

**STORMWATER MANAGEMENT AND EROSION CONTROL PLAN**  
for  
**SANDPOINT BUILDING SUPPLY**  
**STORAGE BUILDING ADDITION**  
**477421 US-95**  
**PONDERAY, IDAHO**

Owner: Sandpoint Building Supply

Prepared by: James A. Sewell & Associates, LLC  
1319 North Division  
Sandpoint, Idaho 83864

Date: February 6, 2020



## **INTRODUCTION**

Sandpoint Building Supply is proposing to construct a 30 ft. x 60 ft. storage building adjacent to the east side of their paved parking lot. As a result, approximately 1,800 sf of additional roof area will be added to the overall site layout. The purpose of this report is to recommend facilities to control storm water and prevent erosion and sediment transport, and to describe the analysis used in the selection and design of those facilities. The design and selection of storm water facilities are based on and limited to known topography of the site and soils information obtained from the "Soil Survey of Bonner County Area, Idaho".

During frequent storm events, runoff will be detained onsite in shallow grass lined basins and landscaped areas prior to regaining predevelopment flow patterns.

## **EXISTING SITE CONDITIONS**

The current, developed 8-acre site includes approximately 2.1-acres of pavement, 0.5-acres of roof top, and 5.4-acres of undeveloped, native grass area. Runoff from impervious surfaces currently sheet flows in all directions to grassy areas and ditches. A 12-inch PVC storm drain traverses the site which also collects runoff within paved areas and along the east boundary of the site. The runoff is discharged to a ditch along Highway-95.

## **SOILS**

The NRCS Soil survey shows on site soils consisting of Mission Silt Loam. The soil has a low infiltration rate and depth to water table is generally 6-inches to 18-inches below the surface.

A summary of the typical properties of each soil type found on the site is included in Appendix A, and is taken from the NCRS Soil survey of *Bonner County Area, Idaho, Parts of Bonner and Boundary Counties (Version 14, September 13, 2018)*.

### **PRE-CONSTRUCTION LAND COVER – TOTAL SITE**

Pavement (C = 0.9)	= 97,000 sf
Undeveloped/Landscaped Area (C = 0.25)	= 230,930 sf
Roof (C = 0.9)	= 20,550 sf
Total all surface types	= 348,480 sf

Total pre-construction impervious	= 117,550
Composite Runoff Coefficient (C)	= 0.46

### **POST-CONSTRUCTION LAND COVER – TOTAL SITE**

Pavement (C = 0.9)	= 97,000 sf
Undeveloped/Landscaped Area (C = 0.25)	= 229,130 sf

Roof (C = 0.9)	= 22,350 sf
Total all surface types	= 348,480 sf
Total post-construction impervious	= 119,350
Composite Runoff Coefficient (C)	= 0.47

**POST-CONSTRUCTION LAND COVER – NEW DEVELOPMENT ONLY**

Pavement (C = 0.9)	= 0 sf
Undeveloped/Landscaped Area (C = 0.25)	= 0 sf
Roof (C = 0.9)	= 1,800 sf
Total all surface types	= 1,800 sf
Total impervious from new development	= 1,800 sf
Composite Runoff Coefficient (C)	= 0.9

**STORMWATER MANAGEMENT**

Based on the given site, topography and soil characteristics, surface dispersion of storm water and very shallow detainment areas are recommended for flow management and treatment. It is further recommended that site disturbance be minimal and existing, well vegetated areas be retained and protected as much as possible.

The proposed infiltration facilities have been sized retain and treat the first ½” of impervious surfaces from new development only, and also retain the difference between pre-development and post-development runoff based on a 25-year storm event.

**The first ½ inch of runoff from impervious surfaces is 75 cubic feet:**

$$V = 0.5 \text{ in} \times 1,800 \text{ sf} / (12 \text{ in/ft}) = 75 \text{ cf}$$

**The pre-development 25-yr, 24-hour runoff volume is 257 cubic feet:**

Estimate the volume of runoff using the Modified Rational Equation:

$$Q = C \times I \times A \quad \textit{rational equation}$$

To estimate total runoff volume of storm, assume the runoff hydrograph is triangular with peak = Q, and base = 2 x duration of storm (modified rational equation).

$$V = C \times I \times (1/12 \text{ ft/in}) \times A \times 24 \text{ hours} \quad \textit{runoff volume for entire storm}$$

C = 0.25	<i>composite C (see appendix)</i>
I = 0.0 in/hr	<i>25-year, 24-hour event</i>
A = 1,800 sf	

V = 99 cubic feet

24-hr, 25-yr runoff pre-development

**The post-development 25-yr, 24-hour runoff volume is 16,120 cubic feet:**

C = 0.9

composite C (see appendix)

I = 0.0 in/hr

25-year, 24-hour event

A = 1,800 sf

V = 356 cubic feet

24-hr, 25-yr runoff post-development

**The difference between the post-development and pre-development volume, less infiltration, is 257 cubic feet.**

### **EROSION CONTROL PLAN**

Temporary erosion control shall be maintained through the use of existing vegetation and an existing stabilized construction entrance. Permanent facilities that will also serve to control erosion during construction include the grass infiltration basins, grass ditches, vegetated buffer, and reseeding of disturbed areas. Use the BMP's described in *Catalog of Stormwater Best Management Practices for Idaho Cities and Counties* (Idaho BMP Manual). Silt fence shall be placed downslope of construction areas as shown in the stormwater management plan. Areas where construction activities temporarily cease for more than 21 days shall be stabilized with seeding or straw mulching. All erosion control measures shall be maintained in good working order. The contractor shall be responsible for maintenance of erosion control measures until such time that final stabilization of the site is complete. Once final stabilization is complete, the owner shall be responsible for maintenance of permanent erosion control measures.

#### **Site Re-seeding Recommendation:**

Existing areas disturbed during construction shall be reseeded with natural grasses, lawn grasses, or sod as soon as possible after finish grading. Seed mixture recommendations may be obtained from the U.S.D.A. Natural Resource Conservation Service, a licensed landscape architect or a commercially marketed grass mixture may be applied.

#### **Fertilization**

It is recommended that a soil analysis be performed prior to fertilization and seeding. The fertilization guidelines should be determined by the soil analysis. The fertilizer type and rate of application should follow the recommendation of the U.S.D.A. Natural Resource Conservation Service or a landscape architect.

### **OPERATION AND MAINTENANCE PLAN**

#### **During Construction**

During construction the contractor shall walk the site and inspect storm water and erosion control measures at least once every 7 days and following any storm event of 0.5 inches or greater. Items the contractor shall inspect are:

- Reseeding / Straw Mulching
  - Re-seed add straw mulch to bare spots and washouts, and verify healthy growth
- Grass ditches
  - Periodically inspect ditches and remove any sediment deeper than 6 inches
  - Re-establish vegetation that is damaged during high runoff events.
- Grass infiltration basins
  - Periodically inspect basins and remove any sediment deeper than 6 inches
  - Re-establish vegetation that is damaged during high runoff events.

If maintenance of any temporary or final BMP is found to be necessary, the contractor shall begin repairs within 24 hours.

After Final Stabilization

Upon completion of construction and final stabilization, the owners shall take responsibility for operation and maintenance of the stormwater management and erosion control system as well as the funding for the continued maintenance of this system. After final stabilization, the stormwater management and erosion control system shall be inspected at least every six months. The items that shall be inspected are:

- Grass infiltration basins
  - Remove all sediment from the basin and dispose off-site at the end of construction, and during each inspection.
- Grass ditches
  - Remove all sediment from the ditches and dispose off-site at the end of construction, and during each inspection.
- Sloped areas
  - Re-establish grass or vegetation in bare spots found on all sloped areas, or stabilize with another best management practice.
  -

**IMPLEMENTATION SCHEDULE**

The proposed construction schedule is as follows:

Spring 2020

- Install temporary erosion control
- Perform fill and excavation work for building pad and drive surfaces

Spring/Summer 2020

- Complete building construction
- Check re-vegetated areas for bare spots, washouts, etc.

Late Summer 2020

- Repair and reseed as necessary
- Final stabilization complete

## **SUMMARY**

With the proper implementation of the best management practices listed above, the subject property is capable of supporting the proposed site development without substantial risk of soil erosion or sedimentation of surface waters. The site is capable of treating and conveying stormwater runoff from the proposed driveway using the best management practices described in this report.

# APPENDIX A

NRCS Soils Classification, IDF Curve Area Classification Map, Rainfall Intensity Diagram, Runoff Coefficients

## Bonner County Area, Idaho, Parts of Bonner and Boundary Counties

### 31—Mission silt loam, 0 to 2 percent slopes

#### Map Unit Setting

*National map unit symbol:* 5462  
*Elevation:* 2,000 to 2,800 feet  
*Mean annual precipitation:* 25 to 38 inches  
*Mean annual air temperature:* 43 to 45 degrees F  
*Frost-free period:* 90 to 120 days  
*Farmland classification:* Prime farmland if drained

#### Map Unit Composition

*Mission and similar soils:* 75 percent  
*Minor components:* 5 percent  
*Estimates are based on observations, descriptions, and transects of  
the mapunit.*

#### Description of Mission

##### Setting

*Landform:* Terraces  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Parent material:* Volcanic ash and loess over silty glaciolacustrine  
deposits

##### Typical profile

*O<sub>i</sub> - 0 to 1 inches:* slightly decomposed plant material  
*A - 1 to 3 inches:* silt loam  
*B<sub>w</sub> - 3 to 12 inches:* silt loam  
*2B<sub>tx</sub> - 12 to 21 inches:* silt loam  
*2E - 21 to 33 inches:* silt  
*2B<sub>t</sub> - 33 to 48 inches:* silt loam  
*3C - 48 to 67 inches:* fine sand

##### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* 10 to 20 inches to fragipan  
*Natural drainage class:* Somewhat poorly drained  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Very  
low to moderately low (0.00 to 0.06 in/hr)  
*Depth to water table:* About 6 to 18 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 5 percent  
*Available water storage in profile:* Very low (about 2.7 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 6e



*Land capability classification (nonirrigated): 6e*  
*Hydrologic Soil Group: D*  
*Other vegetative classification: western redcedar/queencup  
beadlily (CN530)*  
*Hydric soil rating: No*

### **Minor Components**

#### **Hoodoo**

*Percent of map unit: 3 percent*  
*Landform: Flood plains, drainageways*  
*Down-slope shape: Concave*  
*Across-slope shape: Linear*  
*Hydric soil rating: Yes*

#### **Odenson**

*Percent of map unit: 2 percent*  
*Landform: Depressions*  
*Hydric soil rating: Yes*

## **Data Source Information**

Soil Survey Area: Bonner County Area, Idaho, Parts of Bonner and Boundary  
Counties

Survey Area Data: Version 15, Sep 16, 2019

STATE OF IDAHO

AREA CLASSIFICATION MAP

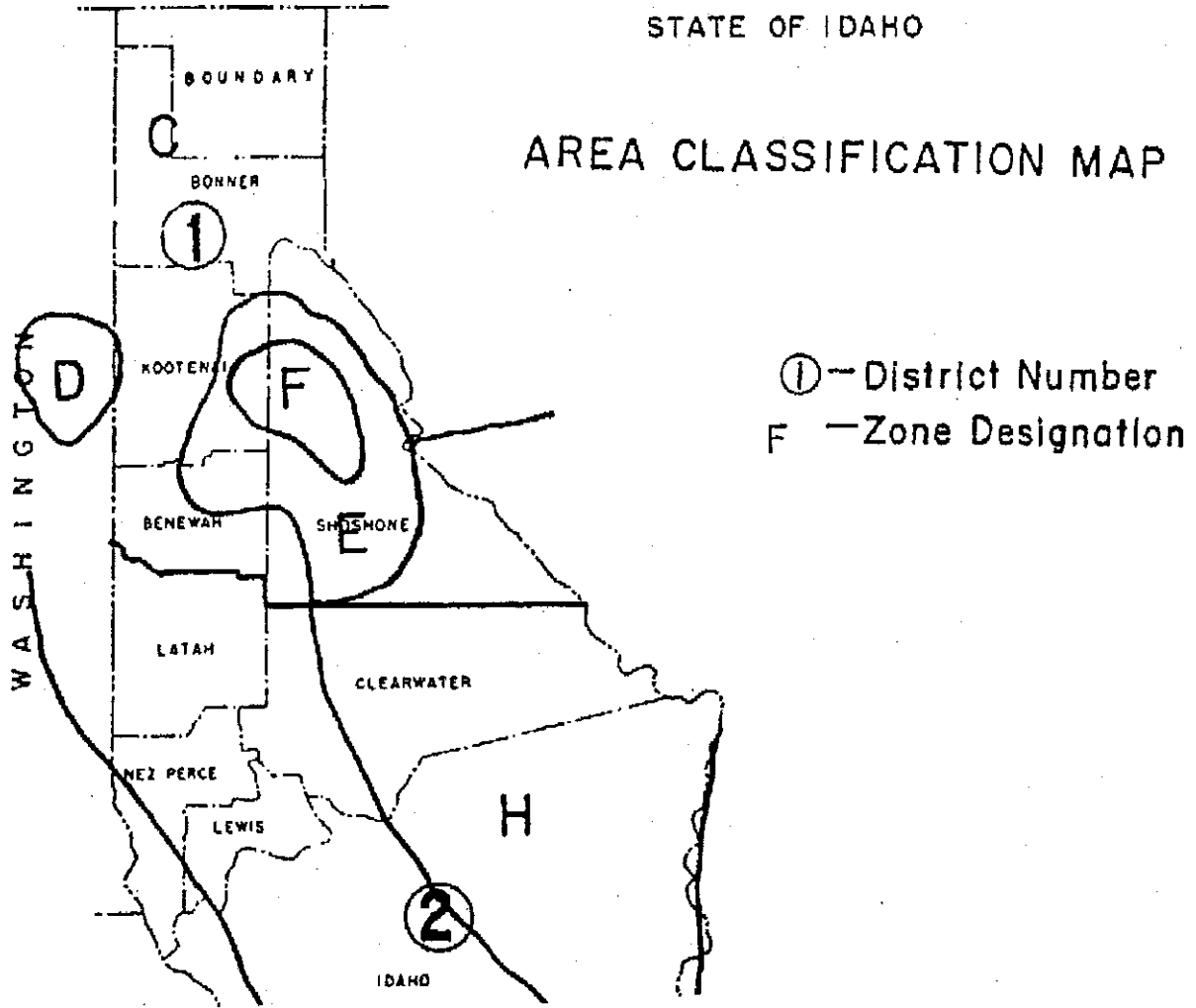
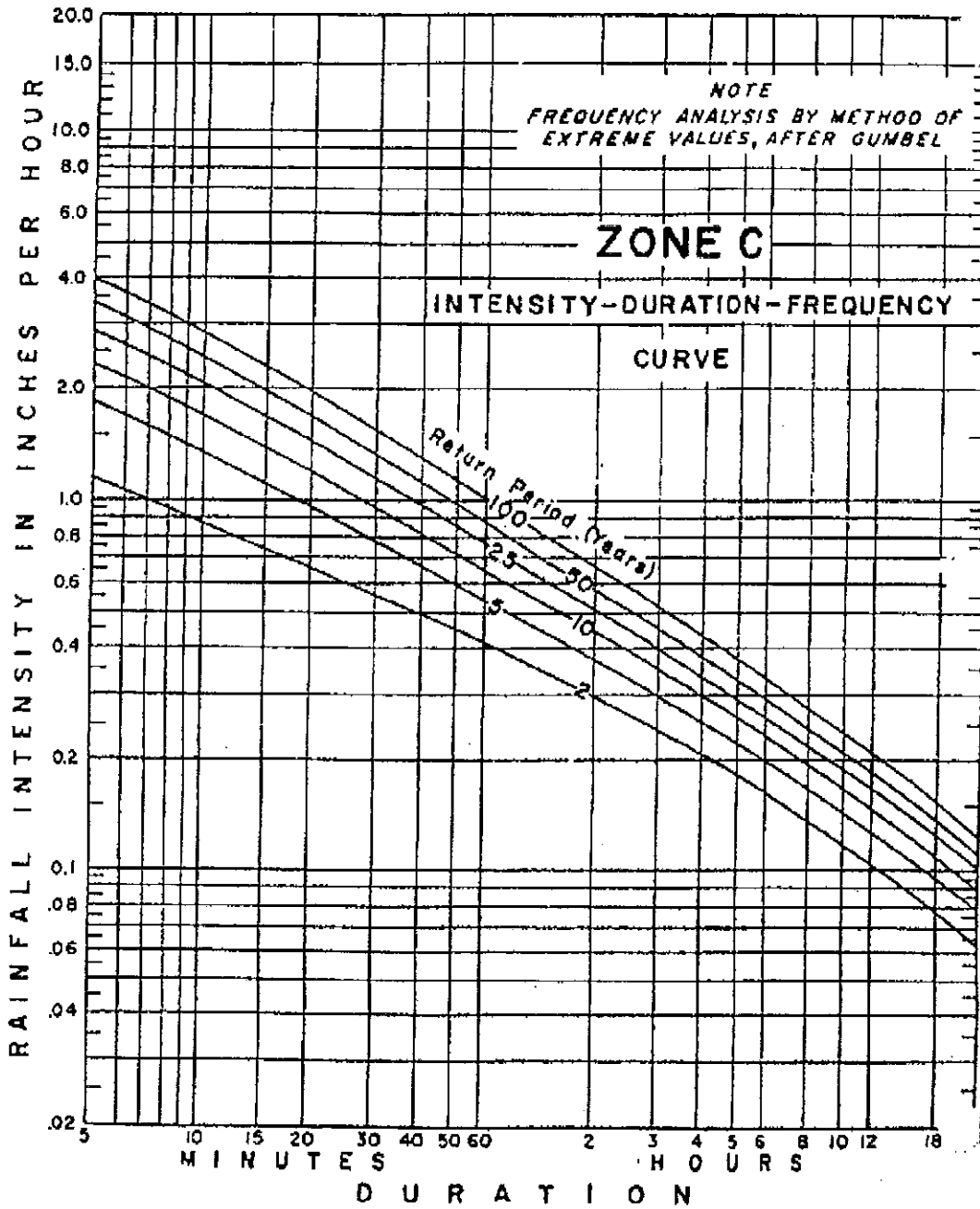


FIGURE 6-3 AREA CLASSIFICATION MAP FOR IDF CURVES - IDAHO  
(IDAHO TRANSPORTATION DEPARTMENT)

FIGURE 6-4 ZONE C, INTENSITY-DURATION-FREQUENCY CURVE  
(IDAHO TRANSPORTATION DEPARTMENT)



**Table 4B.2. Values of Runoff Coefficient (C) for Rational Formula**

Land Use	Description	Hydrologic Soils Group			
		A	B	C	D
Cultivated Land	Without conservation treatment	0.49	0.67	0.81	0.88
	With conservation treatment	0.27	0.43	0.67	0.67
Pasture or Range Land	Poor condition	0.38	0.63	0.78	0.84
	Good condition	---	0.25	0.51	0.65
Meadow	Good condition	---	---	0.41	0.61
Wood or Forest Land	Thin stand, poor cover, no mulch	---	0.34	0.59	0.70
	Good cover	---	---	0.45	0.59
Open Space, Lawn, Park, Golf Course, or Cemetery	Good condition (grass cover on 75% or more)	---	0.25	0.51	0.65
	Fair condition (grass cover on 50% to 75%)	---	0.45	0.63	0.74
Commercial and Business Area	85% impervious	0.84	0.90	0.93	0.96
Industrial District	72% impervious	0.67	0.81	0.88	0.92
Residential Lot					
Average lot size (acres):	Average % of lot impervious:				
1/8	65	0.59	0.76	0.86	0.90
1/4	38	0.29	0.55	0.70	0.80
1/3	30	---	0.49	0.67	0.78
1/2	25	---	0.45	0.65	0.76
1.0	20	---	0.41	0.63	0.74
Paved Area	Parking lots, roofs, driveways, etc.	0.99	0.99	0.99	0.99
Street or Road	Paved with curbs and storm sewers	0.99	0.99	0.99	0.99
		0.57	0.76	0.84	0.88
	Gravel	0.49	0.69	0.80	0.84

**Note:** The designer must use judgment to select the appropriate C value within the range. Generally, larger areas with permeable soils, flat slopes, and dense vegetation should have the lowest C values. Smaller areas with dense soils, moderate to steep slopes, and sparse vegetation should assigned the highest C values.

**SOURCE:** Panhandle Stormwater Erosion Control and Education Program Training Manual (2007)

# APPENDIX B

Storm Water Calculations



**James A Sewell & Associates, LLC**

Project: Sandpoint Building Supply  
 Prepared by: B. Scott Brown, PE  
 Date: 2/5/2020

**Design Values**

I, Rainfall Intensity (25-yr/24hr) (in/hr):	0.11	Idaho Roadway Design Manual Appendix B, Fig. B-7, pg. 129
GIA Infiltration Rate (in/hr)	0.00	NRCS Web Soil Survey (see attached)

**Existing Conditions**

	Acres	Sq. Ft	Rational C
Concrete/Pavement	0.00	0	0.9
Landscaped Area	0.04	1,800	0.25
Roof	0.00	0	0.9
Gravel Walkways	0.00	0	0.5
<b>Total</b>	<b>0.04</b>	<b>1,800</b>	<b>0.25</b>

Composite C            0.25  
 Runoff Volume V        99 cf  
 Runoff Rate Q           0.0011 cfs            <== pre-development

**Proposed Conditions**

	Acres	Sq. Ft	Rational C
Concrete	0.00	0	0.9
Landscaped Area	0.00	0	0.25
Roof	0.04	1,800	0.9
Gravel Walkways	0.00	0	0.5
<b>Total</b>	<b>0.04</b>	<b>1,800</b>	<b>0.90</b>

Composite C            0.90  
 Runoff Volume V        356 cf  
 Runoff Rate Q           0.0041 cfs            <== post-development  
 Total Impervious       1,800 sf

**Proposed Treatment Swale TOTAL**

Average Area	512 sf
Depth	0.50 ft
Volume	256 cf
Infiltration Area	0 sf
Infiltration Volume	0 cf

1st 1/2" on Impervious Surfaces	75	CF
25-yr, 24-hr POST - PRE - INFILTRATION:	257	CF

<b>Total Required Storage:</b>	<b>257 cf</b>	<b>25yr 24hr</b>
--------------------------------	---------------	------------------