

Clearwater Engineering

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Attn: City of Ponderay - Planning Department
288 Fourth Street
P O Box 500
Ponderay, Idaho 83852

May 26, 2022

RE: Kessa's Coffee –Site Development – Revised Site Plan

Kessa's Coffee Site Development was a project previously approved by the City of Ponderay Planning Department. The owner has since requested modifications to the site plan that will also include modifications to the storm plan. Pertinent drawings and calculations have been provided for your review. The main modifications are as follows:

- Addition of a 12' x 24' food service building with previously approved utilities
- Small increase in future coffee shop footprint from 25' x 15' to 27' x 17'
- Gravel parking and travel ways in place of asphalt
- Increased detention area within the G.I.A. along Bonner Mall Way
 - South end of G.I.A. – additional 203 cf
 - North end of G.I.A. – additional 45 cf
 - Total increase in detention provided – 248 cf

Attached are the revised Stormwater and Site Plan drawings and revised stormwater calculations.

If you have any questions, please do not hesitate to call.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Debra M. Van Dyk', written over a horizontal line.

Debra M. Van Dyk, P.E.
Principal

STORMWATER ANALYSIS

Rational Method for Runoff Calculations
Pre-Development

Water Quantity Storm 25 year -----

Surface Type	Area A (ft ²)	Area A (Acres)	Runoff Coefficient C
Unimproved Area	42,079	0.966	0.20
Gravel Drive	-	0.000	0.80
Roofs + Concrete + Asphalt	-	0.000	0.90
Totals	42,079	0.966	

Weighted Runoff Coefficient, C = 0.200
 i = 1.7 in/hr

TIME OF CONCENTRATION:

$$tc = C_t \left(\frac{Ln}{S^2} \right)^{0.6}$$

$C_t = 0.15$ for overland flow
 $L = 329$ ft
 $n = 0.40$ 0.4 for grass, 0.02 for pavement
 $S = 0.003$ ft/ft
 $tc = 16.01$ min

Peak Runoff, $Q_p = CiA$ $Q_p = 0.328$ cfs

Post-Development

Water Quantity Storm 25 year -----

Surface Type	Area A (ft ²)	Area A (Acres)	Runoff Coefficient C
Unimproved Area	17,085	0.392	0.20
Gravel Drive	23,741	0.545	0.80
Roofs + Concrete + Asphalt	1,253	0.029	0.90
Totals	42,079	0.966	

Weighted Runoff Coefficient, C = 0.559
 i = 2.1 in/hr

TIME OF CONCENTRATION:

$$tc = \frac{1}{v} * L = \left(\left(\frac{1.49}{R} \right)^2 * R^2 * \sqrt{S} \right)^{-1} * L$$

$C_t = 0.15$ for overland flow $L = 66$ ft $n = 0.40$ 0.4 for grass $S = 0.025$ ft/ft $tc_1 = 3.23$ min	$C_t = 0.15$ for overland flow $L = 181$ ft $n = 0.10$ 0.1 for gravel $S = 0.003$ ft/ft $tc_2 = 5.08$ min	$C_t = 0.15$ for overland flow $L = 21$ ft $n = 0.40$ 0.4 for grass $S = 0.018$ ft/ft $tc_3 = 1.80$ min	$A = 3.33$ ft ² $P = 5.11$ ft $R = 0.65$ ft $n = 0.027$ for grassed swale $S = 0.007$ ft/ft $L = 125.00$ ft $tc_4 = 36.02$ sec $tc_5 = 0.60$ min
$tc = tc_1 + tc_2 + tc_3 + tc_4 = 10.71$ min			

Peak Runoff, $Q_p = CiA$ $Q_p = 1.135$ cfs

Difference in $Q_p =$	0.806 cfs
Increase in impervious surfaces =	24,994 sf
Required Detention Volume =	834 cf (Per Bowstring Method - See attached calculation)

Previous plan post-development requirements:

Required treatment volume = 575.7 cf
 Required detention volume = 339.5 cf

Detention/Treatment volume provided = 597.5 cf

834 cf - 597.5 cf = 236.5 cf

Therefore, 236.5 cf of additional detention volume is required for the revised plan

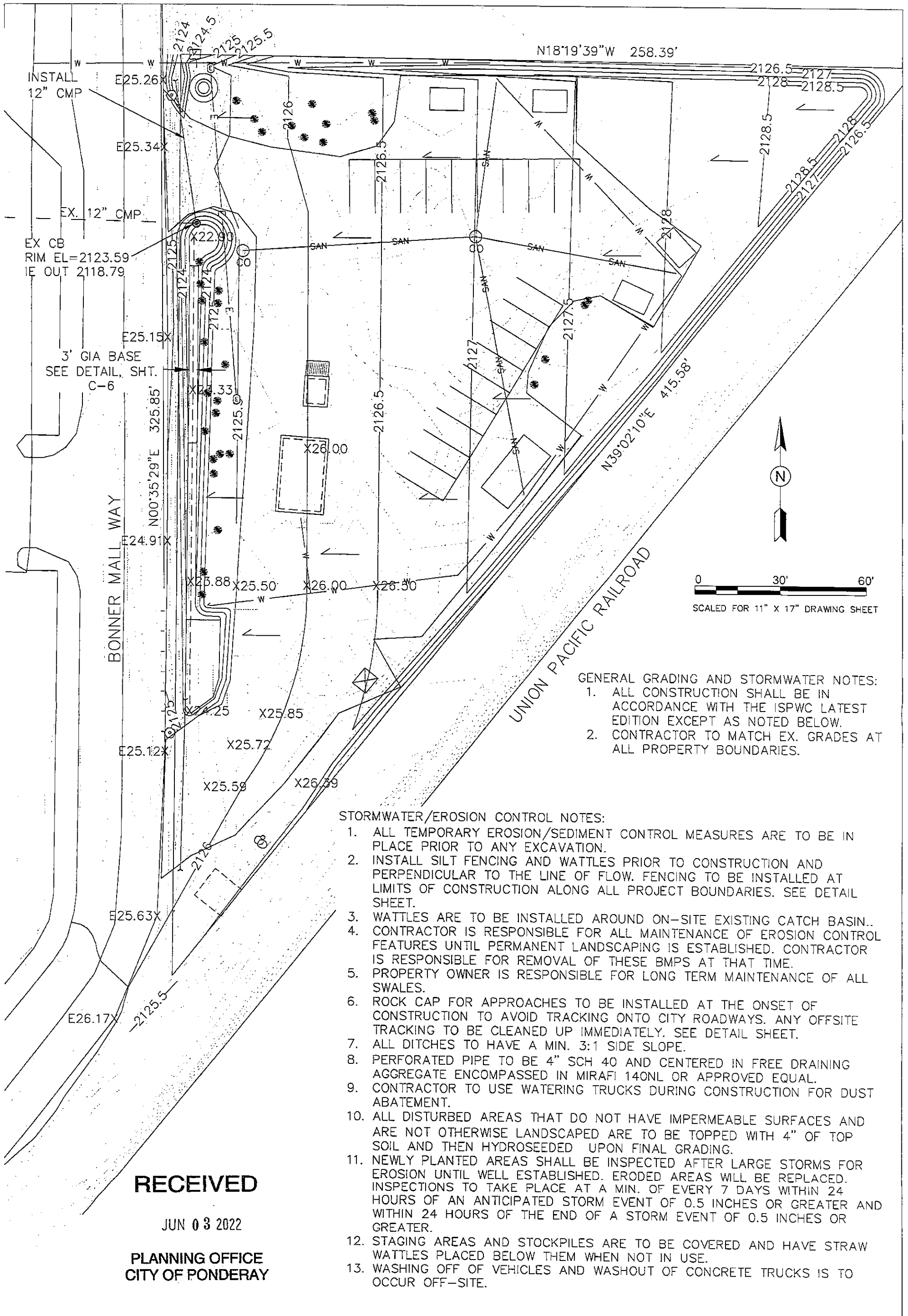
Bowstring Method

Kessa's Coffee - Site Development - Revised Site Plan
 Parcel RP00000115000A
 PONDERAY, ID
 Revised 5.24.22

BOWSTRING METHOD

DETENTION BASIN DESIGN							
Within Property Boudaries							
Volume In = $1.34 * Q \text{ dev.} * t$				(t <= tc)			
Volume In = $(Q \text{ dev.} * t) + (0.34 * Q \text{ dev.} * Tc * 60)$				(t > tc)			
Volume Out = Outflow * t							
Time Increment (min.)	5						
Time of Concentration, tc (min.)	10.71						
Outflow (cfs)	0.328						
Design Year Flow (yr.)	25						
Area (acres)	0.966						
Developed "C" factor	0.56						
Area X "C"	0.541						
	Time Inc. (min.)	Time Inc. (sec.) t	Intensity (in./hr.) i	Q dev. (cfs) AxCxi	Volume in (cu. ft.)	Volume out (cu.ft.)	Storage (cu. ft.) Vin- Vout
	5	300	2.80	1.51	609	98	511
	10	600	2.10	1.14	913	197	717
	15	900	1.70	0.92	1,029	295	733
	20	1200	1.60	0.87	1,228	394	834
	25	1500	1.40	0.76	1,301	492	809
	30	1800	1.20	0.65	1,310	590	720
	35	2100	1.10	0.60	1,380	689	691
	40	2400	0.95	0.51	1,346	787	558
	45	2700	0.90	0.49	1,421	886	535
	50	3000	0.87	0.47	1,515	984	531
	55	3300	0.85	0.46	1,520	1,082	438
	60	3600	0.78	0.42	1,734	1,181	553
	65	3900	0.75	0.41	1,590	1,279	311
	70	4200	0.70	0.38	1,595	1,378	217
	75	4500	0.69	0.37	1,684	1,476	208
	80	4800	0.67	0.36	1,740	1,574	165
	85	5100	0.65	0.35	2,403	1,673	730
	90	5400	0.63	0.34	1,840	1,771	69
	95	5700	0.60	0.32	1,883	1,870	14
	100	6000	0.59	0.32	1,980	1,968	12
	105	6300	0.58	0.31	2,073	2,066	6
	110	6600	0.55	0.30	2,085	2,165	80
	115	6900	0.52	0.28	2,084	2,263	179
	120	7200	0.50	0.27	2,113	2,362	249
	240	14400	0.33	0.18	2,698	4,723	2,025
	480	28800	0.22	0.12	3,525	9,446	5,922
	720	43200	0.17	0.09	4,057	14,170	10,112
	1440	86400	0.11	0.06	4,966	28,339	23,374

Detention Required = 834 cf



GENERAL GRADING AND STORMWATER NOTES:
 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE ISPWC LATEST EDITION EXCEPT AS NOTED BELOW.
 2. CONTRACTOR TO MATCH EX. GRADES AT ALL PROPERTY BOUNDARIES.

- STORMWATER/EROSION CONTROL NOTES:
1. ALL TEMPORARY EROSION/SEDIMENT CONTROL MEASURES ARE TO BE IN PLACE PRIOR TO ANY EXCAVATION.
 2. INSTALL SILT FENCING AND WATTLES PRIOR TO CONSTRUCTION AND PERPENDICULAR TO THE LINE OF FLOW. FENCING TO BE INSTALLED AT LIMITS OF CONSTRUCTION ALONG ALL PROJECT BOUNDARIES. SEE DETAIL SHEET.
 3. WATTLES ARE TO BE INSTALLED AROUND ON-SITE EXISTING CATCH BASIN..
 4. CONTRACTOR IS RESPONSIBLE FOR ALL MAINTENANCE OF EROSION CONTROL FEATURES UNTIL PERMANENT LANDSCAPING IS ESTABLISHED. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF THESE BMPs AT THAT TIME.
 5. PROPERTY OWNER IS RESPONSIBLE FOR LONG TERM MAINTENANCE OF ALL SWALES.
 6. ROCK CAP FOR APPROACHES TO BE INSTALLED AT THE ONSET OF CONSTRUCTION TO AVOID TRACKING ONTO CITY ROADWAYS. ANY OFFSITE TRACKING TO BE CLEANED UP IMMEDIATELY. SEE DETAIL SHEET.
 7. ALL DITCHES TO HAVE A MIN. 3:1 SIDE SLOPE.
 8. PERFORATED PIPE TO BE 4" SCH 40 AND CENTERED IN FREE DRAINING AGGREGATE ENCOMPASSED IN MIRAFI 140NL OR APPROVED EQUAL.
 9. CONTRACTOR TO USE WATERING TRUCKS DURING CONSTRUCTION FOR DUST ABATEMENT.
 10. ALL DISTURBED AREAS THAT DO NOT HAVE IMPERMEABLE SURFACES AND ARE NOT OTHERWISE LANDSCAPED ARE TO BE TOPPED WITH 4" OF TOP SOIL AND THEN HYDROSEEDED UPON FINAL GRADING.
 11. NEWLY PLANTED AREAS SHALL BE INSPECTED AFTER LARGE STORMS FOR EROSION UNTIL WELL ESTABLISHED. ERODED AREAS WILL BE REPLACED. INSPECTIONS TO TAKE PLACE AT A MIN. OF EVERY 7 DAYS WITHIN 24 HOURS OF AN ANTICIPATED STORM EVENT OF 0.5 INCHES OR GREATER AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER.
 12. STAGING AREAS AND STOCKPILES ARE TO BE COVERED AND HAVE STRAW WATTLES PLACED BELOW THEM WHEN NOT IN USE.
 13. WASHING OFF OF VEHICLES AND WASHOUT OF CONCRETE TRUCKS IS TO OCCUR OFF-SITE.

CLEARWATER ENGINEERING
 PLANNING, DESIGN, CONSTRUCTION MGMT.
 P.O. BOX 251, SANDPOINT, IDAHO 83864
 (208)255-8803

KESSA'S COFFEE
 STORM WATER AND GRADING PLAN

CW157 PROJ. NO.	REVISION	DATE:	BY:
DMV	REVISED SITE LAYOUT	5/26/22	DMV
3/2021 DATE			
C-3 DWG. NO.			

