

EXHIBIT H

STORMWATER MANAGEMENT PLAN - COFFMAN ENGINEERS

RECEIVED

JAN 26 2022

**PLANNING OFFICE
CITY OF PONDERAY**



January 7, 2022

City of Ponderay
288 4th Street
Ponderay, Idaho 83852

Project: Phase I – Ponderay Plaza Apartments
Ponderay, ID 83852
CEI Project #212146

RECEIVED

JAN 26 2022

PLANNING OFFICE
CITY OF PONDERAY

Subject: Special Use Permit Application – Stormwater Management Memo

Dear City of Ponderay:

The Phase I – Ponderay Plaza Apartments project, located in Ponderay, Idaho, includes the construction of three apartment buildings. The project includes the construction of paved parking areas, concrete sidewalks, concrete curbs, paved vehicle circulation, a playground area, landscaping, and stormwater management facilities. The existing project area is relatively flat covered with grass, soil, and various trees. Storm water runoff from the existing site is served by natural sheet flow and infiltrates into the pervious surface.

Storm water management for the project is provided in conformance with the City of Ponderay standards, *Idaho Standards for Public Works Construction*, and *Idaho Department of Environmental Quality (IDEQ) Catalog of Stormwater Best Management Practices*. The Rational Method is used to determine the peak runoff flow with a 25-year return frequency. The stormwater management facilities for the project will be sized to adequately store the entire 25-year storm event, utilizing the SCS Method with a given precipitation from the *NOAA ATLAS 2, Volume V, Idaho, 25-Year Isopluvial Map*.

The design for stormwater treatment and disposal follows the geotechnical recommendations, provided by ALLWEST in their report *Limited Geotechnical Engineering Evaluation*, dated November 10, 2021, included as Attachment C of this memo. The report recommends water quality treatment via bio-infiltration swales and disposal via infiltration galleries with an infiltration rate of 2.5 inches per hour. The swales for this project are designed to treat the first one-half inch of runoff from the pollutant generating impervious surface (PGIS) areas and hydrologically connected non-pollutant generating impervious surface areas, in accordance with the *IDEQ Catalog of Stormwater Best Management Practices*.

Stormwater runoff from the project will be handled by four (4) on-site drainage basins. Stormwater from each basin will sheet flow away from all buildings and be directed to stormwater management facilities for treatment, storage, and disposal. Runoff from the pollutant generating impervious surface areas will be directed to bio-infiltration swales, located along the perimeter of the project for treatment and storage. Subsurface infiltration galleries, located below the swales, will assist with storage and disposal. Roof runoff from the buildings will be collected via roof drains and architectural downspouts and piped directly to subsurface galleries



for disposal. Refer to the Post-Development Basin Map and associated preliminary drainage calculations provided within this memo.

In the case of an unforeseen storm water event where the system capacity is exceeded, stormwater from the central basins will utilize overflow piping and discharge directly to the perimeter stormwater management facilities for additional capacity. If the capacity of the perimeter facilities is exceeded, stormwater will then overland flow to the public right-of-way.

Additional detailed design information, operational characteristics, and perpetual maintenance of stormwater facilities will be provided in a Drainage Report submitted as part of the final civil design package.

Please let us know if you have any comments or if you need additional information to complete your review and approval for this Special Use Permit application. Thank you.

Sincerely,

COFFMAN ENGINEERS, INC.

A handwritten signature in cursive script that reads "Christie Johnson".

Christie Johnson, P.E.
Civil Engineer

A handwritten signature in cursive script that reads "Chad Heimbigner".

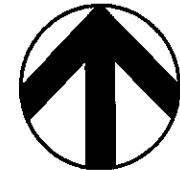
Chad Heimbigner, P.E., LEED AP
Principal

Enclosure

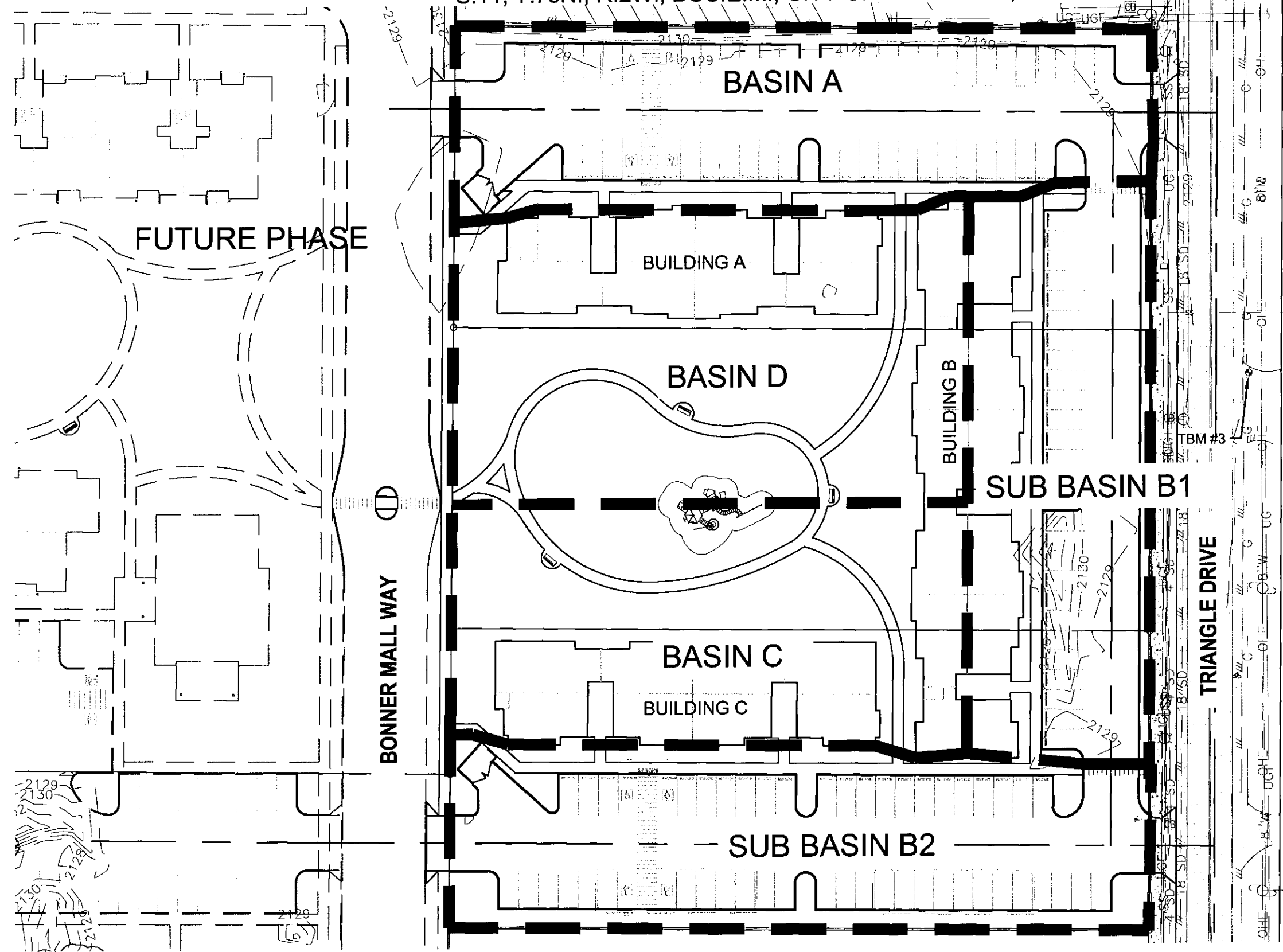
- Attachment "A" – Post-Development Basin Map
- Attachment "B" – Preliminary Drainage Calculations
- Attachment "C" – Geotechnical Report

POST-DEVELOPMENT BASIN MAP

ATTACHMENT "A"



SCALE: 1"=50'



FUTURE PHASE

BASIN A

BUILDING A

BASIN D

BUILDING B

SUB BASIN B1

BASIN C

BUILDING C

SUB BASIN B2

BONNER MALL WAY

TRIANGLE DRIVE

POST-DEVELOPMENT BASIN MAP

LEGEND

	BASIN BOUNDARY
BASIN "A"	BASIN DESIGNATION

COFFMAN ENGINEERS
 10 N. Post Street, Suite 500
 Spokane, WA 99201
 ph 509.328.2994
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project	PONDERAY PLAZA APARTMENTS - PHASE 1	by	DLS	sheet no.	B2
location	PONDERAY, IDAHO	date	1/07/2022	job no.	212146
client	EASTMARK CAPITAL GROUP	checked	CLJ		
		date	1/07/2022		

PRELIMINARY DRAINAGE CALCULATIONS

ATTACHMENT "B"

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: Entire Phase 1 (Post Development)

CONTRIBUTING AREAS

Site	3.00 Acres		130506 s.f.				
	PGIS Areas	Non-PGIS Areas	PGIS Areas	Non-PGIS Areas	"C"	A*C	
	(s.f.)	(s.f.)	(Ac.)	(Ac.)			
Asphalt	47128	0	1.08	0.00	0.90	0.9737	<u>Total Impervious</u> 1.90
Sidewalks	7248	3430	0.17	0.08	0.90	0.2206	
Building / Roof	0	24875	0.00	0.57	0.90	0.5139	
Gravel	0	0	0.00	0.00	0.61	0.0000	<u>Total Pervious</u> 1.10
Grass / Landscaping	0	47825	0.00	1.10	0.17	0.1866	
Unimproved	0	0	0.00	0.00	0.33	0.0000	
Other	0	0	0.00	0.00	0.30	0.0000	
			<u>Total A (PGIS)</u>	<u>Total A (Non-PGIS)</u>		<u>Comp "C"</u>	
			1.25	1.75		0.63	

*C-values increased by 10% for 25-year storm

RATIONAL METHOD

Time of Conc. (min)	5.00	Intensity	Q peak (cfs)
		I*	Q = CIA
		2.90	5.50

*Intensity (I) based on the Idaho Transportation Department, Figure I-C, Zone C, Intensity - Duration - Frequency Curve

SWALE CALCULATIONS

Required Treatment Volume:
 $V = A * (0.5 \text{ in.}) / (12 \text{ in./ft})$ 2266 cf

Provided Treatment Volume:

Swale Number	Bottom Elevation Area (sf)	Depth to Treatment Elevation (ft)	Treatment Elevation Area (sf)	Depth to Top Elevation (ft)	Top Elevation Area (sf)	Treatment Volume (cf)	Storage Volume (cf)
1	2456	0.50	2456	1.0	2456	1228	2456
2	641	0.50	641	1.0	641	320.5	641
3	2777	0.50	2777	1.0	2777	1388.5	2777
						2937	5874

Adequate Treatment Volume

UNDERGROUND PERCOLATION GALLERIES

Soil Infiltration Rate: 2.5 in/hr
 5.78704E-05 ft/sec
 Voids in Drainrock: 0.4
 Gallery Outflow Rate: 0.80 cfs

Gallery ID Number	Gallery Width (ft)	Bottom Length (ft)	Gallery Depth (ft)	Total Infiltration Area (Bottom Area) (sf)	Pipe Length (ft)	Pipe Diameter (ft)	Pipe Volume (cf)	Drainrock Volume (cf)	Total Gallery Volume (cf)
1	25.0	60.0	3.0	1500	60.0	1.0	47.1	1781.2	1828.3
2	25.0	46.0	3.0	1150	46.0	1.0	36.1	1365.5	1401.7
3	25.0	48.0	3.0	1200	48.0	1.0	37.7	1424.9	1462.6
4	5.0	235.0	3.0	1175	235.0	1.0	184.6	1336.2	1520.7
5	25.0	60.0	3.0	1500	60.0	1.0	47.1	1781.2	1828.3
6	25.0	43.0	3.0	1075	43.0	1.0	33.8	1276.5	1310.3
7	25.0	46.0	3.0	1150	46.0	1.0	36.1	1365.5	1401.7
8	16.0	160.0	3.0	2560	160.0	1.0	125.7	3021.7	3147.4
9	16.0	160.0	3.0	2560	160.0	1.0	125.7	3021.7	3147.4
				<u>13670</u>					<u>17048</u>

SUMMARY

Total Outflow: 0.80 cfs
Total Storage: 22922 cf

See next page for storage requirement calculations

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: *Ponderay Plaza Apartments*
DATE: *1/7/2022*
BY: *CLJ*



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: *Entire Phase 1 (Post Development)*

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Time of Conc. (min) 5.00
 Area (Acres) 3.00
 Composite "C" 0.63
 Volume Provided 22922
 Outflow (cfs) 0.80
 Area * C" Factor 1.89
 "m" coefficient * 0.00
 "n" coefficient * 0

*"m" and "n" coefficients obtained from Figure 2-4 from the WSDOT Hydraulics Manual

#1	#2	#3	#4	#5	#6	#7
Time Inc. (min.)	Time Inc. (#1*60)	Intensity (in./hr.)	Q dev. (cfs) (A*C*#3)	V in (cu. ft.)	V out (cu. ft.) (Outf.*#2)	Storage (cu. ft.) (#5-#6)
5.00	300.00	0.00	0.00	0	240.80	-241
5	300	0.00	0.00	0	240.80	-241
10	600	0.00	0.00	0	481.60	-482
15	900	0.00	0.00	0	722.40	-722
20	1200	0.00	0.00	0	963.19	-963
25	1500	0.00	0.00	0	1203.99	-1204
30	1800	0.00	0.00	0	1444.79	-1445
35	2100	0.00	0.00	0	1685.59	-1686
40	2400	0.00	0.00	0	1926.39	-1926
45	2700	0.00	0.00	0	2167.19	-2167
50	3000	0.00	0.00	0	2407.99	-2408
55	3300	0.00	0.00	0	2648.78	-2649
60	3600	0.00	0.00	0	2889.58	-2890
65	3900	0.00	0.00	0	3130.38	-3130
70	4200	0.00	0.00	0	3371.18	-3371
75	4500	0.00	0.00	0	3611.98	-3612
80	4800	0.00	0.00	0	3852.78	-3853
85	5100	0.00	0.00	0	4093.58	-4094
90	5400	0.00	0.00	0	4334.38	-4334
95	5700	0.00	0.00	0	4575.17	-4575
100	6000	0.00	0.00	0	4815.97	-4816

Rainfall intensities were calculated by using the equation in Section 2-5.4 of the WSDOT Hydraulics Manual

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Maximum storage required by Bowstring = **-241 cf**
 Storage Provided = **22922 cf**
 Storage Volume: **Adequate**

Table value at 72 hours:

4320 259200 0.00 0.00 0 208050 -208050
Swale / Infiltration Gallery drains within 72 hours

SCS METHOD - 25-YEAR STORM VOLUME

Basin	3.00 Acres	130506 s.f.		Impervious	
Areas (Ac.)	CN	A*CN	Areas (s.f.)	P ₂₅ =	S =
Asphalt	1.08	98	106.0272	47128	2.9 in
Sidewalks	0.25	98	24.0230	10678	0.20
Building / Roof	0.57	98	55.9630	24875	Q ₂₅ = 2.67 in
Other	0.00	98	0.0000	0	V _i = 18388 cf
Grass / Landscaping	1.10	61	88.9726	47825	Pervious
Unimproved	0.00	58	0.0000	0	P ₂₅ = 2.9 in
Gravel	0.00	85	0.0000	0	S = 6.39
					Q ₂₅ = 0.33 in
					V = 1307 cf
					V _{TOT} = 19695 cf
	Impervious A	Impervious CN	Pervious A	Pervious CN	
	1.90	98.00	1.10	61.00	

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: Basin A

CONTRIBUTING AREAS

Site	0.60 Acres		26217 s.f.				
	PGIS Areas (s.f.)	Non-PGIS Areas (s.f.)	PGIS Areas (Ac.)	Non-PGIS Areas (Ac.)	"C"	A*C	
Asphalt	17768	0	0.41	0.00	0.90	0.3671	<u>Total Impervious</u> 0.46
Sidewalks	2298	0	0.05	0.00	0.90	0.0475	
Building / Roof	0	0	0.00	0.00	0.90	0.0000	
Gravel	0	0	0.00	0.00	0.61	0.0000	
Grass / Landscaping	0	6151	0.00	0.14	0.17	0.0240	<u>Total Pervious</u> 0.14
Unimproved	0	0	0.00	0.00	0.33	0.0000	
Other	0	0	0.00	0.00	0.30	0.0000	
			<u>Total A (PGIS)</u> 0.46	<u>Total A (Non-PGIS)</u> 0.14		<u>Comp "C"</u> 0.73	

*C-values increased by 10% for 25-year storm

RATIONAL METHOD

Time of Conc. (min)	5.00	Intensity I*	Q peak (cfs) Q = CIA
		2.90	1.27

*Intensity (I) based on the Idaho Transportation Department, Figure I-C, Zone C, Intensity - Duration - Frequency Curve

SWALE CALCULATIONS

Required Treatment Volume:
 $V = A * (0.5in.) / (12in./ft)$ 836 cf

Provided Treatment Volume:

Swale Number	Bottom Elevation Area (sf)	Depth to Treatment Elevation (ft)	Treatment Elevation Area (sf)	Depth to Top Elevation (ft)	Top Elevation Area (sf)	Treatment Volume (cf)	Storage Volume (cf)
1	2456	0.50	2456	1.0	2456	1228	2456
						1228	2456

Adequate Treatment Volume

UNDERGROUND PERCOLATION GALLERIES

Soil Infiltration Rate: 2.5 in/hr
 5.78704E-05 ft/sec
 Voids in Drainrock: 0.4
 Gallery Outflow Rate: 0.22 cfs

Gallery ID Number	Gallery Width (ft)	Bottom Length (ft)	Gallery Depth (ft)	Total Infiltration Area (Bottom Area) (sf)	Pipe Length (ft)	Pipe Diameter (ft)	Pipe Volume (cf)	Drainrock Volume (cf)	Total Gallery Volume (cf)
1	25.0	60.0	3.0	1500	60.0	1.0	47.1	1781.2	1828.3
2	25.0	46.0	3.0	1150	46.0	1.0	36.1	1365.5	1401.7
3	25.0	48.0	3.0	1200.0	48.0	1.0	37.7	1424.9	1462.6
				3850					4693

SUMMARY

Total Outflow: 0.22 cfs
Total Storage: 7149 cf

See next page for storage requirement calculations

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: *Ponderay Plaza Apartments*
DATE: *1/7/2022*
BY: *CLJ*



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: **Basin A**

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Time of Conc. (min) 5.00
 Area (Acres) 0.60
 Composite "C" 0.73
 Volume Provided 7149
 Outflow (cfs) 0.22
 Area * C" Factor 0.44
 "m" coefficient * 0.00
 "n" coefficient * 0

*"m" and "n" coefficients obtained from Figure 2-4 from the WSDOT Hydraulics Manual

#1 Time Inc. (min.)	#2 Time Inc. (sec.) (#1*60)	#3 Intensity (in./hr.)	#4 Q dev. (cfs) (A*C*#3)	#5 V in (cu. ft.)	#6 V out (cu. ft.) (Out.*#2)	#7 Storage (cu. ft.) (#5-#6)
5.00	300.00	0.00	0.00	0	66.84	-67
5	300	0.00	0.00	0	66.84	-67
10	600	0.00	0.00	0	133.68	-134
15	900	0.00	0.00	0	200.52	-201
20	1200	0.00	0.00	0	267.36	-267
25	1500	0.00	0.00	0	334.20	-334
30	1800	0.00	0.00	0	401.04	-401
35	2100	0.00	0.00	0	467.88	-468
40	2400	0.00	0.00	0	534.72	-535
45	2700	0.00	0.00	0	601.56	-602
50	3000	0.00	0.00	0	668.40	-668
55	3300	0.00	0.00	0	735.24	-735
60	3600	0.00	0.00	0	802.08	-802
65	3900	0.00	0.00	0	868.92	-869
70	4200	0.00	0.00	0	935.76	-936
75	4500	0.00	0.00	0	1002.60	-1003
80	4800	0.00	0.00	0	1069.44	-1069
85	5100	0.00	0.00	0	1136.28	-1136
90	5400	0.00	0.00	0	1203.13	-1203
95	5700	0.00	0.00	0	1269.97	-1270
100	6000	0.00	0.00	0	1336.81	-1337

Rainfall intensities were calculated by using the equation in Section 2-5.4 of the WSDOT Hydraulics Manual

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Maximum storage required by Bowstring = **-87 cf**
 Storage Provided = **7149 cf**
 Storage Volume: **Adequate**

Table value at 72 hours:

4320	259200	0.00	0.00	0	57750	-57750
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Swale / Infiltration Gallery drains within 72 hours

SCS METHOD - 25-YEAR STORM VOLUME

Basin	0.60 Acres	26217 s.f.		Impervious	
				P ₂₅ =	2.9 in
				S =	0.20
	Areas	CN	A*CN	Q ₂₅ =	2.67 in
	(Ac.)		Areas (s.f.)	V _i =	4463 cf
Asphalt	0.41	98	39.9739	Pervious	
Sidewalks	0.05	98	5.1700	P ₂₅ =	2.9 in
Building / Roof	0.00	98	0.0000	S =	6.39
Other	0.00	98	0.0000	Q ₂₅ =	0.33 in
Grass / Landscaping	0.14	61	8.6137	V =	168 cf
Unimproved	0.00	58	0.0000		
Gravel	0.00	85	0.0000		
				V _{TOT} =	4631 cf
	Impervious A	Impervious CN	Pervious A	Pervious CN	
	0.46	98.00	0.14	61.00	

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: Basin B

CONTRIBUTING AREAS

Site	1.13 Acres		49404 s.f.		"C"	A*C	
	PGIS Areas (s.f.)	Non-PGIS Areas (s.f.)	PGIS Areas (Ac.)	Non-PGIS Areas (Ac.)			
Asphalt	29360	0	0.67	0.00	0.90	0.6066	<u>Total Impervious</u> 0.91
Sidewalks	4950	0	0.11	0.00	0.90	0.1023	
Building / Roof	0	5240	0.00	0.12	0.90	0.1083	
Gravel	0	0	0.00	0.00	0.61	0.0000	<u>Total Pervious</u> 0.23
Grass / Landscaping	0	9854	0.00	0.23	0.17	0.0385	
Unimproved	0	0	0.00	0.00	0.33	0.0000	
Other	0	0	0.00	0.00	0.30	0.0000	
			<u>Total A (PGIS)</u>	<u>Total A (Non-PGIS)</u>	<u>Comp "C"</u>		
			0.79	0.35	0.75		

RATIONAL METHOD

Time of Conc. (min)	5.00	Intensity I*	Q peak (cfs) Q = CiA
		2.90	2.48

*Intensity (I) based on the Idaho Transportation Department, Figure I-C, Zone C, Intensity - Duration - Frequency Curve

SWALE CALCULATIONS

Required Treatment Volume:
 $V = A(0.5in.)(12in./ft)$ 1430 cf

Provided Treatment Volume:

Swale Number	Bottom Elevation Area (sf)	Depth to Treatment Elevation (ft)	Treatment Area (sf)	Depth to Top Elevation (ft)	Top Elevation Area (sf)	Treatment Volume (cf)	Storage Volume (cf)
2	640	0.50	640	1.0	640	320	640
3	2777	0.50	2777	1.0	2777	1388.5	2777
						1708.5	3417
Adequate Treatment Volume							

UNDERGROUND PERCOLATION GALLERIES

Soil Infiltration Rate: 2.5 in/hr
 5.78704E-05 ft/sec
 Voids in Drainrock: 0.4
 Gallery Outflow Rate: 0.28 cfs

Gallery ID Number	Gallery Width (ft)	Bottom Length (ft)	Gallery Depth (ft)	Total Infiltration Area (Bottom Area) (sf)	Pipe Length (ft)	Pipe Diameter (ft)	Pipe Volume (cf)	Drainrock Volume (cf)	Total Gallery Volume (cf)
4	5.0	235.0	3.0	1175	235.0	1.0	184.6	1336.2	1520.7
5	25.0	60.0	3.0	1500	60.0	1.0	47.1	1781.2	1828.3
6	25.0	43.0	3.0	1075	43.0	1.0	33.8	1276.5	1310.3
7	25.0	46.0	3.0	1150	46.0	1.0	36.1	1365.5	1401.7
				4900					6061

SUMMARY

Total Outflow: 0.28 cfs
Total Storage: 9478 cf

See next page for storage requirement calculations

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2984

BASIN: Basin B

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Time of Conc. (min) 5.00
 Area (Acres) 1.13
 Composite "C" 0.75
 Volume Provided 9478
 Outflow (cfs) 0.28
 Area * C" Factor 0.86
 "m" coefficient * 0.00
 "n" coefficient * 0

* "m" and "n" coefficients obtained from Figure 2-4 from the WSDOT Hydraulics Manual

#1 Time Inc. (min.)	#2 Time Inc. (sec.) (#1*60)	#3 Intensity (in./hr.)	#4 Q dev. (cfs) (A*C*#3)	#5 V in (cu. ft.)	#6 V out (cu. ft.) (Outf.*#2)	#7 Storage (cu. ft.) (#5-#6)
5.00	300.00	0.00	0.00	0	85.07	-85
5	300	0.00	0.00	0	85.07	-85
10	600	0.00	0.00	0	170.14	-170
15	900	0.00	0.00	0	255.21	-255
20	1200	0.00	0.00	0	340.28	-340
25	1500	0.00	0.00	0	425.35	-425
30	1800	0.00	0.00	0	510.42	-510
35	2100	0.00	0.00	0	595.49	-595
40	2400	0.00	0.00	0	680.56	-681
45	2700	0.00	0.00	0	765.63	-766
50	3000	0.00	0.00	0	850.69	-851
55	3300	0.00	0.00	0	935.76	-936
60	3600	0.00	0.00	0	1020.83	-1021
65	3900	0.00	0.00	0	1105.90	-1106
70	4200	0.00	0.00	0	1190.97	-1191
75	4500	0.00	0.00	0	1276.04	-1276
80	4800	0.00	0.00	0	1361.11	-1361
85	5100	0.00	0.00	0	1446.18	-1446
90	5400	0.00	0.00	0	1531.25	-1531
95	5700	0.00	0.00	0	1616.32	-1616
100	6000	0.00	0.00	0	1701.39	-1701

Rainfall intensities were calculated by using the equation in Section 2-5.4 of the WSDOT Hydraulics Manual

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Maximum storage required by Bowstring = -85 cf
 Storage Provided = 9478 cf
 Storage Volume: Adequate

Table value at 72 hours:

4320	259200	0.00	0.00	0	73500	-73500
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Swale / Infiltration Gallery drains within 72 hours

SCS METHOD - 25-YEAR STORM VOLUME

Basin	1.13 Acres	49404 s.f.		Impervious	
				P ₂₅ =	2.9 in
				S =	0.20
	Areas	CN	A*CN	Q ₂₅ =	2.67 in
	(Ac.)		Areas (s.f.)	V _i =	8796 cf
Asphalt	0.67	98	66.0533	29360	
Sidewalks	0.11	98	11.1364	4950	
Building / Roof	0.12	98	11.7888	5240	
Other	0.00	98	0.0000	0	
Grass / Landscaping	0.23	61	13.7992	9854	
Unimproved	0.00	58	0.0000	0	
Gravel	0.00	85	0.0000	0	
				V _{TOT} =	9065 cf
	Impervious A	Impervious CN	Pervious A	Pervious CN	
	0.91	98.00	0.23	61.00	

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: Sub Basin B1

CONTRIBUTING AREAS

Site	0.52 Acres		22799 s.f.		"C"	A°C	
	PGIS Areas (s.f.)	Non-PGIS Areas (s.f.)	PGIS Areas (Ac.)	Non-PGIS Areas (Ac.)			
Asphalt	11657	0	0.27	0.00	0.90	0.2408	<u>Total Impervious</u> 0.45
Sidewalks	2563	0	0.06	0.00	0.90	0.0530	
Building / Roof	0	5240	0.00	0.12	0.90	0.1083	
Gravel	0	0	0.00	0.00	0.61	0.0000	<u>Total Pervious</u> 0.08
Grass / Landscaping	0	3339	0.00	0.08	0.17	0.0130	
Unimproved	0	0	0.00	0.00	0.33	0.0000	
Other	0	0	0.00	0.00	0.30	0.0000	
			<u>Total A (PGIS)</u>	<u>Total A (Non-PGIS)</u>	<u>Comp "C"</u>		
			0.33	0.20	0.79		

*C-values increased by 10% for 25-year storm

RATIONAL METHOD

Time of Conc. (min)	5.00	Intensity I*	Q peak (cfs) Q = CIA
		2.90	1.20

*Intensity (I) based on the Idaho Transportation Department, Figure I-C, Zone C, Intensity - Duration - Frequency Curve

SWALE CALCULATIONS

Required Treatment Volume:
 $V = A \cdot (0.5 \text{ in.}) / (12 \text{ in. / ft})$ 593 cf

Provided Treatment Volume:

Swale Number	Bottom Elevation Area (sf)	Depth to Treatment Elevation (ft)	Treatment Elevation Area (sf)	Depth to Top Elevation (ft)	Top Elevation Area (sf)	Treatment Volume (cf)	Storage Volume (cf)
2	640	0.50	640	1.0	640	320	640
						320	640
Inadequate Treatment Volume							

UNDERGROUND PERCOLATION GALLERIES

Soil Infiltration Rate: 2.5 in/hr
 5.78704E-05 ft/sec
 Voids in Drainrock: 0.4
 Gallery Outflow Rate: 0.07 cfs

Gallery ID Number	Gallery Width (ft)	Bottom Length (ft)	Gallery Depth (ft)	Total Infiltration Area (Bottom Area) (sf)	Pipe Length (ft)	Pipe Diameter (ft)	Pipe Volume (cf)	Drainrock Volume (cf)	Total Gallery Volume (cf)
4	5.0	235.0	3.0	1175	235.0	1.0	184.6	1336.2	1520.7
				1175					1521

SUMMARY

Total Outflow: 0.07 cfs
Total Storage: 2161 cf

See next page for storage requirement calculations

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2894

BASIN: Sub Basin B1

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Time of Conc. (min) 5.00
 Area (Acres) 0.52
 Composite "C" 0.79
 Volume Provided 2161
 Outflow (cfs) 0.07
 Area * C" Factor 0.42
 "m" coefficient * 0.00
 "n" coefficient * 0

* "m" and "n" coefficients obtained from Figure 2-4 from the WSDOT Hydraulics Manual

#1 Time Inc. (min.)	#2 Time Inc. (sec.) (#1*60)	#3 Intensity (in./hr.)	#4 Q dev. (cfs) (A*C*#3)	#5 V in (cu. ft.)	#6 V out (cu. ft.) (Out.*#2)	#7 Storage (cu. ft.) (#5-#6)
5.00	300.00	0.00	0.00	0	20.40	-20
5	300	0.00	0.00	0	20.40	-20
10	600	0.00	0.00	0	40.80	-41
15	900	0.00	0.00	0	61.20	-61
20	1200	0.00	0.00	0	81.60	-82
25	1500	0.00	0.00	0	102.00	-102
30	1800	0.00	0.00	0	122.40	-122
35	2100	0.00	0.00	0	142.80	-143
40	2400	0.00	0.00	0	163.19	-163
45	2700	0.00	0.00	0	183.59	-184
50	3000	0.00	0.00	0	203.99	-204
55	3300	0.00	0.00	0	224.39	-224
60	3600	0.00	0.00	0	244.79	-245
65	3900	0.00	0.00	0	265.19	-265
70	4200	0.00	0.00	0	285.59	-286
75	4500	0.00	0.00	0	305.99	-306
80	4800	0.00	0.00	0	326.39	-326
85	5100	0.00	0.00	0	346.79	-347
90	5400	0.00	0.00	0	367.19	-367
95	5700	0.00	0.00	0	387.59	-388
100	6000	0.00	0.00	0	407.99	-408

Rainfall intensities were calculated by using the equation in Section 2-5.4 of the WSDOT Hydraulics Manual

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Maximum storage required by Bowstring = -20 cf
 Storage Provided = 2161 cf
 Storage Volume: Adequate

Table value at 72 hours:

4320 259200 0.00 0.00 0 17625 -17625
 Swale / Infiltration Gallery drains within 72 hours

SCS METHOD - 25-YEAR STORM VOLUME

Basin	0.52 Acres	22799 s.f.		Impervious	
				P ₂₅ =	2.9 in
				S =	0.20
	Areas	CN	A*CN	Q ₂₅ =	2.67 in
	(Ac.)		Areas (s.f.)	V _i =	4328 cf
Asphalt	0.27	98	26.2256	11657	
Sidewalks	0.06	98	5.7662	2563	Pervious
Building / Roof	0.12	98	11.7888	5240	P ₂₅ =
Other	0.00	98	0.0000	0	S =
Grass / Landscaping	0.08	61	4.6758	3339	Q ₂₅ =
Unimproved	0.00	58	0.0000	0	V =
Gravel	0.00	85	0.0000	0	
				V _{TOT} =	4419 cf
	Impervious A	Impervious CN	Pervious A	Pervious CN	
	0.45	98.00	0.08	61.00	

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: Sub Basin B2

CONTRIBUTING AREAS

Site	0.61 Acres		26605 s.f.		"C"	A*C	
	PGIS Areas (s.f.)	Non-PGIS Areas (s.f.)	PGIS Areas (Ac.)	Non-PGIS Areas (Ac.)			
Asphalt	17703	0	0.41	0.00	0.90	0.3658	<u>Total Impervious</u> 0.46
Sidewalks	2387	0	0.05	0.00	0.90	0.0493	
Building / Roof	0	0	0.00	0.00	0.90	0.0000	
Gravel	0	0	0.00	0.00	0.61	0.0000	
Grass / Landscaping	0	6515	0.00	0.15	0.17	0.0254	<u>Total Pervious</u> 0.15
Unimproved	0	0	0.00	0.00	0.33	0.0000	
Other	0	0	0.00	0.00	0.30	0.0000	
			<u>Total A (PGIS)</u>	<u>Total A (Non-PGIS)</u>	<u>Comp "C"</u>		
			0.46	0.15	0.72		

*C-values increased by 10% for 25-year storm

RATIONAL METHOD

Time of Conc. (min)	5.00	Intensity I"	Q peak (cfs) Q = CIA
		2.90	1.28

*Intensity (I) based on the Idaho Transportation Department, Figure I-C, Zone C, Intensity - Duration - Frequency Curve

SWALE CALCULATIONS

Required Treatment Volume:
 $V = A * (0.5 \text{ in.}) / (12 \text{ in. / ft})$ 837 cf

Provided Treatment Volume:

Swale Number	Bottom Elevation Area (sf)	Depth to Treatment Elevation (ft)	Treatment Elevation Area (sf)	Depth to Top Elevation (ft)	Top Elevation Area (sf)	Treatment Volume (cf)	Storage Volume (cf)
3	2777	0.50	2777	1.0	2777	1388.5	2777
						1388.5	2777

Adequate Treatment Volume

UNDERGROUND PERCOLATION GALLERIES

Soil Infiltration Rate: 2.5 in/hr
 5.78704E-05 ft/sec
 Voids in Drainrock: 0.4
 Gallery Outflow Rate: 0.22 cfs

Gallery ID Number	Gallery Width (ft)	Bottom Length (ft)	Gallery Depth (ft)	Total Infiltration Area (Bottom Area) (sf)	Pipe Length (ft)	Pipe Diameter (ft)	Pipe Volume (cf)	Drainrock Volume (cf)	Total Gallery Volume (cf)
5	25.0	60.0	3.0	1500	60.0	1.0	47.1	1781.2	1828.3
6	25.0	43.0	3.0	1075	43.0	1.0	33.8	1276.5	1310.3
7	25.0	46.0	3.0	1150	46.0	1.0	36.1	1365.5	1401.7
				3725					4540

SUMMARY

Total Outflow: 0.22 cfs
Total Storage: 7317 cf

See next page for storage requirement calculations

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: Sub Basin B2

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Time of Conc. (min) 5.00
 Area (Acres) 0.61
 Composite "C" 0.72
 Volume Provided 7317
 Outflow (cfs) 0.22
 Area * C" Factor 0.44
 "m" coefficient * 0.00
 "n" coefficient * 0

* "m" and "n" coefficients obtained from Figure 2-4 from the WSDOT Hydraulics Manual

#1 Time Inc. (min.)	#2 Time Inc. (sec.) (#1*60)	#3 Intensity (in./hr.)	#4 Q dev. (cfs) (A*C*#3)	#5 V in (cu. ft.)	#6 V out (cu. ft.) (Outf.*#2)	#7 Storage (cu. ft.) (#5-#6)
5.00	300.00	0.00	0.00	0	64.67	-65
5	300	0.00	0.00	0	64.67	-65
10	600	0.00	0.00	0	129.34	-129
15	900	0.00	0.00	0	194.01	-194
20	1200	0.00	0.00	0	258.68	-259
25	1500	0.00	0.00	0	323.35	-323
30	1800	0.00	0.00	0	388.02	-388
35	2100	0.00	0.00	0	452.69	-453
40	2400	0.00	0.00	0	517.36	-517
45	2700	0.00	0.00	0	582.03	-582
50	3000	0.00	0.00	0	646.70	-647
55	3300	0.00	0.00	0	711.37	-711
60	3600	0.00	0.00	0	776.04	-776
65	3900	0.00	0.00	0	840.71	-841
70	4200	0.00	0.00	0	905.38	-905
75	4500	0.00	0.00	0	970.05	-970
80	4800	0.00	0.00	0	1034.72	-1035
85	5100	0.00	0.00	0	1099.39	-1099
90	5400	0.00	0.00	0	1164.06	-1164
95	5700	0.00	0.00	0	1228.73	-1229
100	6000	0.00	0.00	0	1293.40	-1293

Rainfall intensities were calculated by using the equation in Section 2-5.4 of the WSDOT Hydraulics Manual

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Maximum storage required by Bowstring = -65 cf
 Storage Provided = 7317 cf
 Storage Volume: Adequate

Table value at 72 hours:
 4320 259200 0.00 0.00 0 55875 -55875
 Swale / Infiltration Gallery drains within 72 hours

SCS METHOD - 25-YEAR STORM VOLUME

Basin	0.61 Acres	26605 s.f.		Impervious	
				P ₂₅ =	2.9 in
				S =	0.20
	Areas	CN	A*CN	Q ₂₅ =	2.67 in
	(Ac.)		Areas (s.f.)	V _i =	4468 cf
Asphalt	0.41	98	39.8277	17703	
Sidewalks	0.05	98	5.3702	2387	Pervious
Building / Roof	0.00	98	0.0000	0	P ₂₅ = 2.9 in
Other	0.00	98	0.0000	0	S = 6.39
Grass / Landscaping	0.15	61	9.1234	6515	Q ₂₅ = 0.33 in
Unimproved	0.00	58	0.0000	0	V = 178 cf
Gravel	0.00	85	0.0000	0	
				V _{TOT} =	4648 cf
	Impervious A	Impervious CN	Pervious A	Pervious CN	
	0.46	98.00	0.15	61.00	

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: Basin C

CONTRIBUTING AREAS

Site	0.63 Acres		27480 s.f.		"C"	A°C	
	PGIS Areas (s.f.)	Non-PGIS Areas (s.f.)	PGIS Areas (Ac.)	Non-PGIS Areas (Ac.)			
Asphalt	0	0	0.00	0.00	0.90	0.0000	<u>Total Impervious</u> 0.27
Sidewalks	0	1715	0.00	0.04	0.90	0.0354	
Building / Roof	0	9855	0.00	0.23	0.90	0.2036	<u>Total Pervious</u> 0.37
Gravel	0	0	0.00	0.00	0.61	0.0000	
Grass / Landscaping	0	15910	0.00	0.37	0.17	0.0621	
Unimproved	0	0	0.00	0.00	0.33	0.0000	
Other	0	0	0.00	0.00	0.30	0.0000	
			<u>Total A (PGIS)</u>	<u>Total A (Non-PGIS)</u>	<u>Comp "C"</u>		
			0.00	0.63	0.48		

*C-values increased by 10% for 25-year storm

RATIONAL METHOD

Time of Conc. (min)	5.00	Intensity I*	Q peak (cfs) Q = CIA
		2.90	0.87

*Intensity (I) based on the Idaho Transportation Department, Figure I-C, Zone C, Intensity - Duration - Frequency Curve

UNDERGROUND PERCOLATION GALLERIES

Soil Infiltration Rate: 2.5 in/hr
 5.78704E-05 ft/sec
 Voids in Drainrock: 0.4
 Gallery Outflow Rate: 0.15 cfs

Gallery ID Number	Gallery Width (ft)	Bottom Length (ft)	Gallery Depth (ft)	Total Infiltration Area (Bottom Area) (sf)	Pipe Length (ft)	Pipe Diameter (ft)	Pipe Volume (cf)	Drainrock Volume (cf)	Total Gallery Volume (cf)
8	16.0	160.0	3.0	2560.0	160.0	1.0	125.7	3021.7	3147.4
				2560					3147

SUMMARY

Total Outflow: 0.15 cfs
Total Storage: 3147 cf

See next page for storage requirement calculations

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: Basin C

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Time of Conc. (min) 5.00
 Area (Acres) 0.63
 Composite "C" 0.48
 Volume Provided 3147
 Outflow (cfs) 0.15
 Area * C" Factor 0.30
 "m" coefficient * 0.00
 "n" coefficient * 0

* "m" and "n" coefficients obtained from Figure 2-4 from the WSDOT Hydraulics Manual

#1 Time Inc. (min.)	#2 Time Inc. (sec.) (#1*60)	#3 Intensity (in./hr.)	#4 Q dev. (cfs) (A*C*#3)	#5 V in (cu. ft.)	#6 V out (cu. ft.) (Out.*#2)	#7 Storage (cu. ft.) (#5-#6)
5.00	300.00	0.00	0.00	0	44.44	-44
5	300	0.00	0.00	0	44.44	-44
10	600	0.00	0.00	0	88.89	-89
15	900	0.00	0.00	0	133.33	-133
20	1200	0.00	0.00	0	177.78	-178
25	1500	0.00	0.00	0	222.22	-222
30	1800	0.00	0.00	0	266.67	-267
35	2100	0.00	0.00	0	311.11	-311
40	2400	0.00	0.00	0	355.56	-356
45	2700	0.00	0.00	0	400.00	-400
50	3000	0.00	0.00	0	444.44	-444
55	3300	0.00	0.00	0	488.89	-489
60	3600	0.00	0.00	0	533.33	-533
65	3900	0.00	0.00	0	577.78	-578
70	4200	0.00	0.00	0	622.22	-622
75	4500	0.00	0.00	0	666.67	-667
80	4800	0.00	0.00	0	711.11	-711
85	5100	0.00	0.00	0	755.56	-756
90	5400	0.00	0.00	0	800.00	-800
95	5700	0.00	0.00	0	844.44	-844
100	6000	0.00	0.00	0	888.89	-889

Rainfall intensities were calculated by using the equation in Section 2-5.4 of the WSDOT Hydraulics Manual

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Maximum storage required by Bowstring = -44 cf
 Storage Provided = 3147 cf
 Storage Volume: Adequate

Table value at 72 hours:

4320	259200	0.00	0.00	0	38400	-38400
------	--------	------	------	---	-------	--------

Swale / Infiltration Gallery drains within 72 hours

SCS METHOD - 25-YEAR STORM VOLUME

Basin	0.63 Acres	27480 s.f.		Impervious	
				P ₂₅ =	2.9 in
				S =	0.20
Areas	CN	A*CN	Areas (s.f.)	Q ₂₅ =	2.67 in
(Ac.)				V _i =	2573 cf
Asphalt	98	0.0000	0	Pervious	
Sidewalks	98	3.8584	1715	P ₂₅ =	2.9 in
Building / Roof	98	22.1715	9855	S =	6.39
Other	98	0.0000	0	Q ₂₅ =	0.33 in
Grass / Landscaping	61	22.2798	15910	V =	435 cf
Unimproved	58	0.0000	0		
Gravel	85	0.0000	0		
				V _{TOT} =	3008 cf
Impervious A	Impervious CN	Pervious A	Pervious CN		
0.27	98.00	0.37	61.00		

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: Basin D

CONTRIBUTING AREAS

Site	0.63 Acres		27405 s.f.		"C"	A"C	
	PGIS Areas (s.f.)	Non-PGIS Areas (s.f.)	PGIS Areas (Ac.)	Non-PGIS Areas (Ac.)			
Asphalt	0	0	0.00	0.00	0.90	0.0000	<u>Total Impervious</u> 0.26
Sidewalks	0	1715	0.00	0.04	0.90	0.0354	
Building / Roof	0	9780	0.00	0.22	0.90	0.2021	
Gravel	0	0	0.00	0.00	0.61	0.0000	<u>Total Pervious</u> 0.37
Grass / Landscaping	0	15910	0.00	0.37	0.17	0.0821	
Unimproved	0	0	0.00	0.00	0.33	0.0000	
Other	0	0	0.00	0.00	0.30	0.0000	
			<u>Total A (PGIS)</u>	<u>Total A (Non-PGIS)</u>	<u>Comp "C"</u>		
			0.00	0.63	0.48		

*C-values increased by 10% for 25-year storm

RATIONAL METHOD

Time of Conc. (min)	5.00	Intensity I*	Q peak (cfs) Q = CIA
		2.90	0.87

*Intensity (I) based on the Idaho Transportation Department, Figure I-C, Zone C, Intensity - Duration - Frequency Curve

UNDERGROUND PERCOLATION GALLERIES

Soil Infiltration Rate 2.5 in/hr
 5.78704E-05 ft/sec
 Voids in Drainrock 0.4
 Gallery Outflow Rate 0.15 cfs

Gallery ID Number	Gallery Width (ft)	Bottom Length (ft)	Gallery Depth (ft)	Total Infiltration Area (Bottom Area) (sf)	Pipe Length (ft)	Pipe Diameter (ft)	Pipe Volume (cf)	Drainrock Volume (cf)	Total Gallery Volume (cf)
9	16.0	160.0	3.0	2560.0	160.0	1.0	125.7	3021.7	3147.4
				<u>2560.0</u>					<u>3147</u>

SUMMARY

Total Outflow: 0.15 cfs
Total Storage: 3147 cf

See next page for storage requirement calculations

STORM WATER MANAGEMENT CALCULATIONS -

25 Year Design Storm

PROJECT: Ponderay Plaza Apartments
DATE: 1/7/2022
BY: CLJ



10 North Post St., Suite 500
 Spokane, WA 99201
 (509) 328-2994

BASIN: Basin D

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Time of Conc. (min) 5.00
 Area (Acres) 0.63
 Composite "C" 0.48
 Volume Provided 3147
 Outflow (cfs) 0.15
 Area * C" Factor 0.30
 "m" coefficient * 0.00
 "n" coefficient * 0 -

*"m" and "n" coefficients obtained from Figure 2-4 from the WSDOT Hydraulics Manual

#1 Time Inc. (min.)	#2 Time Inc. (sec.) (#1*60)	#3 Intensity (in./hr.)	#4 Q dev. (cfs) (A*C*#3)	#5 V in (cu. ft.)	#6 V out (cu. ft.) (Outf.*#2)	#7 Storage (cu. ft.) (#5-#6)
5.00	300.00	0.00	0.00	0	44.44	-44
5	300	0.00	0.00	0	44.44	-44
10	600	0.00	0.00	0	88.89	-89
15	900	0.00	0.00	0	133.33	-133
20	1200	0.00	0.00	0	177.78	-178
25	1500	0.00	0.00	0	222.22	-222
30	1800	0.00	0.00	0	266.67	-267
35	2100	0.00	0.00	0	311.11	-311
40	2400	0.00	0.00	0	355.56	-356
45	2700	0.00	0.00	0	400.00	-400
50	3000	0.00	0.00	0	444.44	-444
55	3300	0.00	0.00	0	488.89	-489
60	3600	0.00	0.00	0	533.33	-533
65	3900	0.00	0.00	0	577.78	-578
70	4200	0.00	0.00	0	622.22	-622
75	4500	0.00	0.00	0	666.67	-667
80	4800	0.00	0.00	0	711.11	-711
85	5100	0.00	0.00	0	755.56	-756
90	5400	0.00	0.00	0	800.00	-800
95	5700	0.00	0.00	0	844.44	-844
100	6000	0.00	0.00	0	888.89	-889

Rainfall intensities were calculated by using the equation in Section 2-5.4 of the WSDOT Hydraulics Manual

BOWSTRING METHOD - REQUIRED STORAGE VOLUME

Maximum storage required by Bowstring = -44 cf
 Storage Provided = 3147 cf
 Storage Volume: Adequate

Table value at 72 hours:

4320 259200 0.00 0.00 0 38400 -38400
 Swale / Infiltration Gallery drains within 72 hours

SCS METHOD - 25-YEAR STORM VOLUME

Basin	0.63 Acres	27405 s.f.		Impervious
	Areas (Ac.)	CN	A*CN	Areas (s.f.)
Asphalt	0.00	98	0.0000	0
Sidewalks	0.04	98	3.8584	1715
Building / Roof	0.22	98	22.0028	9780
Other	0.00	98	0.0000	0
Grass / Landscaping	0.37	61	22.2798	15910
Unimproved	0.00	58	0.0000	0
Gravel	0.00	85	0.0000	0
	Impervious A	Impervious CN	Pervious A	Pervious CN
	0.26	98.00	0.37	61.00

P₂₅ = 2.9 in
 S = 0.20
 Q₂₅ = 2.67 in
 V_i = 2556 cf
 P₂₅ = 2.9 in
 S = 6.39
 Q₂₅ = 0.33 in
 V = 435 cf
 V_{TOT} = 2991 cf

GEOTECHNICAL REPORT

ATTACHMENT "C"



November 10, 2021

Eastmark Capital Group
2212 Queen Anne Ave N #339
Seattle, Washington 98109

Attention: Mr. Sean M. Barnes

RE: Limited Geotechnical Evaluation
Ponderay Land
Schweitzer Plaza Drive and Triangle Drive
Ponderay, Idaho
ALLWEST Project No. 121-411G

Mr. Barnes,

ALLWEST has completed the authorized Limited Geotechnical Evaluation for the property located at Schweitzer Plaza Drive and Triangle Drive in Ponderay, Idaho. The purpose of this evaluation was to characterize the soil and geologic conditions on the property and prepare the attached report with the results of the field evaluation and our geotechnical recommendations to assist with design and construction of the proposed project. Based on our evaluation, the site is suitable for the planned development.

We appreciate the opportunity to work with you on this project. If you have any questions or need additional information, please call us at 208.762.4721.

Sincerely,
ALLWEST

Kenneth Rukavina, G.I.T.
Staff Geologist

Samuel P. Sommers, P.E.
Engineering Services Manager

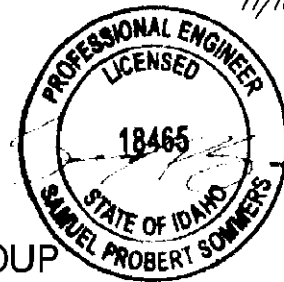


GEOTECHNICAL | ENVIRONMENTAL
MATERIALS TESTING | SPECIAL INSPECTION

AN EMPLOYEE-OWNED COMPANY

**LIMITED GEOTECHNICAL EVALUATION
PONDERAY LAND
SCHWEITZER PLAZA DRIVE AND TRIANGLE DRIVE
PONDERAY, IDAHO
ALLWEST PROJECT NO. 121-411G**

November 10, 2021



Prepared for:
EASTMARK CAPITAL GROUP
2212 QUEEN ANNE AVE N #339
SEATTLE, WASHINGTON 98109

Prepared by:
ALLWEST
690 W. CAPSTONE CT.,
HAYDEN, ID 83835



690 W. Capstone Ct., Hayden, ID 83835
Phone: 208.762.4721

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PONDERAY LAND
SCHWEITZER PLAZA DRIVE AND TRIANGLE DRIVE
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EXECUTIVE SUMMARY

ALLWEST has completed the authorized geotechnical evaluation for the Ponderay Land project located at Schweitzer Plaza Drive and Triangle Drive in Ponderay, Idaho. The purpose of this evaluation was to assess the subsurface conditions on the project site with respect to the planned development. This report details the results of the field evaluation and laboratory testing and presents our geotechnical recommendations to assist the design and construction of the planned development. The following geotechnical considerations were identified:

- ◆ The topsoil and native soils are unsuitable for use as structural fill.
- ◆ We recommend a permanent foundation drainage system be designed and constructed around the perimeter of the structures.
- ◆ Two infiltration tests were performed in the northern section of the site, west and east of the existing radio tower. The tests were performed within the silt with sand stratum, just past the topsoil. The percolation rate for both tests was measured to be 5-inches per hour. We recommend a design infiltration rate of 2.5 inches per hour.

Our services were provided in accordance with our proposal no. 121-411G dated September 16, 2021. Close monitoring of the construction operations discussed herein will be critical in achieving the design subgrade support. If we are not retained to provide required construction observation and materials testing services, we cannot be responsible for soil engineering related construction errors or omissions. This summary should be used in conjunction with the entire report for design purposes. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. Section *7.0 EVALUATION LIMITATIONS* should be read for an understanding of the report limitations.



**LIMITED GEOTECHNICAL EVALUATION
PONDERAY LAND
SCHWEITZER PLAZA DRIVE AND TRIANGLE DRIVE
PONDERAY, IDAHO**

1.0 PROJECT DESCRIPTION

We understand the site is mostly undeveloped, except for an existing radio tower in the northern section of the site. At this time, we evaluated the site conditions specifically for stormwater disposal potential. A separate evaluation for the proposed commercial buildings will be completed when the proposed building locations and approximately footing loads are provided. If the proposed design or loads vary from those stated, we should be notified to review our recommendations and provide additional or revised information, as necessary.

2.0 EVALUATION PROCEDURES

To complete this evaluation, we reviewed soil and geologic literature for the project site and surrounding area. We evaluated the subsurface conditions at the site by excavating twenty-five test pits throughout the project site. Information obtained from the field evaluation, laboratory testing, and geotechnical analyses was utilized to develop the recommendations presented in this report.

3.0 SITE CONDITIONS

The project site is partially developed, 11 acres in total size. Topographically, the property is relatively flat. The property is bordered by multiple developed parcels to the north, U.S. Rte 95 to the west, Schweitzer Plaza Drive to the south, and Triangle drive to the east. The ground coverage consists of mostly grass, soil, and 2 to 24-inch coniferous trees. The property has been partially logged, leaving existing slash piles throughout the site.

3.1 SUBSURFACE CONDITIONS

3.1.1 Published Geologic Information

The geologic conditions in the site vicinity are mapped on the Geologic Map of the Sandpoint Quadrangle, Bonner County, Idaho, by S. Lewis, F. Burmester, M. Breckenridge, E. Box, and D. McFadden, 2006. The project site is mapped as glaciolacustrine deposits (Pleistocene to Holocene), which is described as massive to finely laminated clay, silt, and sand deposited in ice marginal and post glacial lakes in the Purcell Trench.

The USDA Natural Resources Conservation Service (NRCS) has mapped the soils on and around the property predominately as the Mission silt loam and the Odenson silt loam. The Mission silt loam is described as volcanic ash and loess over silty glaciolacustrine deposits. The soil profile



is described as silt, silty clay, and very fine sandy loam. The permeability is slow, and run-off is slow. A season high water table is reported at a depth of 12 inches from February through May. The Odenson soil is described as very deep, poorly drained soil in low areas. It formed in silty glacial lake-laid sediment derived from mixed sources and has a mantle of loess and volcanic ash. The soil profile is described as silt, silty clay, and very fine sandy loam. The permeability is slow, run-off is slow, and the hazard of erosion is none to slight. A seasonal high-water table is reported at a depth of 6 to 24 inches from February to June.

3.1.2 Subsurface Exploration Program

We observed the excavation of 25 test pits at the site on September 28, 2021, and September 29, 2021, utilizing a Bobcat E50 with a 24-inch toothed excavation bucket. The approximate locations of the test pits are shown on Figure A-1, Exploration Location Plan in Appendix A. The soil conditions observed in the test pits were visually described and classified in general accordance with ASTM D 2488 and we logged the subsurface profiles.

Detailed descriptions of the soil observed within the test pits are presented on individual test pit logs in Appendix B of this report. The descriptive soil terms used on the test pit logs, and in this report, can be referenced by the *Unified Soil Classification System (USCS)*. A summary of the USCS is included in Appendix B. The subsurface conditions may vary between exploration locations; such changes in subsurface conditions may not be apparent until construction.

The near surface geologic profile appears to consist of topsoil overlying native fine-grained soils. General descriptions of the observed soil units follow:

Topsoil – Topsoil was encountered in all the test pits. The topsoil layer varied from 6 to 12 inches in thickness.

Native Fine-Grained Soil – Underlying the topsoil we encountered native fine-grained soil, consisting of silt, sand, and clay.

3.2 Groundwater Conditions

We did not encounter groundwater within our explorations. We did not observe surface water on the property during our evaluation. Changes in precipitation, irrigation, construction, or other factors may impact depth to groundwater and the surface water flow on the property and therefore, conditions may be different during construction.

4.0 LABORATORY TESTING

We performed laboratory testing to supplement field classifications and to assess some of the soil engineering properties and parameters. The laboratory testing included liquid and plastic limits (ASTM D 4318), moisture content (ASTM D 2216), fines content (ASTM D 1140). The laboratory test results are included in Appendix C of this report, and some results are also summarized on the test pit logs in Appendix B.



5.0 CONCLUSIONS AND RECOMMENDATIONS

The previous sections of this report presented our understanding of the proposed project and surface and subsurface site conditions. The following conclusions and recommendations are based on this understanding. If the proposed development changes or if unforeseen conditions are encountered, we must be given the opportunity to review the new information and, if necessary, update our recommendations. Additionally, if the geotechnical parameters presented in this report are utilized for the design of structures or retaining walls, we need to be given the opportunity to review the plans and specifications to determine whether the recommendations presented in this report were properly incorporated.

5.1 Site Preparation

Clearing and Stripping: Once temporary erosion and sediment control (TESC) measures are installed, we expect site preparation to continue with clearing and grubbing brush and stripping of organic-rich topsoil. Based on our explorations, the stripping depth for topsoil removal is estimated to be approximately 6 to 12 inches. Clearing and stripping debris should be wasted off-site or used for topsoil within non-structural/landscape areas.

Subgrade Preparation: ALLWEST defines the subgrade as the native soil exposed at the base of excavation prior to placement of fill or concrete. The subgrade requires an evaluation by the geotechnical engineer of record or staff under their supervision to confirm the site conditions are consistent with those observed during our geotechnical evaluation. The subgrade should be moisture conditioned to within two percentage points of the optimum moisture content for compaction. The subgrade should then be compacted to a firm and unyielding condition.

In the event the exposed subgrade becomes unstable, yielding, or unable to be compacted due to high moisture conditions or construction traffic, we recommend that the materials be removed to a sufficient depth to develop stable subgrade soils that can be compacted to the minimum recommended levels. The severity of construction problems will be dependent, in part, on the precautions that are taken by the contractor to protect the subgrade soils.

5.2 Excavation

Based on the conditions observed within our explorations, we anticipate excavation of the on-site soil can be achieved with typical excavation equipment. Temporary excavation slope stability is a function of many factors, including:

- ◆ The presence and abundance of groundwater;
- ◆ The type and density of the various soil strata;
- ◆ The depth of cut;
- ◆ Surcharge loadings adjacent to the excavation; and
- ◆ The length of time the excavation remains open.



It is exceedingly difficult under the variable circumstances to pre-establish a safe and "maintenance-free" temporary cut slope angle. Therefore, it is the responsibility of the contractor to maintain safe temporary slope configurations since the contractor is continuously at the job site, able to observe the nature and condition of the cut slopes, and able to monitor the subsurface materials and groundwater conditions encountered. Unsupported vertical slopes or cuts deeper than 4 feet are not recommended if worker access is necessary. The cuts should be adequately sloped, shored, or supported to prevent injury to personnel from local sloughing and spalling. The excavation should conform to applicable federal, state, and local regulations. Regarding trench wall support, the site soil is considered Type C soil according to OSHA guidelines and therefore should not exceed a 1.5H:1V (horizontal to vertical) temporary slope.

We recommend that all permanent cut or fill slopes constructed in native soils be designed at a 2H:1V inclination or flatter. All permanent cut and fill slopes should be adequately protected from erosion both temporarily and permanently. Prior to construction ALLWEST should be provided a copy of the final grading plan to determine whether the proposed site grading will affect the recommendations provided in this report.

5.3 Materials

The topsoil and native soils are unsuitable for use as structural fill.

Import materials should consist of granular soil, free of organics, debris, and other deleterious material and meet the following criteria. Import materials should be approved by the Geotechnical Engineer prior to delivery to the site. *Table 1* below presents our recommended requirements for structural fill and utility trench backfill materials.

Fill Type	Criteria
Structural Fill	Maximum size \leq 3 inches; Retained on $\frac{3}{4}$ -inch sieve $<$ 30% Passing No. 200 Sieve \leq 10%; Non-plastic
Utility-Trench Backfill	Maximum size \leq 2 inches; Passing No. 200 Sieve \leq 15%; Non-plastic

Table 1 - Structural fill / utility trench backfill requirements.

5.4 Fill Placement and Compaction

Fill should be placed in lift thicknesses which are appropriate for the compaction equipment used. Typically, eight-inch loose lifts are appropriate for typical rubber tire and steel drum compaction equipment. Lift thicknesses should be reduced to four inches for hand operated compaction equipment. Fill should be moisture conditioned to within two percentage points of the optimum moisture content prior to placement to facilitate compaction. Structural fill and utility trench backfill should be compacted to a minimum of 95 percent of the maximum dry density established by ASTM D1557 (modified Proctor).



5.5 Wet Weather Construction

Due to the climatic effects in this region during late fall, winter, and spring (generally wet conditions), we recommend construction (especially site grading) take place during the summer and early fall season, if possible. If construction occurs during or immediately after excessive precipitation, it may be necessary to over-excavate and replace wet subgrade soil which might otherwise be suitable.

We recommend earthwork for this site be scheduled for the drier seasons of the year. If construction is undertaken in wet periods of the year, it will be important to slope the ground surface to provide drainage away from construction.

5.6 Cold Weather Construction

We recommend removal of frost susceptible soils (soil with fines contents greater than 10 percent) within the frost-depth zone below concrete flatwork (sidewalks, patios, etc.) to reduce the potential detrimental effects of frost heave.

If site grading and construction are anticipated during cold weather, we recommend good winter construction practices be observed. Snow and ice should be removed from excavated and fill areas prior to additional earthwork or construction. Footings, floor slabs or structural portions of the construction should not be placed on frozen ground; nor should the supporting soils for buildings be permitted to freeze during or after construction. Frozen soils should not be used as backfill or fill.

5.7 Lateral Earth Pressures

Below-grade building walls should be designed to resist lateral earth pressures. *Table 2* below presents the equivalent fluid pressures for structural fill for calculation of lateral earth pressures. For recommendations for site retaining wall design, refer to the section *5.8 Retaining Walls* of this report.

Condition	Equivalent Fluid Pressure Structural Fill (pcf)
At-rest	55
Active	35
Passive	350

Table 2 - Lateral earth pressures for structural fill.

The above values are for level backfill only and do not account for hydrostatic forces. Walls should be provided with adequate drainage so hydrostatic forces do not adversely affect the walls. We recommend placement of gravel behind walls and/or weep holes to assist with drainage and reduce the potential for the buildup of hydrostatic pressures. Walls that are braced in a manner that does not allow any rotational movement (rigid) (e.g. basement walls) should be designed using the given "at-rest" equivalent fluid pressure. The active and at-rest pressures should be

increased by an equivalent fluid weight of 10 pounds per cubic foot (pcf) and the passive pressure should be reduced by 10 pcf for seismic design. The dynamic component of the active pressure acts at a height of approximately 0.6 times the height of the wall.

5.8 Retaining Walls

At the time this report was prepared we have no knowledge of planned retaining walls for this project. If retaining walls are to be implemented as part of this project ALLWEST should be provided the opportunity to review the plans to determine if further geotechnical evaluation is required. We may need to develop wall specific lateral earth pressures depending on location and height of proposed retaining walls. Our scope of services did not include segmental block design, boulder faced slope design, or global stability analyses; we can provide these services for an additional fee, if requested.

5.9 Seismicity

We anticipate the *2018 International Building Code (IBC)* will be used as the basis for design of the proposed structures. The soil at the site can be characterized as Site Class E for seismic design.

Table 3 below contains seismic parameters that were calculated using USGS U.S. Seismic Design Maps for use with the 2018 IBC. The latitude and longitude for the site were used to specify the location of the subject property.

Latitude (degrees)	Longitude (degrees)	Spectral Accelerations		Site Coefficients	
		S _s	S ₁	F _a	F _v
48.3062	-116.5421	0.332g	0.112g	2.171	4.2

Table 3 - Seismic design parameters.

5.10 Stormwater and Drainage

We recommend a permanent foundation drainage system be designed and constructed around the perimeter of the structures. The drainage system should consist of a four-inch diameter, Schedule 40 or ADS, perforated pipe surrounded with a free draining aggregate. The pipe should be located at the lowest elevation of the footing trench excavation such that gravity drainage may be achieved. Water collected in the drains should be discharged down-gradient of the structure.

We recommend the grading plan include slopes such that storm water run-off is directed away from the building and pavement areas to a storm water management system. We recommend ground surface adjacent to foundations be sloped a minimum of five percent within ten feet of the building. If the adjoining ground surface consists of hardscapes it may be sloped a minimum of two percent in the first ten feet. Water should not be allowed to infiltrate or pond adjacent to the foundations.

Infiltration Testing: Two infiltration tests were performed in the northern section of the site, west and east of the existing radio tower. The tests were performed within the silt with sand stratum,

just past the topsoil. The percolation rate for both tests was measured to be 5-inches per hour. We recommend an design infiltration rate of 2.5 inches per hour be used.

6.0 ADDITIONAL RECOMMENDED SERVICES

We recommend ALLWEST be retained to provide construction materials testing and observation to verify the soil and geologic conditions and the report recommendations are incorporated into the actual construction. The design engineer of record should determine applicable testing and special inspection requirements in accordance with the governing code documents. If we are not retained to provide required construction observation and materials testing services, we cannot be responsible for soil engineering related construction errors or omissions.

7.0 EVALUATION LIMITATIONS

This report has been prepared to assist the planning and design for the Ponderay Land project located at Schweitzer Plaza Drive and Triangle Drive in Ponderay, Idaho. Reliance by any other party is prohibited without the written authorization of ALLWEST. Our services consist of professional opinions and conclusions made in accordance with generally accepted geotechnical engineering principles and practices in the local area at the time this report was prepared. This acknowledgement is in lieu of all warranties, express or implied.

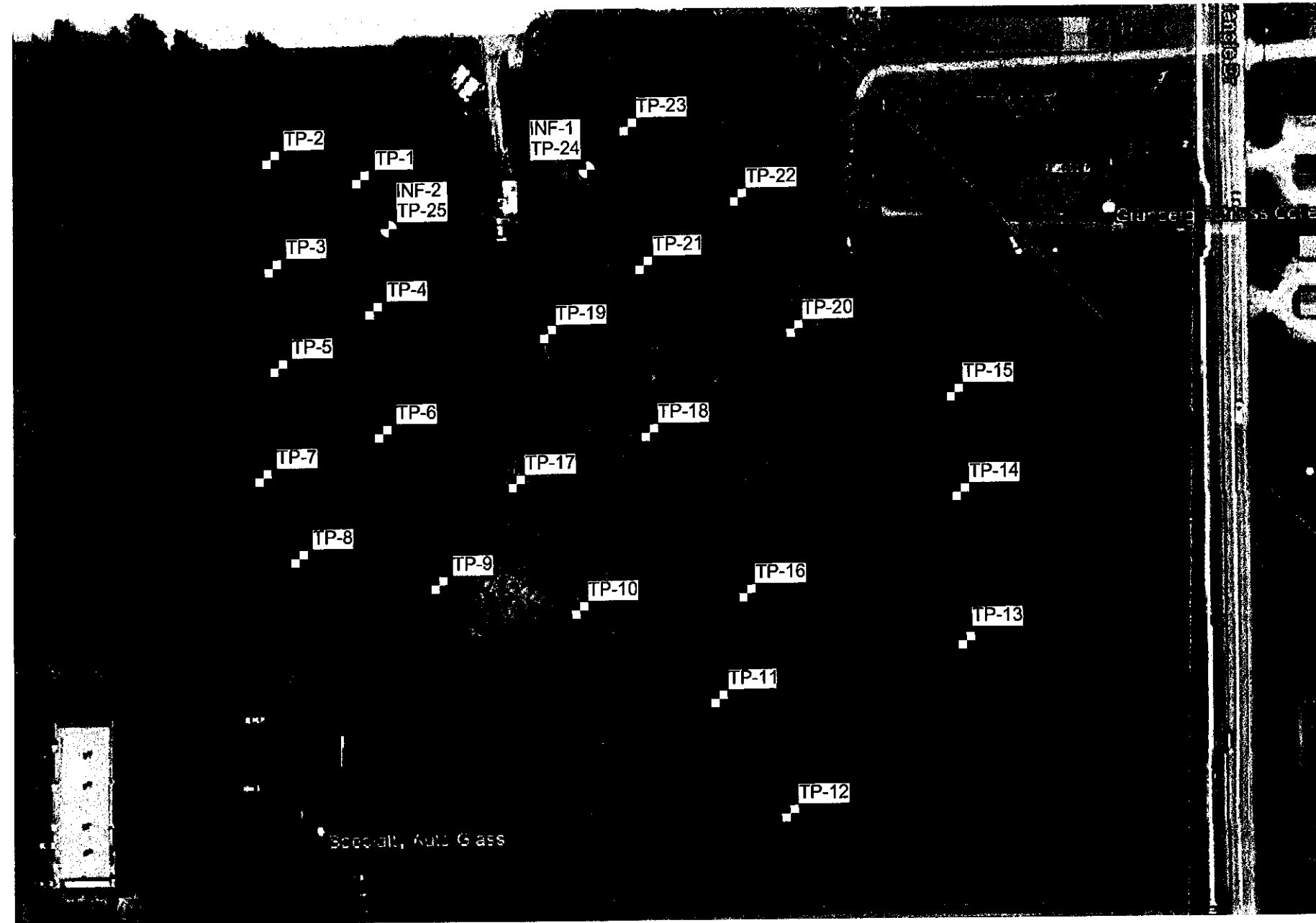
The following appendices complete this report:

- Appendix A – Site and Exploration Plan
- Appendix B – Test Pit Logs, Unified Soil Classification System
- Appendix C – Laboratory Test Results



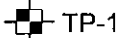

Appendix A
Site and Exploration Plan





BASEMAP SOURCE: GOOGLE EARTH PRO, COPYRIGHT 2021 GOOGLE.

LEGEND:

-  TP-1 TEST PIT NUMBER AND APPROXIMATE LOCATION
-  INF-1 INFILTRATION NUMBER AND APPROXIMATE LOCATION



690 W Capstone Court
 Hayden, Idaho 83835
 (208) 762-4721
www.allwesttesting.com

FIGURE A-1: SITE AND EXPLORATION PLAN

PROJECT:	121-411G PONDERAY LAND		
LOCATION:	SCHWEITZER PLAZA DR. AND TRIANGLE DR.		
CLIENT NAME:	EASTMARK CAPITAL GROUP		
DATE:	OCTOBER, 2021	SCALE:	NOT TO SCALE

Appendix B

Test Pit Logs Unified Soil Classification System



ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/202
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-1
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 11'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1	ML	SILT with sand, gray-brown, moist, stiff.	
2			
3			
4			
5	CL	Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist to very moist, stiff to medium stiff.	
6			
7			
8			
9			
10			
11		Test pit TP-1 terminated at 11 feet. No groundwater observed. No caving observed.	
12			
13			
14	WATER LEVELS		
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING		

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-2

EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1	ML	SILT with sand, gray-brown, moist, stiff.	
2			
3			
4			
5	CL	Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist to very moist, stiff to medium stiff.	
6			
7			
8			
9			
10		Test pit TP-2 terminated at 10 feet. No groundwater observed. No caving observed.	
11			
12			
13			
14	WATER LEVELS		
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING		

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG




DATE STARTED: 9/28/20.
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-3

EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	NOTES
		TOTAL DEPTH: 10'		
0	TOPSOIL	Topsoil, dark brown, moist. Contained roots.		
1	CL	Lean CLAY, gray-brown, moist, stiff.		Liquid and Plastic Limits Test at 3 feet. Liquid Limit = 31 Plastic Limit = 23 Plasticity Index = 8 #200 Wash Test at 3 feet. Silt / Clay = 92%
2				
3				
4				
5				
6	ML	SILT with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.		
7				
8	CL	Lean CLAY, light brown, very moist, medium stiff.		
9				
10		Test pit TP-3 terminated at 10 feet. No groundwater observed. No caving observed.		
11				
12				
13				

14	WATER LEVELS
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-4

EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'	GRAPHIC LOG	NOTES
		DESCRIPTION		
0	TOPSOIL	Topsoil, dark brown, moist.		
1	ML	SILT with sand, gray-brown, moist, stiff.		
2				
3				
4				
5				
6	CL	Lean CLAY with interbedded layers of SILT, light brown to gray, moist, medium stiff.		
7				
8	CL	Lean CLAY, light brown, very moist, medium stiff.		
9				
10		Test pit TP-4 terminated at 10 feet. No groundwater observed. No caving observed.		#200 Wash Test at 7 feet. Silt / Clay = 94%
11				
12				
13				

14	WATER LEVELS
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-5
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (#)	USCS	TOTAL DEPTH: 9'	GRAPHIC LOG	NOTES
		DESCRIPTION		
0	TOPSOIL	Topsoil, dark brown, moist.		
0.5		SILT with sand, gray-brown, moist, stiff.		
1				
2				
3	ML			
4				
5		Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.		
6	CL			
7				
8	CL	Lean CLAY, light brown, very moist, medium stiff.		
9		Test pit TP-5 terminated at 9 feet. No groundwater observed. No caving observed.		
10				
11				
12				
13				

14	WATER LEVELS
	∇ WHILE EXCAVATING
	∇ AT COMPLETION
	∇ AFTER EXCAVATING

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20
 DATE FINISHED: 9/28/2021
 OPERATOR: Rick Marcus
 COMPANY: R&K, LLC
 LOGGER: Kenny Rukavina
 WEATHER: Rain

TEST PIT TP-6
 EXCAVATOR: Bobcat E50
 EXCAVATION METHOD: 24" Toothed Soil
 Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'	GRAPHIC LOG	NOTES
		DESCRIPTION		
0	TOPSOIL	Topsoil, dark brown, moist.		
1	ML	SILT with sand, gray-brown, moist, very stiff.		
2				
3				
4	CL	Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.		
5				
6	CL	Lean CLAY with sand lenses, fine-grained, light brown, very moist, medium stiff.		
7				
8	CL	Lean CLAY with sand lenses, fine-grained, light brown, very moist, medium stiff.		
9				
10		Test pit TP-6 terminated at 10 feet. No groundwater observed. No caving observed.		
11				
12				
13				

14	WATER LEVELS
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING

**ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG**

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-7

EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 9'		GRAPHIC LOG	NOTES
		DESCRIPTION			
0	TOPSOIL	Topsoil, dark brown, moist.			
1	ML	SILT with sand, gray-brown, moist, stiff.			
2					
3					
4					
5					
6	CL	Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.			
7					
8	CL	Lean CLAY, light brown, very moist, medium stiff.			
9		Test pit TP-7 terminated at 9 feet. No groundwater observed. No caving observed.			
10					
11					
12					
13					

14	WATER LEVELS
	▽ WHILE EXCAVATING
	▽ AT COMPLETION
	▽ AFTER EXCAVATING

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-8
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	NOTES
		TOTAL DEPTH: 10'		
0	TOPSOIL	Topsoil, dark brown, moist.		
0.5		SILT with sand, gray-brown, moist, stiff.		
1				
2				
3	ML			
4				
5				
6		Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.		
7	CL			
8		Lean CLAY with sand lenses, fine-grained, light brown, very moist, medium stiff to stiff.		
9	CL			
10		Test pit TP-8 terminated at 10 feet. No groundwater observed. No caving observed.		
11				
12				
13				

14	WATER LEVELS
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20
 DATE FINISHED: 9/28/2021
 OPERATOR: Rick Marcus
 COMPANY: R&K, LLC
 LOGGER: Kenny Rukavina
 WEATHER: Rain

TEST PIT TP-9
 EXCAVATOR: Bobcat E50
 EXCAVATION METHOD: 24" Toothed Soil
 Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1		SILT with sand, gray-brown, moist, stiff.	
2			
3	ML		
4			
5			
6		Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.	
7	CL		
8		Lean CLAY with sand lenses, fine-grained, light brown, very moist, medium stiff.	
9	CL		
10		Test pit TP-9 terminated at 10 feet. No groundwater observed. No caving observed.	
11			
12			
13			

14	WATER LEVELS
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING

**ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG**

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-10
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'		GRAPHIC LOG	NOTES
		DESCRIPTION			
0	TOPSOIL	Topsoil, dark brown, moist.		<p>Liquid and Plastic Limits Test at 6 feet. Liquid Limit = 27 Plastic Limit = 21 Plasticity Index = 6</p> <p>Moisture Content Test at 6 feet. Moisture Content = 31.6%</p>	
1		SILT with sand, gray-brown, moist, stiff.			
2					
3	ML				
4					
5		Silty CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist to very moist, medium stiff.			
6	CL-ML				
7					
8		Lean CLAY, light brown, very moist, medium stiff.			
9	CL				
10		Test pit TP-10 terminated at 10 feet. No groundwater observed. No caving observed.			
11					
12					
13					
14	WATER LEVELS				
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING				

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION

TEST PIT LOG

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-11

EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1		SILT with sand, gray-brown, moist, stiff.	
2			
3	ML		
4			
5		Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.	
6	CL		
7			
8		Lean CLAY, light brown, very moist, medium stiff.	
9	CL		
10		Test pit TP-11 terminated at 10 feet. No groundwater observed. No caving observed.	
11			
12			
13			
14	WATER LEVELS		
	▽ WHILE EXCAVATING ▽ AT COMPLETION ▽ AFTER EXCAVATING		

**ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG**

DATE STARTED: 9/28/20.
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-12
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1		SILT with sand, gray-brown, moist, stiff.	
2			
3	ML		
4			
5		Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.	
6	CL		
7			
8		Lean CLAY, light brown, very moist, medium stiff.	
9	CL		
10		Test pit TP-12 terminated at 10 feet. No groundwater observed. No caving observed.	
11			
12			
13			
14	WATER LEVELS		
	▽ WHILE EXCAVATING		
	▽ AT COMPLETION		
	▽ AFTER EXCAVATING		

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20.
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-13
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 11'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	GRAPHIC LOG
1	ML	SILT with sand, gray-brown, moist, stiff.	
6		Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist to very moist, medium stiff.	
11	CL	Test pit TP-13 terminated at 11 feet. No groundwater observed. No caving observed.	

14	WATER LEVELS
	∇ WHILE EXCAVATING
	∇ AT COMPLETION
	∇ AFTER EXCAVATING

**ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG**

DATE STARTED: 9/28/20.
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-14
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'		GRAPHIC LOG	NOTES
		DESCRIPTION			
0	TOPSOIL	Topsoil, dark brown, moist.			
1		SILT with sand, gray-brown, moist, stiff.			
2	ML				
3					
4					
5	CL	Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.			
6					
7	CL	Lean CLAY, light brown, very moist, medium stiff.			
8					
9					
10		Test pit TP-14 terminated at 10 feet. No groundwater observed. No caving observed.			
11					
12					
13					

14	WATER LEVELS
	▽ WHILE EXCAVATING
	▽ AT COMPLETION
	▽ AFTER EXCAVATING

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20.
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-15
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 11'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1		SILT with sand, gray-brown, moist, stiff.	
2			
3	ML		
4			
5			
6		Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist to very moist, medium stiff.	
7	CL		
8			
9		Lean CLAY, light brown, very moist, medium stiff.	
10	CL		
11		Test pit TP-15 terminated at 11 feet. No groundwater observed. No caving observed.	

14	WATER LEVELS
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING


ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20.
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-16
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1		SILT with sand, gray-brown, moist, stiff.	
2			
3	ML		
4			
5		Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.	
6	CL		
7			
8		Lean CLAY, light brown, very moist, medium stiff.	
9	CL		
10		Test pit TP-16 terminated at 10 feet. No groundwater observed. No caving observed.	

14	WATER LEVELS
	▽ WHILE EXCAVATING ▽ AT COMPLETION ▽ AFTER EXCAVATING

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20.
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-17
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 9'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1	TOPSOIL	SILT with sand, gray-brown, moist, stiff.	
2	ML		
3			
4			
5	ML	Sandy SILT with interbedded layers of SILT, fine-grained, gray to light brown, moist, medium stiff.	
6	CL		
7		Lean CLAY, light brown, very moist, medium stiff.	
8			
9		Test pit TP-17 terminated at 9 feet. No groundwater observed. No caving observed.	
10			
11			
12			
13			

14	WATER LEVELS
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG


DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-18

EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1	ML	SILT with sand, gray-brown, moist, stiff.	
2			
3			
4			
5			
6	ML	SILT with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.	
7			
8			
9	CL	Lean CLAY, light brown, very moist, medium stiff.	
10		Test pit TP-18 terminated at 10 feet. No groundwater observed. No caving observed.	Moisture Content Test at 9 feet. Moisture Content = 29.2%
11			
12			
13			
14	WATER LEVELS		
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING		

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-19
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1	ML	SILT with sand, gray-brown, moist, stiff.	
2			
3			
4			
5			
6	CL	Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.	
7			
8	CL	Lean CLAY, light brown, very moist, medium stiff.	
9			
10		Test pit TP-19 terminated at 10 feet. No groundwater observed. No caving observed.	

14	WATER LEVELS	
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING	

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-20
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 9.5'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1		SILT with sand, gray-brown, moist, stiff.	
2			
3	ML		
4			
5		Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.	
6	CL		
7			
8		Lean CLAY, light brown, very moist, medium stiff.	
9	CL		
10		Test pit TP-20 terminated at 9.5 feet. No groundwater observed. No caving observed.	
11			
12			
13			
14	WATER LEVELS		
	▽ WHILE EXCAVATING ▼ AT COMPLETION ▼ AFTER EXCAVATING		

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20.
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-21
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'		GRAPHIC LOG	NOTES
		DESCRIPTION			
0	TOPSOIL	Topsoil, dark brown, moist.			
1	ML	SILT with sand, gray-brown, moist, stiff.			
2					
3					
4					
5					
6	CL	Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.			
7					
8	CL	Lean CLAY, light brown, very moist, medium stiff.			
9					
10		Test pit TP-21 terminated at 10 feet. No groundwater observed. No caving observed.			
11					
12					
13					

14	WATER LEVELS
	▽ WHILE EXCAVATING
	▽ AT COMPLETION
	▽ AFTER EXCAVATING

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-22
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 9'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1		SILT with sand, gray-brown, moist, stiff.	
2			
3	ML		
4			
5		Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.	
6	CL		
7			
8		Lean CLAY, light brown, very moist, medium stiff.	
9	CL		
9		Test pit TP-22 terminated at 9 feet. No groundwater observed. No caving observed.	
10			
11			
12			
13			

14	WATER LEVELS
	▽ WHILE EXCAVATING
	▽ AT COMPLETION
	▽ AFTER EXCAVATING

**ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG**

DATE STARTED: 9/28/20.
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Rain

TEST PIT TP-23
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	DESCRIPTION	GRAPHIC LOG	NOTES
		TOTAL DEPTH: 10'		
0	TOPSOIL	Topsoil, dark brown, moist.		
1	ML	SILT with sand, gray-brown, moist, stiff.		
2				
3				
4	CL	Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.		
5				
6				
7	CL	Lean CLAY, light brown, very moist, medium stiff.		
8				
9				
10		Test pit TP-23 terminated at 10 feet. No groundwater observed. No caving observed.		
11				
12				
13				

14	WATER LEVELS
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING


ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Overcast

TEST PIT TP-24
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 10'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1	TOPSOIL	SILT with sand, gray-brown, moist, stiff.	
2	ML		
3			
4			
5	CL	Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist, medium stiff.	
6			
7			
8	CL	Lean CLAY, light brown, very moist, medium stiff.	
9			
10		Test pit TP-24 terminated at 10 feet. No groundwater observed. No caving observed.	
11			
12			
13			

14	WATER LEVELS
	<input type="checkbox"/> WHILE EXCAVATING <input type="checkbox"/> AT COMPLETION <input type="checkbox"/> AFTER EXCAVATING

ALLWEST
HAYDEN, IDAHO
GEOTECHNICAL SECTION
TEST PIT LOG

DATE STARTED: 9/28/20.
DATE FINISHED: 9/28/2021
OPERATOR: Rick Marcus
COMPANY: R&K, LLC
LOGGER: Kenny Rukavina
WEATHER: Overcast

TEST PIT TP-25
EXCAVATOR: Bobcat E50
EXCAVATION METHOD: 24" Toothed Soil
Excavation Bucket

PROJECT: 121-411G Ponderay Land

NOTES:

DEPTH (ft)	USCS	TOTAL DEPTH: 12'	
		DESCRIPTION	NOTES
0	TOPSOIL	Topsoil, dark brown, moist.	
1	ML	SILT with sand, gray-brown, moist, stiff.	
2			
3			
4			
5	CL	Lean CLAY with interbedded layers of Sandy SILT, fine-grained, light brown to gray, moist to very moist, medium stiff.	
6			
7			
8			
9			
10			
11			
12		Test pit TP-25 terminated at 12 feet. No groundwater observed. No caving observed.	
13			

14	WATER LEVELS
	▽ WHILE EXCAVATING
	▽ AT COMPLETION
	▽ AFTER EXCAVATING

Unified Soil Classification System

MAJOR DIVISIONS		SYMBOL	TYPICAL NAMES
COARSE GRAINED SOILS	GRAVELS	CLEAN GRAVELS	GW Well-Graded Gravel, Gravel-Sand Mixtures.
		GRAVELS WITH FINES	GP Poorly-Graded Gravel, Gravel-Sand Mixtures.
			GM Silty Gravel, Gravel-Sand-Silt Mixtures.
		GC Clayey Gravel, Gravel-Sand-Clay Mixtures.	
	SANDS	CLEAN SANDS	SW Well-Graded Sand, Gravelly Sand.
			SP Poorly-Graded Sand, Gravelly Sand.
		SANDS WITH FINES	SM Silty Sand, Sand-Silt Mixtures.
			SC Clayey Sand, Sand-Clay Mixtures.
FINE GRAINED SOILS	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50%	ML Inorganic Silt, Silty or Clayey Fine Sand.	
		CL Inorganic Clay of Low to Medium Plasticity, Sandy or Silty Clay.	
		OL Organic Silt and Clay of Low Plasticity.	
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%	MH Inorganic Silt, Elastic Silt, Micaceous Silt, Fine Sand or Silt.	
		CH Inorganic Clay of High Plasticity, Fat Clay.	
		OH Organic Clay of Medium to High Plasticity.	
Highly Organic Soils		PT Peat, Muck and Other Highly Organic Soils.	

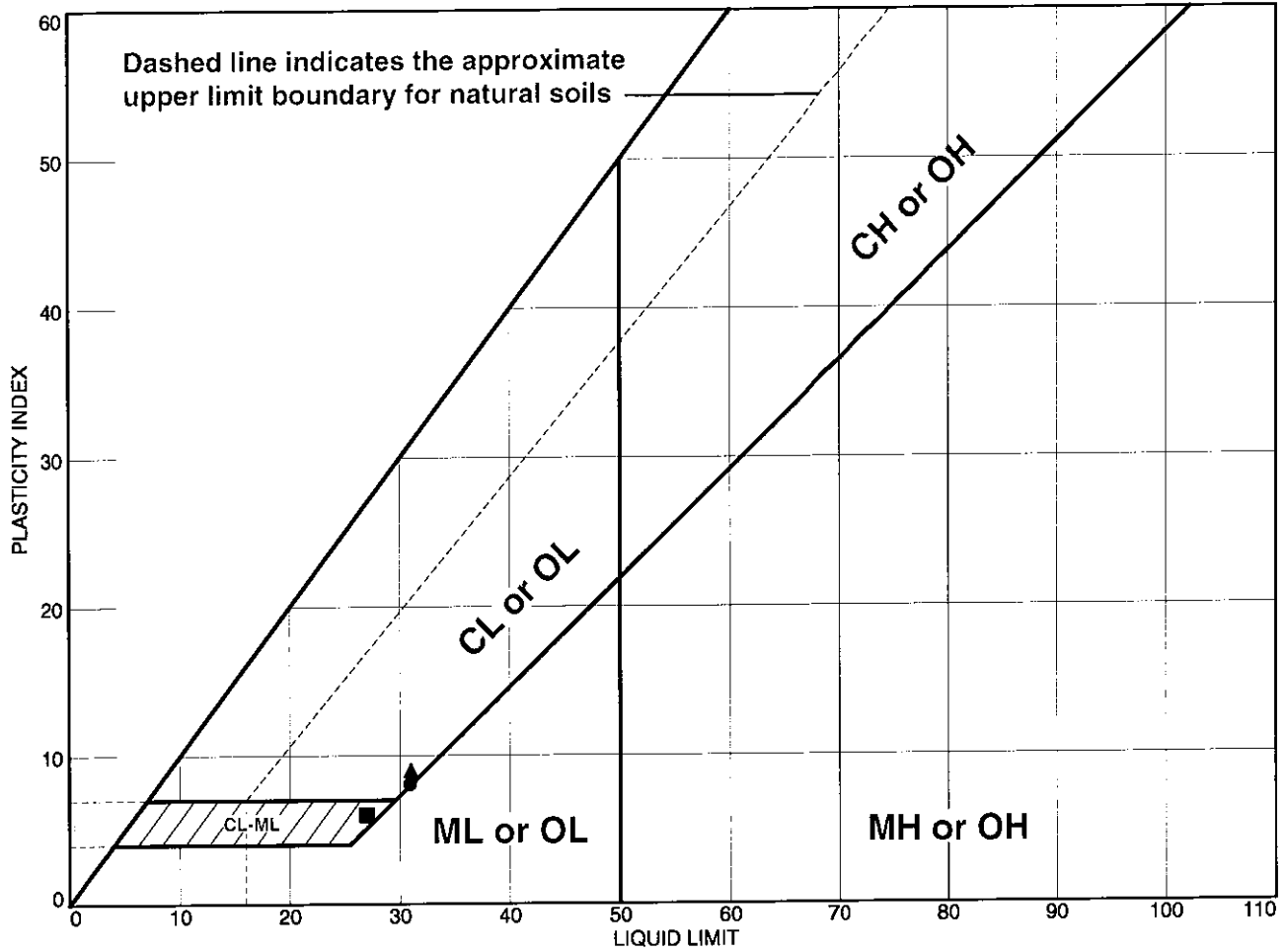


Appendix C

Laboratory Test Results



LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean clay	31	23	8		92	
■	Silty clay	27	21	6			
▲	Lean clay	31	22	9			
◆	Silt					94	

Project No. 121-411G **Client:** Eastmark Capital Group

Project: Ponderay Land

● **Location:** TP-3 **Depth:** -2.5' **Sample Number:** S121-1090
 ■ **Location:** TP-10 **Depth:** -6' **Sample Number:** S121-1092
 ▲ **Location:** TP-18 **Depth:** -9' **Sample Number:** S121-1093
 ◆ **Location:** TP-4 **Depth:** -7' **Sample Number:** S121-1091

Remarks:

● All Sample By: K.Rukavina
 All Sample On: 10/6/21
 ■ Received Moisture Content: 31.6%
 ▲ Received Moisture Content: 29.2%



Figure

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Tested By: ○ Christian Kreiger □ Christian Kreiger △ Christian Kreiger ◇ Noah White **Checked By:** Chris McKissen