

T-O ENGINEERS

*West 280 Prairie Avenue
Coeur d'Alene, ID 83815*

Stormwater Management Report

for

Monarch Marble & Granite

LOCATED IN PONDERAY, ID



SP18-045
RECEIVED

JUN 13 2018

**PLANNING OFFICE
CITY OF PONDERAY**

PREPARED BY: B. Scott Brown, P.E.

June 13, 2018

T-O Project No. 180143

SECTION 1: SITE EVALUATION AND PLANNING

1.1 Project and Site Information

Monarch Marble & Granite will be relocating to 200 McNearney Rd. in Ponderay, ID. The business is currently located in Kootenai, ID.

There is a single-family residence currently located on the site, which will remain. A fence will be constructed around the house and yard, and access will not be interrupted. An existing 800 sf shed and about 980 sf of existing gravel driveway will be removed within the area of new development.

New development will consist of constructing a 4,000 sf building, paved approach and driveway fronting the city street. The rear of the site will be developed with gravel access and material storage areas.

1.2 Contact Information/Responsible Parties

The person in charge of implementing the storm water management plan, performing inspections, and all other activities required will be the owner of the project:

Josh Stebbins, Monarch Marble & Granite, 355 McGhee Rd., Sandpoint, ID.
208-263-5777

The preparer of the storm water management plan is:

B. Scott Brown, PE, T-O Engineers, W. 280 Prairie Ave., Coeur d'Alene, ID.
208-762-3644

1.3 Nature and Sequence of Construction Activity

Work will consist of cutting and filling to balance the site and constructing about 5,300 sf of pavement and 13,380 net-sf of gravel areas, along with landscaping, storm water management features, and utility installation. A 4,000 sf building with an attached 1,200 sf covered storage area will also be constructed.

Land disturbing activity will consist of: Clearing and grubbing, hauling organic debris, parking lot sub grade construction, foundation excavation, and excavation/grading for storm water management features. It is assumed that the total site disturbance will not exceed 0.75 acres.

1.4 Soils, Slopes, Vegetation, and Drainage Patterns

The site is relatively flat. The natural runoff pattern is sheet flow to existing ditches along McNearney Rd. and along the south property line. Land cover in undeveloped areas consists of sparse trees and prairie grasses. Native soil consists of Bonner silt loam, as classified by the Soil Conservation Service.

The direction of flow will not significantly change due to development. Runoff will be directed overland across paved and gravel areas to grassy conveyance swales which will discharge the water to one of two different retention areas. Once the water is detained and treated, it will regain its natural flow pattern.

The existing ditch located along the south property line will be relocated but will remain functional to accepted and bypass runoff from the east.

1.5 Construction Site Estimates

Total Site Area:	1.20 acres
Proposed Site Disturbance:	0.75 acres
Existing Impervious Area:	0.10 acres
New Impervious Surface:	0.57 acres
Total Impervious Surface:	0.67 acres
Green Space:	0.60 acres
Percentage of Impervious Area Before Construction:	8%
Percentage of Impervious Area After Construction:	54%
Composite Runoff Coefficient Prior to Development:	0.28
Composite Runoff Coefficient After Development:	0.40

1.6 Receiving Waters

The closest bodies of water to the site are Sand Creek (approximately 0.7 miles west) and Lake Pend Oreille (approximately 1 mile south).

1.7 Site Features and Sensitive Areas to be Protected

There are no known sensitive wildlife habitat or endangered species in the vicinity of the site. In addition, there are no known archeological sites in the vicinity.

Neighboring property in the direction of flow will be protected from pollution during construction by the installation of silt fences and sediment ponds (to be converted to grassy infiltration areas or wet ponds).

1.8 Potential Sources of Pollution

Potential sources of pollution in storm water runoff during construction related to sediment include: Native silt and sand during excavation and fines from imported road materials, and possibly trench dewatering.

Potential pollutants and sources, other than sediment, in storm water runoff include: Petroleum products from construction equipment, concrete wash-out, fertilizers, debris generated from construction and general activity.

SECTION 2: EROSION AND SEDIMENT CONTROL BMPS

2.1 Minimize Disturbed Area and Protect Natural Features and Soil

Construction activity for the development will include the following:

1. Conveyance swale construction.
2. Clearing and grubbing (excavate and haul sod and organic debris).
3. Sub grade excavation and parking lot construction.
4. Foundation excavation and building construction.
5. Top soil stock piles will be placed on site to be used for the landscaping and re-vegetation phase of the project. It is assumed that the majority of the structural material for the driveway and parking areas will be trucked in on demand.

The total area of land disturbing activity is assumed to not exceed 0.7 acres. Removal of native organic material shall be kept at a minimum and done in phases where possible. All disturbed areas shall be mulched and re-vegetated as outlined in the following Erosion Control Plan.

Temporary Erosion and Sedimentation Control shall be done by mulching disturbed areas with hay or straw (8-10 lbs. per 100 sf), placing rock check dams in conveyance swales, and constructing silt fence barriers in areas where overland flow may occur. The temporary erosion control features shall be installed and maintained as detailed and shall prevent storm water runoff and sediment from migrating and will reduce water velocities and lessen erosion; moreover, the barriers shall be placed perpendicular to the flow direction to achieve the aforementioned purpose. The silt fences shall be implemented before construction begins and left in place until vegetation has re-established. Rock check dams shall be placed once the ditch has been formed and graded. Mulching shall be done after exposing bare soil.

Tracking of mud or other debris beyond property boundaries is prohibited. Construction equipment will access the site from McNearney Rd. and travel across existing gravel drives to areas where disturbance will occur. Additional measures to prevent tracking off-site should not be needed; however, tracking shall be monitored at all times.

Where temporary conveyance swales are constructed to collect runoff from the site disturbed areas during construction, runoff shall be directed in a non-erosive manner to a sediment basin (unfinished grassy infiltration or wet pond area). Runoff shall be free to flow to the swales from disturbed areas including, but not limited to: driveway subgrade and stock piles. The conveyance swales shall include check dams placed at intervals as shown on the plan.

Conveyance swales shall have max. 3:1 side slopes, a 1' wide bed, and be graded at a max. 1/2% slope to slow water velocity and further lessen erosion.

All imported soil (parking lot and driveway materials) and top soil stock piles shall be placed on site. Top soil stockpiles to remain unattended for more than 5 working days shall be covered or planted with grass.

2.2 Phase Construction Activity

Final Drainage Patterns and Treatment System Layout:

The site is divided into sub-drainage areas, based on the direction of finished grades and topography. Runoff from the site will drain to the designated pond for treatment, based on cross slope and corresponding conveyance systems. The size of each sub area, the impervious surface in each sub-area, and corresponding pond characteristics are more detailed in the Calculation Summary of this report. It is recommended that the construction of the project be phased according to sub-area (at max.). Excavation to sub-grade and exposing bare soil should be kept to a minimum and covered as soon as possible during the spring and early summer months.

General Construction Outline:

7/18	Site Plan Approval.
7/18	Install all silt fencing as designated on the Drawings.
8/18	Construct conveyance swales, install erosion control devices in the swales and mulch as indicated.
8/18	Parking lot & building construction.
10/18	Final construction.
5/19	Remove temporary erosion control features.

Construction Schedule Notes:

1. The temporary erosion control (silt fences) shall be removed only after construction has permanently ceased. In addition, the re-vegetated areas must have sufficient root depth.

2. An operation and maintenance schedule shall be implemented as outlined in the operation and maintenance plan. Newly seeded areas shall be inspected weekly until it is certain that adequate root depth has formed.
3. The construction schedule is subject to change by the contractor or developer. This is only an outline of sequential events.

2.3 Stormwater Flowing onto and through the Project

Offsite Runoff: There are existing ditches adjacent to the south side of the property, draining vacant land to the west. The ditches will remain functional and left in place to bypass storm water away from the site. Storm water from the proposed development will be detained and not adversely impact the existing ditches.

2.4 Stabilize Soils

Permanent Erosion Control will consist of spreading a min. of 3" of topsoil over all bare soil areas and hydroseeding to establish permanent seeding. All areas where soil has been exposed shall be re-vegetated.

Any disturbed area shall be re-vegetated with grass and shrubs native to the area. Seed mix shall conform to that as specified.

2.5 Protect Slopes

All exposed slopes shall be covered with top soil, seeded, mulched and matted if done during heavy or continuous rain events. Mulching can take place prior to or concurrent with seeding. If applied after seeding, then mulch immediately. Seeding and mulching shall not be applied when there is standing surface water but may be applied when the surface is damp. Wheat straw or rye straw shall be uniformly spread 2-3" thick and loose, with a max. of 20% of the original ground surface noticeable. Cover with Jute netting or spray with a tacking agent (28.5 cf/ac) to protect from wind drifting and water damage. No more than 1.5 acres of exposed area shall be left without cover. Jute matting shall consist of fiber cloth of a uniform plain weave, undyed and unbleached, 3-4 ft. wide and 0.4 lb/lf, with a tolerance of 5%. The material should have approx. 78 warp ends per width of cloth and 45 weft ends per linear meter. The yarn should be of loosely twisted construction having an average twist of not less than 6.3 turns per 4 inches and should not vary in thickness by more than ½ its normal diameter.

Installation of the matting shall conform to construction guidelines outlined in the IDEQ Storm Water Best Management Practices, BMP-18

2.6 Protect Storm Drain Inlets

Catch basin inlets shall be protected by installing the grate 6" above the pond bed. Rock check dams shall be installed in conveyance swales exceeding a 2% flow line slope where implemented to reduce sediment. Debris and trapped sediment shall be removed from the site as indicated.

2.7 Establish Perimeter Controls and Sediment Barriers

A silt fence barrier shall be installed between the construction site and adjacent south property boundary as indicated on the Plans. Sediment build-up shall be removed when reaching 1/3 the height of the fence.

2.8 Retain Sediment On-Site

A sediment basin shall be constructed for each sub area to collect runoff during construction and retain the water on-site. Grassy infiltration areas and wet ponds, as shown on the plan, will act as a sediment basin until the site is stabilized. Retained sediment must be removed when design capacity has been reduced by 50%. The Engineer shall be notified and the storage volume shall be adjusted prior to exceeding the designated area of site disturbance or if the volume is found to be inadequate due to storm events greater than expected.

Prior to converting the sediment pond to serve as a permanent storm water feature, all sediment and other foreign debris shall be removed from the sediment basin, and the bed and side slopes returned to native soil conditions. The bed shall be tilled and scoured as part of the preparation to convert the basin to a permanent storm water management feature.

SECTION 3: STORM WATER CONTROL & TREATMENT

3.1 Basis of Design

The site has been divided into two sub drainage areas. Runoff from impervious surfaces located in the southwest quadrant of the site will drain toward a grassy infiltration area adjacent to the west property line. Runoff from the northeast and east portions of the site will drain toward a wet pond located to the east of the new building.

The GIA's have been designed based on retaining the first half inch of runoff from impervious areas and infiltrating it through sandy loam topsoil and gravelly, sandy loam native soils. The GIA's will collect sediment, debris and other solids, as well as, remove phosphorus, trace metals, bacteria, petroleum hydrocarbons,

and other pollutants. As a result, the rate of storm water leaving the site will not be increased beyond pre-development conditions.

Runoff from the east portion of the site will be directed overland toward grassy conveyance swales. The swales will direct the runoff to a wet pond. The wet pond has been designed based on retaining a 2 yr., 24 hr. storm event (permanent pool storage) and detaining a 25-yr. event (extended detention storage). In either case, the first ½ inch of runoff from impervious surfaces will be retained. The wet pond will collect sediment, debris and other solids, as well as, remove phosphorus, trace metals, bacteria, petroleum hydrocarbons, and other pollutants. As a result, the rate of storm water leaving the site will not be increased beyond pre-development conditions.

3.2 Methodology

Method of Treatment: Min. ½ inch of runoff from impervious surfaces will be retained for treatment in grassy infiltration areas or in a shallow wetland marsh and dead storage (permanent pool). The wet pond has been designed based on IDEQ BMP #45 guidelines.

Method of Controlling a 25 yr. Event: Infiltration in GIA's based on 2 in/hr which is expected for sandy loam topsoil (NRCS). Sizing calculations are presented in the Calculation Summary, Section 9.

Method of Conveyance: Storm water will be conveyed by overland flow (sheet flow) across impervious surfaces with grades not less than 1% and no greater than 4% to grassy conveyance swales.

SECTION 4: POST CONSTRUCTION BMP'S

4.1 Post Construction O&M Practices

After construction has ceased, the system shall be checked once per month, and after moderate rain events if the entire site is stabilized and/or runoff is unlikely due to winter conditions (snow, ice, frozen ground).

Maintenance of the system shall be the responsibility of the owner. All permanent erosion and storm water control features must be installed per plan and functioning properly. All vegetated areas must have adequate root depth and stability. The owner is responsible for all costs associated with O & M during this period. All construction and maintenance costs shall be bonded for by the owner if an occupancy permit precedes acceptance of the storm water system by the City.

Inspect the catch basin orifices, inlet grates, and sediment traps. Sediment deposits and other debris shall be removed and disposed of off-site. The orifices

shall be free of any debris or build-up and discharging properly.

SECTION 5: INSPECTIONS

5.1 Inspections

Inspections must include but are not limited to: all areas of the site disturbed by construction, stockpiles, and areas used for equipment storage that are exposed to weather.

Newly seeded areas and storm water management features shall be inspected once per week and after moderate rain events (1/2" or greater) for erosion. If erosion has occurred the eroded soils and vegetation shall be replaced.

SECTION 6: CALCULATION SUMMARY

6.1 Design Assumptions and Methodology

Return period = 25 years for storm water control and treatment design.

Return period = 50 years for storm water conveyance system design.

Rational method used for all hydrologic calculations unless otherwise noted.

Open channel hydraulics analyzed by using Manning's Equation.

Time of concentration based on Kirby-Hathaway methods, where $T_c = (0.826((L*n)^{0.467})/((s)^{0.234}))$ L = overland flow length; n = land cover coeff.; s = avg. slope

Runoff Intensity based on ITD Intensity-Duration Frequency curves, Fig. 6-4, Kennedy Report.

Infiltration Rates based on SCS suggested data per SCS Soil Group, Table 17.2, *Stormwater BMP's and Detention for Water Quality, Drainage, and CSO Management by Urbonas and Stahre*.

Runoff Coefficients based on Table 6-2, Kennedy Report.

Culvert Design based on methodology presented in the *AISI Handbook of Steel Drainage and Highway Construction Products, 1994 Ed.*

Calculation method for Pre vs. Post Development Retention Volume Req'd. based on BCPW interpretation of the BCRC, using ITD curves to obtain intensity for a 25 yr., 24 hr. event.

6.2 Storm Water Control & Treatment Systems

Sub Drainage Area A to GIA No. 1

Description of Area Serving: Pavement and gravel in the southwest quadrant of the site.

Area of Impervious Surface = 6,280 sf (5300 sf pavement; 980 net-sf gravel)

Runoff Coefficients: Pre C = 0.25; Post C = 0.90

Calculated Results (see spreadsheet calculations, Appendix B)

Storage Needed to Retain the 1st 1/2" of runoff from Imp. Surfaces = 262 cf
Volume Required to Detain a 25 yr. Event (based on infiltration rates) = 285 cf
Min. Bed Area Required = 480 sf

GIA No. 1 Volume Provided

Operating Depth = 6", Overall Depth = 8"; Bed Length = 32', Bed Width = 15',
Side Slopes = 3:1; Bed Area Provided = 435 sf
Resulting Volume = 289 cf

Sub Drainage Area B to New Wet Pond

Description of Max. Area Serving: Easterly portion of the site
Area of Impervious Surface = 12,400 sf
Runoff Coefficients: Pre C = 0.25 (undeveloped areas); Post C = 0.5
Calculated Results (see spreadsheet calculations, Appendix B)
Storage Needed to Retain the 1st 1/2" of runoff from Imp. Surfaces = 517 cf
Volume Required (2 yr, 24 hr event) = 496 cf
Extended Storage Vol. Needed to Detain Runoff to Pre-Development Rates =
238 cf

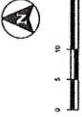
Wet Pond Volume Provided

Permanent Pool Depth = 12", Bed Length = 20', Bed Width = 20', Side Slopes =
3:1
Resulting Volume = 529 cf
Ext. Storage Depth = 4", Bed Length = 28', Bed Width = 28', Side Slopes = 4:1
Resulting Volume = 287 cf
Freeboard = 6"
Resulting Equivalent Top Dimensions = 35' x 35'

Note: Consistent with the City of Ponderay's storm water management ordinance, runoff from new roof tops has not been considered in storm water treatment and detention area design.

Appendix A

Half-Scale Drawings

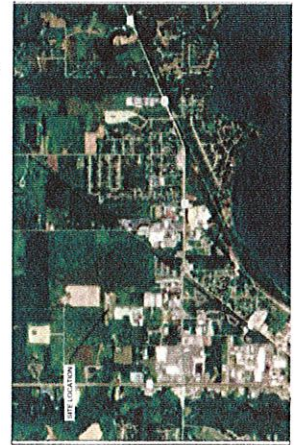


LEGEND

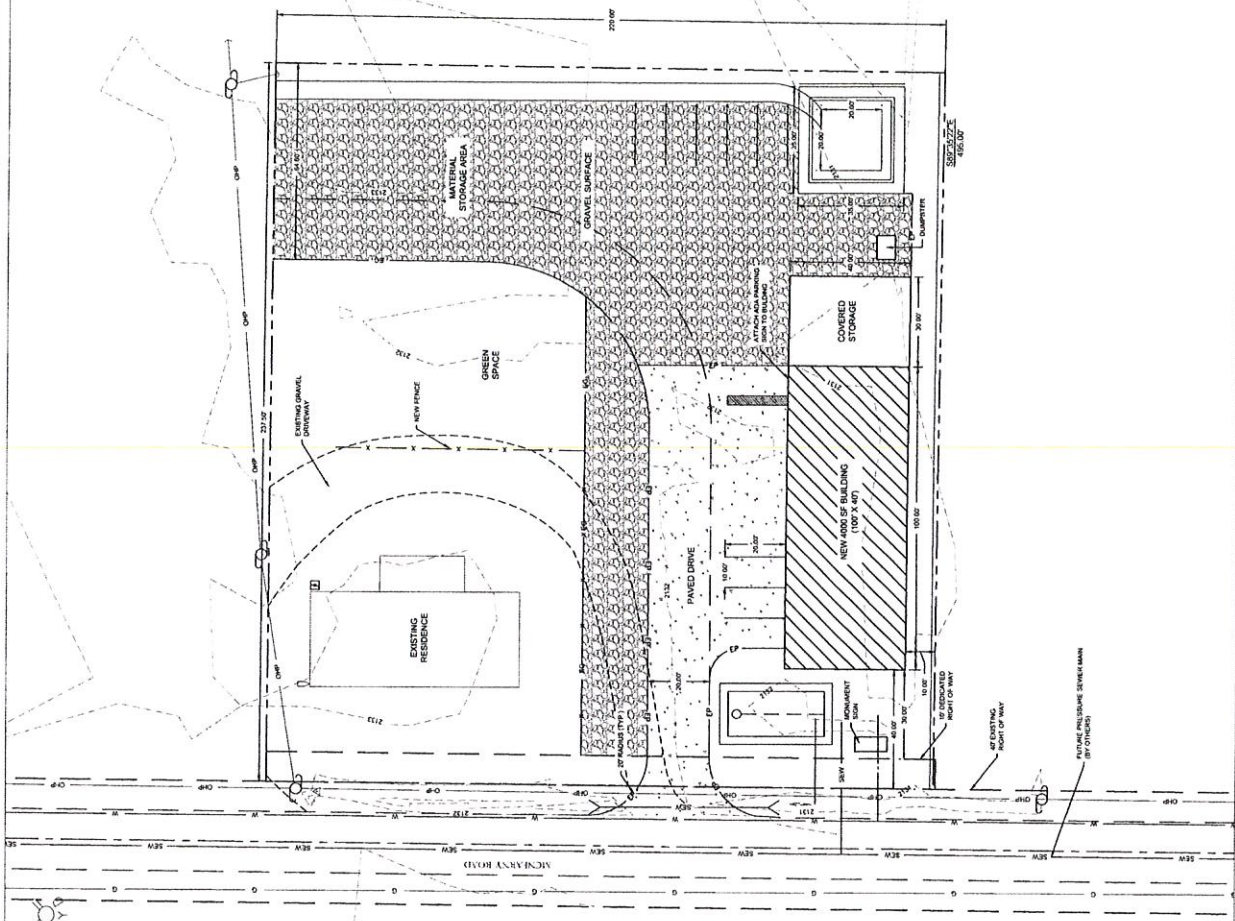
- PROPOSED BUILDING
- RIGHT OF WAY
- PROPOSED PAVEMENT
- EXISTING ROAD
- MAIN ROAD CENTERLINE
- LEASE LOT LINE
- BURIED UTILITY LINE
- WATER LINE
- GAS LINE
- PROPOSED FENCE
- EXISTING GRAVEL DRIVEWAY
- EXISTING BUILDING
- PARKING LINES
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING WATER VALVE
- EXISTING POWER UTILITY
- EXISTING CATCH BASIN
- PROPOSED PAVEMENT
- PROPOSED GRAVEL

SITE PLAN NOTES

- TOTAL AREA 52,269 SF
- EXISTING BUILDING AREA 2,495 SF
- NEW BUILDING AREA 1,200 SF
- TOTAL PROPOSED BUILDING AREA 3,695 SF
- PROPOSED GRAVEL DRIVE AND PARKING AREA 17,544 SQ SF
- TOTAL IMPERVIOUS SURFACE 25,134 SF
- TOTAL OPEN SPACE 26,200 SF
- LANDSCAPE TO EDGE OF GRAVEL WITH GRASS.
- SEE GRADING PLAN FOR FINISH GRADE AND SLOPE INFORMATION.
- ALL NEW LIGHTING WILL BE ATTACHED TO BUILDING.
- EXISTING UTILITIES SHOWN ARE APPROXIMATE AND NOT VERIFIED



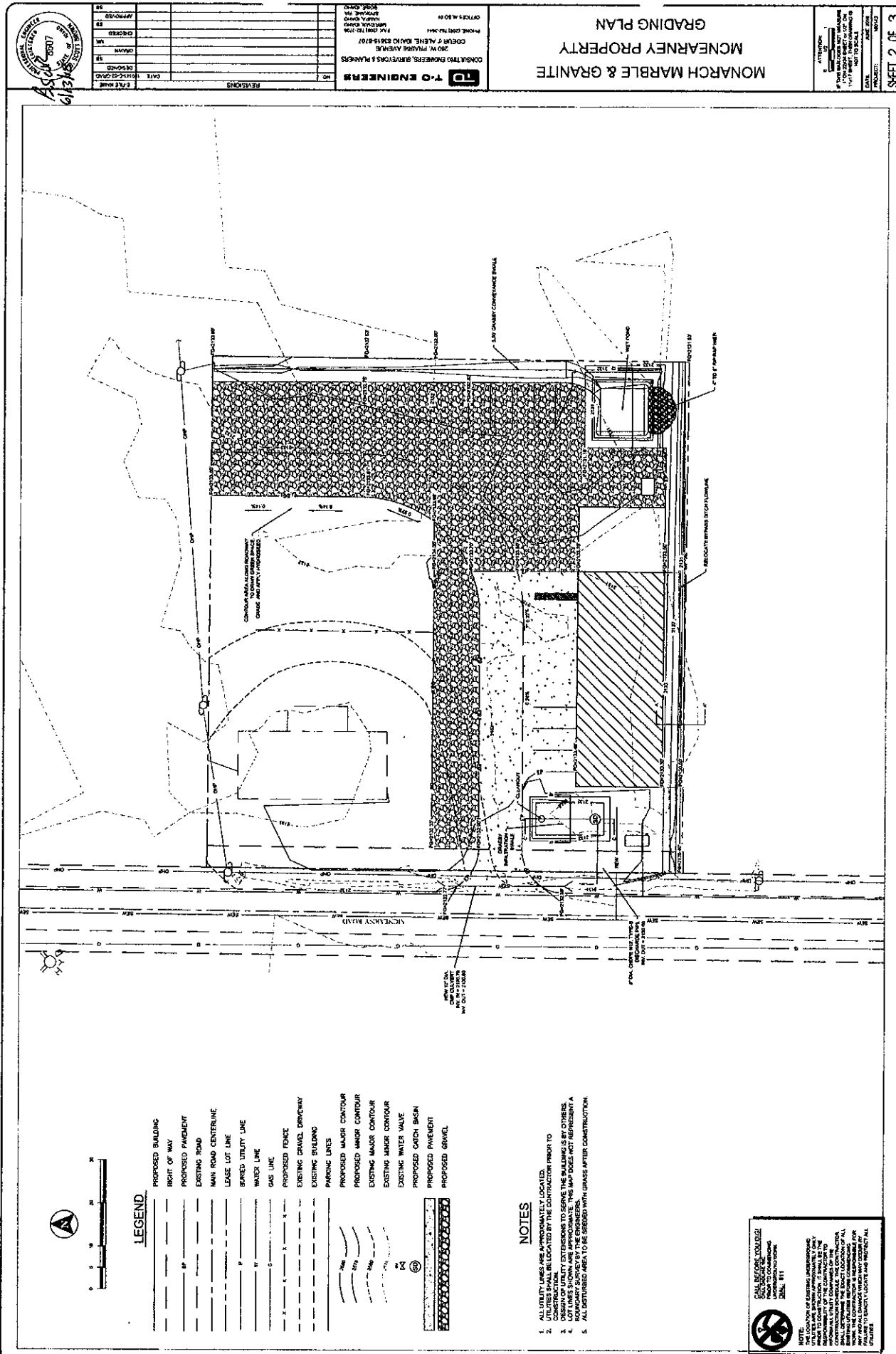
VICINITY MAP
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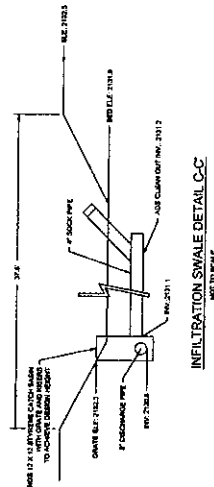
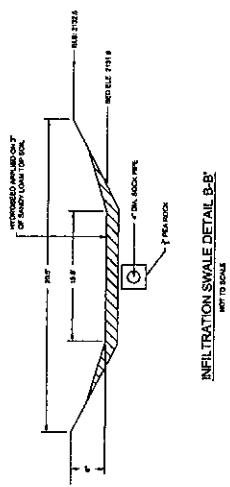
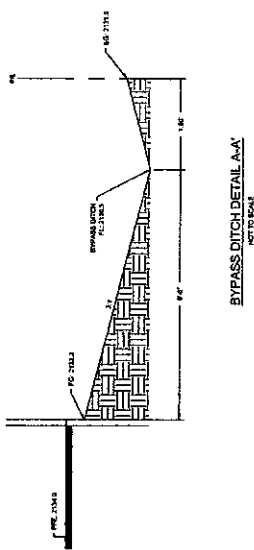
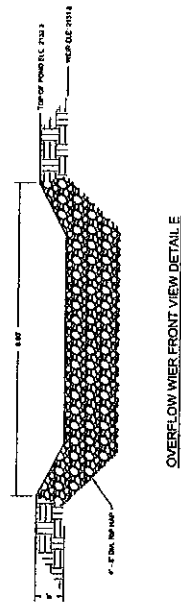
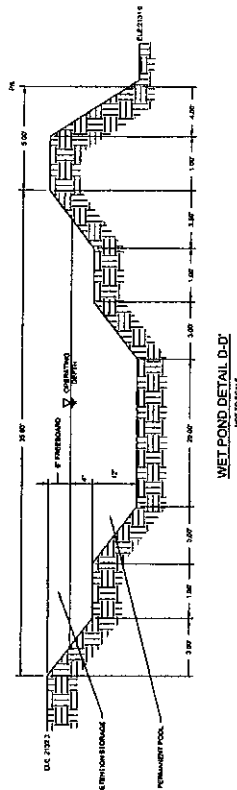
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ALL UTILITIES LOCATED
ON THIS PLAN ARE BASED ON
THE LOCATION OF EXISTING UNDERGROUND
UTILITIES. THE LOCATION OF EXISTING
UNDERGROUND UTILITIES IS NOT GUARANTEED
AND THE CONTRACTOR SHALL BE RESPONSIBLE
FOR VERIFYING THE LOCATION OF ALL
UTILITIES PRIOR TO CONSTRUCTION.
IF THE CONTRACTOR DISCOVERS
ANY UTILITIES NOT SHOWN ON THIS
PLAN, THEY SHALL BE STOPPED
IMMEDIATELY AND THE CONTRACTOR
SHALL BE RESPONSIBLE FOR
NOTIFYING THE APPROPRIATE
AUTHORITY.

T-O ENGINEERS		CONSULTING ENGINEERS, SURVEYORS & PLANNERS		280 W. PARKWAY AVE. SUITE 100 BOISE, IDAHO 83725 PHONE: (208) 333-1111 FAX: (208) 333-1112 WWW.TOENGINEERS.COM		OFFICE: 280 W. PARKWAY AVE. SUITE 100 BOISE, IDAHO 83725 PHONE: (208) 333-1111 FAX: (208) 333-1112 WWW.TOENGINEERS.COM	
NO.	DATE	DESIGNED	DRAWN	CHECKED	APPROVED	BY	DATE
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MONARCH MARBLE & GRANITE
PONDERAY, IDAHO
SITE PLAN



CHALLENGE YOU DOZ
CALL BEFORE THE
CONSTRUCTION WORK
BEGINS.
NOTE:
WE HAVE AN EXISTING CONSTRUCTION
PROJECT IN THE AREA OF THE
PROPOSED CONSTRUCTION. IT IS THE
CONTRACTOR'S RESPONSIBILITY TO
OBTAIN ALL NECESSARY PERMITS
BEFORE BEGINNING THE CONSTRUCTION
WORK. THE CONTRACTOR IS RESPONSIBLE FOR
OBTAINING ALL NECESSARY PERMITS
BEFORE BEGINNING THE CONSTRUCTION
WORK.



MONARCH MARBLE & GRANITE
MCNEARNEY PROPERTY
CONSTRUCTION DETAILS

T-O ENGINEERS
CONSULTING ENGINEERS, SURVEYORS & PLANNERS
280 W. PULASKI AVENUE
CHICAGO, ILLINOIS 60607
PHONE: (312) 321-1000
FAX: (312) 321-1001
WWW.T-OENGINEERS.COM

DATE	11/11/15
PROJECT	MCNEARNEY PROPERTY
SHEET	3 OF 3

REVISIONS

NO.	DATE	DESCRIPTION
1	11/11/15	ISSUED FOR PERMIT

SCALE
1" = 10'-0"

NOTES
1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE ILLINOIS CONSTRUCTION SPECIFICATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS BEFORE BEGINNING THE CONSTRUCTION WORK.

Appendix B

Spreadsheet Calculations

Monarch Marble

G/A

BED VARIABLES				TOP DIMENSIONS											
T = 25 yrs A = 0.14 ac C (post) = 0.84 f = 2 in/hr IA = 6,280 sf				C (pre) = 0.25 (Import Sandy Loam) (NET impervious area)				32 FT. 15 FT. 6.00 IN. 4 : 1				36.00 FT. 19.00 FT.			
SIDE SLOPE =															

DETENTION POND #3 (BMP #45 Conventional Wet Pond)

Project: Monarch Marble

t_c (nat.) =		40 min.	i (nat.) =		1 in/hr	Conc. Reservoir Dimensions:	
C (dev.) =		0.50	C (nat.) =		0.25	A_p =	sf
Area =		0.28 ac =	12,400 sf			d =	ft
Design Storm Event = 25 yr. Return Period			12,400 sf			V =	0 cf
Duration (min.)	Int. (25 yr.) (in./hr.)	Q_p (dev.) (cfs)	Q_p (nat.) (cfs)	Storage (cub. ft.)	Storage (gal.)	Overflow Discharge (flow level outlet):	
5	2.8	0.40	0.07	103	768	Q_p (50 yr) =	3.40 cfs
10	2.1	0.30	0.07	125	938	Cd =	0.60
15	1.75	0.25	0.07	128	960	h =	1.25 ft
20	1.45	0.21	0.07	228	1,708		
30	1.2	0.17	0.07	238	1,781	a =	0.63 sf
40	0.95	0.14	0.07	205	1,535		
50	0.85	0.12	0.07	211	1,577	dia. =	11 in min.
60	0.76	0.11	0.07	206	1,539	Extended Storage	
120	0.51	0.07	0.07	182	1,363	Discharge (multiple orifices):	
180	0.4	0.06	0.07	134	1,000	Q_n =	0.07 cfs
240	0.33	0.05	0.07	59	442	Cd =	0.60
300	0.29	0.04	0.07	-7	-52	h =	9.00 in
360	0.25	0.04	0.07	-114	-853		
480	0.22	0.03	0.07	-240	-1,799	a Req'd. =	0.02 sf
600	0.18	0.03	0.07	-481	-3,596	No. Ea. =	2
720	0.16	0.02	0.07	-678	-5,070	Dia. Req'd.	0.88 in
1080	0.12	0.02	0.07	-1,328	-9,934		
1440	0.1	0.01	0.07	-1,976	-14,781		

Permanent Pool Vol. = 496 cf (req'd.)
First 1/2" Retention = 517 cf (req'd.)

BED VARIABLES		TOP DIMENSIONS	
LENGTH =	20 FT.		26.00 FT.
WIDTH =	20 FT.		26.00 FT.
DEPTH =	12.00 IN.		
SIDE SLOPE =	3 : 1		
Resulting Volume:	529 cf		

Ext. Detention Vol. = 238 cf (req'd.)

BED VARIABLES		OPERATING DIM.	
LENGTH =	28 FT.		30.67 FT.
WIDTH =	28 FT.		30.67 FT.
DEPTH =	4.00 IN.		
SIDE SLOPE =	4 : 1		
Resulting Volume:	287 cf		

Total Pond Depth: 22 in
1.83 ft

Resulting Top Dimensions with freeboard = 6 in
TOP DIMENSIONS 34.67 FT.
34.67 FT.

Bed Area 1 Req'd 400 sf
Bed Area 2 Req'd 784 sf