



*Storm Water Management Plan
For
Another Screw Machine*

ACE # 21-041

Located In:
Ponderay
Bonner County, Idaho

May 13, 2021

Prepared By: RJG

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I. Project Summary

The property is currently developed in the southern portion. There is a 30 ft. easement for the benefit of the lot to the east. The owner will be improving and building a 45 ft x 100 ft warehouse building on the northern portion of the parcel. There is an existing stormwater drainage culvert parallel to the street graded to flow water south. This improvement will continue to use this culvert as the site outfall location. Site grading will be dependent on the invert elevation of the existing drainage culvert and the elevation of the existing building. There will be a portion of the existing onsite asphalt that will be removed and replaced to accommodate grading. Stormwater treatment will occur onsite in a grassy treatment area before leaving through the outfall culvert. The Approved Site Disturbance Permit No. shall remain posted onsite at all times during construction. The Approved Construction plans for the site shall remain onsite at all times during construction as well.

1. Tax parcel number

RPP37450000010A

SECTION 11, TOWNSHIP 57 NORTH, RANGE 2 WEST, B.M.,

2. Street address

147 Emerald Industrial Park Rd.

Ponderay, Id.

3. Property owner

Donald F. Blaese Jr.

4. Size of site

0.649 acres +/-

5. Structures to be constructed

45 ft x 100 ft warehouse building

6. Area of planned roads, parking, and sidewalks

There is a planned vehicle access parking along the front of the building.

7. Changes in drainage

No net changes are proposed in the site's drainage characteristics

8. Changes in vegetative cover

The vegetation under the footprint of the structure and necessary cuts/fills will be removed and reseeded were applicable.

9. Description of temporary and permanent erosion control measures.

See attached stormwater plan.

10. Description of the stormwater system

grassy swales and surface flow lines. See attached stormwater plan.

11. Constraining environmental conditions

The existing drainage culvert invert elevation.

12. How the proposed BMP's were selected

The grassy swale and surface drainage ditches were selected due to the area soils.

13. Pertinent information supporting the design calculations.

The impervious area, required swale area and swale area provided is shown on the site plan.

14. Soil type and suitability for proposed BMP's

One soil type is with in the proposed project per the soil conservation service. 31 Mission Silt Loam.

15. Method(s) for handling anticipated groundwater

There is evidence of ground water. Site inspection verified this.

16. Fill placement considerations (benching, terracing, compaction, justification for steeper than ordinance standards)

Fill areas shall be compacted to a 95% of a modified proctor and inspected by Engineer. See site plan.

17. Cut slope considerations (terracing, justifications for steeper than ordinance standards)

Cut slopes will vary depending on soil conditions. Solid rock –near vertical, shot rock 1:1 and all others shall not exceed 2:1 slope. 3:1 slopes are anticipated.

18. Product specifications

See attached stormwater plan.

19. Permanent stabilization requirements (seed types, fertilizers, application rates, timing)

See attached stormwater plan.

20. Winterization requirements

If project is constructed in the winter months, there shall be two additional inspections required to insure proper instillation of soil stabilizers and BMP's.

21. Inspection schedule

There shall be an inspection to ensure proper instillation of BMP's prior to any excavation and another after project is completed.

22. Cost estimate

See bond estimate below.

23. Construction schedule

June 2021 – November 2021

II. Vicinity Drainage

1. Stormwater drainage patterns within one mile of site

All up gradient water is conveyed in natural drainages. The adjacent lot has a stormwater swale in place.

2. Existing surface water within one mile of site

Lake Pend Oreille

3. Extent of the watershed area which drains to or through the project site

local

III. Project drawings

A. Existing site conditions

1. Site boundaries: (As shown on site plan)

2. **Roads, sidewalks and parking areas:** There is an existing access road and building on site
3. **Structures:** N/A
4. **Water sources:** Community water system.
5. **Surface water bodies & buffer zones:** N/A
Water drainage channels: (See site plan)
6. **Utilities:** (As shown)
7. **Easements:** There is an 30 ft existing access easement
8. **Topography:** (See site plan)
9. **Location of Soils Types:**
31 Mission silt loam.
10. **Vegetative cover types:** The site is primarily vegetated with native grasses, shrubs.

B. Proposed Features (See site plan)

1. **Specific vegetation preserve areas:** All areas outside of construction limits as shown on the plans shall be preserved.
2. **Areas where soil is to be stockpiled**
All excess material will have to be placed on site, stabilized and surrounded by silt fence.
3. **Areas to be graded, filled, and /or excavated**
See site plan.
4. **Location/width/configuration of benches, terraces, other slope treatments**
See site plan.
5. **Areas to be re-vegetated**
All areas outside of the building and asphalt that are disturbed due to construction activity.
6. **New structures**
A 45 ft x 100 ft warehouse.
7. **New roads, parking areas, sidewalks**
N/A. See site plan.
8. **Utilities**
See site plan
9. **Easements**
No additional easements are needed.

10. Erosion and Sedimentation Control Plan

Erosion and sedimentation control will be done in accordance with all federal, state, and local laws; and it will be the responsibility of the contractor to monitor control erosion and sedimentation on a daily basis. It will also be the responsibility of the contractor use appropriate BMP's to ensure that erosion and sedimentation is controlled. Such BMP's can be found in the Catalog of Storm Water Best Management Practices For Idaho Cities And Counties prepared by the Idaho Division of Environmental Quality.

11. Post construction stormwater drainage patterns

No net change in stormwater drainage patterns is anticipated.

12. Stormwater conveyance, treatment, and detention features, including: Locations, profile/cross section(s), bottom elevations, slope(s), dimensions, invert elevation(s), other information necessary to convey the design parameters and method of functioning

See site plan

13. Cross section dimensions and bottom elevations of any off-site drainage channel which will either contribute runoff to the site or into which on-site runoff will pass

See site plan

IV. Design Calculations

1. Hydrologic Model Used

- Basins under 10 acres: Rational method

2. Assumptions Made/ Data Used

- Design Storm: 25 year return period (see attachment C to this submittal)
- Time of concentration. (see attachment C to this submittal)

3. Calculations

See Attachment "C" for design storm calculations

4. Off-Site Runoff Flowing On-Site

Based on the local topography, there is no indication of permanent or seasonally flowing drainage channels through the property. Site observation confirms this.

5. Existing Runoff Generated On-Site

See attached Calculations.

6. Post Construction Runoff Generated On-Site

Post Construction runoff will be generated by the new building and asphalt areas. This runoff will be collected and treated in the swale areas on the site. Treatment will occur in the swale itself.

7. Stormwater System Components

- **Anticipated Loss Rates:** Observed ditch loss rates are neglected for conservative design. (frozen ground scenario)
- **Anticipated Flow Capacities of components:** See attached calculations.
- **Other Design Considerations:** n/a

8. Post Construction Runoff Moving Off-Site

Post construction runoff moving off-site will not occur at a higher flow rate or faster than pre-construction runoff.

V. Operation and Maintenance Plan

1. Inspection frequency

Inspections are noted above and it shall be the responsibility of the contractor to notify engineer when inspections are needed.

2. Responsible person or entity

The responsibility of operation and maintenance of the BMP's shall be that of the owner.

3. Routine maintenance requirements

Shall be the responsibility of the owner.

4. System failure

If the system should ever fail, it shall be the owner's responsibility to ensure replacement or repair of the system to good working order.

Bond Cost Estimate

N/A

Attachment “A”

(Vicinity Map)

(Site Plan)

(Details)

Attachment “B”

(Site Soils Data)

Soil Map—Bonner County Area, Idaho, Parts of Bonner and Boundary Counties
(Blaise)



Soil Map may not be valid at this scale.





































Map Scale: 1:1,390 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

Soil Map—Bonner County Area, Idaho, Parts of Bonner and Boundary Counties
(Blaise)

MAP LEGEND

 Area of Interest (AOI)	 Spoil Area
Soils	 Stony Spot
 Soil Map Unit Polygons	 Very Stony Spot
 Soil Map Unit Lines	 Wet Spot
 Soil Map Unit Points	 Other
Special Point Features	 Special Line Features
 Blowout	Water Features
 Borrow Pit	 Streams and Canals
 Clay Spot	Transportation
 Closed Depression	 Rails
 Gravel Pit	 Interstate Highways
 Gravelly Spot	 US Routes
 Landfill	 Major Roads
 Lava Flow	 Local Roads
 Marsh or swamp	Background
 Mine or Quarry	 Aerial Photography
 Miscellaneous Water	
 Perennial Water	
 Rock Outcrop	
 Saline Spot	
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale. Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bonner County Area, Idaho, Parts of Bonner and Boundary Counties
Survey Area Data: Version 16, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 15, 2010—Aug 23, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
14	Haploxeralfs and Xerochrepts, 30 to 55 percent slopes	0.1	0.8%
31	Mission silt loam, 0 to 2 percent slopes	8.8	99.2%
Totals for Area of Interest		8.8	100.0%

Attachment “C”

(Stormwater Calculations)

Basin 1

Pre-Developed Condition

Area (acres)	0.35
Pre-Developed "C" Factor	0.33
Design Storm Intensity (in/hr)	2.85
Pre-Developed Outflow (c.f.s.)	0.33
Time Increment (min)	13.46

Developed Condition

Time Increment (min)	5.00
Time of Concentration (min)	8.77
# of 600 Gallon Dry Wells	0
# of 1000 Gallon Dry Wells	0
Post-Developed Outflow (cfs)	0.33
Design Year Flow (yr)	25.00
Area (acres)	0.35
Developed "C" Factor	0.58
Area x "C"	0.20
Soil infiltration rate (in/hr)	0.50

Flow Calcs:

Q _{INFILTRATE}	0.01 ± CFS
Q _{DRYWELL}	0.00 CFS

#1 Time Inc. (min.)	#2 t Time Inc. (sec.) (#1*60)	#3 Intensity (in./hr.)	#4 Q _{dev} (cfs)	#5 V _{in} (1) (ft ³) (see below)	#6 V _{out} (ft ³)	Required Storage Volume (ft ³)
			(see below)	(see below)		
0	0.00	0	0	0	0	0
5	300.00	2.85	0.56	225	99	126
10	600.00	2.21	0.43	336	198	138
15	900.00	1.87	0.36	392	297	95
20	1,200.00	1.68	0.33	448	396	52
25	1,500.00	1.49	0.29	482	495	0
30	1,800.00	1.29	0.25	492	594	0
35	2,100.00	1.22	0.23	531	693	0
40	2,400.00	1.14	0.22	560	792	0
45	2,700.00	1.06	0.20	579	891	0
50	3,000.00	0.98	0.19	589	990	0
55	3,300.00	0.90	0.17	590	1089	0
60	3,600.00	0.82	0.15	581	1188	0

(1) $V_{in} = 1.34 * Q_{dev} * t$ for $t < T_c$

$V_{in} = (Q_{dev} * t) + (.34 * Q_{dev} * T_c)$ for $t > T_c$

$Q_{dev} = CIA - Q_{DRYWELL} - Q_{INFILTRATE}$

Pre-Development:

Tributary Area:

Description:	Area (ft ²)	Area (Ac.)	CN	Runoff Coefficients
Grass	11,520.00	0.26	50	0.15
Gravel	0.00	0.00	76	0.55
Pavement	3,600.00	0.08	98	0.9
Trees/Brush	0.00	0.00	36	0.2
0	0.00	0.00	0	0
Totals:	15,120.00	0.35	61.4285714	0.328571429

Post-Development:

Tributary Area:

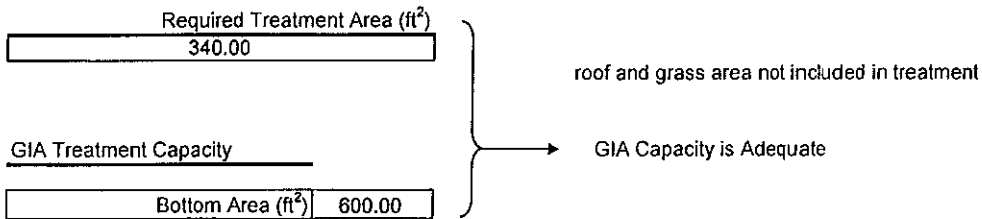
Description:	Area (ft ²)	Area (Ac.)	CN	Runoff Coefficients
Pavement/concrete	4,080.00	0.09	98	0.9
Roof	4,500.00	0.10	98	0.9
Grass/Lawn	6,540.00	0.15	50	0.15
Trees/Brush	0.00	0.00	36	0.2
0	0.00	0.00	0	0
0	0.00	0.00	0	0
0	0.00	0.00	0	0
Totals:	15,120.00	0.35	77	0.58

Impervious Area:

Tributary Area:

Description:	Area (ft ²)	Area (Ac.)
Building Roof	4,080.00	0.09
Driveway	4,500.00	0.10
Grass	6,540.00	0.15013774
Totals:	15,120.00	0.35

Required treatment volume calculated for treatment of first 1/2" of a rain event



Storm Attenuation:

Stormwater Detention Basin Area (ft ²)	600
Detention Basin Depth (ft)	0.5
Detention Basin Storage Volume (ft ³)	300

Pre-Developed Flow (cfs)	0.33
Post-Developed Flow (cfs)	0.33
Required Storage Volume (ft ³)	138
Storage Volume (ft ³)	300

Capacity is Adequate