1050 FONTAINE DRIVE MULTI-FAMILY STORMWATER REPORT

2020

FEBRUARY 23

7B ENGINEERING
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DESIGN REPORT

SITE, GRADING, STORMWATER & EROSION CONTROL PLAN

For

RPP00000115800A aka **1050 Fontaine Drive**, Ponderay, ID 83852
TAX 2 of Section 11, Township 57 North, Range 2 West,
Boise Meridian, Bonner County, Ponderay, Idaho

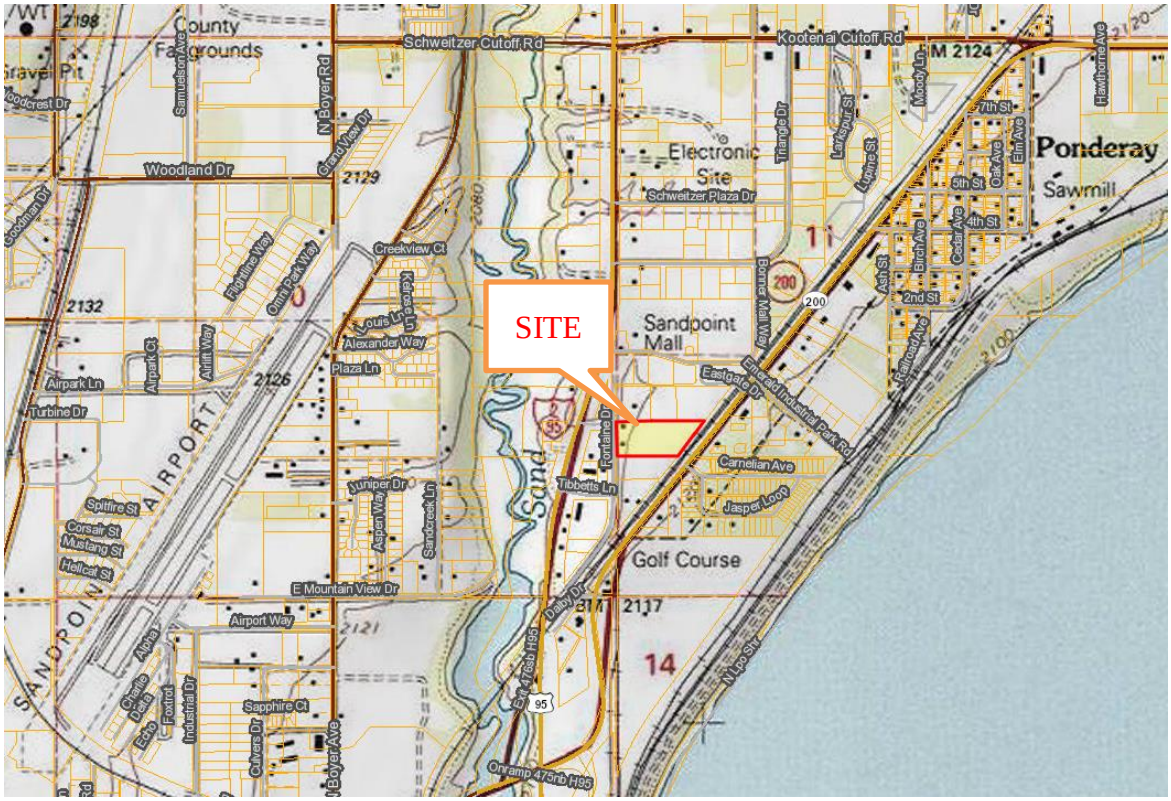

Figure 1: Vicinity Map

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Introduction

This report has been prepared to address design required by the City of Ponderay for a site plan application on 5.2 acres at 1050 Fontaine Drive in Ponderay, Idaho for Fontaine Park LLC. More specifically, this Site, Grading, Stormwater, and Erosion Control Plan addresses site requirements to construct four new 24-unit multi-family buildings.

Four buildings totaling 42,863 SF (roof areas) and 80,238 SF of parking lot will be constructed. Stormwater runoff, after treatment and detention, will be directed to an existing stormwater swale along the west side of the property. This report, calculations, and drawings are for review by the City of Ponderay and shall become the property of the Owner when approved for construction. All other requirements for any future building permits must be met by the Owner. This report addresses design requirements of the City.

Project Location

The site is located on the east side of Fontaine Drive (see Figure 1) between US-95 and the SH-200 in Ponderay. Property Identification Numbers: RPP00000115800A aka Tax2 of Section 11, Township 57 North, Range 2 West, Boise Meridian, Bonner County, City of Ponderay, Idaho.

Location:	**Property owner:**	**Size of Lot:**
Section 11, T57N, R2W	Fontaine Park LLC	5.2 Acres

Geotechnical

The USDA NRCS Web Soil Survey was used to categorize the soil characteristics at this site. A site visit confirmed the findings of the NRCS and the soils appeared to be consistent with the Survey. In general, the site consists of Mission silt loam, soils in Hydrologic group D. These soils have a low infiltration rate (high runoff potential), are very deep and very poorly drained. These consist chiefly of volcanic ash and loess over silty glaciolacustrine.

Soil amendment and underdrains (where feasible) are recommended for any infiltration treatment design. All required testing and inspections will be coordinated by the Owner and Contractor and/or his representative and will be submitted to the Engineer if required at the completion of construction.

Water System

The city of Sandpoint supplies water to the site.

Sewer System

The site is currently served by the Kootenai-Ponderay Sewer District.

Road Specifications

Fontaine Drive is a publicly owned and maintained roadway.

Stormwater Facility Description and Calculations

In general, this project disturbs 4 acres sloping less than 2 percent. All new impervious surface areas are required to be treated per the City of Ponderay. Coverage under the Idaho NPDES Permit through a NOI – or a Low Erosivity Waiver may be acquired if construction takes place during the dry season. The Grassed Infiltration Area (BMP 2: Bioinfiltration Swale) Best Management Practice from the DEQ Stormwater Catalog (Catalog, 2005) is chosen for stormwater treatment. The GIA is sized to capture the first ½" of runoff from the for treatment and detention as required by city code.

Hydrology and Hydraulics

To protect the drainage and downstream properties from hazardous runoff flooding, the NRCS TR-20 was used for stormwater calculations. An existing drainage basin contributing runoff to the site was determined by site visit and analysis of the available maps. Calculations were made using the Type II, 25-Year, 24-Hour Unit Hydrograph. Rainfall amounts were taken from the NOAA Isopluvial precipitation maps for Idaho. The predeveloped condition assumes the existing house, driveway, and grass over more than 75% of the existing site. The developed condition considers the proposed roof and parking lot areas over the site. Just downstream of the site is an existing regional stormwater system that empties into Sand Creek.

HydroCAD 10 was used to model the hydrology and hydraulics of the stormwater runoff. These procedures were developed by the Soil Conservation Service and in HydroCAD, fully-integrated with other H&H calculations to develop an interactive stormwater modeling system. The results of the stormwater model are presented in the following tables.

Table 1: Stormwater Summary

Predeveloped Stormwater Summary				
25-Year, 24 Hr Storm	Area (SF)	CN	24-Hr Peak Flow (CFS)	Post-Detention Peak (CFS)
Pre-Dveloped	5.174	81	6.46	5.31
Post-Developed	5.174	91	18.41	1.94

All stormwater discharges through a stormwater system on the property that also treats and detains Fontaine Drive. The existing ditch combines the public and private stormwater and the proposed facility will also combine stormwater.

Treatment Calculations

In general, more treatment volume is provided in the design than is required for the improvements shown. Table 2 below summarizes the treatment design calculations for the required first ½ inch of runoff from new impervious surface areas created by the project.

Table 2: Treatment Volume Summary

Treatment Summary			
Facility	Impervious Area (SF)	Volume Required (CF)	Volume Proposed (CF)
Existing	13,292	554	
Proposed	135,168	5632	25,869

Existing site impervious areas include the existing improvements and Fontaine Drive. Proposed areas do not include the existing home to be removed but do include Fontaine Drive.

The treatment volumes were found using the following calculations:

- **Treatment Volume** was calculated with the following equation:

$$(V_{treatment}\ cf) = (A_{impervious}\ sf) \times \left[\left(\frac{1}{2} in \text{ of runoff}\right) \times \left(\frac{1ft}{12in}\right)\right]$$

- **Infiltration Disposal Rate** was calculated with the following equation:

$$(Q_{infiltrate}\ CFS) = (A_{treatment}\ sf) \times (f_s\ \frac{in}{hr}) \times \left(\frac{1\ ft}{12\ in}\right) \times \left(\frac{1\ hr}{360\ sec}\right)$$

where f_s is the Infiltration Rate assumed or proposed for a given soil and sand (~2 in/hr).

- **Manning's Equations**:

$$Q = VA \qquad V = \frac{k}{n}\left(\frac{A}{P}\right)^{2/3} S^{1/2}$$

Where:

k is a unit conversion factor:
k=1.49 for English units (feet and seconds).
k=1.0 for SI units (meters and seconds).
A = Flow area of the pipe, culvert, or channel.
P = Wetted perimeter (the portion of the circumference that is in contact with water).
Q = Discharge (flow rate).
S = Downward (longitudinal) slope of the culvert, pipe, or channel.
V = Average velocity in the pipe, culvert, or channel.

It is assumed that the topsoil layer of facility will be properly modified for infiltration and plant growth as detailed in the section below. An infiltration rate of 1 to 3 inches is desirable. For this analysis, a rate of 2 in/hr is assumed. An underdrain is included so that the stormwater facility could meet the required infiltration rate.

- **Underdrain Pipe Capacity Calculation:**

$$(A_{swale}\ sf) = (22{,}613\ sf)$$

$$(Q_{infiltrate}\ cfs) = (22{,}613\ sf) \times (2_{swale}\ \frac{in}{hr}) \times \left(\frac{1\ ft}{12\ in}\right) \times \left(\frac{1\ hr}{3600\ sec}\right) = \mathbf{1.05\ cfs}$$

From commonly available nomographs for smooth interior pipe (Manning's "n" of 0.012), an 10" pipe at 0.30% slope **has a capacity of 1.5 cfs at a velocity of 2.5 fps**. A capacity chart is included in the Appendices but is based on Manning's Equation.

Stormwater Facility Construction and Maintenance

The facilities shown on these plans are intended to be constructed as a bioretention facility (Raingarden). The system are presented here is not intended to be exhaustive.

Constructions considerations

Grassed Infiltration Area (GIA)

GIA's are commonly seen as depressed grassy areas or swales free of invasive weeds, shrubs, or trees. They use soils and a compact root zone (typically from grass) to remove stormwater pollutants. They require frequent mowing and light maintenance (see below).

1) Grass or sod may be used but should be a species adapted to permeable soils. Avoid grass intended for clay soils or sod grown on clay.
2) Soil should be less than 25% clay, 3 to 5% organic material, and at least 60% sand.
3) Apply compost at a depth of 3 inches over area and till to 8-inch depth.
4) Scarify facility subgrade to 12-inch depth before planting. DO NOT COMPACT.
5) Grass height should be kept at 3 inches to 9 inches and all grass clippings removed.

Sediment should be removed when it begins to inhibit the growth of grass.

Maintenance Requirements

Inspect the constructed facility monthly and between large storm events for the first year. After the facility is established and working as designed, inspect in the spring and fall. Remove any dead or diseased vegetation and replant as needed. Mulch any bare spots at inspection and the entire facility every 2 to 3 years.

Water standing for more than 4 days after a storm when temperatures are above 50 degrees Fahrenheit may indicate a problem with the facility. Sediment removal and scarification of the topsoil or subgrade may be required. In extreme cases, soils may need to be replaced.

In addition to the treatment/filtration facility required to treat the driving surfaces, the treatment swale must be kept clean and clear to allow snow storage and stormwater floaters.

Erosion and Sediment Control BMP's

In general, this project disturbs 3 acres with an average slope of less than 2 percent. By constructing through the summer month, much of the maintenance needed on slopes with these soils can be avoided. A simple erosion control plan is presented here and shown on the plans, consisting primarily of fiber rolls, compost berms, and maintaining existing vegetation. Care must be taken by the Contractor to practice additional erosion control measures if needed.

To properly construct this project, approximately 3 Acres will be disturbed, including:

- Site Grading
- Utility Construction
- Building Pad
- Fine grading of landscape and stormwater facilities

All disturbed exposed areas will be covered with suitable topsoil, mulched, and either landscaped or re-vegetated on slopes 3:1 or less. Slopes steeper than 2:1 will be stabilized with stone mulch, riprap or boulders.

Temporary Erosion and Sediment Controls

All temporary erosion control features shall be installed and maintained as detailed and shall prevent stormwater runoff or sediment migration off-site. Barriers shall be placed perpendicular to the direction of flow and shall be deployed before construction begins. Leave all temporary stormwater and erosion control measures in place until vegetation has been re-established. Construct silt fence, compost berms, or fiber rolls where overland flow may allow runoff to leave the construction site or enter the neighboring properties. Mulching of disturbed, final graded areas can be done with hay, straw, wood chips, or grass clippings (8-10 pounds per 100 sf).

Timing of Construction

Construction activities for this site grading will proceed as follows:

Construction Schedule	Timing
Excavation and grading	May-21
Utility Construction	Jun-21
Finish grade bioswales and landscape areas	Jun-21
Reseed slopes and distrubed areas	Oct-21
Building Construction	May-21

By constructing in the dry season, the risk of sediment laden runoff is minimized and the sequence of construction will occur during optimal conditions. The Owner and Contractor shall continually monitor the site conditions and progress of the work, keeping erosion control measures in good repair.

Inlet Protection:

Inlet Filters that are placed inside catch basins or storm inlets. The inlet filtration/protection system is comprised of a corrosion resistant frame and a replaceable geotextile sediment bag attached to the frame with a stainless-steel locking band. The sediment bag hangs suspended from the rigid frame at a distance below the grate that shall allow full water flow into the drainage structure if the bag is completely filled with sediment. They are used to protect catch basins and storm systems against sedimentation, oils, debris and require certain considerations and light maintenance (see below).

1) Clean the ledge (lip) of the casting frame or drainage structure to ensure it is free of stone and dirt.
2) Drop in the Inlet Filter through the clear opening and be sure the suspension hangers rest firmly on the inside ledge (lip) of the casting.
3) Replace the grate and confirm it is elevated no more than 1/8", which is the thickness of the steel hangers.
4) To replace, engage the lifting bars or handles with the removal tool, and lift from the drainage structure.
5) Empty the sediment bag if more than half filled with sediment and debris, or as directed by the Engineer or Maintenance Contract in accordance with EPA guidelines. As an alternative, an industrial vacuum may be used to collect the accumulated sediment.

6) Remove any caked-on silt from the sediment bag and reverse flush the bag with medium spray for optimal filtration.
7) Replace the bag if torn or punctured to ½" diameter or greater on the lower half of the bag.
8) The skimmers start yellow in color and will gradually turn brown as they become saturated, indicating time for replacement. Dispose of all oil contaminated products in accordance with EPA guidelines.

Construction Entrance/Exit

A pad of crushed rock (2" to 8") constructed at the point of entry and exit to the project Stone to be placed at least 6" deep with the top layer made of 2" fractured rock. The pad should be at least 10 feet in width (or the full width of the approach used) and 50 to 100 feet in length (30 feet minimum). The crushed rock should be placed on a geotextile fabric and sloped to drain to a sediment trap or basin (a temporary berm may be created to satisfy).

Staging Areas

Equipment will be staged on the property and adjacent to the right-of-way that is undeveloped, ensuring any runoff from equipment or vehicles has adequate time for treatment. No dikes, berms or grading of staging areas is warranted or proposed.

Preservation of Existing Vegetation

Preserve all vegetation (trees and grass) not within the areas to be graded and minimize bare soil exposure. Grading activity areas shall be limited to those shown on the Plan. Keep all construction equipment, materials, and waste within the areas designated on the Plan and out of areas to be preserved.

Clearing Limits

Minimize the total area of bare soil exposed to 1 acre and cover with straw or stone mulch within 14 days of disturbance. Mulch slopes and cover exposed driveway surfaces with rock as grading progresses to reduce dust and erosion potential. Do not disturb areas outside of the grading limits established by the Plan. At the end of construction, prepare all slopes and landscape areas for seeding or include seed in the erosion control mulch used.

Mulching

Apply straw, grass, grass hay, compost, wood chips, or wood fibers onto exposed soils leaving no more than 1 acre exposed for no more than 14 days. Driveway graded surfaces should be mulched or covered by aggregate as soon as practical to prevent erosion and reduce dust. Slopes steeper than 2:1 may require netting or tacking agents to hold mulch in place.

If wood chips or fibers are used, especially if obtained by chipping trees or stumps on the site, limit use to slopes under 6%. If vegetation is desired, treat chipped areas with a nitrogen fertilizer to aid plant germination and growth – otherwise wood chips tent to reduce growth of undesirable plants.

Use wood or stone mulches in areas that are not desirable to mowed or maintain. Bark chips in particular should not be used on sloped areas as they tend to be carried away by spring runoff.

Gravel or crushed rock placed as mulch should be placed at 10 tons / 0.10 acre (4,400 sf) at a depth of 3 inches (average). Use where subject to traffic or on slopes where maintenance of vegetation is not desired.

Hay or straw mulch should be free of unwanted seeds and applied at 2 or 3 bales per 1,100 sf of exposed soil at a depth of 2 to 3 inches in a uniform mat. No more than 40% of the original ground or exposed soils should be visible through the mat. Netting or tacking agents may be needed on slopes exposed to wind or steeper than 2:1.

Wood fiber mulches should be used where plant growth is to be inhibited, particularly on slopes steeper than 3:1 where mowing or maintenance of vegetation is not desired. If used in areas where growth is to be encouraged, nitrogen treatment will be needed. Apply to an average depth of 3 inches or about 25 lbs per 1,000 sf.

Compost used as mulching should be applied to the Grassed Infiltration Area and any other areas where growth (grasses) is desired. Apply compost at a depth of 3 inches over areas where seeding is to be done.

Inspect all mulched areas weekly and repair any damaged or exposed soils immediately. Mulching should cease once vegetation is re-established.

Fiber Rolls

A fiber roll (wattle/compost-filled socks) consists of straw, flax, or other similar materials bound into a biodegradable tubular plastic or similar encasing material. Fibers rolls should be placed along a contour unless otherwise shown in plans. For slope inclinations 2:1 or greater, fiber rolls should be placed a maximum interval of 10 ft. When placing, turn the ends of the fiber roll up slope to prevent runoff from going around the roll. If more than one wattle is placed in a row, the rolls shall be overlapped a minimum of 12 inches. Maintain rolls daily during extended rain events, after rain events, and two-week intervals during dry season. Sediment shall be removed when sediment accumulation reaches one-half of the exposed height of the roll.

Temporary Berms

A berm or ridge of compacted soil, compost, or sandbags which is created to intercept and divert runoff from small construction areas. They are often constructed along the top edge of a fill slope but may also be constructed along a roadway, across a roadway (a transverse berm) at an angle with the centerline.

Temporary berms are used to direct or divert runoff flow from newly constructed slopes until vegetation is established or other permanent measures are in place. They intercept the stormwater flow from the construction area and direct it to temporary slopes drains or protected outlets for safe discharge. They can also be used as barriers to collect and store runoff. They can be used at storm drain inlets, across minor ditches or swales, or other areas where the structure is temporary.

Soil berms have an approximate height of 12 to 20 inches with a minimum top width of 2 to 3 feet and side slopes of 2:1 or flatter. Berms should be high enough to prevent flow from overtopping and are normally constructed of embankment materials. Grade to drain to a slope or drain inlet. Compact the entire width of the berm with a bulldozer or loader/grader wheels.

Compost berms act as filter berms and are most effective when constructed 1 foot high by 2 feet wide or 1.5 feet high and 3 feet wide. Construct with 25-100% organic matter with particles not to exceed 3-inches thick or 6-inches long. Particle gradation should also be 90-100% passing a 1-in. filter, 70-100% passing the ¾ inch filter, and 30%-75% passing the ¼ inch filter.

Sandbag berms have the following dimensions

- Height: 20 in. minimum
- Top Width: 20 in. minimum
- Bottom Width: 4-1/4 to 5 feet
- Sandbag size – length 2 -2.6 ft, width 16-20 in., depth or thickness 6-8 inches. and weight 88 to 132 lbs.

Install so that flow between bags is prevented. Stack bags in an interlocking fashion but no more than 3 bags high without widening the base. Can be used to impound the volume of the design storm.

Permanent Erosion Controls

After construction is complete, all exposed soils shall be covered by a minimum of 3-inches topsoil or mulch. Areas to be vegetated will be seeded, planted, or landscaped. Slopes in excess of 2:1 shall be armored with rip-rap or covered with topsoil, seeding, mulch, and matt.

Seeding and mulching shall not be applied to areas of standing water. Mulch shall be applied at a rate of 8-10 pounds per 100 square feet (2" – 3" thick when loose) with a maximum of 20% of original ground noticeable. Slopes in excess of 3:1 which are not rip-rapped shall be covered with Jute matting or hydro-seeded for stability of seed bed.

Plant List

Refer to Bonner County Code Title 12, Appendix B - North Idaho Native and Beneficial Plant List.

Proposed Supplementary Conditions

The following are proposed & recommend conditions to help achieve site approval by the City of Ponderay.

Sidewalk or Bike Path

The owner requests to pay a fee in lieu for sidewalk (or bike path) construction because there are no sidewalks or bike paths adjacent of the project. A stormwater drainage swale and public utilities make the installation of the sidewalk unreasonable on the property frontage. Please see the attached engineers estimated value.

Right-of-Ways

A proposed 30-foot Right-of-Way dedication to the City of Ponderay is proposed along the northern boundary of the property. A proposed 20-foot Right-of-Way dedication to the City of Ponderay is proposed along the southern boundary of the property.

Operation and Maintenance Plan

Temporary and Permanent Erosion and Stormwater control measures will be the responsibility of the Owner:

Inspection Schedule & Maintenance Activities

As described above, both temporary and permanent erosion and sediment control measures should be inspected by the Owner and/or Contractor. Below is an inspection schedule table for convenience.

Stormwater Feature or Erosion Control Measure	Inspection Frequency	Maintenance Activities
Mulching	Weekly & following major rain event	Mulch exposed soil
Fiber Rolls	Weekly & following major rain event	Repair and remove sediment
Temporary Berms	Weekly & following major rain event	Repair or Replace as needed.
Treatment and Detention Facility	Monthly the first year and bi-annually thereafter	Mulch exposed soil and mulch cell every 2 to 3 years

In conclusion, I find that the proposed permanent improvements if properly constructed and maintained as described herein and shown on the Plans, will treat and detain the additional runoff to be generated with the future construction of the roadway and buildings on these properties.

References

Catalog, I. S. (2005). *http://www.deq.idaho.gov/media/622263-Stormwater.pdf.* Retrieved from deq.idaho.gov: http://www.deq.idaho.gov/media/622263-Stormwater.pdf

Kennedy Engineers. (1992). *Stormwater Management Plan Criteria and Engineering Standards.* Spokane, WA: Interagency Stormwater Committee.

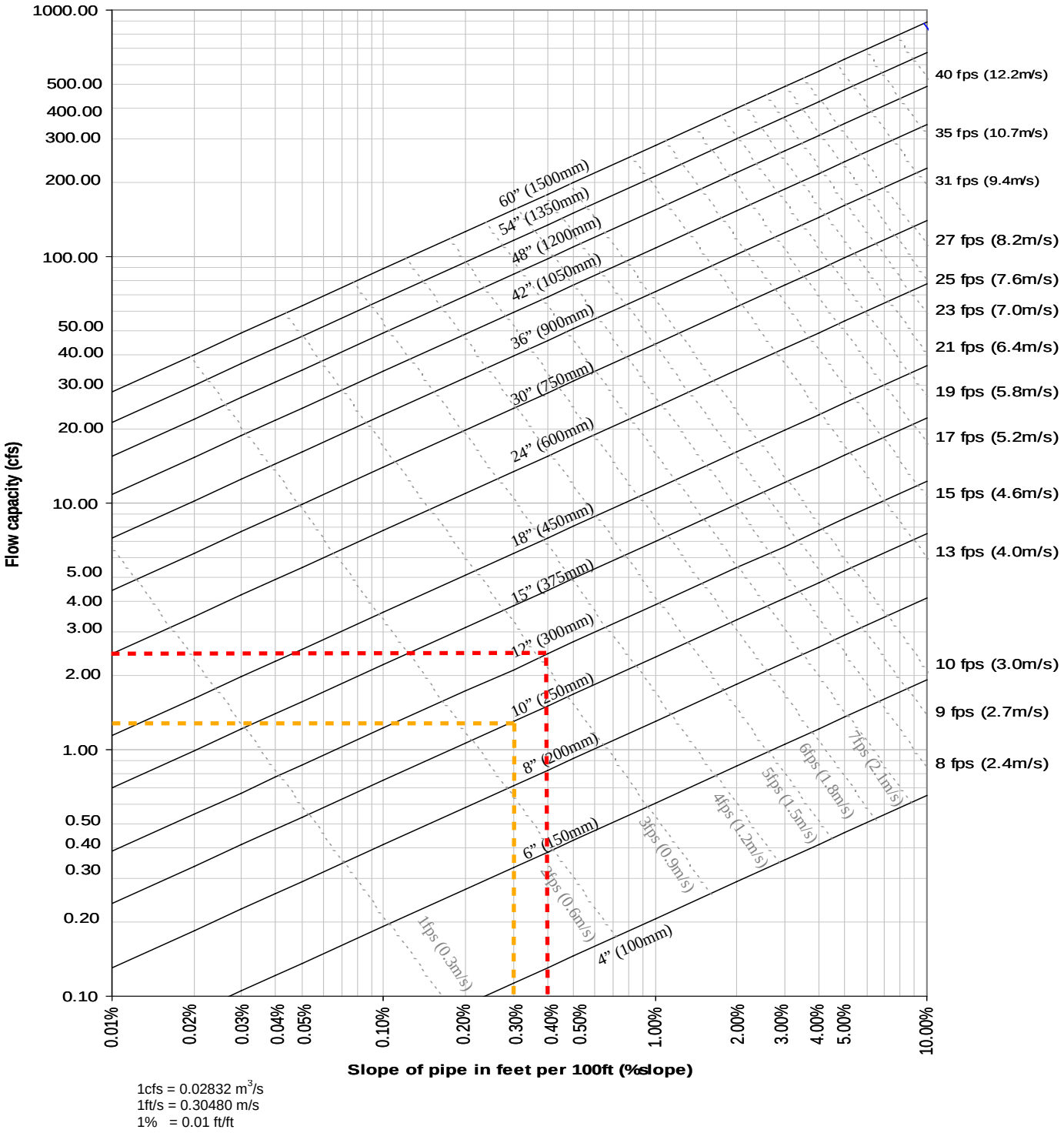
National Resource Conservation Service. (n.d.). *Web Soil Survey*. Retrieved from USDA NRCS: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

NOAA Atlas 2. (1973). *Precipitation Frequency Isopluvials.* NOAA.

Thomas J. Glover and Richard A. Young. (2001-2017). *Handyman In-Your-Pocket.* Anchorage, Alaska, U.S.A.: Sequoia Publishing, Inc.

U.S. Environmental Protection Agency. (September, 2004). *Stormwater Best Management Practice Design Guide: Volume 1 General Considerations.* Washington DC: Office of Research and Development.

Figure 3-1
Discharge Rates for ADS Corrugated Pipe with Smooth Interior Liner[1]



1cfs = 0.02832 m^3/s
1ft/s = 0.30480 m/s
1% = 0.01 ft/ft

1. Applicable products: N-12®, MEGA GREEN®, N-12 STIB, N-12 WTIB, HP STORM, SaniTIte®, SaniTite HP, N-12 Low Head

Note: Based on a design Manning's "n" of 0.012.
Solid lines indicate pipe diameters. Dashed lines indicate approximate flow velocity.
Redeveloped from FHWA HDS 3 – Design Charts for Open-Channel Flow[2]

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Engineers Estimate of Probable Costs

Concrete Sidewalk and Approach

Fontaine Frontage

Description	Quantity	Units	Unit Price	Cost	
GRADING AND EXCAVATION	6000	SF	$ 0.60	$ 3,600.00	
12" ADS STORM PIPE	300	LF	$ 30.00	$ 9,000.00	
WSDOT TYPE 1 CATCH BASINS	2	EA	$ 850.00	$ 1,700.00	
ODOT FIELD INLET TOP	2	EA	$ 750.00	$ 1,500.00	
SIDEWALK CONSTRUCTION/ CONCRETE (5 FT X300 FT)	1500	SF	$ 5.00	$ 7,500.00	
TEMPORARY ADA RAMP	1	EA	$ 1,000.00	$ 1,000.00	
APPROACH CONSTRUCTION/CONRETE	520	SF	$ 5.00	$ 2,600.00	**$ 26,900.00**

Summary

Estimated Costs To Construct	$ 26,900.00
Contingency (15%)	$ 4,035.00
Total Estimated Costs	**$ 30,935.00**
Estimated Project Costs	**$ 31,000.00**

This Engineers Estimate is based upon the 2013 - 2020 Average Unit Price Report Low Bid Average as published by ITD, where available and actual bids received.

The Average Unit prices used are assumed to be relatively accurate.

Design Costs include estimated costs for Survey, Drafting, Engineering,Construction Staking, Inspection, As Builts, and Estimates including this estimate.

This Estimate is intended to serve as a cost analysis for the Developer

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2/23/21

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

Map Scale: 1:1,420 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

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
31	Mission silt loam, 0 to 2 percent slopes	5.8	100.0%
Totals for Area of Interest		**5.8**	**100.0%**

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: Lake 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

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 3 inches: silt loam
Bw - 3 to 12 inches: silt loam
2Btx - 12 to 21 inches: silt loam
2E - 21 to 33 inches: silt
2Bt - 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
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): 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 content: 5 percent
Available water capacity: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): 6e

Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F043AY527WA - Warm-Frigid, Udic, Loamy Foothills/Valleys, high water table (western redcedar, moist herb) Thuja plicata / Clintonia uniflora
Other vegetative classification: western redcedar/queencup beadlily (CN530)
Hydric soil rating: No

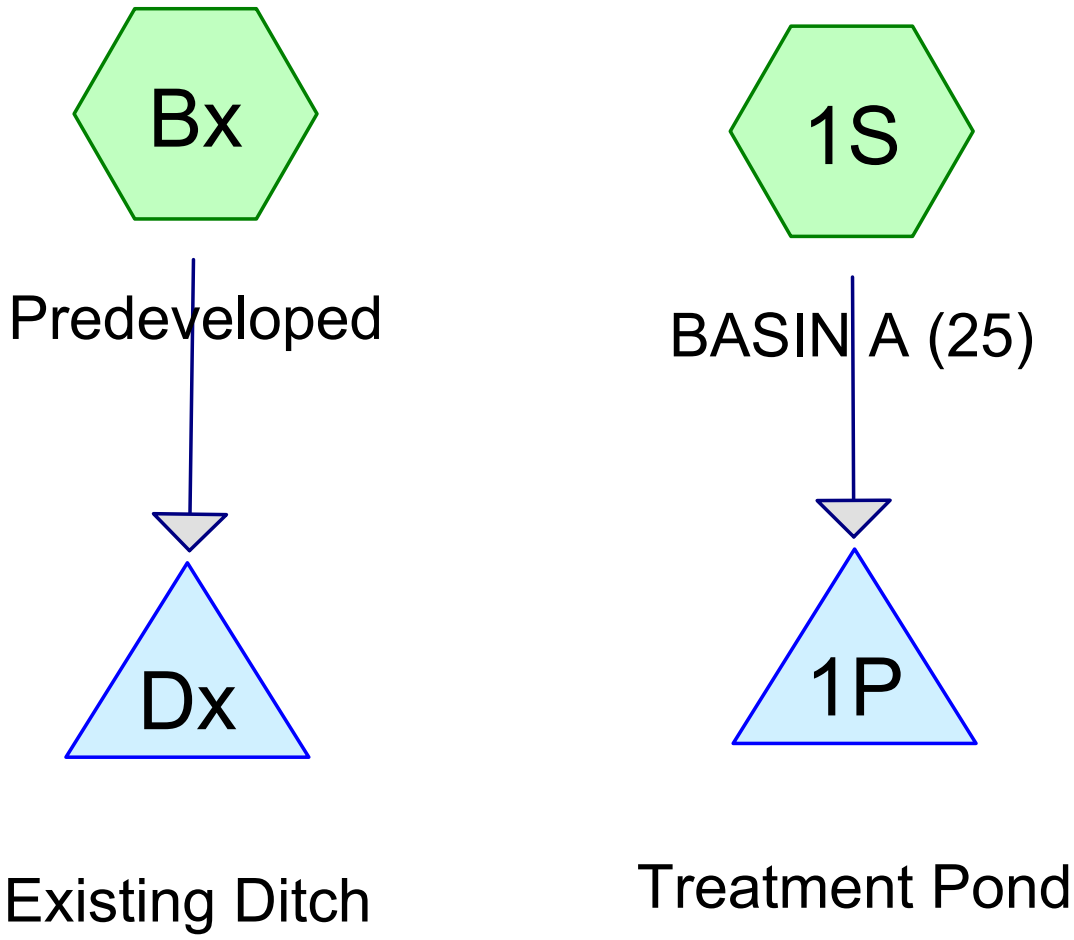
Minor Components

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
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

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



Subcat Reach Pond Link

Routing Diagram for 02.23.21 Developed
Prepared by D2G, Printed 2/23/2021
HydroCAD® 10.00-22 s/n 10419 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.571	84	50-75% Grass cover, Fair, HSG D (1S)
6.674	80	>75% Grass cover, Good, HSG D (1S, Bx)
1.842	98	Paved parking, HSG D (1S)
0.984	98	Roofs, HSG D (1S)
0.260	98	S Access, HSG D (1S)
0.017	98	Unconnected roofs, HSG D (1S)
10.348	**86**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
10.348	HSG D	1S, Bx
0.000	Other	
10.348		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.571	0.000	0.571	50-75% Grass cover, Fair	1S
0.000	0.000	0.000	6.674	0.000	6.674	>75% Grass cover, Good	1S, Bx
0.000	0.000	0.000	1.842	0.000	1.842	Paved parking	1S
0.000	0.000	0.000	0.984	0.000	0.984	Roofs	1S
0.000	0.000	0.000	0.260	0.000	0.260	S Access	1S
0.000	0.000	0.000	0.017	0.000	0.017	Unconnected roofs	1S
0.000	**0.000**	**0.000**	**10.348**	**0.000**	**10.348**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	2,121.00	2,119.19	55.0	0.0329	0.012	12.0	0.0	0.0
2	Dx	2,119.77	2,119.19	55.0	0.0105	0.012	12.0	0.0	0.0

Time span=1.00-30.00 hrs, dt=0.01 hrs, 2901 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: BASIN A (25) Runoff Area=225,381 sf 59.97% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=91 Runoff=18.41 cfs 0.893 af

Subcatchment Bx: Predeveloped Runoff Area=5.174 ac 0.00% Impervious Runoff Depth=1.25"
Flow Length=250' Tc=23.2 min CN=80 Runoff=6.46 cfs 0.539 af

Pond 1P: Treatment Pond Peak Elev=2,123.29' Storage=18,475 cf Inflow=18.41 cfs 0.893 af
Outflow=1.94 cfs 0.890 af

Pond Dx: Existing Ditch Peak Elev=2,122.30' Storage=1,668 cf Inflow=6.46 cfs 0.539 af
12.0" Round Culvert n=0.012 L=55.0' S=0.0105 '/' Outflow=5.31 cfs 0.539 af

Total Runoff Area = 10.348 ac Runoff Volume = 1.432 af Average Runoff Depth = 1.66"
70.01% Pervious = 7.245 ac 29.99% Impervious = 3.103 ac

Summary for Subcatchment 1S: BASIN A (25)

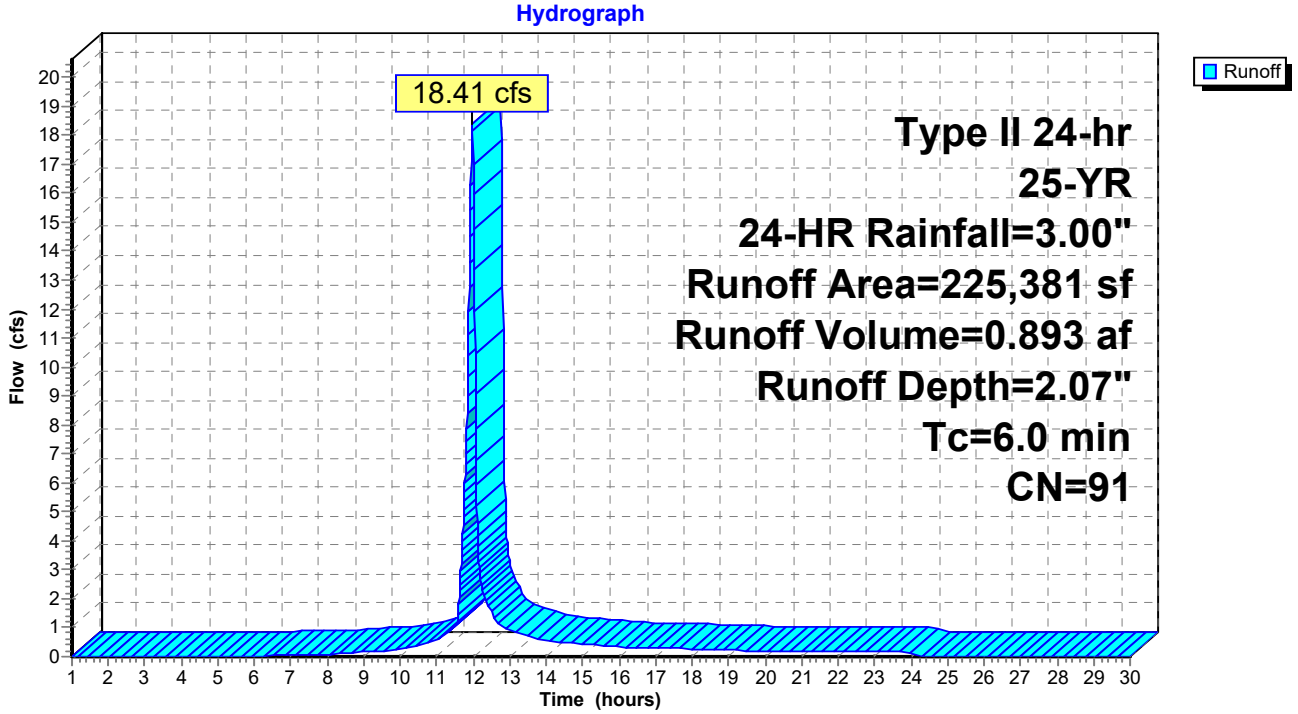
Runoff = 18.41 cfs @ 11.97 hrs, Volume= 0.893 af, Depth= 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR, 24-HR Rainfall=3.00"

	Area (sf)	CN	Description
	65,340	80	>75% Grass cover, Good, HSG D
	42,863	98	Roofs, HSG D
	80,238	98	Paved parking, HSG D
	741	98	Unconnected roofs, HSG D
*	11,326	98	S Access, HSG D
	24,873	84	50-75% Grass cover, Fair, HSG D
	225,381	91	Weighted Average
	90,213		40.03% Pervious Area
	135,168		59.97% Impervious Area
	741		0.55% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum**

Subcatchment 1S: BASIN A (25)



Hydrograph for Subcatchment 1S: BASIN A (25)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
1.00	0.03	0.00	0.00
1.50	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.50	0.08	0.00	0.00
3.00	0.10	0.00	0.00
3.50	0.12	0.00	0.00
4.00	0.14	0.00	0.00
4.50	0.17	0.00	0.00
5.00	0.19	0.00	0.00
5.50	0.21	0.00	0.01
6.00	0.24	0.00	0.02
6.50	0.27	0.00	0.04
7.00	0.30	0.01	0.05
7.50	0.33	0.02	0.07
8.00	0.36	0.02	0.09
8.50	0.40	0.03	0.12
9.00	0.44	0.05	0.17
9.50	0.49	0.07	0.20
10.00	0.54	0.09	0.27
10.50	0.61	0.12	0.38
11.00	0.71	0.17	0.59
11.50	0.85	0.26	**1.08**
12.00	1.99	1.15	**17.01**
12.50	2.20	1.34	1.50
13.00	2.32	1.44	0.92
13.50	2.40	1.52	0.70
14.00	2.46	1.57	0.55
14.50	2.51	1.62	0.49
15.00	2.56	1.67	0.44
15.50	2.60	1.70	0.39
16.00	2.64	1.74	0.34
16.50	2.67	1.77	0.32
17.00	2.71	1.80	0.30
17.50	2.74	1.83	0.28
18.00	2.76	1.85	0.26
18.50	2.79	1.88	0.25
19.00	2.81	1.90	0.23
19.50	2.84	1.92	0.21
20.00	2.86	1.94	0.19
20.50	2.88	1.96	0.19
21.00	2.89	1.97	0.18
21.50	2.91	1.99	0.18
22.00	2.93	2.01	0.18
22.50	2.95	2.02	0.17
23.00	2.97	2.04	0.17
23.50	2.98	2.06	0.16
24.00	**3.00**	**2.07**	0.16
24.50	3.00	2.07	0.00
25.00	3.00	2.07	0.00
25.50	3.00	2.07	0.00
26.00	3.00	2.07	0.00
26.50	3.00	2.07	0.00
27.00	3.00	2.07	0.00
27.50	3.00	2.07	0.00
28.00	3.00	2.07	0.00
28.50	3.00	2.07	0.00
29.00	3.00	2.07	0.00
29.50	3.00	2.07	0.00
30.00	3.00	2.07	0.00

Summary for Subcatchment Bx: Predeveloped

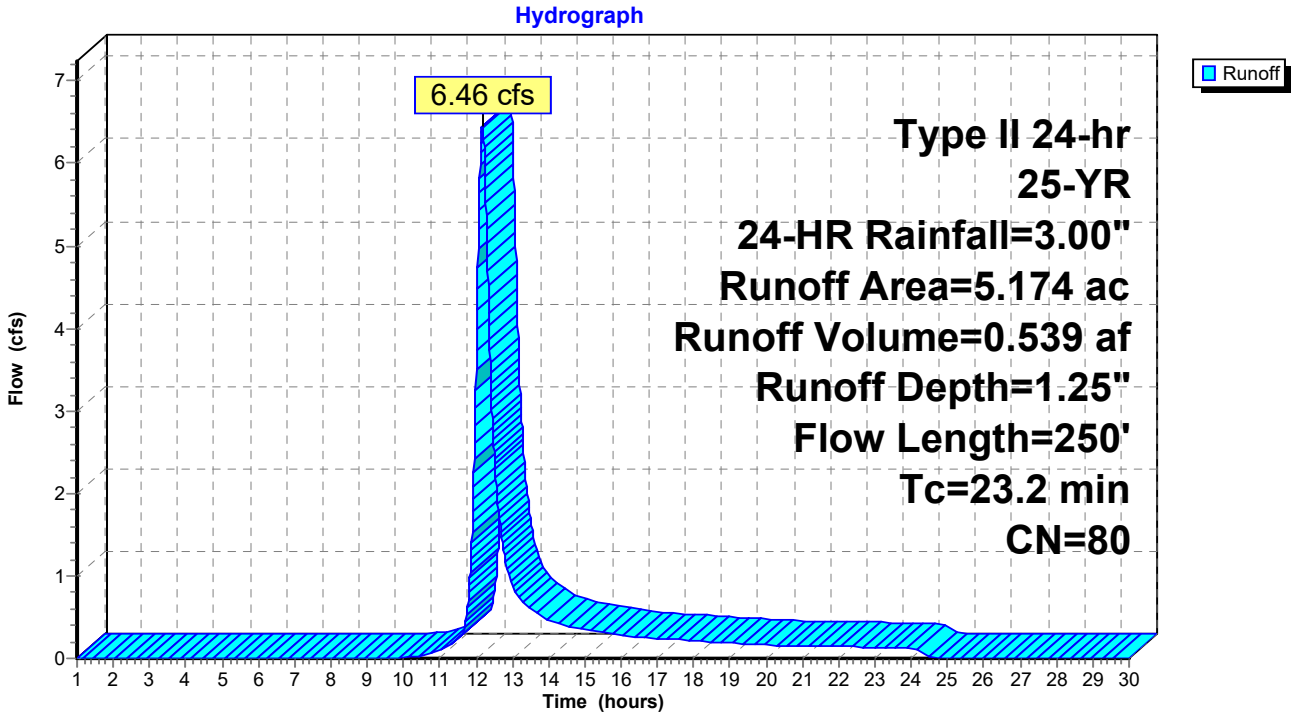
Runoff = 6.46 cfs @ 12.17 hrs, Volume= 0.539 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR, 24-HR Rainfall=3.00"

Area (ac)	CN	Description
5.174	80	>75% Grass cover, Good, HSG D
5.174		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0050	2.89	4.34	**Channel Flow, Conveyance Channel** Area= 1.5 sf Perim= 2.0' r= 0.75' n= 0.030 Short grass
22.6	150	0.0100	0.11		**Sheet Flow, Sheet flow** Grass: Short n= 0.150 P2= 2.00"
23.2	250	Total			

Subcatchment Bx: Predeveloped



Hydrograph for Subcatchment Bx: Predeveloped

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
1.00	0.03	0.00	0.00
1.50	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.50	0.08	0.00	0.00
3.00	0.10	0.00	0.00
3.50	0.12	0.00	0.00
4.00	0.14	0.00	0.00
4.50	0.17	0.00	0.00
5.00	0.19	0.00	0.00
5.50	0.21	0.00	0.00
6.00	0.24	0.00	0.00
6.50	0.27	0.00	0.00
7.00	0.30	0.00	0.00
7.50	0.33	0.00	0.00
8.00	0.36	0.00	0.00
8.50	0.40	0.00	0.00
9.00	0.44	0.00	0.00
9.50	0.49	0.00	0.00
10.00	0.54	0.00	0.00
10.50	0.61	0.00	0.03
11.00	0.71	0.02	0.09
11.50	0.85	0.04	0.23
12.00	1.99	0.56	**3.49**
12.50	2.20	0.69	**2.50**
13.00	2.32	0.76	0.89
13.50	2.40	0.82	0.60
14.00	2.46	0.86	0.47
14.50	2.51	0.90	0.39
15.00	2.56	0.93	0.35
15.50	2.60	0.96	0.32
16.00	2.64	0.99	0.28
16.50	2.67	1.01	0.25
17.00	2.71	1.03	0.24
17.50	2.74	1.06	0.23
18.00	2.76	1.08	0.21
18.50	2.79	1.09	0.20
19.00	2.81	1.11	0.19
19.50	2.84	1.13	0.17
20.00	2.86	1.14	0.16
20.50	2.88	1.16	0.15
21.00	2.89	1.17	0.15
21.50	2.91	1.18	0.14
22.00	2.93	1.20	0.14
22.50	2.95	1.21	0.14
23.00	2.97	1.22	0.14
23.50	2.98	1.24	0.13
24.00	**3.00**	**1.25**	0.13
24.50	3.00	1.25	0.02
25.00	3.00	1.25	0.00
25.50	3.00	1.25	0.00
26.00	3.00	1.25	0.00
26.50	3.00	1.25	0.00
27.00	3.00	1.25	0.00
27.50	3.00	1.25	0.00
28.00	3.00	1.25	0.00
28.50	3.00	1.25	0.00
29.00	3.00	1.25	0.00
29.50	3.00	1.25	0.00
30.00	3.00	1.25	0.00

Summary for Pond 1P: Treatment Pond

Inflow Area = 5.174 ac, 59.97% Impervious, Inflow Depth = 2.07" for 25-YR, 24-HR event
Inflow = 18.41 cfs @ 11.97 hrs, Volume= 0.893 af
Outflow = 1.94 cfs @ 12.36 hrs, Volume= 0.890 af, Atten= 89%, Lag= 23.3 min
Primary = 1.94 cfs @ 12.36 hrs, Volume= 0.890 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 2,123.29' @ 12.36 hrs Surf.Area= 17,472 sf Storage= 18,475 cf
Flood Elev= 2,123.50' Surf.Area= 18,531 sf Storage= 22,167 cf

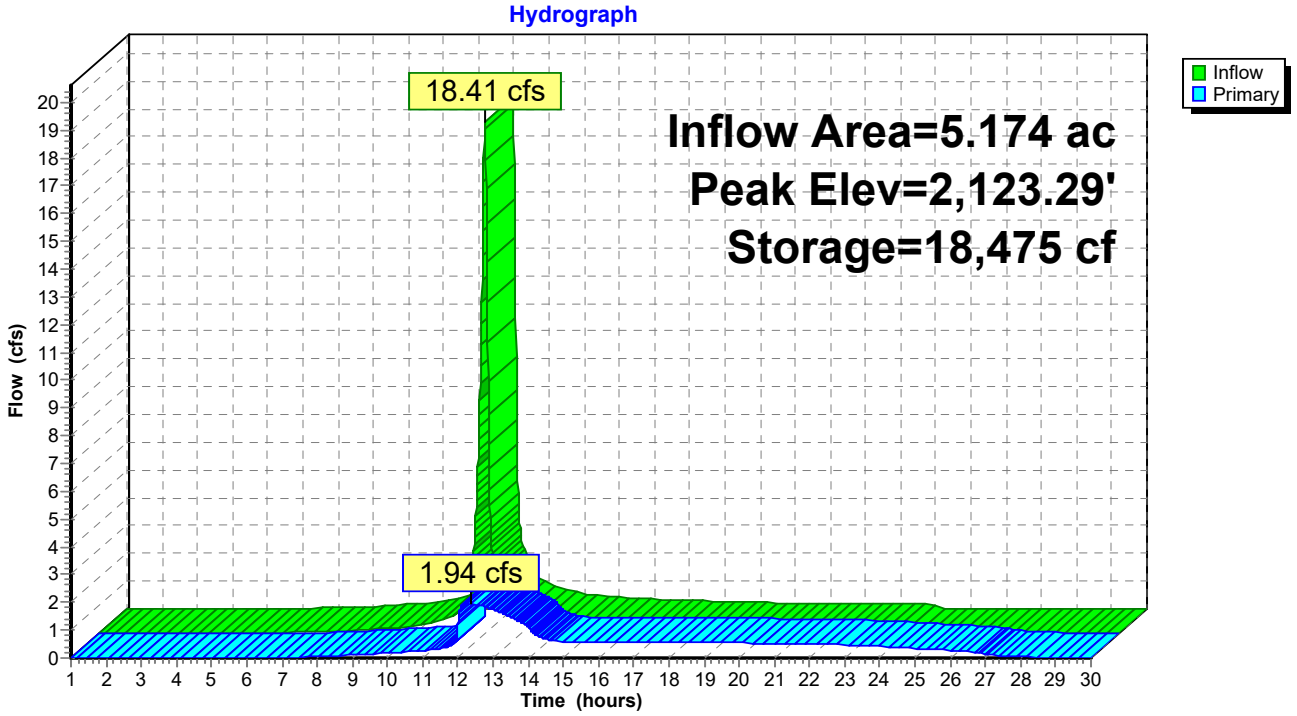
Plug-Flow detention time= 215.1 min calculated for 0.889 af (100% of inflow)
Center-of-Mass det. time= 212.7 min (1,014.5 - 801.8)

Volume	Invert	Avail.Storage	Storage Description
#1	2,121.00'	9,513 cf	**15.00'W x 122.00'L x 3.00'H North Pond Z=3.0**
#2	2,121.00'	6,489 cf	**15.00'W x 80.00'L x 3.00'H South Pond Z=3.0**
#3	2,122.50'	9,867 cf	**15.00'W x 545.00'L x 1.00'H Treatment Swale Z=3.0**
		25,869 cf	Total Available Storage

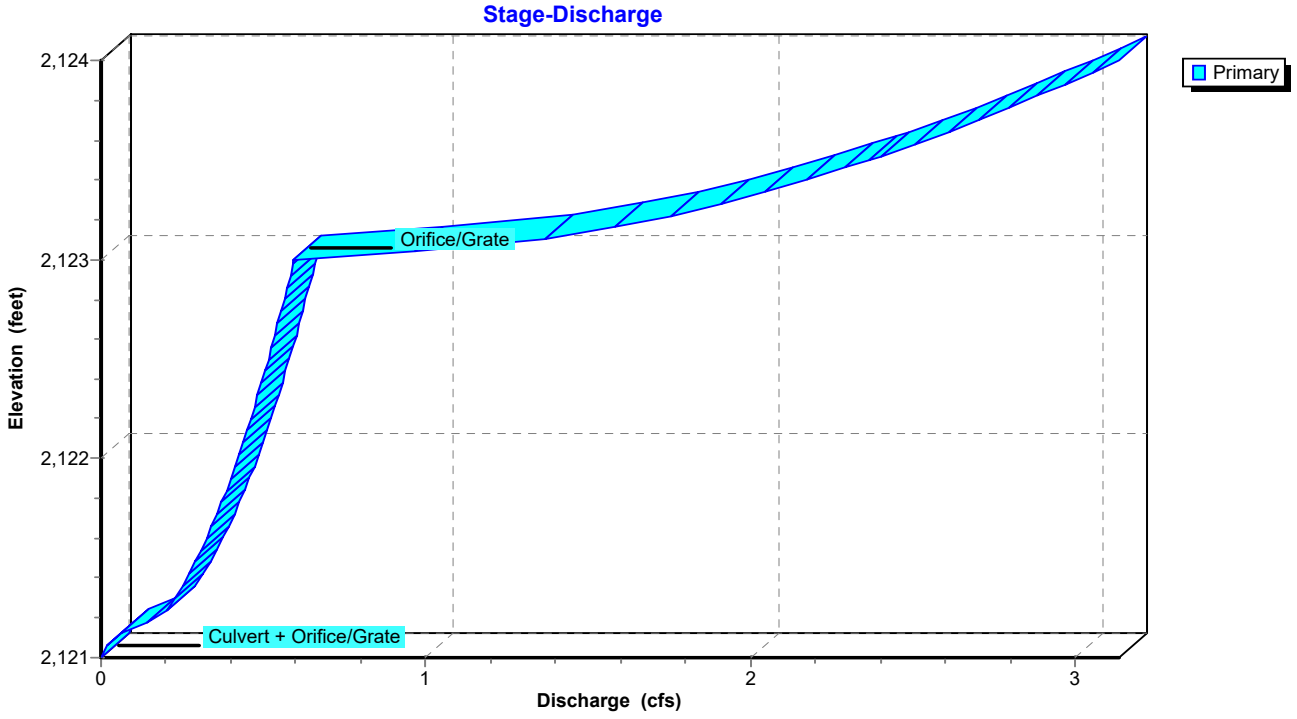
Device	Routing	Invert	Outlet Devices
#1	Primary	2,121.00'	**12.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,121.00' / 2,119.19' S= 0.0329 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	2,121.00'	**4.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	2,123.00'	**1.0" x 6.0" Horiz. Orifice/Grate X 2.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.94 cfs @ 12.36 hrs HW=2,123.29' (Free Discharge)
└**1=Culvert** (Passes 1.94 cfs of 5.07 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.64 cfs @ 7.29 fps)
  └**3=Orifice/Grate** (Orifice Controls 1.31 cfs @ 2.61 fps)

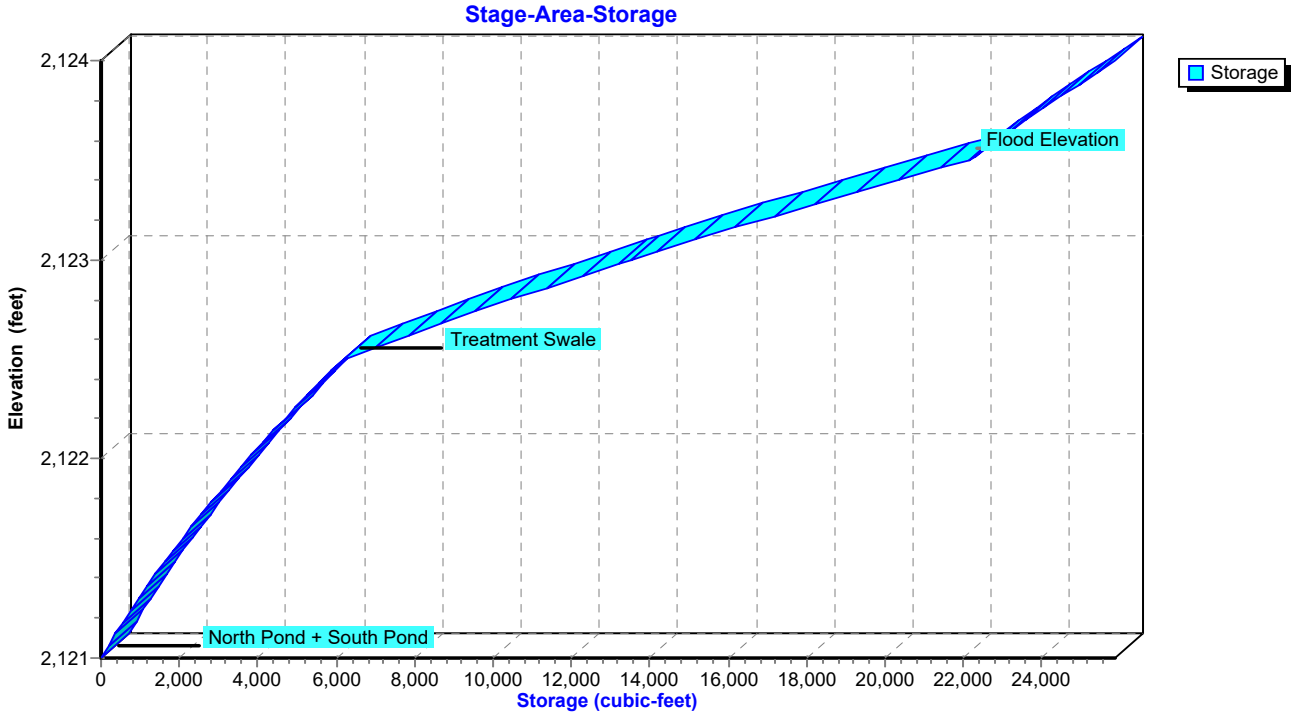
Pond 1P: Treatment Pond



Pond 1P: Treatment Pond



Pond 1P: Treatment Pond



Hydrograph for Pond 1P: Treatment Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
1.00	0.00	0	2,121.00	0.00
2.00	0.00	0	2,121.00	0.00
3.00	0.00	0	2,121.00	0.00
4.00	0.00	0	2,121.00	0.00
5.00	0.00	0	2,121.00	0.00
6.00	0.02	25	2,121.01	0.00
7.00	0.05	140	2,121.05	0.01
8.00	0.09	302	2,121.10	0.04
9.00	0.17	494	2,121.16	0.11
10.00	0.27	692	2,121.22	0.20
11.00	**0.59**	1,324	2,121.40	0.27
12.00	**17.01**	**14,458**	**2,123.06**	**1.18**
13.00	0.92	**17,079**	**2,123.21**	**1.74**
14.00	0.55	14,374	2,123.05	1.14
15.00	0.44	13,495	2,123.00	0.59
16.00	0.34	12,768	2,122.95	0.59
17.00	0.30	11,810	2,122.89	0.58
18.00	0.26	10,761	2,122.82	0.57
19.00	0.23	9,624	2,122.74	0.55
20.00	0.19	8,406	2,122.66	0.54
21.00	0.18	7,152	2,122.57	0.53
22.00	0.18	5,930	2,122.45	0.51
23.00	0.17	4,799	2,122.22	0.47
24.00	0.16	3,794	2,122.01	0.42
25.00	0.00	2,451	2,121.70	0.35
26.00	0.00	1,337	2,121.40	0.27
27.00	0.00	558	2,121.18	0.13
28.00	0.00	294	2,121.09	0.04
29.00	0.00	197	2,121.06	0.02
30.00	0.00	147	2,121.05	0.01

Stage-Discharge for Pond 1P: Treatment Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
2,121.00	0.00	2,122.04	0.43	2,123.08	1.29
2,121.02	0.00	2,122.06	0.43	2,123.10	1.37
2,121.04	0.01	2,122.08	0.44	2,123.12	1.45
2,121.06	0.02	2,122.10	0.44	2,123.14	1.52
2,121.08	0.03	2,122.12	0.44	2,123.16	1.58
2,121.10	0.04	2,122.14	0.45	2,123.18	1.64
2,121.12	0.06	2,122.16	0.45	2,123.20	1.70
2,121.14	0.09	2,122.18	0.46	2,123.22	1.76
2,121.16	0.11	2,122.20	0.46	2,123.24	1.81
2,121.18	0.14	2,122.22	0.46	2,123.26	1.86
2,121.20	0.17	2,122.24	0.47	2,123.28	1.91
2,121.22	0.20	2,122.26	0.47	2,123.30	1.96
2,121.24	0.21	2,122.28	0.48	2,123.32	2.00
2,121.26	0.21	2,122.30	0.48	2,123.34	2.05
2,121.28	0.22	2,122.32	0.48	2,123.36	2.09
2,121.30	0.23	2,122.34	0.49	2,123.38	2.13
2,121.32	0.24	2,122.36	0.49	2,123.40	2.17
2,121.34	0.25	2,122.38	0.49	2,123.42	2.21
2,121.36	0.25	2,122.40	0.50	2,123.44	2.25
2,121.38	0.26	2,122.42	0.50	2,123.46	2.29
2,121.40	0.27	2,122.44	0.50	2,123.48	2.33
2,121.42	0.27	2,122.46	0.51	2,123.50	2.37
2,121.44	0.28	2,122.48	0.51	2,123.52	2.40
2,121.46	0.28	2,122.50	0.51	2,123.54	2.44
2,121.48	0.29	2,122.52	0.52	2,123.56	2.47
2,121.50	0.30	2,122.54	0.52	2,123.58	2.51
2,121.52	0.30	2,122.56	0.52	2,123.60	2.54
2,121.54	0.31	2,122.58	0.53	2,123.62	2.58
2,121.56	0.31	2,122.60	0.53	2,123.64	2.61
2,121.58	0.32	2,122.62	0.53	2,123.66	2.64
2,121.60	0.33	2,122.64	0.54	2,123.68	2.67
2,121.62	0.33	2,122.66	0.54	2,123.70	2.70
2,121.64	0.34	2,122.68	0.54	2,123.72	2.74
2,121.66	0.34	2,122.70	0.55	2,123.74	2.77
2,121.68	0.35	2,122.72	0.55	2,123.76	2.80
2,121.70	0.35	2,122.74	0.55	2,123.78	2.83
2,121.72	0.36	2,122.76	0.56	2,123.80	2.86
2,121.74	0.36	2,122.78	0.56	2,123.82	2.89
2,121.76	0.37	2,122.80	0.56	2,123.84	2.91
2,121.78	0.37	2,122.82	0.57	2,123.86	2.94
2,121.80	0.38	2,122.84	0.57	2,123.88	2.97
2,121.82	0.38	2,122.86	0.57	2,123.90	3.00
2,121.84	0.39	2,122.88	0.58	2,123.92	3.03
2,121.86	0.39	2,122.90	0.58	2,123.94	3.05
2,121.88	0.39	2,122.92	0.58	2,123.96	3.08
2,121.90	0.40	2,122.94	0.59	2,123.98	3.11
2,121.92	0.40	2,122.96	0.59	2,124.00	**3.14**
2,121.94	0.41	2,122.98	0.59		
2,121.96	0.41	2,123.00	0.59		
2,121.98	0.42	2,123.02	0.73		
2,122.00	0.42	2,123.04	0.97		
2,122.02	0.42	2,123.06	1.19		

Stage-Area-Storage for Pond 1P: Treatment Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
2,121.00	0	2,122.04	3,931	2,123.08	14,839
2,121.02	61	2,122.06	4,022	2,123.10	15,167
2,121.04	122	2,122.08	4,114	2,123.12	15,498
2,121.06	184	2,122.10	4,207	2,123.14	15,830
2,121.08	247	2,122.12	4,300	2,123.16	16,165
2,121.10	310	2,122.14	4,394	2,123.18	16,501
2,121.12	374	2,122.16	4,489	2,123.20	16,840
2,121.14	438	2,122.18	4,584	2,123.22	17,181
2,121.16	503	2,122.20	4,680	2,123.24	17,524
2,121.18	568	2,122.22	4,776	2,123.26	17,868
2,121.20	634	2,122.24	4,873	2,123.28	18,215
2,121.22	701	2,122.26	4,971	2,123.30	18,564
2,121.24	768	2,122.28	5,069	2,123.32	18,915
2,121.26	835	2,122.30	5,168	2,123.34	19,268
2,121.28	903	2,122.32	5,268	2,123.36	19,623
2,121.30	972	2,122.34	5,368	2,123.38	19,981
2,121.32	1,042	2,122.36	5,468	2,123.40	20,340
2,121.34	1,112	2,122.38	5,570	2,123.42	20,701
2,121.36	1,182	2,122.40	5,672	2,123.44	21,064
2,121.38	1,253	2,122.42	5,775	2,123.46	21,430
2,121.40	1,325	2,122.44	5,878	2,123.48	21,797
2,121.42	1,397	2,122.46	5,982	2,123.50	22,167
2,121.44	1,470	2,122.48	6,087	2,123.52	22,307
2,121.46	1,543	2,122.50	6,192	2,123.54	22,447
2,121.48	1,617	2,122.52	6,462	2,123.56	22,588
2,121.50	1,692	2,122.54	6,734	2,123.58	22,729
2,121.52	1,767	2,122.56	7,008	2,123.60	22,872
2,121.54	1,843	2,122.58	7,284	2,123.62	23,015
2,121.56	1,919	2,122.60	7,562	2,123.64	23,159
2,121.58	1,996	2,122.62	7,842	2,123.66	23,303
2,121.60	2,074	2,122.64	8,124	2,123.68	23,448
2,121.62	2,152	2,122.66	8,409	2,123.70	23,594
2,121.64	2,231	2,122.68	8,695	2,123.72	23,741
2,121.66	2,310	2,122.70	8,983	2,123.74	23,888
2,121.68	2,390	2,122.72	9,273	2,123.76	24,036
2,121.70	2,470	2,122.74	9,565	2,123.78	24,185
2,121.72	2,551	2,122.76	9,859	2,123.80	24,334
2,121.74	2,633	2,122.78	10,155	2,123.82	24,485
2,121.76	2,715	2,122.80	10,453	2,123.84	24,636
2,121.78	2,798	2,122.82	10,753	2,123.86	24,787
2,121.80	2,882	2,122.84	11,055	2,123.88	24,940
2,121.82	2,966	2,122.86	11,359	2,123.90	25,093
2,121.84	3,051	2,122.88	11,666	2,123.92	25,247
2,121.86	3,136	2,122.90	11,974	2,123.94	25,401
2,121.88	3,222	2,122.92	12,284	2,123.96	25,556
2,121.90	3,308	2,122.94	12,596	2,123.98	25,712
2,121.92	3,395	2,122.96	12,910	2,124.00	**25,869**
2,121.94	3,483	2,122.98	13,227		
2,121.96	3,571	2,123.00	13,545		
2,121.98	3,660	2,123.02	13,865		
2,122.00	3,750	2,123.04	14,188		
2,122.02	3,840	2,123.06	14,512		

Summary for Pond Dx: Existing Ditch

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 5.174 ac, 0.00% Impervious, Inflow Depth = 1.25" for 25-YR, 24-HR event
Inflow = 6.46 cfs @ 12.17 hrs, Volume= 0.539 af
Outflow = 5.31 cfs @ 12.28 hrs, Volume= 0.539 af, Atten= 18%, Lag= 6.8 min
Primary = 5.31 cfs @ 12.28 hrs, Volume= 0.539 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-30.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 2,122.30' @ 12.28 hrs Surf.Area= 2,201 sf Storage= 1,668 cf
Flood Elev= 2,122.50' Surf.Area= 2,314 sf Storage= 1,713 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 2.0 min (860.7 - 858.8)

Volume	Invert	Avail.Storage	Storage Description
#1	2,120.00'	1,643 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
#2	2,122.00'	648 cf	**140.00'L x 1.50'H Ditch at RV Park Z=2.0**
		2,291 cf	Total Available Storage

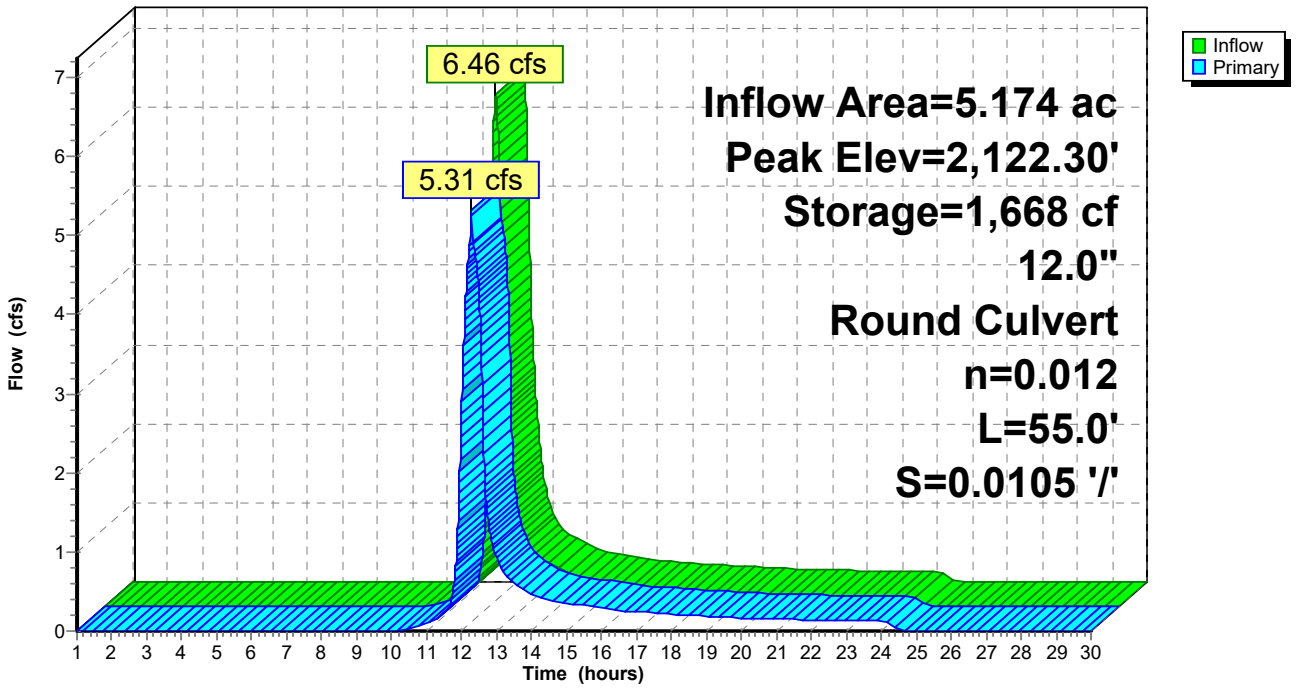
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
2,120.00	183	0	0
2,121.00	536	360	360
2,122.00	2,030	1,283	1,643

Device	Routing	Invert	Outlet Devices
#1	Primary	2,119.77'	**12.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 2,119.77' / 2,119.19' S= 0.0105 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.31 cfs @ 12.28 hrs HW=2,122.30' (Free Discharge)
1=Culvert (Barrel Controls 5.31 cfs @ 6.76 fps)

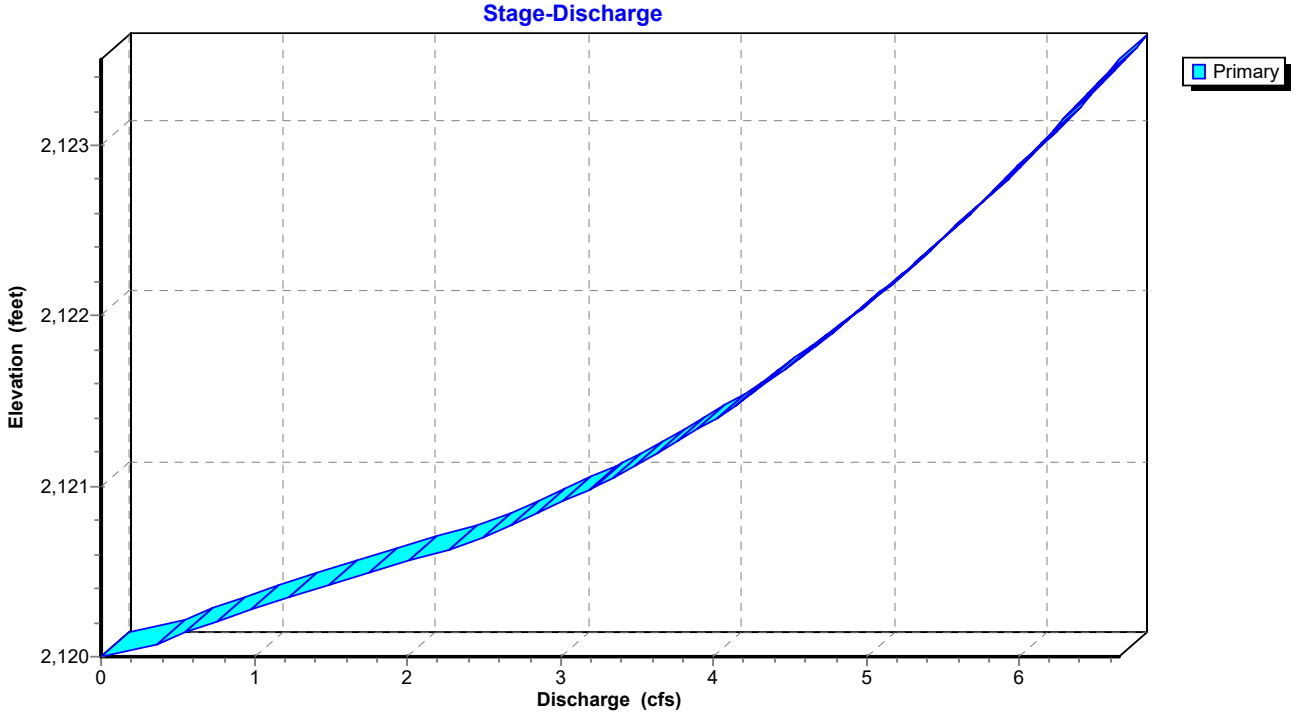
Pond Dx: Existing Ditch

Hydrograph

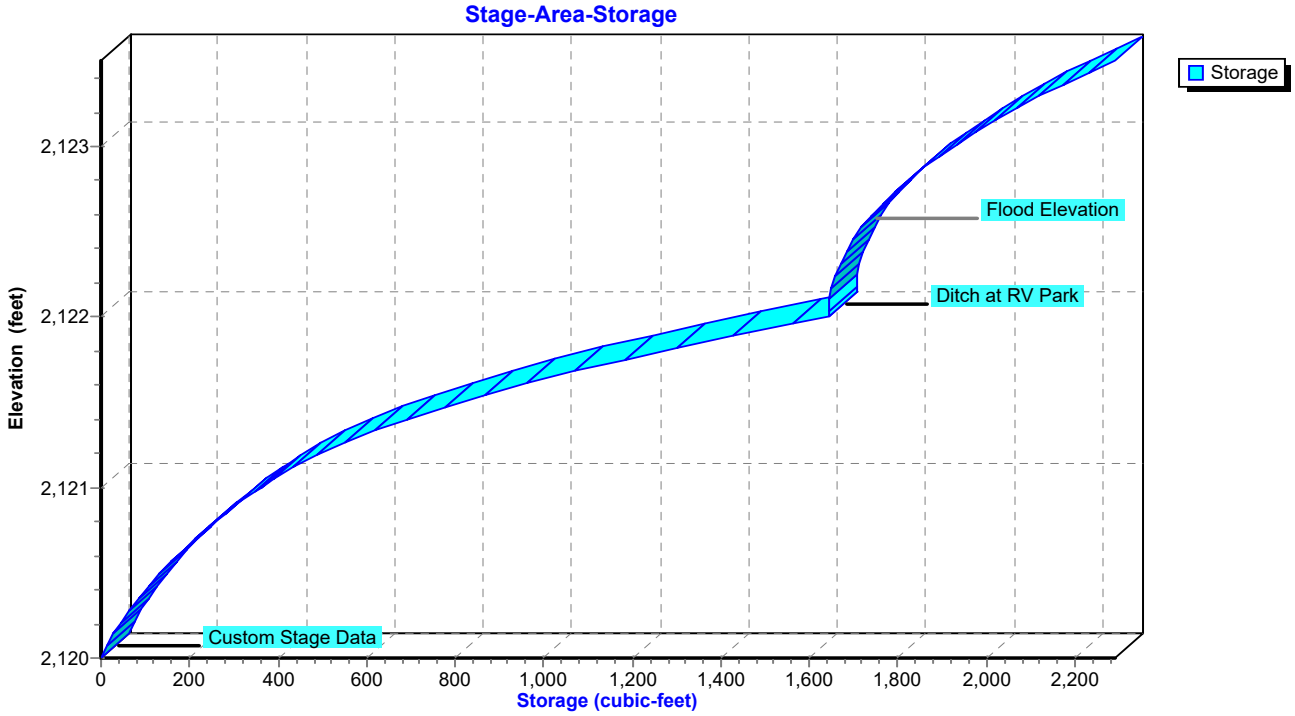


Pond Dx: Existing Ditch

Stage-Discharge



Pond Dx: Existing Ditch



Hydrograph for Pond Dx: Existing Ditch

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
1.00	0.00	0	2,120.00	0.00
2.00	0.00	0	2,120.00	0.00
3.00	0.00	0	2,120.00	0.00
4.00	0.00	0	2,120.00	0.00
5.00	0.00	0	2,120.00	0.00
6.00	0.00	0	2,120.00	0.00
7.00	0.00	0	2,120.00	0.00
8.00	0.00	0	2,120.00	0.00
9.00	0.00	0	2,120.00	0.00
10.00	0.00	0	2,120.00	0.00
11.00	0.09	0	2,120.00	0.09
12.00	**3.49**	**257**	**2,120.79**	**2.74**
13.00	**0.89**	**60**	**2,120.26**	**0.92**
14.00	0.47	23	2,120.11	0.48
15.00	0.35	12	2,120.06	0.36
16.00	0.28	6	2,120.03	0.28
17.00	0.24	2	2,120.01	0.24
18.00	0.21	0	2,120.00	0.21
19.00	0.19	0	2,120.00	0.19
20.00	0.16	0	2,120.00	0.16
21.00	0.15	0	2,120.00	0.15
22.00	0.14	0	2,120.00	0.14
23.00	0.14	0	2,120.00	0.14
24.00	0.13	0	2,120.00	0.13
25.00	0.00	0	2,120.00	0.00
26.00	0.00	0	2,120.00	0.00
27.00	0.00	0	2,120.00	0.00
28.00	0.00	0	2,120.00	0.00
29.00	0.00	0	2,120.00	0.00
30.00	0.00	0	2,120.00	0.00

Stage-Discharge for Pond Dx: Existing Ditch

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
2,120.00	0.00	2,121.04	3.32	2,122.08	5.03	2,123.12	6.26
2,120.02	0.26	2,121.06	3.36	2,122.10	5.05	2,123.14	6.28
2,120.04	0.30	2,121.08	3.40	2,122.12	5.08	2,123.16	6.30
2,120.06	0.35	2,121.10	3.45	2,122.14	5.11	2,123.18	6.32
2,120.08	0.39	2,121.12	3.49	2,122.16	5.13	2,123.20	6.34
2,120.10	0.44	2,121.14	3.53	2,122.18	5.16	2,123.22	6.36
2,120.12	0.49	2,121.16	3.57	2,122.20	5.18	2,123.24	6.39
2,120.14	0.55	2,121.18	3.61	2,122.22	5.21	2,123.26	6.41
2,120.16	0.60	2,121.20	3.65	2,122.24	5.24	2,123.28	6.43
2,120.18	0.66	2,121.22	3.69	2,122.26	5.26	2,123.30	6.45
2,120.20	0.72	2,121.24	3.72	2,122.28	5.29	2,123.32	6.47
2,120.22	0.78	2,121.26	3.76	2,122.30	5.31	2,123.34	6.49
2,120.24	0.85	2,121.28	3.80	2,122.32	5.34	2,123.36	6.51
2,120.26	0.91	2,121.30	3.84	2,122.34	5.36	2,123.38	6.53
2,120.28	0.98	2,121.32	3.88	2,122.36	5.39	2,123.40	6.55
2,120.30	1.05	2,121.34	3.91	2,122.38	5.41	2,123.42	6.57
2,120.32	1.12	2,121.36	3.95	2,122.40	5.44	2,123.44	6.59
2,120.34	1.19	2,121.38	3.98	2,122.42	5.46	2,123.46	6.61
2,120.36	1.26	2,121.40	4.02	2,122.44	5.48	2,123.48	6.63
2,120.38	1.33	2,121.42	4.06	2,122.46	5.51	2,123.50	**6.65**
2,120.40	1.41	2,121.44	4.09	2,122.48	5.53		
2,120.42	1.48	2,121.46	4.12	2,122.50	5.56		
2,120.44	1.56	2,121.48	4.15	2,122.52	5.58		
2,120.46	1.63	2,121.50	4.18	2,122.54	5.61		
2,120.48	1.71	2,121.52	4.22	2,122.56	5.63		
2,120.50	1.79	2,121.54	4.25	2,122.58	5.65		
2,120.52	1.86	2,121.56	4.28	2,122.60	5.68		
2,120.54	1.94	2,121.58	4.31	2,122.62	5.70		
2,120.56	2.01	2,121.60	4.34	2,122.64	5.72		
2,120.58	2.09	2,121.62	4.37	2,122.66	5.75		
2,120.60	2.16	2,121.64	4.40	2,122.68	5.77		
2,120.62	2.23	2,121.66	4.43	2,122.70	5.79		
2,120.64	2.30	2,121.68	4.46	2,122.72	5.82		
2,120.66	2.37	2,121.70	4.49	2,122.74	5.84		
2,120.68	2.44	2,121.72	4.52	2,122.76	5.86		
2,120.70	2.50	2,121.74	4.55	2,122.78	5.88		
2,120.72	2.56	2,121.76	4.58	2,122.80	5.91		
2,120.74	2.61	2,121.78	4.61	2,122.82	5.93		
2,120.76	2.66	2,121.80	4.64	2,122.84	5.95		
2,120.78	2.70	2,121.82	4.67	2,122.86	5.97		
2,120.80	2.75	2,121.84	4.70	2,122.88	6.00		
2,120.82	2.80	2,121.86	4.73	2,122.90	6.02		
2,120.84	2.86	2,121.88	4.75	2,122.92	6.04		
2,120.86	2.90	2,121.90	4.78	2,122.94	6.06		
2,120.88	2.95	2,121.92	4.81	2,122.96	6.09		
2,120.90	3.00	2,121.94	4.84	2,122.98	6.11		
2,120.92	3.05	2,121.96	4.86	2,123.00	6.13		
2,120.94	3.10	2,121.98	4.89	2,123.02	6.15		
2,120.96	3.14	2,122.00	4.92	2,123.04	6.17		
2,120.98	3.19	2,122.02	4.95	2,123.06	6.19		
2,121.00	3.23	2,122.04	4.97	2,123.08	6.22		
2,121.02	3.28	2,122.06	5.00	2,123.10	6.24		

Stage-Area-Storage for Pond Dx: Existing Ditch

Elevation (feet)	Storage (cubic-feet)
2,120.00	0
2,120.05	10
2,120.10	20
2,120.15	31
2,120.20	44
2,120.25	57
2,120.30	71
2,120.35	86
2,120.40	101
2,120.45	118
2,120.50	136
2,120.55	154
2,120.60	173
2,120.65	194
2,120.70	215
2,120.75	237
2,120.80	259
2,120.85	283
2,120.90	308
2,120.95	333
2,121.00	360
2,121.05	388
2,121.10	421
2,121.15	457
2,121.20	497
2,121.25	540
2,121.30	588
2,121.35	639
2,121.40	693
2,121.45	752
2,121.50	814
2,121.55	880
2,121.60	950
2,121.65	1,024
2,121.70	1,101
2,121.75	1,182
2,121.80	1,266
2,121.85	1,355
2,121.90	1,447
2,121.95	1,543
2,122.00	1,643
2,122.05	1,643
2,122.10	1,645
2,122.15	1,649
2,122.20	1,654
2,122.25	1,660
2,122.30	1,668
2,122.35	1,677
2,122.40	1,688
2,122.45	1,700
2,122.50	1,713
2,122.55	1,728
2,122.60	1,744
2,122.65	1,762
2,122.70	1,782
2,122.75	1,802
2,122.80	1,824
2,122.85	1,848
2,122.90	1,873
2,122.95	1,900
2,123.00	1,928
2,123.05	1,957
2,123.10	1,988
2,123.15	2,021
2,123.20	2,055
2,123.25	2,090
2,123.30	2,127
2,123.35	2,166
2,123.40	2,206
2,123.45	2,247
2,123.50	**2,291**

Stormwater Management Calculations
Rational Method
Post-Developed Peak Storm

Post-Developed Runoff and Developed "C" Factor

		Area(ft^2)	Area(acres)	CN	Runoff	
Pavement		91564	2.110	98	0.90	1.90
Gravel		0	0.000	95	0.60	0.00
Building		43604	1.010	98	0.90	0.91
Woodland		0	0.000	80	0.20	0.00
Grass		90213	2.080	80	0.25	0.52
	Totals	225381	5.2000	91	2.85	3.33

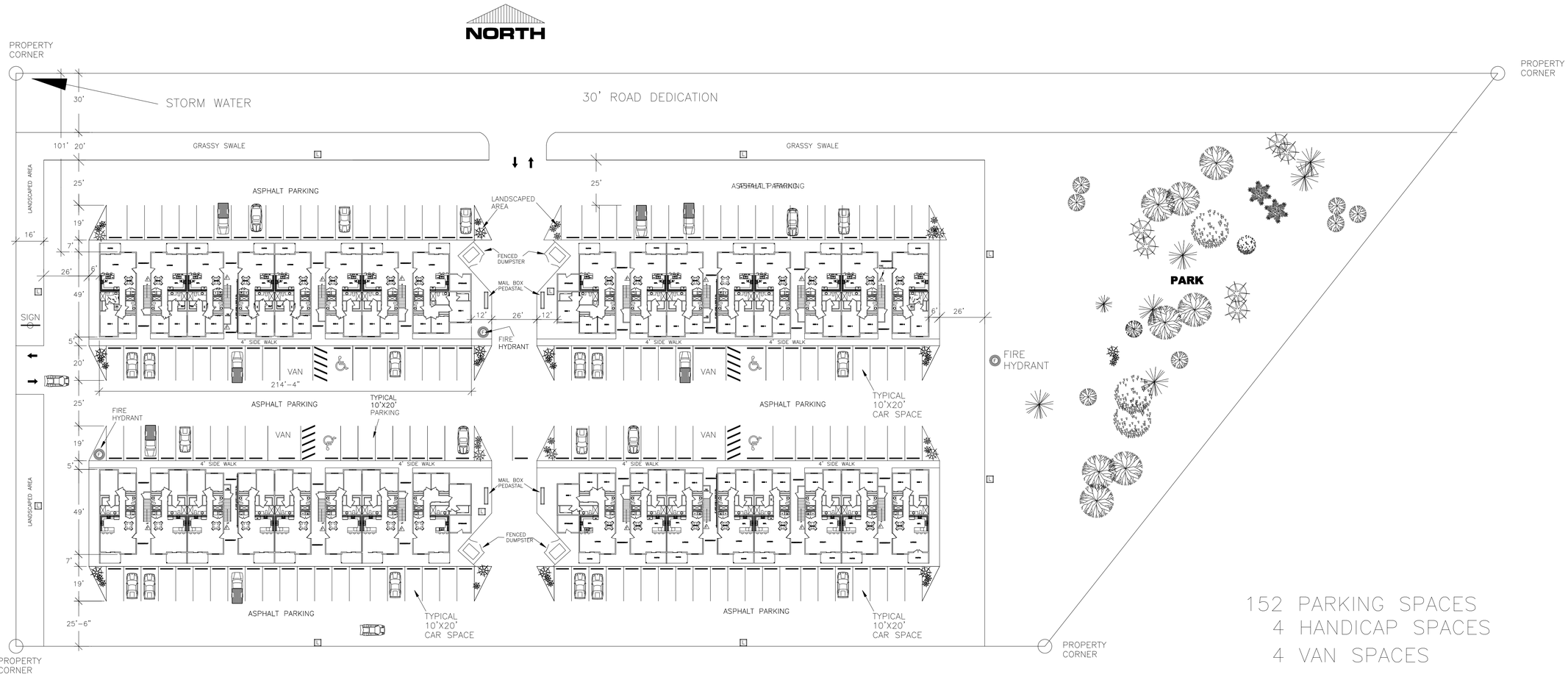
	Developed "C"	0.64	
Time increment	5	min	
Time of concentration	5	min	
Outflow (Infiltration)	62.8139	cfm	Exifiltration through engineered soils
Design year	25		1) input outflow (0.3 cfs 600 gal drywell,
Area (sqft)	225381	sqft	1.0 cfs 1000 gal drywell)
Area (acres)	5.17	Ac	2) input surface area for basin (in sqft)
Area x "C"	3.31		3) input the basins "C" factor
Developed "C" factor	0.64		Weighted value

Time Inc. (min)	Time Inc. (sec)	Intensity (in / hr)	Q dev (cfs)	V in	Storage Required
5	300	2.80	9.27	3727	3413
10	600	2.10	6.95	4882	4254
11	660	2.00	6.62	5047	4356
12	720	1.90	6.29	5172	4418
13	780	1.85	6.13	5403	4587
14	840	1.75	5.79	5459	4579
15	900	1.70	5.63	5641	4698
20	1200	1.60	5.30	6898	5642
25	1500	1.40	4.64	7427	5856
30	1800	1.20	3.97	7558	5673
35	2100	1.10	3.64	8021	5822
40	2400	0.95	3.15	7871	5358
45	2700	0.90	2.98	8351	5524
50	3000	0.87	2.88	8937	5796
55	3300	0.85	2.81	9576	6121
60	3600	0.78	2.58	9562	5793
65	3900	0.75	2.48	9939	5856
70	4200	0.70	2.32	9972	5575
75	4500	0.69	2.28	10515	5804
80	4800	0.67	2.22	10876	5851
85	5100	0.65	2.15	11197	5858
90	5400	0.63	2.09	11478	5825
95	5700	0.60	1.99	11528	5560
100	6000	0.59	1.95	11922	5640
105	6300	0.58	1.92	12296	5700
110	6600	0.55	1.82	12206	5297
115	6900	0.52	1.72	12057	4833
120	7200	0.5	1.66	12090	4552
125	7500	0.49	1.61	12212	4361
130	7800	0.48	1.57	12442	4276
135	8100	0.48	1.57	12914	4435
140	8400	0.46	1.51	12844	4050
145	8700	0.45	1.48	13016	3908
150	9000	0.44	1.45	13169	3747
155	9300	0.43	1.41	13303	3567
160	9600	0.42	1.38	13418	3368
165	9900	0.41	1.35	13513	3149
170	10200	0.40	1.32	13590	2911
175	10500	0.39	1.29	13647	2655
180	10800	0.38	1.26	13685	2379
360	21600	0.25	0.83	17966	0
720	43200	0.17	0.57	24496	0
1440	86400	0.11	0.36	31031	0

25 year design (store or infiltrate 25 year peak flow and volume)
Peak Storm required storage 6121 cu ft

Overall Treatment Req and Soil Infiltraion Rate		
Impervious Area	135168	SF
Req Treatment	5632	CF
Req Treatment Area (6" depth)	11264	SF
Proposed Treatment Area	22613	SF
Treatment soil infiltration	2	in/hr
Soil infiltration of Treatment Area	1.04689815	CFS
Depth of Treatment Area Req'd for Detention	0.27	FT

FONTAINE



PAGE SCHEDULE

PAGE #A-1 SITE PLAN
PAGE #A-2 ELEVATIONS
PAGE #A-3 ONE FLOOR (FOOTPRINT)
PAGE #A-4 1/2 OF FLOOR (2ND & 3RD FLOOR)
PAGE #A-5 1/2 OF FLOOR (2ND & 3RD FLOOR)
PAGE #A-6 ONE UNIT 2 & 3 BEDROOM UNITS(2ND & 3RD FLOOR)
PAGE #A-7 ONE UNIT 2 & 3 BEDROOM UNITS (SLAB ON GRADE)
PAGE #A-8 1/2 OF FLOOR (SLAB ON GRADE) HANDICAP
PAGE #A-9 1/2 OF FLOOR (SLAB ON GRADE) HANDICAP
PAGE #A-10 FOUNDATION PLAN
PAGE #A-11 FLOOR FRAMING & SHEAR
PAGE #A-12 STRUCTURAL DETAILS

BUILDING PLANS SHALL COMPLY TO THE 2018 INTERNATIONAL BUILDING CODE,
(ENGINEERED TRUSS PLANS WILL BE ON SITE DURING FRAMING INSPECTION
APPROVED SET OF BUILDING PLANS WILL BE ON SITE DURING CONSTRUCTION
ADDRESS WILL BE POSTED ON SITE DURING CONSTRUCTION

ENGINEERED TRUSS SHEETS must be on job site for framing inspection

ENGINEERED "I" JOIST SHEET must be on job site for framing inspection

20' ROAD DEDICATION

SITE PLAN

SCALE 1/32"=1'-0"

F FIRE EXTENGUISHER

F FIRE HYDRANT

L PARKING LOT LIGHT POLE

152 PARKING SPACES
4 HANDICAP SPACES
4 VAN SPACES

160 TOTAL PARKING SPACES

8,271 SF LIVING AREA PER FLOOR
X3

24,813 SF TOTAL LIVING (3 FLOORS)
9,775 TOTAL SF UNDER ROOF (FOOT PRINT)

(21 UNITS (2 BEDROOMS) 1017 SF EACH
3 UNITS (3 BEDROOMS) 1224 SF EACH
PER BUILDING)

SITE PLAN

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

MUST HAVE COPY OF DRAWINGS ON JOB SITE

DATE: 2-14-21

PLAN # FONTAINE

A-1

FRONT ELEVATION
SCALE 1/8"=1'-0"

6/12 ROOF SLOPE

COMPOSITION ROOFING

ROOF VENTILATION
1 SQ' OF VENT PER EVERY
150 SQ' OF ATTIC AREA
ASPHALT SHINGLES SHALL BE FASTENED ACCORDING TO MANUFACTURERES INSTRUCTIONS TO SOLIDLY SHEATHED ROOFS, BUT NOT LESS THAN 4 NAILS PER EACH 36" TO 40" STRIP SHINGLES AND 2 NAILS PER EACH INDIVIDUAL SHINGLES 9" TO 18" WIDE SHALL BE USED

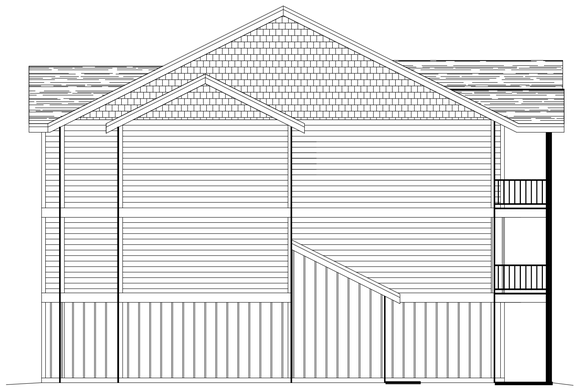
SEE TRUSS DATA SHEET
ENGINEERED ROOF TRUSSES AT 24" O.C.
ATTACH TO TOP PLATE W/ SIMPSON H1
HURRICANE ANCHORS. BRACING PER
TRUSS DATA SHEETS & B W T-76
WITH W BRACING AT BOTH GABLE ENDS
ALSO WEB BRACING WHERE NEEDED

TOP PLATE REQUIREMENTS
MIN. 4' LAP SPLICE W/11 - 16d
NAILS OR SIMPSON ST6215 STRAP

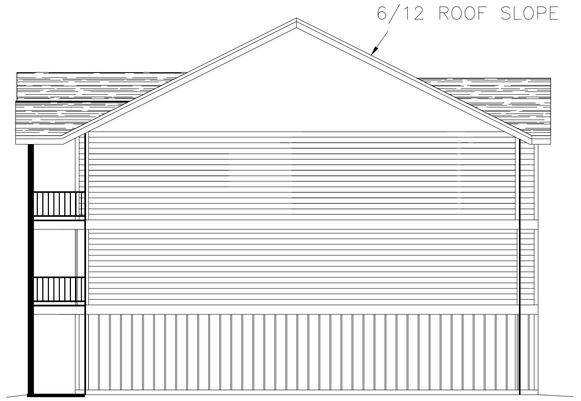
IRC R905.2.7.1
ICE BARRIER ON ROOF EAVE REQUIRED

ROOF LOADS:
D.L. = 15#/SF
S.L. = 50#/SF
FLOOR LOADS:
D.L. = 12#/
L.L. = 40/SF
DECK LOADS:
D.L. = 7#/SF
L.L. = 40#/SF

WIND = 90 MPH EXP "B" (3 SEC GUST)
SEISMIC DESIGN CATEGORY C



LEFT ELEVATION
SCALE 1/8"=1'-0"



RIGHT ELEVATION
SCALE 1/8"=1'-0"

BACK ELEVAITON
SCALE 1/8"=1'-0"

ELEVATIONS

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

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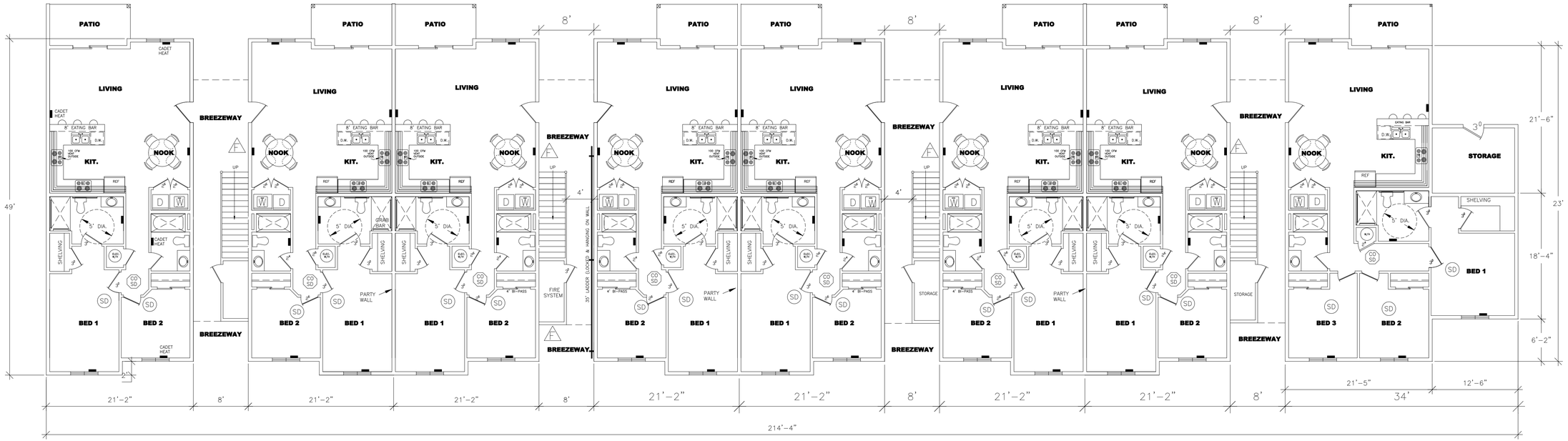
DATE:
2-14-21

PLAN #
FONTAINE

A-2



FLOOR PLAN

1ST FLOOR (SLAB ON GRADE)

FIRE EXTINGUISHER

SCALE 1/8"=1'-0"

FLOOR PLAN

ENTIRE MAIN FLOOR

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

DESIGNER/DRAFTER
DESIGNER HOMES
HOWARD HUSTOFT 704-2518

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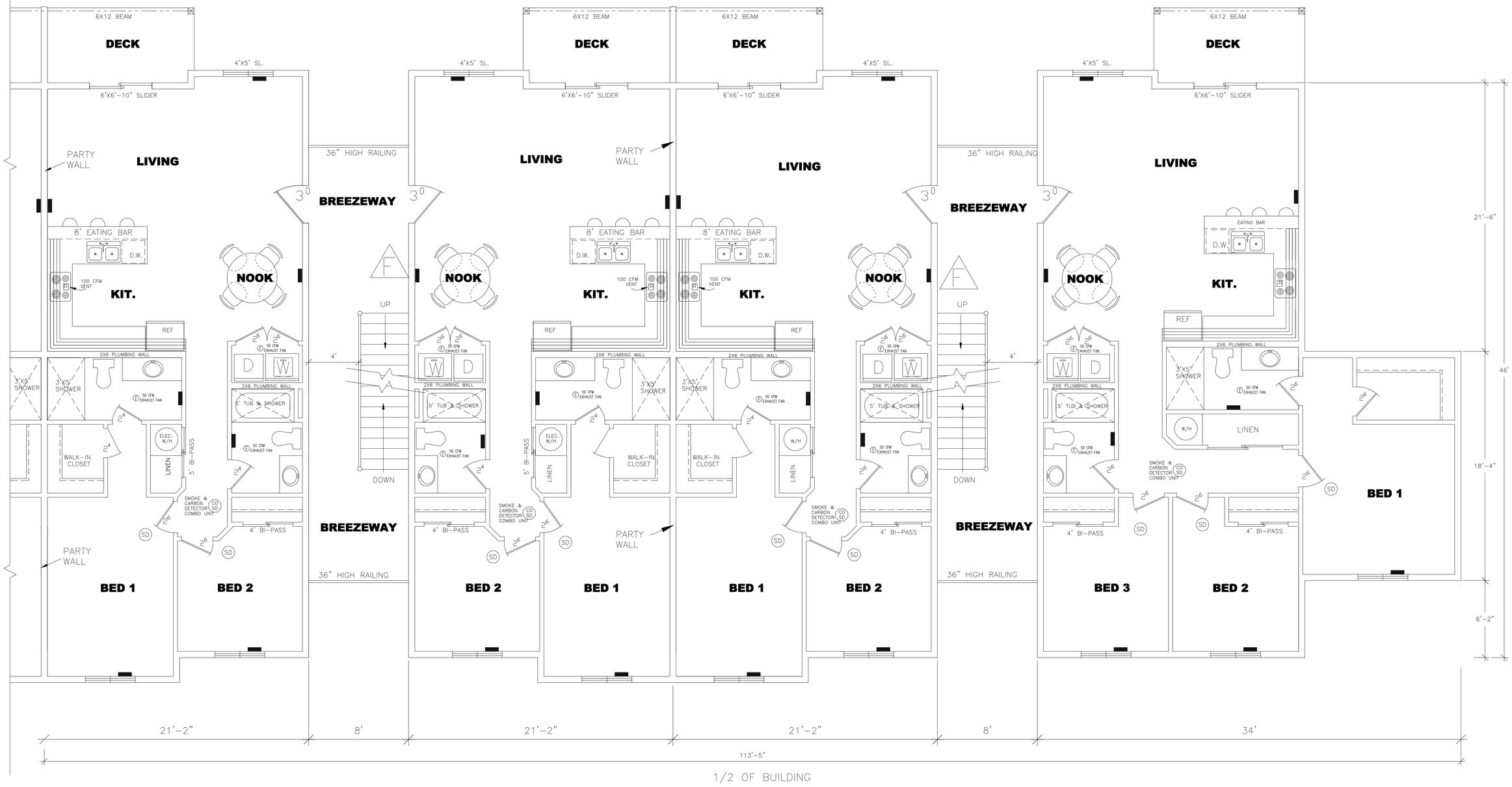
1-21-21

PLAN #
FONTAINE

A-3



2 BED
1017 SF
EACH UNIT

2 BED
1017 SF
EACH UNIT

2 BED
1017 SF
EACH UNIT

3 BED
1224 SF
EACH UNIT

2ND FLOOR
1/2 OF ONE BUILDING

SCALE 1/4"=1'-0"

2ND & 3RD FLOOR PLAN

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

DESIGNER/DRAFTER
DESIGNER HOMES
HOMES AUTOCAD Rev 2018

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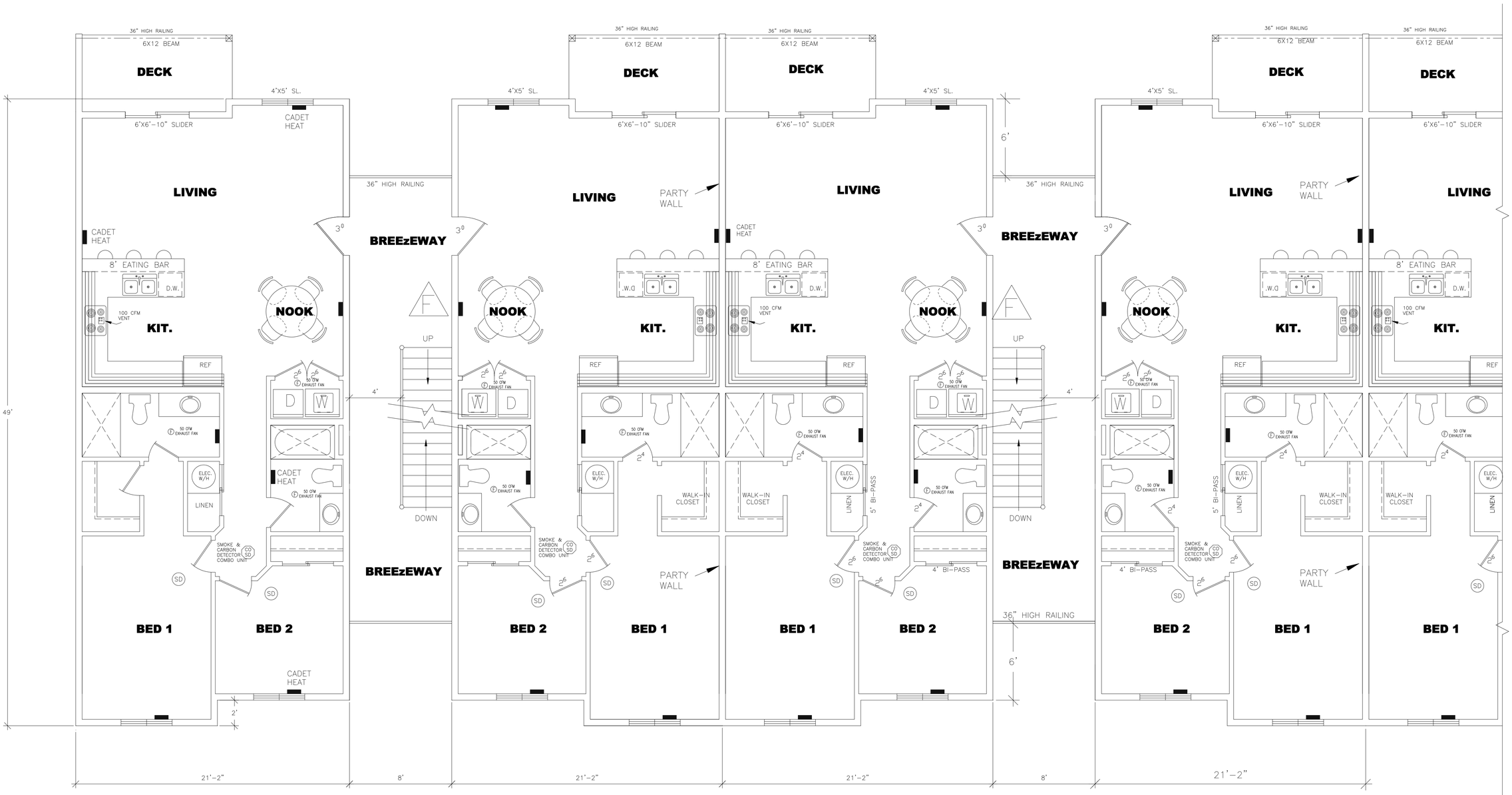
PLAN #
FONTAINE

A-4



2 BED
1017 SF
EACH UNIT

2 BED
1017 SF
EACH UNIT

2 BED
1017 SF
EACH UNIT

2 BED
1017 SF
EACH UNIT

2nd FLOOR (GRADE LEVEL)
1/2 OF ONE BUILDING

SCALE 1/4"=1'-0"

2ND & 3RD FLOOR
FLOOR PLAN

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

DESIGNER/DRAFTER
DESIGNER HOMES
HOMES HUSTOFT 704-2018

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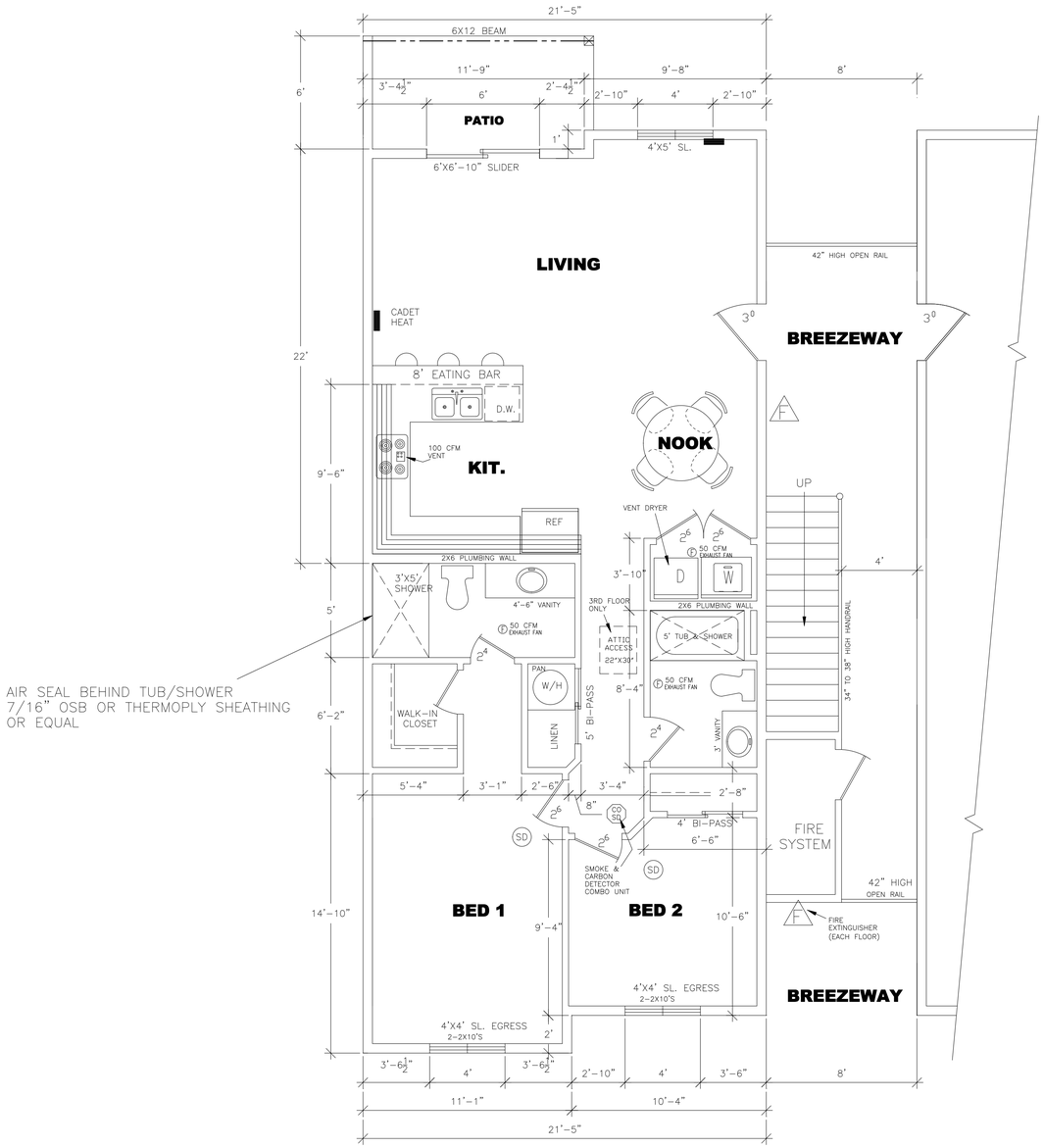
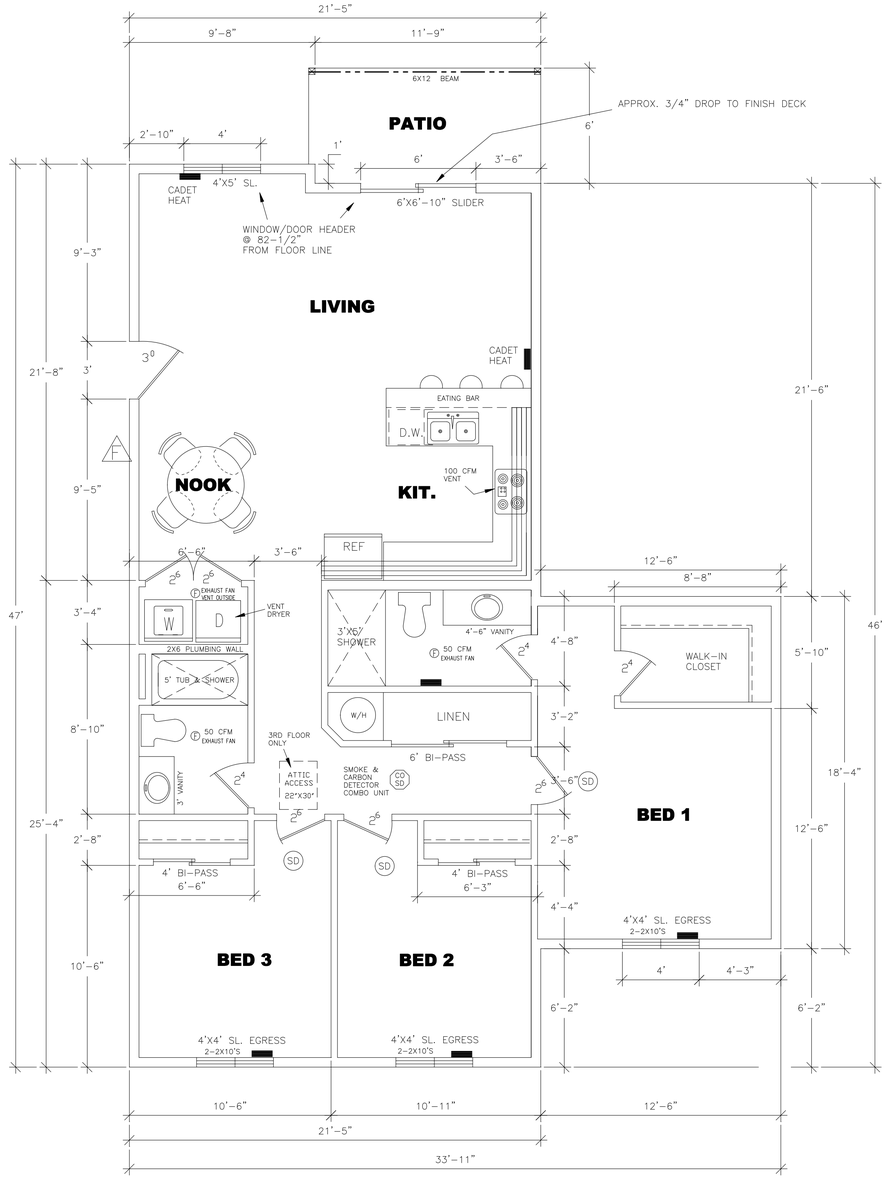
1-21-21

PLAN #
FONTAINE

A-5



2 BED
1017 SF
EACH UNIT
2ND & 3RD FLOOR



3 BED
1224 SF
EACH UNIT
2ND & 3RD FLOOR

2 BED & 3 BED UNIT
1ST FLOOR PLAN
SLAB ON GRADE

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

DESIGNER/DRAFTER
DESIGNER HOMES
HOWARD HUSTOFT 704-2518

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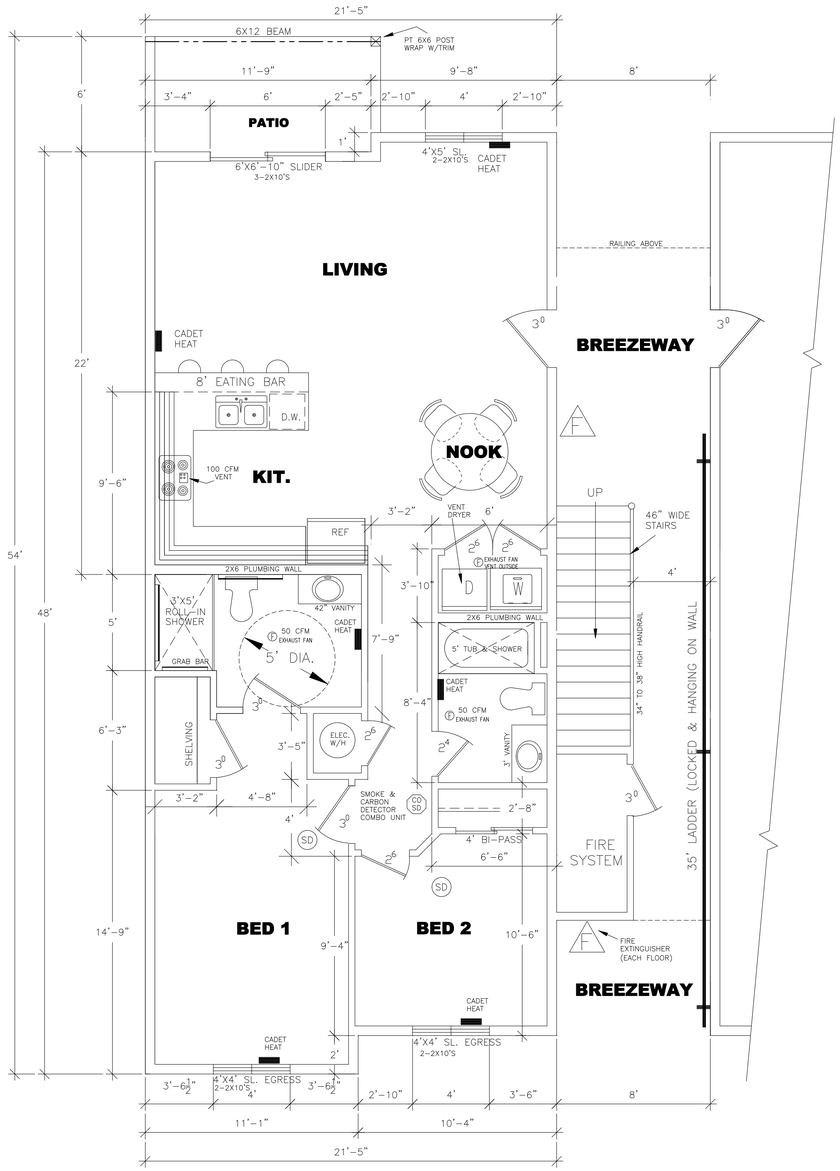
1-21-21

PLAN #
FONTAINE

A-6



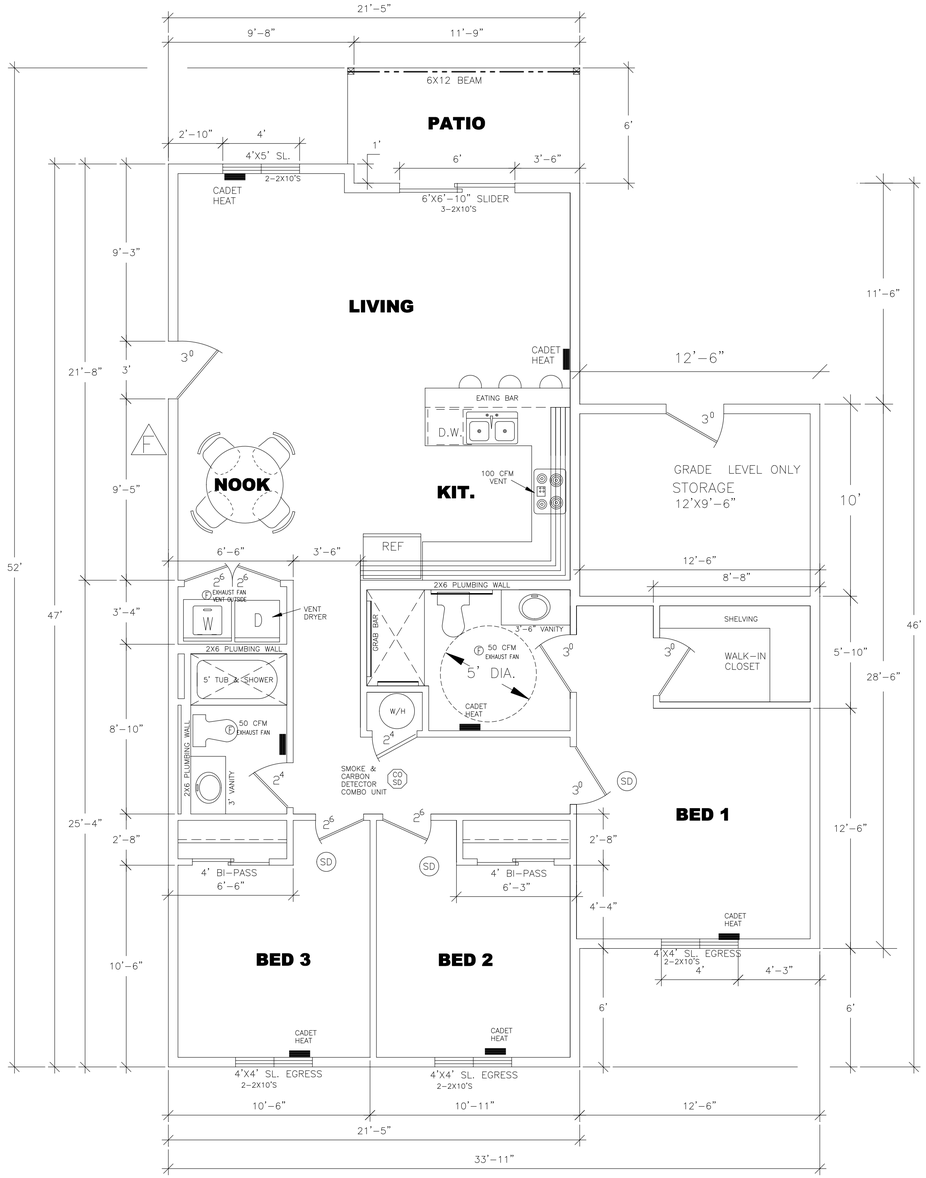
2 BED
1017 SF

EACH UNIT

SLAB ON GRADE

CADET HEATING IN EACH ROOM

F FIRE EXTINGUISHER



3 BED
1224 SF

EACH UNIT

SLAB ON GRADE

CADET HEATING IN EACH ROOM

2 BED & 3 BED UNIT
1ST FLOOR PLAN

SLAB ON GRADE

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

DESIGNER/DRAFTER
DESIGNER HOMES
NOMAS #U23971 704-2018

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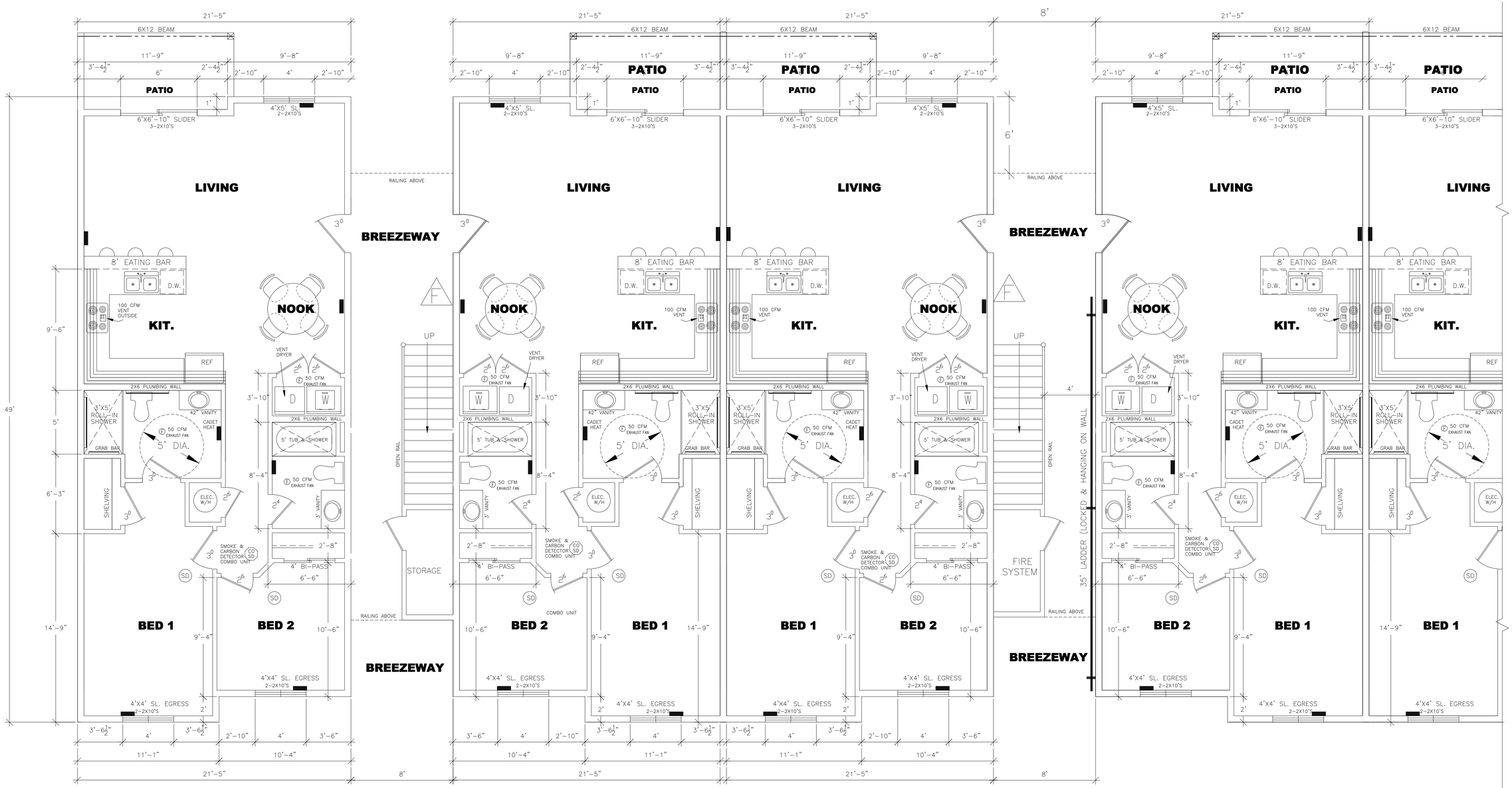
PLAN #
FONTAINE

A-7



2 BED
1017 SF
EACH UNIT

2 BED
1017 SF
EACH UNIT

2 BED
1017 SF
EACH UNIT

2 BED
1017 SF
EACH UNIT

1ST FLOOR (GRADE LEVEL)
1/2 OF ONE BUILDING

SCALE 1/4"=1'-0"

1ST FLOOR PLAN

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

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DESIGNER HOMES
HOWARD HUSTOFT 704-2518

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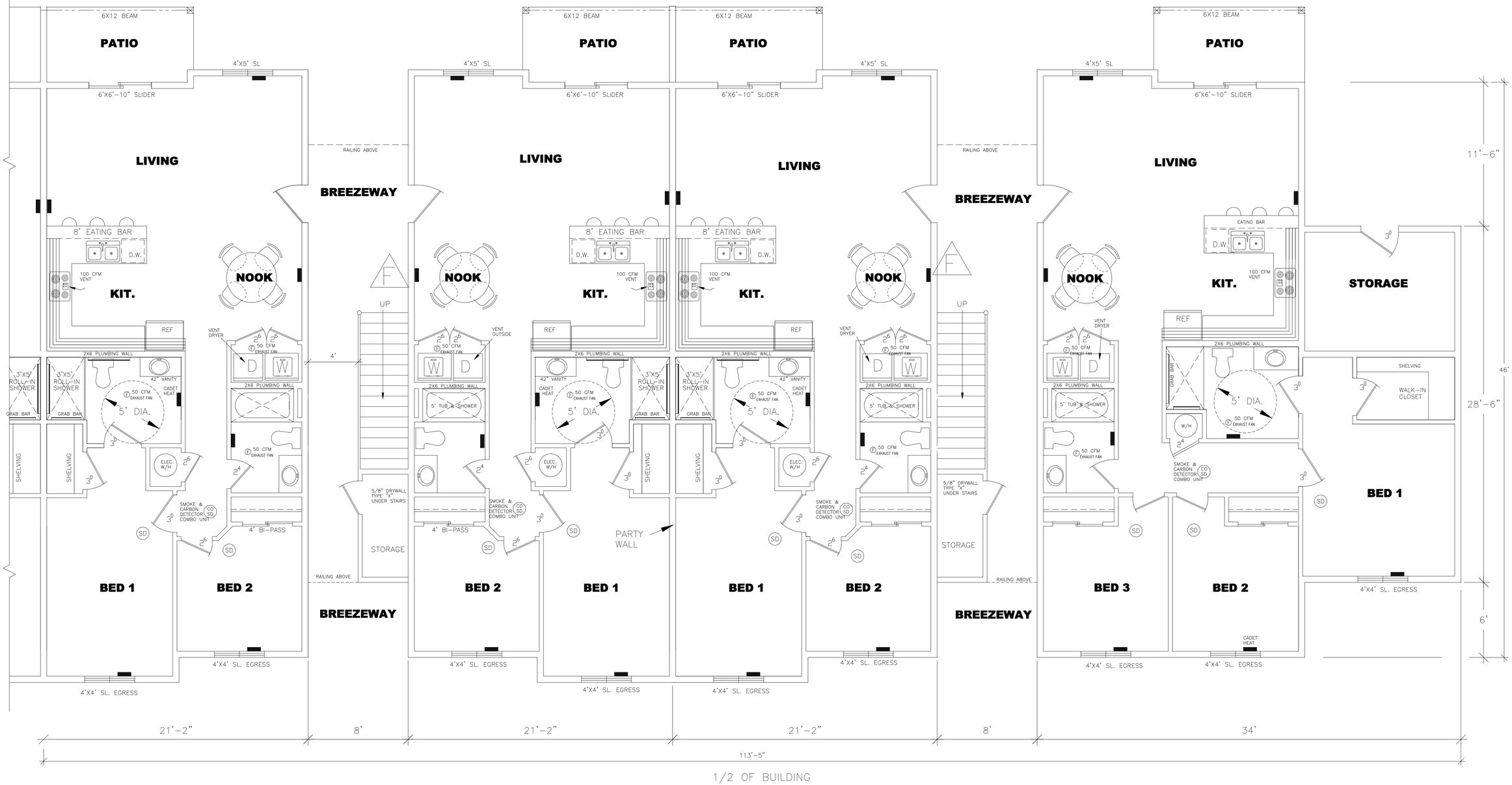
PLAN #
FONTAINE

A-8



1ST FLOOR (GRADE LEVEL)
1/2 OF ONE BUILDING
SCALE 1/4"=1'-0"

1ST FLOOR PLAN

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

DESIGNER/DRAFTER
DESIGNER HOMES
HOWARD HUSTOFT 704-1518

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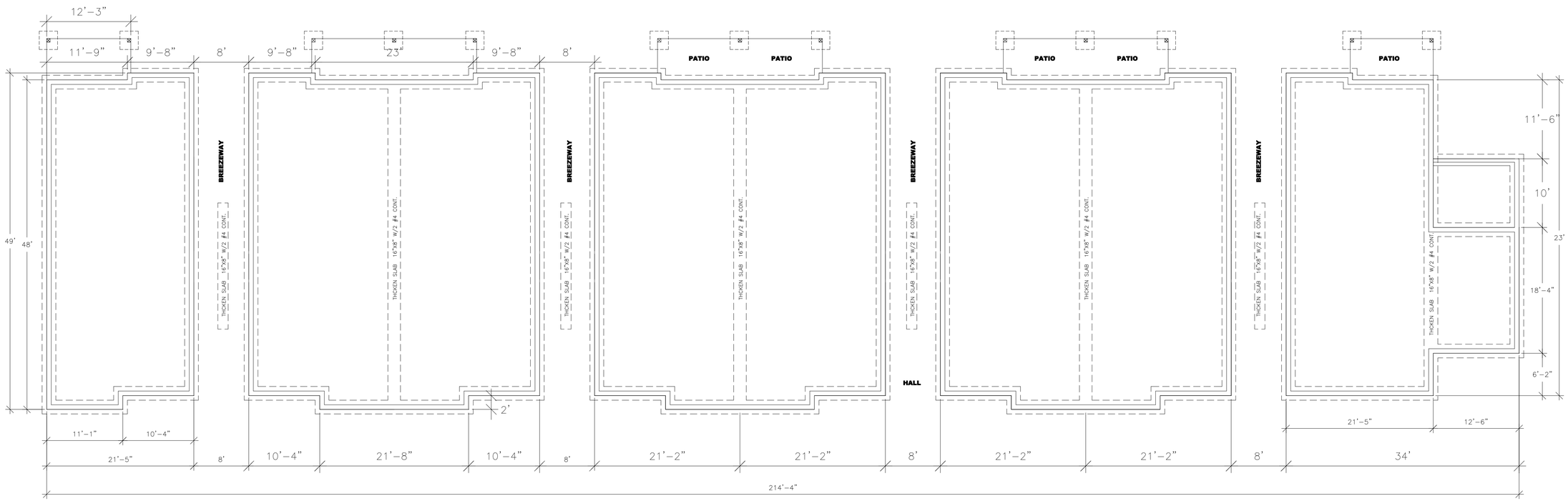
1-21-21

PLAN #
FONTAINE

A-9



FOUNDAITON

SCALE 1/8"=1'-0"

FOUNDATION

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

DESIGNER/DRAFTER
DESIGNER HOMES
HOWARD HUSTOFT 704-2518

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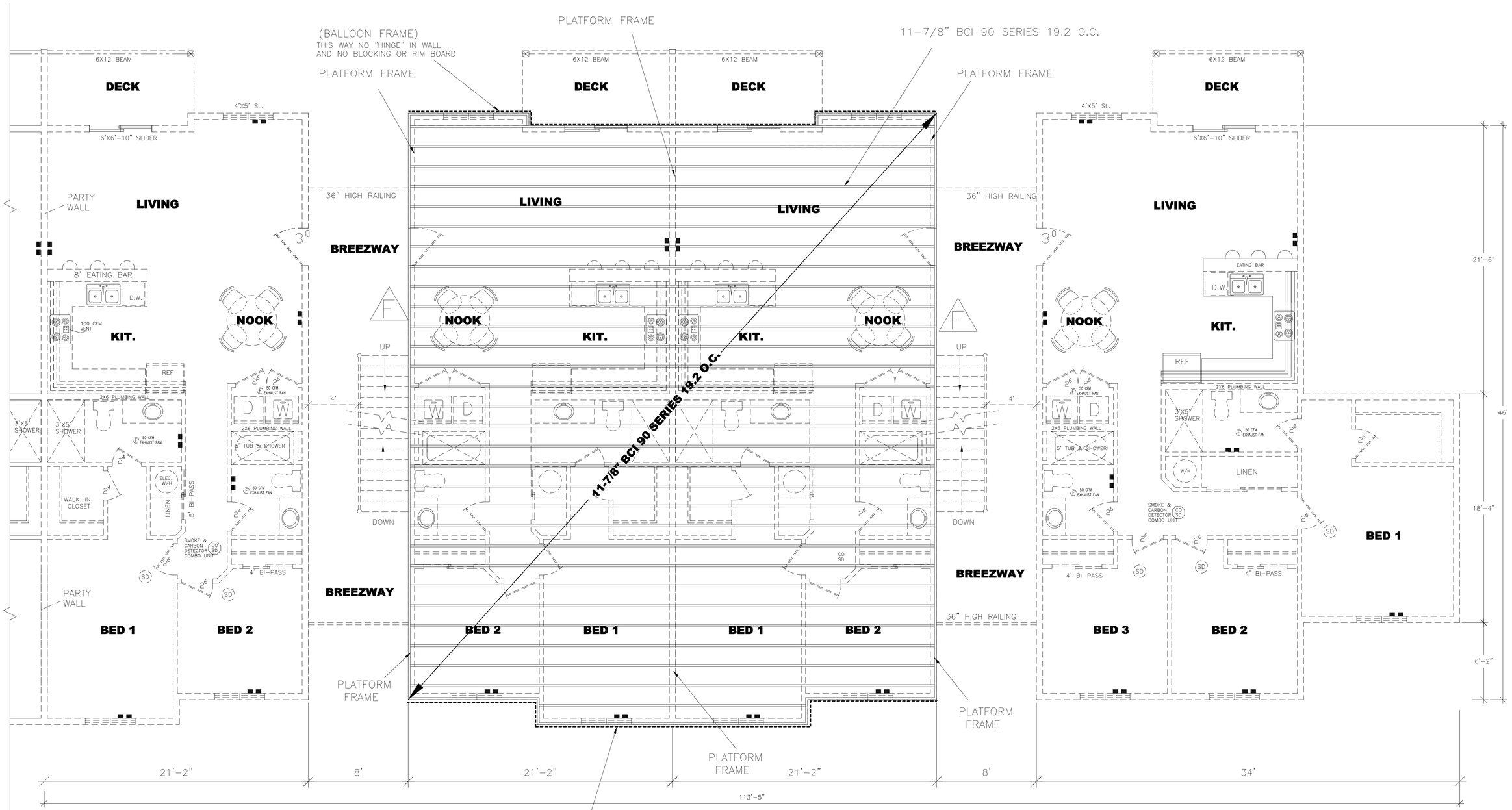
1-21-21

PLAN #
FONTAINE

A-10



SHEAR NAIL ENTIRE STRUCTURE

R602.10.3 BRACED WALL PANEL
CONSTRUCTION METHODS

WOOD STRUCTURAL PANES – WSP
WOOD STRUCTURAL PANEL SHEATHING WITH
A THICKNESS NOT LESS THAN 7/16" FOR
16" STUD SPACING NAILING
0.097–0.099 NAIL 1–1/2" 6" EDGES. 12" FIELD

DRYWALL SHEAR
7" O.C. NAILING WITH ALL EDGES BLOCKED

EACH PANEL SHALL BE SHEATHED ON ONE FACE WITH A SINGLE LAYER OF 3/8 INCH MINIMUM THICKNESS WOOD STRUCTURAL PANEL FASTENED WITH 8d COMMON OR GALVANIZED BOX NAILS 3 INCH O.C. IN ALL FRAMING. THE SHEATHING SHALL EXTEND UP AND OVER THE HEADER AND SHALL BE NAILED TO THE HEADER IN A 3 INCH GRID PATTERN

NOTE: STAPLES NOT PERMITTED IN ANY WALL PANEL

CS COMPLETELY SHEATHED WITH 7/16" OSB WITH 8d NAILS 6" O.C. EDGES & 12" O.C. CENTER FIELD OR 1/2" CDX PLYWOOD W/10d NAILS @ 6" /12" (EDGE/FIELD)

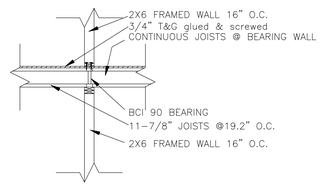
GWB 1/2" GYPSUM WALL BOARD WITH EDGES BLOCKED #1-1/4 SCREWS 6" O.C. EDGES AND 12" O.C. FIELD

(BALLOON FRAME)
THIS WAY NO "HINGE" IN WALL
AND NO BLOCKING OR RIM BOARD

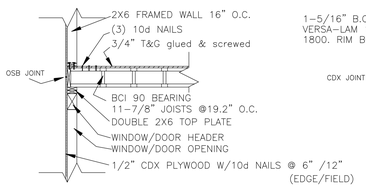
1/2 OF BUILDING

2ND FLOOR
1/2 OF ONE BUILDING

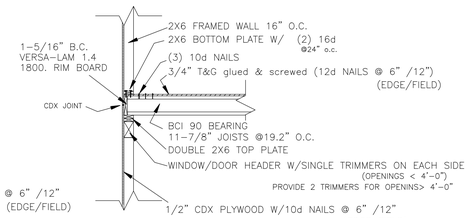
SCALE 1/4"=1'-0"



WALL TRUSS SUPPORT



PLATFORM FRAME WALL
PARALLEL JOIST



TYP. EXT. BEARING WALL

FLOOR FRAMING
SHEAR BRACING

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

DESIGNER/DRAFTER
DESIGNER HOMES
HOME AUTOPY INC-2018

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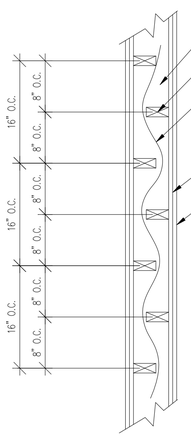
PLAN #
FONTAINE

A-11



BASE LAYER 5/8" TYPE "X" GWB OR VENEER BASE APPLIED AT RIGHT ANGLES TO EACH SIDE OF 2X4 WOOD STUDS 16" O.C. STAGGERED 8" O.C. ON 2X6 WOOD PLATES W/ 6d COATED NAILES 1 7/8" LONG, .085" SHANK,1/4" HEADS,24" O.C. ADEQUATE BRACING REQ.
BASE LAYER 5/8" TYPE "X" GWB OR VENEER BASE APPLIED AT RIGHT ANGLES TO EACH SIDE OF 2X4 WOOD STUDS 16" O.C. STAGGERED 8" O.C. ON 2X6 WOOD PLATES W/ 8d COATED NAILES 2 3/8" LONG, .113" SHANK,9/32" HEADS,8" O.C. STAGGER VERT JOINTS 16" O.C. EACH LAYER AND SIDE

PARTITION WALL DETAIL
GA FILE NO. WP 3910
SCALE: 1" =1'

50 TO 54 STC
SOUND

FASTENERS USED IN PRESSURE TREATED WOOD SHALL BE MINIMUM HOT DIPPED GALVANIZED STEEL

FRAMING NOTES

PLYWOOD TO BE STRUCTURAL II, CC, CD OR OTHER GRADES COVERED IN PRODUCT STANDARD PS 1-07, PS 2-04, & APA PRP-108 (THICKNESSES SHOWN ARE NOMINAL)

GLB = GLUE LAMINATED BEAMS (UNBALANCED, 24F-1.8E WS)

PSL = PARALLAM BEAMS & COLUMNS (2.0E, 2900Fb)

LVL = MICRO=LAM BEAMS (1.8E, 2200Fb UNLESS NOTED OTHERWISE)

STRUCTURAL FRAMING LUMBER IS DFL No. 2 or BETTER

15/32" OSB ROOF SHEATHING NAILED WITH 8d COMMON NAILS @ 6"o.c. AT SUPPORTED ENDS OF EACH PANEL, 12"o.c. AT OTHER SUPORTS, AND 6"o.c. AT PERIMETER AND AROUND OPENINGS - UNLESS NOTED OTHERWISE

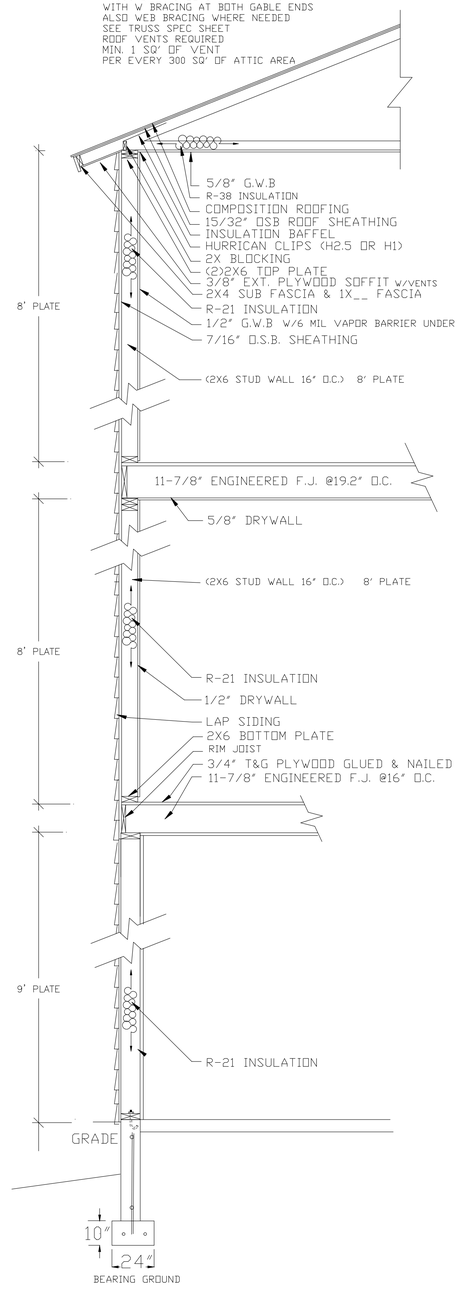
3/4" T&G APA (48/24) FLOOR SHEATHING GLUED AND NAILED WITH 10d COMMON NAILS @ 6"o.c. AT SUPPORTED ENDS OF EACH PANEL, 12"o.c. AT OTHER SUPPORTS, AND 6"o.c. AT PERIMETER AND AROUND OPENINGS - UNLESS NOTED OTHERWISE

7/16" OSB SHEATHING EXTERIOR WALL SHEATHING NAILED WITH 8d COMMON OR GALVANIZED BOX NAILS @ 6"o.c. AT ALL EDGES (ALL EDGES MUST BE BLOCKED AT SHEAR PANELS) AND 12"o.c. AT ALL OTHER SUPPORTS - UNLESS NOTED OTHERWISE

PRE-MANUFACTURED TRUSSESS, RAFTERS, JOISTS, CONNECTORS, HANGERS, ETC. MUST BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS WITH BRACING, FULL NAILING, ETC. - OBTAINING AND COMPLYING WITH INSTALLATION REQUIREMENTS IS THE CONTRACTOR'S RESPONSIBILITY

ALL POSTS MUST BE CONTINUOUS FROM MEMBER SUPPORTED AT TOP TO SUPPORTING MEMBER AT BOTTOM. BUTT SPLICES MUST BE LINED WITH SHEET METAL AND RESTRAINED AGAINST LATERAL MOVEMENT (AS AT FLOOR LINE).

SEE TRUSS DATA SHEET
6/12 PITCH
ENGINEERED ROOF TRUSSES AT 24" O.C.
ATTACH TO TOP PLATES W/SIMPSON H-2
HURRICAN ANCHORS. BRACING PER
TRUSS DATA SHEETS & B W T-76
WITH W BRACING AT BOTH GABLE ENDS
ALSO WEB BRACING WHERE NEEDED
SEE TRUSS SPEC SHEET
ROOF VENTS REQUIRED
MIN. 1 SQ' OF VENT
PER EVERY 300 SQ' OF ATTIC AREA



STRUCTURAL DETAIL
SCALE : NTS

STRUCTURAL DETAILS
PARTY WALL DETAILS

BUILDING CONTRACTOR / HOME OWNER TO REVIEW AND VERIFY ALL DIMENSIONS, SPECS, AND CONNECTORS BEFORE CONSTRUCTION BEGINS

DESIGNER/DRAFTER
DESIGNER HOMES
HOWARD HUSTOFT 704-2518

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1-21-21

PLAN #
FONTAINE

A-12