West Vancouver Freight Access Project

Project 03 Terminal 5

SPL Landfill Cap Construction Certification Report

August 2010

Prepared for:
Port of Vancouver
3103 NW Lower River Road
Vancouver, Washington 98660-1027

PORT OF VANCOUVER U.S.A.

Prepared by:
HDR Engineering, Inc.
1001 SW Fifth Ave, Suite 1800
Portland, Oregon 97204

HDR

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1.0 Introduction

As part of the West Vancouver Freight Access Project, the Port of Vancouver (Port) constructed a two-mile rail loop at Terminal 5 in 2010. This project extends west from Gateway Avenue to the edge of the contiguous Evergreen property and consists of a storage track, a car preparation track, and loop lead track (Figure 1). Construction of the loop lead track required disturbance of two areas protected under a restrictive covenant administered by the Washington Department of Ecology (Ecology): Spent Pot Liner (SPL) Landfill Storage Area and Vanexco Cap (Figure 1).

Prior to construction the Port coordinated with Ecology to design a replacement cap for each site. In October 2009, Ecology approved the final design of the replacement caps (Appendix A).This report documents the construction of the SPL landfill at Terminal 5 at the Port of Vancouver as required by the Ecology, and certifies that construction was in accordance with the plans, specifications, and Construction Quality Assurance (CQA) plan. Documentation of as-built drawings, test results, daily reports, and acceptance forms for the base grades and liner are included in Appendix B and C.

2.0 Background

The SPL landfill consists of an approximately 3.8 acre area that was initially covered with 1 to 2 feet of clean soil, a high-density polyethylene (HDPE) liner, and contaminated soil and crushed spent potliner below the liner. The HDPE liner, the crushed spent potliner, and all soil beneath the HDPE liner are Resource Conversation and Recovery Act (RCRA) and Chapter 173-303 of the Washington Administrative Code (WAC) hazardous waste that is designated as K088.

The Port performed sampling and analysis of the soils in May 2009 to ensure appropriate management of these soils during the construction of the rail and associated laydown area (HDR 2009a). The results of this sampling effort confirmed that soils remain K088 waste. No “contained in” determination was presented to Ecology. While the design originally planned for off-site disposal of soils, in the final design, it was determined that no soils would leave the site. The Port has prepared a Contaminated Media Management Plan to ensure safe and compliant management of these soils during construction (HDR 2009b).

The 1992 Consent Decree (Ecology 1992) required that the cap for the SPL Landfill be either a synthetic liner (40 mil PVC or 50 mil HDPE) covered with two feet of clean sand and topsoil including vegetation, or two feet of recompacted clay or other material with a permeability of no more than 1×10^{-6} cm/sec.

To mitigate the removal of the SPL cover, the Port proposed to replace the soil cover with an asphalt cap system. The cap system would consist of a minimum of two lifts of asphaltic concrete with an asphaltic cement-impregnated geotextile between lifts. Asphalt sections would include a 2.5 inch asphalt base below the geotextile, and a 5.5-inch thick asphalt above the geotextile. This represents a 2.5 inch cap layer plus a 3 inch wearing course. The final hydraulic conductivity of the asphalt would have a maximum permeability of 10^{-7} cm/sec, which provides equivalent or better protection than the requirements under the 1992 Consent Decree (no more than 10^{-6} cm/sec).

In addition to the design, a bench scale analysis of the proposed cap system was completed. The bench scale test measured hydraulic conductivity results for samples compacted to 91%, 94%, and 98% of theoretical density. Results of the testing indicated that the target hydraulic conductivity of $1\text{x}10^{-7}$ cm/sec can be achieved at all three of the target densities, and that there is a trend of decreasing hydraulic conductivity as asphalt density is increased. These results supported the final design (HDR 2009d).

This final construction design was submitted to Ecology in October 2009 (HDR 2009c) and subsequently approved by Ecology (Appendix A) prior to construction.

3.0 Construction Narrative

The proposed construction of the cap was reviewed in the Pre-Construction meeting held on February 16, 2010 with the General Contractor, Rotschy Inc., Port, City of Vancouver (COV), and HDR staff. Construction of the replacement cap began in March 2010 and was completed in April 2010. The entire 3.38 acre soil cover was replaced with asphalt. Approved submittals related to the materials of construction and construction methods are included in Appendix B as part if the Test Pad Construction Report and summarized in Table 1.

Table 1: Approved Submittals for SPL Landfill Cap Construction

Submittal Number	Description
18	Substitute TerraTex OL Asphalt Fabric for Propex Petromat 4599
30	¾" Hot Mix Asphaltic Concrete Mix Design
73	SPL Test Pad Area Work Plan for Test Pad Construction
83.2	TRI Environmental Testing Laboratory
108	Specification and Material Certification for PG-64-22 oil for paving fabric
118	Hot Oil Application Data Sheet

Minor modifications to plans and specifications to accommodate conditions in the field were proposed and approved by the COV, POV, and HDR. These modifications are provided in the as-builts in Appendix C and include:

- Request for Information (RFI) 22 which requested a change in the application of oil (tack coat) to both sides of the paving fabric was approved and subsequently the test pad passed/exceeded the specified hydraulic conductivity.
- Submittal 73 which requested the use of a vibratory roller to achieve Hot Mix Asphalt (HMA) compaction versus the pneumatic roller specified by the Washington State Department of Transportation (WSDOT) specifications for paving during the months of October through April.

Construction was observed by the HDR Construction Quality Assurance Monitor (CQAM). Construction consisted of the following elements and met the construction specifications:

- Subgrade material placement and compaction to meet the construction specification of 94% compaction. This specification was verified by the COV.
- Tensar Triaxial Geogrid was placed and consisted of rolling the material out over the compacted subgrade and covering with the surfacing base course. The Triaxial Geogrid was overlapped approximately 12 inches with the roll widths extending over the cap area. Three inches of surfacing base course was placed and compacted over the Triaxial Geogrid.

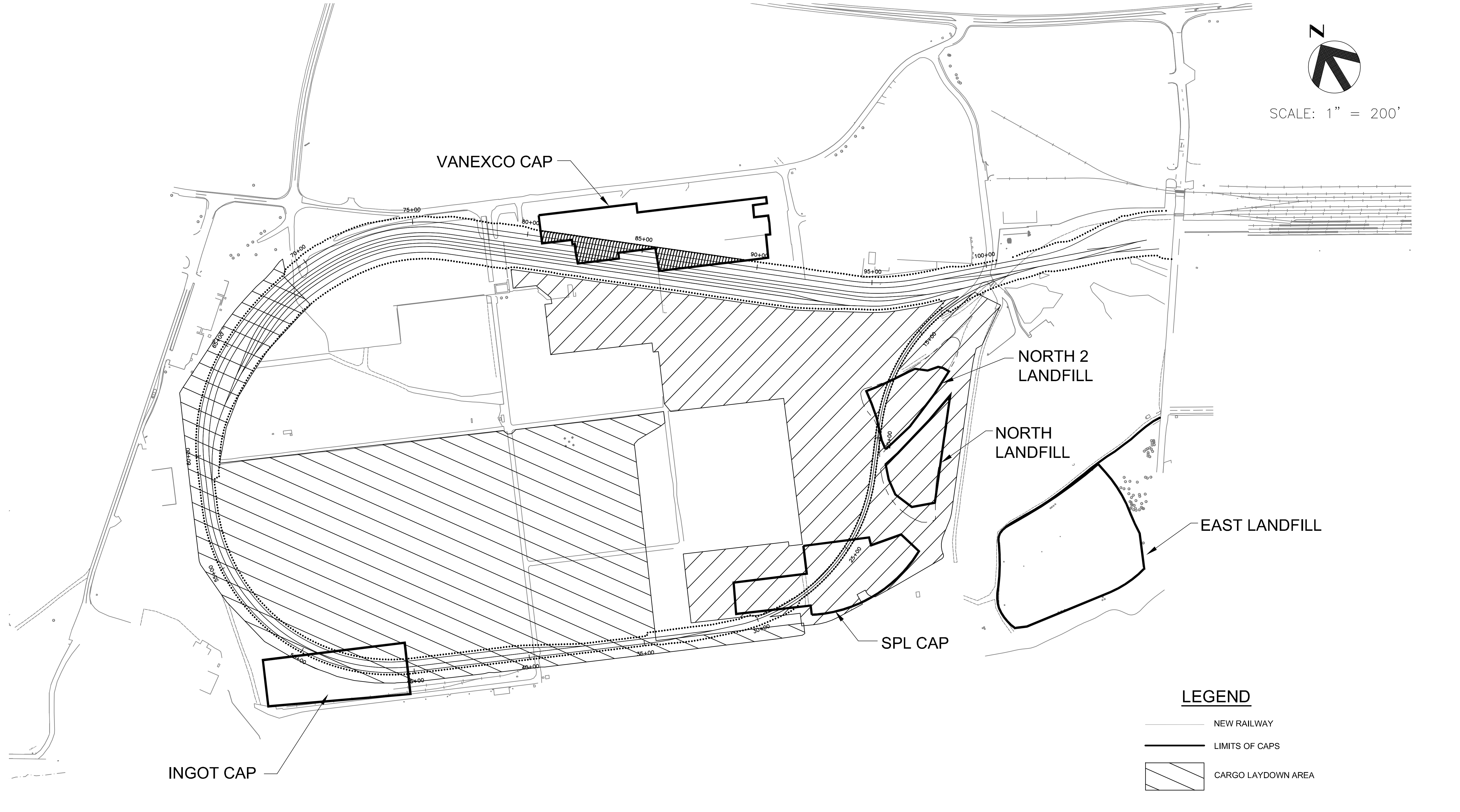
- ¾-inch PG-64-22 Level 3 hot mix asphalt (HMA) was placed over the subgrade. 2 ½-inch HMA was applied with a Blaw Knox PF 4410 with a Carlson Easy Screed. The HMA was then compacted with a HYPAC tandem-drum vibratory roller and a Volvo DD90 HF roller. Static rolling was applied in the forward rolling direction with vibratory rolling applied in the reverse rolling direction. HMA compaction was verified by roller pattern observation by the COV.
- A tack coat of PG-64-22 oil was then mechanically applied over the HMA base course. The tack coat was applied by a mechanical sprayer at a rate of 0.203 gallons per square yard. The application rate was verified by Vancouver Paving.
- TerraTex OL asphalt overlay fabric was placed over the tack coat using a roller system developed by Rotschy. Overlay fabric creases were either straightened out or cut to provide a smooth surface and panels were overlapped 2 feet.
- The ¾-inch Level 3 HMA was then placed over the fabric overlay. The 2 ½-inch HMA overlay was applied with a Blaw Knox PF 4410 with a Carlson Easy Screed. The HMA was then compacted with a HYPAC tandem-drum vibratory roller and a Volvo DD90 HF roller. Static rolling was applied in the forward rolling direct with vibratory rolling applied in the reverse rolling direction. HMA compaction was verified by the COV using ASTM D2950.

4.0 Conclusions

Construction of the SPL Landfill Cap was observed by HDR CQAM. The equipment used in construction met the specified requirements, and materials delivered to the site were in good condition. Based on the CQAM construction observations and the results of the hydraulic conductivity and density testing during Test Pad installation, the final SPL Landfill Cap was constructed in accordance with the design criteria, plans, and specifications, with the exception of the two modifications noted in Section 3. The constructed SPL Landfill Cap meets the $1x10^{-7}$ or greater hydraulic conductivity and meets the design requirements as approved by Ecology.

Kurt Reichelt, P.E.

HDR Project Manager



HDR

RAIL IMPROVEMENT FOOTPRINT SHOWING LANDFILL CAPS

DATE: MAY 2009

FIGURE: 1

5.0 References

(Ecology) Washington State Department of Ecology

1992 Consent Decree No. 92-2-00783-9. Washington State Department of Ecology, Olympia, Washington.

HDR Engineering, Inc.

2009a Environmental Investigation of the SPL Landfill, Port of Vancouver, Washington. July 13, 2009. Portland, Oregon.

2009b. Contaminated Media Management Plan, Terminal 5, Port of Vancouver, Washington. July 31, 2009. Portland, Oregon.

2009c. Final Request for Review and Approval of Disturbance of Landfills on Former Alcoa/Evergreen Properties. October 15, 2009. Portland, Oregon.

2009d. Memo to Patty Boyden and Jessi Belston, Port of Vancouver: Re SPL Cap Bench Scale Asphalt Testing Results. August 31, 2009.

APPENDIX A

Ecology Approval of Final Request for Review and Approval of Disturbance of Landfills on Former Alcoa/Evergreen Properties

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

October 21, 2009

Ms. Patty Boyden
Director of Environmental Services
Port of Vancouver
3103 NW Lower River Rd.
Vancouver, WA 98660

Re: Review of Terminal 5 Rail Improvement Engineering.

Dear Ms. Boyden:

Ecology has reviewed the October 15, 2009 Terminal 5 Improvements - Final Request for Review and Approval of Disturbance of Landfills on Former Alcoa/Evergreen Properties work plan for the former Alcoa/Evergreen smelter facility. The site is located on the former Alcoa/Evergreen aluminum smelter west of Vancouver, WA. The Terminal 5 rail improvements consist of a two-mile rail loop that will traverse four of five covered areas on the site. These affected areas are known as: Vanexco Cap, Ingot Cap, North and North2 landfills, and Spent Potliner NPL site cap. Ecology received and commented on the draft work plan on July 15, 2009 by e-mail. The final work plan is the result of the July review.

The October 15, 2009 Final Request for Review and Approval of Disturbance of Landfills on Former Alcoa/Evergreen Properties is approved as submitted in the October 15 document. The revised document fulfills the requirements of the MTCA consent decrees that regulate the four areas. The Port of Vancouver is approved to begin work at the site once local permits are final.

We look forward to visiting the site once construction has begun. If you have any questions regarding the approval of the work plan, please contact me in Lacey (360) 407-6949 or psky461@ecy.wa.gov.

Sincerely,

Paul Skyllingstad

Paul Skyllingstad
Industrial Section

Cc: B. Morson - HDR
M. Stiffler - Alcoa

APPENDIX B

Test Pad Construction Report

West Vancouver Freight Access Project

Project 03 Terminal 5
Spent Pot Liner Test Pad Construction Report

May 6, 2010

Prepared for:
Port of Vancouver
3103 NW Lower River Road
Vancouver, Washington 98660-1027

Prepared by:
HDR Engineering, Inc.
1001 SW Fifth Ave, Suite 1800
Portland, Oregon 97204

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1.0 Introduction

This report documents the construction of the Spent Pot Liner (SPL) Asphalt Cap Test Pad as presented in the SPL Asphalt Cap Test Pad Protocol, HDR Engineering (HDR) dated July 30, 2009 (Attachment A). The SPL Asphalt Cap Test Pad Protocol proposes the construction of an asphalt cap over the SPL Cap (3.8 acres) that contains contaminated soils. The cap consists of a layer of asphalt overlain by an asphalt-impregnated geotextile (a combination of non-woven polypropylene fabric and asphalt cement tack coat) overlain by a second layer of asphalt. The fabric and tack coat combination form an asphalt membrane interlayer within the pavement section. The purpose of the test pad is to verify the results, under field conditions, of the bench scale testing of the asphalt section (Attachment B).

2.0 Test Pad Objectives

The test pad objectives for the SPL Asphalt Cap are:

- To verify that the materials and methods of construction will produce an asphalt liner that meets the target hydraulic conductivity for the project. The target hydraulic conductivity for the test pad section is $1x10^{-7}$ cm/sec, or less.
- To establish a correlation between the bench scale testing and full-scale testing. If the test pad meets the performance objectives for the cap (as verified by hydraulic conductivity and density tests) and the full-scale liner is constructed to density standards that equal or exceed those used in building the test pad, then assurance is provided that the full-scale liner will also meet hydraulic conductivity performance objectives.

3.0 Construction Narrative

The test pad was constructed on March 4, 2010 by Vancouver Paving a subcontractor of Rotschy Inc., the General Contractor for this project. As required by the SPL Test Pad Protocol, Rotschy Inc. prepared the SPL Test Pad Construction Plan which detailed the methods and techniques for constructing the SPL Test Pad. The Plan was reviewed and approved by the City of Vancouver (COV), Port of Vancouver (POV), and HDR. The Plan was also reviewed in the Pre-Construction meeting held on February 16, 2010. Approved submittals related to the materials of construction and construction methods are listed in Table 1 and are included in Attachment C.

Table 1: Approved Submittals for SPL Test Pad Construction

Submittal Number	Description
18	Substitute TerraTex OL Asphalt Fabric for Propex Petromat 4599
30	¾" Hot Mix Asphaltic Concrete Mix Design
73	SPL Test Pad Area Work Plan for Test Pad Construction
83.2	TRI Environmental Testing Laboratory
108	Specification and Material Certification for PG-64-22 oil for paving fabric
118	Hot Oil Application Data Sheet

Construction was observed by the HDR Construction Quality Assurance Monitor (CQAM). Construction consisted of the following elements:

- Subgrade material placement and compaction to meet the construction specification of 94% compaction. This specification was verified by the COV (Attachment D). The subgrade was tested in 19 separate locations and all test locations met or exceeded the 94% compaction specification. The overall dimension of the test pad is 28 feet wide and 200 feet long for a total area of 6,000 square feet.
- Tensar Triaxial Geogrid was placed on February 23, 2010. Placement of the Triaxial Geogrid consisted of rolling the material out over the compacted subgrade and covering with the surfacing base course. The Triaxial Geogrid was overlapped approximately 12 inches with the roll widths extending over the test pad area. Three inches of surfacing basecourse was placed and compacted over the Triaxial Geogrid.
- On March 4, 2010 the ¾-inch PG-64-22 Level 3 hot mix asphalt (HMA) was placed over the subgrade. The 2 ½-inch HMA was applied with a Blaw Knox PF 4410 with a Carlson Easy Screed with a panel width of 14 feet. The HMA was then compacted with a HYPAC tandem-drum vibratory roller and a Volvo DD90 HF roller. Static rolling was applied in the forward rolling direction with vibratory rolling applied in the reverse rolling direction. HMA compaction was verified by roller pattern observation by the COV.
- A tack coat of PG-64-22 oil was then mechanically applied over the HMA base course. The tack coat was applied by a mechanical sprayer at a rate of 0.203 gallons per square yard. The application rate was verified by Vancouver Paving based on the test shot and gallons of PG-64-22 applied to the HMA base course.
- TerraTex OL asphalt overlay fabric was placed over the tack coat using a roller system develop by Rotschy. Overlay fabric creases were either straightened out or cut to provide a smooth surface. The overlap fabric rolls were 12.5 feet wide and overlapped 2 feet.
- The ¾-inch Level 3 HMA was then placed over the fabric overlay. The 2 ½-inch HMA overlay was applied with a Blaw Knox PF 4410 with a Carlson Easy Screed with a panel width 14 feet. The HMA was then compacted with a HYPAC tandem-drum vibratory roller and a Volvo DD90 HF roller. Static rolling was applied in the forward rolling direct with vibratory rolling applied in the reverse rolling direction. HMA compaction was verified by the COV using ASTM D2950 (Attachment E). Six density tests were performed at different locations on the paved panels with percent compactions ranging from 92.8% to 95%. The average compaction density was 93.7% meeting the Washington State Department of Transportation (WSDOT) specification of 92%.

Construction of the SPL Test Pad is documented in the photographs presented in Attachment F.

4.0 Materials Testing

HDR obtained core samples for hydraulic conductivity testing on March 5, 2010. Three 12 inch by 12 inch core samples were cut from the west end of the SPL test pad using a cut-off saw. Sample ID 1 is from the first overlay fabric, base HMA and HMA overlay. Sample ID 2 is from the second overlay fabric, base HMA and HMA overlay. Sample ID 3 is form the overlay fabric overlap, base HMA and HMA overlay. The samples were sent for hydraulic conductivity analysis by ASTM D5084 to TRI Environmental Laboratory in Austin, TX (Attachment G). HDR specified that the testing must be performed with 70 kPa confining pressure with the sides of the core samples treated with silicone vacuum grease or bentonite paste to reduce sidewall leakage. Three inch diameter cores were taken from the 12 inch by 12 inch samples for testing. Hydraulic conductivity test results are provided in Table 2.

Table 2: Hydraulic Conductivity Test Results

Submittal Number	Analysis Result	Analysis Result
Test Pad required hydraulic conductivity	$1x10^{-7}$	.000001
Sample ID 1	1.5E-08	.000000015
Sample ID 2	1.1E-08	.000000011
Sample ID 3	1.1E-08	.000000011

Six 3 inch core samples were taken on March 17, 2010 and sent for density testing to the COV using method ASTM 2950 (Attachment F). Core samples were collected from each side of the 12 inch by 12 inch cores samples taken for hydraulic conductivity testing. The samples were split to test each lift of HMA. Density testing results are presented Table 3.

Table 3: Density Testing Results

Core Sample Identification	Core Density	Percent Compaction
North 1 Top	149.98	96.4
North 1 Bottom	146.47	94.2
North 2 Top	146.49	94.2
North 2 Bottom	143.43	92.2
Middle 1 Top	149.21	96.0
Middle 1 Bottom	145.43	93.5
Middle 2 Top	149.23	96.0
Middle 2 Bottom	148.72	95.6
South 1 Top	146.35	94.1
South 1 Bottom	147.14	94.6
South 2 Top	145.97	93.9
South 2 Bottom	147.35	94.8

The densities achieved in the Bench Scale Testing were 91%, 94% and 98%. Hydraulic conductivity of $1x10^{-7}$ was achieved at all of these densities. Comparison of the Bench Scale Testing results to the core densities from the SPL Test Pad indicates that all SPL Test Pad densities are comparable to the Bench Scale Testing.

5.0 SPL Test Pad Construction Analysis

Construction of the SPL Test Pad was observed by HDR CQAM. The CQAM noted that the construction was performed in general compliance with design criteria, plans and specifications. The equipment used in construction met the test requirements and materials delivered to the site were in good condition. The samples taken from the SPL Test Pad were in general accordance with the ASTM methodology and procedures. The CQAM verified that the SPL Test Pad was constructed in accordance with plans and specifications with no noted deviations.

Based on the CQAM construction observations and the results of the hydraulic conductivity and density testing, the SPL Test Pad was constructed in accordance with the design criteria, plans and specifications. SPL Test Pad core sample results indicate that $1x10^{-7}$ hydraulic conductivity was achieved in two test panels and the panel overlap. Density test results were within those achieved in the Bench Scale Study. These testing results strongly correlation with the Bench Scale Study Results and SPL Test Pad results and this construction technique applied over the existing SPL Cap should provide $1x10^{-7}$ or greater hydraulic conductivity. No deviations from the project documents were noted other than the following which were approved by the POV, COV, and HDR: 1) RFI 22 which requested a change in the application of oil (tack coat) to both sides of the paving fabric which was approved and subsequently the test pad passed/exceeded the specified hydraulic conductivity; and, 2) Submittal 73 which requested the use of a vibratory roller to achieve HMA compaction versus the pneumatic roller specified by the WSDOT specifications for paving during the months of October through April.

Kurt Reichelt, P.E.

HDR Construction Quality Assurance Engineer

WASHINGTON REGISTERED PROFESSIONAL ENGINEER
KURT W. REICHELT
35550
12/2/11

ATTACHMENT A

SPL Asphalt Cap Test Pad Protocol

PORT OF VANCOUVER
SPL ASPHALT CAP TEST PAD PROTOCOL
VANCOUVER, WASHINGTON

PREPARED FOR:
Port of Vancouver

PREPARED BY:
HDR ENGINEERING, INC.
Omaha, Nebraska

July 30, 2009

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1. Introduction

The Port of Vancouver, Washington proposes to place an asphalt cap over the SPL Cap (3.8 acres) that contains contaminated soils. The cap will consist of a layer of asphalt overlain by an asphalt-impregnated geotextile (a combination of non-woven polypropylene fabric and asphalt cement tack coat) overlain by a second layer of asphalt. The fabric and tack coat combination will form an asphalt membrane interlayer within the pavement section. Additional asphalt layers will be required for structural design purposes, but are not included in this protocol. The purpose of the test pad is to verify the results, under field conditions, of bench scale testing of the asphalt section.

2. Test Pad Objectives

1. To verify that the materials and methods of construction will produce an asphalt liner that meets the target hydraulic conductivity for the project. The target hydraulic conductivity for the test pad section is $1x10^{-7}$ cm/sec, or less.

2. To establish a correlation between the bench scale testing and full-scale testing. If the test pad meets the performance objectives for the cap (as verified by hydraulic conductivity and density tests) and the full-scale liner is constructed to density standards that equal or exceed those used in building the test pad, then assurance is provided that the full-scale liner will also meet hydraulic conductivity performance objectives.

3. Test Pad Protocol

3.1 Definitions

Construction Quality Assurance (CQA) Engineer: The owner's representative responsible for verification of the construction methods and materials to project plans, specifications, and protocols.

Construction Quality Assurance Monitor: The individual responsible for observation and documentation of construction under the supervision of the CQA Engineer.

3.2 Test Pad Dimensions

The test pad shall be constructed to the minimum compaction as determined by the Bench Scale Protocol, References 2 and 3. Details of construction shall be proposed by the Contractor and approved by the CQA Engineer. The configuration of the test pad shall conform to the following criteria:

1. The lane width must be sufficient to allow the specified compaction equipment to operate without overlapping the drum into the ballast and introducing ballast material into the asphalt.

2. The lane length must be sufficient to allow the compaction equipment to reach its design operating speed.

3. Lanes must be adequately separated to ensure that each lift can be compacted to the desired relative compaction.

4. The test pad shall be constructed in two lifts with a minimum compacted thickness of 2.5 inches per lift. An asphalt-impregnated geotextile shall be placed between the asphalt lifts.

3.3 Materials and Construction

All materials and methods used in the construction of the test pad shall conform to the project specifications, the Bench Scale Testing Protocol (HDR, 2009b), and the Bench Scale Test Final Report (HDR, 2009c). The methods, materials and equipment used in successful completion of the test pad shall be used in construction of the Cap. Each lift of each lane shall be compacted using the same equipment, operating speed and number of passes. The lower lift of the test pad shall provide a smooth surface, with consistent texture and free of irregularities. The lift must be constructed and finished to provide continuous intimate contact with the overlying geotextile. Adequate geotextile shall be left exposed along the ends and sides of the pad to allow incorporation of the pad into the final cap, if the cap section meets the hydraulic conductivity specification.

3.4 Test Pad Construction Observation

Full time observation of subgrade preparation is not required. The CQA Monitor shall document and observe proof-rolling and density testing of the subgrade. The CQA monitor shall observe the completed placement of the recycled concrete. Observations shall be documented in daily reports. Full-time observation and documentation of the placement of the asphalt and asphalt impregnated geotextile is required. The number of passes of the compactor over each lane shall be documented. Daily field reports will note observations and any deviations from the plans, specifications, and this protocol.

3.5 Required Tests

The tests listed in Table 1 are required to evaluate the hydraulic conductivity of the test section and its ability to control infiltration. At the owner's request, additional testing may be performed per WSDOT test pad requirements to verify the structural suitability of the section.

Table 1: Required Tests

Material Tested	Parameter	Frequency	Test method
Subgrade	Placement and compaction	Full coverage	Visual observation
Subgrade density testing	Placement and compaction	2 per lane	ASTM D2922
Crushed Concrete Base	Placement and compaction	2 per lane	ASTM D2922
Hot Mix Asphalt	Mix Design	1 per mix	Submittal review
Geotextile Interlayer	Strength and retention properties	Bracketed by manufacturer's quality control testing	Verification of manufacturer's QC
Geotextile Interlayer	Retention properties	Full coverage	Observation
Asphalt	Compaction	3 per lane per lift	ASTM D2950
Asphalt and Geotextile Interlay	Hydraulic conductivity	2 representing the range of compaction	Modified ASTM D-5084[1]

[1] 70kPa confining pressure, sides of core treated with silicone vacuum grease or bentonite paste to reduce sidewall leakage.

3.6 Deviations from this Protocol

The CQA Engineer may propose deviations from the protocol, if warranted by the results of the bench scale testing. Deviations proposed by the Contractor to more efficiently utilize available machinery may also be considered, if the machinery will be used in full-scale construction as well. Proposed deviations must be provided to and approved by the Port of Vancouver prior to submittal to the Washington Department of Ecology (WDOE). Once submitted to the WDOE, an approval in writing from the WDOE must be obtained and provided to the Port of Vancouver 5 days before construction of the test pad begins.

4. Documentation and Recommendations

Test pad construction shall be documented in a written report, sealed by the CQA Engineer. The report shall include at a minimum:

- Construction narrative detailing methods, materials and equipment used
- Construction daily reports documenting activities and noting deviations from the project plans,
- Specifications and this protocol
- Test results and a statement that the test pad was constructed in substantial accordance with the project documents.
- Deviations from the project documents shall also be noted in the report.

The report shall be submitted to the Port of Vancouver 5 days prior to construction of the SPL replacement cap.

5. References

HDR, 2009a. *Contract Provisions and Plans for Construction of West Vancouver Freight Access Project Terminal 5 Unit Train Improvements*. August 2009.

HDR, 2009b. *Port of Vancouver SPL Landfill Asphalt Cap Bench Scale Testing Protocol*. July 2009.

HDR, 2009c. *Final Report for Port of Vancouver SPL Landfill Asphalt Cap Bench Scale Testing Protocol*. August 2009.

ATTACHMENT B

SPL Landfill, Asphalt Cap Bench Scale Testing Protocol

ONE COMPANY
Many Solutions℠

Memo

To:	Patty Boyden, Port of Vancouver Jessi Belston, Port of Vancouver		
From:	Ted Alexander, HDR	Project:	WVFA Project Port of Vancouver, Washington
CC:	Scott Hale, HDR Greg Shafer, HDR Bruce Larsen, HDR		
Date:	August 31, 2009	Job No:	98539

RE: SPL Cap Bench-Scale Asphalt Testing Results

The bench scale testing results (see attached) includes measured hydraulic conductivity results for samples compacted to 91%, 94% and 98% of theoretical density. Results of the testing indicate that the target hydraulic conductivity of $1x10^{-7}$ cm/sec can be achieved at all three of the target densities, and that there is a trend of decreasing hydraulic conductivity as asphalt density is increased. In the bench scale tests, the asphalt pills were "glued together by the asphalt cement with only hand pressure to distribute the asphalt cement and press the textile into contact with the asphalt samples. It is possible that the measured hydraulic conductivities in the test pad will be substantially lower than the laboratory measurements. In the field, the upper layer of asphalt will be compacted over the lower layer and the textile, which may result in a more intimate contact between the textile and the asphalt, as well as a more uniform distribution of the asphalt cement within the textile.

The protocol allows deviation from established test pad construction procedures if warranted by the results of the bench scale testing. Given the results of the bench-scale tests, construction of the asphalt test pad can proceed as outlined in the Asphalt Full Scale Test Pad Protocol (July 2009).

Cal-Tech Testing, Inc.
• Engineering
• Geotechnical
• Environmental
LABORATORIES

P.O. Box 1625 • Lake City, FL 32056 Tel (386) 755-3633 • Fax (386) 752-5456
4784 Rosselle Street • Jacksonville, FL 32254 Tel (904) 381-8901 • Fax (904) 381-8902

August 26, 2009

HDR Engineering, Inc.
200 West Forsyth Street, Suite 800
Jacksonville, Florida 32202

Attention: Mr. Ted Alexander, P.E.

Reference: SPL landfill, Asphalt Cap Bench Scale Testing Protocol
Port of Vancouver
Cal-Tech Project No. 09-00233-01

Dear Mr. Alexander:

On June 1, 2009 Cal-Tech Testing (CTI) received a request via e-mail to provide bench scale testing per a written Protocol (the Protocol) prepared by HDR Engineering, revised and finalized July of 2009 and received by CTI on July 20, 2009. We understand that our scope of services consists of preparing eighteen (18) asphalt specimens in general accordance with the Materials and Density Testing of Samples sections of the attached Protocol. These pills were prepared and blended in accordance with the approved mix design (attached). Each of these gyratory compacted samples were cored through the approximate center to extract a 2¾-inch diameter specimen. The specimens were then saw-cut (using a wet saw) on both ends to produce 2½-inch high pills for use in the permeameters.

For each permeability test sample, two of the 2¾"-diameter by 2½"-high pills were bonded together by means of two layers of tack-coat separated by a layer of Petromat® PV-4599 geotextile fabric manufactured by PROPEX. The geotextile was placed smooth-face down. With each face coated with tack, a rate of about ±0.20 gal/yd^2 was applied. The coated geotextile was placed between the two cored samples to create a bonded 2-layer 2¾"-diameter 5"-high specimen to be tested for hydraulic conductivity. Human pressure was applied to align and join the two specimens. The side face of the hydraulic conductivity specimens were treated with silicon vacuum grease (the top and bottom were not treated).

The nine (9) hydraulic conductivity specimens were then placed in the permeameters and tested in general accordance with ASTM D-5084. The following table summarizes our laboratory test results:

Sample ID	% Theoretical Max. Specific Gravity, Gmm (AASHTO T 209)	Unit Weight (AASHTO T 312) (pcf)	Hydraulic Conductivity (ASTM D 5084) (cm/sec)
91-1-Top	91.1	144.9	$6.213x10^{-8}$
91-1-Bottom	91.0	144.8	
91-2 Top	91.1	144.9	$6.518x10^{-8}$
91-2 Bottom	91.0	144.8	
91-3-Top	91.1	144.9	$3.393x10^{-8}$
91-3-Bottom	91.5	145.6	
94-1-Top	94.1	149.7	$2.844x10^{-8}$
94-1-Bottom	94.2	149.9	
94-2-Top	94.2	149.9	$3.270x10^{-8}$
94-2-Bottom	94.2	149.9	
94-3-Top	93.7	149.1	$3.426x10^{-8}$
94-3-Bottom	94.1	149.7	
98-1-Top	97.8	155.6	$1.746x10^{-8}$
98-1-Bottom	97.7	155.5	
98-2-Top	98.0	155.9	$1.613x10^{-8}$
98-2-Bottom	97.9	155.8	
98-3-Top	97.6	155.3	$1.708x10^{-8}$
98-3-Bottom	97.8	155.6	

We appreciate the opportunity to be of service on this project and look forward to a continued association. Should you have questions concerning this report or if we may be further service, please contact this office.

Respectfully submitted,
Cal-Tech Testing, Inc.

8/26/09

Nabil O. Hmeidi, P.E.
Senior Geotechnical Engineer
Licensed, Florida No. 57842

David B. Brown
Executive Vice President

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STATEMENT OF SOURCE OF MATERIALS AND JOB MIX FORMULA FOR BITUMINOUS CONCRETE

SUBMIT TO THE STATE MATERIALS ENGINEER, CENTRAL BITUMINOUS LABORATORY, 5007 NORTHEAST 39TH AVENUE, GAINESVILLE, FL 32609

Project No. ______ CTQP Qualified Mix Designer Richard Godbold

Contractor ______ Address ______

Phone No. ______ Fax No. ______ E-mail ______

Submitted By Cal-Tech Testing, Inc. Type Mix ______ Intended Use of Mix ______

Submitter Mix ID. 09-233;12398

TYPE MATERIAL	F.D.O.T. CODE	PRODUCER	PIT NO.	DATE SAMPLED
1. #67 Stone	42	Junction City Mining, L.L.C.	GA-553	07 / 30 / 2007
2. #78 Stone	44	Martin Marietta Aggregates	NS-315	07 / 30 / 2007
3. #89 Stone	54	Martin Marietta Aggregates	NS-315	07 / 30 / 2007
4. W-10 Screenings	21	Martin Marietta Aggregates	GA-383	07 / 30 / 2007
5. M-10 Screenings	22	Martin Marietta Aggregates	GA-383	07 / 30 / 2007
6. Sand		Duval Asphalt Products	Gunner	07 / 30 / 2007
7. PG 76-22				07 / 30 / 2007

PERCENTAGE BY WEIGHT TOTAL AGGREGATE PASSING SIEVES

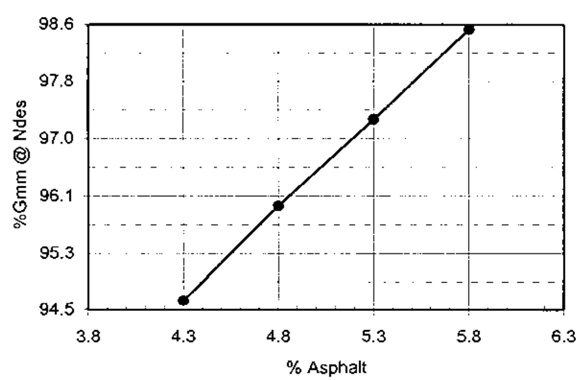
	Blend	18%	15%	12%	20%	20%	15%	JOB MIX	CONTROL	
	Number	1	2	3	4	5	6	FORMULA	POINTS	
S	3/4" 19.0mm	100	100	100	100	100	100	100	90 - 100	
I	1/2" 12.5mm	59	83	100	100	100	100	90	- 90	
E	3/8" 9.5mm	27	59	94	100	100	100	80		
V	No. 4 4.75mm	2	7	40	100	100	100	61		
E	No. 8 2.36mm	1	2	12	59	71	100	43	23 - 49	
	No. 16 1.18mm	1	1	5	44	47	95	33		
S	No. 30 600μm	1	1	4	25	35	87	26		
I	No. 50 300μm	1	1	3	16	27	50	17		
Z	No. 100 150μm	1	1	2	7	20	17	9		
E	No. 200 75μm	1.0	1.0	1.0	5.0	14.0	3.0	4.7	2 - 7	
S	G_{SB}	2.808	2.627	2.625	2.725	2.735	2.626	2.699		

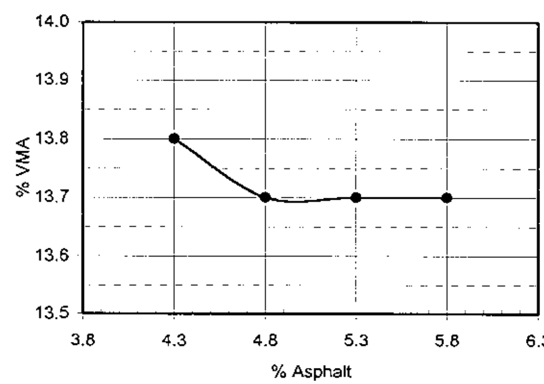
Optimum Asphalt = 4.8
Viscosity of M.M. = ______
AC in M.M. = ______

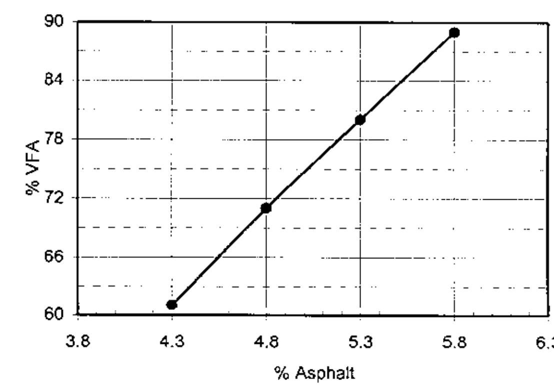
HOT MIX DESIGN DATA SHEET

09-233;12398

P_b	G_{mb} @ N_{des}	G_{mm}	V_a	VMA	VFA	P_{be}	$P_{0.075}/P_{be}$	$\%G_{mm}$ @ N_{ini}	$\%G_{mm}$ @ N_{max}
4.3	2.432	2.570	5.4	13.8	61	3.6	1.3	87.7	95.7
4.8	2.448	2.550	4.0	13.7	71	4.1	1.1	89.0	97.0
5.3	2.460	2.530	2.8	13.7	80	4.6	1.0	90.2	98.2
5.8	2.473	2.510	1.5	13.7	89	5.1	0.9	91.5	99.5







Total Binder Content 4.80 %

Lab. Density 152.8 Lbs/Ft³ 2448 Kg/m³

VMA 13.7 %

FAA 45 %

$\%G_{mm}$ @ N_{des} 96.0

NCAT Oven Calibration Factor 0.00

(+To Be Added)/(-To Be Subtracted)

Mixing Temperature 325 °F 163 °C

Compaction Temperature 325 °F 163 °C

Additives ______ % ______ %

ATTACHMENT C

Submittals

Submittal 18

SUBMITTAL TRANSMITTAL / SOURCE APPROVAL

Port of Vancouver USA

FROM: Rotschy, Inc
9210 NE 62nd Ave
Vancouver, Washington 98665

DATE: 12/01/2009

Resubmittal ☐
Previous Submittal No.

This section to be completed by COV:
Submittal No. 18

TO: CONSTRUCTION MANAGER
3103 NW Lower River Road
Vancouver, Washington 98660

PROJECT: Terminal 5 Unit Train Improvements
CP0144

This section to be completed by contractor:

Bid Item Number(s)	Drawing Sheet No.	Description - Manufacturer's Specific Product*	Type** Code	Local Supplier	Manufacturer / Brand / WSDOT Pit #	Review Action	Notes
96	29 & 30	TerraTex OL Asphalt Overlay Fabric meets the requirements listed on F-71 as is an exact	A,B	Hanes Geotextile; Puyallup Wa	Hanes Geo; Salem NC	3	Manufacter MARV Cert Required
		equal to Propex (same mill, same material, different label). See attached certification letter					
?	66-68	TerraTex NOS for seperation under access roads; meets Washdot 9-33.2(1) no other spec	A,B	Hanes Geotextile; Puyallup Wa	Hanes Geo; Salem NC	3	Manufacter MARV Cert Required
		found					

Contractor shall submit 6 copies of each attachment, and shall write bid item number(s)) on each attached page.

* one component per line

** Type Codes: A - Source approval only; B - Catalog Cut/Data Sheet; C - Mix Design; D - QPL; E - Cert. of Compliance; F - Sample; G - Shop Drawings; H - Other

Received: 12-1-09

Contractor certifies compliance with Contract Documents.

By: [signature]

COV Review Comments:

Legend: Review Action

1 No exceptions taken ☐
2 Note markings ☐
3 Comments attached-Resubmit ☐
4 Rejected ☐
5 Submit WSDOT Pit# ☐

Distribution	Review Target Date	Initial	Date
Reviewed by: HDR		D.K.W	12-7-09
Reviewed by: Mat Lab			
Reviewed by:			
COV, Construction			
Returned to contractor			

Contractor ____ Project File ____ Project Inspector ____ Materials Lab ____ Port of Vancouver ____ HDR Inc ____

Updated Jan 2009

HANES GEO COMPONENTS

A Leggett & Platt® COMPANY

TerraTex OL

ASPHALT OVERLAY FABRIC

TerraTex OL is a nonwoven geotextile made up of polypropylene fibers. These fibers are needled to form a stable and durable network such that the fibers retain their relative position. It is non-biodegradable and resistant to most soil chemicals, acids and alkali with a pH range of 3 to 12. **TerraTex OL** is manufactured to meet or exceed the following minimum average roll values:

Property	Test Method	Minimum Average Roll Value English		Minimum Average Roll Value Metric	
Unit Weight	ASTM D-5261	**3.8**	oz/yd^2	**128**	g/m^2
Tensile Strength	ASTM D-4632	**90**	lbs	**.400**	kN
Tensile Elongation	ASTM D-4632	**50**	%	**50**	%
Trapezoidal Tear	ASTM D 4533	**35**	lbs	**.16**	kN
Puncture Resistance	ASTM D 4833	**55**	lbs	**.25**	kN
Mullen Burst	ASTM D-3786	**180**	psi	**1240**	kPa
UV Resistance	ASTM D-4355	**70**	% @ 150 hr	**70**	% @ 150 hr
Asphalt Retention	TX DOT 3099	**0.2**	gal/yd^2	**0.9**	l/m^2
Melting Point	ASTM D 276	**300°**	F	**149°**	C

9/08

815 Buxton Street · Winston Salem, NC 27101
888-239-4539 · Fax: 336-747-1652
www.hanesgeo.com · info@hanesgeo.com

HANES GEO COMPONENTS
A Leggett & Platt COMPANY

Greg Osendorf
greg.osendorf@hanesindustries.com
5927 Balfour Ct., Suite 108
Carlsbad, CA 92008
Tel. 760-431-2452
Fax 760-431-2453

Tuesday, December 01, 2009

Hanss Schmeusser
Rotschy, Inc.
9210 NE 62nd Ave.
Vancouver, WA 98665

Re: Petromat vs Terratex OL

Dear Hanss:

This letter is to address the equivalency between Petromat 4599 and Terratex OL. Below, please find a property by property comparison between the two products showing the Terratex OL meets or exceeds the properties of the Petromat 4599:

		Propex Petromat 4599	**Terratex OL**
Property	**Test Method**	**MARV Value**	**MARV Value**
Weight (Typical)	ASTM D-5261	3.6 oz/sy	3.8 oz/sy
Tensile Strength	ASTM D-4632	90 lbs	90 lbs
Tensile Elongation	ASTM D-4632	50%	50%
Trapezoidal Tear	ASTM D-4533	N/A	35 lb
Mullen Burst	ASTM D-3786	180 psi	180 psi
Asphalt Retention	TX DOT 3099	0.20 gal/yd^2	0.20 gal/yd^2
Puncture Strength	ASTM D-4833	N/A	50 lb
UV Stability	ASTM D-4355	70% @ 150 hr	70% @ 500 hr

If you have any questions or need any additional information, please do not hesitate to contact me. Thank you.

Regards,

Greg Osendorf

HANES GEO COMPONENTS

A Leggett & Platt® COMPANY

TerraTex N06

Nonwoven Geotextile

TerraTex N06 is a nonwoven geotextile made up of polypropylene fibers. These fibers are needled to form a stable and durable network such that the fibers retain their relative position. It is non-biodegradable and resistant to most soil chemicals, acids and alkali with a pH range of 3 to 12. TerraTex N06 is manufactured to meet or exceed the following minimum average roll values:

Property	Test Method	Minimum Average Roll Value English	Minimum Average Roll Value Metric
Tensile Strength	ASTM D-4632	160 lb	0.711 kN
Tensile Elongation	ASTM D-4632	>50%	>50%
Seam Strength	ASTM D-4632	140 lb	0.623 kN
Mullen Burst	ASTM D-3786	315 psi	2170 kPa
Puncture Strength	ASTM D-4833	90 lb	0.400 kN
CBR Puncture	ASTM D-6241	450 lb	1.998 kN
Trapezoid Tear	ASTM D-4533	65 lb x 65 lb	0.289 kN
UV Resistance	ASTM D-4355	70% @ 500 hr	70% @ 500 hr
AOS	ASTM D-4751	70 US Sieve	0.212 mm
Permittivity	ASTM D-4491	1.6 sec^{-1}	1.6 sec^{-1}
Water Flow Rate	ASTM D-4491	110 $gal/min/ft^2$	4480 $l/min/m^2$

9/2009

815 Buxton Street Winston Salem, NC 27101
888 - 239 - 4539 • Fax: 336 - 747 - 1652
www.hanesgeo.com www.webtecgeos.com

Rose, Gretchen

From: Hans Schmeusser [hanss@rotschyinc.com]
Sent: Tuesday, December 01, 2009 1:34 PM
To: Rose, Gretchen
Subject: Emailing: T5 geotextile submittal.pdf

Attachments: T5 geotextile submittal.pdf

T5 geotextile submittal.pdf (2...

The message is ready to be sent with the following file or link attachments:

T5 geotextile submittal.pdf

Note: To protect against computer viruses, e-mail programs may prevent sending or receiving certain types of file attachments. Check your e-mail security settings to determine how attachments are handled.

Submittal 30

SUBMITTAL TRANSMITTAL / SOURCE APPROVAL

Port of Vancouver USA

TO: CONSTRUCTION MANAGER
3103 NW Lower River Road
Vancouver, Washington 98660

FROM: Rotschy, Inc
9210 NE 62nd Ave
Vancouver, Washington 98665

PROJECT: Terminal 5 Unit Train Improvements
CP0144

This section to be completed by contractor.

DATE: 12/08/2009

Resubmittal ☐
Previous Submittal No.

This section to be completed by COV:
Submittal No. 30

Bid Item Number(s)	Drawing Sheet No.	Description - Manufacturer's Specific Product*	Type** Code	Local Supplier	Manufacturer / Brand / WSDOT Pit #	Review Action	Notes
23, 24, 75, 90		3/4" Level 3 HMAC Mix Design	C	Porter Yett	Porter Yett & Santosh	2	(A)
					Pit# OR27		

Contractor shall submit 6 copies of each attachment, and shall write bid item number(s)) on each attached page.

* one component per line

** Type Codes: A - Source approval only; B - Catalog Cut/Data Sheet; C - Mix Design; D - QPL; E - Cert. of Compliance; F - Sample; G - Shop Drawings; H - Other

Received: 12/9/09

Contractor certifies compliance with Contract Documents.

By: [signature]

COV Review Comments:

(A) Submit aggregate and asphalt samples for Ignition Furnace Calibration Factor.

Legend: Review Action

- 1 No exceptions taken ☒
- 2 Note markings ☒
- 3 Comments attached-Resubmit ☐
- 4 Rejected ☐
- 5 Submit WSDOT Pit # ☐

Distribution	Review Target Date	Initial	Date
Reviewed by: HDR		BEC	12/11/09
Reviewed by: Mat. Lab		MK	1/6/10
Reviewed by: Const		SL	1/6/10
COV, Construction			
Returned to contractor			

Contractor ______ Project File ______ Project Inspector ______ Materials Lab ______ Port of Vancouver ______ HDR Inc ______

Updated Jan 2009

KE & ASSOCIATES, LLC
PO BOX 1062
BEAVERTON, OREGON 97075

SUPERPAVE MIX DESIGN

CLIENT: Porter Yett

PROJECT: Various

MIX DESIGNATION: WSDOT HMA 3/4" Level 3

SAMPLE SOURCE: Santosh Quarry

LAB NO: DBL - 0911

DATE: 11/17/2009

PROJECT NO: N/A

SOURCE NO.: OR-27

SAMPLED BY: Client

% MINERAL ADMIX: 0.0

COMPOSITE GRADATION

MATERIAL I.D.		% USED WITHOUT ADMIX	% USED WITH ADMIX
#8 - 0.0	Sand	22	22.0
1/4" - #8	Agg	21	21.0
1/2" - 1/4	Agg	20	20.0
3/4"-1/2"	Agg	17	17.0
RAP	Agg	20	20.0
ADMIX		0.0	0.0
TOTAL		100	100

SIEVE / mm	W/O ADMIX % PASSING	W/ADMIX % PASSING	SPEC. LIMITS
1.5	100	100	
1.0	100	100	
3/4	98	98	90 - 100
1/2	83	83	90
3/8	72	72	0
1/4	56	56	
#4	48	48	
#8	31	31	23 - 49
#10	28	28	
#16	21	21	
#30	15	15	
#40	12	12	
#50	11	11	
#100	7	7	
#200	5.1	5.1	2.0 - 8.0

AGGREGATE PROPERTIES

MATERIAL			COMBINED
BULK OD SP GR			2.659
SSD SP GR			2.704
APPARENT SP GR			2.790
ABSORPTION			1.720

DESIGN DATA

SPECIMEN ID	DESIGN 1	2		3	4	Project Specification
BITUMEN GRADE/SP GR	PG 64 - 22	1.0371				
% of Bitumen	4.5	5.0	5.0	5.5	6.0	
Bulk Density (lbs/ft3)	151.3	152.0	152.0	153.2	154.1	
% Air Voids	5.3	4.1	4.1	2.6	1.3	4.0%
% VMA	12.9	12.9	12.9	12.8	12.7	13.0 min.
% Air Voids Filled	59.1	68.5	68.5	79.5	89.9	65 - 75
% Effective Asphalt Total Mix	3.27	3.78	3.78	4.28	4.79	
N initial 8 Gyration	84.5	86.0	85.5	88.0	90.0	< 89
N design 80 Gyrations	94.8	95.9	96.0	97.4	98.7	
P.075/Pbe	1.55	1.34	1.34	1.18	1.06	.8 - 1.6
P.075/Pb	1.12	1.01	1.01	0.92	0.84	

TENSILE STRENGTH RATIO

SET I.D.		DRY	WET	TENSILE RATIO	PERCENT ASPHALT	PERCENT ADMIX
NO.1	PSI	189.41	168.15	88.8	5.0	0.0
Specification :	WSDOT Test Method T 702 / T 718					

RECOMMENDED BITUMEN CONTENT (%) = 5.0

Mixing Temperature: 307 - 316 F
WSDOT HMAC 3/4" LEVEL 3

Compaction Temperature: 288 - 295 F
NDES 100 Gyrations

SIGNED:

ADDITIONAL DATA

MAXIMUM THEORETICAL DENSITY -	2.540	@	5.0 %
ASPHALT ABSORPTION ON DRY AGG (%) -	1.287		
ASPHALT TYPE	PG 64- 22		
ASPHALT SOURCE	McCall Oil		

Rose, Gretchen

From: Hans Schmeusser [hanss@rotschyinc.com]
Sent: Wednesday, December 09, 2009 12:02 PM
To: Rose, Gretchen
Subject: FW:
Attachments: WSDOT 19mm VP~Port of V I.JPG; ac mix design submittal cover.pdf

HMAC mix design submittal attached.

Hans Schmeusser
Project Manager
Rotschy Inc.
O: 360.334.3128
F: 360. 334.3101
C: 360.608.5056

From: Gregg Walker [mailto:gwalker@vancouverpavingco.com]
Sent: Wednesday, December 09, 2009 9:06 AM
To: Hans Schmeusser
Subject:

Hans,
Here is the mix design for the 3/4" HMAC.
Gregg

Submittal 73

SUBMITTAL TRANSMITTAL / SOURCE APPROVAL

Port of Vancouver USA

FROM: Rotschy, Inc
9210 NE 62nd Ave
Vancouver, Washington 98665

DATE: 01/25/2009

Resubmittal ☐
Previous Submittal No.

This section to be completed by COV:

Submittal No. 73

TO: CONSTRUCTION MANAGER
3103 NW Lower River Road
Vancouver, Washington 98660

PROJECT: Terminal 5 Unit Train Improvements
CP0144

This section to be completed by contractor:

Bid Item Number(s)	Drawing Sheet No.	Specification	Description - Manufacturer's Specific Product*	Type** Code	Local Supplier	Manufacturer / Brand / WSDOT Pit #	Review Action	Notes
90, 96	sht # 28	SPL Test Pad Protocol	SPL Test Pad Submittal Plan	H	Rotschy / Vancouver Paving	Rotschy / Vancouver Paving		

Contractor shall submit 6 copies of each attachment, and shall write bid item number(s)) on each attached page.

* one component per line

** Type Codes:
A - Source approval only
B - Catalog Cut/Data Sheet
C - Mix Design
D - QPL
E - Cert. of Compliance
F - Sample
G - Shop Drawings
H - Other

Received: 1-26-10

Contractor certifies compliance with Contract Documents.

By: Hans Schmeusser

COV Review Comments:

Legend: Review Action
1 No exceptions taken ☐
2 Note markings ☐
3 Comments attached-Resubmit ☐
4 Rejected ☐
5 Submit WSDOT Pit # ☐

Distribution	Review Target Date	Initial	Date
Reviewed by: HDR			
Reviewed by: POV			
Reviewed by:			
COV, Construction			
Returned to contractor			

Contractor ____ Project File ____ Project Inspector ____ Materials Lab ____ Port of Vancouver ____ HDR Inc ____

Updated Jan 2009

9210 NE 62nd Ave
Vancouver, WA 98665

Rotschy Inc.

P 360.334.3100
F 360.334.3101

SPL (Spent Pot Liner) Area Work Plan

(specific to test pad construction)

Introduction: Rotschy Inc. under contract with the Port of Vancouver (for the Terminal 5 Unit Train Improvement Project) intends to conduct drainage installation, excavation, grading and paving work in the area known as the "SPL Cap". The paving design incorporates a "oil soaked" impermeable geotextile inner -layer. This geotextile and paving form an impermeable "cap". To provide assurance of the quality and impermeability of the said cap; the project specs require a test section be constructed and proven (IE: tested) prior to construction. This submittal addresses just work associated with this test section.

Location of work: The SPL Area exists at 45* 38′ 51″ Lat and 122* 43′ 49″ Lon. See attached site map (nearest address is 5701 NW Lower River Rd, Vancouver Wa.) on the former "Alcoa" Site outskirts.

Site Description: 3.8 acre site is flat (or very little gradient) ranging from elevation 29.0 to 32.0 feet above sea level.

Important notes: See attached Health and Safety Plans (HASP), Contaminated Media Plans, Hazardous Materials Management plan, Exposure Monitoring Plan and Quality Assurance plan for all requirements regarding personnel health, safety, decontamination, etc regarding work in contaminated media. This work plan is solely intended to describe the test plot work sequence.

Description and order of work:

Step 1 (general excavation and embankment): Existing sub-soils will be excavated, graded and compacted to design subgrade. "Fill areas" will receive embankment per plan lines and grades. In areas of minimal cover (over existing liner) we would propose the initial soil lift will be 12" thick to insure less ground pressure affect to the liner below.

Step 2 (base rock and geogrid): work shall commence after subgrade is graded, compacted & approved; IE step 1) Work shall be placing Tensar Tri-axial geogrid (in accordance with manufactures recommendations) and crushed surfacing base rock in accordance with specs / standard practice. Occasional Construction Quality Assurance (CQA) engineer oversight (by owner) will be required per the Test Pad Protocol (attached). Compaction testing will be approved in writing prior to step 3 work.

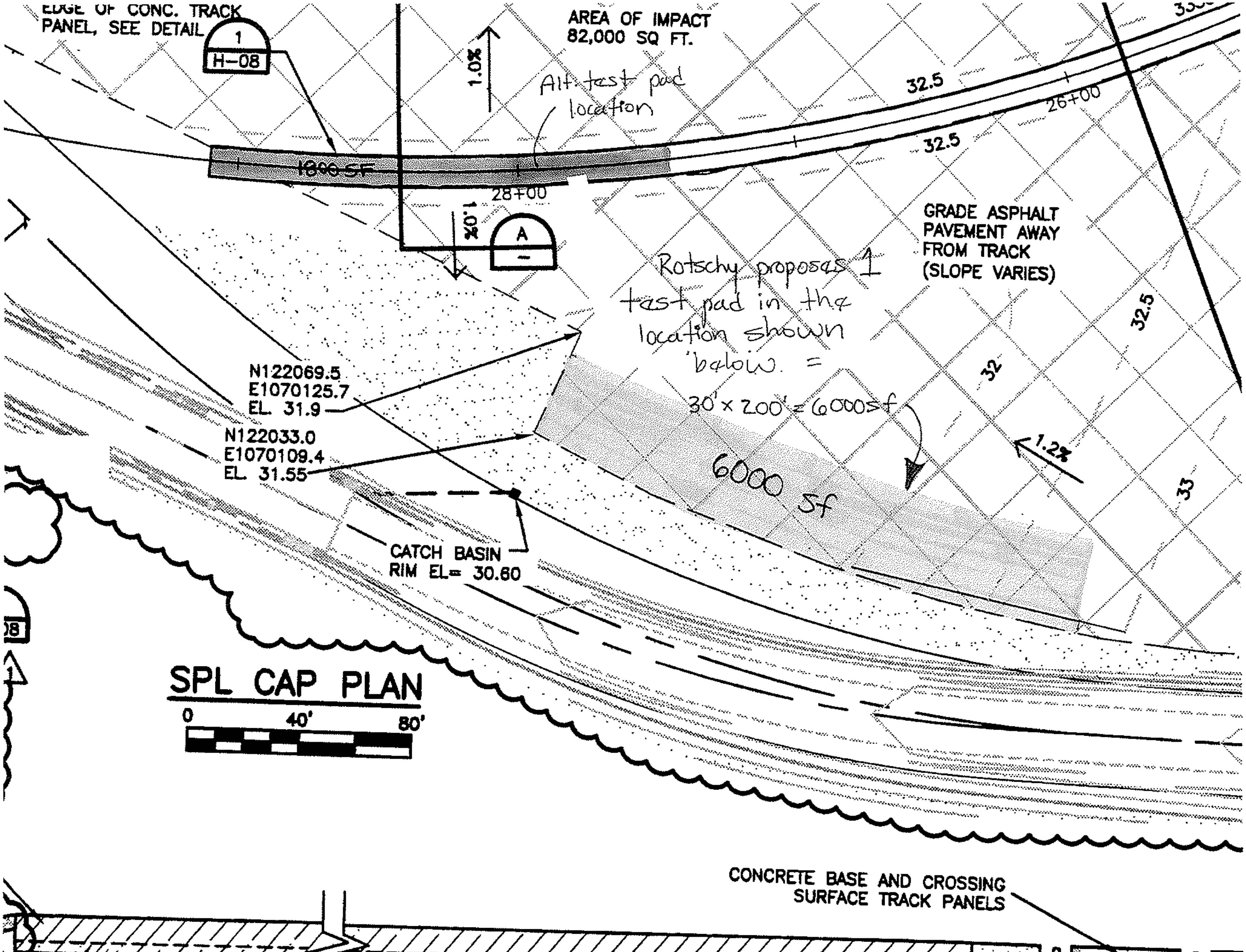
Step 3 (paving test section): Rotschy Inc and subcontractor Vancouver Paving will construct an asphalt cap test section per the requirements of the attached SPL Asphalt Test Pad Protocol. Asphalt mix design has been approved and is attached. Test Pad Size and location will be as shown on exhibit A attached. Conduct preconstruction meeting with engineer, owner, contractors, CQA person and others to review construction means and methods. Place base lift paving with continuous CQA engineer oversight as required per the Test Pad Protocol. After approval of the base lift asphalt, hot oil will be surface applied by subcontractor utilizing a "spray truck" (per spec and at the rate recommended by the fabric manufacture; materials submittal forthcoming later this week) and then subsequently overlain by approved 6oz paving fabric. This fabric will be applied via a "mechanical applicator". We can provide a website for an online demonstration of this process should you be interested. Oil will not be applied over the fabric as approved in RFI #22 response. Top lift paving timing to follow in accordance with the fabric manufactures recommendations.

Step 4 (testing of cap cores): Per the requirements of the SPL Asphalt Cap Test Pad Protocol the CQA engineer will core and test the asphalt cap for impermeability requirements. Failure of the test pad to meet impermeability requirements will result in removal of such and the need to construct a new test pad / retest. Passing tests will allow the test section to remain and be part of the permanent cap.

Step 5 (permanent asphalt cap construction): Only after approval of the impermeability test results, agreement on the proper work sequence plans (to insure a cap like the test pad) including timing, means & methods, etc. will work commence in strict accordance with such agreed plans. At minimum the initial phase will include paving under the tub crossing. At most it would be the entire SPL cap area base lift. Continuous CQA engineer oversight required per Test Pad Protocol will be required. Top lift paving may wait till spring / better weather.

Step 6 (tub crossing placement): Subcontractor Coast Rail or Rotschy Inc will place a 1.5" thick layer of fine aggregate leveling course over the new asphalt cap. Coast Rail will then place the tub crossing directly on the leveling course.

Step 7 (top lift paving): With ambient temperatures in accordance with Washdot spec; Top lift paving will occur in strict accordance with Test Pad Protocol. This will include paving against the new tub crossing. Continuous CQA engineer oversight shall be required per the Test Pad Protocol.


EDGE OF CONC. TRACK
PANEL, SEE DETAIL
1
H-08
AREA OF IMPACT
82,000 SQ FT.
1.0%
Alt. test pad
location
1800 SF
28+00
1.0%
A
-
32.5
26+00
32.5
GRADE ASPHALT
PAVEMENT AWAY
FROM TRACK
(SLOPE VARIES)
Rotschy proposes 1
test pad in the
location shown
below =
30' x 200' = 6000sf
6000 sf
32.5
32
1.2%
33
N122069.5
E1070125.7
EL. 31.9
N122033.0
E1070109.4
EL. 31.55
CATCH BASIN
RIM EL= 30.60
SPL CAP PLAN
0
40'
80'
CONCRETE BASE AND CROSSING
SURFACE TRACK PANELS

VANCOUVER PAVING Co., Inc.

406 N. E 139th STREET
Vancouver, WA 98685
(360) 573-7973
(360) 574-1609 Fax

COMPACTION CONTROL PLAN

December 16, 2009

PROJECT: Terminal 5 Unit Train Improvements
PROJECT #: CP0144

Equipment used:

2 10 ton steel wheeled vibratory rollers.
5-04.3 (10)a requires a pneumatic roller between October 1 and April 1. We would request release from this requirement as pneumatic rollers tend to pick up on the tires at cooler temperatures. Wind even mild winds aggravate this problem. We feel the vibratory rollers will give compaction without the problems of pneumatic rollers.

Process:

1. A rolling pattern will be established to best achieve compaction during the construction of the SPL cap test strip. Breakdown will be with the 10 ton vibratory roller, and finished with the 10 ton vibratory. The Foreman will work with the roller operators and the Density Technician to determine the method and number of passes required toachieve compaction. Once the compaction pattern is established, the rollers will continue running that pattern unless there is a need for additional compactive effort. Throughout the day, the Foreman and Density Technician will monitor compaction to ensure that the required density is being achieved. Coordinate paving speed to insure that the lay-down rate does not exceed the capabilities of the rolling train. Paving operations will be stopped if the required compaction results are not being achieved.

Detailed daily procedure:

1. Project Mgr or Superintendent will lay out the schedule for the day with the Foreman and the Density Technician.
2. Foreman, Density Technician and Roller operators will establish rolling patterns and determine the number of passes required at a given temperature to achieve compaction for the specific depth before the mat begins to break over. This would be the maximum compactive effort for the work at that depth. This sequence will be repeated through the entirc rolling train.
3. Foreman will be responsible for monitoring compaction throughout the day to insure that compaction is continuing to be achieved. He/she will also monitor temperature and direct the Density Technician monitor the rolling train to insure that the established pattern is followed.
4. Both the Foreman and the Density Technician may recommend rolling pattern changes as required by changes in conditions

1. Introduction

The Port of Vancouver, Washington proposes to place an asphalt cap over the SPL Cap (3.8 acres) that contains contaminated soils. The cap will consist of a layer of asphalt overlain by an asphalt-impregnated geotextile (a combination of non-woven polypropylene fabric and asphalt cement tack coat) overlain by a second layer of asphalt. The fabric and tack coat combination will form an asphalt membrane interlayer within the pavement section. Additional asphalt layers will be required for structural design purposes, but are not included in this protocol. The purpose of the test pad is to verify the results, under field conditions, of bench scale testing of the asphalt section.

2. Test Pad Objectives

1. To verify that the materials and methods of construction will produce an asphalt liner that meets the target hydraulic conductivity for the project. The target hydraulic conductivity for the test pad section is 1×10^{-7} cm/sec, or less.

2. To establish a correlation between the bench scale testing and full-scale testing. If the test pad meets the performance objectives for the cap (as verified by hydraulic conductivity and density tests) and the full-scale liner is constructed to density standards that equal or exceed those used in building the test pad, then assurance is provided that the full-scale liner will also meet hydraulic conductivity performance objectives.

3. Test Pad Protocol

3.1 Definitions

Construction Quality Assurance (CQA) Engineer: The owner's representative responsible for verification of the construction methods and materials to project plans, specifications, and protocols.

Construction Quality Assurance Monitor: The individual responsible for observation and documentation of construction under the supervision of the CQA Engineer.

3.2 Test Pad Dimensions

The test pad shall be constructed to the minimum compaction as determined by the Bench Scale Protocol, References 2 and 3. Details of construction shall be proposed by the Contractor and approved by the CQA Engineer. The configuration of the test pad shall conform to the following criteria:

1. The lane width must be sufficient to allow the specified compaction equipment to operate without overlapping the drum into the ballast and introducing ballast material into the asphalt.

2. The lane length must be sufficient to allow the compaction equipment to reach its design operating speed.

3. Lanes must be adequately separated to ensure that each lift can be compacted to the desired relative compaction.

4. The test pad shall be constructed in two lifts with a minimum compacted thickness of 2.5 inches per lift. An asphalt-impregnated geotextile shall be placed between the asphalt lifts.

3.3 Materials and Construction

All materials and methods used in the construction of the test pad shall conform to the project specifications, the Bench Scale Testing Protocol (HDR, 2009b), and the Bench Scale Test Final Report (HDR, 2009c). The methods, materials and equipment used in successful completion of the test pad shall be used in construction of the Cap. Each lift of each lane shall be compacted using the same equipment, operating speed and number of passes. The lower lift of the test pad shall provide a smooth surface, with consistent texture and free of irregularities. The lift must be constructed and finished to provide continuous intimate contact with the overlying geotextile. Adequate geotextile shall be left exposed along the ends and sides of the pad to allow incorporation of the pad into the final cap, if the cap section meets the hydraulic conductivity specification.

3.4 Test Pad Construction Observation

Full time observation of subgrade preparation is not required. The CQA Monitor shall document and observe proof-rolling and density testing of the subgrade. The CQA monitor shall observe the completed placement of the recycled concrete. Observations shall be documented in daily reports. Full-time observation and documentation of the placement of the asphalt and asphalt impregnated geotextile is required. The number of passes of the compactor over each lane shall be documented. Daily field reports will note observations and any deviations from the plans, specifications, and this protocol.

3.5 Required Tests

The tests listed in Table 1 are required to evaluate the hydraulic conductivity of the test section and its ability to control infiltration. At the owner's request, additional testing may be performed per WSDOT test pad requirements to verify the structural suitability of the section.

Table 1: Required Tests

Material Tested	Parameter	Frequency	Test method
Subgrade	Placement and compaction	Full coverage	Visual observation
Subgrade density testing	Placement and compaction	2 per lane	ASTM D2922
Crushed Concrete Base	Placement and compaction	2 per lane	ASTM D2922
Hot Mix Asphalt	Mix Design	1 per mix	Submittal review
Geotextile Interlayer	Strength and retention properties	Bracketed by manufacturer's quality control testing	Verification of manufacturer's QC
Geotextile Interlayer	Retention properties	Full coverage	Observation
Asphalt	Compaction	3 per lane per lift	ASTM D2950
Asphalt and Geotextile Interlay	Hydraulic conductivity	2 representing the range of compaction	Modified ASTM D-5084[1]

[1]70kPa confining pressure, sides of core treated with silicone vacuum grease or bentonite paste to reduce sidewall leakage.

3.6 Deviations from this Protocol

The CQA Engineer may propose deviations from the protocol, if warranted by the results of the bench scale testing. Deviations proposed by the Contractor to more efficiently utilize available machinery may also be considered, if the machinery will be used in full-scale construction as well. Proposed deviations must be provided to and approved by the Port of Vancouver prior to submittal to the Washington Department of Ecology (WDOE). Once submitted to the WDOE, an approval in writing from the WDOE must be obtained and provided to the Port of Vancouver 5 days before construction of the test pad begins.

4. Documentation and Recommendations

Test pad construction shall be documented in a written report, sealed by the CQA Engineer. The report shall include at a minimum:

- Construction narrative detailing methods, materials and equipment used
- Construction daily reports documenting activities and noting deviations from the project plans,
- Specifications and this protocol
- Test results and a statement that the test pad was constructed in substantial accordance with the project documents.
- Deviations from the project documents shall also be noted in the report.

The report shall be submitted to the Port of Vancouver 5 days prior to construction of the SPL replacement cap.

Submittal 83.2

SUBMITTAL TRANSMITTAL / SOURCE APPROVAL

Port of Vancouver USA

TO: CONSTRUCTION MANAGER
3103 NW Lower River Road
Vancouver, Washington 98660

FROM: Rotschy, Inc
9210 NE 62nd Ave
Vancouver, Washington 98665

PROJECT: Terminal 5 Unit Train Improvements
CP0144

This section to be completed by contractor:

DATE: 2/9/2009

Resubmittal ☒
Previous Submittal No. 83

This section to be completed by COV:

Submittal No. **83.2**

Bid Item Number(s)	Drawing Sheet No.	Specification	Description - Manufacturer's Specific Product*	Type** Code	Local Supplier	Manufacturer / Brand / WSDOT Plt #	Review Action	Notes
77	sht 24	F-85	TRI Enviromental Certification for acceptance under F-75 as they have	H	N/A	N/A	1	
			more than 3 years experience (see attached) and they are GAI certified					
			Specs call for GRI certification which I understand does not apply to					
			laboratory such as this. Please confirm, Thanks!					

Contractor shall submit 6 copies of each attachment, and shall write bid item number(s)) on each attached page.

* one component per line

** Type Codes:
A - Source approval only
B - Catalog Cut/Data Sheet
C - Mix Design
D - QPL
E - Cert. of Compliance
F - Sample
G - Shop Drawings
H - Other

Received: 2/9/2010

Contractor certifies compliance with Contract Documents.

By: Hans Schmeusser

COV Review Comments:

Legend: Review Action
1 No exceptions taken ☐
2 Note markings ☐
3 Comments attached-Resubmit ☐
4 Rejected ☐
5 Submit WSDOT Plt # ☐

Distribution	Review Target Date	Initial	Date
Reviewed by: HDR		[signature]	2/10/10
Reviewed by:			
Reviewed by:			
COV, Construction			
Returned to contractor			

Contractor ______ Project File ______ Project Inspector ______ Materials Lab ______ Port of Vancouver ______ HDR Inc ______

Updated Jan 2009

Submittal 108

SUBMITTAL TRANSMITTAL / SOURCE APPROVAL

Port of Vancouver USA

FROM: Rotschy, Inc
9210 NE 62nd Ave
Vancouver, Washington 98665

DATE: 2/23/2009

Resubmittal ☐
Previous Submittal No.

This section to be completed by COV:

Submittal No. **108**

TO: CONSTRUCTION MANAGER
3103 NW Lower River Road
Vancouver, Washington 98660

PROJECT: Terminal 5 Unit Train Improvements
CP0144

This section to be completed by contractor:

Bid Item Number(s)	Drawing Sheet No.	Specification	Description - Manufacturer's Specific Product*	Type** Code	Local Supplier	Manufacturer / Brand / WSDOT Pit #	Review Action	Notes
96	SPL	F-70	Spec and Material Cert for PG-64-22 oil for paving fabric application	A, E	Blueline Transportation	McCall		

Contractor shall submit 6 copies of each attachment, and shall write bid item number(s)) on each attached page.

* one component per line

** Type Codes:
A - Source approval only
B - Catalog Cut/Data Sheet
C - Mix Design
D - QPL
E - Cert. of Compliance
F - Sample
G - Shop Drawings
H - Other

Received: 2/23/2010

Contractor certifies compliance with Contract Documents.

By: Hans Schmeusser / Terri Zahler

COV Review Comments:

Legend: Review Action
1 No exceptions taken ☐
2 Note markings ☐
3 Comments attached-Resubmit ☐
4 Rejected ☐
5 Submit WSDOT Pit # ☐

Distribution	Review Target Date	Initial	Date
Reviewed by: HDR			
Reviewed by: Mat. Lab.			
Reviewed by:			
COV, Construction			
Returned to contractor			

Contractor ____ Project File ____ Project Inspector ____ Materials Lab ____ Port of Vancouver ____ HDR Inc ____

Updated Jan 2009

McCall

Oil & Chemical Corporation

PG64-22

Feb 18, 2010

		Specification
Original Properties		
Specific Gravity @ 15.6 C (60 F)	1.0294	
Flashpoint, C	316	230+
Dynamic Shear, G*/sin δ, 64 C, kPa	1.20	1.0+
Rotational Viscosity, 135 C, Pas	0.435	3.00-
RTFO Residue Properties		
Loss on Heat, %	0.020	1.00-
Dynamic Shear, G*/sin δ, 64 C, kPa	3.12	2.20+
PAV Residue Properties		
Dynamic Shear, G*sin δ, 25 C, kPa	4630	5000-
Creep Stiffness, -12 C, Mpa	238	300-
m-value, -12 C	0.312	0.300+

I certify that the asphaltic material identified above complies with current AASHTO M320-05, ASTM D6373, Washington State Department of Transportation specifications, and Oregon Department of Transportation Standard Specifications for Asphalt Materials.

Terri Zahler
Lab Manager
McCall Oil & Chemical Co.

5480 NW Front Ave. Portland, Oregon 97210 503-221-6400 Fax: 503-221-6405

Rose, Gretchen

From: Hans Schmeusser [hanss@rotschyinc.com]
Sent: Tuesday, February 23, 2010 8:44 AM
To: Rose, Gretchen
Subject: FW:
Attachments: 2010 Header PG 64-22.doc; Submittal form 2009.xls

Urgent oil submittal / cert attached. Thanks!

Hans Schmeusser
Project Manager
Rotschy Inc.
O: 360.334.3128
F: 360. 334.3101
C: 360.608.5056

From: Troy Tindall [mailto:Troy@bluelinetrans.com]
Sent: Monday, February 22, 2010 2:09 PM
To: hanss@rotschyinc.com
Subject: FW:

From: Troy Tindall
Sent: Thursday, February 18, 2010 2:00 PM
To: 'hanss@rotsbhyinc.com'
Subject:

Above it the product sheet and the MSDS is at this website.
http://www.mccalloil.com/asphalt.html

Troy Tindall
503-702-1236

SUBMITTAL TRANSMITTAL / SOURCE APPROVAL

Port of Vancouver USA

TO: CONSTRUCTION MANAGER
3103 NW Lower River Road
Vancouver, Washington 98660

FROM: Rotschy, Inc
9210 NE 62nd Ave
Vancouver, Washington 98665

PROJECT: Terminal 5 Unit Train Improvements
CP0144

This section to be completed by contractor:

DATE: 2/23/2009

Resubmittal ☐
Previous Submittal No.

This section to be completed by COV:

Submittal No. **108**

Bid Item Number(s)	Drawing Sheet No.	Specification	Description - Manufacturer's Specific Product*	Type** Code	Local Supplier	Manufacturer / Brand / WSDOT Pit #	Review Action	Notes
96	SPL	F-70	Spec and Material Cert for PG-64-22 oil for paving fabric application	A, E	Blueline Transportation	McCall		

Contractor shall submit 6 copies of each attachment, and shall write bid item number(s)) on each attached page.

* one component per line

** Type Codes: A - Source approval only; B - Catalog Cut/Data Sheet; C - Mix Design; D - QPL; E - Cert. of Compliance; F - Sample; G - Shop Drawings; H - Other

Received: 2/23/2010

Contractor certifies compliance with Contract Documents.

By: Hans Schmeusser / Terri Zahler

COV Review Comments:

Legend: Review Action

- 1 No exceptions taken ☒
- 2 Note markings ☐
- 3 Comments attached-Resubmit ☐
- 4 Rejected ☐
- 5 Submit WSDOT Pit # ☐

Distribution	Review Target Date	Initial	Date
Reviewed by: HDR		[illegible]	2-26-10
Reviewed by: Mat. Lab.			
Reviewed by:			
COV, Construction			
Returned to contractor			

Contractor ______ Project File ______ Project Inspector ______ Materials Lab ______ Port of Vancouver ______ HDR Inc ______

Updated Jan 2009

McCall

Oil & Chemical Corporation

PG64-22

Feb 18, 2010

		Specification
Original Properties		
Specific Gravity @ 15.6 C (60 F)	1.0294	
Flashpoint, C	316	230+
Dynamic Shear, G*/sin δ, 64 C, kPa	1.20	1.0+
Rotational Viscosity, 135 C, Pas	0.435	3.00-
RTFO Residue Properties		
Loss on Heat, %	0.020	1.00-
Dynamic Shear, G*/sin δ, 64 C, kPa	3.12	2.20+
PAV Residue Properties		
Dynamic Shear, G*sin δ, 25 C, kPa	4630	5000-
Creep Stiffness, -12 C, Mpa	238	300-
m-value, -12 C	0.312	0.300+

I certify that the asphaltic material identified above complies with current AASHTO M320-05, ASTM D6373, Washington State Department of Transportation specifications, and Oregon Department of Transportation Standard Specifications for Asphalt Materials.

Terri Zahler
Lab Manager
McCall Oil & Chemical Co.

5480 NW Front Ave. Portland, Oregon 97210 503-221-6400 Fax: 503-221-6405

Rose, Gretchen

From: Hans Schmeusser [hanss@rotschyinc.com]
Sent: Tuesday, February 23, 2010 8:44 AM
To: Rose, Gretchen
Subject: FW:
Attachments: 2010 Header PG 64-22.doc; Submittal form 2009.xls

Urgent oil submittal / cert attached. Thanks!

Hans Schmeusser
Project Manager
Rotschy Inc.
O: 360.334.3128
F: 360. 334.3101
C: 360.608.5056

From: Troy Tindall [mailto:Troy@bluelinetrans.com]
Sent: Monday, February 22, 2010 2:09 PM
To: hanss@rotschyinc.com
Subject: FW:

From: Troy Tindall
Sent: Thursday, February 18, 2010 2:00 PM
To: 'hanss@rotsbhyinc.com'
Subject:

Above it the product sheet and the MSDS is at this website.
http://www.mccalloil.com/asphalt.html

Troy Tindall
503-702-1236

Submittal 118

SUBMITTAL TRANSMITTAL / SOURCE APPROVAL

Port of Vancouver USA

TO: CONSTRUCTION MANAGER
3103 NW Lower River Road
Vancouver, Washington 98660

FROM: Rotschy, Inc
9210 NE 62nd Ave
Vancouver, Washington 98665

PROJECT: Terminal 5 Unit Train Improvements
CP0144

This section to be completed by contractor:

DATE: 3/9/2010

Resubmittal ☐
Previous Submittal No.

This section to be completed by COV:

Submittal No. **118**

Bid Item Number(s)	Drawing Sheet No.	Specification	Description - Manufacturer's Specific Product*	Type** Code	Local Supplier	Manufacturer / Brand / WSDOT Pit #	Review Action	Notes
96	SPL Dwgs	SPL Specs	Hot oil application data sheet	H	Blueline	McCall		

Contractor shall submit 6 copies of each attachment, and shall write bid item number(s)) on each attached page.

* one component per line

** Type Codes:
A - Source approval only
B - Catalog Cut/Data Sheet
C - Mix Design
D - QPL
E - Cert. of Compliance
F - Sample
G - Shop Drawings
H - Other

Received: 3/9/2010

Contractor certifies compliance with Contract Documents.

By: Hans Schmeusser & Eric w / Blueline

COV Review Comments:

Legend: Review Action

1 No exceptions taken ☐
2 Note markings ☐
3 Comments attached-Resubmit ☐
4 Rejected ☐
5 Submit WSDOT Pit # ☐

Distribution	Review Target Date	Initial	Date
Reviewed by: HDR			
Reviewed by: Mat Lab.			
Reviewed by:			
COV, Construction			
Returned to contractor			

Contractor ____ Project File ____ Project Inspector ____ Materials Lab ____ Port of Vancouver ____ HDR Inc ____

Updated Jan 2009

CUSTOMER Rotschy Inc. DATE 3/4/10 DESTINATION Vancouver, Wa.

PRESSURE 7 SNIVEY 2 PRODUCT PG64-22 JOB DISC. Petro-Mat

YDS SHOT 611 GAL SHOT 125 AVG SHOT .205 TONS/HR

FLOAT GALLONS	GALS USED	WIDTH	LENGTH	SQ. YDS.	ACT SHOT	DES SHOT	STREET OR ROAD
2400							
2275	125	13	423	611	.205	.20	Test shot

upon Return Tonage shot came out to .41. In this situation the "Float gallons" & "Gallons Used" is the most accurate number. 20 gallons residule asphalt would make tonage innacurate & is probable. I shot .49 tons.

.49 tons @ 253 gallons per ton @ 340°F = 123.97 gallons

124 ÷ 611 = .203 gallons per sq/yd

Rose, Gretchen

From: Hans Schmeusser [hanss@rotschyinc.com]
Sent: Tuesday, March 09, 2010 12:53 PM
To: Rose, Gretchen
Cc: Lee, Steve; samuel.albino@hdrinc.com; Kelsey, Mike; Burggraff, Joe
Subject: FW: Shot Sheet
Attachments: Shot Sheet.PDF; Submittal form 2009.xls

Gretchen,

Blueline oil amounts used on the test strip attached for your records. Looks like the quantity / application rate was per spec. Thanks!

Hans Schmeusser
Project Manager
Rotschy Inc.
O: 360.334.3128
F: 360. 334.3101
C: 360.608.5056

From: Ross Imes [mailto:ROSS@bluelinetrans.com]
Sent: Tuesday, March 09, 2010 12:18 PM
To: hanss@rotschyinc.com
Subject: Shot Sheet

Hi Hans,

Here is the shot sheet from Eric.

Ross B. Imes
503-279-2627

CASCADE PETROLEUM TRANSPORTATION
PORTLAND MOTOR TRANSPORT

ATTACHMENT D

City of Vancouver Subgrade Density Test

Washington State Department of Transportation

Hot Mix Asphalt Test Section Report

Indicate Unit of Measure: ◉ English ○ Metric

Date	Gauge
3/1/2010	COV 3440:

Project	Cont. No.
POV Ter 5 Rail Construction: SPL Cap Test Pad	CP0144
	SR No.

Project Engineer: Steve Lee

Weather: Partly Cloudy — Air Temp From: 55+/- To: 65+/-

HMA	Other	Thickness
3/4" PG64-22	PY 11-17-09	2.5"
Wearing	Leveling: first lift	Class: 3.0 to 30

Left: — Right: North Panel — Lane: ☐ NB ☐ SB ☐ EB ☐ WB

Other: SPL Test Pad

Rollers: Name, Type, and Mass
1. HyVac C766C
2. Pneumatic
3. Volvo DD90 HF
4.

Standard Density Readings

No.	Readings	Corrected
1.	145.6	145.6
2.	144.7	144.7
3.	145.1	145.1
Sum	435.4	
Avg.	145.1	93.3% ①

Gauge Correction Factor 1.0000

Remarks
"s" = static pass; "v" = vibratory pass; a "pass" is forward & back across a point; temp = surface reading of mat;
("s/v" = forward w/static & back w/ vibe)

Rice 155.5** Std. Den. % of Rice 92

Stand. Density - Initial Pt. **Actual Rice for the day

Insp. MK / JB St. Insp. J Burggraff

① ("Test Sample Area" compaction, South Panel = 145.3, 93.4% compaction)

Control Strip Approx. ______ Sq. Yards

Sta. ______ Sta. ______

See attached field sketches (2). Results below are from the 2nd roller pattern established on the North Panel. An initial roller pattern on the South Panel averaged 91.8% w/ one less breakdown vibe pass

Roller	1-s/v	1-s/v	1-s/v	2	2	2	3-s	3-s	15' +	15' -		
Gauge Reading		140.1	142.3				144.6	145.6	144.7	145.1		
Time (min. After Pavt. Laydown		23	29				55	63				
Temp.		224	209	203			170	166				
Roller Passes	1	2	3	4	5	6	7	8	9	10	11	12

DENSITY P.C.F. — TEMP °F

1 of 3

*IP = Initial Point

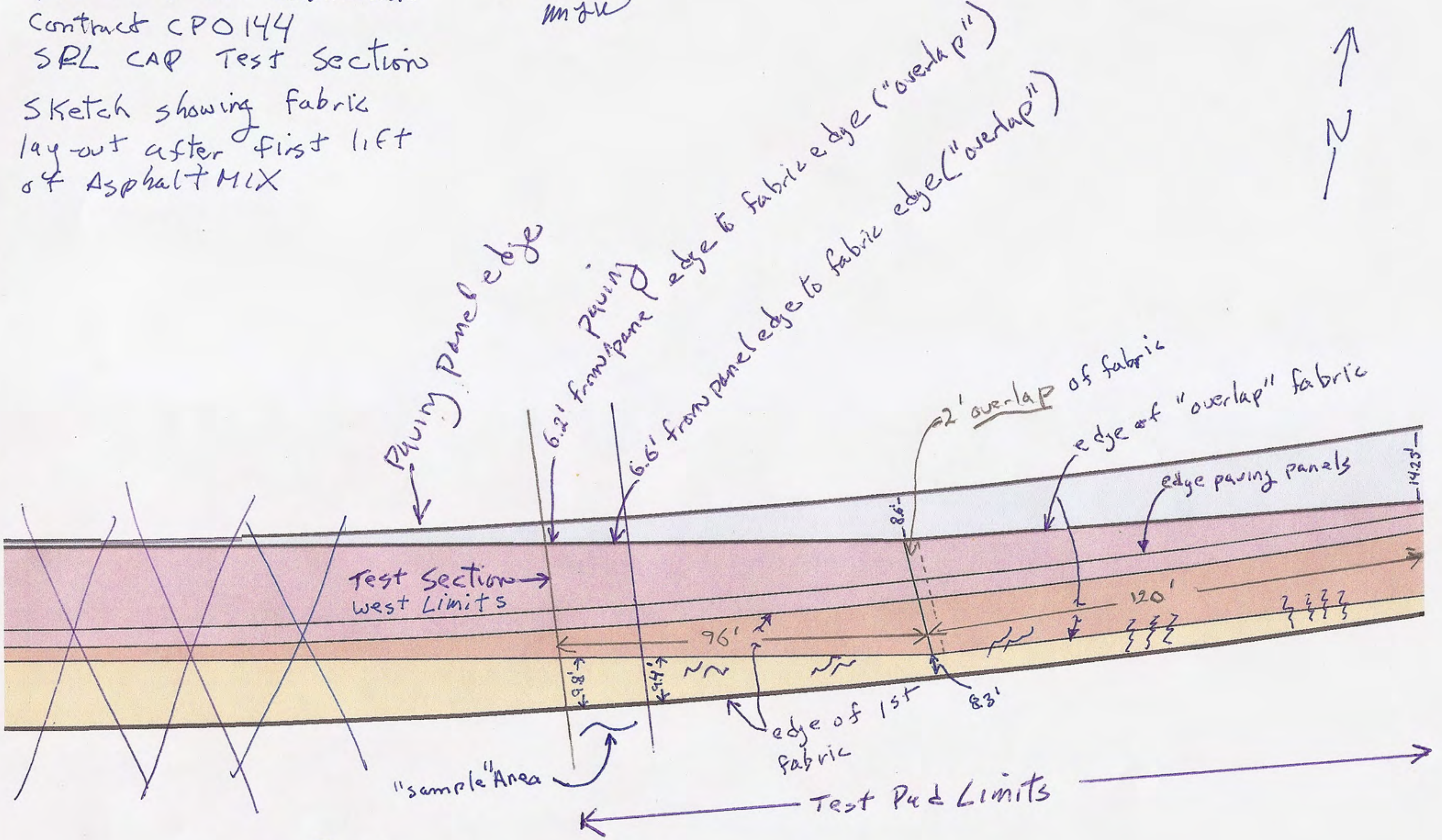
Distribution: Region Materials ______

Project Engineer Steve Lee

POU TERS Rail Construction
Contract CPO144
SRL CAP Test Section

3-1-10
MJK

Sketch showing fabric lay-out after first lift of Asphalt MIX

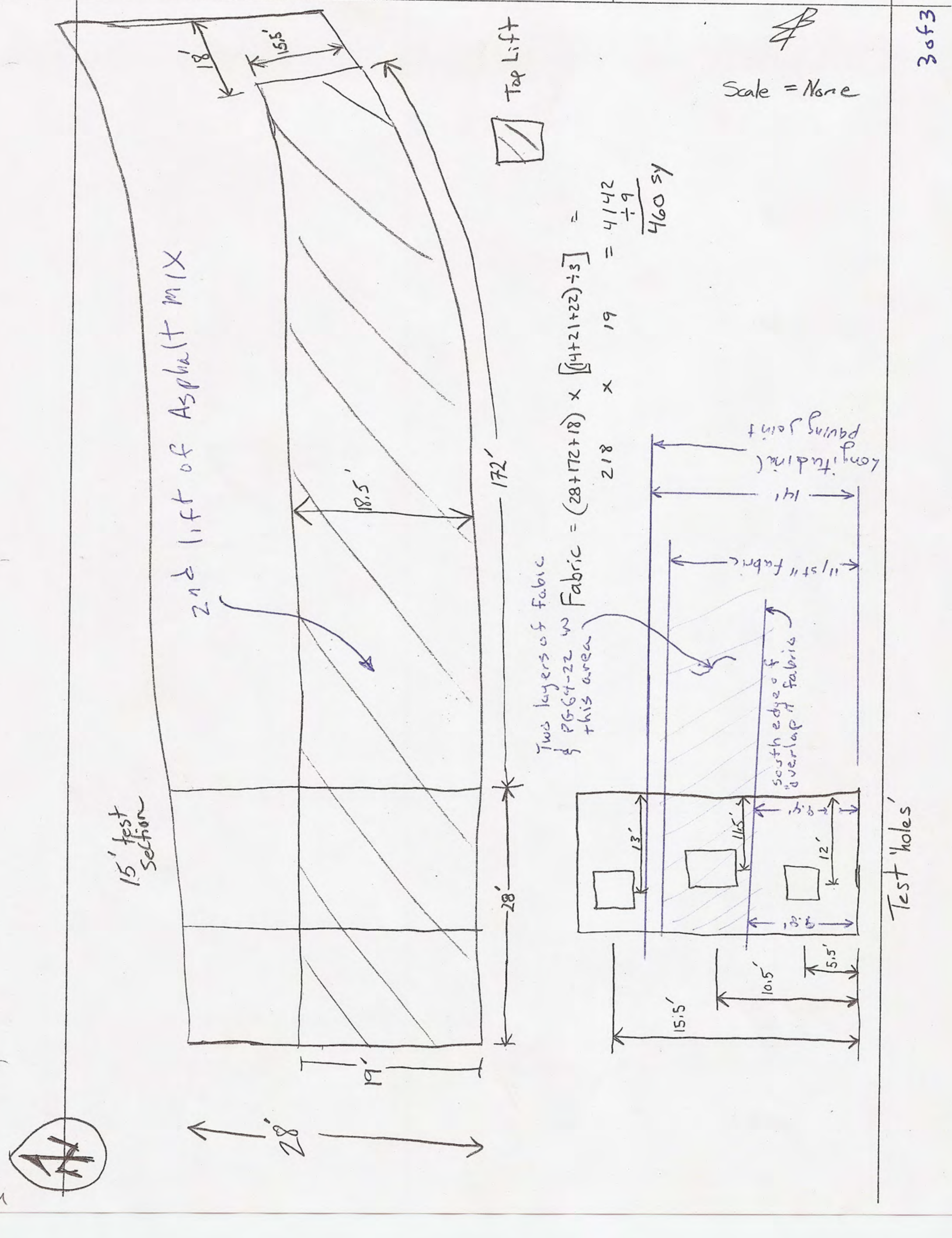


Paving Panels are 14' wide

Fabric is 12.5' wide

~ = wrinkles in "first" fabric

N.T.S.


3 of 3
Scale = None
Top Lift
2nd lift of Asphalt MIX
15' test section
18'
15.5'
18.5'
172'
28'
19'
28'
Fabric = (28+172+18) x [(14+21+22)÷3] =
218 x 19 = 4142
÷9
460 sy
Two layers of fabric & PG64-22 in this area
longitudinal paving joint
14'
"1st" fabric
south edge of "overlap" fabric
13'
11.5'
12'
10.5'
5.5'
15.5'
Test 'holes'

ATTACHMENT E

City of Vancouver HMA Compaction Testing

Project #: **CPO144** **Project Name:** **POV Ter. #5**

Contractor: **Rotchy** **Paving By:** **Vancouver Paving**

HMA Mix Design Type: 3/4" PG64-22, 3 to 30

HMA Supplier: Porter Yett **Test Date:** 3/1/2010 **Tested By:** JB

Mix Design ID: PY DBL-0911 **Gauge used:** 3440 -27297

Pave Date: **3/1/2010**

Test Number	Density Reading #1	Density Reading #2	Density Reading #3	Ave Density Reading	Test Depth (feet)	Rice Density	Percent Comp.	Location & Comments
1	144.3			**144.3**	**BS**	155.5	**92.8**	**26+98, -152'**
2	144.9			**144.9**	**BS**	155.5	**93.2**	**27+10, -136'**
3	145.1			**145.1**	**BS**	155.5	**93.3**	**27+57, -112'**
4	147.2			**147.2**	**BS**	155.5	**94.7**	**27+78, -90'**
5	147.8			**147.8**	**BS**	155.5	**95.0**	**27+97, -77'**
6	145.1			**145.1**	**BS**	155.5	**93.3**	
						AVE=	**93.7**	

Comments SPL Cap Test Section second lift Test results. First lift tested by roller pattern establishment
approx. pavement surface temp = 238. Trucks on site for second lift at 3:30pm, finish rolling at 4:40pm

ATTACHMENT F

Photographic Documentation

SPL Test Pad Construction
Photograph Log

Photo 1 SPL Test Pad Triaxial Geogrid Installation 2/23/201

Photo 2 SPL Test Pad Triaxial Geogrid and Subgrade Installation 2/23/2010

Photo 3 SPL Test Pad Subgrade Placement and Compaction 3/05/2010

Photo 4 SPL Test Pad Subgrade Preparation 3/05/2010

Photo 5 SPL Test Pad HMA Base Layer 2 1/2" Placement and Compaction 3/05/2010

Photo 6 SPL Test Pad HMA Base Layer 2 ½" Placement and Compaction 3/05/2010

Photo 7 SPL Test Pad Geotextile Roll Placement Equipment 3/05/2010

Photo 8 SPL Test Pad Tack Coat Application 3/05/2010

Photo 9 SPL Test Pad Tack Coat Application 3/05/2010

Photo 10 SPL Test Pad Geotextile Inerlayer Application 3/05/2010

Photo 11 SPL Test Pad Geotextile Inerlayer Application 3/05/2010

Photo 12 SPL Test Pad Geotextile Inerlayer Application 3/05/2010

Photo 13 SPL Test Pad Geotextile Inerlayer Application 3/05/2010

Photo 14 SPL Test Pad Geotextile Interlayer Application 3/05/2010

Photo 15 SPL Test Pad Geotextile Interlayer between HMA Base Layer and Top Layer 3/05/2010

Photo 16 SPL Test Pad HMA Top Layer Application

Photo 17 SPL Test Pad HMA Top Layer Application

Photo 18 SPL Test Pad Hydraulic Conductivity Sample Locations 3/17/2010

Photo 19 SPL Test Pad Density Test Boring Locations 3/17/2010

ATTACHMENT G

TRI Environmental SPL Hydraulic Conductivity Test

March 11, 2010

Mail To:

Dave Wineman
HDR
184 Creekside Park, Suite 100
Spring Branch, Texas 78070

email: david.wineman@hdrinc.com

Bill To:

<= Same

Dear Mr. Wineman:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Port of Vancouver, Test Pad**
TRI Job Reference Number:	E2337-22-03
Material(s) Tested:	3 Aggragate and Asphalt Blocks
Test(s) Requested:	Hydraulic Conductivity (ASTM D 5084)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

John M. Allen, P.E.
Division Director
Geosynthetic Services Division
www.GeosyntheticTesting.com

GCL TEST RESULTS

TRI Client: HDR
Project: Port of Vancouver, Test Pad

Material: Aggragate and Asphalt Block
Sample Identification: 1
TRI Log #: E2337-22-03

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN
Hydraulic Conductivity (ASTM D 5084, 70 kPa)											
Hydraulic Conductivity (cm/sec)	1.5E-08										1.5E-08

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

GCL TEST RESULTS

TRI Client: HDR
Project: Port of Vancouver, Test Pad

Material: Aggragate and Asphalt Block
Sample Identification: 2
TRI Log #: E2337-22-03

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN
Hydraulic Conductivity (ASTM D 5084, 70 kPa)											
Hydraulic Conductivity (cm/sec)	1.1E-08										1.1E-08

MD Machine Direction   TD Transverse Direction   NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GCL TEST RESULTS

TRI Client: HDR
Project: Port of Vancouver, Test Pad

Material: Aggragate and Asphalt Block
Sample Identification: 3
TRI Log #: E2337-22-03

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN
Hydraulic Conductivity (ASTM D 5084)											
Hydraulic Conductivity (cm/sec)	1.1E-08										**1.1E-08**

MD Machine Direction TD Transverse Direction NA Not Available

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

ATTACHMENT H

City of Vancouver SPL HMA Density Testing

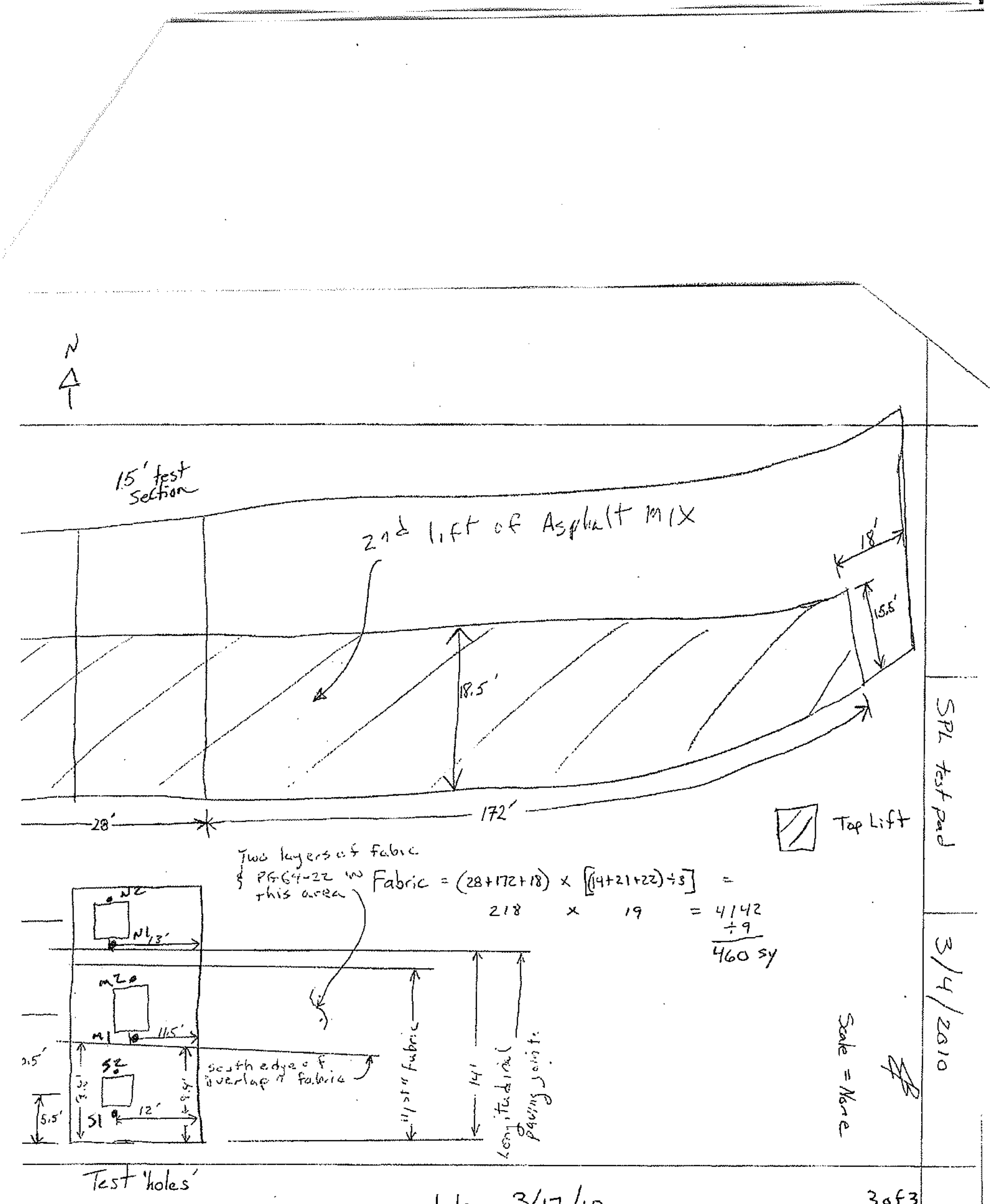
THE CITY OF VANCOUVER
CONSTRUCTION DIVISION: MATERIALS LABORATORY REPORT

3/26/2010

WORKSHEET FOR DETERMINING CORE COMPACTION

PROJECT #: CP0144 **DESCRIPTION:** POV T-5 **MIX CLASS** 3 to 30 PG64-22
CONTRACTOR: Rotschy **RICE =** 155.5
CORING DATE: 3/17/2010 **CORED BY:** Mayes Testing **TESTING DATE(S):** 3/25/2010 3/26/2010
PAVING BY: Vancouver Paving
Mix ID Porter Yett DBL-0911 **DRYING TEMP:** 125F - over night plus

CORE ID	STREET	STATION	OFFSET	THKNESS	WT. IN H20	S.S.D. WT	TARE WT	GROSS DRY WT	NET DRY WT	CORE DENSITY	Percent Comp.
N1T	SPL Cap Test Pad	Location Sketch attached		0.175	530.1	905.5	0.0	904.6	904.6	**149.98**	**96.4**
N1B				0.215	608.1	1056.4	0.0	1055.0	1055.0	**146.47**	**94.2**
N2T				0.195	571.6	992.3	0.0	990.2	990.2	**146.49**	**94.2**
N2B				0.185	499.2	877.8	0.0	872.5	872.5	**143.43**	**92.2**
M1T				0.180	526.5	902.3	0.0	900.9	900.9	**149.21**	**96.0**
M1B				0.230	642.6	1121.6	0.0	1119.2	1119.2	**145.43**	**93.5**
M2T				0.190	567.0	971.9	0.0	970.8	970.8	**149.23**	**96.0**
M2B				0.230	681.3	1170.2	0.0	1168.2	1168.2	**148.72**	**95.6**
S1T				0.210	614.6	1065.2	0.0	1059.5	1059.5	**146.35**	**94.1**
S1B				0.230	694.4	1202.2	0.0	1200.5	1200.5	**147.14**	**94.6**
S2T				0.200	571.7	992.8	0.0	987.6	987.6	**145.97**	**93.9**
S2B				0.220	669.8	1158.8	0.0	1157.7	1157.7	**147.35**	**94.8**



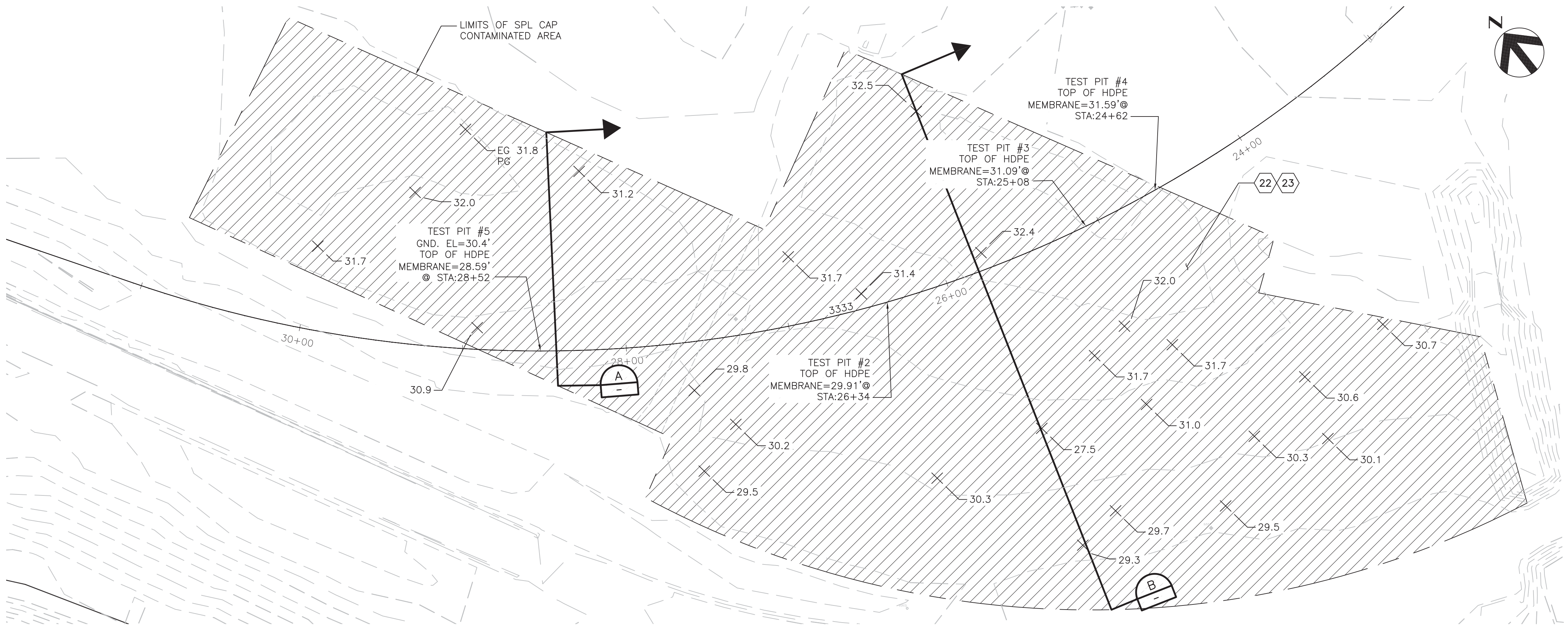
taken 3/17/10

3 of 3

6 cores
South 1 & 2
middle 1 & 2
North 1 & 2

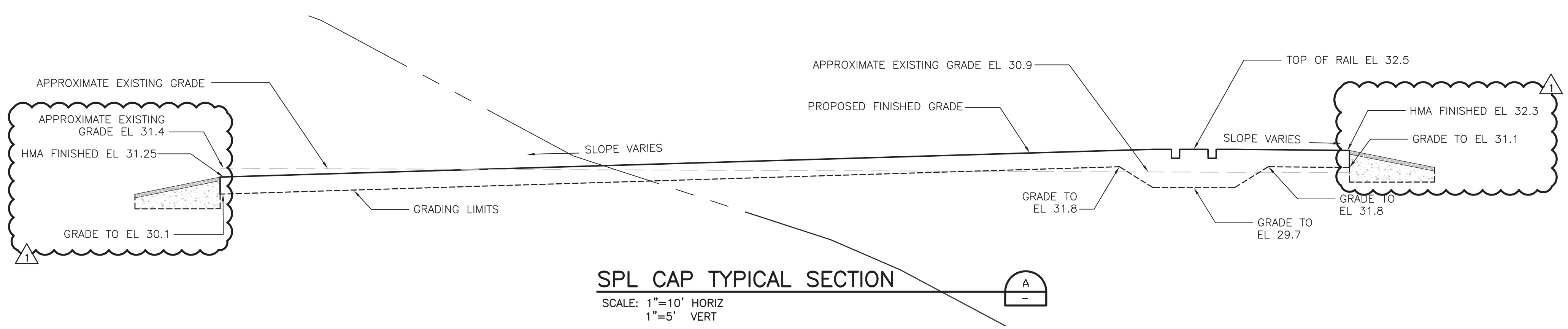
APPENDIX C

As-Built Drawings



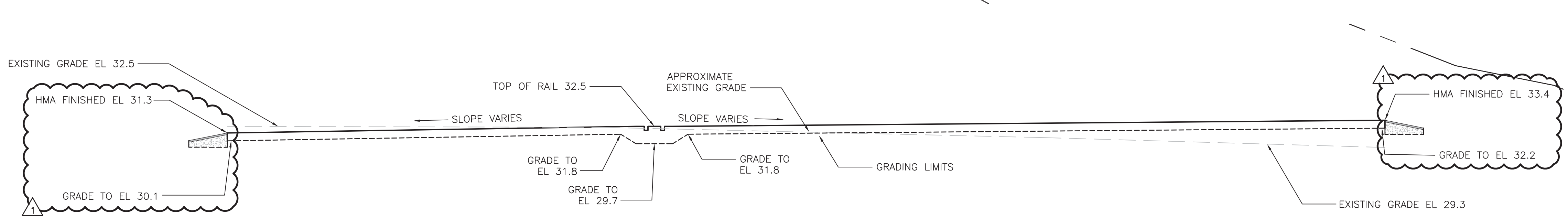
SPL CAP PLAN

0 40' 80'



SPL CAP TYPICAL SECTION (A)

SCALE: 1"=10' HORIZ
1"=5' VERT



SPL CAP TYPICAL SECTION (B)

SCALE: 1" = 20' HORIZ
1" = 10' VERT

DCN #1

KEY NOTES:

22. 60-MIL HDPE LINER HAZARDOUS WASTE REMOVAL AND MANAGEMENT
23. ROADWAY EXCAVATION INCL. HAUL

LEGEND

- EXISTING GRADE ELEVATION IN FEET
- EXISTING GRADE

NOTES:

1. POTENTIAL HAZARDOUS WASTE MATERIALS SHALL BE HANDLED IN ACCORDANCE WITH THE SPECIFICATIONS.
2. CONTRACTOR TO VERIFY POSITION OF EXISTING LINER BEFORE PROCEEDING WITH EXCAVATION.

Jun 04, 2010 – 9:44am

KURT W. REICHELT, STATE OF WASHINGTON, 35550, REGISTERED PROFESSIONAL ENGINEER

DATE

HDR Engineering, Inc.

A/E PROJECT NUMBER: 131272

DRAWING SCALE: AS SHOWN
DRAWN BY: SJF
APPROVED BY: KWR
DATE: 08/18/2009

REVISION NO.	DATE.
1	12/02/2009

WEST VANCOUVER FREIGHT ACCESS PROJECT

Terminal 5 Unit Train Improvements

Port of Vancouver USA
3103 N.W. LOWER RIVER ROAD
VANCOUVER, WA 98660-1027
(360) 693-3611 FAX (360) 735-1565

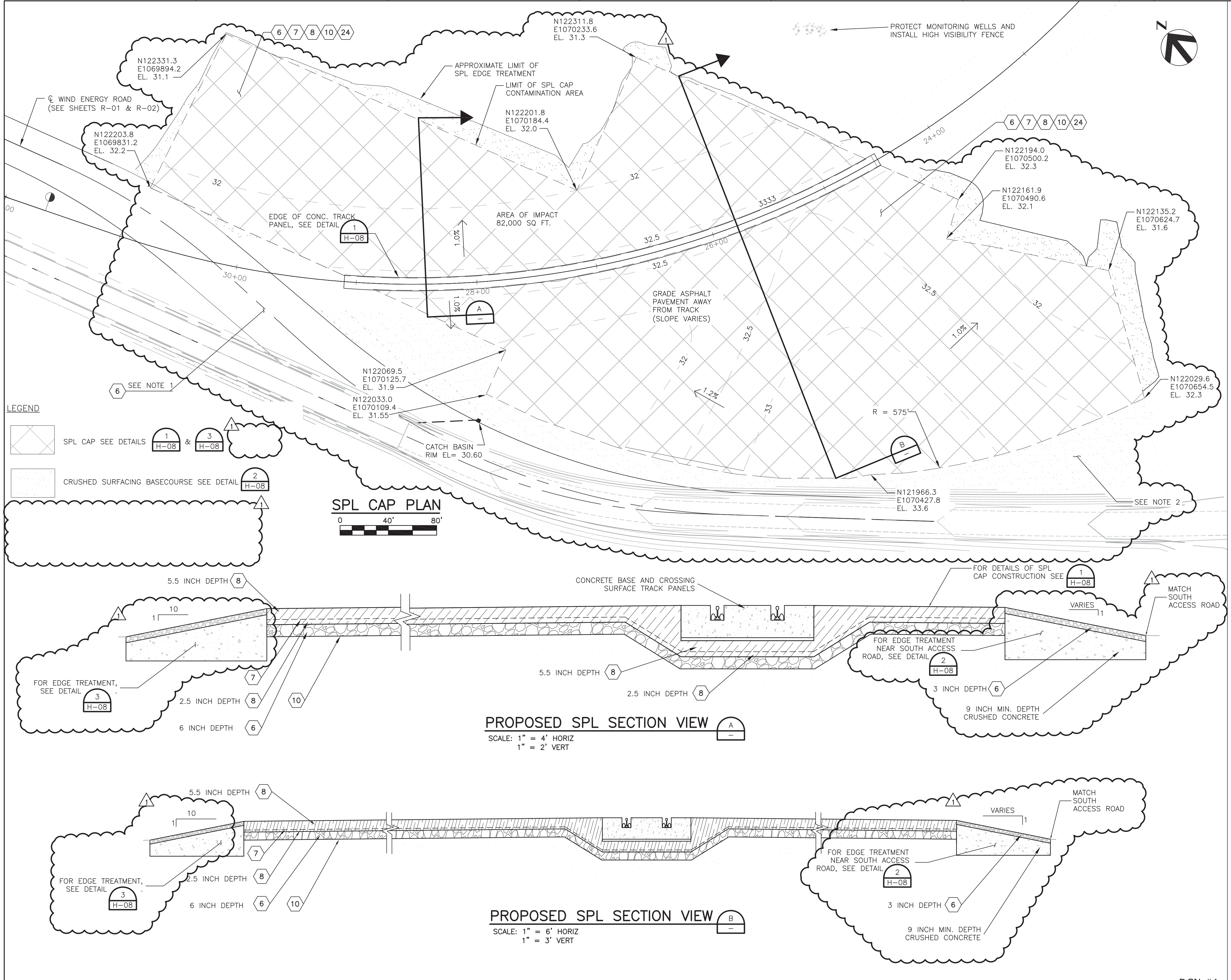
SHEET CONTENTS
SPL Cap - Removal Plan & Section

DRAWING NUMBER
H-06

SHEET NUMBER 28 OF 151

POV PROJECT NO: CP0144

pwaggone C:\pwworking\sea\d0254446\P3-98532_H-06.dwg



KEY NOTES:

- (6) CRUSHED SURFACING BASE COURSE
- (7) GEOTEXTILE INTERLAYER FOR BITUMINOUS PAVEMENT OVERLAYS
- (8) HMA CL ½" PG-64-22
- (10) TRIAXIAL GEOGRID
- (24) EMBANKMENT COMPACTION

NOTES:

1. POTENTIAL HAZARDOUS WASTE MATERIALS SHALL BE HANDLED IN ACCORDANCE WITH THE SPECIFICATIONS.
2. CRUSHED CONCRETE FROM EXISTING PORT STOCKPILE, SEE SHEET C-03 FOR LOCATION.

Jun 04, 2010 – 9:44am

KURT W. REICHELT, STATE OF WASHINGTON, 35550, REGISTERED PROFESSIONAL ENGINEER

DATE

HDR Engineering, Inc.

A/E PROJECT NUMBER: 131272

DRAWING SCALE: AS SHOWN

DRAWN BY: SJF

APPROVED BY: KWR

DATE: 08/18/2009

REVISION NO.	DATE.
1	12/02/2009

WEST VANCOUVER FREIGHT ACCESS PROJECT

Terminal 5 Unit Train Improvements

Port of Vancouver USA
3103 N.W. LOWER RIVER ROAD
VANCOUVER, WA 98660-1027
(360) 693-3611 FAX (360) 735-1565

SHEET CONTENTS
SPL Cap - Plan & Sections

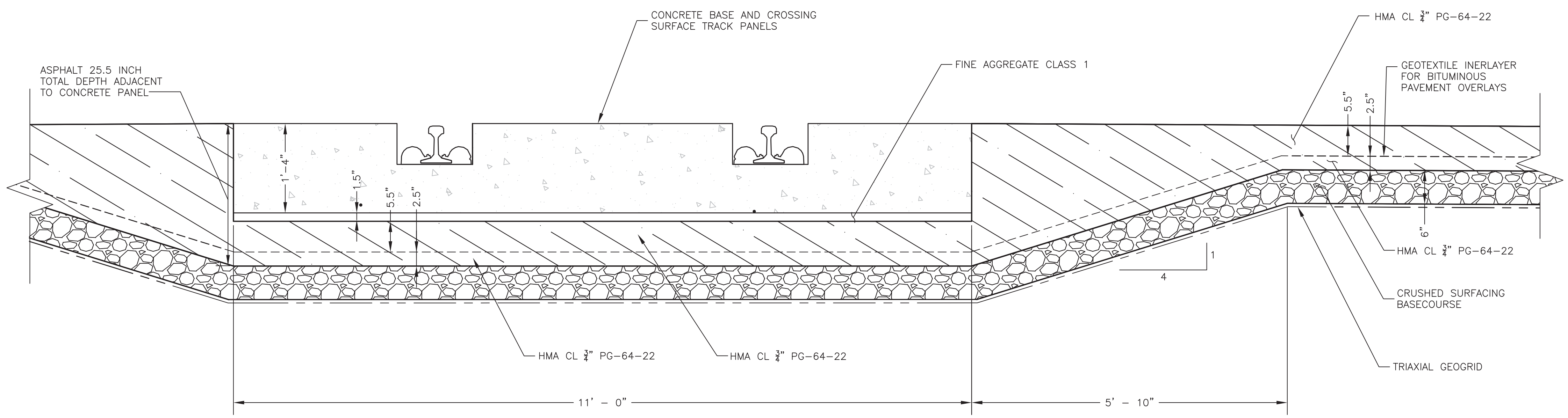
DRAWING NUMBER
H-07

SHEET NUMBER 29 OF 151

POV PROJECT NO: CP0144

pwaggone C:\pwworking\sea\d0254446\P3-98532_H-07.dwg

1 2 3 4 5 6 7 8

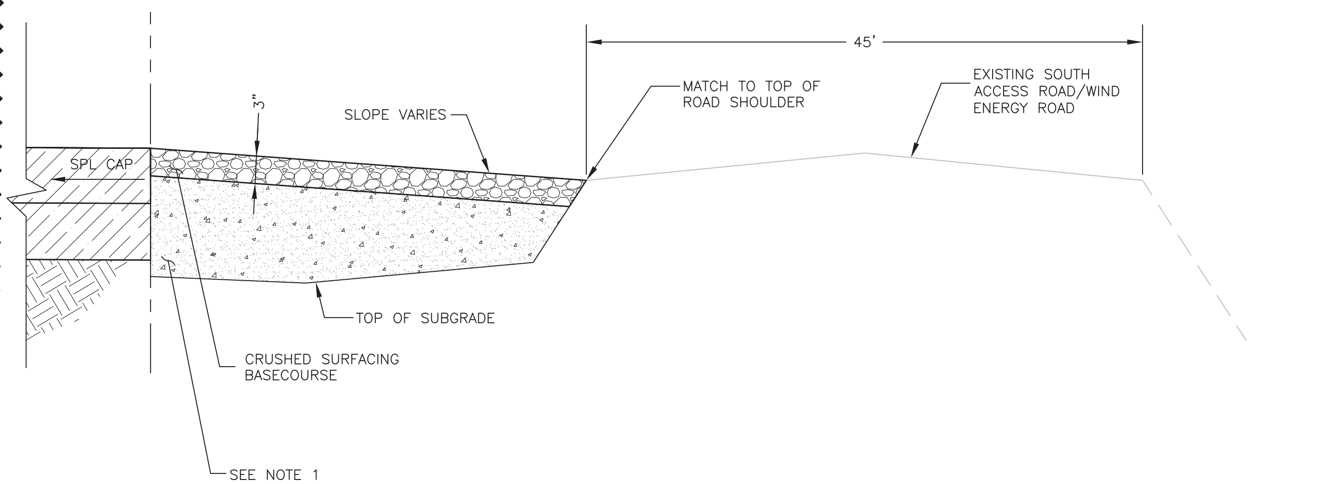


SPL CAP ASPHALT LIFT DETAIL (1/–)

SCALE: 1" = 1'

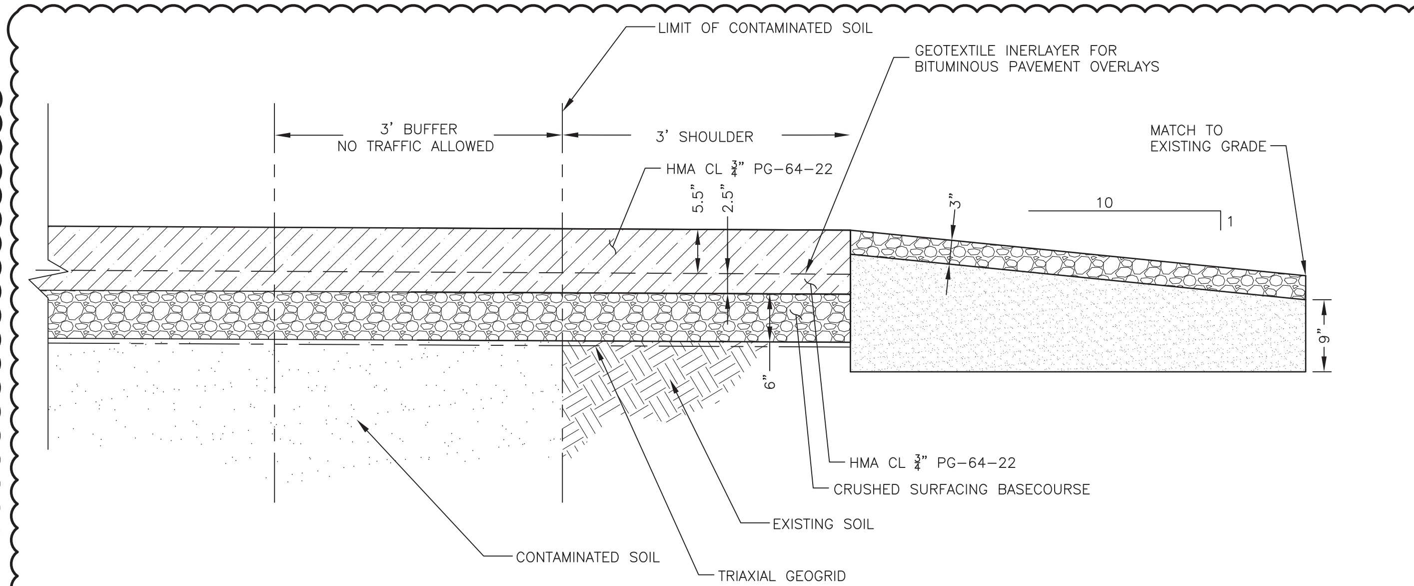
NOTES:

1. CRUSHED CONCRETE FROM EXISTING PORT STOCKPILE, SEE SHEET C-03 FOR LOCATION



SURFACE DETAIL BETWEEN SPL CAP AND SOUTH ACCESS ROAD/WIND ENERGY ROAD (2/–)

SCALE: NTS



SPL EDGE TREATMENT (3/–)

SCALE: NTS

DCN #1

Jun 04, 2010 - 9:44am

pwaggone C:\pwworking\sea\d0254446\P3-98532_H-08.dwg

KURT W. REICHELT, STATE OF WASHINGTON, 35550 REGISTERED PROFESSIONAL ENGINEER

DATE

HDR Engineering, Inc.

A/E PROJECT NUMBER: 131272

DRAWING SCALE: AS SHOWN

DRAWN BY: SJF

APPROVED BY: KWR

DATE: 08/18/2009

REVISION NO.	DATE.
1	12/02/2009

WEST VANCOUVER FREIGHT ACCESS PROJECT

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VANCOUVER, WA 98660-1027
(360) 693-3611 FAX (360) 735-1565

SHEET CONTENTS
SPL Cap - Details

DRAWING NUMBER
H-08

SHEET NUMBER 30 OF 151

POV PROJECT NO: CP0144