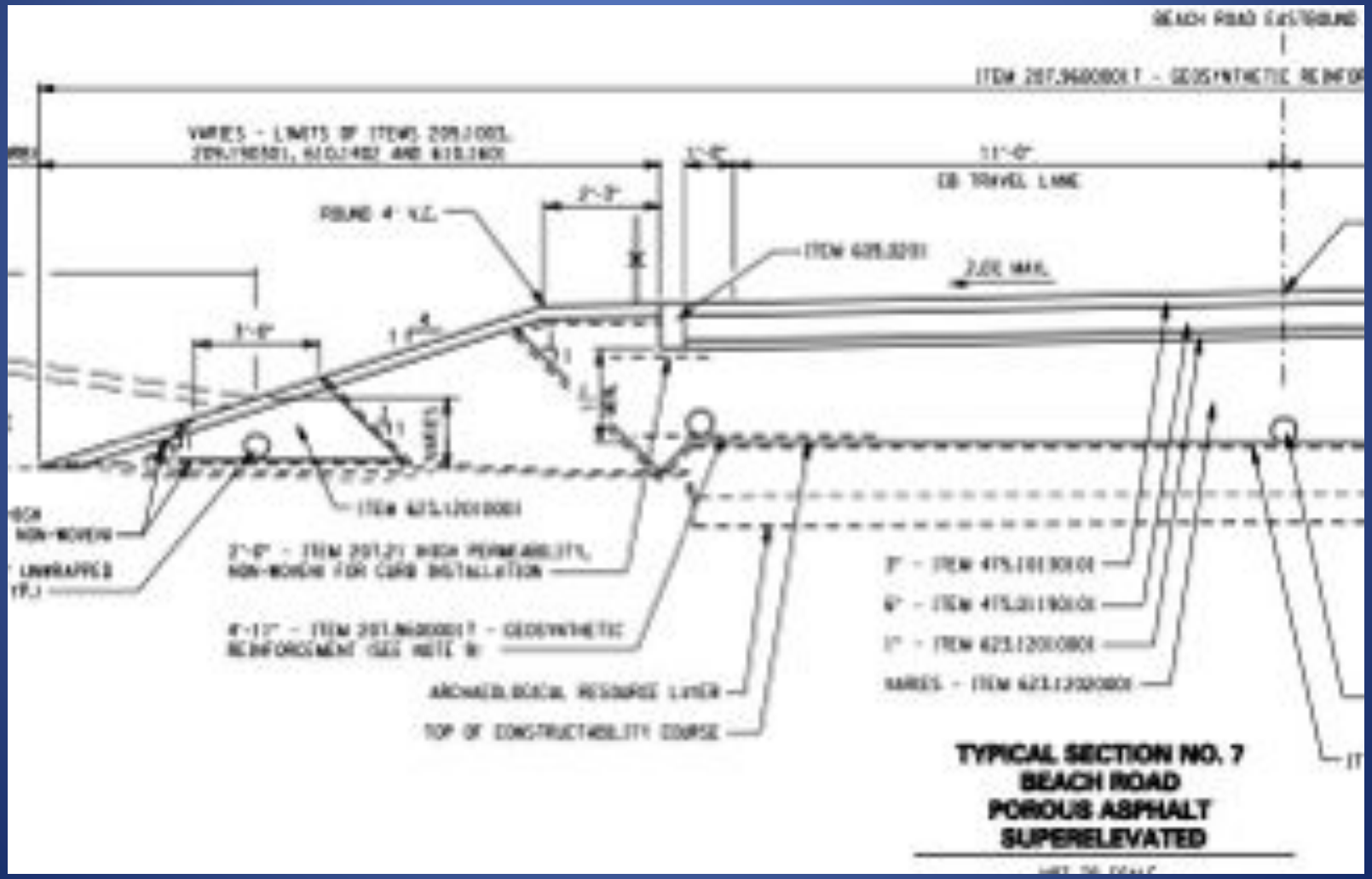
Federal Highway Administration – Section 106
SHPO, Native American Resources, NYS Museum



Environmental Challenges

Historic and Cultural Resources

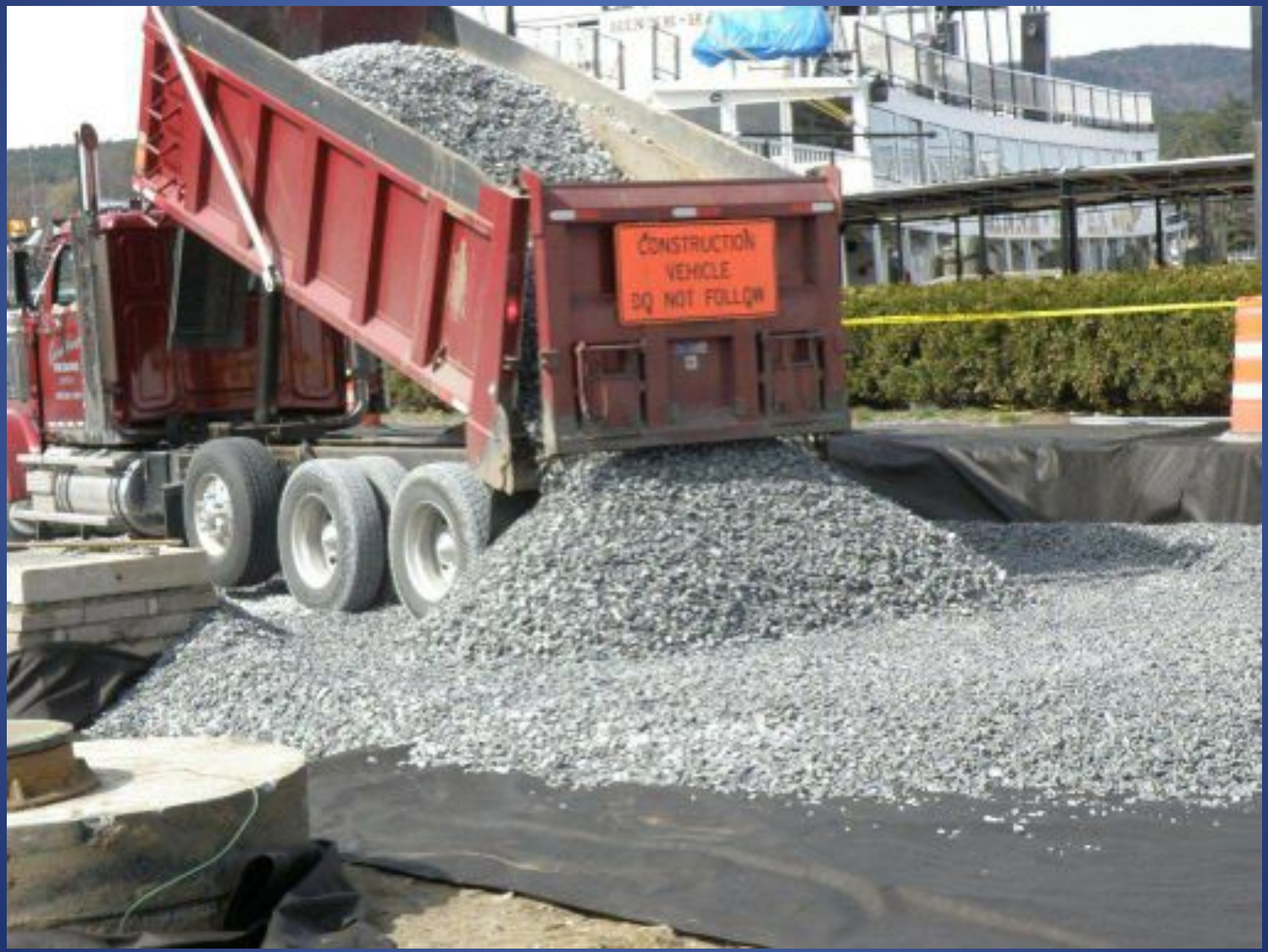
Impact Avoidance – Spanning the Resource



Use of Synthetic Materials

Use of Synthetic Materials

Use of Geotextiles

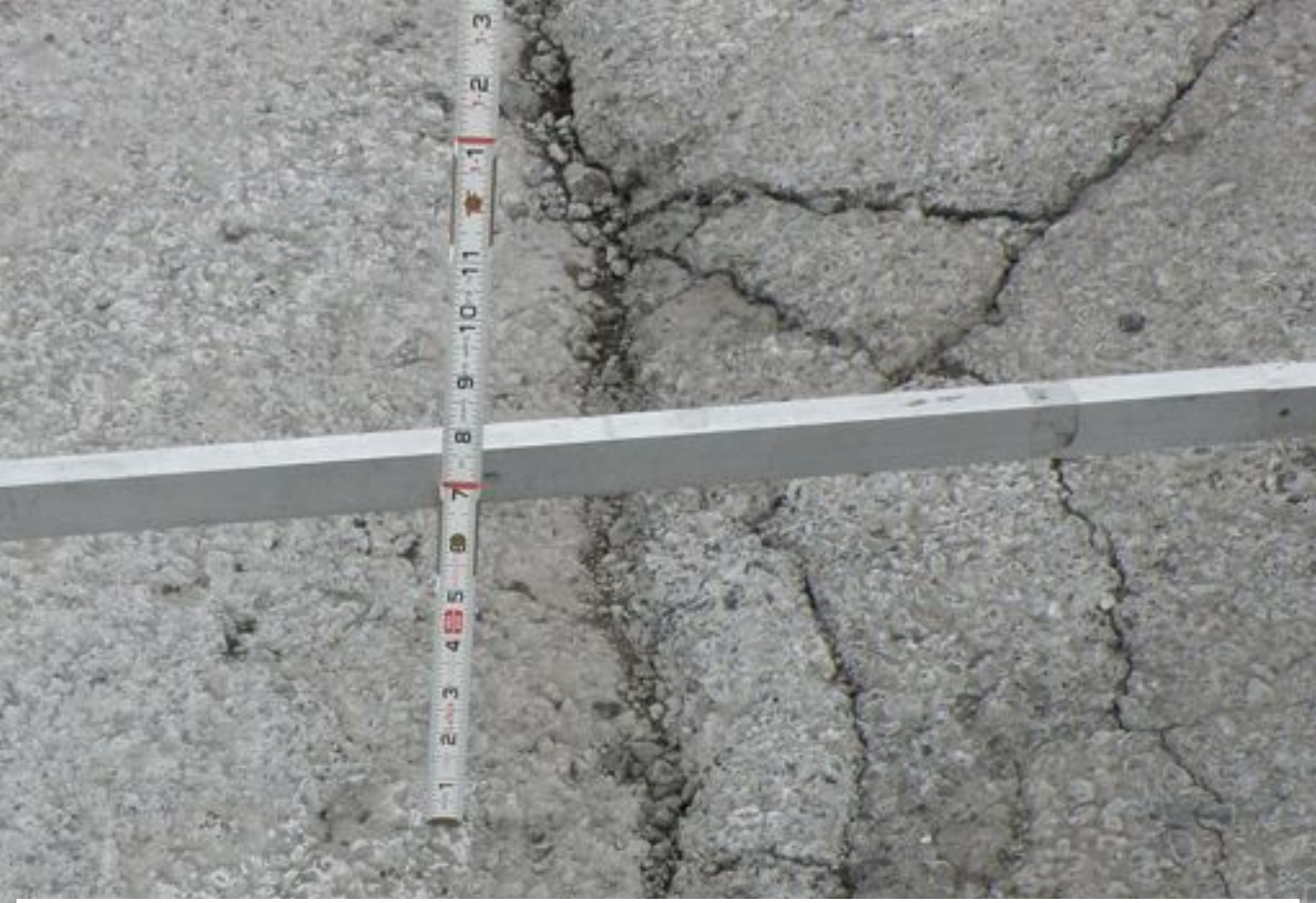


Geotextiles

SUNY Albany
August 2015

Frost Heave - 03/05/ 2015 – Project Specifics Unknown

Frost Heave - 03/05/ 2015 – Project Specifics Unknown



Frost Heave - 03/05/ 2015 – Project Specifics Unknown


Moving Forward
Frost Resistance
Beach Road – March 2015

Beach Road – March 2015

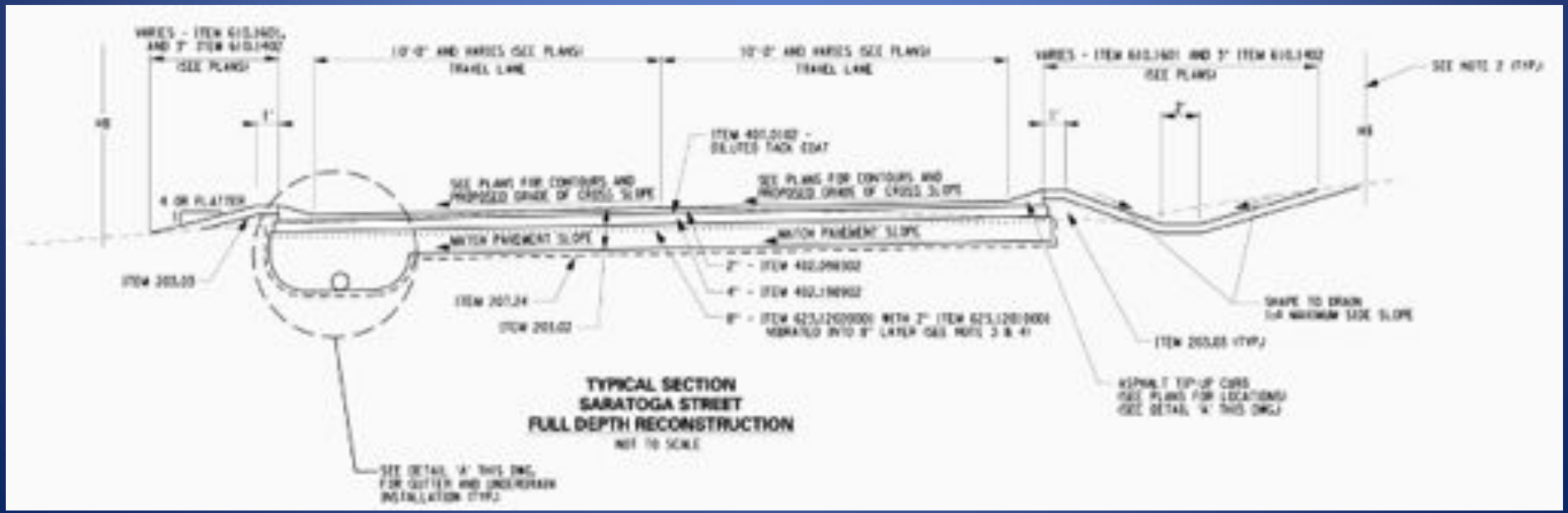
Beach Road – March 2015

Isolated location Beach Road Centerline Joint Close-up
No Action Necessary – March 2015

Conventional Pavement Section - East Side Beach Road
Frost depth = 5’+ (March 2015)

Village of Green Island

Village of Green Island



Village of Green Island

Green Island – November 17, 2015

Village of Green Island

Village of Green Island

Maintenance

Vacuum

~~Sweeping~~ Porous Pavement

Research demonstrates that vacuum sweepers are the best option when sweeping porous pavement

The use of porous pavement surfaces for parking lots, driveways, alleys, and footpaths as an effective best management practice to control stormwater runoff has been growing at a double digit rate in the United States in recent years. The long-term success of porous pavement systems to promote maximum water flow depends on proper installation, maintenance and cleaning practices – including regular sweeping with a pure vacuum sweeper.

Brian Giles, sweeper products manager at Elgin Sweeper, says Elgin has participated in various research programs with major universities and municipalities across the United States

porous subsurface. The blocks have a gap between them filled with loose, sandy filler which allows water to percolate through the gaps. Giles says the use of interlocking pavers is growing in the United States, especially in low-speed (under 45 mph) traffic and parking areas and in high-pedestrian areas.

Plugging

Porous asphalt, porous concrete, and interlocking paver block surfaces can all become plugged with fine debris – mixtures of silt and oils – that can stop the percolating action and negate the purpose of the system. The first step in retaining the porous nature of the surface is to prevent the buildup of these sediments.

If pavers are routinely cleaned, the depth of plugging can generally be limited to half an inch. The most effective way to restore the percolation of paver surfaces is to remove the top layer of granular filler that is contaminated. Clean filler is then reapplied.

Several industry studies have shown that both surface types will plug, to varying degrees, with silt, fine clay, cement derivatives, and decomposed plant material. Maintaining and cleaning porous pavement surfaces to prevent the buildup of these sediments requires a different approach than the one used for traditional pavement.

- Design Offsite Protection Systems into your project
- Maintain Vegetated Areas
- Vacuum 2 - 3 X / Year
- Slope Vegetated Areas Away from Roadway
- Use Sod to Establish Turf
- Education – Public and Municipal
- Deep Clean Promptly if Accident Occurs

Expect Continued Improvements in Maintenance Options and Equipment

Maintenance

Sweeping Porous Pavement

Questions ?

Thomas Baird, P.E.

Barton & Loguidice, D.P.C.

10 Airline Drive
Suite 200
Albany, NY 12205
(518) 218-1801

tbaird@bartonandloguidice.com

PDH Questions

- A Porous Pavement systems may **NOT** be advisable when:

a. It is Adjacent to a Contaminated soil site
b. Operating Speeds are over 45 mph
c. Proposed for use at a fueling station
d. Installed adjacent to a Desert
e. All of the Above

PDH Questions

- How many Acres of Porous Asphalt was Installed at the NYSDEC Lake George Beach

a. 11.0
b. 26.0
c. 3.0
d. 0.0

PDH Questions

- At what ambient air temperature range is it recommended to place and finish Porous Asphalt?

  a. 85 to 100 degrees Fahrenheit

  b. 30 to 40 degrees Fahrenheit

  c. 867 5309 Call Lorenzo

  d. 98.6 degrees Celsius

  e. 50 to 70 degrees Fahrenheit

PDH Questions

- Applying a Choker Course Can help you accomplish which of the following:
  - Get Arrested
  - Seal off the Lower layers
  - Win a Cage Fight
  - Stabilize the larger stone course or courses

PDH Questions

- True or False

  Geotextiles and other Geosynthetics require careful Attention to Detail for proper performance

PDH Questions

- The Pre-cast Porous Concrete Used was Cured for how many days before arriving on-site

a. 7 days
b. 2 days
c. 6 months
d. 28 days

PDH Questions

- True or False

- The lower the Asphalt Mix Temperature, The likelihood the project will have a higher quality Porous Asphalt.

PDH Questions

Name Two (2) Invasive Species Threatening Lake George

Zebra Mussel

Asian Clam

Chinese Mystery Snail

Spiny Water Flea