Washington State Department of Transportation

Memorandum

WILLIAM M. PRESTON
STATE OF WASHINGTON
36211
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 06/03/2010

Region Materials Engineer

January 7th, 2009

TO: Brian White, PE
SCR ARA for Project Development

FROM: Bill Preston, PE
SCR Materials Engineer
(509) 577-1792

SUBJECT: **PS-S-255, Rocky Run, Lake Keechelus Source Report;** XL-2779
PIN 509009B, I-90, "Snoqualmie Pass East – Hyak to Keechelus Dam", MP's 56.6 to 56.9 vicinity.

This report discusses and investigates an existing WSDOT borrow site, PS-S-255, on Bureau of Reclamation Lands in Lake Keechelus reservoir. The primary function of this site is to offset lake storage loss resulting from the project by increasing Lake Keechelus's reservoir storage capacity. The borrow and mineral aggregate materials found within the source, called PS-S-255 and named "Rocky Run Creek" are proposed for use on the subject project. This project will be split into multiple phases, the first project, I-90, "Snoqualmie Pass East - Phase 1A. Hyak to Crystal Springs - Detour" will excavate materials from this source. The project will stockpile the material at the Crystal Springs staging area off of the Stampede Pass I/C and also build a detour embankment at Gold Creek out of the scalpings and other less desirable material. The proposed Ad date for this project is February 2009.

SOURCE DESCRIPTION

Topography

PS-S-255 is located in the West ½ of the SW ¼ of section 23 of T22N, R11E in Kittitas County. The 38 acre site lies within Lake Keechelus, on the eastern slope of the central Cascade Mountains, along I-90, approximately 57 miles east of Seattle and four miles east of Snoqualmie Pass (see figure 1, Appendix A). The topographic elevation of this site varies between 2,474 to 2,496 feet, with the highest level of the reservoir reaching nearly 2,517 feet in June, and then being drawn down to a lowest recorded elevation of nearly 2,439 feet in November.

Rocky Run Creek flows from the east and drains into the south east corner of the borrow site. The lake is the headwaters of the Yakima River and also serves as one of six major reservoirs the Bureau of Reclamation uses in its Yakima River drainage irrigation projects. The surrounding topography is rugged mountain peaks and valleys.

Vegetation

The vegetation surrounding Lake Keechelus is mixed coniferous forests extending down from the timberline to the reservoir. Various bushes and grasses exist in the reservoir and thrive during draw-down times.

Climate

The site's climate is typical of the east slopes of the Cascade Mountains. In the late fall through mid spring, maritime climate is dominant with prevailing westerly winds from the Pacific Ocean and cold air from the Canadian interior creating severe cold weather. Air masses cool as they rise over the Cascade Range, resulting in heavy precipitation along the windward slope and also the vicinity east of the crest, well within the pit site's location. Annual precipitation is between 110 to 140 inches at Snoqualmie Pass. Approximately half of this precipitation occurs as snowfall, accumulating between late October and mid April with between 10 to 15 feet average and up to 59 feet in heavy snowfall years. The driest time is during mid July through mid September when less than 10 percent of the precipitation occurs. Winter temperatures range from highs between 25 and 35 F during the daytime and as low as -15 to -25 F at night. Daytime summer temperatures can be as high as 70 to 95 F and possible lows dipping down into the 30's at night.

Land Rights

The site is owned by the United States, Bureau of Reclamation (BOR). The State will utilize this source by a permit issued from the Untied States Forest Service (USFS) The permit will be issued by the USFS in an agreement with the BOR. Access to the site will be from I-90 to the north off of the WSDOT maintained easement from the United States Forest Service (USFS).

Geotechnical Field Exploration:

There have been three separate phases of field investigation at PS-S-255 (formerly known as CB-S-255). The first two field testing surveys occurred in September of 1969 and then again in March of 1973. The 1969 investigation consisted of eight backhoe excavations varying from six feet to 12 feet in depth while the 1973 investigation consisted of 12 test pits of nine feet to 12 feet in depth (See Figure 5, Appendix B).

Unfortunately, detailed documentation describing the exact locations of the test pits has been lost over time. However, surviving documentation in the form of field sketches as well as present day field observations indicate that the pits were excavated in a systematic fashion over *portions* of the PS-S-255 site as well as a proposed extension to the south in an area that later became designated PS-S-272.

Careful interpretation of a hand sketch indicates that test pits one through four of the 1969 exploration were excavated at 300 feet +/- intervals in a roughly north-south line parallel to and approximately 900 feet to 1000 feet east of the I-90 alignment. Test pits five through eight were excavated in a more random fashion between the I-90 alignment and the line created by test pits one through four. All of these test pits are within the PS-S-255 boundary. The 1973 test pit excavations are less useful to the investigation as most of the pits were excavated in the area south of Rocky Run Creek in the area that became designated PS-S-272. However, test pits 50, 51 and 52 are situated close enough to the southern boundary of PS-S-255 to be considered representative of the material in that area.

As was the case in many of the older field investigations, test pit excavation and testing frequency tended to be more intensive in small areas of large materials sources where excavation was expected to occur during construction. Regardless, the results obtained from the test pits is quality data worthy of inclusion in this report as it may be more descriptive of the in-situ soil conditions than other types of boring.

A far more comprehensive field investigation was conducted in September of 2007. A total of 38 bore holes were drilled with a Becker Hammer on the conventional 200 feet by 200 feet grid over the entirety of the old PS-S-255 boundary (as described on Figure 2 in Appendix A) as well as additional potential minable areas to the north and southeast. Depths ranged from 9 ft. to 50 ft. with the average depth being 40 feet. The test borings were of sufficient depth to establish a soil profile in the source to a basal elevation of 2445 feet. At most of the shallower bore holes, boring was ceased when bedrock was encountered. Datalogging pneumatic piezometers were installed in four of these borings for long-term groundwater monitoring. The locations of the boreholes produced during the 2007 exploration are shown on Figure 4 in Appendix B. A copy of the 2007 bore logs are also included in Appendix B.

Laboratory Testing:

Multiple samples were obtained from the 1969 test pits and submitted for "R" value, swell pressure, gradation & Sand Equivalent (SE) determination. Los Angeles wear (LA wear), Washington Degradation (Deg.), and Specific Gravity (spG) values were apparently not determined in 1969.

Samples from the 1973 test pits were submitted for more intensive testing. In addition to the customary gradation and SE values, LA wear, Deg., and spG values were also determined for representative samples from test pit 51. The source was approved on April 1, 1973 for the production of most types of WSDOT specification mineral aggregates.

As was the case with the earlier exploration, multiple samples were obtained from the 2007 Becker Hammer test borings and submitted for Los Angeles wear (LA wear), Washington Degradation (Deg.), Specific Gravity (spG) testing, and gradation analysis. In addition to the "basic" testing, selected samples were also submitted for stability and "R" value determination and moisture-density relationship (AASHTO T 99 & AASHTO T 180) determination. A table summarizing the numerous test results from the excavations as well as the Becker Hammer borings, is located in Appendix C.

GEOLOGY

Regional Geology

PS-S-255 is located within the rugged bedrock terrain of the central Cascade Mountains of Washington. The region has been shaped by episodes of sediment deposition, volcanism, uplift, and glaciation over the past approximately 55 million years. During the Eocene (~55-34 million years ago) much of central Washington State was a broad coastal flood plain with large river systems draining portions of what is now modern Canada and northern Idaho. These river systems deposited vast amounts of sediments that eventually

hardened into sandstones, siltstones and conglomerates. Major north-south crustal strikeslip faulting perhaps contributed to the volcanism that left these sediments interbedded with andesites, basalts and rhyolitic volcanic rocks. In the area of the pit site, the seinterbedded sediments are collectively called the Naches Formation. (Tabor, et al, 1984).

About 37 million years ago the subduction of the Juan de Fuca Plate off the west cost of Washington initiated the episode of Cascade Arc volcanism and mountain building that has persisted to the present. The Ohanapecosh Formation, which outcrops just south of PS-S-255, is a remnant of some of the first Cascade Arc volcanism. Uplift of the modern Cascade Range initiated some time between 4 and 7 million years ago that left the sedimentary and volcanic rocks folded and steeply dipping in the vicinity of PS-S-255.

During the Pleistocene (1.6 million to 10,000 years ago), at least three major glacial advances occurred with glaciers extending down the Yakima River Valley a distance of approximately 40 to 50 miles from the Snoqualmie Pass Summit. The last glacial advance, occurring near the end of the Pleistocene, was less extensive. Terminal moraines from this glaciation dammed alpine valleys near the Snoqualmie Pass Summit, creating large lakes, including Lake Keechelus. These glaciers modified previous landforms and left behind vast amounts of glacial sediment. Since deglaciation, fluvial, lacustrine, and mass wasting processes have dominated within the area.

Site Geology

PS-S-255 is on the alluvial fan/delta of Rocky Run Creek. Prior to the completion of Keechelus Dam in 1917 Rocky Run Creek flowed out of the mountains east of the pit site depositing gravels and sands in an alluvial fan on the side of a broad glacial valley that contained the narrower/lower volume Lake Keechelus. The leading edge of the Rocky Run Creek fan may have been deposited in this pre 1917 Lake Keechelus. After the completion of the dam, the level of Lake Keechelus was raised filling most of valley. The water level of Lake Keechelus varies seasonally, leaving the pit site exposed during the late summer and fall and completely submerging the pit site when snowmelt swells the reservoir in the spring and early summer. Since 1917 the pit site has been alternately a subaerial alluvial fan or a subaqueous deltaic depositional environment for Rocky Run Creek, depending on the water level of Lake Keechelus.

The thickest portions of the alluvial fan/delta of Rocky Run Creek are built on top of an unknown thickness of alpine glacial sediments from the repeated advance and retreat of glaciers in the Cascades during the Pleistocene. Close to I-90, the fan/delta is built on top of sedimentary rock and basaltic rock units of the Naches Formation (Frizzell, et.al.,1984). The fan/delta environment of the pit site consist mostly of sediments (gravel, sand and silt) washed out of the Rocky Run Creek drainage with interbedded lacustrine sediment (silt) from the times when the pit site is completely submerged beneath Lake Keechelus. The 39 Becker Hammer exploratory borings advanced in September 2007 at the site indicate that the alluvial fan/delta deposit is composed of interfingered gravel, sand, and silt horizons.

The sediments washed out of the Rocky Run Creek drainage consist of glacial drift left

behind as alpine glaciers retreated, and sediments derived from bedrock units of the Rocky Run Creek drainage. The Rocky Run Creek drainage is underlain by sandstones and basalts of the Naches Formation and a small amount of intrusive granitic rock (tonalite) (Frizzell, et.al, 1984).

Groundwater

Lake Keechelus submerges and exposes PS-S-255 depending on the season, making ground water levels at the pit site highly variable. In September 2007, Level Troll piezometric data loggers were installed in four of the Becker Hammer boreholes at the pit site. The installations are located close to I-90 at BH-101 and BH-106; at the approximate center of the pit site at BH-118; and close to the late summer shoreline of Lake Keechelus at BH-134.

One year of piezometric data was collected from late September 2007 to September of 2008. The late summer water table declines from I-90 to Lake Keechelus across the pit site at about a 1% to 4% gradient. The variance in the gradient is a result of the 2008 data for BH-134 being much lower than the 2009. This is the expected configuration of an unconfined aquifer in permeable sediments roughly mimicking ground topography as the steep slopes East of I-90 decline to meet Lake Keechelus west of the pit site. The water table is slightly higher (~ 1-3 feet) at the northern end of the pit site at BH-101 than it is at BH-106 to the south, but this gradient is much less than the east-west water table gradient across the pit site. During the late summer the water table is at roughly an elevation of 2485 feet close to the freeway and an elevation of 2455 feet in the borings closest to Lake Keechelus. This translates to a water table of about 8 feet below the surface in the eastern most part of the pit site; about 4 feet below the surface in the center and about 8 feet below the surface at the western most part of the pit site. Detailed groundwater information is located in Appendix D.

Quality of Material

Representative samples for material quality (LA wear, Deg., & spG) were obtained from several of the older test pits as well as the Becker Hammer borings. On some occasions, composite testing of adjacent Becker Hammer borings was performed due to the small amount of recovered material. As discussed above, test results are tabulated on Table 1 in Appendix C. The quality testing results do indicate that the material present in the source is suitable for the production of almost all forms of WSDOT specification aggregate products.

In addition to the quality testing, particle size analysis (gradation) and SE testing was performed on selected samples from both the test pits and test borings and the results, again, are tabulated on in Table 1. The results of the gradation testing confirm what was already indicated from the boring logs and test pit logs, that PS-S-255 possesses areas and stratigraphy where the particle size varies from silt and clay all the way up to sands, gravels, cobbles, and boulders. As a result, it may be inferred that most products could be produced from this source based on the particle size distribution. However no specific details can be described about what difficulties might be encountered during production, (i.e. scalping percentage, washing of raw material, uniformity of raw material going into crusher, etc.).

For the purposes of the Snoqualmie Pass East - Phase 1A. Hyak to Crystal Springs – Detour project, where the only proposed use of material from this source will consist of common borrow, the gradation testing indicates that the majority of material present in the site is suitable for use. However pockets of unsuitable material will most likely be encountered during the excavation.

Quantity of Material

The proposed excavation is approximately 360,000 cubic yards of material in-place. This volume was calculated using a digital terrain model and reflects the contours shown on the reclamation plan (see sheet, RP1, Appendix A). Using the a factor of safety of 1.25, as suggested in the Geotechnical Design Manual, this source should yield approximately 290,000 cubic yards of usable material not including shrinkage.

An overall compaction factor of 12 to 18 percent shrinkage should be used for embankment materials excavated from this site. The material in the site should have a swell factor of between 5 and 15 percent.

Clearing and Stripping

A minimal amount of preparation will be required to use this site. There are bush type vegetation, grasses and thin top soil, less than a half a foot that will have to be removed.

Slope Stability

The proposed final slopes at this site will be constructed no steeper than 2(H):1(V). The current proposed slope configuration consists of a 10-15 high 2:1 back slope (with the great majority being the shallower depth). The top of the excavation has a minimum 100 foot setback from the I-90's existing toe of fill and 50 foot from the toe of any new embankment.

The proposed 2:1 slopes and setback should provide an adequate margin of safety against any potential encroachment on the I-90 embankment although no detailed slope stability analysis has been performed. A more detailed slope stability analysis should be performed if modifications to the proposed slope, depth or setback are planned.

Mining Considerations

General Mining Recommendations

Specific plans regarding how the site is to be mined should comply with any and all BOR or USFS requirements.

The best potential for mineral aggregate production in the site are generally located within the yellow boundary of Figure 3 in Appendix A. These materials are 30 or more feet in depth with a proposed maximum floor elevation of 2,440 to 2,450 feet. Areas outside the yellow ring boundary are sands with silts that are more suitable for use as borrow.

Temporary Erosion and Sediment Control BMPs (Best Management Practices) should encompass the areas to be excavated on this project to keep contaminated water from entering

Lake Keechelus. Furthermore, large containment ponds may be needed to settle out silt and clay materials from dewatering activities or from washing. The Project Engineer will be responsible for determining what methods will be required.

Phase - 1A Proposed Mining Plan

The primary goal of excavating this source is to maintain existing lake storage and any future development or mining of this site is unlikely. The proposed mining plan is to start excavating on the east side of the site, as soon as the water levels permit, around the middle of August, and continue to move towards the west finishing all work by mid October. The initial material excavated will be used to construct a temporary haul road parallel to I-90 on the east side of the site and a stockpiled in between the Gold Creek bridges. The excavated materials will then be hauled via the haul road and I-90 to a staging area and then processed under a future contract as needed.

Special Considerations

The surface soils encountered may be soft when saturated and the use of pneumatic tired equipment may be limited. Additionally, material excavated may be saturated beyond the optimum moisture content and difficult to use for the construction of the haul road and the detour embankment.

Special consideration should be given to the relatively high water tables found on the east side of the site and the fact that saturated silty sandy soils will be encountered. Provisions should be made for excavating in the water or for dewatering the areas being worked.

Materials stockpiled for future processing should be segregated as much as feasible when they are dumped in the stockpile site. Representative samples should be obtained while placing material in the stockpile site for use in upcoming contracts. Contact the SCR Materials Lab for assistance.

Reference

Frizzell, Virgil A., Jr.; Tabor, Rowland W.; Booth, Derek B.; Ort, Kathleen M.; Waitt, Richard B., Jr., 1984, Preliminary geologic map of the Snoqualmie Pass 1:100,000 quadrangle, Washington: U.S. Geological Survey Open-File Report 84-693, 1 plate, scale 1:100,000, with 43 p. text.;

Tabor, R. W.; Frizzell, V. A., Jr.; Vance, J. A.; Naeser, C. W., 1984, Ages and stratigraphy of lower and middle Tertiary sedimentary and volcanic rocks of the central Cascades, Washington--Application to the tectonic history of the Straight Creek fault: Geological Society of America Bulletin, v. 95, no. 1, p. 26-44.

"Route Evaluation, I-90 Existing Roadway Data, SR90, MP 55.17 to MP 111.00", May 1996, South Central Region, Yakima, Washington.

BP/dmm/msh/adb

Appendices

Appendix A
Figure 1 – Vicinity Map
Figure 2 – Sundry Site Plan
Figure 3 – Preliminary assessment of gravel deposits
Pit Site Reclamation Plan (RP1)
Pit Site Reclamation Plan Cross Sections (RP2)
Pit Site TESC Plan (TP1)

Appendix B
Figure 4 – Plan view of 2007 bore hole and geologic cross section locations
Figure 5 – Plan view of 1969 and 1973 investigations.
Geologic Cross Sections
Logs of Borings

Appendix C
Table 1 – Test Result Summary Table
Laboratory test results

Appendix D
Table 2 – Piezometer Data
Figure 5 – Water Table Chart
Figure 6 – Keechelus Lake Water Elevation

Appendix E
Site Photos

Appendix A

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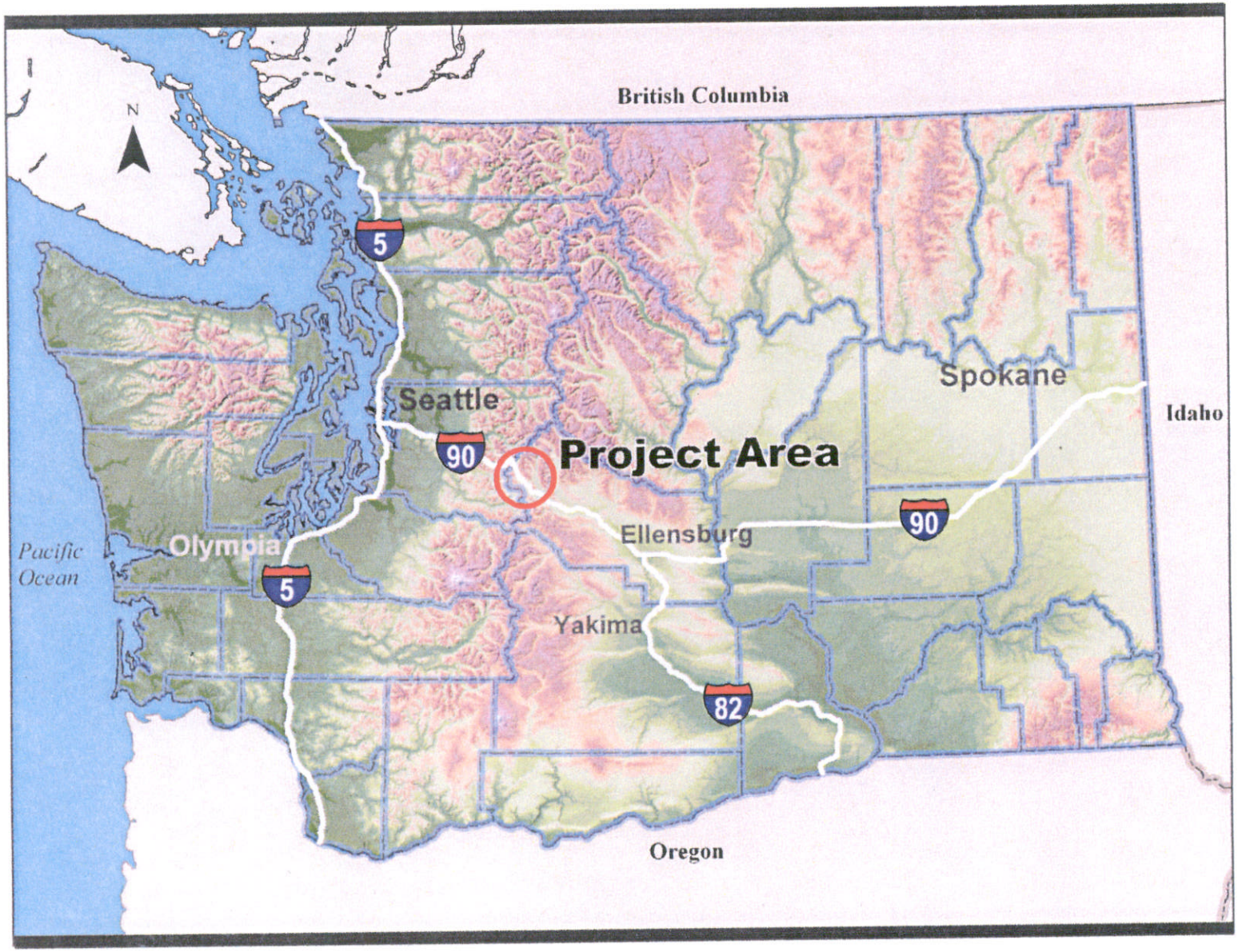


Figure 1 Vicinity Map

thompga	5/15/2008	11:13:22 AM	Plot 1	K:\Engineering_I_2779\I_2779\WorkingFiles\To_Be_Deleted_on_2008-07-01\Gary\SUNDRY PLANS\Rocky Run Sundry Sheet\Rev01.dgn

T. 22N. R. 11E. W.M.

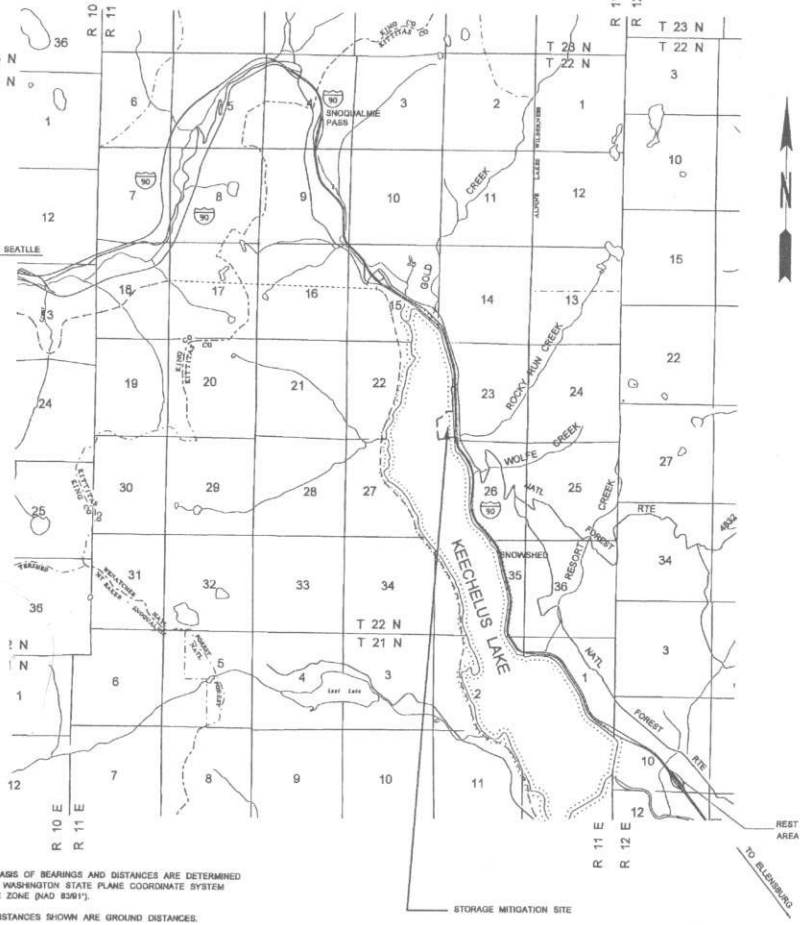


Figure No. 2

THE BASIS OF BEARINGS AND DISTANCES ARE DETERMINED FROM WASHINGTON STATE PLANE COORDINATE SYSTEM SOUTH ZONE (NAD 83/91*).

THE DISTANCES SHOWN ARE GROUND DISTANCES.

FOR SURVEY INFORMATION SEE RECORD OF SURVEY FOR THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, I-90 SNOQUALMIE PASS EAST RECORDED OCTOBER 28,2003, IN KITTATAS COUNTY, BOOK 29, PAGES 91-113, AF-N 200310280012.

VICINITY MAP AND TOTAL PARCEL DETAIL

0 .75M 1.5M
SCALE IN MILES

* NOTE:

WHEN THE LAKE WATERS RECEDE TO THE ELEVATION OF 2462.00' THE EXPOSED LAND FALLS UNDER THE JURISDICTION OF THE U.S. FOREST SERVICE.

AS THE LAKE FILLS THE PIT BOUNDARY REVERTS BACK UNDER THE JURISDICTION OF THE U.S. BUREAU OF RECLAMATION.

-						
-						
-						
5-06315	USA - WENATCHEE NATIONAL FOREST	UNDETERMINED				* 38.21 AC.
5-06644	U.S BUREAU OF RECLAMATION	UNDETERMINED				* 38.21 AC.
PARCEL NO.	NAME	TOTAL AREA	R/W	LT. REMAINDER RT.		EASM'T

TOTAL AREA IS FROM ASSESSOR'S RECORDS UNLESS OTHERWISE NOTED.

OWNERSHIPS

ALL AREAS ARE SHOWN IN SQUARE FEET UNLESS OTHERWISE NOTED.

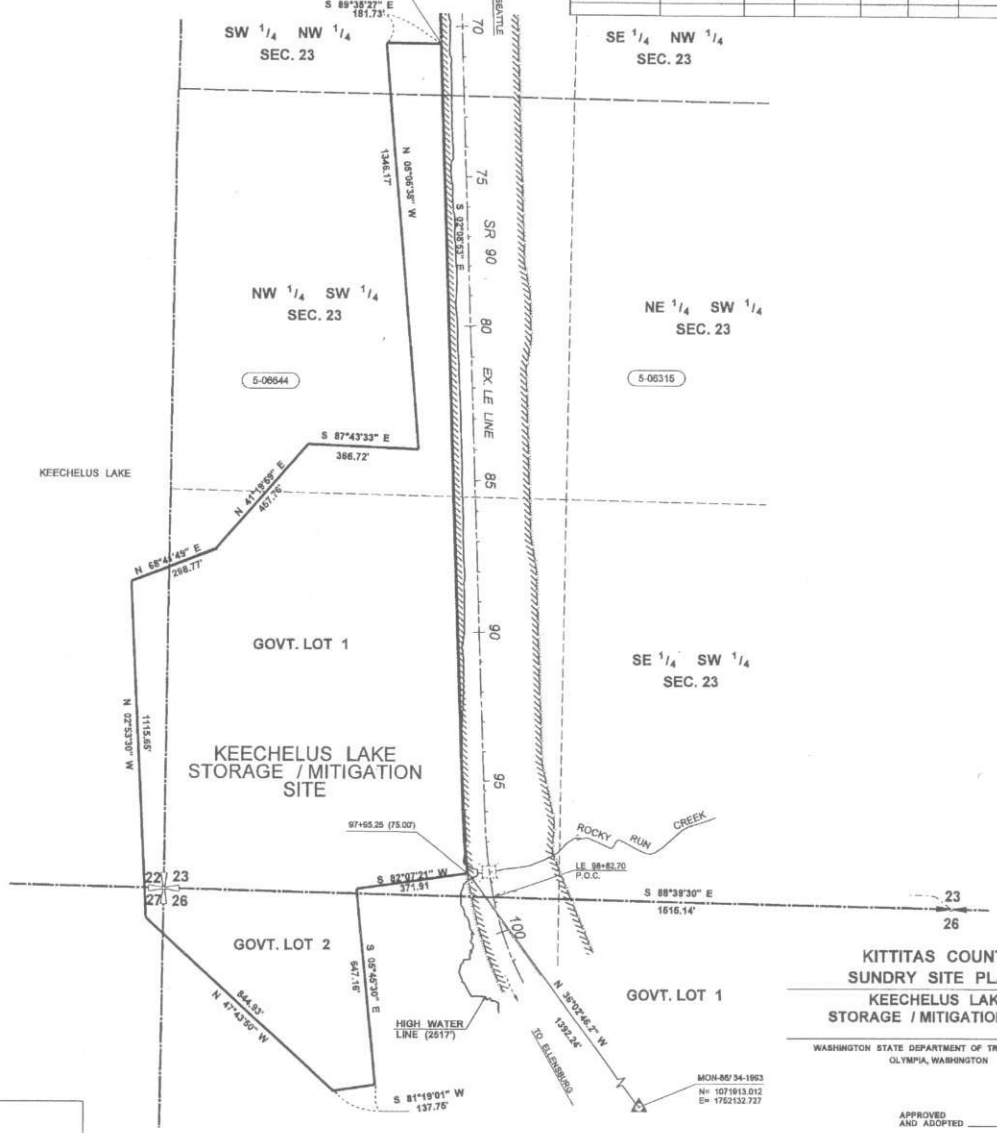
LEGEND

PROPERTY OWNERSHIP NUMBERS

PROPERTY LINES

0 200 400
SCALE IN FEET

TOTAL CURVE DATA			CURVE DATA			SPIRAL DATA		
P.I. STATION	DELTA	TANGENT	DELTA	RADIUS	LENGTH	a	DE	Ls
LE 100+92.07	39°01'52"	557.21'	24°01'52"	1145.92'	480.82'		07°30'00"	300.00'



KITTITAS COUNTY
SUNDRY SITE PLANS
KEECHELUS LAKE
STORAGE / MITIGATION SITE

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
OLYMPIA, WASHINGTON

APPROVED AND ADOPTED _____

PROJECT ENGINEER _____ RIGHT OF WAY PLANS ENGINEER _____

Reference	Approval	Revision Description	By

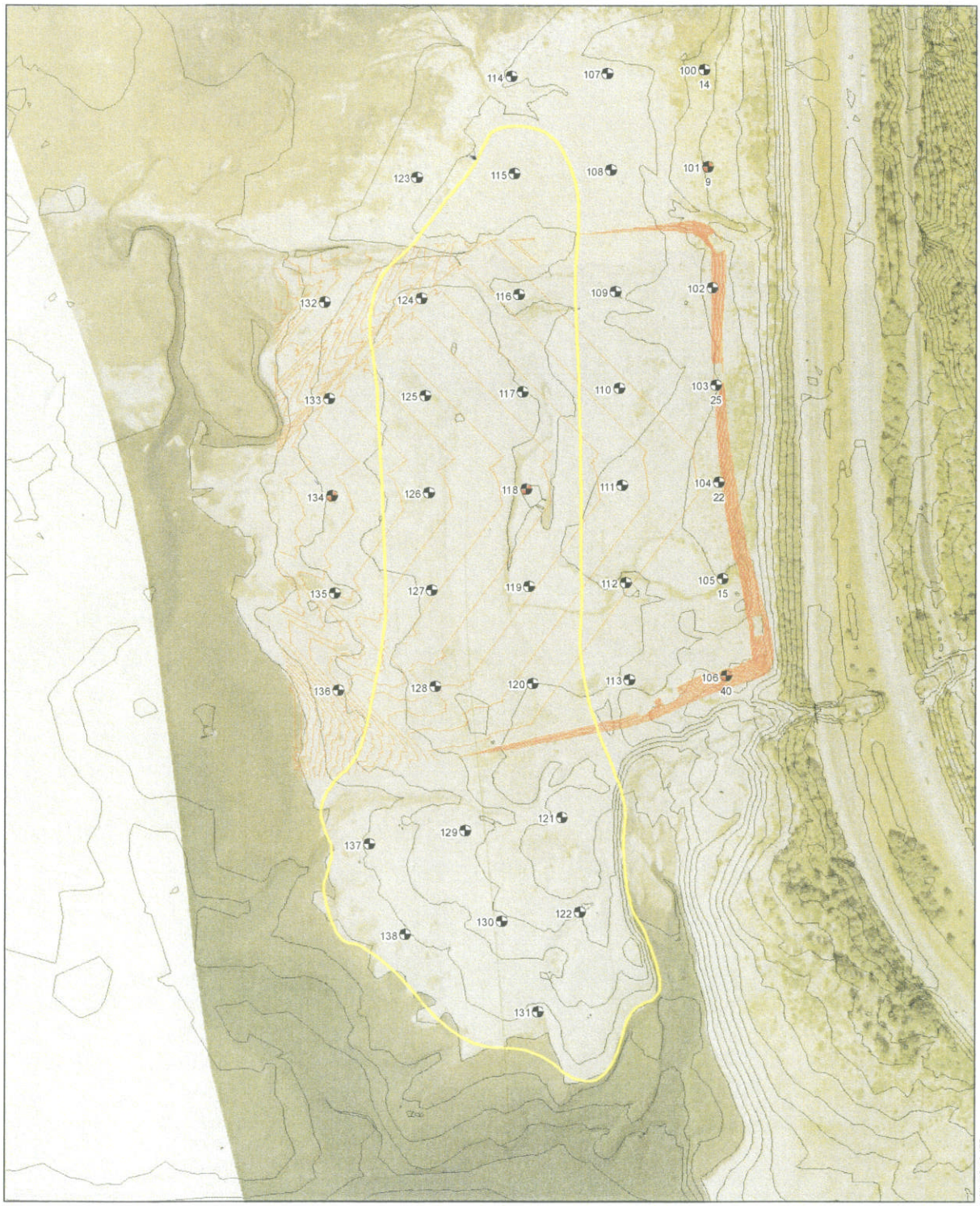
SHEET 1 OF 1 SHEETS

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL DIVISION

FIGURE 3 : PRELIMINARY ASSESSMENT OF GRAVEL DEPOSIT

KITTITAS COUNTY PIT SITE 255

JOB# XL-2779



LEGEND

- Borehole
- Piezometer
- Area of highest potential for gravel (based on boring logs)
- Area of highest potential for gravel (based on boring logs)

LABELS

Test Boring #

Depth
To Bedrock
(Where Encountered)

N

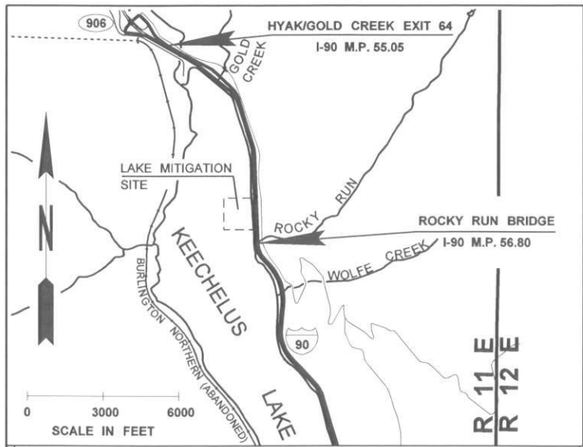
FEET
0 50 100 200 300 400

1:2,400

1 inch equals 200 feet

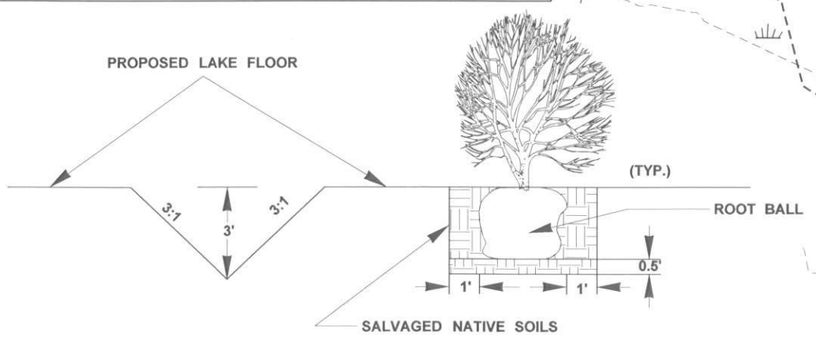
PROJECT MANAGER	Lynn Moses
PREPARED BY	Jeff Fisher
PHONE	360-709-5574
EMAIL	fisheje@wsdot.wa.gov
DATE	September 4, 2008

File Location: M:\ABShare\Elderback\Projects\Pits and Quarries\WA\site_siteWork\PS-5-255



LEGEND

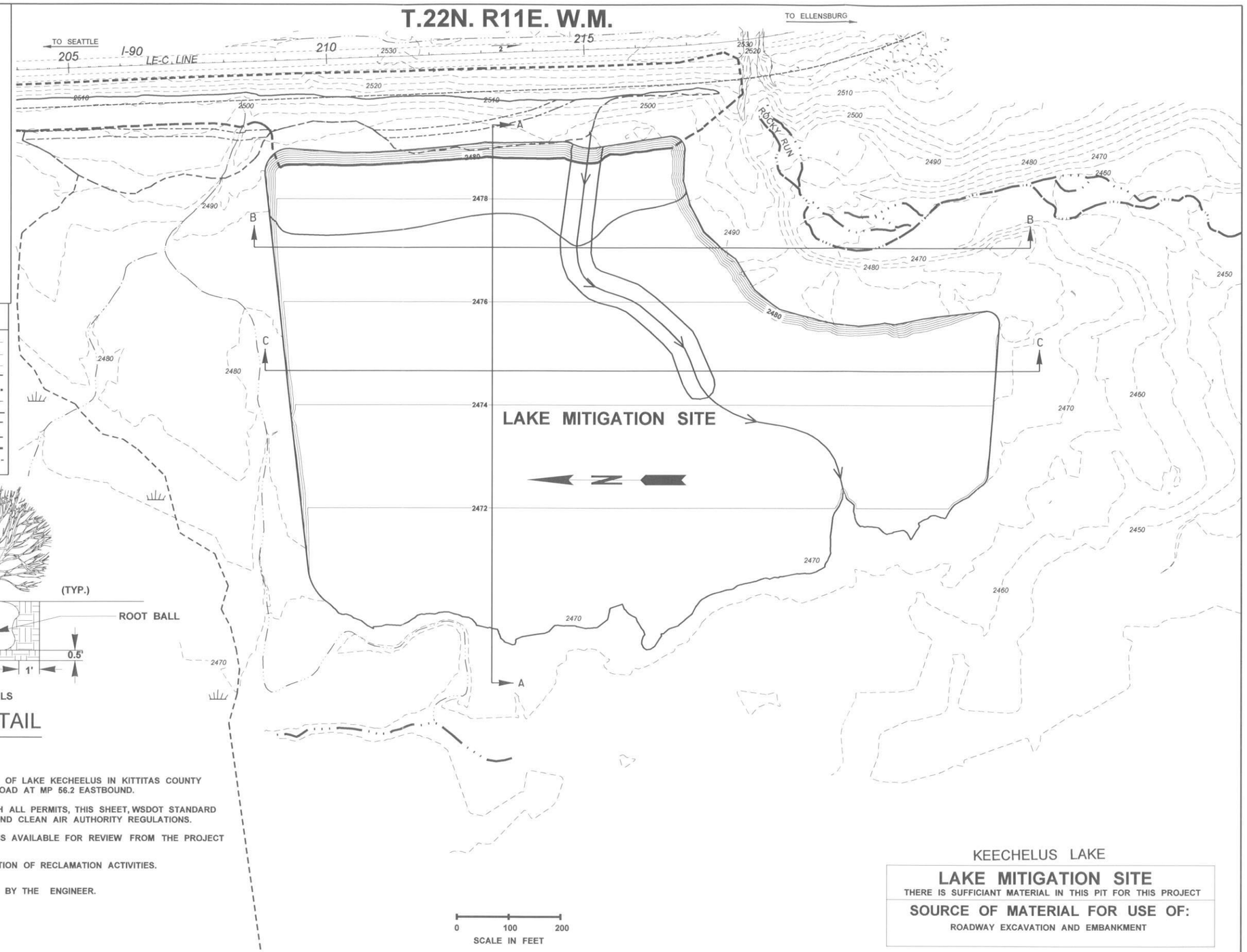
- ULTIMATE CONTOURS
- EXISTING 10' INDEX CONTOURS
- EXISTING 5' INTERMEDIATE CONTOURS
- LAKE MITIGATION SITE LIMITS
- CONTINUOUS SPRING
- SEASONAL RUNOFF
- PROPOSED MEANDERING CHANNEL (SEE DETAIL BELOW)
- WETLAND BOUNDARY
- RESTORATION BOUNDARY
- BOUNDARY FOR SALVAGING SOILS
- WETLAND IMPACT BOUNDARY



MEANDERING CHANNEL DETAIL

NOTES:

1. LAKE MITIGATION SITE IS LOCATED AT M.P. 56.7 ON THE NORTH EAST END OF LAKE KECHEELUS IN KITTITAS COUNTY WASHINGTON. THE SITE WILL BE ACCESSIBLE FROM A TEMPORARY HAUL ROAD AT MP 56.2 EASTBOUND.
2. ALL MINING AND RECLAMATION PRACTICES SHALL BE IN ACCORDANCE WITH ALL PERMITS, THIS SHEET, WSDOT STANDARD SPECIFICATIONS, DOE REGULATIONS, LABOR AND INDUSTRIES REGULATIONS, AND CLEAN AIR AUTHORITY REGULATIONS.
3. LAKE MITIGATION SITE, ROCKY RUN, I-90 LAKE KEECHELUS SOURCE REPORT IS AVAILABLE FOR REVIEW FROM THE PROJECT ENGINEERS OFFICE.
4. TEMPORARY WATER CONTROL BARRIER SHALL BE REMOVED UPON COMPLETION OF RECLAMATION ACTIVITIES. SEE SPECIAL PROVISION "PROJECT RECLAMATION".
5. LAKE MITIGATION SITE LIMITS AND MEANDERING CHANNEL WILL BE STAKED BY THE ENGINEER.
6. FOR THE PROFILE OF A-A, B-B AND C-C SEE SHEET RP2.
7. FOR HAUL ROAD ACCESS SEE SHEET AH1, AH2 AND AH3.
8. LOCATION OF WILLOW REPLANTINGS WILL BE STAKED BY THE ENGINEER.



KEECHELUS LAKE

LAKE MITIGATION SITE

THERE IS SUFFICIANT MATERIAL IN THIS PIT FOR THIS PROJECT

SOURCE OF MATERIAL FOR USE OF:

ROADWAY EXCAVATION AND EMBANKMENT

FILE NAME	K:\Review\08y020 XL2779\dgn\REVIEW SUBMITAL\Pit 255\PIT 255 TESC.dgn				REGION NO. 10	STATE WASH	FED.AID PROJ.NO.
TIME	9:40:12 AM						
DATE	1/7/2009				JOB NUMBER 08Y020		
PLOTTED BY	keend						
DESIGNED BY	J. WOOD				CONTRACT NO.		LOCATION NO.
ENTERED BY	M. LEE						
CHECKED BY	B. HOOKER						
PROJ. ENGR.	W. SMITH						
REGIONAL ADM.	D. WHITEHOUSE	REVISION	DATE	BY			

P.E. STAMP BOX DATE

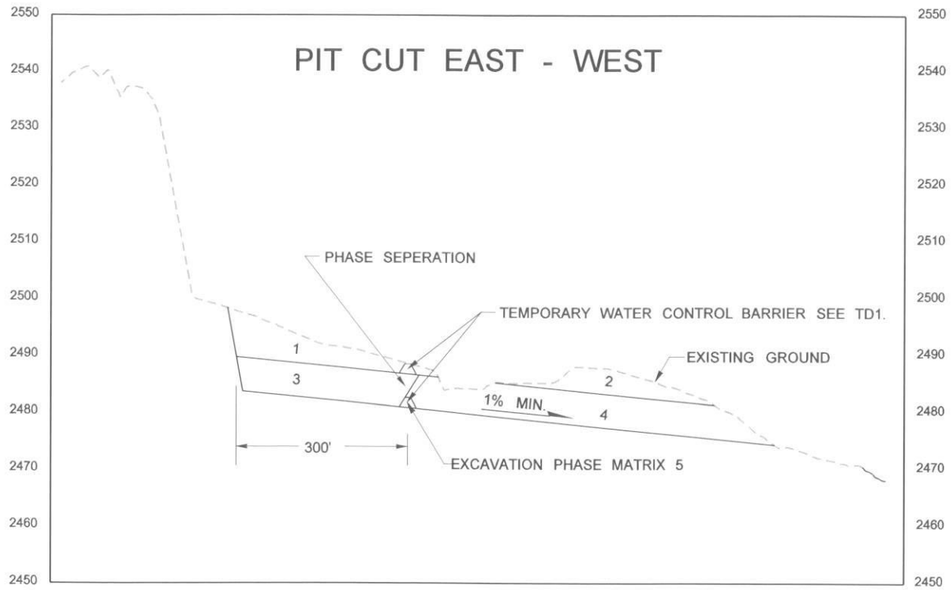
P.E. STAMP BOX DATE

Washington State Department of Transportation

I-90
SNOQUALMIE PASS EAST - PHASE 1A
HYAK TO CRYSTAL SPRINGS - DETOUR

RECLAMATION PLAN (SECTION 2)

Plot 5
PLAN REF NO RP1

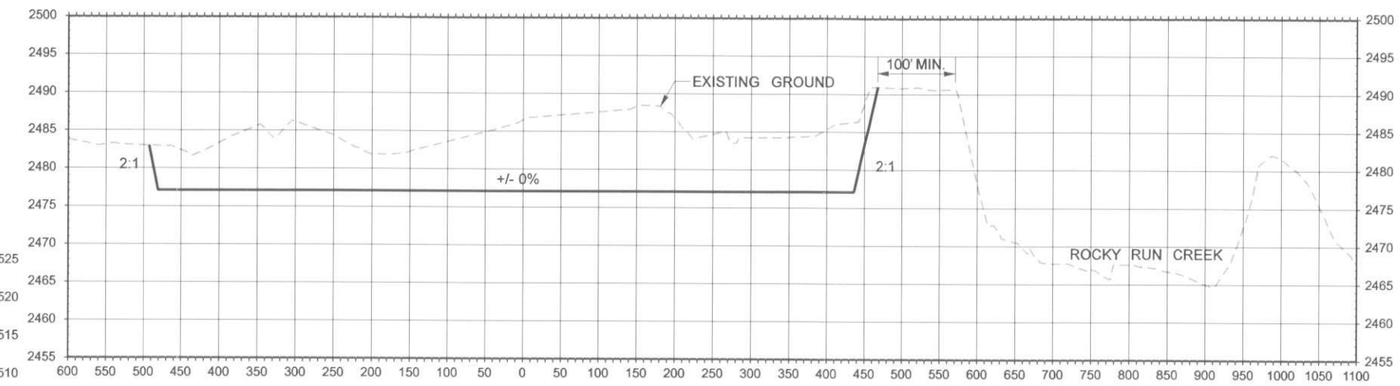


EXCAVATION PHASES

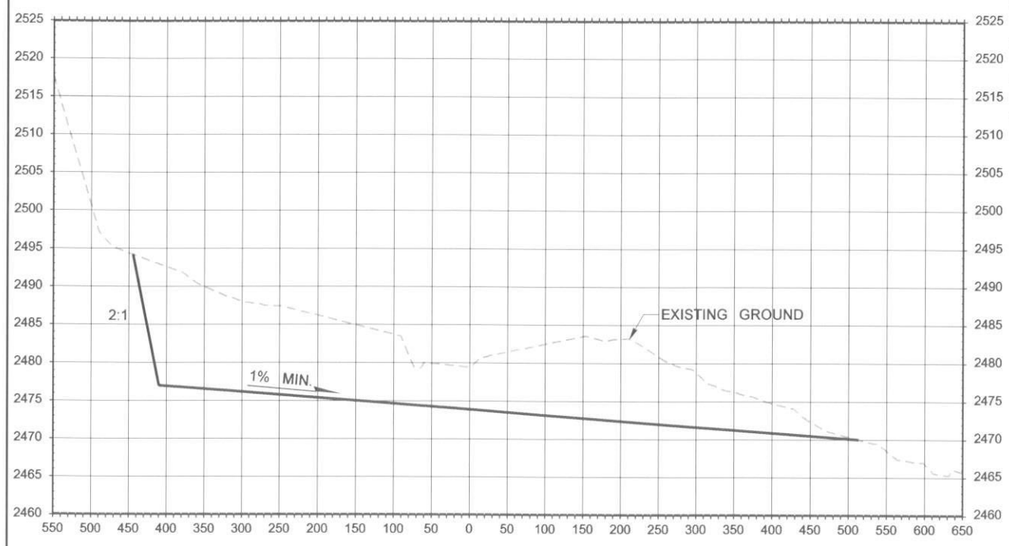
EXCAVATION PHASE MATRIX		
PHASE	ELEVATION	ESTIMATED QUANTITY
1	2485.0	28280 C.Y.
2	2482.0	43890 C.Y.
3	2479.0	46640 C.Y.
4	2477.0	131630 C.Y.
5	VARIES	6450 C.Y.

NOTES:

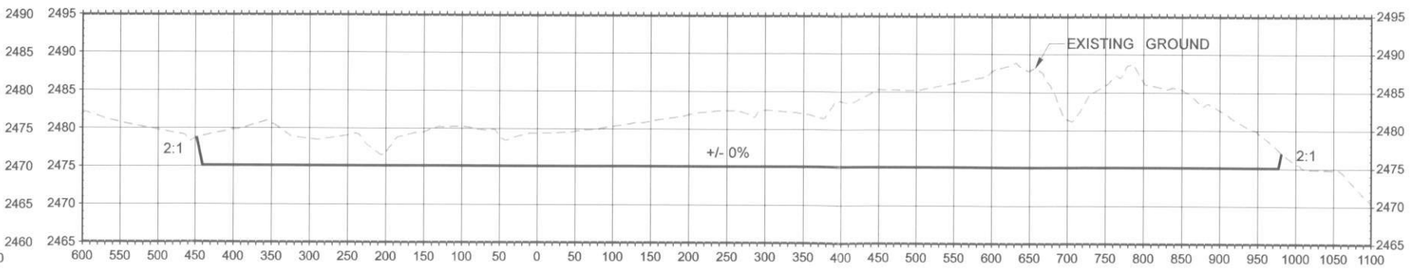
1. LAKE MITIGATION LIMITS WILL BE STAKED BY THE ENGINEER.
2. SEE SHEET RP1 FOR PROFILE LOCATIONS
3. 100' BUFFER SHALL BE MAINTAINED BETWEEN LAKE MITIGATION SITE LIMITS AND ROCKY CREEK RUN AT ALL TIMES.
4. TEMPORARY WATER CONTROL BARRIER SHALL BE REMOVED IN EXCAVATION PHASE MATRIX 5 OR AS DIRECTED BY THE ENGINEER.



PROFILE B-B



PROFILE A-A



PROFILE C-C

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TIME	9:40:08 AM
DATE	1/7/2009
PLOTTED BY	keend
DESIGNED BY	J. WOOD
ENTERED BY	M. LEE
CHECKED BY	B. HOOKER
PROJ. ENGR.	W. SMITH
REGIONAL ADM.	D. WHITEHOUSE

REVISION | DATE | BY

REGION NO. 10 | STATE WASH | FED.AID PROJ.NO.

JOB NUMBER 08Y020

CONTRACT NO. | LOCATION NO.

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

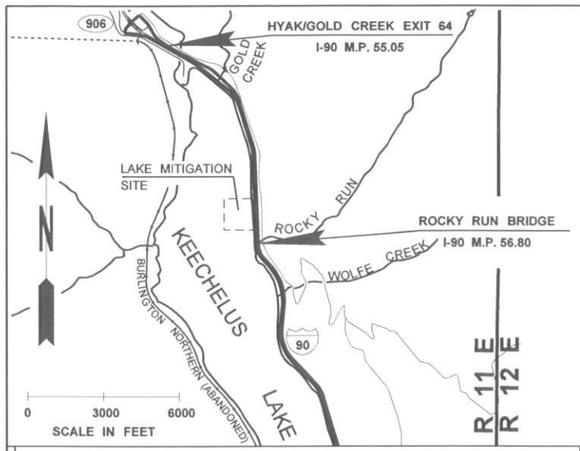
Washington State Department of Transportation

I-90
SNOQUALMIE PASS EAST - PHASE 1A
HYAK TO CRYSTAL SPRINGS - DETOUR

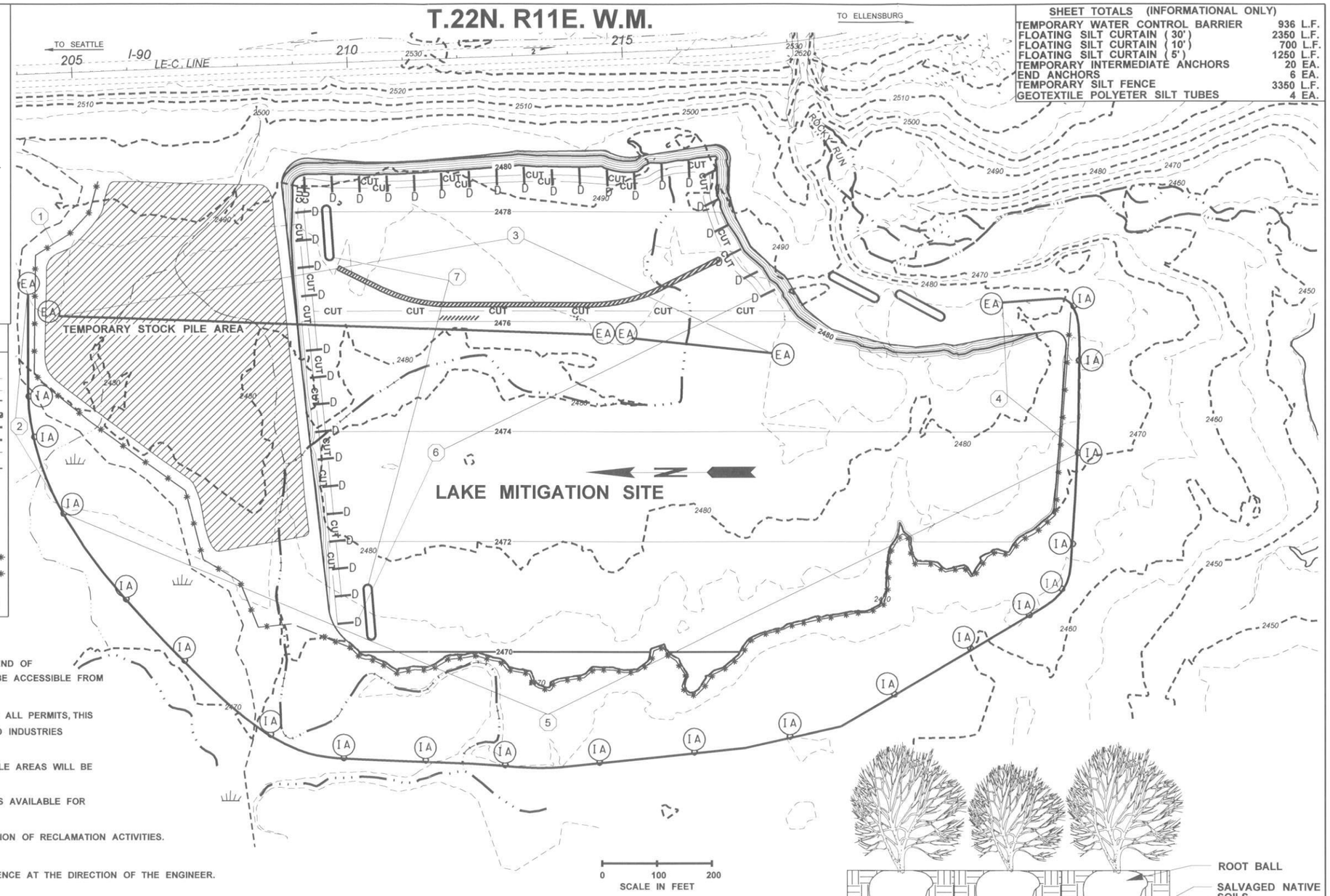
RECLAMATION PLAN (SECTION 2)

Plot 2

RP2



T.22N. R11E. W.M.



SHEET TOTALS (INFORMATIONAL ONLY)

TEMPORARY WATER CONTROL BARRIER	936 L.F.
FLOATING SILT CURTAIN (30')	2350 L.F.
FLOATING SILT CURTAIN (10')	700 L.F.
FLOATING SILT CURTAIN (5')	1250 L.F.
TEMPORARY INTERMEDIATE ANCHORS	20 EA.
END ANCHORS	6 EA.
TEMPORARY SILT FENCE	3350 L.F.
GEOTEXTILE POLYETER SILT TUBES	4 EA.

LEGEND

- GEOTEXTILE ENCASED CHECK DAM — D
- EXISTING 10' INDEX CONTOURS
- EXISTING 5' INTERMEDIATE CONTOURS
- LAKE MITIGATION SITE LIMITS
- TEMPORARY WATER CONTROL BARRIER (SEE DETAIL TD1)
- TEMPORARY FLOATING SILT CURTAIN (SEE DETAIL TD1)
- CONTINUOUS SPRING
- SEASONAL RUNOFF
- WETLAND BOUNDARY
- TEMPORARY INTERMEDIATE ANCHOR (SEE DETAIL TD1) — IA
- TEMPORARY END ANCHOR (SEE DETAIL TD1) — EA
- CONSTRUCTION FEATURE (SEE QUANTITY TABULATION SHEETS) — ?
- SILT FENCE (ORANGE)
- SILT FENCE (ORANGE) (FOR WATER ELEVATION UNDER 2455')
- GEOTEXTILE POLYESTER SILT TUBES

NOTES:

1. FOR HAUL ROAD ACCESS SEE SHEET AH1, AH2 AND AH3.
2. THE LAKE MITIGATION SITE IS LOCATED AT M.P. 56.7 ON THE NORTH EAST END OF LAKE KECHEELUS IN KITTITAS COUNTY WASHINGTON. THE SITE WILL BE ACCESSIBLE FROM A TEMPORARY HAUL ROAD AT MP 56.2 EASTBOUND.
3. ALL MINING AND RECLAMATION PRACTICES SHALL BE IN ACCORDANCE WITH ALL PERMITS, THIS SHEET, WSDOT STANDARD SPECIFICATIONS, DOE REGULATIONS, LABOR AND INDUSTRIES REGULATIONS, AND CLEAN AIR AUTHORITY REGULATIONS.
4. WORKING AREAS, NEW HAUL ROAD AND CLEARING AND GRUBBING STOCKPILE AREAS WILL BE STAKED BY THE ENGINEER.
5. LAKE MITIGATION SITE, ROCKY RUN, I-90 LAKE KEECHELUS SOURCE REPORT IS AVAILABLE FOR REVIEW FROM THE PROJECT ENGINEERS OFFICE.
6. TEMPORARY WATER CONTROL BARRIER SHALL BE REMOVED UPON COMPLETION OF RECLAMATION ACTIVITIES. SEE SPECIAL PROVISION "PROJECT RECLAMATION".
7. FLOATING SILT CURTAINS SHALL BE SUPPLEMENTED WITH ORANGE SILT FENCE AT THE DIRECTION OF THE ENGINEER. SUPPLEMENTED ORANGE SILT FENCE WILL BE STAKED BY THE ENGINEER.
8. LAKE MITIGATION SITE LIMITS WILL BE STAKED BY THE ENGINEER.
9. FOR THE PROFILE OF A-A, B-B AND C-C SEE SHEET RP2.
10. ALL SILT CURTAINS SHALL BE PLACED PRIOR TO RECLAMATION ACTIVITIES
11. FLOATING SILT CURTAIN END ANCHORS SHALL BE PLACED AND REMOVED ON DRY GROUND ONLY AS DIRECTED BY THE ENGINEER.
12. SEE SPECIAL PROVISION "FLOATING SILT CURTAIN"
13. WILLOWS IN TEMPORARY PLANTING TRENCH SHALL BE WATERED DAILY.

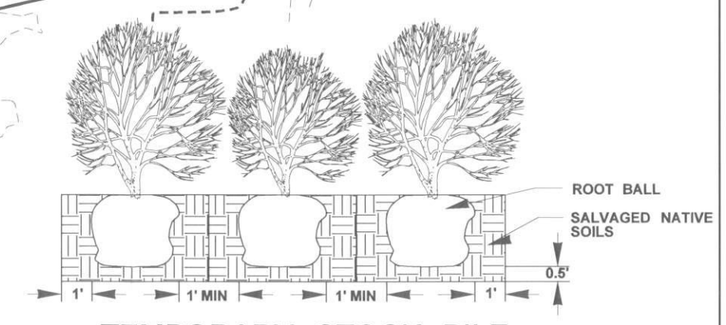
KEECHELUS LAKE

LAKE MITIGATION SITE

THERE IS SUFFICIANT MATERIAL IN THIS PIT FOR THIS PROJECT

SOURCE OF MATERIAL FOR USE OF:

ROADWAY EXCAVATION AND EMBANKMENT

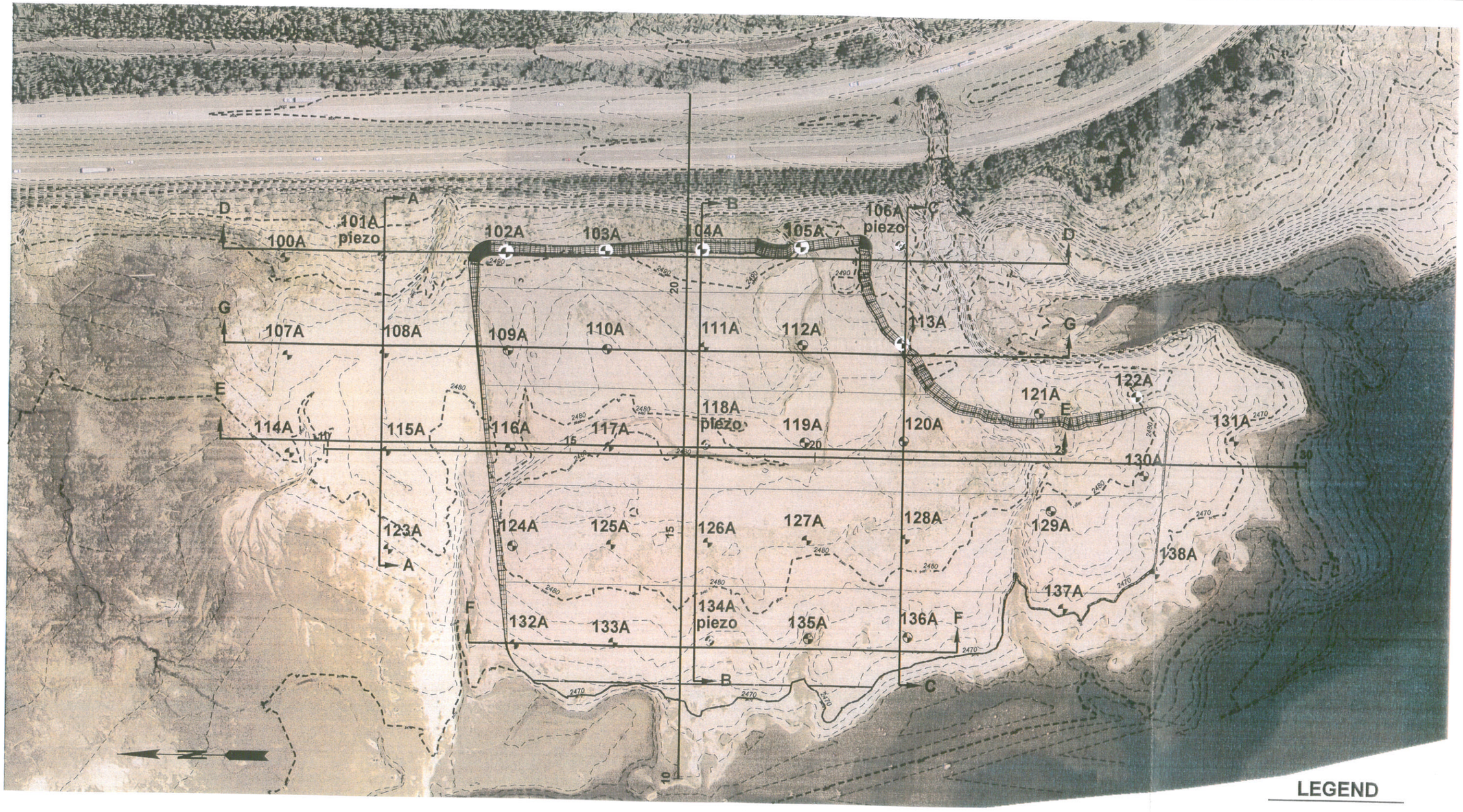


TEMPORARY STOCK PILE TRENCH FOR LIVE WILLOWS

FILE NAME	K:\Review\08y020 XL2779\dgn\REVIEW SUBMITAL\Pit 255\PIT 255 TESC.dgn									Plot 1
TIME	9:40:03 AM				REGION NO. 10	STATE WASH	FED.AID PROJ.NO.		Washington State Department of Transportation	I-90 SNOQUALMIE PASS EAST - PHASE 1A HYAK TO CRYSTAL SPRINGS - DETOUR	TP1
DATE	1/7/2009										
PLOTTED BY	keend										
DESIGNED BY	J. WOOD				JOB NUMBER 08Y020						
ENTERED BY	D.KEEN										
CHECKED BY	B. HOOKER				CONTRACT NO.		LOCATION NO.				
PROJ. ENGR.	W. SMITH										
REGIONAL ADM.	D. WHITEHOUSE	REVISION	DATE	BY				P.E. STAMP BOX DATE	P.E. STAMP BOX DATE	TESC PLAN (SECTION 2)	

Appendix B

Figure 4 – Plan view of 2007 bore holes
Figure 5 – Plan view of 1969 and 1973 investigations
Geologic Cross Sections
Logs of Borings



LEGEND

- BORE HOLE
- 2007 HOLES WITH GRADUATION
- PIEZOMETER

FIGURE 4

0 100 200
SCALE IN FEET

FILE NAME	P:\454302\DESIGN\2007 Design\XL2779 - I-90 Hyak to Crystal Springs Sno-Park - Lake Storage Mitigation and Detour\XL2779_XM\CADD\From I-90\PS255Borehole\BoreholeSheet.dgn
TIME	10:56:25 AM
DATE	1/8/2009
PLOTTED BY	keend
DESIGNED BY	
ENTERED BY	
CHECKED BY	
PROJ. ENGR.	
REGIONAL ADM.	

REVISION | DATE | BY

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	

JOB NUMBER

CONTRACT NO. | LOCATION NO.

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

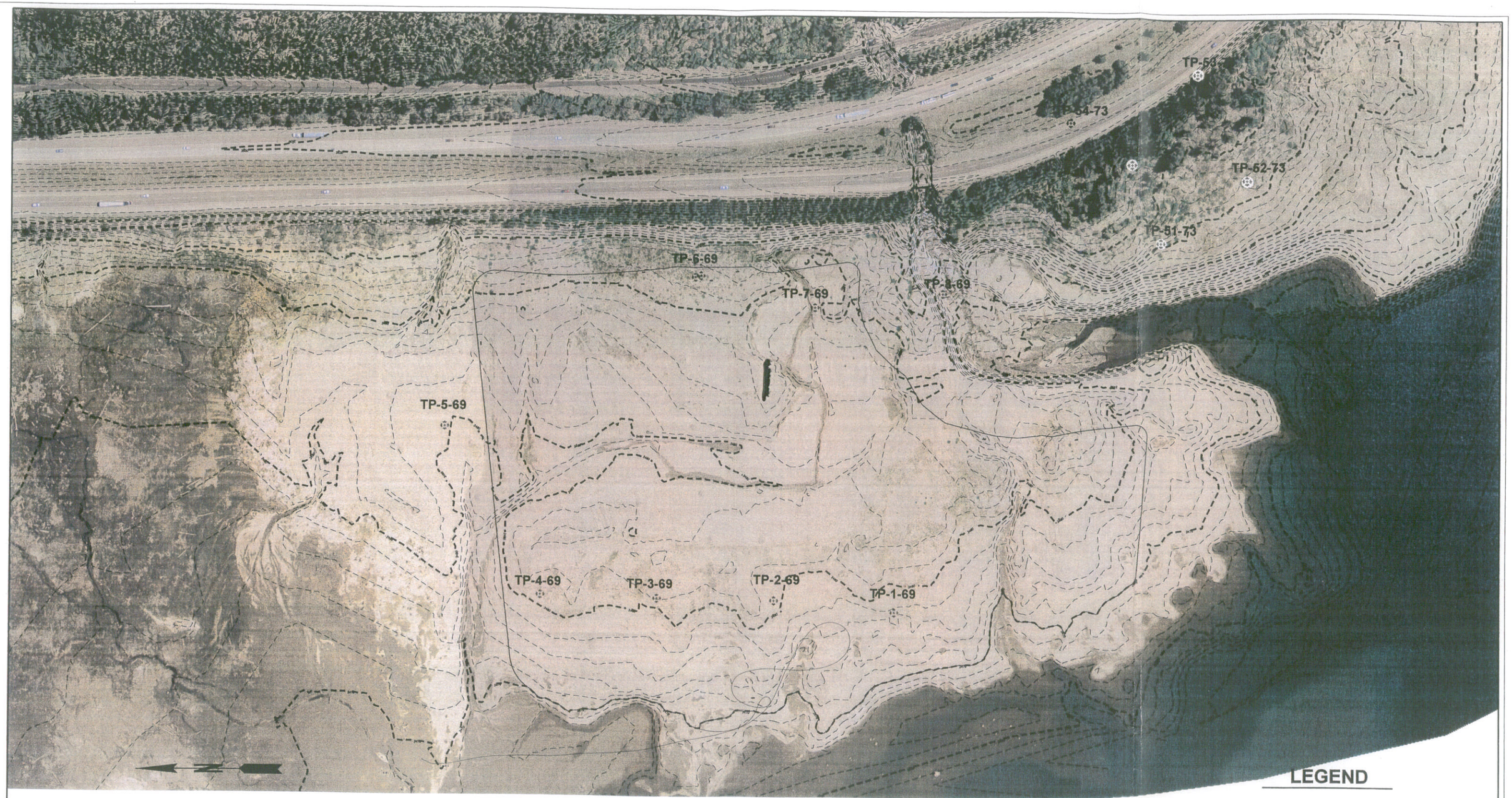
Washington State
Department of Transportation

I-90 HYAK TO EASTON
GEOTECHNICAL FIELD EXPLORATION
PS-255 STUDY

2007 BORE HOLES

Plot 1
PLAN REF NO

SHEET
OF
SHEETS



LEGEND

TEST PIT

FIGURE 5

0 100 200
SCALE IN FEET

FILE NAME	P:\454302\DESIGN\2007 Design\XL2779 - I-90 Hyak to Crystal Springs Sno-Park - Lake Storage Mitigation and Detour\XL2779_XM\CADD\From I-90\PS255Borehole\BoreholeSheet.dgn								
TIME	2:30:34 PM				REGION NO. 10	STATE WASH	FED.AID PROJ.NO.		
DATE	1/8/2009								
PLOTTED BY	keend				JOB NUMBER				
DESIGNED BY									
ENTERED BY									
CHECKED BY					CONTRACT NO.		LOCATION NO.		
PROJ. ENGR.									
REGIONAL ADM.		REVISION	DATE	BY					

P.E. STAMP BOX DATE

P.E. STAMP BOX DATE

Washington State
Department of Transportation

I-90- HYAK TO EASTON
GEOTECHNICAL FIELD EXPLORATION
PS-255 STUDY

1969 & 1973 TEST PITS

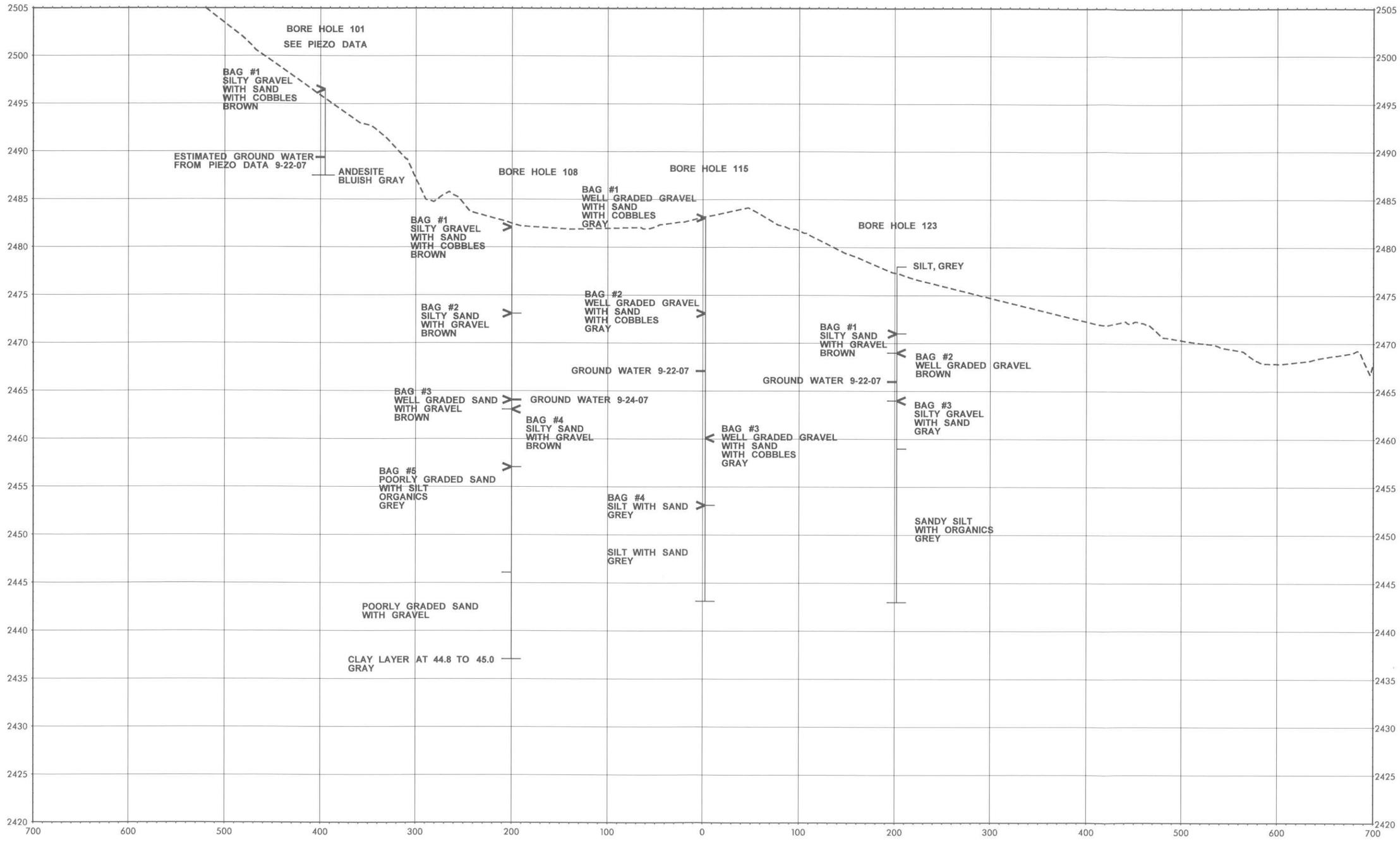
Plot 2
PLAN REF NO

SHEET
OF
SHEETS

I-90 EB

East/West

SECTION A-A



11+26

LEGEND

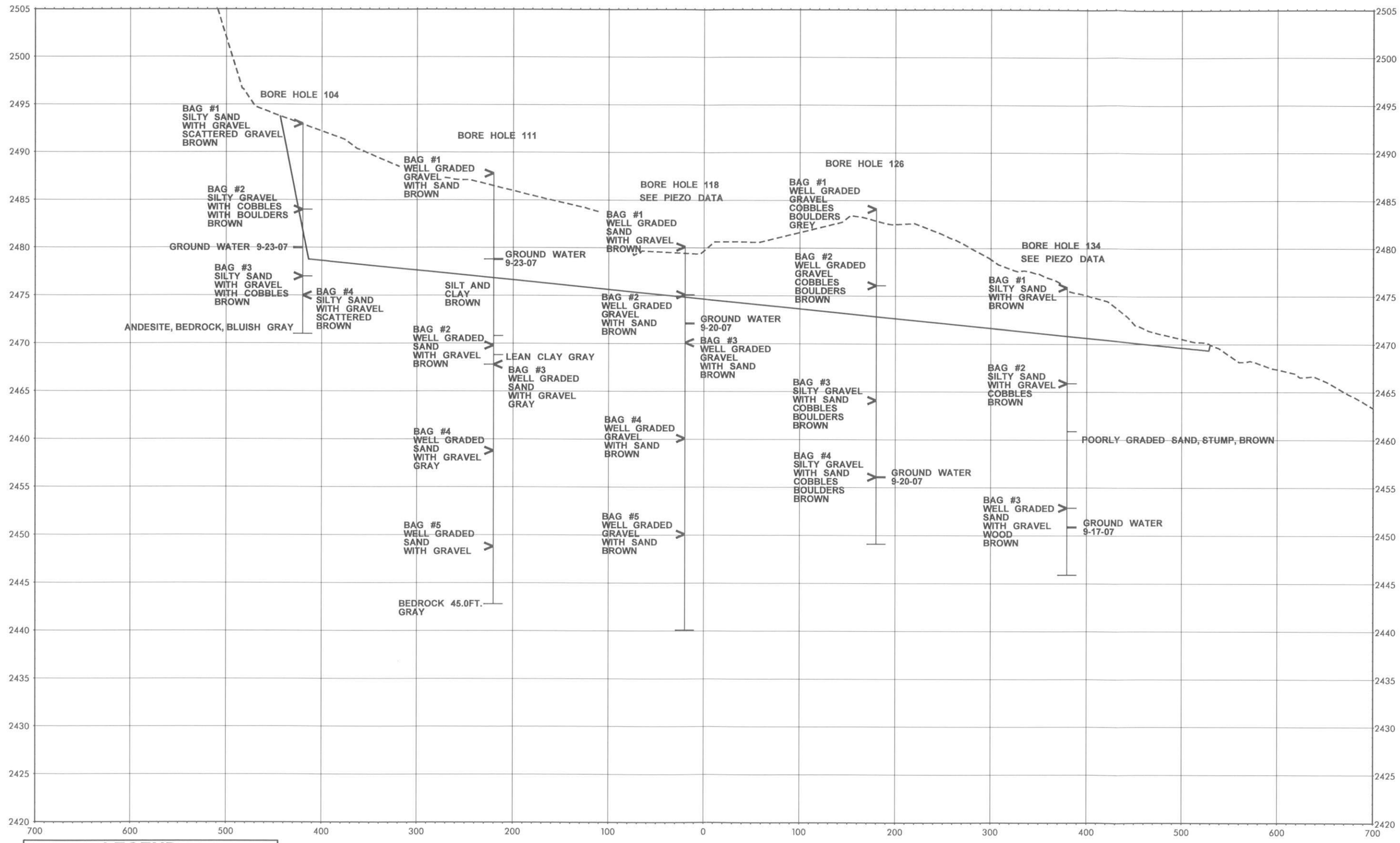
- > SAMPLE LOCATION
- — MATERIAL DESCRIPTION SEPARATION
- ▬ GROUND WATER ELEVATION
- —— BORE HOLE DEPTH

101A peizo 405.25

I-90 EB

East/West

SECTION B-B



LEGEND

- > SAMPLE LOCATION
- — MATERIAL DESCRIPTION SEPARATION
- ▬ GROUND WATER ELEVATION
- —— BORE HOLE DEPTH

17 + 71

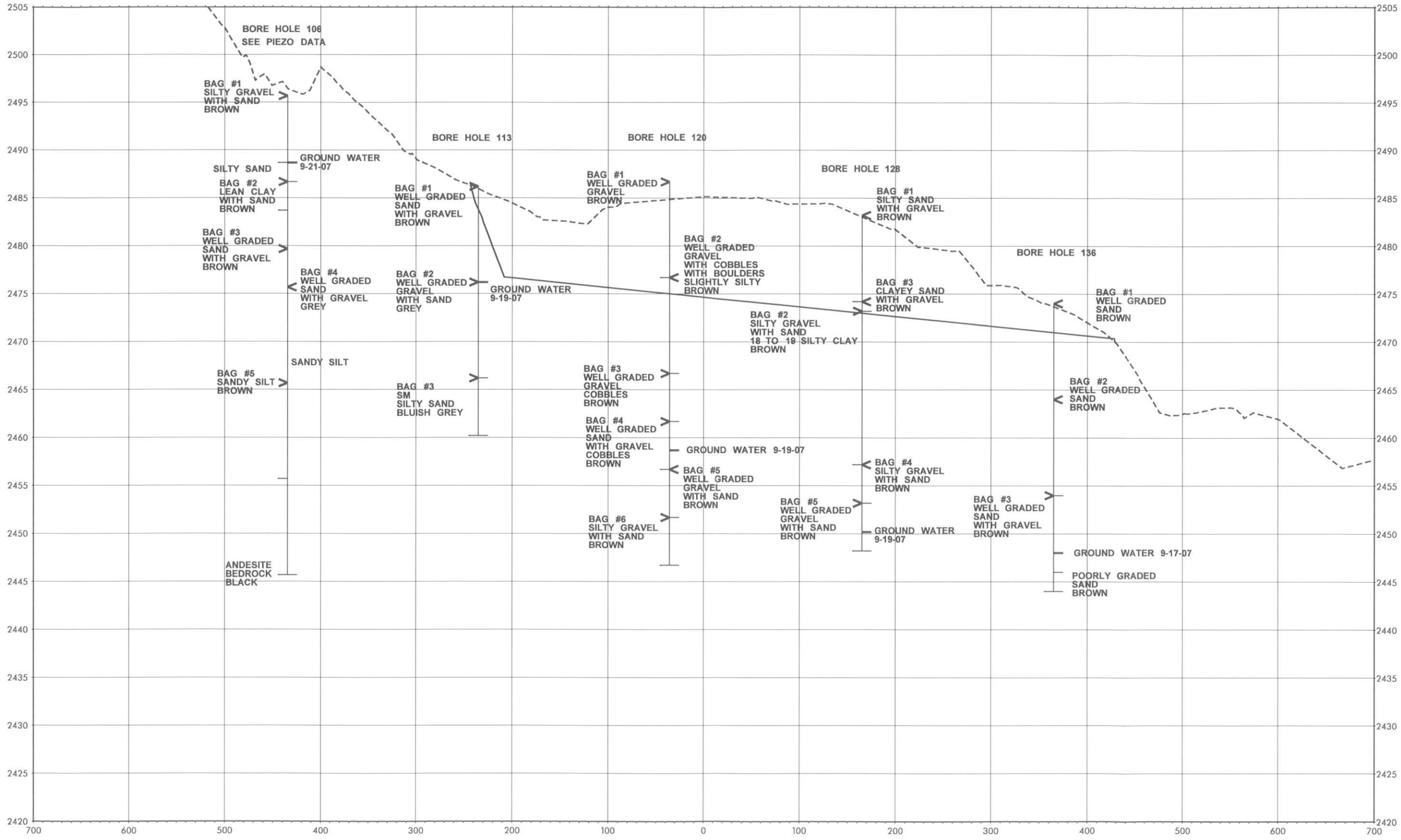
118A peizo (23.98)

134A peizo (354.65)

I-90 EB

East/West

SECTION C-C



LEGEND

- > SAMPLE LOCATION
- — MATERIAL DESCRIPTION SEPARATION
- ▬ GROUND WATER ELEVATION
- —— BORE HOLE DEPTH

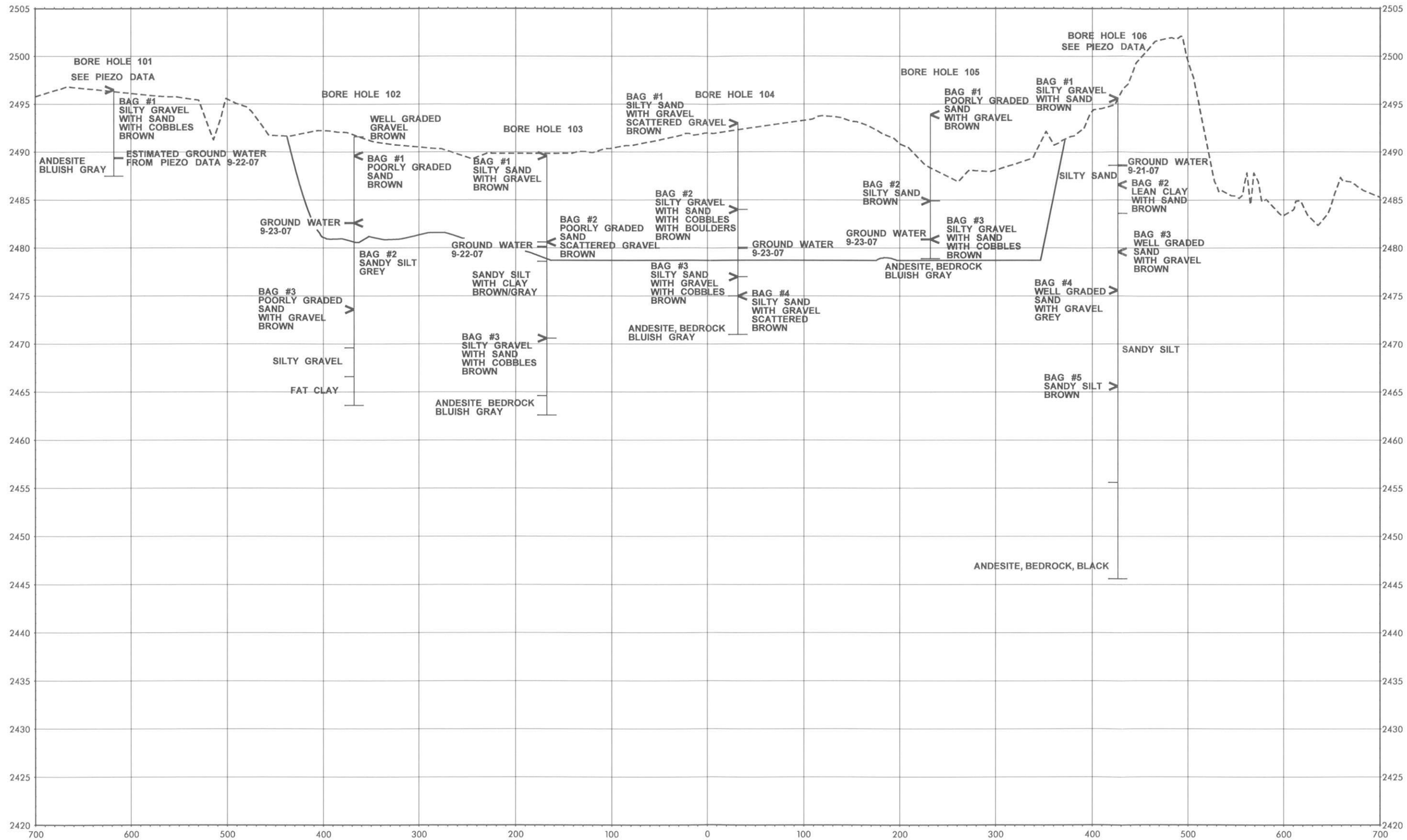
21+74

106A peizo (435.73)

North/South

Looking from Lake towards I-90

SECTION D-D



20+63

101A peizo (607.62)

106A peizo (440.36)

LEGEND

- > SAMPLE LOCATION
- — MATERIAL DESCRIPTION SEPARATION
- ▬ GROUND WATER ELEVATION
- —— BORE HOLE DEPTH

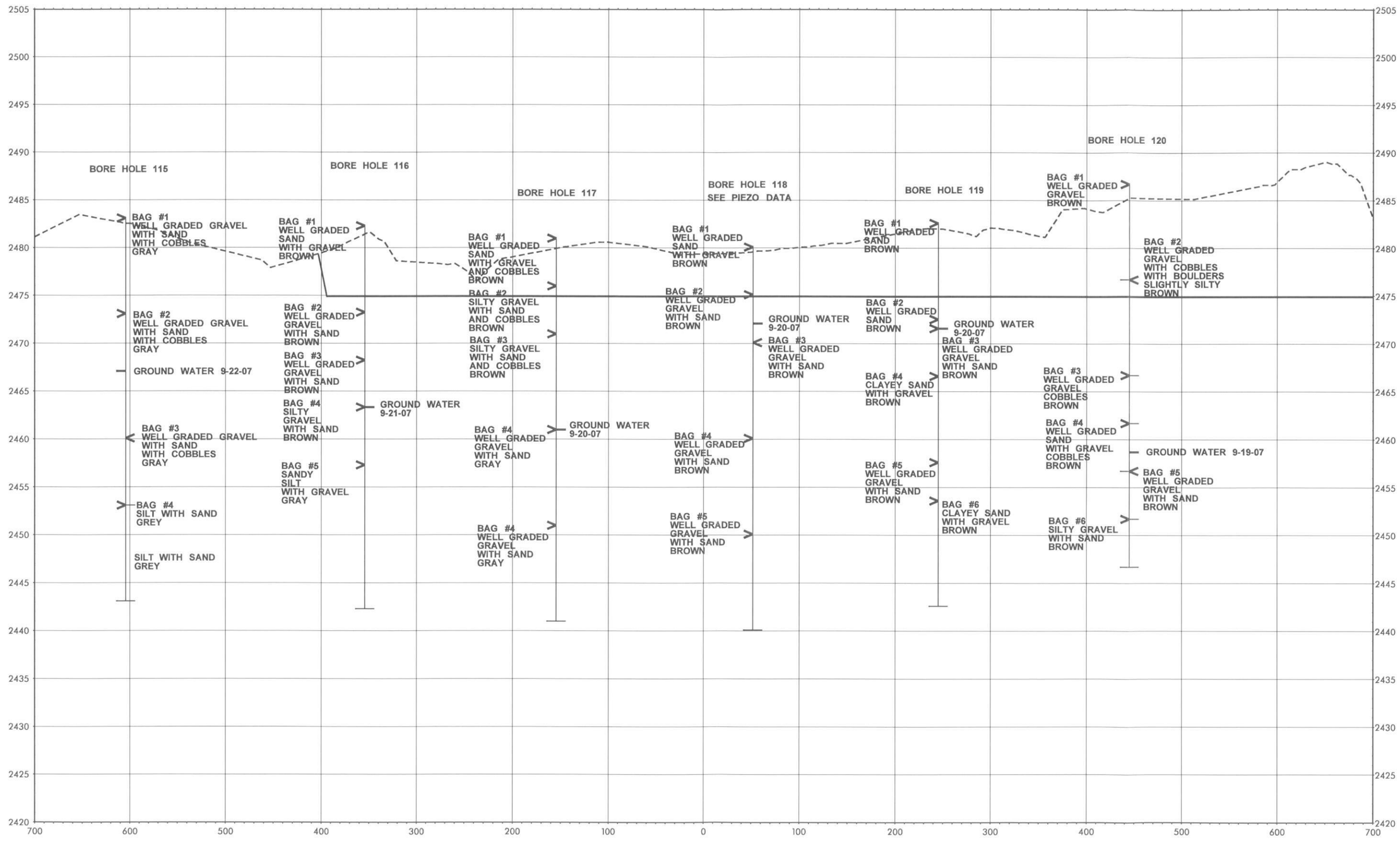
NOTE

FOR BORE HOLE #100 INFORMATION SEE LOG OF TEST BORING.

Looking from Lake towards I-90

North/South

SECTION E-E



16 + 82

LEGEND

- > SAMPLE LOCATION
- — MATERIAL DESCRIPTION SEPARATION
- ▬ GROUND WATER ELEVATION
- —— BORE HOLE DEPTH

118A peizo (36.97)

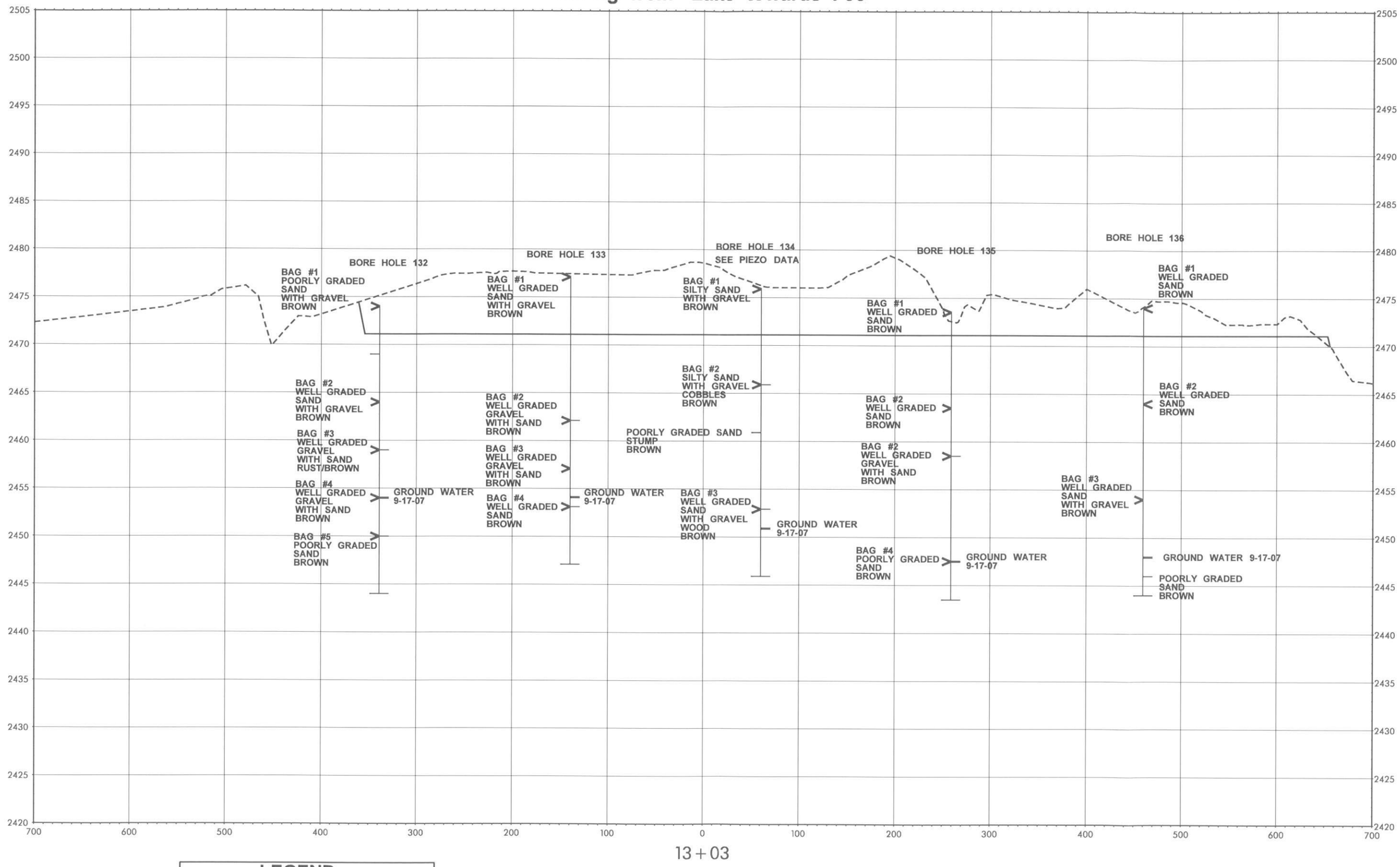
NOTE

FOR BORE HOLE #114 INFORMATION SEE LOG OF TEST BORING.

North/South

Looking from Lake towards I-90

SECTION F-F



13 + 03

LEGEND

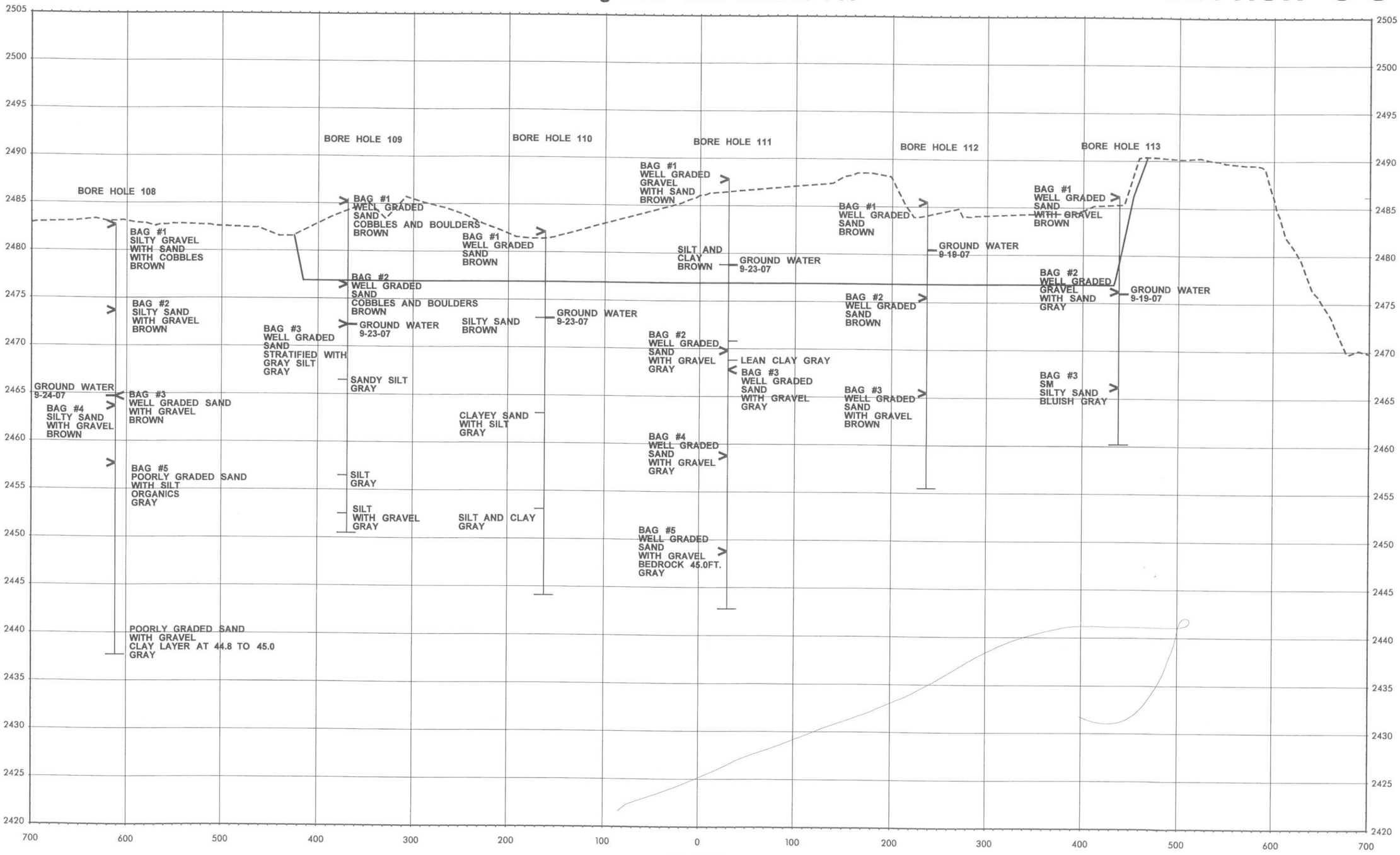
- > SAMPLE LOCATION
- — MATERIAL DESCRIPTION SEPARATION
- ▬ GROUND WATER ELEVATION
- —— BORE HOLE DEPTH

134A peizo (95.24)

North/South

Looking from Lake towards I-90

SECTION G-G



LEGEND

- > SAMPLE LOCATION
- — MATERIAL DESCRIPTION SEPARATION
- ▬ GROUND WATER ELEVATION
- —— BORE HOLE DEPTH

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-103-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2489.6 ft

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6 Inspector Dave Nelson

Start September 22, 2007 Completion September 22, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073714.24 Easting 1751150.31 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Silty SAND with gravel, brown, homogenous		
5	2485.0									
10	2480.0					B-2		Poorly graded SAND, scattered gravel, brown, homogenous	▽ 9/22/2007	
								Sandy SILT, with clay, brown/gray, stratified		
15	2475.0									
20	2470.0					B-3		Silty GRAVEL with sand with cobbles, brown, homogenous		

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2489.6 ft

HOLE No. BH-103-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2465									
25								ANDESITE, bedrock, bluish gray		
								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2460									
30								End of test hole boring at 27 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2455									
35										
	2450									
40										
	2445									
45										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL.GDT 8/27/08 8:52:46 A8

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-104-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2493.0 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 23, 2007 Completion September 23, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073514.38 Easting 1751157.80 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Silty SAND with gravel, scattered gravel, brown, homogenous		
	2490.0									
5										
	2485.0									
						B-2		Silty GRAVEL with sand, with cobbles and boulders, brown, homogenous		
10										
	2480.0								▽ 9/23/2007	
15										
						B-3		Silty SAND with gravel with cobbles, brown, homogenous		
	2475.0									
						B-4		Silty SAND with gravel, scattered gravel, brown, homogenous		
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL GDT 8/27/08 8:52:46 AB

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2493.0 ft HOLE No BH-104-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD 20 40 60 80	Blows/6" (N) and/or RQD FF	Sample Type	Sample No (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
								ANDESITE, bedrock, bluish gray		
	2470							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
25										
								End of test hole boring at 22 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2465									
30										
	2460									
35										
	2455									
40										
	2450									
45										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255) GPJ SOIL GDT 8/27/08 8:52:48 A8

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-100-07

Sheet 1 of 1

Job No. XL-2779 SR 90 Elevation 2492.0 ft

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6 Inspector Dave Nelson

Start September 22, 2007 Completion September 22, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1074363.78 Easting 1751125.98 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Silty GRAVEL with sand, brown, stratified		
	2490.0									
5										
	2485.0									
						B-2		Silty GRAVEL with sand, brown, homogenous	▽ 9/22/2007	
10										
	2480.0									
15						B-3		ANDESITE, black, homogenous		
	2475.0							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. End of test hole boring at 16 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card R-69967

Job No. XL-2779 SR 90 Elevation 2496.5 ft

HOLE No. BH-101-07

Sheet 1 of 1

Project Snoqlamie Pass East (PS-255)

Driller Dave Nelson Lic# 1678

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 23, 2007 Completion September 23, 2007 Well ID# ALM-735

Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6

Method dual wall reverse air circulation

Northing 1074163.92 Easting 1751133.47 Collected by

Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2495.0					B-1		Silty GRAVEL with sand, and cobbles, brown, homogenous		
5	2490.0							ANDESITE, bluish gray		
10	2485.0							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
15	2480.0							End of test hole boring at 9 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No BH-102-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2491.6 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 23, 2007 Completion September 23, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073914.10 Easting 1751142.83 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
								Well graded GRAVEL, not enough for sample bag, brown, homogenous		
	2490.0									
						B-1		Poorly graded SAND, brown, homogenous		
5										
	2485.0									
						B-2		Sandy SILT, gray, homogenous	▽ 9/23/2007	
10										
	2480.0									
15										
	2475.0									
						B-3		Poorly graded SAND with gravel, brown, homogenous		
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-102-07

Job No. XL-2779 SR 90 Elevation 2491.6 ft

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2470									
								Silty GRAVEL		
25								Fat CLAY		
	2465									
30								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2460							End of test hole boring at 28 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
35										
	2455									
40										
	2450									
45										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL GDT 8/27/08 9:03:58 AS

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-105-07

Sheet 1 of 1

Job No. XL-2779 SR 90 Elevation 2493.9 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 23, 2007 Completion September 23, 2007 Well ID#

Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6

Method dual wall reverse air circulation

Northing 1073314.52 Easting 1751165.29 Collected by

Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD 20 40 60 80	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Poorly graded SAND with gravel, brown, homogenous		
	2490.0									
5										
	2485.0					B-2		Silty SAND, brown, homogenous		
10									▽	
	2480.0					B-3		Silty GRAVEL with sand with cobbles, brown, homogenous 9/23/2007 ANDESITE, bedrock, bluishgray		
15								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2475.0							End of test hole boring at 15 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card R-69967

Job No. XL-2779 SR 90 Elevation 2495.6 ft

HOLE No. BH-106-07

Sheet 1 of 3

Project Snoqlamie Pass East (PS-255)

Driller Dave Nelson Lic# 1678

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 21, 2007 Completion September 21, 2007 Well ID# ALM-734

Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6

Method dual wall reverse air circulation

Northing 1073114.66 Easting 1751172.78 Collected by

Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No (Tube No)	Lab Tests	Description of Material	Groundwater	Instrument
	2495.0					B-1		Silty GRAVEL with sand, brown, homogenous		
5	2490.0									
								Silty SAND	9/21/2007	
10	2485.0					B-2		Lean CLAY with sand, brown, homogenous		
15	2480.0					B-3		Well graded SAND with gravel, brown, homogenous		
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card R-69967

Job No. XL-2779 SR 90 Elevation 2495.6 ft

HOLE No. BH-106-07

Sheet 2 of 3

Project Snoqlamie Pass East (PS-255)

Driller Dave Nelson Lic# 1678

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2475					B-4		Well graded SAND with gravel, gray, homogenous		
25	2470							Sandy SILT		
30	2465					B-5		Sandy SILT, brown, homogenous		
35	2460									
40	2455							ANDESITE, bedrock, black		
45										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255) GPJ SOIL GDT 8/27/08 8:52:52 AB

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card R-69967

Job No. XL-2779 SR 90 Elevation 2495.6 ft HOLE No BH-106-07

Sheet 3 of 3

Project Snoqlamie Pass East (PS-255) Driller Dave Nelson Lic# 1678

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2450									
50	2445							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
55	2440							End of test hole boring at 50 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
60	2435									
65	2430									
70										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-107-07

Sheet 1 of 3

Job No. XL-2779 SR 90 Elevation 2482.7 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 22, 2007 Completion September 22, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1074356.29 Easting 1750926.12 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Well graded SAND with gravel, brown, homogenous		
	2480.0									
5										
	2475.0									
						B-2		Well graded SAND with gravel, brown, homogenous	▽ 9/22/2007	
10										
	2470.0									
15								ORGANIC Soil, brown, homogenous		
	2465.0									
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.7 ft HOLE No BH-107-07

Sheet 2 of 3

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2460							Sandy SILT with organics, gray, homogenous		
25										
	2455									
30								Lean CLAY, gray, homogenous		
	2450									
35										
	2445									
40								Clayey SAND with GRAVEL, scattered gravels, gray, homogenous		
	2440									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-107-07

Job No. XL-2779 SR 90 Elevation 2482.7 ft

Sheet 3 of 3

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD 20 40 60 80	Blows/6" (N) and/or RQD FF	Sample Type	Sample No (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2435							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
50	2430							End of test hole boring at 45 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
55	2425									
60	2420									
65	2415									
70										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-108-07

Job No. XL-2779 SR 90 Elevation 2482.7 ft

Sheet 1 of 3

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 24, 2007 Completion September 24, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1074156.43 Easting 1750933.61 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 *Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Silty GRAVEL with sand, with cobbles, brown, homogenous		
	2480.0									
5										
	2475.0									
						B-2		Silty SAND with gravel, brown, homogenous		
10										
	2470.0									
15										
	2465.0								▽	
						B-3		Well graded SAND with gravel, brown, homogenous 9/24/2007		
						B-4		Silty SAND with gravel, brown, homogenous		
20										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.7 ft

HOLE No. BH-108-07

Sheet 2 of 3

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2460									
25						B-5	GS HT	SP-SM Poorly gradedSAND with silt and sand, organics, gray, homogenous		
	2455									
30										
	2450									
35								Poorly graded SAND with gravel, clay layer @ 44.8 to 45.0, gray, homogenous		
	2445									
40										
	2440									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.7 ft HOLE No. BH-108-07

Sheet 3 of 3

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD 20 40 60 80	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2435							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
50								End of test hole boring at 45 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2430									
55										
	2425									
60										
	2420									
65										
	2415									
70										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2485.5 ft

HOLE No. BH-109-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 24, 2007 Completion September 24, 2007 Well ID#

Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6

Method dual wall reverse air circulation

Northing 1073906.61 Easting 1750942.97 Collected by

Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2485.0					B-1	GS PROCTOR	SW Well graded SAND, cobbles and boulders, brown, homogenous		
5	2480.0									
10	2475.0					B-2	GS PROCTOR	SW Well graded SAND, cobbles and boulders, brown, homogenous		
						B-3	GS PROCTOR	SW Well graded SAND, stratified with gray silt, 13.5 to 14.1, gray, stratified 9/24/2007	▽	
15	2470.0									
20								Sandy SILT, gray, homogenous		

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2485.5 ft

HOLE No. BH-109-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2465									
25	2460									
30	2455							SILT, gray, homogenous		
35	2450							SILT with GRAVEL, gray, homogenous		
40	2445							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. End of test hole boring at 35 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.2 ft

HOLE No. BH-110-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 23, 2007 Completion September 23, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073706.75 Easting 1750950.45 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1	GS PROCTOR	SW Well graded SAND, brown, homogenous		
	2480.0									
5										
	2475.0									
								Silty SAND, brown, homogenous	▽ 9/23/2007	
10										
	2470.0									
15										
	2465.0									
								Clayey SAND, with silt, gray, homogenous		
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.2 ft

HOLE No. BH-110-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2460									
25										
	2455									
								SILT, and clay, gray, homogenous		
30										
	2450									
35								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2445							End of test hole boring at 33 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
40										
	2440									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2487.8 ft

HOLE No BH-111-07

Sheet 1 of 3

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 23, 2007 Completion September 23, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073506.89 Easting 1750957.94 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Well graded GRAVEL with sand, brown, homogenous		
	2485.0									
5										
	2480.0									
								SILT, and clay, brown, homogenous	▽ 9/23/2007	
10										
	2475.0									
15										
	2470.0					B-2		Well graded SAND with gravel, gray, homogenous		
								Lean CLAY, gray, homogenous		
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No BH-111-07

Job No. XL-2779 SR 90 Elevation 2487.8 ft

Sheet 2 of 3

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-3		Well graded SAND with gravel, gray, homogenous		
	2465									
25										
	2460									
						B-4		Well graded SAND with gravel, gray, homogenous		
30										
	2455									
35										
	2450									
						B-5		Well graded SAND with gravel, bedrock 45.0ft, gray, homogenous		
40										
	2445									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2487.8 ft HOLE No. BH-111-07

Sheet 3 of 3

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2440							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
50								End of test hole boring at 45 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2435									
55										
	2430									
60										
	2425									
65										
	2420									
70										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2485.5 ft

HOLE No. BH-112-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 19, 2007 Completion September 19, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073307.03 Easting 1750965.43 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2485.0					B-1	GS PROCTOR	SW Well graded SAND, brown, homogenous		
5	2480.0								9/19/2007	
10	2475.0					B-2	GS PROCTOR	SW Well graded SAND, brown, homogenous		
15	2470.0									
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL.GDT 8/28/08 8:29:44 A8

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2485.5 ft HOLE No. BH-112-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2465					B-3		Well graded SAND with gravel, brown, homogenous		
25	2460									
30	2455							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
35	2450							End of test hole boring at 30 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
40	2445									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2486.2 ft HOLE No. BH-113-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6 Inspector Dave Nelson

Start September 19, 2007 Completion September 19, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073107.17 Easting 1750972.92 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2485.0					B-1		Well graded SAND with gravel, brown, homogenous		
5	2480.0									
10	2475.0					B-2		Well graded GRAVEL with sand, gray, homogenous 9/19/2007	▽	
15	2470.0									
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL.GDT 8/28/08 8:29:47 A8

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2486.2 ft HOLE No. BH-113-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2465					B-3	GS HT PROCTOR	SM Silty SAND, bluishgray, homogenous		
25										
	2460							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
30								End of test hole boring at 26 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2455									
35										
	2450									
40										
	2445									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No BH-114-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2481.0 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 22, 2007 Completion September 22, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1074348.81 Easting 1750726.26 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2480.0					B-1		Well graded GRAVEL with sand, gray, homogenous		
5	2475.0									
10	2470.0									
								Silty SAND, brown, homogenous		
15	2465.0									
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2481.0 ft HOLE No. BH-114-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD 20 40 60 80	Blows/6" (N) and/or RQD FF	Sample Type	Sample No (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
								9/18/2007		
	2460									
								Well graded SAND, layer, brown, homogenous		
25								Sandy SILT with organics, brown, homogenous		
	2455									
30								Sandy SILT with organics and wood, brown, homogenous		
	2450									
35										
	2445									
40										
	2440							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
								End of test hole boring at 40 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
45										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255) GPJ SOIL GDT 8/27/08 8:53:02 A8

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-115-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2483.1 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 22, 2007 Completion September 22, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1074148.95 Easting 1750733.75 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Well graded GRAVEL with sand, cobbles, gray, homogenous		
	2480.0									
5										
	2475.0									
10						B-2		Well graded GRAVEL with sand, cobbles, gray, homogenous		
	2470.0									
15									▽ 9/22/2007	
	2465.0									
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255) GPJ SOIL.GDT 8/28/08 8:43:21 A8

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2483.1 ft HOLE No. BH-115-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-3		Well graded GRAVEL with sand, cobbles, gray, homogenous		
	2460					B-4		SILT with sand, gray, homogenous		
25										
	2455									
30								SILT with sand, gray, homogenous		
	2450									
35										
	2445									
40								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2440							End of test hole boring at 40 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.3 ft

HOLE No. BH-116-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 21, 2007 Completion September 21, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073899.12 Easting 1750743.11 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Well graded SAND, brown, homogenous		
	2480.0									
5										
	2475.0									
						B-2	GS LA DG SG	GW Well graded GRAVEL, brown, homogenous		
10										
	2470.0									
						B-3	GS LA DG SG	GW Well graded GRAVEL, brown, homogenous		
15										
	2465.0									
						B-4		Silty GRAVEL with sand, brown, homogenous	▽ 9/21/2007	
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL.GDT 8/28/08 8:29:51 A8

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.3 ft HOLE No. BH-116-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2460									
25						B-5		Sandy SILT with gravel, gray, homogenous		
	2455									
								Sandy SILT with gravel, gray, homogenous		
30										
	2450									
35										
	2445									
40										
	2440							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. End of test hole boring at 40 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-117-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2481.0 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 20, 2007 Completion September 20, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073699.26 Easting 1750750.60 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2480.0					B-1		Well graded SAND with gravel and cobbles, brown, homogenous		
5	2475.0					B-2		Silty GRAVEL with sand and cobbles, brown, homogenous		
10	2470.0					B-3		Silty GRAVEL with sand and cobbles, brown, homogenous		
15	2465.0									
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL.GDT 8/28/08 8:45:31 A8

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-117-07

Job No. XL-2779 SR 90 Elevation 2481.0 ft

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-4		Well graded GRAVEL with sand, gray, homogenous 9/20/2007		
	2460									
25										
	2455									
30						B-5		Well graded GRAVEL with sand, gray, homogenous		
	2450									
35										
	2445									
40										
	2440							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
								End of test hole boring at 40 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card R-69967

HOLE No. BH-118-07

Job No. XL-2779 SR 90 Elevation 2480.1 ft

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Dave Nelson Lic# 1678

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 20, 2007 Completion September 20, 2007 Well ID# ALM-736

Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (Inches) 6

Method dual wall reverse air circulation

Northing 1073499.40 Easting 1750758.08 Collected by

Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Well graded SAND with gravel, brown, homogenous		
5	2475.0					B-2		Well graded GRAVEL with sand, brown, homogenous	9/20/2007	
10	2470.0					B-3		Well graded GRAVEL with sand, brown, homogenous		
15	2465.0									
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL.GDT 8/27/08 8:53:11 AB

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card R-69967

Job No. XL-2779 SR 90 Elevation 2480.1 ft HOLE No. BH-118-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Dave Nelson Lic# 1678

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (.20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-4		Well graded GRAVEL with sand, brown, homogenous		
25	2455									
30	2450					B-5		Well graded GRAVEL with sand, brown, homogenous		
35	2445									
40	2440									
45										

The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.

End of test hole boring at 40 ft below ground elevation.
This is a summary Log of Test Boring.
Soil/Rock descriptions are derived from visual field identifications and laboratory test data.
Note: REF = SPT Refusal

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.6 ft

HOLE No. BH-119-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 20, 2007 Completion September 20, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073299.54 Easting 1750765.57 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1	GS PROCTOR	SW Well graded SAND, brown, homogenous		
	2480.0									
5										
	2475.0									
10						B-2	GS PROCTOR	SW Well graded SAND, brown, homogenous		
						B-3		Well graded GRAVEL with sand, brown, homogenous 9/20/2007	▽	
	2470.0									
15										
	2465.0					B-4		Clayey SAND with GRAVEL, brown, homogenous		
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL.GDT 8/28/08 8:29:55 A8

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.6 ft HOLE No. BH-119-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2460									
25						B-5		Well graded GRAVEL with sand, gray, homogenous		
	2455									
30						B-6		Clayey SAND with GRAVEL, brown, homogenous		
	2450									
35										
	2445									
40								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2440							End of test hole boring at 40 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-120-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2486.7 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 19, 2007 Completion September 19, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073099.68 Easting 1750773.06 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1	GS R	GW Well graded GRAVEL, brown, homogenous		
	2485.0									
5										
	2480.0									
10						B-2	GS R	GW Well graded GRAVEL, cobbles and boulders, slightly silty, brown, homogenous		
	2475.0									
15										
	2470.0									
20										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2486.7 ft

HOLE No. BH-120-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

◆ Field SPT (N) ✚ Moisture Content ▨ RQD

Depth (ft)	Elevation (ft)	Profile (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2465				B-3	GS R	GW Well graded GRAVEL, cobbles, brown, homogenous		
25	2460				B-4		Well graded SAND with gravel, cobbles, brown, homogenous 9/19/2007	▽	
30	2455				B-5		Well graded GRAVEL with sand, brown, homogenous		
35	2450				B-6		Silty GRAVEL with sand, brown, homogenous		
40	2445						The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. End of test hole boring at 40 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
45									

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2485.7 ft HOLE No. BH-121-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6 Inspector Dave Nelson

Start September 19, 2007 Completion September 19, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1072824.06 Easting 1750834.78 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2485.0					B-1	GS LA DG SG	GW Well graded GRAVEL, cobbles and boulders, brown, homogenous		
5	2480.0									
10	2475.0					B-2	GS LA DG SG	GW Well graded GRAVEL, cobbles and boulders, gray, homogenous		
15	2470.0					B-3		Well graded SAND with gravel, cobbles and boulders, brown, homogenous 9/19/2007	▽	
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL GDT 8/28/08,8:30:03 AB

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2485.7 ft HOLE No. BH-121-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2465					B-4		Silty GRAVEL with sand, cobbles and boulders, brown, homogenous		
25	2460					B-5		Silty GRAVEL with sand, cobbles and boulders, brown, homogenous		
30	2455					B-6		Silty GRAVEL with sand, cobbles and boulders, brown, homogenous		
35	2450									
40	2445							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
45								End of test hole boring at 40 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-122-07

Job No. XL-2779 SR 90 Elevation 2479.8 ft

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6 Inspector Dave Nelson

Start September 18, 2007 Completion September 18, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (Inches) 6 Method dual wall reverse air circulation

Northing 1072638.84 Easting 1750910.24 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Well graded GRAVEL with sand and cobbles and boulders, brown, homogenous		
5	2475.0									
10	2470.0					B-2		Silty GRAVEL with sand and cobbles and boulders, brown, homogenous		
15	2465.0									
20	2460.0									

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2479.8 ft HOLE No BH-122-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-3		Silty SAND with gravel and cobbles and boulders, brown, homogenous		
25	2455									
30	2450					B-4		Well graded GRAVEL with sand and cobbles and boulders, slightly silty, brown, homogenous	▽ 9/18/2007	
35	2445									
40	2440									
45	2435							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew. End of test hole boring at 40 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255) GPJ SOIL GDT 8/27/08 8:53:15 AB

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-123-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2478.0 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 22, 2007 Completion September 22, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1074141.46 Easting 1750533.89 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
								SILT, gray, homogenous		
	2475.0									
5										
						B-1		Silty SAND with gravel, brown, homogenous		
	2470.0									
						B-2		Well graded GRAVEL, brown, homogenous		
10										
									9/22/2007	
	2465.0									
						B-3		Silty GRAVEL with sand, gray, homogenous		
15										
	2460.0									
								Sandy SILT with organics, gray, homogenous		
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2478.0 ft HOLE No. BH-123-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2455									
25										
	2450									
30										
	2445									
35								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2440									
40								End of test hole boring at 35 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2435									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.1 ft

HOLE No. BH-124-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 20, 2007 Completion September 20, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073891.63 Easting 1750543.25 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1	GS LA DG SG	GW Well graded GRAVEL, cobbles, brown, homogenous		
	2480.0									
5										
	2475.0									
10						B-2	GS LA DG SG	GW Well graded GRAVEL, cobbles, gray, homogenous		
	2470.0									
15										
	2465.0									
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL.GDT 8/28/08 8:30:07 AB

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.1 ft HOLE No. BH-124-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-3		Silty GRAVEL with sand, cobbles, gray, homogenous		
	2480									
25										
	2455					B-4		Sandy SILT, gray, homogenous	▽ 9/20/2007	
30										
	2450									
35								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2445									
40								End of test hole boring at 35 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2440									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No. BH-125-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2482.7 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 20, 2007 Completion September 20, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073691.77 Easting 1750550.74 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Silty GRAVEL with sand with cobbles, gray, homogenous		
	2480.0									
5										
	2475.0									
10						B-2		Silty GRAVEL with sand with cobbles, gray, homogenous		
	2470.0									
15										
	2465.0									
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2482.7 ft HOLE No BH-125-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-3		Silty GRAVEL with sand with cobbles, gray, homogenous		
	2460									
25										
	2455								▽	
						B-4		Well graded SAND, brown, homogenous 9/20/2007		
						B-5		Silty GRAVEL with sand, brown, homogenous		
30										
	2450									
35										
	2445							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
40								End of test hole boring at 35 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2440									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2484.1 ft

HOLE No. BH-126-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 20, 2007 Completion September 20, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073491.91 Easting 1750558.22 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD 20 40 60 80	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1	GS LA DG SG	GW Well graded GRAVEL, cobbles and boulders, gray, homogenous		
	2480.0									
5										
						B-2	GS LA DG SG	GW Well graded GRAVEL, cobbles and boulders, brown, homogenous		
	2475.0									
10										
	2470.0									
15										
	2465.0									
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2484.1 ft

HOLE No. BH-126-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-3		Silty GRAVEL with sand, cobbles and boulders, brown, homogenous		
	2460									
25										
						B-4		Silty GRAVEL with sand, cobbles and boulders, brown, homogenous	▽	
	2455							9/20/2007		
30										
	2450									
35								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2445							End of test hole boring at 35 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
40										
	2440									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2483.3 ft

HOLE No. BH-127-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 21, 2007 Completion September 21, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073292.05 Easting 1750565.05 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1	GS LA DG SG	GW Well graded GRAVEL, cobbles and boulders, brown, homogenous		
	2480.0									
5										
						B-2	GS LA DG SG	GW Well graded GRAVEL, cobbles and boulders, brown, homogenous		
	2475.0									
						B-3	GS LA DG SG	GW Well graded GRAVEL, cobbles and boulders, brown, homogenous,		
10										
	2470.0									
15										
	2465.0									
						B-4		Silty GRAVEL with sand, , brown, homogenous,		
20										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2483.3 ft HOLE No. BH-127-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2460									
25										
	2455									
						B-5		Silty SAND with scattered gravel, brown, homogenous 9/20/2007	▽	
30										
	2450									
35								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2445									
40								End of test hole boring at 35 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2440									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No BH-128-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2483.2 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 19, 2007 Completion January 19, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073092.19 Easting 1750573.20 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Silty SAND with gravel, brown, homogenous		
	2480.0									
5										
	2475.0									
						B-3		Clayey SAND with GRAVEL, brown, homogenous		
10						B-2		Silty GRAVEL with sand, 18 to 19 silty clay, brown, homogenous		
	2470.0									
15										
	2465.0									
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2483.2 ft HOLE No. BH-128-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2460									
25										
						B-4		Silty GRAVEL with sand, brown, homogenous		
	2455									
30						B-5		Well graded GRAVEL with sand, brown, homogenous		
	2450							9/19/2007	▽	
35								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2445									
40								End of test hole boring at 35 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2440									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2478.1 ft

HOLE No. BH-129-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 18, 2007 Completion September 18, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1072796.51 Easting 1750635.67 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 *Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1	GS LA DG SG	GW Well graded GRAVEL, cobbles and boulders, brown, homogenous		
	2475.0									
5										
	2470.0									
10						B-2	GS LA DG SG	GW Well graded GRAVEL, cobbles and boulders, brown, homogenous		
	2465.0									
15										
	2460.0									
20										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2478.1 ft HOLE No. BH-129-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic#. 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-3		Silty SAND with gravel, brown, homogenous		
	2455									
25										
	2450								9/18/2007	
30						B-4		Silty SAND with gravel, brown, homogenous		
	2445									
35								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2440									
40								End of test hole boring at 35 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2435									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2479.7 ft

HOLE No. BH-130-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 18, 2007 Completion September 18, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1072611.29 Easting 1750711.13 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 *Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1	GS LA DG SG	GW Well graded GRAVEL, cobbles, brown, homogenous		
5	2475.0									
10	2470.0					B-2	GS LA DG SG	GW Well graded GRAVEL, cobbles and boulders, brown, homogenous		
						B-3	GS LA DG SG	GW Well graded GRAVEL, cobbles and boulders, brown, homogenous		
15	2465.0									
20	2460.0									

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2479.7 ft HOLE No. BH-130-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-4		Silty GRAVEL with sand, brown, homogenous		
25	2455									
									▽ 9/18/2007	
30	2450					B-5		Well graded GRAVEL with sand, brown, homogenous		
35	2445									
								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
40	2440							End of test hole boring at 35 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
45	2435									

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

HOLE No BH-131-07

Job No XL-2779 SR 90 Elevation 2468.1 ft

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.6

Inspector Dave Nelson

Start September 18, 2007 Completion September 18, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1072426.07 Easting 1750786.60 Collected by Datum

County Kittitas Subsection SW1/4 of SW 1/4 Section 23 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Well graded SAND with gravel, brown, homogenous		
	2465.0									
5										
	2460.0									
10						B-2		Well graded SAND with gravel, brown, homogenous		
	2455.0									
15										
	2450.0									
20									▽	

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26726

Job No. XL-2779 SR 90 Elevation 2468.1 ft HOLE No BH-131-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-3		Well graded SAND with gravel, brown, homogenous 9/18/2007		
	2445									
25										
	2440									
30						B-4		Well graded GRAVEL with sand, brown, homogenous		
	2435									
35								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2430							End of test hole boring at 35 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
40										
	2425									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26727

HOLE No. BH-132-07

Job No. XL-2779 SR 90 Elevation 2474.0 ft

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.8

Inspector Dave Nelson

Start September 27, 2007 Completion September 17, 2007 Well ID#

Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6

Method dual wall reverse air circulation

Northing 1073884.14 Easting 1750343.37 Collected by

Datum

County Kittitas Subsection NW1/4 of NW 1/4 Section 26 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Poorly graded SAND with gravel, brown, homogenous		
	2470.0									
5										
	2465.0									
10						B-2		Well graded SAND with gravel, brown, homogenous		
	2460.0									
15						B-3		Well graded GRAVEL with sand, rust/brown, homogenous		
	2455.0									
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL GDT 8/27/08 8:53:28 AB

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26727

Job No. XL-2779 SR 90 Elevation 2474.0 ft HOLE No BH-132-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-4		Well graded GRAVEL with sand, brown, homogenous 9/17/2007		
	2450					B-5		Poorly graded SAND, brown		
25										
	2445									
30								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2440							End of test hole boring at 30 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
35										
	2435									
40										
	2430									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26727

HOLE No BH-133-07

Job No. XL-2779 SR 90 Elevation 2477.1 ft

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.8

Inspector Dave Nelson

Start September 27, 2007 Completion September 17, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073684.28 Easting 1750350.88 Collected by Datum

County Kittitas Subsection NW1/4 of NW 1/4 Section 26 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Well graded SAND with gravel, brown, homogenous		
	2475.0									
5										
	2470.0									
10										
	2465.0									
15						B-2		Well graded GRAVEL with sand, brown, homogenous		
	2460.0									
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255).GPJ SOIL.GDT 8/27/08 8:53:31 AB

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26727

Job No. XL-2779 SR 90 Elevation 2477.1 ft HOLE No BH-133-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2455					B-3		Well graded GRAVEL with sand, brown, homogenous	9/17/2007	
25	2450					B-4		Well graded SAND, brown, homogenous		
30	2445							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
35	2440							End of test hole boring at 30 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
40	2435									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card R-69968

HOLE No BH-134-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2475.9 ft

Project Snoqlamie Pass East (PS-255)

Driller Nelson, Dave Lic# 1678

Site Address Vic I-90 MP 56.8

Inspector Dave Nelson

Start September 21, 2007 Completion September 21, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073484.42 Easting 1750358.36 Collected by Datum

County Kittitas Subsection NW1/4 of NW 1/4 Section 26 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2475.0					B-1		Silty SAND with gravel, brown, homogenous		
5	2470.0									
10	2465.0					B-2		Silty SAND with gravel, cobbles, brown, homogenous		
15	2460.0							Poorly graded SAND, stump, brown, homogenous		
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card R-69968

Job No. XL-2779 SR 90 Elevation 2475.9 ft HOLE No BH-134-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Nelson, Dave Lic# 1678

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2455									
						B-3		Well graded SAND with gravel, wood, brown, homogenous		
25									9/17/2007	
	2450									
30										
	2445							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
35								End of test hole boring at 30 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2440									
40										
	2435									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26727

Job No. XL-2779 SR 90 Elevation 2473.5 ft

HOLE No. BH-135-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.8

Inspector Dave Nelson

Start September 17, 2007 Completion September 17, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1073284.56 Easting 1750365.85 Collected by Datum

County Kittitas Subsection NW1/4 of NW 1/4 *Section 26 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1	GS R	Well graded SAND, brown, homogenous		
	2470.0									
5										
	2465.0									
10						B-2	GS R	Well graded SAND, brown, homogenous		
	2460.0									
15						B-3		Well graded GRAVEL with sand, brown, homogenous		
	2455.0									
20										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26727

Job No. XL-2779 SR 90 Elevation 2473.5 ft HOLE No. BH-135-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	2450									
25						B-4		Poorly graded SAND, brown, homogenous	▽ 9/17/2007	
	2445									
30								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2440									
35								End of test hole boring at 30 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2435									
40										
	2430									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26727

HOLE No. BH-136-07

Sheet 1 of 2

Job No. XL-2779 SR 90 Elevation 2474.0 ft

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.8

Inspector Dave Nelson

Start September 17, 2007 Completion September 17, 2007 Well ID#

Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6

Method dual wall reverse air circulation

Northing 1073084.56 Easting 1750373.34 Collected by

Datum

County Kittitas Subsection NW1/4 of NW 1/4 Section 26 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1	GS R	Well graded SAND, brown, homogenous		
	2470.0									
5										
	2465.0									
10						B-2	GS R	Well graded SAND, brown, homogenous		
	2460.0									
15										
	2455.0									
20										

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26727

Job No. XL-2779 SR 90 Elevation 2474.0 ft

HOLE No. BH-136-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-3		Well graded SAND with gravel, brown, homogenous		
	2450									
25									▽ 9/17/2007	
	2445							Poorly graded SAND, brown, homogenous		
30										
								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2440							End of test hole boring at 30 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
35										
	2435									
40										
	2430									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26727

HOLE No. BH-137-07

Job No. XL-2779 SR 90 Elevation 2474.0 ft

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.8

Inspector Dave Nelson

Start September 17, 2007 Completion September 17, 2007 Well ID# Equipment Becker Hammer with Becker Hammer

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1072768.96 Easting 1750436.56 Collected by Datum

County Kittitas Subsection NW1/4 of NW 1/4 Section 26 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Well graded GRAVEL with sand, cobbles, brown, homogenous		
	2470.0									
5										
	2465.0									
10						B-2		Silty GRAVEL with sand, brown, homogenous		
	2460.0									
15										
	2455.0									
20										

SOILA XL-2779 I-90 SNOQUALMIE PASS EAST (PS-255) GPJ SOIL GDT 8/27/08 8:53:36 AB

Washington State
Department of Transportation

LOG OF TEST BORING

Start Card S-26727

Job No. XL-2779 SR 90 Elevation 2474.0 ft HOLE No. BH-137-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255) Driller Jim Benson Lic# 2294

Depth (ft)	Elevation (ft)	Profile	◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-3		Well graded GRAVEL with sand, brown, homogenous		
	2450									
25										
								SILT, brown, homogenous	▽ 9/17/2007	
	2445									
30								The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
	2440									
35								End of test hole boring at 30 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
	2435									
40										
	2430									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26727

Job No. XL-2779 SR 90 Elevation 2469.5 ft

HOLE No. BH-138-07

Sheet 1 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

Site Address Vic I-90 MP 56.8

Inspector Dave Nelson

Start September 18, 2007 Completion September 18, 2007 Well ID# Equipment Becker Hammer with Becker Hamme

Station Offset Hole Dia (inches) 6 Method dual wall reverse air circulation

Northing 1072583.74 Easting 1750512.03 Collected by Datum

County Kittitas Subsection NW1/4 of NW 1/4 Section 26 Range 11 EWM Township 22

Depth (ft)	Elevation (ft)	Profile	Field SPT (N) / Moisture Content / RQD (20 40 60 80)	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						B-1		Well graded GRAVEL with sand, brown, homogenous		
	2465.0									
5										
	2460.0									
10						B-2		Silty GRAVEL with sand, brown, homogenous		
	2455.0									
15						B-3		Well graded GRAVEL with sand, cobbles, brown, homogenous		
	2450.0									
20										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card S-26727

Job No. XL-2779 SR 90 Elevation 2469.5 ft

HOLE No. BH-138-07

Sheet 2 of 2

Project Snoqlamie Pass East (PS-255)

Driller Jim Benson Lic# 2294

◆ Field SPT (N) ✚ Moisture Content ▨ RQD (20 40 60 80)

Depth (ft)	Elevation (ft)	Profile	Blows/6" (N) and/or RQD FF	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
					B-4	GS LA DG SG	GW Well graded GRAVEL, cobbles, brown, homogenous		
25	2445							9/17/2007	
					B-5		Silty SAND with gravel, gray, homogenous		
30	2440								
							The implied accuracy of the borehole location information displayed on this boring log is typically sub-meter in (X,Y) when collected by the HQ Geotech Division and sub-centimeter in (X,Y,Z) when collected by the Region Survey Crew.		
35	2435						End of test hole boring at 30 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Note: REF = SPT Refusal		
40	2430								
45	2425								

Appendix C

Table 1 – Test Result Summary Table
Laboratory test results

TABLE 1 - Test Result Summary

Aggregate Quality Value														Atterburg Limits					Gradation (% passing)								Comments
Hole	Bag	Lab ID #	Date	Depth Range	Water Level	LA	Deg.	Spg	Swell	"R"	SE	T99 Max Density	T180 Max Density	LL	PL	PI	4"	3"	2½"	2"	1"	¾"	½"	¼"	#4	#200	
1969 TESTING																											
1	1		9-18-1969						0	78	71								92	85	71	66		48	46	3.4	
3	2		9-18-1969						0	80	66								82	81	54	40		32	29	2.2	
5	3		9-18-1969						0	79	70								85	79	56	44		37	34	1.9	
6	4		9-18-1969						0	69	50								99	99	98	97		91	90	18.2	
1973 TESTING																											
50			3-12-1973			NOT TESTED																					
51	1		3-12-1973			13.5	48	2.700			59								74	68	54	49		31	29	3.1	
52			3-12-1973			NOT TESTED																					
53			3-12-1973			NOT TESTED																					
54	2		3-12-1973								60								77	71	53	47		32	30	3.2	
55	3		3-12-1973								65								74	70	56	38		31	29	2.8	
56	4		3-12-1973								49								69	61	42	35		30	22	4.5	
57	5		3-12-1973								54								75	68	43	33		27	25	3.2	
58	6		3-12-1973								56								76	73	44	34		29	28	4.1	
59			3-12-1973			NOT TESTED																					
60	7		3-12-1973								64								76	71	51	36		30	29	3.6	
61	8		3-12-1973								42								85	81	64	58		38	36	7.2	
2007 TESTING																											

TABLE 1 - Test Result Summary

Aggregate Quality Value														Atterburg Limits					Gradation (% passing)								Comments
Hole	Bag	Lab ID #	Date	Depth Range	Water Level	LA	Deg.	Spg	Swell	"R"	SE	T99 Max Density	T180 Max Density	LL	PL	PI	4"	3"	2½"	2"	1"	¾"	½"	¼"	#4	#200	
BH-100-07	1,2,3		9-22-2007	0.0-16.0	9.5	NOT TESTED																					
BH-101-07	1		9-23-2007	0.0-9.0	0.0	NOT TESTED																					
BH-102-07	1,2,3		9-23-2007	2.0-28.0	9.0	NOT TESTED																					
BH-103-07	1,2,3		9-22-2007	0.0-27.0	9.5	NOT TESTED																					
BH-104-07	1,2,3,4		9-23-2007	0.0-22.0	13.0	NOT TESTED																					
BH-105-07	1,2,3		9-23-2007	0.0-15.2	13.0	NOT TESTED																					
BH-106-07	1,2,3,4,5		9-21-2007	0.0-50.0	7.0	NOT TESTED																					
BH-107-07	1,2		9-22-2007	0.0-45.0	9.0	NOT TESTED																					
BH-108-07	2	225067	9-24-2007	9.0-18.0	18.0						76																
BH-109-07	1,2,3		9-24-2007	0.0-35.0	13.0							127.2 pcf 10.2%						100	93		84		74		61	8.3	T99 Density Curve - 89% passing ¾", 76% passing #4
BH-110-07	1		9-23-2007	0.0-33.0	9.0																						
BH-111-07	1	225066	9-23-2007	0.0-18.0	9.0						60																
BH-112-07	1,2		9-19-2007	0.0-20.0	5.0								137.6 pcf 7.3%							100	95		88		73	7.5	T180 Density Curve - 92% passing ¾", 70% passing #4
BH-119-07	1,2		9-20-2007	0.0-11.0	11.0																						
BH-113-07	3	225060	9-19-2007	20.0-26.0	10.0							121 pcf 11.4%													76		T99 Density Curve - 90% passing ¾", 76% passing #4
BH-114-07	1		9-22-2007	0.0-40.0	20.0	NOT TESTED																					
BH-115-07	3	225059	9-22-2007	20.0-23.0	16.0						72																
BH-116-07	1,2,3,4,5	225070	9-21-2007	0.0-40.0	19.0	15	74	2.667										100		90	69		50		33	4.7	
BH-124-07	1,2,3,4		9-20-2007	0.0-35.0	27.0																						
BH-124-07	3			20.0-27.0							70																
BH-117-07	1,2,3,4,5		9-20-2007	0.0-40.0	20.0	NOT TESTED																					
BH-118-07	1,2,3,4,5		9-20-2007	0.0-40.0	8.0	NOT TESTED																					
BH-120-07	1A,1B,2,3	252065	9-19-2007	0.0-25.0	28.0													100		91	74		56		37	5.3	
BH-121-07	2	225072	9-19-2007	10.0-15.0	15.0						79																
BH-121-07	1,2			0.0-15.0		16	72	2.713										100		83	65		49		31	4.9	
BH-129-07	1,2		9-18-2007	0.0-20.0	28.0																						
BH-122-07	1,2,3,4		9-18-2007	0.0-40.0	30.0	NOT TESTED																					

TABLE 1 - Test Result Summary

Aggregate Quality Value														Atterburg Limits					Gradation (% passing)								Comments
Hole	Bag	Lab ID #	Date	Depth Range	Water Level	LA	Deg.	Spg	Swell	"R"	SE	T99 Max Density	T180 Max Density	LL	PL	PI	4"	3"	2½"	2"	1"	¾"	½"	¼"	#4	#200	
BH-123-07	1,2,3		9-22-2007	7.0-35.0	12.0	NOT TESTED																					
BH-125-07	1,2,3, 4,5		9-20-2007	0.0-35.0	28.0	NOT TESTED																					
BH-126-07	3	225071	9-20-2007	20.0-28.0	28.0						80																
BH-126-07	1,2			0.0-20.0		13	71	2.694										100		86	71		52		33	1.4	
BH-127-07	1,2		9-21-2007	0.0-9.0	29.0																						
BH-128-07	2	225065	9-19-2007	10.0-20.0	33.0						70																
BH-128-07	3	225060		9.0-19.0							67																
BH-130-07	1,2,3	225333	9-18-2007	0.0-20.0	29.0													100	91	88	70		49		30	3.5	
BH-138-07	4		9-18-2007	20.0-28.0	25.0																						
BH-131-07	1,2,3, 4		9-18-2007	0.0-35.0	20.0	NOT TESTED																					
BH-132-07	4	225073	9-17-2007	20.0-24.0	20.0						54																
BH-133-07	2,3		9-17-2007	15.0-24.0	23.0														100	97	78		60		39	9.0	
BH-138-07	1,2,3		9-18-2007	0.0-20.0	25.0																						
BH-134-07	1,2,3		9-21-2007	0.0-30.0	25.0	NOT TESTED																					
BH-135-07	1,2	225069	9-17-2007	0.0-15.0	26.0												100	92		82	73		66		57	8.7	
BH-136-07	1,2		9-17-2007	0.0-20.0	26.0																						
BH-137-07	1		9-17-2007	0.0-10.0	27.0						66																

HYDROMETER WORKSHEET

Job No.:	XL-2779	**Date:**	April 10, 2008
Hole No.:	BH-108-07 BAG 5	**Lab Tech.:**	LLOYD BRISCOE
Lab No.:	F-7754		
Depth:			
Sample No.:	S-5059		

Air Dry Moisture Content

Wet Wt. Soil + Pan (g)		Wet Wt Soil (g)	0.00	Moisture Content	#DIV/0!
Dry Wt. Soil + Pan (g)		Dry Wt Soil (g)	0.00		
Pan Tare (g)		Water Wt (g)	0.00		
		0			
Soil Wt. (g)	30.230	Picnometer + H_2O (g)	666.740	Picnometer + H2O + Soil (g)	685.720
Temp (C)	24.000				

Split Sample at No. 10 Sieve and Determine Soil Fractions for Material Coarser than No. 10

Wt. Retained on these Sieves (g)			13128.2	Total Wt of soil		
3-inch	75.00 mm	0		Wt soil retained		5046.90
1.5-inch	37.50 mm	135.2		Wt soil passing No 10	13128.20 - 5046.90 =	8081.30
1-inch	25.00 mm	302.6		Total Wt of soil	5046.90 + 8081.30 =	13128.20
0.75-inch	19.00 mm	348.7		Wt Adj. for Hygroscopic Water	13128.20 * 99.69%	13087.90
No. 4	4.75 mm	2420.8				
No. 10	2.00 mm	1839.6				

Sieve Results on Hydrometer Sample

Dry Soil Wt Hyd Sample (g)		108.84			
Wt. Retained on these Sieves (g)					
No. 40	0.425 mm	46	Wt soil retained		98.60
No. 60	0.250 mm	27	Wt soil passing 200	108.84 - 98.60 =	10.24
No. 80	0.180 mm	11.6	Total Wt of soil	98.60 + 10.24 =	108.84
No. 100	0.150 mm	4	Wt Adj. for Hygroscopic Water	108.84 * 99.69%	108.51
No. 200	0.075 mm	10			

Hygroscopic Moisture of Hydrometer Sample

Wet Wt. Soil + Pan (g)	75.75	Wet Wt Soil (g)	13.07	Moisture Content	0.31%
Dry Wt. Soil + Pan (g)	75.71	Dry Wt Soil (g)	13.03		
Pan Tare (g)	62.68	Water Wt (g)	0.04		
		89.3			

% Retained on these Sieves (g)				Adjusted Wt Soil Passing No. 10	13087.90 - ##### =	8,041.00
No. 40	0.425 mm	42.39%	3408.90			
No. 60	0.250 mm	24.88%	2000.88			
No. 80	0.180 mm	10.69%	859.64			
No. 100	0.150 mm	3.69%	296.43			
No. 200	0.075 mm	9.22%	741.07			
	Pan	9.13%	734.09			
	SubTotal	100.00%	8041.00			

Sieve Size	**Wt. Ret. (g)**	**Wt. Ret. (g)**	**% Ret.**	**% Passing**
3-inch	**0**	-	0.00%	100.00%
1.5-inch	**135.2**	135.20	1.03%	98.97%
1-inch	**302.6**	437.80	2.31%	96.65%
0.75-inch	**348.7**	786.50	2.66%	93.99%
No. 4	**2420.8**	3,207.30	18.50%	75.49%
No. 10	**1839.6**	5,046.90	14.06%	61.44%
No. 40	**3408.90**	8,455.80	26.05%	35.39%
No. 60	**2000.88**	#######	15.29%	20.10%
No. 80	**859.64**	#######	6.57%	13.54%
No. 100	**296.43**	#######	2.26%	11.27%
No. 200	**741.07**	#######	5.66%	5.61%
pan	**734.09**	#######	5.61%	0.00%
SubTotal	**13087.90**		100.00%	

Wts. for gINT Moisture Tab	
Wet Wt.	**0.00**
Dry Wt.	**0.00**
Pan Tare	**0.00**

Job No. **XL-2779** Date **April 23, 2008**

Hole No. **BH-108-07 BAG 5** Sheet **1** of **1**

Project **Snoqlamie Pass East (PS-255)**

Laboratory Summary

Washington State Department of Transportation

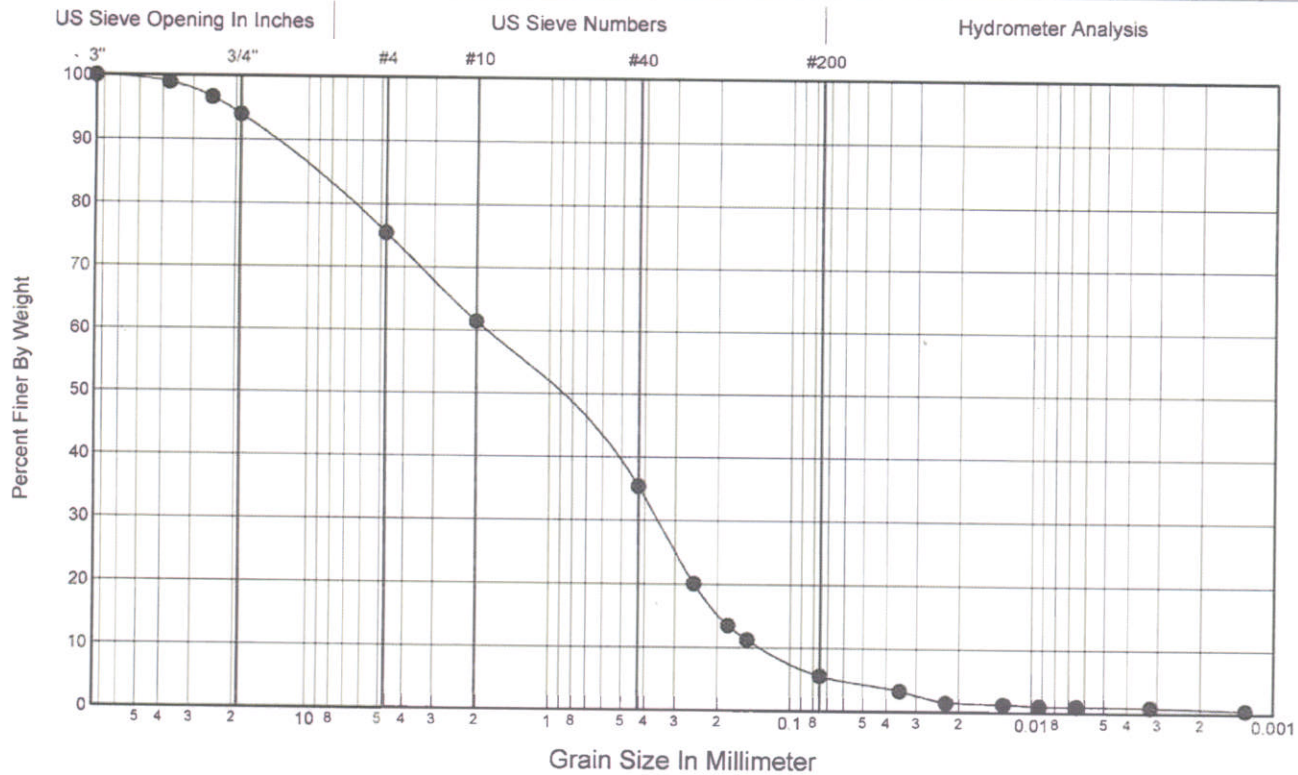
	Depth (ft)	Depth (m)	Sample No.	USCS	Color	Description	MC%	LL	PL	PI
●	1.0	0.30		SP-SM	See Boring Log	POORLY GRADED SAND with SILT and GRAVEL				

GRADATION FRACTIONS

	%Gravel	%Sand	%Fines	Cc	Cu
●	24.5	69.9	5.6	0.5	14.3

GRADATION VALUES

	D60	D50	D30	D20	D10
●	1.836	1.01	0.35	0.25	0.128



WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/24/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/28/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225067
Lab Number S -25067
Trans. No. 225067
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: GRAVEL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH-109-07 AND BH-110-07

Test Loc.: By:

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"	895.7	93	
2-1/4"			
2"	1445.6	89	
1-1/2"			
1-1/4"			
1"	2064.2	84	
3/4"	2526.6	80	
5/8"			
1/2"	3211.0	74	
3/8"	3654.5	71	
1/4"			
No.4	4884.9	61	
TOTAL	12588.3		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6			
No.8	100.3	51	
No.10			
No.16	218.3	39	
No.20			
No.30	328.20	28	
No.40			
No.50	431.70	17	
No.60			
No.70			
No.80			
No.100	487.40	12	
No.140			
No.200	519.60	8.3	
Total	601.81		
	Dust Ratio		

==========

Distribution:

General File
Region Construction
Project Engineer:
DOUG MALSCH
E. BILDERBACK

T43A-
T43B-1.0
T43J-
T43L-
T43M-
T44A-
T44T-
T44U-

Result: INFORMATIONAL
Remarks:
X PROCTOR TO BE REPORTED UNDER SEPERATE COVER.
X(2) SAMPLE CONSISTS OF BH--109-07 BAGS 1,2&3 AND BH-110-07 BAGS 1
X THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/08/2008
Phone: (360)709-5446

grading.dfr 3/03

Washington State Department of Transportation

Moisture - Density Relationship Report

Field Sample Number	Lab Number	Transmittal Number	Control Number	Federal Aid Number
	0000225067	524433		

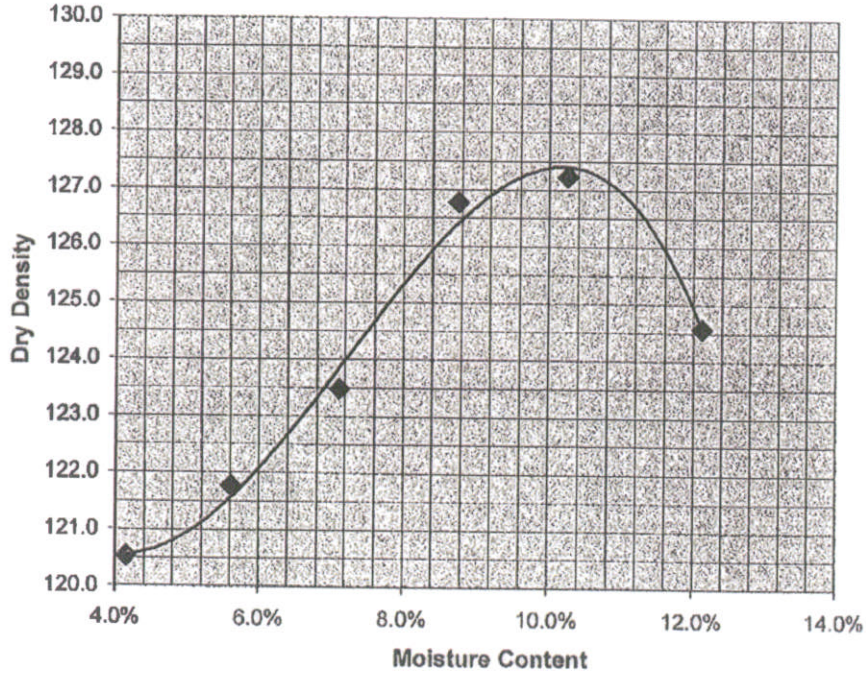
Project Number	SR	Org. Code	Project Description (or section)
XL-2779	90	456002	Briggs to Keechelus

Source of Materials	Type of Material	Sample Weight	Date Sampled	Date Tested	Tested By	% Passing 3/4	% Passing #4
PS-S-255	Gravel	25.8 lb.	9/24/07	4/23/08	LHB	88.7	75.9

T-99 or T-180	Method	Mold Size (in)	Specific Gravity	Comments
99	D	4	Not Tested	BH-109-07 bags 1, 2 & 3 and BH-110-07 bag 1

Can Number		1	2	3	4	5	6	7	8
Specimen Wt. + Mold		5468.9	5515.4	5570.9	5655.7	5692.0	5683.0		
Wt. of Mold:	3568.2	3568.2	3568.2	3568.2	3568.2	3568.2	3568.2		
Vol. Factor:	0.066046	0.066046	0.066046	0.066046	0.066046	0.066046	0.066046		
Wet Sample + Can		333.8	322.5	294.1	274.9	305.9	287.0		
Dry Sample + Can		323.9	309.9	280.1	259.3	285.3	265.1		
Wt. Comp. Soil		1900.7	1947.2	2002.7	2087.5	2123.8	2114.8		
Tare Wt.		85.7	85.3	83.5	81.1	84.4	84.5		
Net Dry Wt.		238.2	224.6	196.6	178.2	200.9	180.6		
Wt. of Water		9.9	12.6	14.0	15.6	20.6	21.9		
Wet Density		125.5	128.6	132.3	137.9	140.3	139.7		
Water Content		0.0416	0.0561	0.0712	0.0875	0.1025	0.1213		
Water Content %		**4.16%**	**5.61%**	**7.12%**	**8.75%**	**10.25%**	**12.13%**		
Dry Density		**120.5**	**121.8**	**123.5**	**126.8**	**127.2**	**124.6**		

Moisture - Density Curve



◆ Dry Density — Poly. (Dry Density)

Maximum Dry Density (pcf) 127.2

Optimum Moisture 10.2%

Maximum Dry Density (pcf) 134

Optimum Moisture 7.7%

Doug Malsch

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/20/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/28/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225066
Lab Number S -25066
Trans. No. 225066
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: GRAVEL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH-112-07 AND BH-119-07

Test Loc.: By:

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"			
2-1/4"			
2"	0.0	100	
1-1/2"			
1-1/4"			
1"	603.3	95	
3/4"	895.9	93	
5/8"			
1/2"	1488.4	88	
3/8"	1929.4	85	
1/4"			
No.4	3410.1	73	
TOTAL	12562.8		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6			
No.8	128.9	58	
No.10			
No.16	282.1	39	
No.20			
No.30	403.20	25	
No.40			
No.50	476.20	16	
No.60			
No.70			
No.80			
No.100	520.40	10	
No.140			
No.200	545.20	7.5	
Total	607.46		
	Dust Ratio		

==========

Distribution:

General File X
Region Construction
Project Engineer:
DOUG MALSCH X(2)
E. BILDERBACK X

T43A- T43L- T44T-
T43B-1.0 T43M- T44U-
T43J- T44A-

Result: INFORMATIONAL
Remarks:
PROCTOR TO BE REPORTED UNDER SEPERATE COVER.
SAMPLE CONSISTS OF BH--112-07 BAGS 1&2 AND BH-119-07 BAGS 1&2
THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/08/2008
Phone: (360)709-5446

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Washington State Department of Transportation

Moisture - Density Relationship Report

Field Sample Number	Lab Number	Transmittal Number	Control Number	Federal Aid Number
	0000225066	524432		

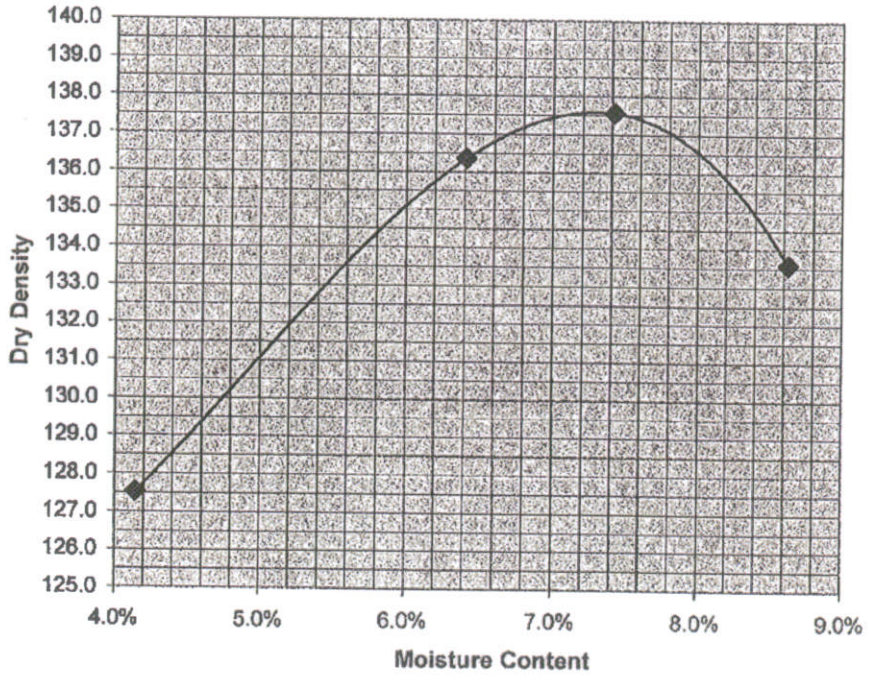
Project Number	SR	Org. Code	Project Description (or section)
XL-2779	90	456002	Briggs to Keechelus

Source of Material's	Type of Material	Sample Weight	Date Sampled	Date Tested	Tested By	% Passing 3/4	% Passing #4
PS-S-255	Gravel	25.8 lb.	9/20/07	4/22/08	LHB	91.9	69.8

T-99 or T-180	Method	Mold Size (in)	Specific Gravity	Comments
180	D	6	Not Tested	BH-112-07 bags 1 & 2, and BH-119-07 bags 1 & 2

Can Number		1	2	3	4	5	6	7	8
Specimen Wt. + Mold		7243.2	7662.2	7753.2	7663.1				
Wt. of Mold:	2715.3	2715.3	2715.3	2715.3	2715.3				
Vol. Factor:	0.02933	0.029330	0.029330	0.029330	0.029330				
Wet Sample + Can		745.0	620.3	647.7	981.1				
Dry Sample + Can		718.7	587.8	608.7	909.6				
Wt. Comp. Soil		4527.9	4946.9	5037.9	4947.8				
Tare Wt.		83.5	80.9	83	81.1				
Net Dry Wt.		635.2	506.9	525.7	828.5				
Wt. of Water		26.3	32.5	39.0	71.5				
Wet Density		132.8	145.1	147.8	145.1				
Water Content		0.0414	0.0641	0.0742	0.0863				
Water Content %		**4.14%**	**6.41%**	**7.42%**	**8.63%**				
Dry Density		**127.5**	**136.4**	**137.6**	**133.6**				

Moisture - Density Curve



◆ Dry Density — Poly. (Dry Density)

Maximum Dry Density (pcf) 137.6

Optimum Moisture 7.3%

Maximum Dry Density (pcf) 139.2

Optimum Moisture 6.7%

Doug Maisch

Job No. **XL-2779** Date **April 23, 2008**

Hole No. **BH-113-07 BAG 3** Sheet **1** of **1**

Project **Snoqlamie Pass East (PS-255)**

Laboratory Summary

Washington State Department of Transportation

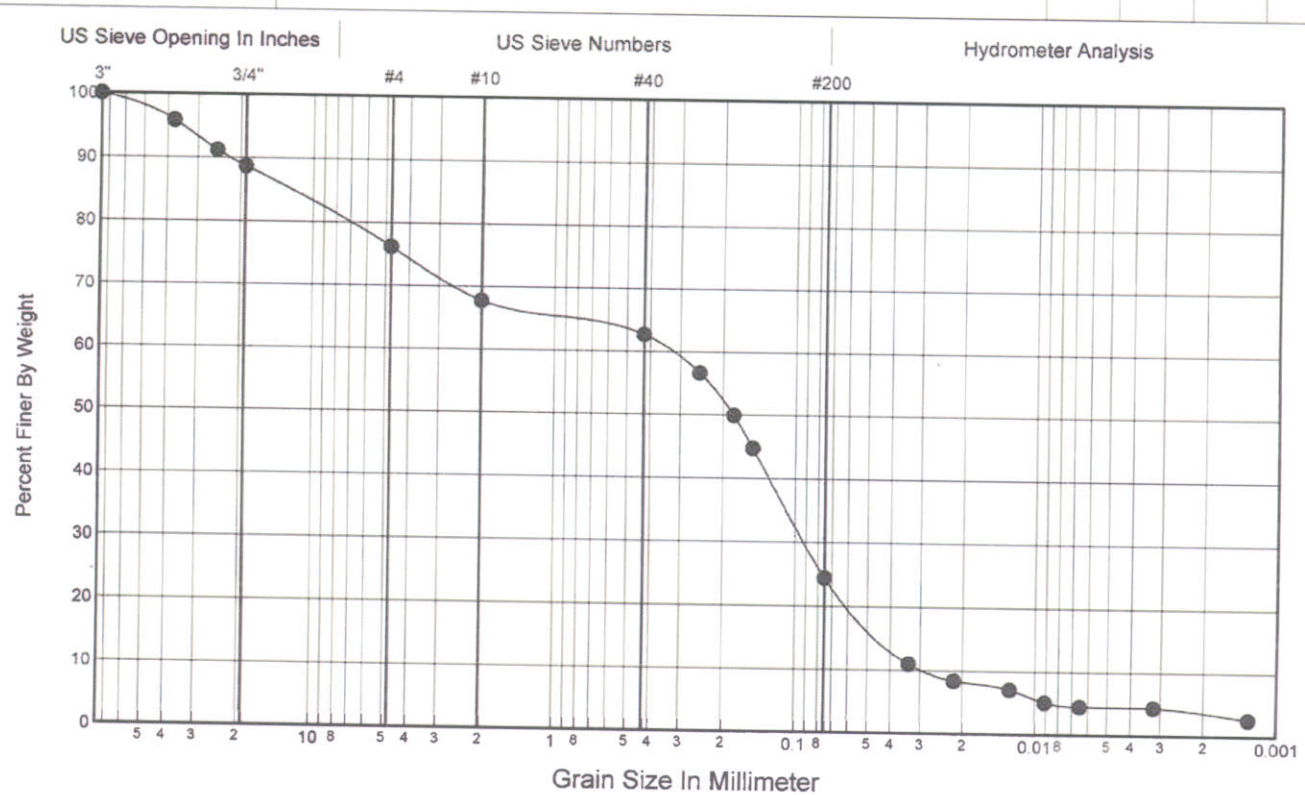
	Depth (ft)	Depth (m)	Sample No.	USCS	Color	Description	MC%	LL	PL	PI
●	2.0	0.61		SM	See Boring Log	SILTY SAND with GRAVEL				

GRADATION FRACTIONS

	%Gravel	%Sand	%Fines	Cc	Cu
●	23.8	51.8	24.4	0.9	11.8

GRADATION VALUES

	D60	D50	D30	D20	D10
●	0.335	0.18	0.09	0.06	0.028



Gravel	Sand			Silt and Clay
	Coarse	Medium	Fine	

HYDROMETER WORKSHEET

Job No.:	XL-2779	**Date:**	April 10, 2008
Hole No.:	BH-113-07 BAG 3	**Lab Tech.:**	LLOYD BRISCOE
Lab No.:	F-7755		
Depth:			
Sample No.:	S-5060		

Air Dry Moisture Content					
Wet Wt. Soil + Pan (g)		Wet Wt Soil (g)	0.00	Moisture Content	#DIV/0!
Dry Wt. Soil + Pan (g)		Dry Wt Soil (g)	0.00		
Pan Tare (g)		Water Wt (g)	0.00		
		0			
Soil Wt. (g)	24.850	Picnometer + H_2O (g)	674.420	Picnometer + H2O + Soil (g)	689.830
Temp (C)	24.000				

Split Sample at No. 10 Sieve and Determine Soil Fractions for Material Coarser than No. 10

Wt. Retained on these Sieves (g)			13,024.30	Total Wt of soil		
3-inch	75.00 mm	0		Wt soil retained		4177.10
1.5-inch	37.50 mm	539.7		Wt soil passing No 10	13024.30 - 4177.10 =	8847.20
1-inch	25.00 mm	603.2		Total Wt of soil	4177.10 + 8847.20 =	13024.30
0.75-inch	19.00 mm	318.9		Wt Adj. for Hygroscopic Water	13024.30 * 99.53%	12963.67
No. 4	4.75 mm	1618.7				
No. 10	2.00 mm	1096.6				

Sieve Results on Hydrometer Sample

Dry Soil Wt Hyd Sample (g)		103.48			
Wt. Retained on these Sieves (g)					
No. 40	0.425 mm	7.7	Wt soil retained		65.90
No. 60	0.250 mm	9.2	Wt soil passing 200	103.48 - 65.90 =	37.58
No. 80	0.180 mm	10.2	Total Wt of soil	65.90 + 37.58 =	103.48
No. 100	0.150 mm	7.8	Wt Adj. for Hygroscopic Water	103.48 * 99.53%	103.00
No. 200	0.075 mm	31			

Hygroscopic Moisture of Hydrometer Sample

Wet Wt. Soil + Pan (g)	90.88	Wet Wt Soil (g)	12.95	Moisture Content	0.47%
Dry Wt. Soil + Pan (g)	90.82	Dry Wt Soil (g)	12.89		
Pan Tare (g)	77.93	Water Wt (g)	0.06		
		89.3			

% Retained on these Sieves (g)				Adjusted Wt Soil Passing No. 10	12963.67 - ##### =	8,786.57
No. 40	0.425 mm	7.48%	656.87	**Sieve Size**	**Wt. Ret. (g)**	**Wt. Ret. (g)**	**% Ret.**	**% Passing**
No. 60	0.250 mm	8.93%	784.83	3-inch	**0**	-	0.00%	100.00%
No. 80	0.180 mm	9.90%	870.14	1.5-inch	**539.7**	539.70	4.16%	95.84%
No. 100	0.150 mm	7.57%	665.40	1-inch	**603.2**	1,142.90	4.65%	91.18%
No. 200	0.075 mm	30.10%	2644.55	0.75-inch	**318.9**	1,461.80	2.46%	88.72%
	Pan	36.02%	3164.78	No. 4	**1618.7**	3,080.50	12.49%	76.24%
	SubTotal	100.00%	8786.57	No. 10	**1096.6**	4,177.10	8.46%	67.78%
				No. 40	**656.87**	4,833.97	5.07%	62.71%
				No. 60	**784.83**	5,618.80	6.05%	56.66%
				No. 80	**870.14**	6,488.95	6.71%	49.95%
				No. 100	**665.40**	7,154.35	5.13%	44.81%
				No. 200	**2644.55**	9,798.89	20.40%	24.41%
				pan	**3164.78**	#######	24.41%	0.00%
				SubTotal	**12963.67**		100.00%	

Wts. for gINT Moisture Tab	
Wet Wt.	**0.00**
Dry Wt.	**0.00**
Pan Tare	**0.00**

Washington State Department of Transportation

Moisture - Density Relationship Report

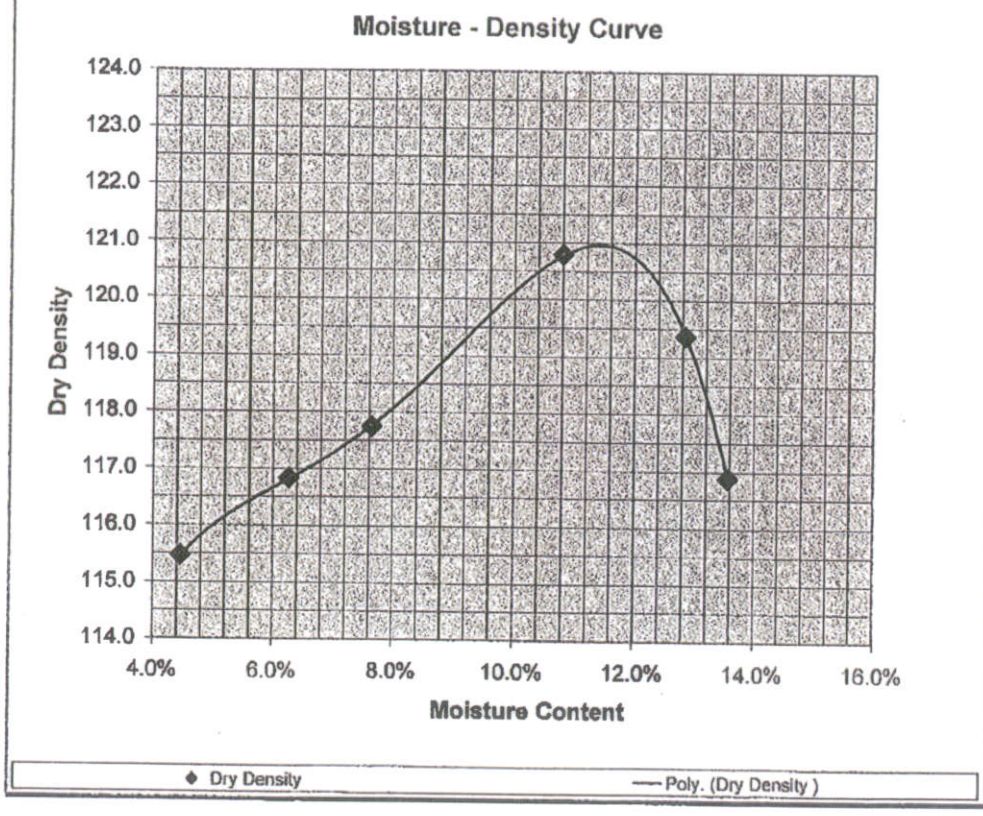
Field Sample Number	Lab Number	Transmittal Number	Control Number	Federal Aid Number
	0000225060	524430		

Project Number	SR	Org. Code	Project Description (or section)
XL-2779	90	456002	Briggs to Keechelus

Source of Materials	Type of Material	Sample Weight	Date Sampled	Date Tested	Tested By	% Passing 3/4	% Passing #4
PS-S-255	Gravel	28.9 lb.	9/19/07	4/8/08	LHB	90.0	76.4

T-99 or T-180	Method	Mold Size (in)	Specific Gravity	Comments
99	D	4	Not Tested	BH-113-07 bag 3

Can Number		1	2	3	4	5	6	7	8
Specimen Wt. + Mold		5394.7	5448.1	5487.3	5594.4	5607.6	5578.0		
Wt. of Mold:	3568.2	3568.2	3568.2	3568.2	3568.2	3568.2	3568.2		
Vol. Factor:	0.066046	0.066046	0.066046	0.066046	0.066046	0.066046	0.066046		
Wet Sample + Can		485.8	496.2	466.2	481.7	495.9	390.1		
Dry Sample + Can		476.7	484.3	452.0	461.8	471.2	353.2		
Wt. Comp. Soil		1826.5	1879.9	1919.1	2026.2	2039.4	2009.8		
Tare Wt.		273.1	294.6	266.4	277.4	278.9	81.3		
Net Dry Wt.		203.6	189.7	185.6	184.4	192.3	271.9		
Wt. of Water		9.1	11.9	14.2	19.9	24.7	36.9		
Wet Density		120.6	124.2	126.7	133.8	134.7	132.7		
Water Content		0.0447	0.0627	0.0765	0.1079	0.1284	0.1357		
Water Content %		**4.47%**	**6.27%**	**7.65%**	**10.79%**	**12.84%**	**13.57%**		
Dry Density		**115.5**	**116.8**	**117.7**	**120.8**	**119.4**	**116.9**		



As Submitted

Maximum Dry Density (pcf): **121.0**

Optimum Moisture: **11.4%**

Corrected for Oversize

Maximum Dry Density (pcf): **129**

Optimum Moisture: **9.2%**

Reviewed by:

Doug Malsch

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - STATE MATERIALS LABORATORY
PO BOX 47365 OLYMPIA WA 98504-7365 / 1655 SOUTH 2ND AVE TUMWATER WA 98512

Physical Testing Section
Preliminary Aggregate Test Report

Date Sampled: 02/21/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.:
Section: BRIGGS TO KEECHELAS
Contractor:

Work Order No. XL2779
Lab ID No. 0000225070
Lab Number P -25070
Trans. No. 225070
Bid. Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Legal Description: SW 1/4 SW 1/4 Sec. 23 T. 22 N., R. 11 E. W.M.

Pit No.: S-255 Sample Loc.: BECKER HAMMER BAGGED SAMPLES
: BH-116-07 AND BH-124-07

Coarse Aggregate (AASHTO T-85):
- Bulk Specific Gravity (SSD) 2.698
- Bulk Specific Gravity 2.667
- Apparent Specific Gravity 2.754
- Absorption (%) 1.19

Fine Aggregate (AASHTO T-84):
- Bulk Specific Gravity (SSD)
- Bulk Specific Gravity
- Apparent Specific Gravity
- Absorption (%)

LA Abrasion (AASHTO T-96):
- Class A (Crushed Agg.) 15
- Class (Round Agg.)

Sand Equivalent (AASHTO T-176; Pre-Wet Method):

Degradation Factor (WSDOT TM 113): 74

Organics (AASHTO T-21):

Asphalt Content-Recycle Mat. (Std. Spec. 9-03.11): (%)

Alkali-Silica Reactivity (AASHTO T-303): (% at 14 Days)
(3 Day = 6 Day = 9 Day =)

==========

Distribution:

Materials File		X
Region Construction	45	X
Project Engineer:		
DOUG MALSCH		X(2)
E. BILDERBACK		X

Result:INFORMATIONAL
Remarks:

GRADATION TO BE REPORTED UNDER SEPERATE COVER.

T42G-	T43L-	T44F-	T44Q-1.0
T43A-1.0	T43M-	T44H-1.0	T44R-
T43B-	T44B-	T44J-	T44U-
T43D-1.0	T44D-	T44L-	T45W-
T43H-	T44E-	T44M-	

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER
Michael Polodna, P.E. By: _____
Date: 04/07/2008
Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 02/21/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.:
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225070
Lab Number P -25070
Trans. No. 225070
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Pit No.: S-255

BH-116-07 AND BH-124-07

Accpt.Samp.No.: Sample Loc.: BECKER HAMMER BAGGED SAMPLES

Test Loc.:BH-116-07 AND BH-124-07 By:D. NELSON

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"			
2-1/4"			
2"	1544.0	90	
1-1/2"			
1-1/4"			
1"	4737.7	69	
3/4"	6071.5	60	
5/8"			
1/2"	7621.5	50	
3/8"	8491.3	44	
1/4"			
No.4	10106.4	33	
TOTAL	15101.8		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6			
No.8	139.1	25	
No.10			
No.16	269.0	18	
No.20			
No.30	364.00	13	
No.40			
No.50	437.10	9	
No.60			
No.70			
No.80			
No.100	481.90	6	
No.140			
No.200	511.20	4.7	
Total	595.70		

Dust Ratio

==========

Distribution:

General File
Region Construction
Project Engineer:
DOUG MALSCH
E. BILDERBACK

T43A-
T43B-1.0
T43L-
T43M-
T44T-
T44U-

Result: INFORMATIONAL
Remarks:
X L.A.ABRASION, SPECIFIC GRAVITY AND DEGRADATION TO BE REPORTED UNDER SEPERATE COVER.
X(2)
X THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/07/2008

T43J- T44A-

Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/19/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/28/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225065
Lab Number S -252065
Trans. No. 225065
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: GRAVEL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH-120-07 BAGS 1A,1B 2&3

Test Loc.: By:

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"			
2-1/4"			
2"	1407.2	91	
1-1/2"			
1-1/4"			
1"	3918.3	74	
3/4"	4882.5	68	
5/8"			
1/2"	6665.3	56	
3/8"	7611.8	50	
1/4"			
No.4	9529.3	37	
TOTAL	15190.7		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6			
No.8	150.9	28	
No.10			
No.16	265.3	21	
No.20			
No.30	351.80	16	
No.40			
No.50	434.70	11	
No.60			
No.70			
No.80			
No.100	485.80	8	
No.140			
No.200	524.20	5.3	
Total	612.10		
	Dust Ratio		

==========

Distribution:

General File
Region Construction
Project Engineer:
DOUG MALSCH
E. BILDERBACK

T43A-
T43B-1.0
T43J-
T43L-
T43M-
T44A-
T44T-
T44U-

Result: INFORMATIONAL
Remarks:
X R-VALUE TO BE REPORTED UNDER SEPERATE COVER.
X(2) SAMPLE CONSISTS OF BH--120-07 BAGS 1A, 1B 2&3.
X THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/08/2008
Phone: (360)709-5446

grading.dfr 3/03

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

GeoTech Section
Soils Test Report
WSDOT Test Methods

Date Sampled: 09/19/2008
Sampled By: **D. NELSON**
Date Recvd HQ: 02/28/2008
S.R. No.: **90**
Section: **BRIGGS TO KEECHELAS**
Contractor:
Material: GRAVEL

Work Order No. **XL2779**
Lab ID No. **0000225065**
Lab Number **S -252065**
Trans. No. **225065**
Bid Item No.
Org. No. **456002**
F.A. No.
Pit No. S-255

Sample No.

R

==========

WTM 606

COARSE DENSITY:
COARSE SPECIFIC GRAVITY:

FINE DENSITY:
FINE SPECIFIC GRAVITY:

AASHTO T-99/T180

OPTIMUM MOISTURE:

MAX DENSITY:

AASHTO T190

STABILOMETER: **68**
SWELL PRESSURE: **0.0**
DRAINAGE: **Free**

SPEC: **72** **MIN**
SPEC: **0.3** **PSI MAX**

AASHTO T292

LIQUID LIMIT:
RESILIENT MODULUS:
PH FACTOR:

PLASTICITY INDEX:
HRB CLASS:

SOIL TEXTURE CLASSIFICATION

SWELL PRESSURE:
ESTIMATED R VALUE:
DRAINAGE FACTOR:

==========

Distribution:
Materials File X
Regional Construction
Project Engineer:
DOUG MALSCH X(2)
Geotech Soils Testing X

Result: DOES NOT MEET SPECIFICATIONS
Remarks:

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

T633-	T42G-	T640-
T634-	T630- 1	T43B- 1
T43J-	T631-	T44N-
T635-	T43H- 1	T44V-

Jim Cuthbertson, P.E.
Date: 04/18/2008
Phone: (360)709-5485

By:

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - STATE MATERIALS LABORATORY
PO BOX 47365 OLYMPIA WA 98504-7365 / 1655 SOUTH 2ND AVE TUMWATER WA 98512

Physical Testing Section
Preliminary Aggregate Test Report

Date Sampled: 09/21/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.:
Section: BRIGGS TO KEECHELAS
Contractor:

Work Order No. XL2779
Lab ID No. 0000225072
Lab Number P -25072
Trans. No. 225072
Bid. Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Legal Description: NW 1/4 NW 1/4 Sec. 26 T. 22 N., R. 11 E. W.M.

Pit No.: S-255 Sample Loc.: BH121-07 AND BH129-07

Coarse Aggregate (AASHTO T-85):	
Bulk Specific Gravity (SSD)	2.734
Bulk Specific Gravity	2.713
Apparent Specific Gravity	2.773
Absorption (%)	0.79
Fine Aggregate (AASHTO T-84):	
Bulk Specific Gravity (SSD)	
Bulk Specific Gravity	
Apparent Specific Gravity	
Absorption (%)	
LA Abrasion (AASHTO T-96):	
Class A (Crushed Agg.)	
Class (Round Agg.)	16
Sand Equivalent (AASHTO T-176; Pre-Wet Method):	
Degradation Factor (WSDOT TM 113):	72
Organics (AASHTO T-21):	
Asphalt Content-Recycle Mat. (Std. Spec. 9-03.11): (%)	
Alkali-Silica Reactivity (AASHTO T-303): (% at 14 Days)	
(3 Day = 6 Day = 9 Day =)	

==========

Distribution:

Materials File		X
Region Construction	45	X
Project Engineer:		
DOUG MALSCH		X(2)
E. BILDERBACK		X

Result:INFORMATIONAL
Remarks:

GRADATION TO BE REPORTED UNDER SEPERATE COVER SAMPLE COSISTS OF BH-121-07 BAGS 1&2 AND BH-129-07 BAGS 1&2.

T42G-	T43L-	T44F-	T44Q-1.0
T43A-1.0	T43M-	T44H-1.0	T44R-
T43B-	T44B-	T44J-	T44U-
T43D-1.0	T44D-	T44L-	T45W-
T43H-	T44E-	T44M-	

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER
Michael Polodna, P.E. By: _____
Date: 04/07/2008
Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/21/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225072
Lab Number P -25072
Trans. No. 225072
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH121-07 AND BH129-07

Test Loc.:PS-S-255 By:

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"			
2-1/4"			
2"	2613.8	83	
1-1/2"			
1-1/4"			
1"	5236.0	65	
3/4"	6388.3	57	
5/8"			
1/2"	7722.5	49	
3/8"	8634.8	43	
1/4"			
No.4	10377.5	31	
TOTAL	15021.0		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6	0.0		
No.8	195.7	23	
No.10			
No.16	342.6	16	
No.20			
No.30	443.20	12	
No.40			
No.50	525.30	8	
No.60			
No.70			
No.80			
No.100	572.50	6	
No.140			
No.200	607.10	4.9	
Total	719.95		
	Dust Ratio		

==========

Distribution:

General File
Region Construction
Project Engineer:
DOUG MALSCH
E. BILDERBACK

T43A-
T43B-1.0
T43L-
T43M-
T44T-
T44U-

Result: INFORMATIONAL
Remarks:
X PRELIMINARY TESTS TO BE REPORTED UNDER SEPERATE COVER.
X(2) SAMPLE CONSISTS OF BH-121-07 BAGS 1&2 AND BH-129-07 BAGS 1&2
X THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/08/2008

T43J- T44A-

Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - STATE MATERIALS LABORATORY
PO BOX 47365 OLYMPIA WA 98504-7365 / 1655 SOUTH 2ND AVE TUMWATER WA 98512

Physical Testing Section
Preliminary Aggregate Test Report

Date Sampled: 09/21/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.:
Section: BRIGGS TO KEECHELAS
Contractor:

Work Order No. XL2779
Lab ID No. 0000225071
Lab Number P -25071
Trans. No. 225071
Bid. Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Legal Description: SW 1/4 SW 1/4 Sec. 23 T. 22 N., R. 11 E. W.M.

Pit No.: S-255 Sample Loc.: BH126-07 AND BH127-07

Coarse Aggregate (AASHTO T-85):

Bulk Specific Gravity (SSD)	2.725
Bulk Specific Gravity	2.694
Apparent Specific Gravity	2.780
Absorption (%)	1.16

Fine Aggregate (AASHTO T-84):

Bulk Specific Gravity (SSD)	
Bulk Specific Gravity	
Apparent Specific Gravity	
Absorption (%)	

LA Abrasion (AASHTO T-96):

Class B (Crushed Agg.)	13
Class (Round Agg.)	

Sand Equivalent (AASHTO T-176; Pre-Wet Method):

Degradation Factor (WSDOT TM 113): 71

Organics (AASHTO T-21):

Asphalt Content-Recycle Mat. (Std. Spec. 9-03.11): (%)

Alkali-Silica Reactivity (AASHTO T-303): (% at 14 Days)
(3 Day = 6 Day = 9 Day =)

==========

Distribution:

Materials File		X
Region Construction	45	X
Project Engineer:		
DOUG MALSCH		X(2)
E. BILDERBACK		X

Result:INFORMATIONAL
Remarks:

GRADATION AND PROCTOR TO BE REPORTED UNDER SEPERATE COVER. SAMPLE CONSISTS OF BH-126-07 BAGS 1&2 & BH-127-07 BAGS 1, 2 & 3

T42G-	T43L-	T44F-	T44Q-1.0
T43A-1.0	T43M-	T44H-1.0	T44R-
T43B-	T44B-	T44J-	T44U-
T43D-1.0	T44D-	T44L-	T45W-
T43H-	T44E-	T44M-	

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER
Michael Polodna, P.E. By: _____
Date: 04/07/2008
Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/21/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225071
Lab Number P -25071
Trans. No. 225071
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH126-07 & BH127-07

Test Loc.:PS-S-255 By:D. NELSON

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"			
2-1/4"			
2"	2275.0	86	
1-1/2"			
1-1/4"			
1"	4538.4	71	
3/4"	6005.5	62	
5/8"			
1/2"	7612.3	52	
3/8"	8495.2	46	
1/4"			
No.4	10577.8	33	
TOTAL	15800.8		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6	0.0		
No.8	153.3	23	
No.10			
No.16	286.8	15	
No.20			
No.30	388.10	8	
No.40			
No.50	451.40	4	
No.60			
No.70			
No.80			
No.100	478.80	3	
No.140			
No.200	495.80	1.4	
Total	518.37		
	Dust Ratio		

==========

Distribution:

General File X
Region Construction
Project Engineer:
DOUG MALSCH X(2)
E. BILDERBACK X

T43A- T43L- T44T-
T43B-1.0 T43M- T44U-

Result: INFORMATIONAL
Remarks:
PRELIMINARY TESTS AND PROCTOR TO BE REPORTED UNDER SEPERATE COVER. SAMPLE CONSISTS OF BH--126-07 BAGS 1 & 2 AND BH-127-07 BAGS 1, 2 &

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/08/2008

T43J- T44A-

Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - STATE MATERIALS LABORATORY
PO BOX 47365 OLYMPIA WA 98504-7365 / 1655 SOUTH 2ND AVE TUMWATER WA 98512

Physical Testing Section
Preliminary Aggregate Test Report

Date Sampled: 09/18/2007
Sampled By:
Date Recvd HQ: 04/17/2008
S.R. No.:
Section:
Contractor:

Work Order No. XL2779
Lab ID No. 0000225333
Lab Number P -25333
Trans. No. 225333
Bid. Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Legal Description: NW 1/4 NW 1/4 Sec. 26 T. 22 N., R. 11 E. W.M.

Pit No.: S-255 Sample Loc.: BH-1~~6~~30-07 & BH-138-07

BH-130-07 & BH-138-07

Coarse Aggregate (AASHTO T-85):
- Bulk Specific Gravity (SSD) 2.742
- Bulk Specific Gravity 2.716
- Apparent Specific Gravity 2.789
- Absorption (%) 0.96

Fine Aggregate (AASHTO T-84):
- Bulk Specific Gravity (SSD)
- Bulk Specific Gravity
- Apparent Specific Gravity
- Absorption (%)

LA Abrasion (AASHTO T-96):
- Class B (Crushed Agg.) 14
- Class (Round Agg.)

Sand Equivalent (AASHTO T-176; Pre-Wet Method):

Degradation Factor (WSDOT TM 113): 60

Organics (AASHTO T-21):

Asphalt Content-Recycle Mat. (Std. Spec. 9-03.11): (%)

Alkali-Silica Reactivity (AASHTO T-303): (% at 14 Days)
(3 Day = 6 Day = 9 Day =)

==========

Distribution:

Materials File		X
Region Construction	45	X
Project Engineer:		
ERIC BILDERBECK		X(2)
DOUG MALSCH		X

Result:INFORMATIONAL
Remarks:

SAMPLE CONSIST OF BH-130-07 BAGS 1,2 & 3 AND BH-138-07 BAG 4. GRADATION TO BE REPORTED UNDER SEPERATE COVER.

T42G-	T43L-	T44F-	T44Q-1.0
T43A-1.0	T43M-	T44H-1.0	T44R-
T43B-	T44B-	T44J-	T44U-
T43D-1.0	T44D-	T44L-	T45W-
T43H-	T44E-	T44M-	

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER
Michael Polodna, P.E. By: _____
Date: 05/13/2008
Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/18/2007
Sampled By:
Date Recvd HQ: 04/17/2008
S.R. No.:
Section:
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225333
Lab Number P -25333
Trans. No. 225333
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH-130-07 & BH-138-07

Test Loc.:PS-S-255 By:

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"	1424.4	91	
2-1/4"			
2"	1941.7	88	
1-1/2"			
1-1/4"			
1"	4662.7	70	
3/4"	6300.8	60	
5/8"			
1/2"	8015.0	49	
3/8"	8978.7	43	
1/4"			
No.4	10938.5	30	
TOTAL	15711.8		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6			
No.8	172.5	21	
No.10			
No.16	309.8	14	
No.20			
No.30	400.80	10	
No.40			
No.50	466.90	6	
No.60			
No.70			
No.80			
No.100	499.90	4	
No.140			
No.200	520.10	3.5	
Total	587.86		
	Dust Ratio		

==========

Distribution:

General File X
Region Construction
Project Engineer:
ERIC BILDERBECK X(2)
DOUG MALSCH X

T43A- T43L- T44T-
T43B-1.0 T43M- T44U-
T43J- T44A-

Result: INFORMATIONAL
Remarks:
SAMPLE CONSIST OF BH-130-07 BAGS 1,2 & 3 AND BH-138-07 BAG 4.

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 05/13/2008
Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/17/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225069
Lab Number S -25069
Trans. No. 225069
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: GRAVEL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH-135-07 AND BH-136-07

Test Loc.: By:

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
		100	
4"	0.0	100	
3"	1222.1	92	
2-1/2"			
2-1/4"			
2"	2679.9	82	
1-1/2"			
1-1/4"			
1"	4077.3	73	
3/4"	4610.9	70	
5/8"			
1/2"	5216.0	66	
3/8"	5557.3	64	
1/4"			
No.4	6513.8	57	
TOTAL	15311.8		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6			
No.8	69.3	50	
No.10			
No.16	154.0	42	
No.20			
No.30	246.80	33	
No.40			
No.50	373.80	21	
No.60			
No.70			
No.80			
No.100	455.10	13	
No.140			
No.200	501.90	8.7	
Total	592.53		
Dust Ratio			

==========

Distribution:

General File
Region Construction
Project Engineer:
DOUG MALSCH
E. BILDERBACK

T43A-
T43B-1.0
T43J-

T43L-
T43M-
T44A-

T44T-
T44U-

Result: INFORMATIONAL
Remarks:
X R-VALUE TO BE REPORTED UNDER SEPERATE COVER.
X(2) SAMPLE CONSISTS OF BH-135-07 BAGS 1,2 AND BH-136-07 BAGS 1&2
X THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/08/2008
Phone: (360)709-5446

grading.dfr 3/03

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

GeoTech Section
Soils Test Report
WSDOT Test Methods

Date Sampled: 09/17/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Material: GRAVEL

Work Order No. XL2779
Lab ID No. 0000225069
Lab Number S -25069
Trans. No. 225069
Bid Item No.
Org. No. 456002
F.A. No.
Pit No. S-255

Sample No.

R

==========

WTM 606

COARSE DENSITY:
COARSE SPECIFIC GRAVITY:

FINE DENSITY:
FINE SPECIFIC GRAVITY:

AASHTO T-99/T180

OPTIMUM MOISTURE:

MAX DENSITY:

AASHTO T190

STABILOMETER: 67
SWELL PRESSURE: 0.2
DRAINAGE: Fast

SPEC: 72 MIN
SPEC: 0.3 PSI MAX

AASHTO T292

LIQUID LIMIT:
RESILIENT MODULUS:
PH FACTOR:

PLASTICITY INDEX:
HRB CLASS:

SOIL TEXTURE CLASSIFICATION

SWELL PRESSURE:
ESTIMATED R VALUE:
DRAINAGE FACTOR:

==========

Distribution:
Materials File X
Regional Construction
Project Engineer:
DOUG MALSCH X(2)
Geotech Soils Testing X

Result: DOES NOT MEET SPECIFICATIONS
Remarks:

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

T633-	T42G-	T640-
T634-	T630- 1	T43B- 1
T43J-	T631-	T44N-
T635-	T43H- 1	T44V-

Jim Cuthbertson, P.E.
Date: 04/18/2008
Phone: (360)709-5485

By:

Job No. **XL-2779** Date **April 23, 2008**

Hole No. **BH-108-07 BAG 5** Sheet **1** of **1**

Project **Snoqlamie Pass East (PS-255)**

Laboratory Summary

Washington State Department of Transportation

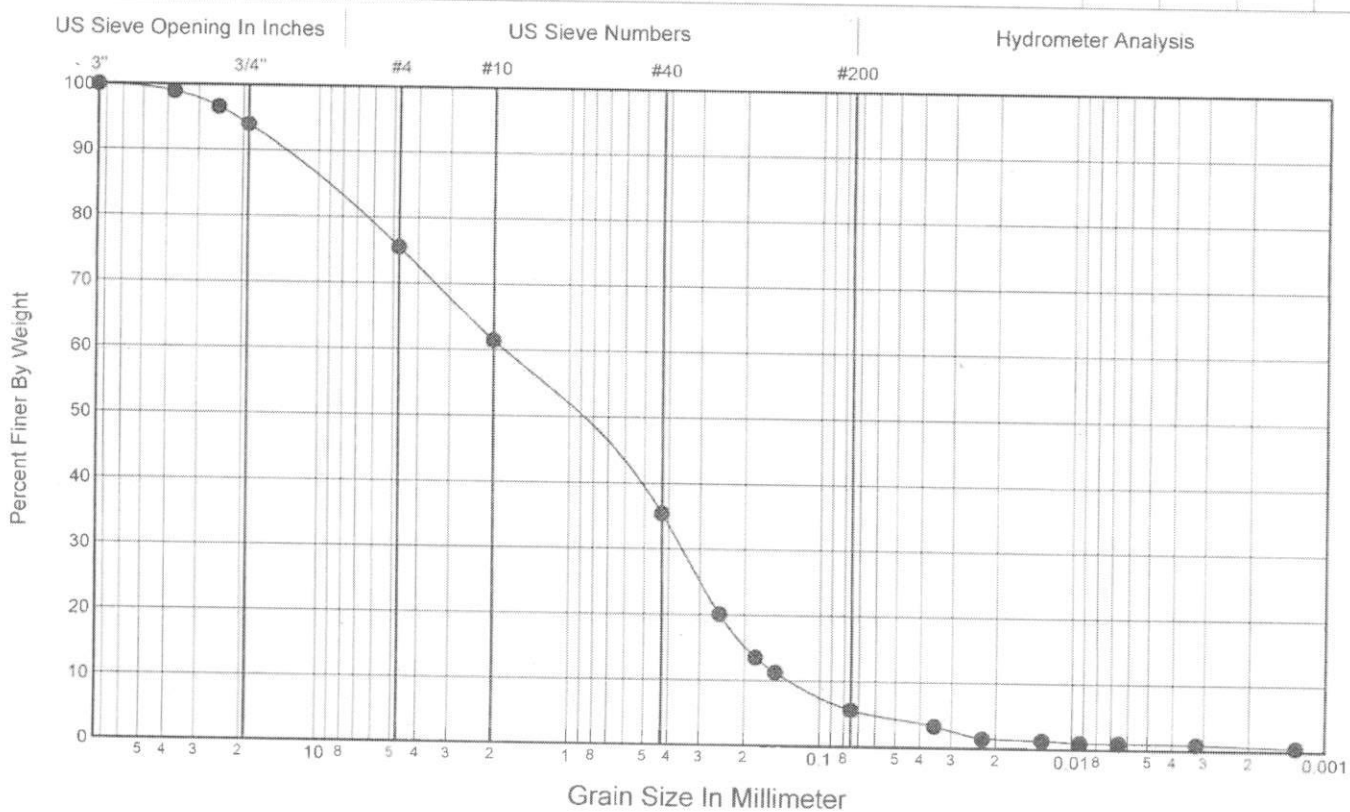
	Depth (ft)	Depth (m)	Sample No.	USCS	Color	Description	MC%	LL	PL	PI
●	1.0	0.30		SP-SM	See Boring Log	POORLY GRADED SAND with SILT and GRAVEL				

GRADATION FRACTIONS

	%Gravel	%Sand	%Fines	Cc	Cu
●	24.5	69.9	5.6	0.5	14.3

GRADATION VALUES

	D60	D50	D30	D20	D10
●	1.836	1.01	0.35	0.25	0.128



WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/24/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/28/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225067
Lab Number S -25067
Trans. No. 225067
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: GRAVEL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH-109-07 AND BH-110-07

Test Loc.: By:

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"	895.7	93	
2-1/4"			
2"	1445.6	89	
1-1/2"			
1-1/4"			
1"	2064.2	84	
3/4"	2526.6	80	
5/8"			
1/2"	3211.0	74	
3/8"	3654.5	71	
1/4"			
No.4	4884.9	61	
TOTAL	12588.3		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6			
No.8	100.3	51	
No.10			
No.16	218.3	39	
No.20			
No.30	328.20	28	
No.40			
No.50	431.70	17	
No.60			
No.70			
No.80			
No.100	487.40	12	
No.140			
No.200	519.60	8.3	
Total	601.81		
	Dust Ratio		

==========

Distribution:

General File X
Region Construction
Project Engineer:
DOUG MALSCH X(2)
E. BILDERBACK X

T43A- T43L- T44T-
T43B-1.0 T43M- T44U-
T43J- T44A-

Result: INFORMATIONAL
Remarks:
PROCTOR TO BE REPORTED UNDER SEPERATE COVER.
SAMPLE CONSISTS OF BH--109-07 BAGS 1,2&3 AND BH-110-07 BAGS 1
THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/08/2008
Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/20/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/28/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225066
Lab Number S -25066
Trans. No. 225066
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: GRAVEL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH-112-07 AND BH-119-07

Test Loc.: By:

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"			
2-1/4"			
2"	0.0	100	
1-1/2"			
1-1/4"			
1"	603.3	95	
3/4"	895.9	93	
5/8"			
1/2"	1488.4	88	
3/8"	1929.4	85	
1/4"			
No.4	3410.1	73	
TOTAL	12562.8		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6			
No.8	128.9	58	
No.10			
No.16	282.1	39	
No.20			
No.30	403.20	25	
No.40			
No.50	476.20	16	
No.60			
No.70			
No.80			
No.100	520.40	10	
No.140			
No.200	545.20	7.5	
Total	607.46		
	Dust Ratio		

==========

Distribution:

General File X
Region Construction
Project Engineer:
DOUG MALSCH X(2)
E. BILDERBACK X

T43A- T43L- T44T-
T43B-1.0 T43M- T44U-
T43J- T44A-

Result: INFORMATIONAL
Remarks:
PROCTOR TO BE REPORTED UNDER SEPERATE COVER.
SAMPLE CONSISTS OF BH--112-07 BAGS 1&2 AND BH-119-07 BAGS 1&2
THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/08/2008
Phone: (360)709-5446

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Washington State
Department of Transportation

Moisture - Density Relationship Report

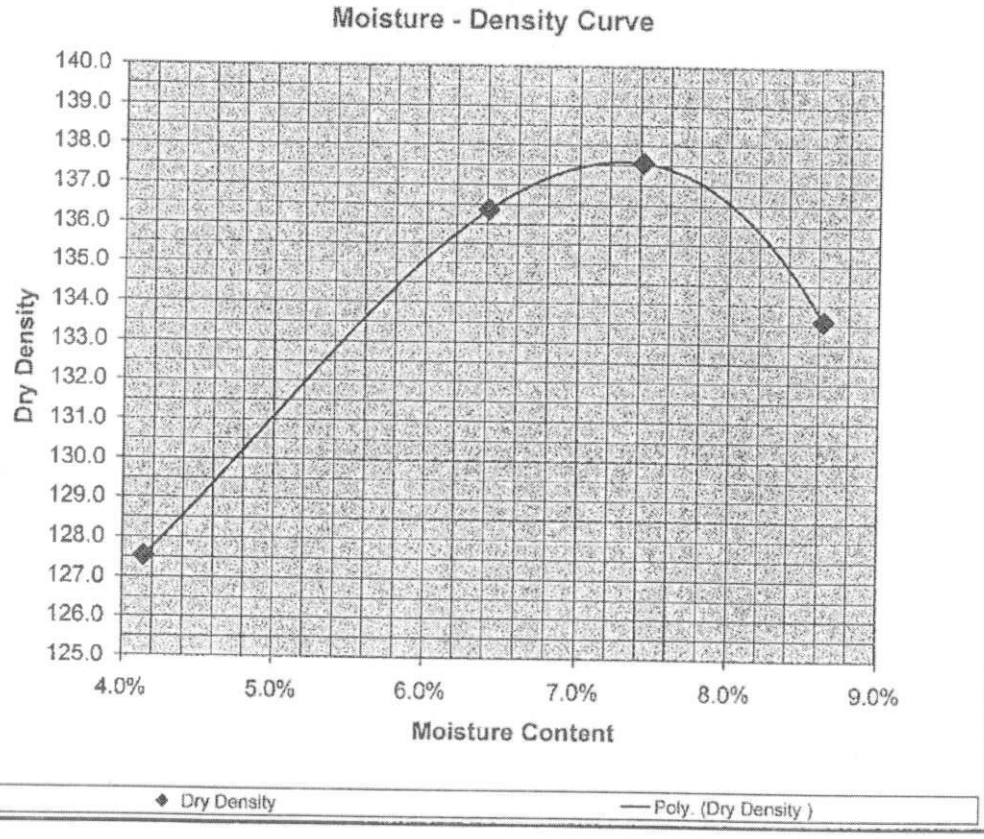
Field Sample Number	Lab Number	Transmittal Number	Control Number	Federal Aid Number
	0000225066	524432		

Project Number	SR	Org. Code	Project Description (or section)
XL-2779	90	456002	Briggs to Keechelus

Source of Materials	Type of Material	Sample Weight	Date Sampled	Date Tested	Tested By	% Passing 3/4	% Passing #4
PS-S-255	Gravel	25.8 lb.	9/20/07	4/22/08	LHB	91.9	69.8

T-99 or T-180	Method	Mold Size (in)	Specific Gravity	Comments
180	D	6	Not Tested	BH-112-07 bags 1 & 2, and BH-119-07 bags 1 & 2

Can Number		1	2	3	4	5	6	7	8
Specimen Wt. + Mold		7243.2	7662.2	7753.2	7663.1				
Wt. of Mold:	2715.3	2715.3	2715.3	2715.3	2715.3				
Vol. Factor:	0.02933	0.029330	0.029330	0.029330	0.029330				
Wet Sample + Can		745.0	620.3	647.7	981.1				
Dry Sample + Can		718.7	587.8	608.7	909.6				
Wt. Comp. Soil		4527.9	4946.9	5037.9	4947.8				
Tare Wt.		83.5	80.9	83	81.1				
Net Dry Wt.		635.2	506.9	525.7	828.5				
Wt. of Water		26.3	32.5	39.0	71.5				
Wet Density		132.8	145.1	147.8	145.1				
Water Content		0.0414	0.0641	0.0742	0.0863				
Water Content %		**4.14%**	**6.41%**	**7.42%**	**8.63%**				
Dry Density		**127.5**	**136.4**	**137.6**	**133.6**				



Maximum Dry Density (pcf)
137.6
Optimum Moisture
7.3%

Maximum Dry Density (pcf)
139.2
Optimum Moisture
6.7%

Doug Maisch

HYDROMETER WORKSHEET

Job No.: XL-2779
Hole No.: BH-113-07 BAG 3
Lab No.: F-7755
Depth:
Sample No.: S-5060

Date: April 10, 2008
Lab Tech.: LLOYD BRISCOE

Air Dry Moisture Content					
Wet Wt. Soil + Pan (g)		Wet Wt Soil (g)	0.00	Moisture Content	#DIV/0!
Dry Wt. Soil + Pan (g)		Dry Wt Soil (g)	0.00		
Pan Tare (g)		Water Wt (g)	0.00		
0					
Soil Wt. (g)	24.850	Picnometer + H_2O (g)	674.420	Picnometer + H2O + Soil (g)	689.830
Temp (C)	24.000				

Split Sample at No. 10 Sieve and Determine Soil Fractions for Material Coarser than No. 10

Wt. Retained on these Sieves (g)			13,024.30	Total Wt of soil		
3-inch	75.00 mm	0		Wt soil retained		4177.10
1.5-inch	37.50 mm	539.7		Wt soil passing No 10	13024.30 - 4177.10 =	8847.20
1-inch	25.00 mm	603.2		Total Wt of soil	4177.10 + 8847.20 =	13024.30
0.75-inch	19.00 mm	318.9		Wt Adj. for Hygroscopic Water	13024.30 * 99.53%	12963.67
No. 4	4.75 mm	1618.7				
No. 10	2.00 mm	1096.6				

Sieve Results on Hydrometer Sample

Dry Soil Wt Hyd Sample (g)		103.48			
Wt. Retained on these Sieves (g)					
No. 40	0.425 mm	7.7	Wt soil retained		65.90
No. 60	0.250 mm	9.2	Wt soil passing 200	103.48 - 65.90 =	37.58
No. 80	0.180 mm	10.2	Total Wt of soil	65.90 + 37.58 =	103.48
No. 100	0.150 mm	7.8	Wt Adj. for Hygroscopic Water	103.48 * 99.53%	103.00
No. 200	0.075 mm	31			

Hygroscopic Moisture of Hydrometer Sample

Wet Wt. Soil + Pan (g)	90.88	Wet Wt Soil (g)	12.95	Moisture Content	0.47%
Dry Wt. Soil + Pan (g)	90.82	Dry Wt Soil (g)	12.89		
Pan Tare (g)	77.93	Water Wt (g)	0.06		
89.3					

% Retained on these Sieves (g)			Adjusted Wt Soil Passing No. 10	12963.67 - ##### = 8,786.57			
No. 40	0.425 mm	7.48%	656.87	**Sieve Size**	**Wt. Ret. (g)**	**Wt. Ret. (g)**	**% Ret.**	**% Passing**
No. 60	0.250 mm	8.93%	784.83	3-inch	**0**	-	0.00%	100.00%
No. 80	0.180 mm	9.90%	870.14	1.5-inch	**539.7**	539.70	4.16%	95.84%
No. 100	0.150 mm	7.57%	665.40	1-inch	**603.2**	1,142.90	4.65%	91.18%
No. 200	0.075 mm	30.10%	2644.55	0.75-inch	**318.9**	1,461.80	2.46%	88.72%
	Pan	36.02%	3164.78	No. 4	**1618.7**	3,080.50	12.49%	76.24%
	SubTotal	100.00%	8786.57	No. 10	**1096.6**	4,177.10	8.46%	67.78%
				No. 40	**656.87**	4,833.97	5.07%	62.71%
				No. 60	**784.83**	5,618.80	6.05%	56.66%
				No. 80	**870.14**	6,488.95	6.71%	49.95%
				No. 100	**665.40**	7,154.35	5.13%	44.81%
				No. 200	**2644.55**	9,798.89	20.40%	24.41%
				pan	**3164.78**	#######	24.41%	0.00%
				SubTotal	**12963.67**		100.00%	

Wts. for gINT Moisture Tab	
Wet Wt.	**0.00**
Dry Wt.	**0.00**
Pan Tare	**0.00**

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - STATE MATERIALS LABORATORY
PO BOX 47365 OLYMPIA WA 98504-7365 / 1655 SOUTH 2ND AVE TUMWATER WA 98512

Physical Testing Section
Preliminary Aggregate Test Report

Date Sampled: 02/21/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.:
Section: BRIGGS TO KEECHELAS
Contractor:

Work Order No. XL2779
Lab ID No. 0000225070
Lab Number P -25070
Trans. No. 225070
Bid. Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Legal Description: SW 1/4 SW 1/4 Sec. 23 T. 22 N., R. 11 E. W.M.

Pit No.: S-255 Sample Loc.: BECKER HAMMER BAGGED SAMPLES

: BH-116-07 AND BH-124-07

Coarse Aggregate (AASHTO T-85):

Bulk Specific Gravity (SSD)	2.698
Bulk Specific Gravity	2.667
Apparent Specific Gravity	2.754
Absorption (%)	1.19

Fine Aggregate (AASHTO T-84):

Bulk Specific Gravity (SSD)	
Bulk Specific Gravity	
Apparent Specific Gravity	
Absorption (%)	

LA Abrasion (AASHTO T-96):

Class A (Crushed Agg.)	15
Class (Round Agg.)	

Sand Equivalent (AASHTO T-176; Pre-Wet Method):

Degradation Factor (WSDOT TM 113): 74

Organics (AASHTO T-21):

Asphalt Content-Recycle Mat. (Std. Spec. 9-03.11): (%)

Alkali-Silica Reactivity (AASHTO T-303): (% at 14 Days)
(3 Day = 6 Day = 9 Day =)

==========

Distribution:

Materials File		X
Region Construction	45	X
Project Engineer:		
DOUG MALSCH		X(2)
E. BILDERBACK		X

Result:INFORMATIONAL
Remarks:

GRADATION TO BE REPORTED UNDER SEPERATE COVER.

T42G-	T43L-	T44F-	T44Q-1.0
T43A-1.0	T43M-	T44H-1.0	T44R-
T43B-	T44B-	T44J-	T44U-
T43D-1.0	T44D-	T44L-	T45W-
T43H-	T44E-	T44M-	

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER
Michael Polodna, P.E. By: _____
Date: 04/07/2008
Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 02/21/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.:
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225070
Lab Number P -25070
Trans. No. 225070
Bid Item No.
Org. No. 456002
F.A. No.

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Pit No.: S-255

2+3 1-2
BH-116-07 AND BH-124-07

Accpt.Samp.No.: Sample Loc.: BECKER HAMMER BAGGED SAMPLES

Test Loc.:BH-116-07 AND BH-124-07 By:D. NELSON

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"			
2-1/4"			
2"	1544.0	90	
1-1/2"			
1-1/4"			
1"	4737.7	69	
3/4"	6071.5	60	
5/8"			
1/2"	7621.5	50	
3/8"	8491.3	44	
1/4"			
No.4	10106.4	33	
TOTAL	15101.8		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6			
No.8	139.1	25	
No.10			
No.16	269.0	18	
No.20			
No.30	364.00	13	
No.40			
No.50	437.10	9	
No.60			
No.70			
No.80			
No.100	481.90	6	
No.140			
No.200	511.20	4.7	
Total	595.70		
	Dust Ratio		

Distribution:

General File X
Region Construction
Project Engineer:
DOUG MALSCH X(2)
E. BILDERBACK X

Result: INFORMATIONAL
Remarks:
L.A.ABRASION, SPECIFIC GRAVITY AND DEGRADATION TO BE REPORTED UNDER SEPERATE COVER.

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

T43A- T43L- T44T-
T43B-1.0 T43M- T44U-

Michael Polodna, P.E. By: _____
Date: 04/07/2008

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/19/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/28/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225065
Lab Number S -252065
Trans. No. 225065
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: GRAVEL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH-120-07 BAGS 1A,1B 2&3

Test Loc.: By:

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"			
2-1/4"			
2"	1407.2	91	
1-1/2"			
1-1/4"			
1"	3918.3	74	
3/4"	4882.5	68	
5/8"			
1/2"	6665.3	56	
3/8"	7611.8	50	
1/4"			
No.4	9529.3	37	
TOTAL	15190.7		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6			
No.8	150.9	28	
No.10			
No.16	265.3	21	
No.20			
No.30	351.80	16	
No.40			
No.50	434.70	11	
No.60			
No.70			
No.80			
No.100	485.80	8	
No.140			
No.200	524.20	5.3	
Total	612.10		
	Dust Ratio		

==========

Distribution:

General File X
Region Construction
Project Engineer:
DOUG MALSCH X(2)
E. BILDERBACK X

T43A- T43L- T44T-
T43B-1.0 T43M- T44U-
T43J- T44A-

Result: INFORMATIONAL
Remarks:
R-VALUE TO BE REPORTED UNDER SEPERATE COVER.
SAMPLE CONSISTS OF BH--120-07 BAGS 1A, 1B 2&3.
THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/08/2008
Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

GeoTech Section
Soils Test Report
WSDOT Test Methods

Date Sampled: 09/19/2008
Sampled By: **D. NELSON**
Date Recvd HQ: 02/28/2008
S.R. No.: **90**
Section: **BRIGGS TO KEECHELAS**
Contractor:
Material: GRAVEL

Work Order No. **XL2779**
Lab ID No. **0000225065**
Lab Number **S -252065**
Trans. No. **225065**
Bid Item No.
Org. No. **456002**
F.A. No.
Pit No. S-255
Sample No.

R

==========

WTM 606

COARSE DENSITY:
COARSE SPECIFIC GRAVITY:

FINE DENSITY:
FINE SPECIFIC GRAVITY:

AASHTO T-99/T180

OPTIMUM MOISTURE:

MAX DENSITY:

AASHTO T190

STABILOMETER: **68**
SWELL PRESSURE: **0.0**
DRAINAGE: **Free**

SPEC: **72** **MIN**
SPEC: **0.3** **PSI MAX**

AASHTO T292

LIQUID LIMIT:
RESILIENT MODULUS:
PH FACTOR:

PLASTICITY INDEX:
HRB CLASS:

SOIL TEXTURE CLASSIFICATION

SWELL PRESSURE:
ESTIMATED R VALUE:
DRAINAGE FACTOR:

==========

Distribution:
Materials File X
Regional Construction
Project Engineer:
DOUG MALSCH X(2)
Geotech Soils Testing X

Result: DOES NOT MEET SPECIFICATIONS
Remarks:

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

T633-	T42G-	T640-
T634-	T630- 1	T43B- 1
T43J-	T631-	T44N-
T635-	T43H- 1	T44V-

Jim Cuthbertson, P.E.
Date: 04/18/2008
Phone: (360)709-5485

By: J

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - STATE MATERIALS LABORATORY
PO BOX 47365 OLYMPIA WA 98504-7365 / 1655 SOUTH 2ND AVE TUMWATER WA 98512

Physical Testing Section
Preliminary Aggregate Test Report

Date Sampled: 09/21/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.:
Section: BRIGGS TO KEECHELAS
Contractor:

Work Order No. XL2779
Lab ID No. 0000225072
Lab Number P -25072
Trans. No. 225072
Bid. Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Legal Description: NW 1/4 NW 1/4 Sec. 26 T. 22 N., R. 11 E. W.M.

Pit No.: S-255 Sample Loc.: BH121-07 AND BH129-07

Coarse Aggregate (AASHTO T-85):

Bulk Specific Gravity (SSD)	2.734
Bulk Specific Gravity	2.713
Apparent Specific Gravity	2.773
Absorption (%)	0.79

Fine Aggregate (AASHTO T-84):

Bulk Specific Gravity (SSD)	
Bulk Specific Gravity	
Apparent Specific Gravity	
Absorption (%)	

LA Abrasion (AASHTO T-96):

Class A (Crushed Agg.)	16
Class (Round Agg.)	

Sand Equivalent (AASHTO T-176; Pre-Wet Method):

Degradation Factor (WSDOT TM 113): 72

Organics (AASHTO T-21):

Asphalt Content-Recycle Mat. (Std. Spec. 9-03.11): (%)

Alkali-Silica Reactivity (AASHTO T-303): (% at 14 Days)
(3 Day = 6 Day = 9 Day =)

==========

Distribution:

Materials File		X
Region Construction	45	X
Project Engineer:		
DOUG MALSCH		X(2)
E. BILDERBACK		X

T42G-	T43L-	T44F-	T44Q-1.0
T43A-1.0	T43M-	T44H-1.0	T44R-
T43B-	T44B-	T44J-	T44U-
T43D-1.0	T44D-	T44L-	T45W-
T43H-	T44E-	T44M-	

Result:INFORMATIONAL
Remarks:

GRADATION TO BE REPORTED UNDER SEPERATE COVER SAMPLE COSISTS OF BH-121-07 BAGS 1&2 AND BH-129-07 BAGS 1&2.

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER
Michael Polodna, P.E. By: _____
Date: 04/07/2008
Phone: (360)709-5446

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/21/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225072
Lab Number P -25072
Trans. No. 225072
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH121-07 AND BH129-07

Test Loc.:PS-S-255 By:

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min.	Specs. Max.
4"		100		
3"	0.0	100		
2-1/2"				
2-1/4"				
2"	2613.8	83		
1-1/2"				
1-1/4"				
1"	5236.0	65		
3/4"	6388.3	57		
5/8"				
1/2"	7722.5	49		
3/8"	8634.8	43		
1/4"				
No.4	10377.5	31		
TOTAL	15021.0			

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min.	Specs Max.
1/4"				
No.4				
No.6	0.0			
No.8	195.7	23		
No.10				
No.16	342.6	16		
No.20				
No.30	443.20	12		
No.40				
No.50	525.30	8		
No.60				
No.70				
No.80				
No.100	572.50	6		
No.140				
No.200	607.10	4.9		
Total	719.95			
	Dust Ratio			

==========

Distribution:

General File
Region Construction
Project Engineer:
DOUG MALSCH
E. BILDERBACK

T43A-
T43B-1.0
T43L-
T43M-
T44T-
T44U-

Result: INFORMATIONAL
Remarks:
X PRELIMINARY TESTS TO BE REPORTED UNDER SEPERATE COVER.
SAMPLE CONSISTS OF BH-121-07 BAGS
X(2) 1&2 AND BH-129-07 BAGS 1&2
X THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/08/2008

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/21/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225071
Lab Number P -25071
Trans. No. 225071
Bid Item No.
Org. No. 456002
F.A. No.

==========

Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH126-07 & BH127-07

Test Loc.:PS-S-255 By:D. NELSON

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min. Max.
4"		100	
3"	0.0	100	
2-1/2"			
2-1/4"			
2"	2275.0	86	
1-1/2"			
1-1/4"			
1"	4538.4	71	
3/4"	6005.5	62	
5/8"			
1/2"	7612.3	52	
3/8"	8495.2	46	
1/4"			
No.4	10577.8	33	
TOTAL	15800.8		

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min. Max.
1/4"			
No.4			
No.6	0.0		
No.8	153.3	23	
No.10			
No.16	286.8	15	
No.20			
No.30	388.10	8	
No.40			
No.50	451.40	4	
No.60			
No.70			
No.80			
No.100	478.80	3	
No.140			
No.200	495.80	1.4	
Total	518.37		
	Dust Ratio		

==========

Distribution:

General File X
Region Construction
Project Engineer:
DOUG MALSCH X(2)
E. BILDERBACK X

Result: INFORMATIONAL
Remarks:
PRELIMINARY TESTS AND PROCTOR TO BE REPORTED UNDER SEPERATE COVER. SAMPLE CONSISTS OF BH--126-07 BAGS 1 & 2 AND BH-127-07 BAGS 1, 2 &
THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

T43A- T43L- T44T-
T43B-1.0 T43M- T44U-

Michael Polodna, P.E. By: _____
Date: 04/08/2008

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - STATE MATERIALS LABORATORY
PO BOX 47365 OLYMPIA WA 98504-7365 / 1655 SOUTH 2ND AVE TUMWATER WA 98512

Physical Testing Section
Preliminary Aggregate Test Report

Date Sampled: 09/18/2007
Sampled By:
Date Recvd HQ: 04/17/2008
S.R. No.:
Section:
Contractor:

Work Order No. XL2779
Lab ID No. 0000225333
Lab Number P -25333
Trans. No. 225333
Bid. Item No.
Org. No. 456002
F.A. No.

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Material: PORTLAND CEMENT, HMA, BASE, SUBBASE AND BACKFILL

Legal Description: NW 1/4 NW 1/4 Sec. 26 T. 22 N., R. 11 E. W.M.

Pit No.: S-255 Sample Loc.: BH-1~~3~~30-07 & BH-138-07

BH-130-07 & BH-138-07

Coarse Aggregate (AASHTO T-85):
- Bulk Specific Gravity (SSD) 2.742
- Bulk Specific Gravity 2.716
- Apparent Specific Gravity 2.789
- Absorption (%) 0.96

Fine Aggregate (AASHTO T-84):
- Bulk Specific Gravity (SSD)
- Bulk Specific Gravity
- Apparent Specific Gravity
- Absorption (%)

LA Abrasion (AASHTO T-96):
- Class B (Crushed Agg.) 14
- Class (Round Agg.)

Sand Equivalent (AASHTO T-176; Pre-Wet Method):

Degradation Factor (WSDOT TM 113): 60

Organics (AASHTO T-21):

Asphalt Content-Recycle Mat. (Std. Spec. 9-03.11): (%)

Alkali-Silica Reactivity (AASHTO T-303): (% at 14 Days)
(3 Day = 6 Day = 9 Day =)

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Distribution:

Materials File		X
Region Construction	45	X
Project Engineer:		
ERIC BILDERBECK		X(2)
DOUG MALSCH		X

Result:INFORMATIONAL
Remarks:

SAMPLE CONSIST OF BH-130-07 BAGS 1,2 & 3 AND BH-138-07 BAG 4. GRADATION TO BE REPORTED UNDER SEPERATE COVER.

T42G-	T43L-	T44F-	T44Q-1.0
T43A-1.0	T43M-	T44H-1.0	T44R-
T43B-	T44B-	T44J-	T44U-
T43D-1.0	T44D-	T44L-	T45W-
T43H-	T44E-	T44M-	

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER
Michael Polodna, P.E. By: _____
Date: 05/13/2008
Phone: (360)709-5446

aggtestp.dfr 3/03

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

Physical Testing Section
Grading Test Report
Test Method AASHTO T 27 & T 11

Date Sampled: 09/17/2008
Sampled By: D. NELSON
Date Recvd HQ: 02/26/2008
S.R. No.: 90
Section: BRIGGS TO KEECHELAS
Contractor:
Subcontractor:

Work Order No. XL2779
Lab ID No. 0000225069
Lab Number S -25069
Trans. No. 225069
Bid Item No.
Org. No. 456002
F.A. No.

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Material: GRAVEL

Pit No.: S-255

Accpt.Samp.No.: Sample Loc.: BH-135-07 AND BH-136-07

Test Loc.: By:

Coarse Grading

Size:	Accum. Weight	Percent Passing	Specs. Min.	Specs. Max.
		100		
4"	0.0	100		
3"	1222.1	92		
2-1/2"				
2-1/4"				
2"	2679.9	82		
1-1/2"				
1-1/4"				
1"	4077.3	73		
3/4"	4610.9	70		
5/8"				
1/2"	5216.0	66		
3/8"	5557.3	64		
1/4"				
No.4	6513.8	57		
TOTAL	15311.8			

Fine Grading

Size:	Accum. Weight	Percent Passing	Specs Min.	Specs Max.
1/4"				
No.4				
No.6				
No.8	69.3	50		
No.10				
No.16	154.0	42		
No.20				
No.30	246.80	33		
No.40				
No.50	373.80	21		
No.60				
No.70				
No.80				
No.100	455.10	13		
No.140				
No.200	501.90	8.7		
Total	592.53			
	Dust Ratio			

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Distribution:

General File X
Region Construction
Project Engineer:
DOUG MALSCH X(2)
E. BILDERBACK X

T43A- T43L- T44T-
T43B-1.0 T43M- T44U-
T43J- T44A-

Result: INFORMATIONAL
Remarks:
R-VALUE TO BE REPORTED UNDER SEPERATE COVER.
SAMPLE CONSISTS OF BH-135-07 BAGS 1,2 AND BH-136-07 BAGS 1&2
THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

Michael Polodna, P.E. By: _____
Date: 04/08/2008
Phone: (360)709-5446

grading.dfr 3/03

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION - MATERIALS LABORATORY
PO BOX 47365 OLYMPIA, WA. 98504-7365/1655 SO. 2ND AVE TUMWATER, WA. 98512

GeoTech Section
Soils Test Report
WSDOT Test Methods

Date Sampled: 09/17/2008
Sampled By: **D. NELSON**
Date Recvd HQ: 02/26/2008
S.R. No.: **90**
Section: **BRIGGS TO KEECHELAS**
Contractor:
Material: GRAVEL

Work Order No. **XL2779**
Lab ID No. **0000225069**
Lab Number **S -25069**
Trans. No. **225069**
Bid Item No.
Org. No. **456002**
F.A. No.
Pit No. S-255
Sample No.

R

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WTM 606

COARSE DENSITY:
COARSE SPECIFIC GRAVITY:

FINE DENSITY:
FINE SPECIFIC GRAVITY:

AASHTO T-99/T180

OPTIMUM MOISTURE:

MAX DENSITY:

AASHTO T190

STABILOMETER: **67**
SWELL PRESSURE: **0.2**
DRAINAGE: **Fast**

SPEC: **72** **MIN**
SPEC: **0.3** **PSI MAX**

AASHTO T292

LIQUID LIMIT:
RESILIENT MODULUS:
PH FACTOR:

PLASTICITY INDEX:
HRB CLASS:

SOIL TEXTURE CLASSIFICATION

SWELL PRESSURE:
ESTIMATED R VALUE:
DRAINAGE FACTOR:

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Distribution:
Materials File X
Regional Construction
Project Engineer:
DOUG MALSCH X(2)
Geotech Soils Testing X

Result: DOES NOT MEET SPECIFICATIONS
Remarks:

THOMAS E. BAKER, P.E.
MATERIALS ENGINEER

T633-	T42G-	T640-
T634-	T630- 1	T43B- 1
T43J-	T631-	T44N-
T635-	T43H- 1	T44V-

Jim Cuthbertson, P.E.
Date: 04/18/2008
Phone: (360)709-5485

By: J

Table 2 I-90 Lake Keechelus Water Table
(water table depth in feet from surface)

Week of	P-101-07 WT	P-106-07 WT	P-118-07 WT	P-134-07 WT
9/26/2007	6.64	9.86	4.23	20.40
10/3/2007	6.96	8.87	3.81	20.25
10/10/2007	7.04	9.40	3.07	19.12
10/17/2007	7.14	10.16	3.93	19.24
10/24/2007	6.50	8.30	1.65	17.11
10/31/2007	6.35	9.03	2.24	16.65
11/7/2007	6.57	9.74	3.26	17.48
11/14/2007	6.28	8.39	1.46	17.05
11/21/2007	6.21	7.69	0.72	13.74
11/28/2007	6.24	8.69	1.73	13.95
12/5/2007	5.25	7.37	-0.25	10.92
12/12/2007	6.53	8.47	1.33	8.47
12/19/2007	7.03	9.35	2.26	7.95
12/26/2007	6.79	9.57	2.12	7.09
1/2/2008	6.59	9.58	2.54	6.52
1/9/2008	6.91	10.39	2.90	6.67
1/16/2008	6.12	8.63	1.45	5.39
1/23/2008	6.31	8.11	1.61	5.44
1/30/2008	7.00	9.60	2.41	6.27
2/6/2008	6.72	9.88	2.69	5.88
2/13/2008	6.38	8.51	1.04	4.92
2/20/2008	6.67	8.55	1.38	4.43
2/27/2008	6.33	8.26	1.08	3.98
3/5/2008	6.17	7.86	0.51	3.06
3/12/2008	5.60	7.85	0.36	2.38
3/19/2008	6.02	8.06	0.51	1.59
3/26/2008	6.75	8.58	1.03	1.13
4/2/2008	6.57	8.59	1.05	0.61
4/9/2008	6.73	8.65	1.02	0.75
4/16/2008	5.62	7.73	0.34	1.92
4/23/2008	6.73	8.55	1.23	2.17
4/30/2008	5.28	7.99	0.35	2.64
5/7/2008	4.84	7.63	-0.26	1.77
5/14/2008	5.00	7.57	-0.55	-1.98
5/21/2008	3.53	2.96	-11.71	-15.34
5/28/2008	-4.22	-4.95	-19.61	-23.42
6/4/2008	-10.67	-11.43	-26.07	-29.94
6/11/2008	-16.08	-16.85	-31.50	-35.32
6/18/2008	-20.57	-21.34	-36.01	-39.81
6/25/2008	-21.36	-22.15	-36.80	-40.65
7/2/2008	-20.91	-21.67	-36.34	-40.19
7/9/2008	-20.33	-21.12	-35.74	-39.59
7/16/2008	-16.28	-17.07	-31.73	-35.64
7/23/2008	-10.69	-11.47	-26.13	-30.14
7/30/2008	-4.12	-4.95	-19.59	-23.74
8/6/2008	2.64	2.02	-12.61	-16.90
8/13/2008	6.54	7.86	-4.93	-9.43
8/20/2008	6.97	8.95	1.04	-0.94
8/27/2008	6.73	9.03	2.33	4.91
9/3/2008	6.51	8.93	2.55	6.96
9/10/2008	6.78	9.32	3.18	7.55
9/16/2008	6.61	9.33	3.24	7.76

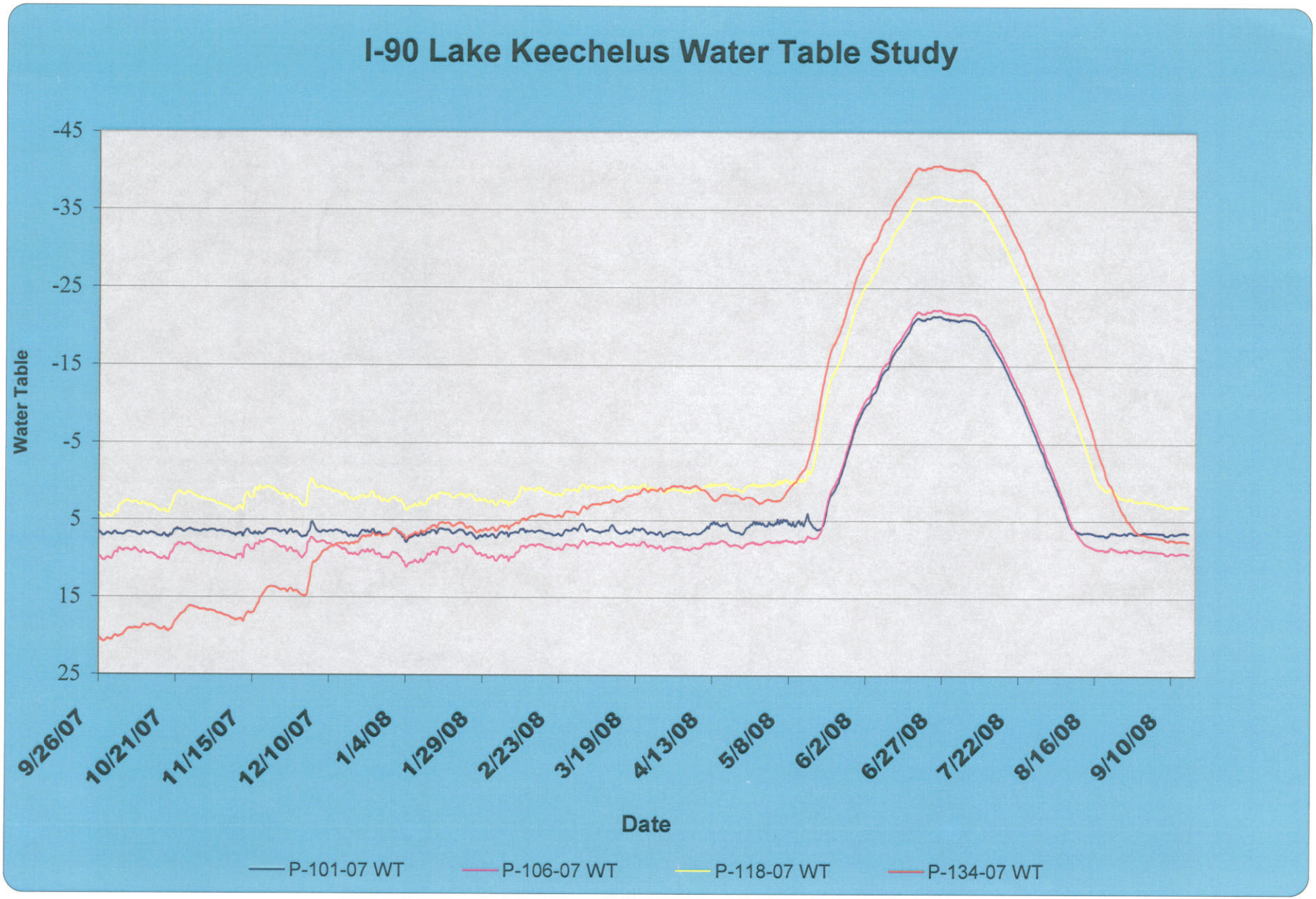
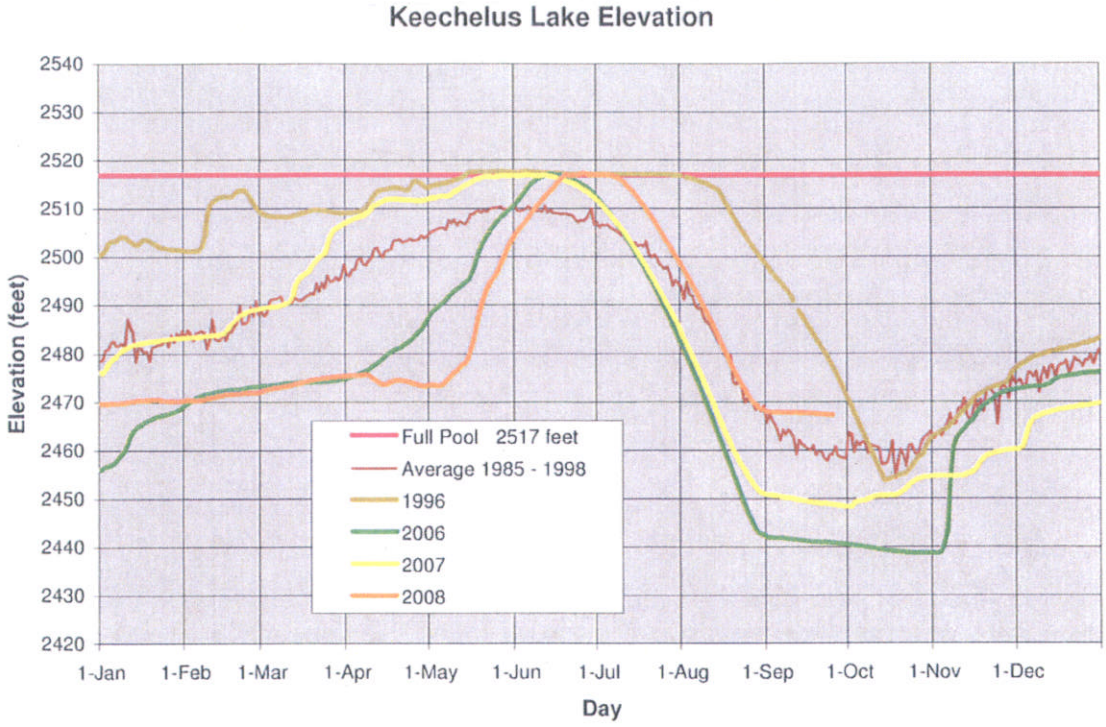
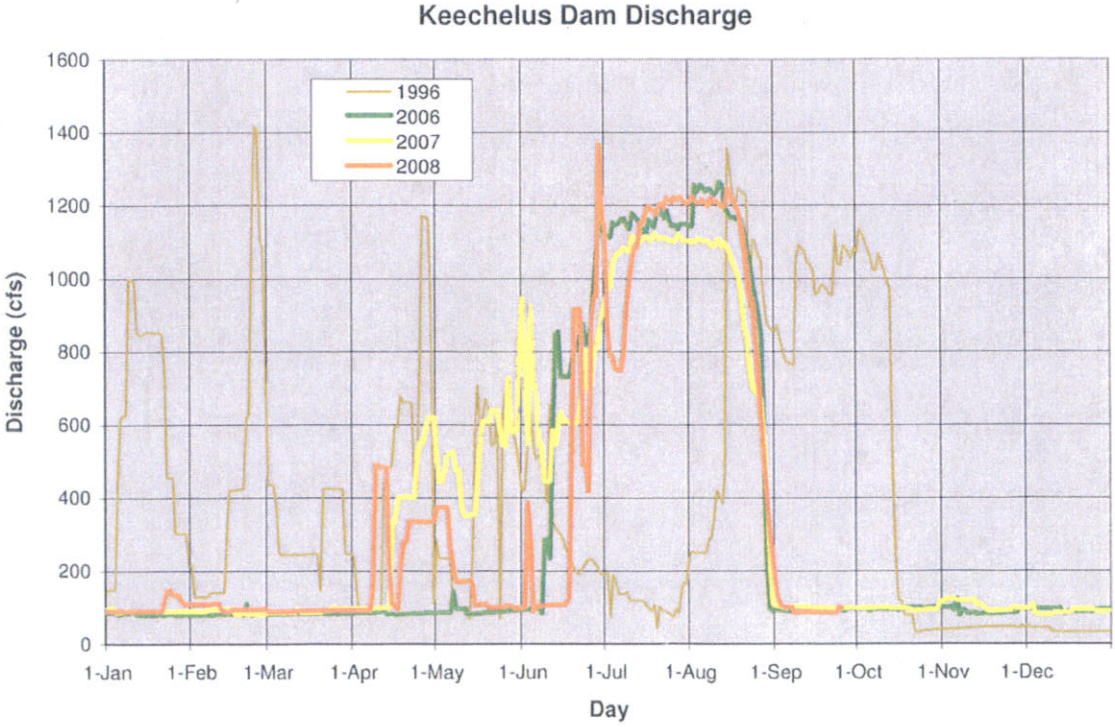

I-90 Lake Keechelus Water Table Study
Water Table
-45
-35
-25
-15
-5
5
15
25
9/26/07
10/21/07
11/15/07
12/10/07
1/4/08
1/29/08
2/23/08
3/19/08
4/13/08
5/8/08
6/2/08
6/27/08
7/22/08
8/16/08
9/10/08
Date
P-101-07 WT
P-106-07 WT
P-118-07 WT
P-134-07 WT

Figure 6

Figure 7



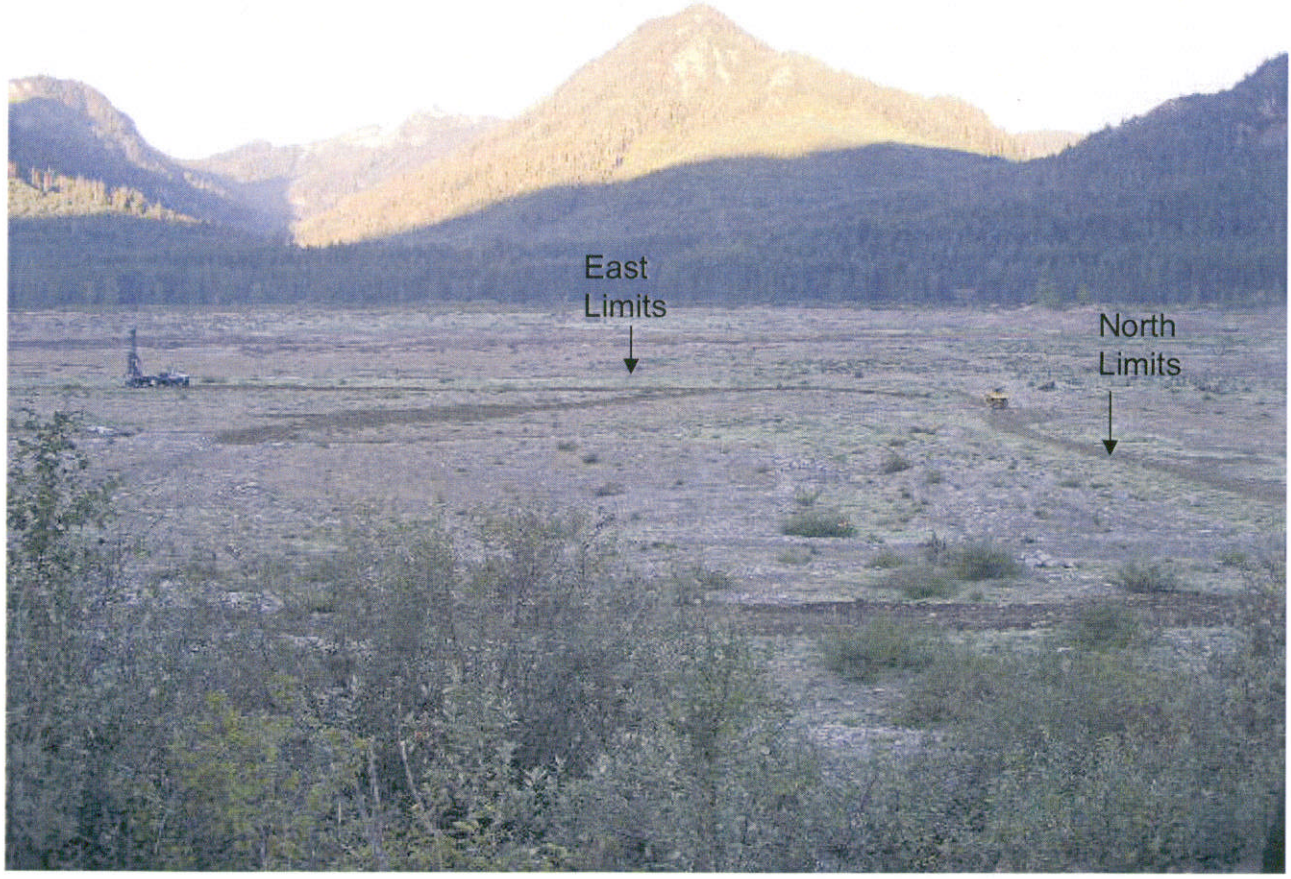


K:\Environmental\Mitigation\AL - Wetland and Aquatic Resources Mitigation Plan\Supporting Material\Keechelus Lake Elevations 1985-2008.xls

Appendix E

Site Photos

Road for Becker Hammer



PS-S-255 Becker Hammer

PS-S-255 Becker Hammer being pulled by D-8 through sand / bottom photo collecting sample

PS-S-255 Becker Hammer sample

PS-S-255 Becker Hammer sample

PS-S-255 Becker Hammer sample