

#117: Planned Unit Development

Case #: PUD16-00011

Property Information

Address

Street Number: 5176	Prefix: N	Street Name: BOGUS BASIN RD	Unit #: 			
Subdivision name: 	Block: 	Lot: 	Section: 	Township: 	Range: 	Zoning:
Parcel Number: S0623336320	Additional Parcel Numbers: S0623347000, S0626223050					

Primary Contact

Who is responsible for receiving e-mail, uploading files and communicating with Boise City?

Agent/Representative Applicant Owner

Applicant Information

First Name: Scott	Last Name: Kimball		
Company: Hackberry North Corporation			
Address: P.O. Box 1436	City: Boise	State: ID	Zip: 83701
E-mail: builder555@gmail.com	Phone Number: (208) 870-0035	Cell: (208) 870-0035	Fax:

Agent/Representative Information

Role Type: Architect Land Developer Engineer Contractor Other

First Name: David	Last Name: Powell		
Company: RiveRidge Engineering Company			
Address: 2447 S. Vista Avenue	City: Boise	State: ID	Zip: 83705
E-mail: dpowell@rvrdg.com	Phone Number: (208) 344-1180	Cell: (208) 830-4654	Fax: (208) 344-1182

Owner Information

Same as Applicant? No Yes (If yes, leave this section blank)

First Name: 	Last Name: 		
Company: 			
Address: 	City: 	State: ID	Zip:
E-mail: 	Phone Number: 	Cell: 	Fax:

Project Information

Is this a Modification application? Yes No File number being modified:

1. Neighborhood Meeting Held (Date):

2. Neighborhood Association:

3. Comprehensive Planning Area:

4. This application is a request to construct, add or change the use of the property as follows:

5. Size of Property:
 Acres Square Feet

6. Water Issues:
A. What are you fire flow requirements? (See International Fire Code):
 gpm

B. Number of hydrants (show location on site plan):
Note: Any new hydrants/hydrant piping require United Water approval.
Number of Existing: Number of Proposed:

C. Is the building "sprinklered"? Yes No

D. What volume of water is available? (Contact United Water of Idaho at 362-7330):
 gpm

7. Existing uses and structures on the property are as follows:

8. Are there any hazards on the property?
(Such as canals, hazardous material spills, soil or water contamination.) If so, describe them and give their locations:

9. Adjacent property information:

	Building types and/or uses	Number of Stories	Zone
North:	<input type="text" value="vacant county la"/>	<input type="text"/>	<input type="text"/>
South:	<input type="text" value="single family resi"/>	<input type="text" value="2"/>	<input type="text" value="(R-1B) Single Family Resider"/>
East:	<input type="text" value="vacant county la"/>	<input type="text"/>	<input type="text"/>
West:	<input type="text" value="single family resi"/>	<input type="text"/>	<input type="text" value="(R-1A) Single Family Resider"/>

10. Non-Residential Structures:

A. Number of **Proposed** non-residential structures:

Square footage of proposed non-residential structures or additions (if 5+ floors, attach narrative with chart):

	Gross Square Feet	Net Leasable Square Feet
1st Floor	<input type="text" value="0"/>	<input type="text" value="0"/>
2nd Floor	<input type="text" value="0"/>	<input type="text" value="0"/>
3rd Floor	<input type="text" value="0"/>	<input type="text" value="0"/>
4th Floor	<input type="text" value="0"/>	<input type="text" value="0"/>

B. Maximum Proposed Height:

C. Number of stories:

D. Number of **EXISTING** non-residential structures to remain:

Square footage of existing non-residential structures or additions (If 5+ floors, attach narrative with chart):

	Gross Square Feet	Net Leasable Square Feet
1st Floor	<input type="text" value="0"/>	<input type="text" value="0"/>
2nd Floor	<input type="text" value="0"/>	<input type="text" value="0"/>
3rd Floor	<input type="text" value="0"/>	<input type="text" value="0"/>
4th Floor	<input type="text" value="0"/>	<input type="text" value="0"/>

E. Existing Structure Height(s):

F. Number of Stories:

11. Residential Structures:

A. Number of **Proposed** residential units (if applicable)::

B. Size of Proposed residential structures (if applicable):

	Number of Units	Square Foot per Unit	Total Square Feet
One-Bedroom:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Two-Bedroom:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Three-Bedroom:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Other:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Total Number:	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

C. Number of **Existing** units to remain:

D. Maximum Proposed Structure Height(s):

E. Number of Stories:

12.Site Design:

A. Percentage of site devoted to building coverage:

B. Percentage of site devoted to landscaping:

C. Percentage of site devoted to paving:

D. Percentage of site devoted to other uses:

E. Describe other use:

13.Loading Facilities, if proposed (For Commercial uses only):

Number: Location:

Size: Screening:

14.Parking:

A. Handicapped Spaces:

Required	<input type="text"/>	Handicapped Spaces:	<input type="text" value="0"/>
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B. Parking Spaces:

Required	<input type="text"/>	Parking Spaces:	<input type="text"/>
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C. Bicycle Spaces:

Required	<input type="text"/>	Bicycle Spaces:	<input type="text" value="0"/>
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D. Proposed Compact Spaces:

E. Restricted (assigned, garage, reserved spaces) parking spaces proposed:

F. Are you proposing off-site parking? Yes No If yes, how many spaces?

G. Are you requesting shared parking or a parking reduction? Yes No If yes, how many spaces?

Note: If you are requesting shared parking or a parking reduction, you must submit a survey of persons using and working on the premises and any additional information demonstrating that use by the regular employees and visitors to the premises will require fewer off-street parking spaces than required by the Zoning Ordinance.

15.Setbacks (Plans that are not graphically dimensioned will not be accepted.)

	Building		Parking	
	Proposed	Required	Proposed	Required
Front:	<input type="text" value="20"/>	<input type="text"/>	<input type="text" value="2"/>	<input type="text" value="2"/>
Rear:	<input type="text" value="15"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Side 1:	<input type="text" value="10"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Side 2:	<input type="text" value="10"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

16.Waivers Requested:

A. Lot size: Yes No Description:

B. Internal Setbacks: Yes No Description:

C. Frontage: Yes No Description:

17. Sidewalks:

Proposed: Attached Detached
Adjacent: Attached Detached

18. Amenities:

Number:
Description:

19. Density:

Allowed Density:
Proposed Density:

20. Building Exterior:

	Materials	Colors
Roof:	<input type="text" value="fire code"/>	<input type="text"/>
Walls:	<input type="text" value="fire code"/>	<input type="text"/>
Windows/Doors:	<input type="text" value="fire code"/>	<input type="text"/>
Fascia, Trim etc.:	<input type="text" value="fire code"/>	<input type="text"/>

21. Drainage (Proposed method of on-site retention):

22. Floodways & Hillside:

- A. Is any portion of this property located in a Floodway or a 100-year Floodplain? Yes No
- B. Does any portion of this parcel have slopes in excess of 15%? Yes No

Note: If the answer to either of the above is yes, you will be required to submit an additional Floodplain and/or Hillside application and additional fee. You must submit the additional required application(s) for review at the same time as this request.

23. Airport Influence Area:

Is the subject site located within the Airport Influence Area? (If yes, please mark which area.)

No Area A Area B Area B1 Area C

24. Street Layout:

A. PUBLIC Street Layout Review

The impacts of proposed development on adjacent land uses and transportation facilities must be considered. A "Traffic Impact Study" (TIS) will be generally required by the Ada County Highway District, if the proposed development contains no more than 100 dwelling units (includes hotels and motels as well as private dwelling units), more than 30,000 square feet of commercial use, or more than 50,000 square feet of industrial or institutional use, or has associated it with special circumstances deemed by ACHD to warrant an impact study. A copy of this study must be submitted with this application.

Is a Traffic Impact Study required?

Yes No

B. PRIVATE Street Layout Review

The impacts of proposed development on adjacent land uses and transportation facilities must be considered. A "Traffic Impact Study" (TIS) prepared by a traffic engineer will be required by Public Works and Planning & Development Services for the interior roadway and parking system. This requirement may be waived when it can be shown by the applicant that no section of on-site roadway will exceed 240 vehicle trips per day.

Is a Traffic Impact Study required?

Yes No

Are you proposing public street connection to adjacent properties?

Yes No

25. Solid Waste:

A. Type of trash receptacles:

Individual Can/Residential 3 Yd Dumpster 6 Yd Dumpster 8 Yd Dumpster Compactor

B. Number of trash receptacles:

15

C. Proposed screening method:

out of site of roadway

D. Is the proposed location accessible for collection? (Contact Boise Public Works at 384-3901.)

Yes No

E. Is recycling proposed?

Yes No

Verification of Legal Lot or Parcel Status

Acceptance of this application does not validate the legal status of any lot or parcel. Prior to submitting for a Building Permit you must have a Verification of Legal Parcel Status form signed by the Boise City Subdivision Department. It is the applicant's responsibility to provide deeds and/or other documentation to the Subdivision Department. See Verification of Legal Lot or Parcel Worksheet for submittal requirements.

The undersigned declares that the above provided information is true and accurate.

The undersigned acknowledges that failure to provide true and accurate information may result in rejection of this application, possible revocation of the permit where wrongfully issued and subject the undersigned any applicable civil and/or criminal penalties.

Agent/Representative Signature:

Date:



April 22, 2016

Mr. Hal Simmons
Boise City Planning & Development Services
P.O. Box 500
Boise, ID 83701-0500

RE: Proposed Hackberry north Subdivision

Dear Mr. Simmons:

On behalf of the Hackberry North Corporation, Scott Kimball president, owner and applicant of the proposed Hackberry North Subdivision property, I am submitting the following associated applications and fees:

1. Annexation and Zoning
2. Subdivision Preliminary Plat Application
3. Planned Unit Development Application
4. Hillside and Foothills Development Application
5. Project Development Agreement

These applications are being submitted after having completed the pre-application requirement and having conducted the required neighborhood meeting.

The following is a detailed description of each of the proposed applications:

1. Annexation and Zoning – The property is currently contiguous with the Boise City limits and is zoned Ada County (RP). The property is also contiguous with the existing Highlands Hackberry No. 4 Subdivision and adjacent to (across Bogus Basin Road) from the existing Hackberry Ranch Subdivision. The property is approximately 40 acres in size and will consist of 15 single family residential lots and 3 common lots. The property is in the Foothills Planning Area and the proposed documents meet the intent of these policy guidelines. The property contains in excess of 15 acres of slopes that are equal to, or less than 25 percent. All proposed home sites are located within the slope limits. There are 2 proposed access points to the development. A lower private street (proposed Corralero Drive) accesses N. Bogus Basin Road from a point about 200' north of Paso Fino Drive. A single driveway is proposed for Lot 1 of the development, to take access from a point on N. Bogus Basin Road near the north most point of the development that will allow for the paved access to the home site. This home site, access, grading and drainage plans and all building plans were previously approved by Ada County as part of an application process based on the legal Ada County lot parcel.

With this development, the Owner is requesting that Lot 1 be zoned A-1, to include the single residential lot and the surrounding approximate 21.7 acres of open space. The Owner intends to own and control this entire lot 1. The remainder of the development is proposed to have the zone

of R-1A for all single family homes and A-1 for the remaining open space lots that will be owned and maintained by the Hackberry North Homeowners Association.

2. Subdivision Application – The Preliminary Plat application is being requested at this time.
3. Planned Unit Development Application. This PUD Application is for a 15-lot single family foothills subdivision as depicted on the supporting documents.
4. Project Development Agreement – The owners intend to submit a draft copy of a proposed development agreement with the City of Boise once the application process for annexation is approved. With annexation into the City of Boise, the Owner will work with the city's attorney to complete the final document prior to City Council approval and recording.

Adjacent Land Use – The project site is located directly east of Bogus Basin Road and north of the existing Highlands Hackberry No. 4 subdivision and east of the existing Hackberry Ranch Subdivision. This existing Highlands Hackberry No. 4 development is a single family foothills development with varying lot sizes that are very comparable to the proposed lots within the proposed development. With the requirement to conform to the Hillside and Foothills open space criteria, the proposed development will provide equal to, or increased open space, as compared to the overall open space of the existing Highlands Hackberry development. The CC&Rs for Hackberry North are anticipated to be very comparable to those of the Hackberry Ranch development, so as to maintain similar completed site and building features.

The access to the lower lots, Corralera Lane, is proposed to be a private roadway to minimize the need for excess grading and to provide a more secluded entry to these lots. The roadway is proposed to be 24' wide, including curb, gutter and 4' wide sidewalks. All surface runoff will be directed to a subsurface drainage collection system. The grading, width and hammer head turn around at the upper terminus are all in accordance with current fire access standards. The private access to Lot 1 is proposed to be a 20' wide paved driveway with an approved fire access and turnaround.

Transportation – The owner has retained Thompson Engineering to conduct a Traffic Impact Study of the current roadway conditions and impacts this development might create for the adjacent Bogus Basin Road and Harrison Boulevard. In summary, the report indicates that: (1) Bogus Basin Road and Harrison Boulevard are both below the maximum level of service vehicle counts; and (2) the trips generated from the 15 lots of this development do not exceed the maximum level of service volumes and do not significantly impact current traffic conditions. The Traffic Impact Study is attached.

5. Hillside and Foothills Development Application - This application is for a of the 15-unit single family foothills subdivision as depicted on the supporting documents.

A detailed slope analysis was performed and submitted to planning staff for review and approval. This slope analysis verifies that there are at least 14 acres of land within the boundaries of the property that have slopes equal to, or less than 25%. In the most aggressive development approach, in which 75% of this area was dedicated to open space, the ordinance would allow up to 14 residential lots and one added lot with the original project zoning of RP and 1 unit per 40 acres. The owner is requesting 15 residential lots that will occupy approximately 3.75 acres of 25% of the property that is sloped at 25% or less. This complies with the formula provided in the ordinance. Each of the building lots have an identified padded limits that is shown in the grading plans and verifies that all are within the limits of the slopes of 25% and less. The plan proposes



to allow for lot areas outside of the slope limits, while limiting the house footprint to these lesser slopes.

Site Grading - The proposed layout also attempts to minimize site grading, while providing the maximum ability to meet the current goals and requirements related to fire protection and defensible space. The current grading plan provides for a balance of earthwork within the limits of the identified impacted grading limits.

We look forward to ongoing coordination with staff and the Planning and Zoning Commission with the goal of approved annexation, zoning and a positive recommendation of plan approval.

Your help on this submittal and past meetings and guidance is greatly appreciated.

Sincerely,

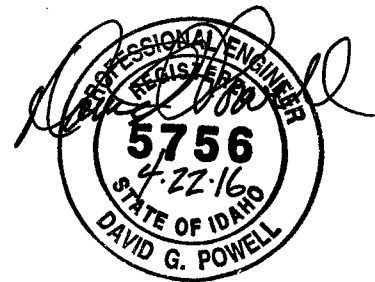
A handwritten signature in black ink that reads "David G. Powell". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

David G. Powell, P.E.
Project Engineer
RiverRidge Engineering Company

HACKBERRY NORTH SUBDIVISION

PRELIMINARY HYDROLOGY REPORT

April 2016



RIVERIDGE
ENGINEERING
COMPANY



RIVERIDGE ENGINEERING COMPANY
2447 S. VISTA AVENUE, BOISE, IDAHO 83705
PH: (208) 344-1180 FAX: (208) 344-1182

HACKBERRY NORTH SUBDIVISION

HYDROLOGY REPORT

April 22, 2016

1. PROJECT OVERVIEW

The proposed Hackberry North Subdivision is located in the foothills adjacent to Bogus Basin Road, approximately 2 miles north of its intersection of Bogus Basin Road and Hill Road, in the southwest 1/4 of Section 23 and the northwest 1/4 of Section 26, Township 4N, Range 2E, Boise Meridian, Ada County, Idaho. The project consists of 40.32 acres to be subdivided into 15, single family residential lots and 3 open space lots. Access will be provided from Bogus Basin Road, along the property's western boundary, through the extension of a private road and through the northerly boundary for a single private access. The residential lots will occupy 3.75 acres with the average lot size of 0.25 acres. There will be a total of 35 acres of open space. The roadways will occupy about 1 acre of land.

2. EXISTING CONDITIONS

The site is located in the Boise foothills and contains slopes ranging from 2% up to 50%. Vegetation is consistent with the lower elevations of the foothills with native grasses, sagebrush, rabbitbrush and bitterbrush. There are 3 existing drainages within this 40-acre site that total 51.8 acres, 11.8 acres being above in elevation and outside of the project boundary. Basin 1 is bound by Bogus Basin Road and the ridgeline that follows just south of the north boundary and then turns south to intercept bogus basin road. This basin is 12.6 acres in size with 1.8 acres of this area being above and outside of the subdivision boundary. All storm water runoff from this basin discharges to the Bogus Basin Road borrow and to a single 24-inch CMP pipe that discharges to the open space area of the Hackberry Ranch property to the west of Bogus Basin Road. Basin 2 makes up the majority of the remaining portion of the property and is bound by Bogus Basin Road to the west; the Basin 1 ridgeline to the north; the primary north south ridgeline above and to the east of the site and the minor ridgeline that separates this drainage from that of the existing Highlands Hackberry Development. This basin is 31.7 acres in size with 5 acres of this area being above and outside of the subdivision boundary. All storm water runoff from this basin discharges to a single 18-inch CMP pipe to the open space area of the Hackberry Ranch property to the west of Bogus Basin Road and to the south of Paso Fino Drive. Basin 3 makes up the southerly most portion of the site and will be completely retained as open space. In addition, none of this basin area contributes to the basin area that

will be occupied by new housing. This basin is 7.5 acres in size with 3.5 acres of this area being above and outside of the subdivision boundary. All runoff from these 3 basins that leaves the site is conveyed through the Hackberry Ranch property to the existing drainage collection system in the intersection of Bogus Basin Road and Curling Drive via overland flow. Any runoff that leaves the site that enters this collection system, discharges to Crane Creek. Due to the permeable nature of the soils within this overall drainage basin, precipitation from most storm events percolates into the soils before reaching the south boundary of the Hackberry Ranch development.

3. SOILS CONDITIONS

Soil conditions are also consistent with the Boise foothills. The Soils Classifications, as listed in the Natural Resources Conservation Service – Soils Survey of the Boise Front Project, Idaho indicate that there are 3 soils classifications across the subject property. See attached map of area and location of the 3 soils areas.

Soils Unit Descriptions:

1. Soils Unit 243 – Flofeather – The Flofeather soils are generally described as soils on slopes ranging from 3% to 25% and consisting of sandy loam to loamy coarse sand. These soils are located in the extreme east portion of the site where storm water retention will be located. These soils have permeability from moderate to rapid at rates from 2 to 20-inches per hour, increasing with soil depth.
2. Soils Unit 358 – Quailridge Fortbois Complex – This complex is generally described as soils on slopes ranging from 35% to 90% and consisting of sandy clay loam to loamy coarse sands. These soils are located along the upper ridge tops of the site. The surface soils tend to be well drained with moderate permeability.
3. Soils Unit 361 – Quailridge Hullsgulch Cranegulch Complex – This complex is generally described as soils on slopes ranging from 15% to 50% and consisting of sandy clay loam to fine gravelly loamy coarse sands. These soils make up most of the area where residential housing is proposed. The surface soils tend to be well drained with moderately slow permeability.

Additional and more detailed soils information is contained in the Geological and Geotechnical Report, prepared by MTI, dated November 25, 2015.

4. PROPOSED DEVELOPMENT

The proposed development includes 15 single family lots that average 0.25 acres. Sanitary Sewer and Domestic Water and utility services will be provided through the extension of existing services available in Bogus Basin Road. The subdivision will be served by one private road and 1 private driveway designed to utilize the existing terrain and minimize the amount of cut and fill required for roadway construction. Cut and fill slopes will be constructed at a maximum slope of 2:1. These slopes will be blended with the adjacent terrain and revegetated with native plants and grasses. The proposed homesites will be prepared during the infrastructure construction.

Basin 1 – Basin 1 is considered pre-development runoff and will continue to discharge off-site without collection, or treatment.

Basin 2A – Basin 2A is also considered pre-development runoff and the majority of this runoff will be captured upstream of the new housing areas and piped through the site to discharge off-site without collection, or treatment.

Basin 2B – Basin 2B includes both undisturbed upper native slopes and the lower 14 residential lots and private access lane. All of this runoff will be collected and routed to an on-site retention/detention facility for treatment, percolation and possible discharge of larger events.

Basin 2C – Basin 2C is comprised of undisturbed upper native slopes just above the residential lots. All of this anticipated flow 1 is considered pre-development runoff and will be collected and piped through the site to discharge off-site without collection, or treatment.

Basin 2D – Basin 2D is comprised of undisturbed upper native slopes just above the proposed retention/detention ponds. This runoff will be allowed to sheet flow to the ponds, or off of the site.

5. STORMWATER SYSTEM ANALYSIS AND SIZING

All on-site storm water within Basin 2B will be collected in roadway gutters and a gravity storm water collection system and routed to an on-site detention/retention pond. Roof runoff from houses will be collected and piped to the storm water collection system. Runoff from yard areas and roadways will be conveyed by sheet flow from paved surfaces to the gutters. Catch basins will intercept the runoff and discharge to the gravity storm water collection system to

sand and grease traps for pretreatment prior to the conveyance to on-site detention/retention facilities.

All storm water runoff from Basins 1 and 3 are considered pre-development flows with no increase in runoff due to these areas undisturbed with the development. These flows will continue to discharge off-site to historic discharge points and to the adjacent Hackberry Ranch open space. All upstream storm water runoff from Basin 2 that discharges to the primary drainage swale directly above and to the north of the housing and the drainage swale to the east of the housing will also be collected in a new pipe and will continue to discharge to the existing drainage pipe that also discharges to the open space of the Hackberry Ranch property. Because this is only a minor portion of the overall basin area, the net total pre-development discharge off-site will be significantly reduced.

All collected storm water from roofs, yards and the paved surfaces is designed to enter a combination forebay and primary drainage pond. All runoff entering the forebay will be designed to percolate into the subsurface sandy soils of the pond bottom. All runoff diverted to the primary pond will be a combination retention/detention pond with larger volumes allowed to discharge off-site at the predevelopment discharge rate. Any residual runoff retained in this primary basin will also percolate into the subsoils. Soils encountered within the limits of the retention site have anticipated percolation rates of as high as 4-inches per hour. The ultimate sizing of the retention ponds will be designed around minor runoff volumes being retained and discharged into the subsurface soils within a maximum 24-hour period. Larger events that exceed available storage areas in the 2 drainage basins will be allowed to discharge off site at pre-development rates. This final system design will be done in accordance with current design requirements of Boise City Public Works. Since all new roadways are private and no new roadway changes are anticipated to Bogus Basin Road, no new required storm water collection is anticipated for this public roadway. Upon completion of construction and acceptance of the entire system, light and heavy maintenance of the private system will be performed by the Hackberry North Homeowners Association. All runoff from existing upstream drainage basins outside of the limits of the housing development drainage basin are considered pre-development flows and will be routed around the retention facility.

A. Methodology

The private lane and adjacent housing - The proposed private Lane system (N. Corralero Lane) will be graded to slope to a single intersection with Bogus Basin Road. The private roadway will be graded to allow for storm water collection at the low point in the roadway just prior to the Bogus Basin intersection. A storm water collection system within the

roadway system will be sized to collect roof runoff from the new and adjacent residences and that portion of yard, uphill slopes and the driveways and roadway runoff that can be directed to the private roadway. All collected runoff from the primary housing area within Basin 2B of the site will be directed to a single detention/retention area located just south of the intersection where runoff will be treated, retained for percolation into the pond subsoils, or discharged off-site at pre-development rates.

Methodology - The Rational Method will be used to determine the peak flow and storage volume required for the storm water collection system and the detention/retention facilities located south of and adjacent to the Private Road and Bogus Basin intersection. The Rational Method utilizes the following formula:

$$Q = C * i * A$$

where Q = Runoff (cfs, cubic feet per second)

C = runoff coefficient based on land use

i = Rainfall intensity (in/hr)

A = area (acres)

B. Peak Flows

The Rational Method for calculating peak flows assumes a constant rainfall intensity throughout the storm event. It also assumes that the peak flow will occur when the runoff from the most hydrologically distant point reaches the point of discharge (time of concentration). The Rational Method uses a Rainfall Intensity, Duration and Frequency graph to determine the rainfall intensity to use. Rainfall intensity decreases as the storm duration increases, therefore the peak runoff will occur when the intensity is the highest and the duration is the shortest. The standard minimum storm duration of 10 minutes will be used to determine the peak 100-year storm runoff.

C. Collection System

The storm water collection system will be located within the private roadway and will be sized in accordance with Boise City requirements for gravity flow conveyance.

Primary Housing area:

Dual catch basins will be constructed at the bottom of the private Lane in order to capture the majority of a 100 year storm event. This will also provide oversized openings in the case of a partial blockage in smaller storm events. Runoff will be pretreated through sand and grease traps that then discharge to the conveyance system to the system forebay. A diversion structure will direct the water quality event to a forebay pond and higher flows to a primary pond. This project does not anticipate improvements to N. Bogus Basin Road.

D. Detention/Retention Facility

The storm water detention/retention facilities will be sized for total containment of the water quality storm within the forebay and for controlled pre-development discharge of stormwater from the primary pond in accordance with Boise City design guidelines. The facility will be oversized for one foot of freeboard above the design volume elevation. The infiltration rate will be designed in accordance with Boise City policy requirements. The detention basin will be sized to provide for the percolation of as much volume as can be accounted for in the limited pond area and based on the 100-year runoff volume in a 24-hour period. All runoff in excess of the available storage volume in the primary pond will be allowed to discharge off-site at the pre-development discharge rate. The infiltration rate for the retained volume will be based on information contained in the Geotechnical Report for the development. All pre-development runoff from adjacent upstream basins and on-site runoff from open areas that are not a part of the new drainage areas generated from this development will be routed through the site without further retention, or treatment.

6. CONCLUSIONS

The storm drainage system and the detention/retention facility for the Hackberry North Subdivision will be designed in accordance with the requirements of the City of Boise Design Policy Manual and will meet the discharge and water quality requirements. The design event is the 100-year return storm. This design will include the evaluation of pre-development and post-development runoff conditions to verify that post-development 100-year discharge rates are less than, or equal to pre-development discharge rates. The historic downstream drainage channel discharges to Crane Creek. All potential runoff from this property will enter this drainage conveyance system without causing damage to adjacent structures, or property.

APPENDIX A

**PRE-DEVELOPMENT AND POST-DEVELOPMENT
CALCULATIONS**

Hackberry North Drainage Calculations

April 22, 2016

1. Predevelopment Calculations

A. Basin 1

Area = 8.3 Acres

Tc = 21 minutes

C = 0.17

I = 2.0 in/hr

$$Q = CIA = (0.17)(2.0)(8.3) = 3.1 \text{ cfs}$$

This is runoff that will continue to flow through the project unrestricted.

B. Basin 2

Area = 16.24 Acres

Tc = 20 minutes

C = 0.17

I = 2.0 in/hr

$$Q = CIA = (0.17)(2.0)(16.24) = 5.5 \text{ cfs}$$

This is runoff that will continue to flow through the project unrestricted.

C. Basin 3

Area = 14.41 Acres

Tc = 20 minutes

C = 0.17

I = 2.0 in/hr

$$Q = CIA = (0.17)(2.0)(14.41) = 4.9 \text{ cfs}$$

Pond size for 1 hour event

I = 1.0 in/hr

$$Q = CIA = (0.17)(1.0)(14.41) = 2.5 \text{ cfs}$$

Pond size = 2.5 cfs * 3600 = 8,819 cubic feet.

2. Post development Calculations

A. Basin 2B

Area = 14.73 Acres

Tc = 16 minutes

C1 = 0.17 (existing upper slopes)

C2 = 0.65 (new lot and roadway areas)

Cw = 0.45

I = 2.5 in/hr

$$Q = CIA = (0.45)(2.5)(14.73) = 16.57 \text{ cfs}$$

Pond size for 1 hour event

I = 1.0 in/hr

$$Q = CIA = (0.45)(1.0)(14.73) = 6.63 \text{ cfs}$$

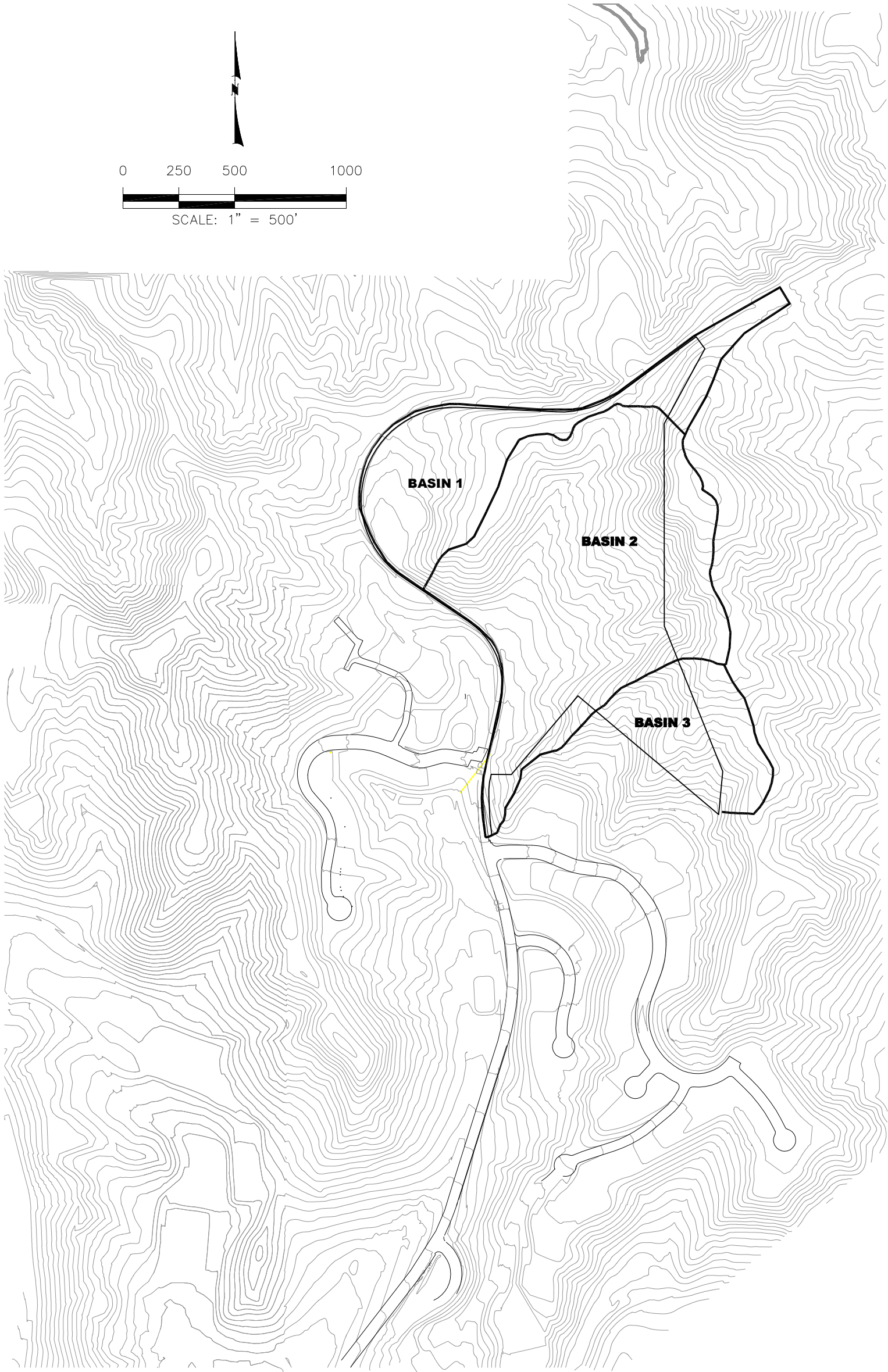
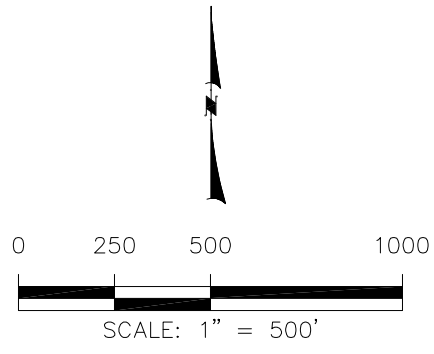
$$\text{Pond size} = 6.63 \text{ cfs} * 3600 = 23,862 \text{ cubic feet.}$$

$$\text{Net pond volume} = 23,862 - 8,819 = 15,044 \text{ cubic feet}$$

Post development discharge to offsite = 4.9 cfs (pre-development rate for Basin 3)

APPENDIX B

**PRE-DEVELOPMENT AND POST-DEVELOPMENT
BASIN MAPS**



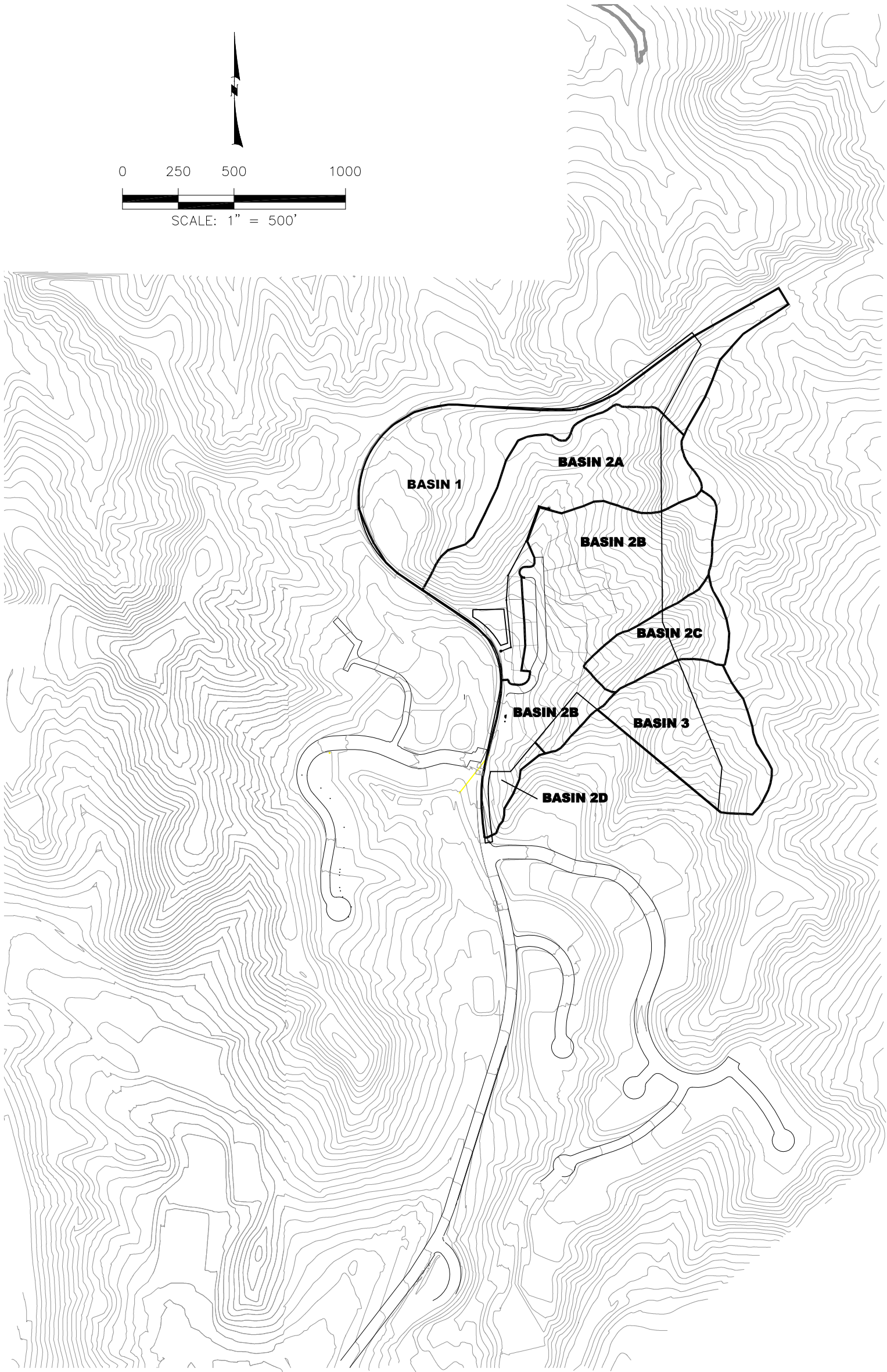
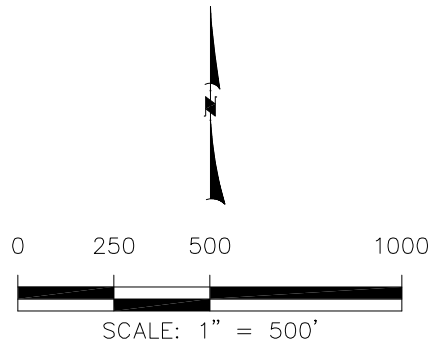
**HACKBERRY NORTH SUBDIVISION
PRE-DEVELOPMENT DRAINAGE AREA MAP**

DATE:	March 31 2016
JOB:	15024
E-FILE:	STORMDRAIN/PRE DEV
DRAWN BY:	WH, DP

**RiveRidge
Engineering
Company**



2447 S. Vista Ave. Boise, Idaho 83705
PHONE: (208) 344-1180 FAX: (208) 344-1182



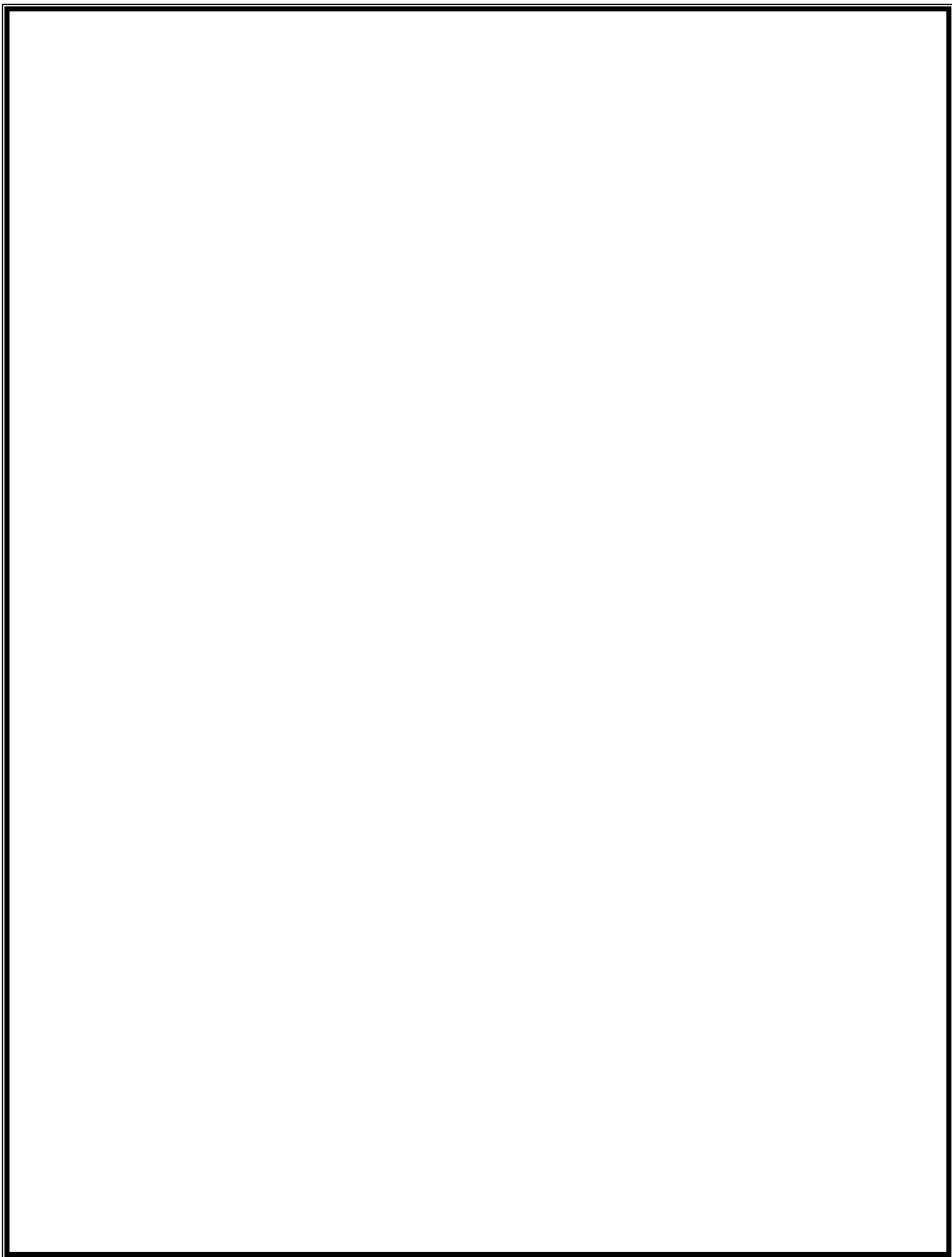
**HACKBERRY NORTH SUBDIVISION
POST-DEVELOPMENT DRAINAGE AREA MAP**

DATE:	March 31 2016
JOB:	15024
E-FILE:	STORMDRAIN/PRE DEV
DRAWN BY:	WH, DP

**RiverRidge
Engineering
Company**



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GEOTECHNICAL ENGINEERING REPORT
of
Hackberry North Subdivision
Bogus Basin Road
Boise, ID

Prepared for:

RiveRidge Engineering Company
2447 South Vista Avenue
Boise, ID 83705

MTI File Number B151231g

Mr. David Powell
RiveRidge Engineering Company
2447 South Vista Avenue
Boise, ID 83705
208-344-1180

Re: Geotechnical Engineering Report
Hackberry North Subdivision
Bogus Basin Road
Boise, ID

Dear Mr. Powell:

In compliance with your instructions, MTI has conducted a soils exploration and foundation evaluation for the above referenced development. Fieldwork for this investigation was conducted on 12 November 2015. Data have been analyzed to evaluate pertinent geotechnical conditions. Results of this investigation, together with our recommendations, are to be found in the following report. We have provided a PDF copy for your review and distribution.

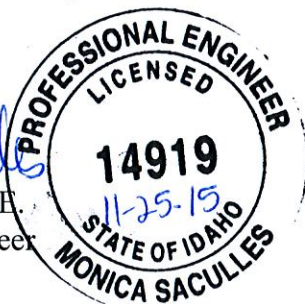
Often, questions arise concerning soil conditions because of design and construction details that occur on a project. MTI would be pleased to continue our role as geotechnical engineers during project implementation. Additionally, MTI can provide materials testing and special inspection services during construction of this project. If you will advise us of the appropriate time to discuss these engineering services, we will meet with you at your convenience.

MTI appreciates this opportunity to be of service to you and looks forward to working with you in the future. If you have questions, please call (208) 376-4748.

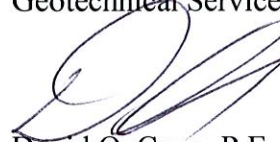
Respectfully Submitted,
Materials Testing & Inspection, Inc.



Monica Saculles, P.E.
Geotechnical Engineer



Reviewed by: Kevin L. Schroeder, P.G.
Geotechnical Services Manager



Reviewed by: David O. Cram, P.E.
General Manager

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INTRODUCTION

This report presents results of a geotechnical investigation and analysis in support of data utilized in design of structures as defined in the 2012 International Building Code (IBC). Information in support of groundwater and stormwater issues pertinent to the practice of Civil Engineering is included. Observations and recommendations relevant to the earthwork phase of the project are also presented. Revisions in plans or drawings for the proposed development from those enumerated in this report should be brought to the attention of the soils engineer to determine whether changes in the provided recommendations are required. Deviations from noted subsurface conditions, if encountered during construction, should also be brought to the attention of the soils engineer.

Project Description

The proposed development is in the northern-most portion of the City of Boise, Ada County, ID, and occupies portions of the NW¹/₄NW¹/₄ and NE¹/₄NW¹/₄ of Section 26, Township 4 North, Range 2 East, Boise Meridian and portions of the SW¹/₄SW¹/₄ and SE¹/₄SW¹/₄ of Section 23, Township 4 North, Range 2 East, Boise Meridian. This project will consist of development of roughly 13 single-family residential lots with associated common lots and residential roadways. The site to be developed is approximately 5 to 10 acres. Retaining walls may be constructed as part of the project.

Authorization

Authorization to perform this exploration and analysis was given in the form of a written authorization to proceed from Mr. David Powell of RiveRidge Engineering Company to Monica Saculles of Materials Testing and Inspection, Inc. (MTI), on 25 November 2015. Said authorization is subject to terms, conditions, and limitations described in the Professional Services Contract entered into between RiveRidge Engineering Company and MTI. Our scope of services for the proposed development has been provided in our proposal dated 3 November 2015 and repeated below.

Purpose

The purpose of this Geotechnical Engineering Report is to determine various soil profile components and their engineering characteristics for use by either design engineers or architects in:

- Preparing or verifying suitability of foundation design and placement
- Preparing site drainage designs
- Indicating issues pertaining to earthwork construction
- Preparing residential pavement section design requirements

Scope of Investigation

The scope of this investigation included review of geologic literature and existing available geotechnical studies of the area, visual site reconnaissance of the immediate site, subsurface exploration of the site, field and laboratory testing of materials collected, and engineering analysis and evaluation of foundation materials. The scope of work did not include design recommendations specific to individual residences.

Warranty and Limiting Conditions

MTI warrants that findings and conclusions contained herein have been formulated in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology only for the site and project described in this report. These engineering methods have been developed to provide the client with information regarding apparent or potential engineering conditions relating to the site within the scope cited above and are necessarily limited to conditions observed at the time of the site visit and research. Field observations and research reported herein are considered sufficient in detail and scope to form a reasonable basis for the purposes cited above.

Limitations

Test pit depths were limited by the client supplied equipment used for excavation.

Exclusive Use

This report was prepared for exclusive use of the property owner(s), at the time of the report, and their retained design consultants (“Client”). Conclusions and recommendations presented in this report are based on the agreed-upon scope of work outlined in this report together with the Contract for Professional Services between the Client and Materials Testing and Inspection, Inc. (“Consultant”). Use or misuse of this report, or reliance upon findings hereof, by parties other than the Client is at their own risk. Neither Client nor Consultant make representation of warranty to such other parties as to accuracy or completeness of this report or suitability of its use by such other parties for purposes whatsoever, known or unknown, to Client or Consultant. Neither Client nor Consultant shall have liability to indemnify or hold harmless third parties for losses incurred by actual or purported use or misuse of this report. No other warranties are implied or expressed.

Report Recommendations are Limited and Subject to Misinterpretation

There is a distinct possibility that conditions may exist that could not be identified within the scope of the investigation or that were not apparent during our site investigation. Findings of this report are limited to data collected from noted explorations advanced and do not account for unidentified fill zones, unsuitable soil types or conditions, and variability in soil moisture and groundwater conditions. To avoid possible misinterpretations of findings, conclusions, and implications of this report, MTI should be retained to explain the report contents to other design professionals as well as construction professionals.

Since actual subsurface conditions on the site can only be verified by earthwork, note that construction recommendations are based on general assumptions from selective observations and selective field exploratory sampling. Upon commencement of construction, such conditions may be identified that require corrective actions, and these required corrective actions may impact the project budget. Therefore, construction recommendations in this report should be considered preliminary, and MTI should be retained to observe actual subsurface conditions during earthwork construction activities to provide additional construction recommendations as needed.

Since geotechnical reports are subject to misinterpretation, **do not** separate the soil logs from the report. Rather, provide a copy of, or authorize for their use, the complete report to other design professionals or contractors. Locations of exploratory sites referenced within this report should be considered approximate locations only. For more accurate locations, services of a professional land surveyor are recommended.

This report is also limited to information available at the time it was prepared. In the event additional information is provided to MTI following publication of our report, it will be forwarded to the client for evaluation in the form received.

Environmental Concerns

Comments in this report concerning either onsite conditions or observations, including soil appearances and odors, are provided as general information. These comments are not intended to describe, quantify, or evaluate environmental concerns or situations. Since personnel, skills, procedures, standards, and equipment differ, a geotechnical investigation report is not intended to substitute for a geoenvironmental investigation or a Phase II/III Environmental Site Assessment. If environmental services are needed, MTI can provide, via a separate contract, those personnel who are trained to investigate and delineate soil and water contamination.

SITE DESCRIPTION

Site Access

Access to the site may be gained via West Hill Road to Bogus Basin Road. Proceed north on Bogus Basin Road approximately 1.8 miles to its intersection with West Paso Fino Drive. The site is located to the northeast of this intersection. Presently the site exists as undeveloped land. The location is depicted on site map plates included in the **Appendix**.

Regional Geology

The project site is located along the margin of the western Snake River Plain of southwestern Idaho and eastern Oregon. The plain is a northwest trending rift basin, about 45 miles wide and 200 miles long, that developed about 14 million years ago (Ma) and has since been occupied sporadically by large inland lakes. Geologic materials found within and along the plain's margins reflect volcanic and fluvial/lacustrine sedimentary processes that have led to an accumulation of approximately 1 to 2 km of interbedded volcanic and sedimentary deposits within the plain. Along the margins of the plain, streams that drained the highlands to the north and south provided coarse to fine-grained sediments eroded from granitic and volcanic rocks, respectively. About 2 million years ago the last of the lakes was drained and since that time fluvial erosion and deposition has dominated the evolution of the landscape. The project site is underlain with "Sand and Mudstone of Stream and Lake Sediments" as mapped by Othberg and Stanford (1993). These deposits have been described a medium- to coarse-grained arkosic sand, sandstone, and claystone that include interbeds of fine gravel, locally cemented, and sandy siltstone. Geologic structures within this unit vary from large foreset beds of sand to thinly-bedded claystone. This undifferentiated unit reflects a variety of stream and lake depositional environments along the northeastern and southwestern margin of the ancestral western Snake River Plain. Includes parts of the Payette, Poison Creek and Succor Creek Formations.

General Site Characteristics

This proposed development consists of approximately 5 to 10 acres of moderately steep to steep hillsides. The property is bounded on the north and east by rural pastureland, on the south by the existing Highlands Hackberry Subdivision, and on the west by Bogus Basin Road. The site generally slopes to the southwest, at slopes ranging between roughly 1.5:1 and 25:1. Surficial soils consisted primarily of silty sand sediments. Vegetation primarily consists of sagebrush, bunchgrass, and other native grass varieties typical of arid to semi-arid environments.

Regional drainage is south and west toward the Boise River. Stormwater drainage for the site is achieved by both sheet runoff and percolation through surficial soils. Runoff predominates for the steeper slopes while percolation prevails across the gently sloping areas. The site may receive some off-site drainage from the north and east. Stormwater drainage collection and retention systems are not in place on the project site, but are proposed as part of the development.

Regional Site Climatology and Geochemistry

According to the Western Regional Climate Center, the average precipitation for the Treasure Valley is on the order of 10 to 12 inches per year, with an annual snowfall of approximately 20 inches and a range from 3 to 49 inches. The monthly mean daily temperatures range from 21°F to 95°F, with daily extremes ranging from -25°F to 111°F. Winds are generally from the northwest or southeast with an annual average wind speed of approximately 9 miles per hour (mph) and a maximum of 62 mph. Soils and sediments in the area are primarily derived from siliceous materials and exhibit low electro-chemical potential for corrosion of metals or concretes. Local aggregates are generally appropriate for Portland cement and lime cement mixtures. Surface water, groundwater, and soils in the region typically have pH levels ranging from 7.2 to 8.2.

Geoseismic Setting

Soils on site are classed as Site Class D in accordance with Chapter 20 of the American Society of Civil Engineers (ASCE) publication ASCE/SEI 7-10. Structures constructed on this site should be designed per IBC requirements for such a seismic classification. Our investigation did not reveal hazards resulting from potential earthquake motions including: slope instability, liquefaction, and surface rupture caused by faulting or lateral spreading. Incidence and anticipated acceleration of seismic activity in the area is low.

Seismic Risk

According to a map titled *Seismicity of Idaho 1973-2012* from the United States Geological Survey (USGS), the majority of the earthquakes in Idaho occurred in the central and southeastern portions of the state. These areas are to the north, northeast, and southeast of the project region. The closest earthquake to the project site occurred on December 24, 1984, approximately 4 miles to the south of the project site, and had an intensity of V, per a map titled *Earthquakes in Idaho 1872-2000* from the Idaho Geological Survey.

Historic and Active Faults

Per a map titled *Miocene and Younger Faults in Idaho*, it was found that a Major Tertiary Fault runs along the southern portion of the property boundary. Major Tertiary faults are those that experienced movement between 1.6 and 16 million years ago. Additionally, according to Figure 630.05.01 in the ITD Materials Manual, there are no active faults in the vicinity of the project. Based on current plans and lot layout, the Major Tertiary Fault appears to be located in the vicinity of the proposed infiltration facility, preventing structures from being constructed across the fault line. Therefore, no lot adjustments are recommended.

SOILS EXPLORATION

Exploration and Sampling Procedures

Field exploration conducted to determine engineering characteristics of subsurface materials included a reconnaissance of the project site and investigation by test pit. Test pit sites were located in the field by means of a Global Positioning System (GPS) device and are reportedly accurate to within sixteen feet. Upon completion of investigation, each test pit was backfilled with loose excavated materials. Re-excavation and compaction of these test pit areas are required prior to construction of overlying structures.

In addition, samples were obtained from representative soil strata encountered. Samples obtained have been visually classified in the field by professional staff, identified according to test pit number and depth, placed in sealed containers, and transported to our laboratory for additional testing. Subsurface materials have been described in detail on logs provided in the **Appendix**. Results of field and laboratory tests are also presented in the **Appendix**. MTI recommends that these logs **not** be used to estimate fill material quantities.

Laboratory Testing Program

Along with our field investigation, a supplemental laboratory testing program was conducted to determine additional pertinent engineering characteristics of subsurface materials necessary in an analysis of anticipated behavior of the proposed structures. Laboratory tests were conducted in accordance with current applicable American Society for Testing and Materials (ASTM) and American Association of State Highway and Transportation Officials (AASHTO) specifications, and results of these tests are to be found on the accompanying logs located in the **Appendix**. The laboratory testing program for this report included: Atterberg Limits Testing – ASTM D4318, Grain Size Analysis – ASTM C117/C136, and Resistance Value (R-value) and Expansion Pressure of Compacted Soils – Idaho T-8.

Soil and Sediment Profile

The profile below represents a generalized interpretation for the project site. Note that on site soils strata, encountered between test pit locations, may vary from the individual soil profiles presented in the logs, which can be found in the **Appendix**.

The materials encountered during exploration were quite typical for the geologic area mapped as Sand and Mudstone of Stream and Lake Sediments. Surficial soils were predominately silty sands. Silty sands were often dark brown to brown in color, exhibited moisture contents of slightly moist, and had a relative density of medium dense. Organic materials were often noted to depths of roughly 1 foot. Surficial silty sands were underlain by sandy silt or silt with sand soils. These fine-grained soils were classified as tan to light brown to brown, dry to slightly moist, and had consistencies ranging from medium stiff to hard, with many of these firmer soil horizons containing some degree of induration. Within test pits 3 and 6, poorly graded sand with silt sediments were encountered at depth. These sands were found to be tan to yellow-brown, dry to slightly moist, and medium dense to dense. Induration was also present through portions of the sand horizons.

Test pit walls were generally stable. However, moisture contents will affect wall competency with saturated soils having a tendency to readily slough when under load and unsupported.

Volatile Organic Scan

No environmental concerns were identified prior to commencement of the investigation. Therefore, soils obtained during on-site activities were not assessed for volatile organic compounds by portable photoionization detector. Samples obtained during our exploration activities exhibited no odors or discoloration typically associated with this type of contamination. No groundwater was encountered.

SITE HYDROLOGY

Existing surface drainage conditions are defined in the **General Site Characteristics** section. Information provided in this section is limited to observations made at the time of the investigation. Either regional or local ordinances may require information beyond the scope of this report.

Groundwater

During this field investigation, groundwater was not encountered in test pits advanced to a maximum depth of 9.8 feet bgs. Soil moistures in the test pits were generally dry to slightly moist throughout. In the vicinity of the project site, groundwater levels are controlled in large part by seasonal runoff. Maximum groundwater elevations likely occur during late spring to early summer runoff season. During previous investigations throughout the existing Hackberry Ranch and Highlands Hackberry Subdivisions immediately to the west and south of the project site, no evidence of groundwater was noted within numerous hand borings and test pits advanced to depths as great as 9.9 to 17.2 feet bgs. For construction purposes, groundwater depth can be assumed to remain greater than 15 feet bgs throughout the year. This depth can be confirmed through long-term groundwater monitoring.

Soil Infiltration Rates

Soil permeability, which is a measure of the ability of a soil to transmit a fluid, was not tested in the field. However, future infiltration testing is planned for the project site in accordance with the Ada County Highway District (ACHD) Policy Manual. Once results have been obtained, they will be forwarded in the form of an addendum.

Given the absence of direct measurements, for this report an estimation of infiltration is presented using generally recognized values for each soil type and gradation. Of soils comprising the generalized soil profile for this study, sandy silt soils will commonly exhibit infiltration rates from 2 to 4 inches per hour; though induration may reduce this value to near zero. Silty sand sediments usually display rates of 4 to 8 inches per hour. Poorly graded sand with silt sediments typically exhibit infiltration values in excess of 12 inches per hour; though induration may decrease values to an unknown degree.

Infiltration facilities for the site are planned to be developed in the vicinity of Test Pit 6. It is recommended that these infiltration facilities be extended into native poorly graded sand with silt sediments. Infiltration testing will be conducted on these sediments, and a design infiltration rate will be provided at that time.

SLOPES AND SETBACKS

Native slopes steeper than 3 feet horizontal to 1 foot vertical (3:1) are relatively common on hillsides within the 5 to 10 acres of the proposed development. Construction is expected to alter existing slopes to as steep as 2:1. For structures to be constructed near slopes like these, it is necessary to apply slope setback requirements as outlined in the IBC. No potential slope stability deficiencies were noted during the investigation.

Soils onsite are not sufficiently stable to allow vertical cuts greater than 4 feet to stand for an extended period of time. Soils in the project vicinity are stable at a 2:1 gradient. However, soil types throughout the area are variable, and existing slopes will be dependent upon soil composition. Proposed cut-fill sections constructed from these soils should not be steeper than 2:1. Cut slopes in fine-grained soil are stable on a 1.5:1 slope with respect to mass movement and downslope creep. Fill slopes should be placed and compacted in a controlled manner as detailed in the **Structural Fill** section of this report. Fills to be constructed on existing slopes steeper than **20 percent** (approximately 5:1) should be benched a minimum of 10 feet into competent native soils.

To ensure slope stability with respect to surficial movement and gulying, cohesive soils should be placed on the face of slopes. This will help limit downslope creep and aid in re-vegetation of slope surfaces. When slopes are steeper than 2:1, soils must be aggressively protected from erosion. More granular soils will require an even greater degree of protection.

Setbacks from constructed slopes should adhere to provisions of Section 1808.7 of the 2012 IBC. Footing loads on soil masses adjacent to slopes must be set back in accordance with the provisions of the IBC. For buildings constructed above slopes steeper than 3:1, the horizontal setback distance from the face of slope to the face of an upslope footing must be no less than $\frac{1}{3}$ the vertical height of the total slope, however, need not exceed 40 feet. Benches or steps in the slope do not modify slope height. For buildings constructed below slopes steeper than 3:1, the horizontal setback distance from the toe of the slope to the face of a downslope structure must be no less than $\frac{1}{2}$ the vertical height of the total slope, however, need not exceed 15 feet.

Retaining walls can be constructed to alter the dimensional parameters of a slope. The top of the retaining wall constitutes the toe of the slope, and slope height is determined from the top of wall. Downslope setback requirements can be reduced to zero if the retaining wall reduces the upslope gradient to 3:1 or flatter. Because upslope setbacks are determined at footing elevation, top of slope setbacks can be managed through the footing depth. In some cases, it may be desirable to use a foundation based on tip bearing piles or caissons to achieve greater footing depths.

LATERAL EARTH PRESSURES

Retaining, below-grade, or basement walls will be subject to lateral earth pressures. The magnitude of earth pressure is a function of both type and compaction of backfill behind walls within the “active” zone, and allowable rotation of the top of the wall. The active zone is defined as the wedge of soil between the surface of the wall and a plane inclined 31 degrees from vertical passing through the base of the wall. The following recommendations should be used when dealing with lateral earth pressures on a gravity block: 1) a sliding frictional coefficient of 0.35 is appropriate considering native silty sand/sandy silt (SM/ML) soils, and 2) a sliding frictional coefficient of 0.45 is appropriate considering native poorly graded sand with silt (SP) and granular structural fill (SP/GP) under typical conditions.

A state of plastic equilibrium is when the subject material is considered to be 1) homogeneous and unbounded and 2) at the point of incipient instability. This state is evaluated on the basis of unit weight, mechanical properties, and the definition of instability. For the purpose of this report, it is assumed that native soils and imported granular fill material will be the materials of concern regarding lateral earth pressures. If other materials are considered for use, MTI must be contacted to provide alternate lateral earth pressure information. Furthermore, changes in natural soil moisture, such as can be imposed by site stormwater systems, can change the values listed below.

Below-grade restrained walls, such as basement walls, should be designed based on at-rest pressures. Active pressures are appropriate under conditions where the wall moves or rotates away from the soil mass at failure. Passive pressures are used for conditions where the wall moves toward the soil mass at failure. Rotation, or lateral movement, of the top of the wall equal to 0.002 times the height of the wall will be necessary for on-site soil backfill to achieve an “active” loading condition. Lateral movement of the top of the wall equal to 0.001 times the height of the wall will be necessary for the “active” pressure condition for imported SP/GP structural backfill.

Retaining Wall Backfill Materials

For lateral earth pressure analysis, MTI anticipates that the soils of interest will be the native silty sand/sandy silt (SM/ML) soils encountered between 0 and 8 feet bgs in the test pits. The following values are applicable under non-surcharged, drained conditions.

Lateral Earth Pressure Values for Native Soil

Soil Type: Silty Sand/Sandy Silt			
Internal Friction Angle:	28 °	Dry Unit Weight:	110 pcf
Cohesion:	175 psf	Buoyant Unit Weight:	73 pcf
Natural Void Ratio:	0.7	Natural Moisture:	16 %
At rest lateral earth pressure:	68 pcf ¹	$K_o =$	0.5
Active lateral earth pressure:	46 pcf ¹	$K_a =$	0.4
Passive lateral earth pressure:	353 pcf ¹	$K_p =$	2.8

¹Lateral earth pressure values are in pounds per square foot, per foot of wall (psf/ft). Alternately, the values presented may also be considered as equivalent fluid with units of pounds per cubic foot (pcf).

Imported, compacted, structural material, which is used to backfill the soil side of walls, must demonstrate the following characteristics:

Lateral Earth Pressure Values for Fill Materials

Soil Type: Compacted Sandy Gravel			
Internal Friction Angle:	35 °	Dry Unit Weight:	128 pcf
Cohesion:	NA	Buoyant Unit Weight:	83 pcf
Natural Void Ratio:	0.4	Natural Moisture:	5 %
At rest lateral earth pressure:	57 pcf ¹	$K_o =$	0.4
Active lateral earth pressure:	36 pcf ¹	$K_a =$	0.3
Passive lateral earth pressure:	496 pcf ¹	$K_p =$	3.7

¹Lateral earth pressure values are in pounds per square foot, per foot of wall (psf/ft). Alternately, the values presented may also be considered as equivalent fluid with units of pounds per cubic foot (pcf).

In the case that another material is used for backfill, MTI should be consulted for alternate lateral earth pressure values. Granular structural fill should consist of 4-inch-minus select, clean, granular soil with no more than 30 percent oversize (greater than ¾-inch) material and no more than 5 percent fines (passing the No. 200 sieve). Retaining wall and basement backfill must be placed in accordance with recommendations in the **Structural Fill** section of this report and must be properly compacted and tested.

Lateral earth pressure values do not incorporate specific factors of safety, and are only applicable for non-surcharged, drained conditions. Factors of safety, if applicable, should be integrated into the structural design of the wall. The preceding values are presented for idealized conditions relating to simple shallow structures. For complex structures, deep structures, or structures with significant perimeter landscaping, a soils engineer should be retained as part of the design team in developing appropriate project design parameters and construction specifications.

Retaining Wall Drainage

MTI recommends that a drainage system be incorporated into the retained soil mass. This can be accomplished by installing wall and toe drains as a part of each soil-supporting wall system. In areas where there is potential for significantly high soil moistures within the supported soil mass, installation of drains within the soil mass is recommended. Particular consideration of roof drain effluent and irrigation water must be made. Further, these drainage systems must be separate from other retaining wall/foundation systems. If the granular structural fill option to reduce lateral pressures is used, a compacted low permeability soil cap is recommended within the upper 2 feet of the surface to limit surface water infiltration behind the walls.

FOUNDATION, SLAB, AND PAVEMENT DISCUSSION AND RECOMMENDATIONS

Various foundation types have been considered for support of the proposed structures. Two requirements must be met in the design of foundations. First, the applied bearing stress must be less than the ultimate bearing capacity of foundation soils to maintain stability. Second, total and differential settlement must not exceed an amount that will produce an adverse behavior of the superstructure. Allowable settlement is usually exceeded before bearing capacity considerations become important; thus, allowable bearing pressure is normally controlled by settlement considerations.

Considering subsurface conditions and the proposed construction, it is recommended that the structures be founded upon conventional spread footings and continuous wall footings. Total settlements should not exceed 1 inch if the following design and construction recommendations are observed. Presently, there are approximately 13 lots proposed for the project site. The following recommendations are not specific to the individual structures, but rather should be viewed as guidelines for the subdivision – wide development.

Foundation Design Recommendations

Based on data obtained from the site and test results from various laboratory tests performed, MTI recommends the following guidelines for the net allowable soil bearing capacity:

Soil Bearing Capacity

Footing Depth	ASTM D1557 Subgrade Compaction	Net Allowable Soil Bearing Capacity
Footings must bear on competent, undisturbed, native sandy silt/silty sand soils or compacted structural fill. Existing organic materials and uncontrolled fill materials (if encountered) must be completely removed from below foundation elements. ¹ Excavation depths of roughly 1 foot bgs should be anticipated to expose proper bearing soils. ²	Not Required for Native Soil 95% for Structural Fill	2,000 lbs/ft ² A 1/3 increase is allowable for short-term loading, which is defined by seismic events or designed wind speeds.

¹It will be required for MTI personnel to verify the bearing soil suitability for each structure at the time of construction.

²Depending on the time of year construction takes place, the subgrade soils may be unstable because of high moisture contents. If unstable conditions are encountered, over-excavation and replacement with granular structural fill and/or use of geotextiles may be required.

Footings should be proportioned to meet either the stated soil bearing capacity or the 2012 IBC minimum requirements. Total settlement should be limited to approximately 1 inch, and differential settlement should be limited to approximately ½ inch. Objectionable soil types encountered at the bottom of footing excavations should be removed and replaced with structural fill. Excessively loose or soft areas that are encountered in the footings subgrade will require over-excavation and backfilling with structural fill. To minimize the effects of slight differential movement that may occur because of variations in the character of supporting soils and seasonal moisture content, MTI recommends continuous footings be suitably reinforced to make them as rigid as possible. For frost protection, the bottom of external footings should be 24 inches below finished grade.

Crawl Space Recommendations

Considering the presence of shallow indurated soils across the site, all residences constructed with crawl spaces should be designed in a manner that will inhibit water in the crawl spaces. MTI recommends that roof drains carry stormwater at least 10 feet away from each residence. Grades should be at least 5 percent for a distance of 10 feet away from all residences. In addition, rain gutters should be placed around all sides of residences, and backfill around stem walls should be placed and compacted in a controlled manner.

Floor, Patio, and Garage Slab-on-Grade

Organic, loose, or obviously compressive materials must be removed prior to placement of concrete floors or floor-supporting fill. In addition, the remaining subgrade should be treated in accordance with guidelines presented in the **Earthwork** section. Areas of excessive yielding should be excavated and backfilled with structural fill. Fill used to increase the elevation of the floor slab should meet requirements detailed in the **Structural Fill** section. Fill materials must be compacted to a minimum 95 percent of the maximum dry density as determined by ASTM D1557.

A free-draining granular mat (drainage fill course) should be provided below slabs-on-grade. This should be a minimum of 4 inches in thickness and properly compacted. The mat should consist of a sand and gravel mixture, complying with Idaho Standards for Public Works Construction (ISPWC) specifications for ¾-inch (Type 1) crushed aggregate. A moisture-retarder should be placed beneath floor slabs to minimize potential ground moisture effects on moisture-sensitive floor coverings. The moisture-retarder should be at least 15-mil in thickness and have a permeance of less than 0.01 US perms as determined by ASTM E96. Placement of the moisture-retarder will require special consideration with regard to effects on the slab-on-grade and should adhere to recommendations outlined in the ACI 302.1R and ASTM E1745 publications. The granular mat should be compacted to no less than 95 percent of the maximum dry density as determined by ASTM D1557. Upon request, MTI can provide further consultation regarding installation.

Recommended Pavement Sections

As required by Ada County Highway District (ACHD), MTI has used a traffic index of 6 to determine the necessary pavement cross-section for the site. MTI has made assumptions for traffic loading variables based on the character of the proposed construction. The Client should review these assumptions to make sure they reflect intended use and loading of pavements both now and in the future.

MTI collected a sample of near-surface soils for Resistance Value (R-value) testing representative of soils to depths of 1 foot below existing ground surface. This sample, consisting of silty sand collected from test pit 5, yielded a R-value of 25. The following are minimum thickness requirements for assured pavement function. Depending on site conditions, additional work, e.g. soil preparation, may be required to support construction equipment. These have been listed within the **Soft Subgrade Soils** section. Results of the test are graphically depicted in the **Appendix**.

Flexible Pavement Section

The Gravel Equivalent Method, as defined in Section 500 of the State of Idaho Department of Transportation (ITD) Materials Manual, was used to develop the pavement section. ACHD parameters for traffic index and substitution ratios, which were obtained from the ACHD Policy Manual, were also used in the design. A calculation sheet provided in the **Appendix** indicates the soils constant, traffic loading, traffic projections, and material constants used to calculate the pavement section. MTI recommends that materials used in the construction of asphaltic concrete pavements meet the requirements of the ISPWC Standard Specification for Highway Construction. Construction of the pavement section should be in accordance with these specifications and should adhere to guidelines recommended in the section on **Construction Considerations**.

Gravel Equivalent Method Flexible Pavement Specifications

Pavement Section Component¹	Roadway Section
Asphaltic Concrete	2.5 Inches
Crushed Aggregate Base	4.0 Inches
Structural Subbase	8.0 Inches
Compacted Subgrade	Not Required

¹It will be required for MTI personnel to verify subgrade competency at the time of construction.

Asphaltic Concrete: Asphalt mix design shall meet the requirements of ISPWC, Section 810 Class III plant mix. Materials shall be placed in accordance with ISPWC Standard Specifications for Highway Construction.

Aggregate Base: Material complying with ISPWC Standards for Crushed Aggregate Materials.

Structural Subbase: Material complying with requirements for granular structural fill (uncrushed) as defined in ISPWC.

Common Pavement Section Construction Issues

The subgrade upon which above pavement sections are to be constructed must be properly stripped, inspected, and proof-rolled. Proof rolling of subgrade soils should be accomplished using a heavy rubber-tired, fully loaded, tandem-axle dump truck or equivalent. Verification of subgrade competence by MTI personnel at the time of construction is required. Fill materials on the site must demonstrate the indicated compaction prior to placing material in support of the pavement section. MTI anticipated that pavement areas will be subjected to moderate traffic. Subgrade silts near and above optimum moisture contents may pump during compaction. Pumping or soft areas must be removed and replaced with structural fill.

Fill material and aggregates in support of the pavement section must be compacted to no less than 95 percent of the maximum dry density as determined by ASTM D698 for flexible pavements and by ASTM D1557 for rigid pavements. If a material placed as a pavement section component cannot be tested by usual compaction testing methods, then compaction of that material must be approved by observed proof rolling. Minor deflections from proof rolling for flexible pavements are allowable. Deflections from proof rolling of rigid pavement support courses should not be visually detectable.

CONSTRUCTION CONSIDERATIONS

Recommendations in this report are based upon structural elements of the project being founded on competent sandy silt/silty sand soils or compacted structural fill. Structural areas should be stripped to an elevation that exposes these soil types.

Earthwork

Excessively organic soils, deleterious materials, or disturbed soils generally undergo high volume changes when subjected to loads, which is detrimental to subgrade behavior in the area of pavements, floor slabs, structural fills, and foundations. Brush and thick grasses with associated root systems were noted at the time of our investigation. It is recommended that organic or disturbed soils, if encountered, be removed to depths of 1 foot (minimum), and wasted or stockpiled for later use. Stripping depths should be adjusted in the field to assure that the entire root zone or disturbed zone or topsoil are removed prior to placement and compaction of structural fill materials. Exact removal depths should be determined during grading operations by MTI personnel, and should be based upon subgrade soil type, composition, and firmness or soil stability.

If underground storage tanks, underground utilities, wells, or septic systems are discovered during construction activities, they must be decommissioned then removed or abandoned in accordance with governing Federal, State, and local agencies. Excavations developed as the result of such removal must be backfilled with structural fill materials as defined in the **Structural Fill** section.

MTI should oversee subgrade conditions (i.e., moisture content) as well as placement and compaction of new fill (if required) after native soils are excavated to design grade. Recommendations for structural fill presented in this report can be used to minimize volume changes and differential settlements that are detrimental to the behavior of footings, pavements, and floor slabs. Sufficient density tests should be performed to properly monitor compaction. For structural fill beneath building structures, one in-place density test per lift for every 5,000 square feet is recommended. In parking and driveway areas, this can be decreased to one test per lift for every 10,000 square feet.

Dry Weather

If construction is to be conducted during dry seasonal conditions, many problems associated with soft soils may be avoided. However, some rutting of subgrade soils may be induced by shallow groundwater conditions related to springtime runoff or irrigation activities during late summer through early fall. Solutions to problems associated with soft subgrade soils are outlined in the **Soft Subgrade Soils** section. Problems may also arise because of lack of moisture in native and fill soils at time of placement. This will require the addition of water to achieve near-optimum moisture levels. Low-cohesion soils exposed in excavations may become friable, increasing chances of sloughing or caving. Measures to control excessive dust should be considered as part of the overall health and safety management plan.

Wet Weather

If construction is to be conducted during wet seasonal conditions (commonly from mid-November through May), problems associated with soft soils must be considered as part of the construction plan. During this time of year, fine-grained soils such as silts and clays will become unstable with increased moisture content, and eventually deform or rut. Additionally, constant low temperatures reduce the possibility of drying soils to near optimum conditions.

Soft Subgrade Soils

Shallow fine-grained subgrade soils that are high in moisture content should be expected to pump and rut under construction traffic. During periods of wet weather, construction may become very difficult if not impossible. The following recommendations and options have been included for dealing with soft subgrade conditions:

- Track-mounted vehicles should be used to strip the subgrade of root matter and other deleterious debris. Heavy rubber-tired equipment should be prohibited from operating directly on the native subgrade and areas in which structural fill materials have been placed. Construction traffic should be restricted to designated roadways that do not cross, or cross on a limited basis, proposed roadway or parking areas.
- Soft areas can be over-excavated and replaced with granular structural fill.
- Construction roadways on soft subgrade soils should consist of a minimum 2-foot thickness of large cobbles of 4 to 6 inches in diameter with sufficient sand and fines to fill voids. Construction entrances should consist of a 6-inch thickness of clean, 2-inch minimum, angular drain-rock and must be a minimum of 10 feet wide and 30 to 50 feet long. During the construction process, top dressing of the entrance may be required for maintenance.
- Scarification and aeration of subgrade soils can be employed to reduce the moisture content of wet subgrade soils. After stripping is complete, the exposed subgrade should be ripped or disked to a depth of 1½ feet and allowed to air dry for 2 to 4 weeks. Further disking should be performed on a weekly basis to aid the aeration process.
- Alternative soil stabilization methods include use of geotextiles, lime, and cement stabilization. MTI is available to provide recommendations and guidelines at your request.

Frozen Subgrade Soils

Prior to placement of structural fill materials or foundation elements, frozen subgrade soils must either be allowed to thaw or be stripped to depths that expose non-frozen soils and wasted or stockpiled for later use. Stockpiled materials must be allowed to thaw and return to near-optimal conditions prior to use as structural fill.

The onsite, shallow silty soils are susceptible to frost heave during freezing temperatures. For exterior flatwork and other structural elements, adequate drainage away from subgrades is critical. Compaction and use of structural fill will also help to mitigate the potential for frost heave. Complete removal of frost susceptible soils for the full frost depth, followed by replacement with a non-frost susceptible structural fill, can also be used to mitigate the potential for frost heave. MTI is available to provide further guidance/assistance upon request.

Structural Fill

Soils recommended for use as structural fill are those classified as GW, GP, SW, and SP in accordance with the Unified Soil Classification System (USCS) (ASTM D2487). Use of silty soils (USCS designation of GM, SM, and ML) as structural fill may also be acceptable. All bearing surfaces must be compacted below structural elements. Use of clayey soils (GC, SC, CL, and CH) as structural fill is prohibited.

Silty materials require very high moisture contents for compaction and require a long time to dry out if natural moisture contents are too high and may also be susceptible to frost heave under certain conditions. Therefore, these materials can be quite difficult to work with as moisture content, lift thickness, and compactive effort becomes difficult to control. If silty soil is used for structural fill, lift thicknesses should not exceed 6 inches (loose), and fill material moisture must be closely monitored at both the working elevation and the elevations of materials already placed. Following placement, silty soils must be protected from degradation resulting from construction traffic or subsequent construction. It is noted that even well-compacted fill zones could consolidate up to 1.5 percent. It is therefore recommended that compacted fill zones deeper than 8 feet below footings or other structural elements be evaluated for total expected settlement.

Recommended granular structural fill materials, those classified as GW, GP, SW, and SP, should consist of a 6-inch minus select, clean, granular soil with no more than 50 percent oversize (greater than ¾-inch) material and no more than 12 percent fines (passing No. 200 sieve). These fill materials should be placed in layers not to exceed 12 inches in loose thickness. Prior to placement of structural fill materials, surfaces must be prepared as outlined in the **Construction Considerations** section. Structural fill material should be moisture-conditioned to achieve optimum moisture content prior to compaction. For structural fill below footings, areas of compacted backfill must extend outside the perimeter of the footings for a distance equal to the thickness of fill between the bottom of foundation and underlying soils, or 5 feet, whichever is less. All fill materials must be monitored during placement and tested to confirm compaction requirements, outlined below, have been achieved.

Each layer of structural fill must be compacted, as outlined below:

- Below Structures and Rigid Pavements: A minimum of 95 percent of the maximum dry density as determined by ASTM D1557.
- Below Flexible Pavements: A minimum of 92 percent of the maximum dry density as determined by ASTM D1557 or 95 percent of the maximum dry density as determined by ASTM D698.

The ASTM D1557 test method must be used for samples containing up to 40 percent oversize (greater than ¾-inch) particles. If material contains more than 40 percent but less than 50 percent oversize particles, compaction of fill must be confirmed by proof rolling each lift with a 10-ton vibratory roller (or equivalent) until the maximum density has been achieved. Density testing must be performed after each proof rolling pass until the in-place density test results indicate a drop (or no increase) in the dry density, defined as maximum density or “break over” point. The number of required passes should be used as the requirements on the remainder of fill placement. Material should contain sufficient fines to fill void spaces, and must not contain more than 50 percent oversize particles.

Backfill of Walls

Backfill materials must conform to the requirements of structural fill, as defined in this report. For wall heights greater than 2.5 feet, the maximum material size should not exceed 4 inches in diameter. Placing oversized material against rigid surfaces interferes with proper compaction, and can induce excessive point loads on walls. Backfill shall not commence until the wall has gained sufficient strength to resist placement and compaction forces. Further, retaining walls above 2.5 feet in height shall be backfilled in a manner that will limit the potential for damage from compaction methods and/or equipment. It is recommended that only small hand-operated compaction equipment be used for compaction of backfill within a horizontal distance equal to the height of the wall, measured from the back face of the wall.

Backfill should be compacted in accordance with the specifications for structural fill, except in those areas where it is determined that future settlement is not a concern, such as planter areas. In nonstructural areas, backfill must be compacted to a firm and unyielding condition.

Excavations

Shallow excavations that do not exceed 4 feet in depth may be constructed with side slopes approaching vertical. Below this depth, it is recommended that slopes be constructed in accordance with Occupational Safety and Health Administration (OSHA) regulations, Section 1926, Subpart P. Based on these regulations, on-site soils are classified as type “C” soil, and as such, excavations within these soils should be constructed at a maximum slope of 1½ feet horizontal to 1 foot vertical (1½:1) for excavations up to 20 feet in height. Excavations in excess of 20 feet will require additional analysis. Note that these slope angles are considered stable for short-term conditions only, and will not be stable for long-term conditions.

During the subsurface exploration, test pit sidewalls generally exhibited little indication of collapse. For deep excavations, native granular sediments cannot be expected to remain in position. These materials are prone to failure and may collapse, thereby undermining upper soil layers. This is especially true when excavations approach depths near the water table. Care must be taken to ensure that excavations are properly backfilled in accordance with procedures outlined in this report.

Groundwater Control

Groundwater was not encountered during the investigation and is anticipated to be below the depth of most construction. Special precautions may be required for control of surface runoff and subsurface seepage. It is recommended that runoff be directed away from open excavations. Silty soils may become soft and pump if subjected to excessive traffic during time of surface runoff. Ponded water in construction areas should be drained through methods such as trenching, sloping, crowning grades, nightly smooth drum rolling, or installing a French drain system. Additionally, temporary or permanent driveway sections should be constructed if extended wet weather is forecasted.

GENERAL COMMENTS

When plans and specifications are complete, or if significant changes are made in the character or location of the proposed development, consultation with MTI should be arranged as supplementary recommendations may be required. Suitability of subgrade soils and compaction of structural fill materials must be verified by MTI personnel prior to placement of structural elements. Additionally, monitoring and testing should be performed to verify that suitable materials are used for structural fill and that proper placement and compaction techniques are utilized.

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APPENDICES

ACRONYM LIST

AASHTO:	American Association of State Highway and Transportation Officials
ACHD:	Ada County Highway District
ACI	American Concrete Institute
ASCE	American Society of Civil Engineers
ASTM:	American Society for Testing and Materials
bgs:	below ground surface
CBR:	California Bearing Ratio
D:	natural dry unit weight, pcf
ESAL	Equivalent Single Axle Load
GS:	grab sample
IBC:	International Building Code
IDEQ	Idaho Department of Environmental Quality
ISPWC:	Idaho Standards for Public Works Construction
ITD:	Idaho Transportation Department
LL:	Liquid Limit
M:	water content
MSL:	mean sea level
N:	Standard "N" penetration: blows per foot, Standard Penetration Test
NP:	nonplastic
OSHA	Occupational Safety and Health Administration
PCCP:	Portland Cement Concrete Pavement
PERM:	vapor permeability
PI:	Plasticity Index
PID:	photoionization detector
PVC:	polyvinyl chloride
Qc:	cone penetrometer value, unconfined compressive strength, psi
Qp:	Penetrometer value, unconfined compressive strength, tsf
Qu:	Unconfined compressive strength, tsf
RMR	Rock Mass Rating
RQD	Rock Quality Designation
R-Value	Resistance Value
SPT:	Standard Penetration Test (140:pound hammer falling 30 in. on a 2:in. split spoon)
USCS:	Unified Soil Classification System
USDA:	United States Department of Agriculture
UST:	underground storage tank
V:	vane value, ultimate shearing strength, tsf

GEOTECHNICAL GENERAL NOTES

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION			
Coarse-Grained Soils	SPT Blow Counts (N)	Fine-Grained Soils	SPT Blow Counts (N)
Very Loose:	< 4	Very Soft:	< 2
Loose:	4-10	Soft:	2-4
Medium Dense:	10-30	Medium Stiff:	4-8
Dense:	30-50	Stiff:	8-15
Very Dense:	>50	Very Stiff:	15-30
		Hard:	>30

Moisture Content	
Description	Field Test
Dry	Absence of moisture, dusty, dry to touch
Moist	Damp but not visible moisture
Wet	Visible free water, usually soil is below water table

Cementation	
Description	Field Test
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

PARTICLE SIZE					
Boulders:	>12 in.	Coarse-Grained Sand:	5 to 0.6 mm	Silts:	0.075 to 0.005 mm
Cobbles:	12 to 3 in.	Medium-Grained Sand:	0.6 to 0.2 mm	Clays:	<0.005 mm
Gravel:	3 in. to 5 mm	Fine-Grained Sand:	0.2 to 0.075 mm		

UNIFIED SOIL CLASSIFICATION SYSTEM			
Major Divisions		Symbol	Soil Descriptions
Coarse-Grained Soils <50% passes No.200 sieve	Gravel & Gravelly Soils <50% coarse fraction passes No.4 sieve	GW	Well-graded gravels; gravel/sand mixtures with little or no fines
		GP	Poorly-graded gravels; gravel/sand mixtures with little or no fines
		GM	Silty gravels; poorly-graded gravel/sand/silt mixtures
		GC	Clayey gravels; poorly-graded gravel/sand/clay mixtures
	Sand & Sandy Soils >50% coarse fraction passes No.4 sieve	SW	Well-graded sands; gravelly sands with little or no fines
		SP	Poorly-graded sands; gravelly sands with little or no fines
		SM	Silty sands; poorly-graded sand/gravel/silt mixtures
		SC	Clayey sands; poorly-graded sand/gravel/clay mixtures
Fine Grained Soils >50% passes No.200 sieve	Silts & Clays LL < 50	ML	Inorganic silts; sandy, gravelly or clayey silts
		CL	Lean clays; inorganic, gravelly, sandy, or silty, low to medium-plasticity clays
		OL	Organic, low-plasticity clays and silts
	Silts & Clays LL > 50	MH	Inorganic, elastic silts; sandy, gravelly or clayey elastic silts
		CH	Fat clays; high-plasticity, inorganic clays
		OH	Organic, medium to high-plasticity clays and silts
Highly Organic Soils		PT	Peat, humus, hydric soils with high organic content

GEOTECHNICAL INVESTIGATION TEST PIT LOGS

Test Pit Log #: TP-1 **Date Advanced:** 12 Nov 2015 **Logged by:** Monica Saculles, P.E.

Excavated by: Client Supplied Backhoe

Location: See Site Map Plates

Latitude: 43.66249

Longitude: -116.18907

Depth to Water Table: Not Encountered

Total Depth: 4.8 Feet bgs

Depth (Feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (Feet bgs)	Qp	Lab Test ID
0.0-1.6	Silty Sand (SM): <i>Dark brown, slightly moist, medium dense, with fine to coarse-grained sand.</i> --Organic material to a depth of 1 foot bgs.				
1.6-4.8	Sandy Silt (ML): <i>Light brown to brown, dry, stiff to hard, with fine-grained sand.</i>			1.5-4.5+	

Test Pit Log #: TP-2 **Date Advanced:** 12 Nov 2015 **Logged by:** Monica Saculles, P.E.

Excavated by: Client Supplied Backhoe

Location: See Site Map Plates

Latitude: 43.66203

Longitude: -116.18827

Depth to Water Table: Not Encountered

Total Depth: 8.0 Feet bgs

Depth (Feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (Feet bgs)	Qp	Lab Test ID
0.0-1.7	Silty Sand (SM): <i>Dark brown, slightly moist, medium dense, with fine to medium-grained sand.</i> --Organic material to a depth of 1.0 foot bgs.				
1.7-8.0	Sandy Silt (ML): <i>Tan, dry, medium stiff to stiff, with fine-grained sand.</i> --Sand content increases with depth. --Weak to moderate induration present below 4.0 feet bgs.			1.0-4.0	

GEOTECHNICAL INVESTIGATION TEST PIT LOGS

Test Pit Log #: TP-3 **Date Advanced:** 12 Nov 2015 **Logged by:** Monica Saculles, P.E.

Excavated by: Client Supplied Backhoe

Location: See Site Map Plates

Latitude: 43.66157

Longitude: -116.18851

Depth to Water Table: Not Encountered

Total Depth: 9.8 Feet bgs

Depth (Feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (Feet bgs)	Qp	Lab Test ID
0.0-0.8	Silty Sand (SM): <i>Dark brown, slightly moist, medium dense, with fine to medium-grained sand.</i> --Organic material throughout.				
0.8-7.6	Sandy Silt (ML): <i>Tan, dry, hard, with fine-grained sand and occasional coarse-grained sand.</i> --Weak induration present throughout.			4.5+	
7.6-9.8	Poorly Graded Sand with Silt (SP-SM): <i>Tan to yellow-brown, dry, medium dense to dense, with medium to coarse-grained sand.</i> --Weak induration present below 9.0 feet bgs.				

Test Pit Log #: TP-4 **Date Advanced:** 12 Nov 2015 **Logged by:** Monica Saculles, P.E.

Excavated by: Client Supplied Backhoe

Location: See Site Map Plates

Latitude: 43.66210

Longitude: -116.18945

Depth to Water Table: Not Encountered

Total Depth: 4.9 Feet bgs

Depth (Feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (Feet bgs)	Qp	Lab Test ID
0.0-4.9	Silty Sand (SM): <i>Dark brown to brown, slightly moist, medium dense, with fine to coarse-grained sand.</i> --Organic material to a depth of 0.4 foot bgs.	GS	4.0-4.5		A

Lab Test ID	M	LL	PI	Sieve Analysis (% passing)				
-	%	-	-	#4	#10	#40	#100	#200
A	3.7	NP	NP	100	95	51	23	12.3

GEOTECHNICAL INVESTIGATION TEST PIT LOGS

Test Pit Log #: TP-5 **Date Advanced:** 12 Nov 2015 **Logged by:** Monica Saculles, P.E.

Excavated by: Client Supplied Backhoe

Location: See Site Map Plates

Latitude: 43.66138

Longitude: -116.18915

Depth to Water Table: Not Encountered

Total Depth: 4.8 Feet bgs

Depth (Feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (Feet bgs)	Qp	Lab Test ID
0.0-1.0	Silty Sand (SM): <i>Dark brown, slightly moist, medium dense, with fine to medium-grained sand.</i> --Organic material to a depth of 0.4 foot bgs.	Bulk	0.5-1.0		B R-value
1.0-4.8	Sandy Silt (ML): <i>Brown, dry to slightly moist, stiff to very stiff, with fine-grained sand.</i> --Intermittent weak induration throughout.			1.5-3.0	

Lab Test ID	M	LL	PI	Sieve Analysis (% passing)				
-	%	-	-	#4	#10	#40	#100	#200
A	3.8	NP	NP	100	97	68	48	32.5

Test Pit Log #: TP-6 **Date Advanced:** 12 Nov 2015 **Logged by:** Monica Saculles, P.E.

Excavated by: Client Supplied Backhoe

Location: See Site Map Plates

Latitude: 43.66101

Longitude: -116.18946

Depth to Water Table: Not Encountered

Total Depth: 9.1 Feet bgs

Depth (Feet bgs)	Field Description and USCS Soil and Sediment Classification	Sample Type	Sample Depth (Feet bgs)	Qp	Lab Test ID
0.0-3.0	Silty Sand (SM): <i>Dark brown to brown, slightly moist, medium dense, with fine to coarse-grained sand.</i> --Organic material to a depth of 0.7 foot bgs.				
3.0-8.2	Sandy Silt (ML): <i>Brown, slightly moist, stiff to very stiff, with fine-grained sand.</i> --Sand content increases with depth.				
8.2-9.1	Poorly Graded Sand with Silt (SP-SM): <i>Yellow-brown, slightly moist, medium dense to dense, with fine to medium-grained sand.</i> --Intermittent weak induration throughout.				

GRAVEL EQUIVALENT METHOD – PAVEMENT THICKNESS DESIGN PROCEDURES

Pavement Section Design Location: Hackberry North Subdivision, Truck Access

Average Daily Traffic Count: 250 All Lanes & Both Directions
Design Life: 20 Years
Traffic Index: 6.00

Climate Factor: 1 **R-Value of Subgrade:** 25.00
Subgrade CBR Value: 10 **Subgrade Mr:** 15,000

R-Value of Aggregate Base: 80
R-Value of Granular Borrow: 60
Subgrade R-Value: 25
Expansion Pressure of Subgrade: 0.00
Unit Weight of Base Materials: 130

Total Design Life 18 kip ESAL's: 33,131

ASPHALTIC CONCRETE:

Gravel Equivalent, Calculated: 0.384
Thickness: 0.1969231

Use = 2.5 Inches

Gravel Equivalent, ACTUAL: 0.41

CRUSHED AGGREGATE BASE:

Gravel Equivalent (Ballast): 0.768
Thickness: 0.329

Use = 4 Inches

Gravel Equivalent, ACTUAL: 0.773

GRANULAR BORROW:

Gravel Equivalent (Ballast): 1.440
Thickness: 0.667

Use = 8 Inches

Gravel Equivalent, ACTUAL: 1.440

TOTAL Thickness: 1.208
Thickness Required by Exp. Pressure: 0.000

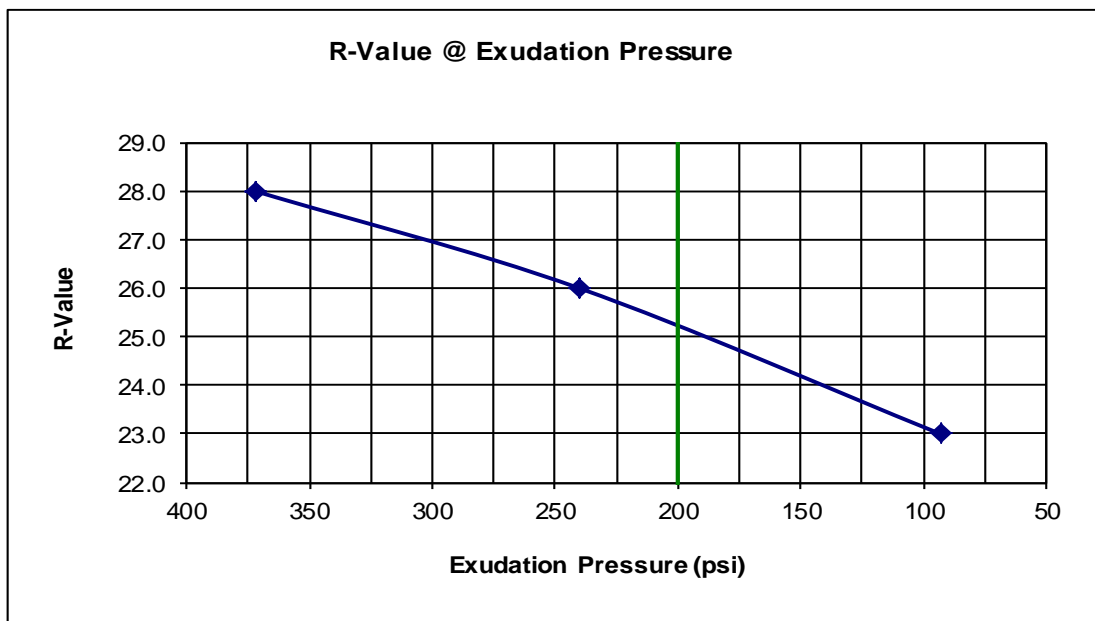
	Design Depth Inches	ACHD Substitution Ratios
Asphaltic Concrete (at least 2.5):	2.50	1.95
Asphalt Treated Base (at least 4.2):	0.00	
Cement Treated Base (at least 4.2):	0.00	
Untreated Aggregate Base (at least 4.2):	4.00	1.10
Granular Borrow (at least 4.2):	8.00	1.00

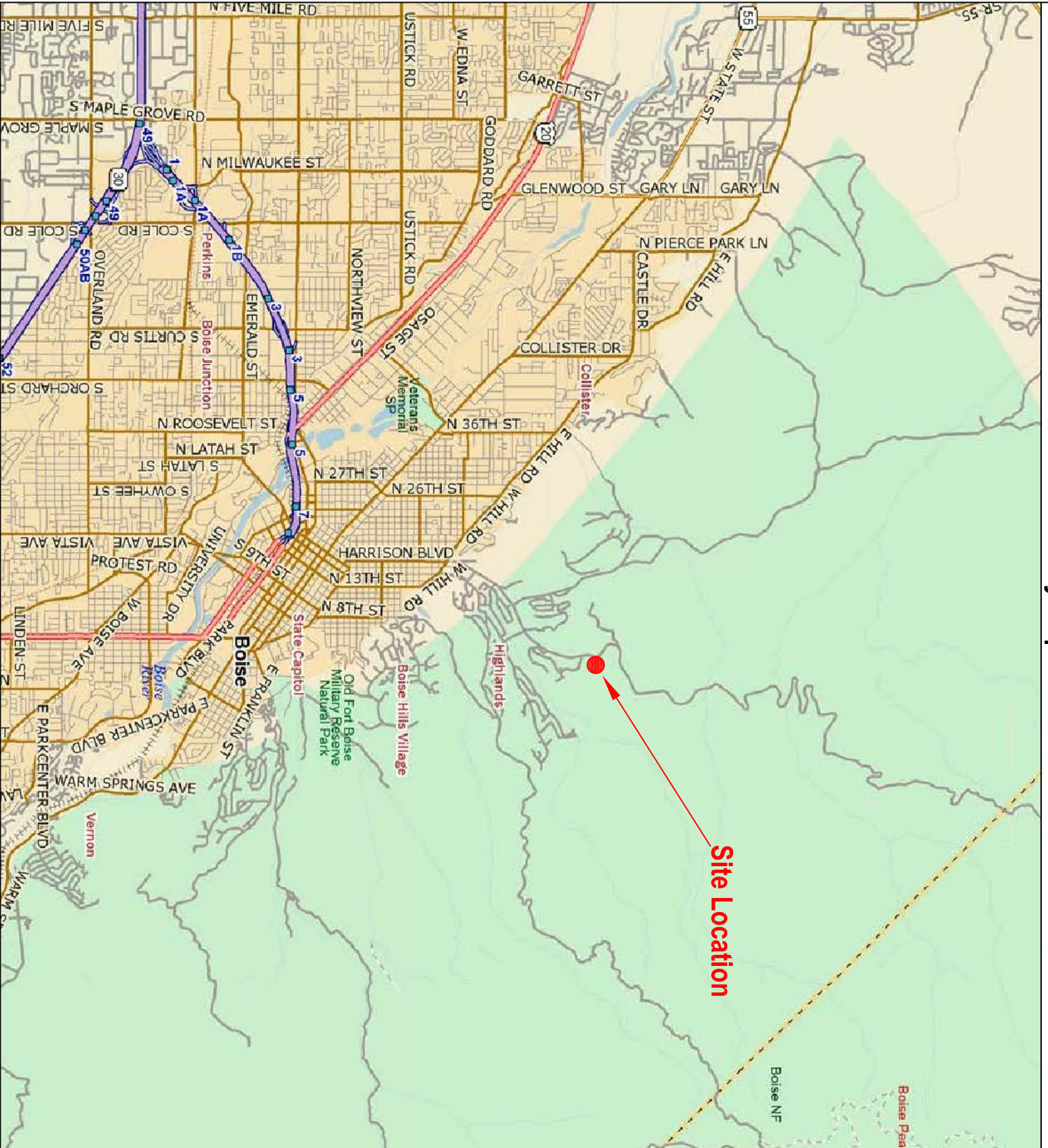
R-VALUE LABORATORY TEST DATA

Source and Description:	TP-5, 0.5' - 1.0' – Silty Sand							
Date Obtained:	November 12, 2015							
Sample ID:	15-7689							
Sampling and Preparation:	ASTM D75:		AASHTO T2:	X	ASTM D421:		AASHTO T87:	X
Test Standard:	ASTM D2844:		AASHTO T190:		Idaho T8:	X		

Sample	A	B	C
Dry Density (lb/ft ³)	94.7	92.1	89.8
Moisture Content (%)	15.2	17.0	18.5
Expansion Pressure (psi)	0.06	0.00	0.00
Exudation Pressure (psi)	372	240	93
R-Value	28	26	23

R-Value @ 200 psi Exudation Pressure = 25





- MAP NOTES:**
- Delorme Street Atlas
 - Not to Scale

- LEGEND**
- Approximate Site Location

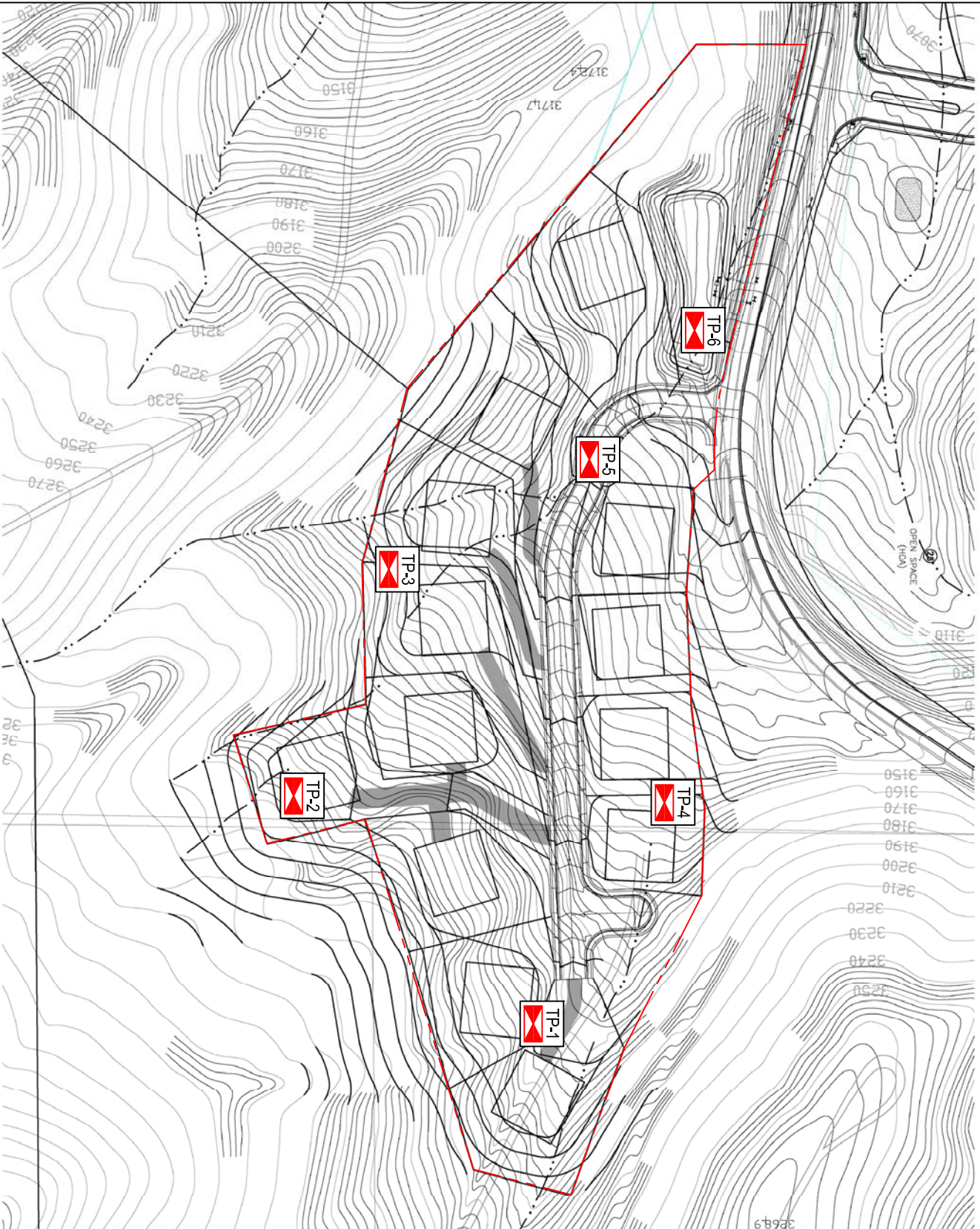


Hackberry North Subdivision
Bogus Basin Road
Boise, ID

Modified from Delorme by: MHS
24 November 2015
Drawing: B151231g



2791 S. Victory View Way
Boise, ID 83709-2835
Phone: 208 376-4748
Fax: 208 322-6515
E-mail: mti@mthd.com



NOTES:

- Not to Scale

LEGEND

- Approximate Site Boundary
- Approximate MTI Test Pit Location



Hackberry North Subdivision
 Bogus Basin Road
 Boise, ID

Modified by: MHS
 24 November 2015
 Drawing: B151231g



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 Boise, ID 83709-2835
 Phone: 208 376-4748
 Fax: 208 322-6515
 E-mail: mt@mti-hd.com



Planning & Development Services

Boise City Hall, 2nd Floor
150 N. Capitol Boulevard
P. O. Box 500
Boise, Idaho 83701-0500

Phone: 208/384-3830
Fax: 208/384-3753
TDD/TTY: 800/377-3529
Website: www.cityofboise.org/pds

Affidavit of Legal Interest

State of Idaho)
) ss
County of Ada)

I, HACKBERRY NORTH CORP
Name

PO BOX 1436
Address

BOISE
City

IDAHO
State

being first duly sworn upon oath, depose and say:

(If Applicant is also Owner of Record, skip to B)

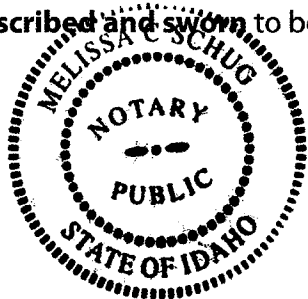
A. That I am the record owner of the property described on the attached, and I grant my permission to DAVID POWELL 2447. S. VISTA AVE, BOISE, ID.
Name Address
to submit the accompanying application pertaining to that property.

B. I agree to indemnify, defend and hold Boise City and its employees harmless from any claim or liability resulting from any dispute as to the statements contained herein or as to the ownership of the property which is the subject of the application.

Dated this 25 day of APRIL, 2016

[Signature] PRESIDENT
Signature

Subscribed and sworn to before me the day and year first above written.



[Signature]
Notary Public for Idaho

Residing at: Boise ID

My commission expires: Feb 17, 2021



April 25, 2016

RE: Hackberry North Subdivision
Landscape Planning

Planner:

The developer for the Hackberry North Development intends at this time to utilize drought resistant native vegetation on all open areas of the site, including the entry area. Please consider this the current status of Landscaping on the project. Therefore, there are no Landscape plans to go along with this application.

All irrigation and landscaping of the individual lots will take place at time of home construction. Please see the uploaded revegetation plan and the uploaded revegetation specification for more detail.

Sincerely,

A handwritten signature in black ink that reads "David G. Powell". The signature is written in a cursive style with a long, sweeping tail that extends to the right.

David G. Powell, P.E.
Project Engineer

**SECTION 02931
REVEGETATION**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. **Work included:** This specification shall govern the work associated with the revegetation of all areas identified on the plan, disturbed by the Contractor. Revegetation shall include application of prescribed native seed, fertilizer, mulch, and installation of wattles, or fascines.
- B. **Related work described elsewhere:**
1. Section 01340 - Submittals, Shop Drawing and Samples.
 2. Section 01500 - Temporary Facilities and Controls.
 3. Section 01567 - Soil Erosion and Siltation Control.

1.2 SUBMITTALS

- A. **Seed and Fertilizer:** The Contractor shall submit the seed and fertilizer mix proposed for use on the project for acceptance prior to ordering and application by the Contractor.
- B. **Mulch:** Suppliers of wood, or paper fiber mulch shall certify that laboratory and field testing of their product has been accomplished and that it meets the material requirements contained herein. Test results shall be made available to the Engineer upon written request.
- C. **Wattles and/or Fascines:** The Contractor shall submit shop drawings of the proposed wattles and/or fascines to be placed on designated slopes for acceptance prior to ordering and placement by the Contractor.
- D. **Reference:** All submittals and samples shall comply with the requirements set forth in Section 01340 in addition to the requirement stated in this section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. **Native and Drought Tolerant Seed: shall consist of a mixture of the following:**

Nordan Crested Wheatgrass	8 lbs/ac.	20%
Rush Intermediate Wheatgrass	8 lbs/ac.	20%
Siberian Wheatgrass P-27	4 lbs/ac.	10%

Hard Fescue	8 lbs/ac.	20%
Sheep Fescue	8 lbs/ac.	20%
Sherman Big Bluegrass	3 lbs/ac.	8%
Big Sagebrush	0.4 lbs/ac.	1%
Rubber Rabbitbrush	0.4 lbs/ac.	1%
Wild Flower Seed	0.4 lbs/ac.	1%

Total 40 lbs. PLS/ac.

PLS= Pure Live Seed

- B. **Wood Fiber Mulch:** The wood fiber mulch shall be mixed into the seed slurry to achieve a minimum application rate of 30 bails per acre. This rate may require an increase on steeper slopes. The mulch shall be treated with a dye to facilitate the monitoring of application coverage on the slopes.
- C. **Soil Amendments/Fertilizer:** Soil amendment/fertilizer shall be a 5-2-4 analysis and organically derived to promote microbial activity in sterile soils (such as that sold under the trade name Sustane). The rate of application shall be 1750 lbs. Per acre.
- D. **Wattles/Fascines:** Contractor shall prepare and place wattles and/or fascines in the locations direction of the Engineer. Wattles and/or fascines shall be prepared and placed in accordance with Engineer’s direction.
- E. **Tackifier:** The tackifier shall be composed of a copolymer acrylimide dry formulation (Evertac, or approved equal) that will allow for improved adhesion of seed to slopes without adversely affecting water penetration into the soils. The rate of mixture shall be 4 ounces of dry formulation per 100 gallons of slurry mix.

PART 3 - EXECUTION

3.1 PREPARATION

- A. **General:** In all disturbed areas, topsoil is to be salvaged and replaced per Section 02920 - Topsoil. Prior to any revegetation activity, the soil shall be prepared in accordance to Section 02920.

3.2 APPLICATION

- A. **Hydroseeding:** All revegetation for this project shall be accomplished using hydroseed technology. The hydro-seed mixture shall be used on a per acre basis and be in conformance with manufacturer’s literature: Contractor shall prepare a submittal in conformance with Section 01340 which completely explains the preparation process, including itemizing the hydroseed mixing process and quantifying each component of the mixture, including seeds, fertilizers, tackifier, mulch, water, etc... No application shall take place until this submittal has been made to the Landscape Architect and approval is given.

Application rate and appearance will be verified by the landscape architect at the time of application. Contractor shall give 48-hour notice to the landscape architect prior to ordering materials to allow inspection of the entire hydro-seed mixing and application process. Failure to notify the landscape architect and have him present throughout this process will result in non-compliance of the seeding application.

- B. Seeding Time and Watering: Seeding shall be accomplished as soon as slopes can be prepared, following site grading and topsoil placement. This application period should be prior to mid-November in order for optimum germination for seedling survival. Application of the seeding after mid October may require supplemental watering of areas identified by the landscape architect, if unseasonal hot and dry weather dry out the hydro-seed mixture.

PART 4 - MEASUREMENT AND PAYMENT

4.1 SEED APPLICATION

Payment shall be per acre seeded per the appropriate Bid item and is to include all work related to preparation and seed application. The Contractor shall supply the landscape architect with all weight and mixture tickets for seeding materials used.

4.2 LIMITATIONS

The Contractor will not be paid for revegetation of disturbed areas which resulted from the Contractor's carelessness or negligence in performing the Work.



T-O ENGINEERS

PROJECT: 140138
DATE: November 18, 2014
PAGE: 1 of 3

EXHIBIT "A"
LAND DESCRIPTION OF
THE HIGHLANDS, INC., PARCEL "A"

A parcel of land situated in the South1/2 of the SW1/4 of Section 23 and the North1/2 of the NW1/4 of Section 26, Township 4 North, Range 2 East, Boise Meridian, Ada County, Idaho, more particularly described as follows:

COMMENCING at the SW corner of said Section 23, from which the South1/4 corner of said Section 23 bears S.89°24'14"E., 2660.62; thence, along said south line of the SW1/4,

A) S.89°24'14" E., 606.02 feet to the centerline of North Bogus Basin Road and the **POINT OF BEGINNING**; thence, along said centerline the following courses:

- 1) N.56°20'16"W., 126.24 feet to the beginning of a tangent curve; thence,
- 2) Northerly along said curve to the right having a radius of 415.00 feet, an arc length of 1076.18 feet, through a central angle of 148°34'47", and a chord bearing and distance of N.17°57'08"E., 798.99 feet; thence, tangent from said curve,
- 3) S.87°45'29"E., 438.50 feet to the beginning of a tangent curve; thence,
- 4) Southwesterly along said curve to the left having a radius of 450.00 feet, an arc length of 305.19 feet, through a central angle of 38°51'30", and a chord bearing and distance of N.72°48'39"E., 299.38 feet; thence, tangent from said curve,
- 5) N.53°22'42"E., 423.07 feet; thence, leaving said centerline,
- 6) S.36°37'18"E., 66.48 feet; thence,
- 7) S.28°05'57"W., 383.24 feet; thence,
- 8) S.00°27'05"E., 773.49 feet to the south line of said South1/2 of the SW1/4; thence,
- 9) S.00°27'05"E., 132.15 feet; thence,



T-O ENGINEERS

PROJECT: 140138
DATE: November 18, 2014
PAGE: 2 of 3

- 10) S.22°19'23"E., 702.03 feet; thence,
- 11) S.05°04'26"W, 193.71 feet to the northeast corner of Lot 9, Block 5 of The Amended Plat of Highlands Hackberry No. 4, in Book 82 of Plats at Pages 9012-9016, Instrument No. 101087816, Records of Ada County, Idaho; thence, along the exterior boundary line of said Lot 9 the following courses:
 - 12) N.50°15'58"W., 824.29 feet; thence,
 - 13) S.39°54'18"W., 291.60 feet; thence, leaving said boundary line,
 - 14) S.39°54'18"W., 170.18 feet; thence,
 - 15) S.89°53'28"W., 90.18 feet; thence,
 - 16) S.11°56'53"W., 16.70 feet to the beginning of a non-tangent curve; thence,
 - 17) Southerly along said curve to the left having a radius of 317.00 feet, an arc length of 83.70 feet, through a central angle of 15°07'45", and a chord bearing and distance of S.04°23'01"W., 83.46 feet; thence, tangent from said curve,
 - 18) S.03°10'51"E., 98.50 feet to the beginning of a tangent curve; thence,
 - 19) Southerly along said curve to the left having a radius of 967.00 feet, an arc length of 118.24 feet, through a central angle of 07°00'20", and a chord bearing and distance of S.06°41'02"E., 118.16 feet; thence, non-tangent from said curve,
 - 20) S.79°48'47"W., 33.00 feet to the beginning of a non-tangent curve, coincident with the centerline of Bogus Basin Road; thence, along said centerline the following courses:
 - 21) Northerly along said curve to the right having a radius of 1000.00 feet, an arc length of 122.27 feet, through a central angle of 07°00'20", and a chord bearing and distance of N.06°41'02"W., 122.20 feet; thence, tangent from said curve,
 - 22) N.03°10'51"W., 98.50 feet; thence,



T-O ENGINEERS

PROJECT: 140138
DATE: November 18, 2014
PAGE: 3 of 3

- 23) Northerly along said curve to the right having a radius of 350.00 feet, an arc length of 92.42 feet, through a central angle of $15^{\circ}07'45''$, and a chord bearing and distance of $N.04^{\circ}23'01''E.$, 92.15 feet; thence, tangent from said curve,
- 24) $N.11^{\circ}56'53''E.$, 355.31 feet to the beginning of a tangent curve; thence,
- 25) Northerly along said curve to the left having a radius of 330.00 feet, an arc length of 393.30 feet, through a central angle of $68^{\circ}17'09''$, and a chord bearing and distance of $N.22^{\circ}11'41''W.$, 370.43 feet; thence, tangent from said curve,
- 26) $N.56^{\circ}20'16''W.$, 238.24 feet to the **POINT OF BEGINNING**.

CONTAINING 40.32 acres, more or less.

SUBJECT TO all Covenants, Rights, Rights-of-Way and Easements of Record.

RECORD OF SURVEY No. 9966 Instrument No. 2014-094490 on file with the Ada County Recorder, and by this reference, made a part hereof.





T-O ENGINEERS

PROJECT: 140138
DATE: October 23, 2014
PAGE: 1 of 3

**EXHIBIT “A”
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T-O ENGINEERS

PROJECT: 140138
DATE: October 23, 2014
PAGE: 2 of 3

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T-O ENGINEERS

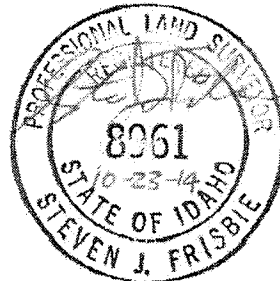
PROJECT: 140138
DATE: October 23, 2014
PAGE: 3 of 3

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CONTAINING 40.32 acres, more or less.

SUBJECT TO all Covenants, Rights, Rights-of-Way and Easements of Record.

RECORD OF SURVEY No. _____, Instrument No. _____ on file with the Ada County Recorder, and by this reference, made a part hereof.




Merchantable Title Agreement

AS OF September 10, 2015, it is mutually understood and agreed by THE HIGHLANDS, INC. ("Seller") and HACKBERRY NORTH CORPORATION ("Buyer"), referred to together as the "Parties" that:

- A. The attached Preliminary Title Report constitutes all known liens and encumbrances on the 40.23 acre parcel referenced in #1 of the September 10, 2015 Real Estate Agreement (the "Agreement") between the Parties.
- B. Should any defect of title emerge, during the term of the Agreement, which would make the title un-merchantable, Seller agrees to take all necessary measures to resolve the defect in favor of the Parties.

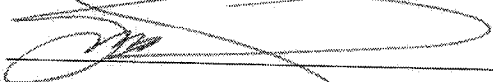
In witness whereof, the Parties have set their hands the date and year first mentioned above:

THE HIGHLANDS, INC.



Diane Bagley, President

HACKBERRY NORTH CORPORATION



Scott G. Kimball, President

March 9, 2016

Dear Resident,

Boise City Code requires an opportunity for a meeting between the applicant of a development proposal and the residents of the neighborhood in which the development site is located. The meeting shall occur prior to formal submittal of the development application to the City. This letter is such notice of an opportunity to review and discuss the proposed 15-lot single family subdivision, located on 40 acres of foothills property along the east side of North Bogus Basin Road and adjacent to the Highlands Hackberry development. This is not a public hearing; public officials will not be present. If you have any questions regarding this Boise City Code neighborhood meeting requirement, please contact the Planning Division of the Planning & Development Services Department at 384-3830. If you have questions about the development project, please contact the development representative listed below.

Purpose

To review and provide comments regarding the proposed Hackberry North Subdivision.

When

Thursday, March 17th at 7:00 pm

Where

All Saints Presbyterian Church, 3600 N. Bogus Basin Road at the intersection of Curling Drive and Bogus Basin Road.

Project Description

The project consists of a proposed 15-lot single family residential development on a 40-acre parcel of foothills land along the east side of N. Bogus Basin Road. Application is being made for a preliminary plat. Applications required with this submittal include:

1. Planned Unit Development Application
2. Hillside and Foothills Development Application
3. Preliminary Plat Application

Attached is a site plan of the development area that shows the location of the proposed 15 single family lots.

If you have questions about the meeting or proposed development project, please contact:

David Powell, P.E.
RiveRidge Engineering,
2447 S. Vista Avenue
Boise, Idaho 83705
(208) 344-1180





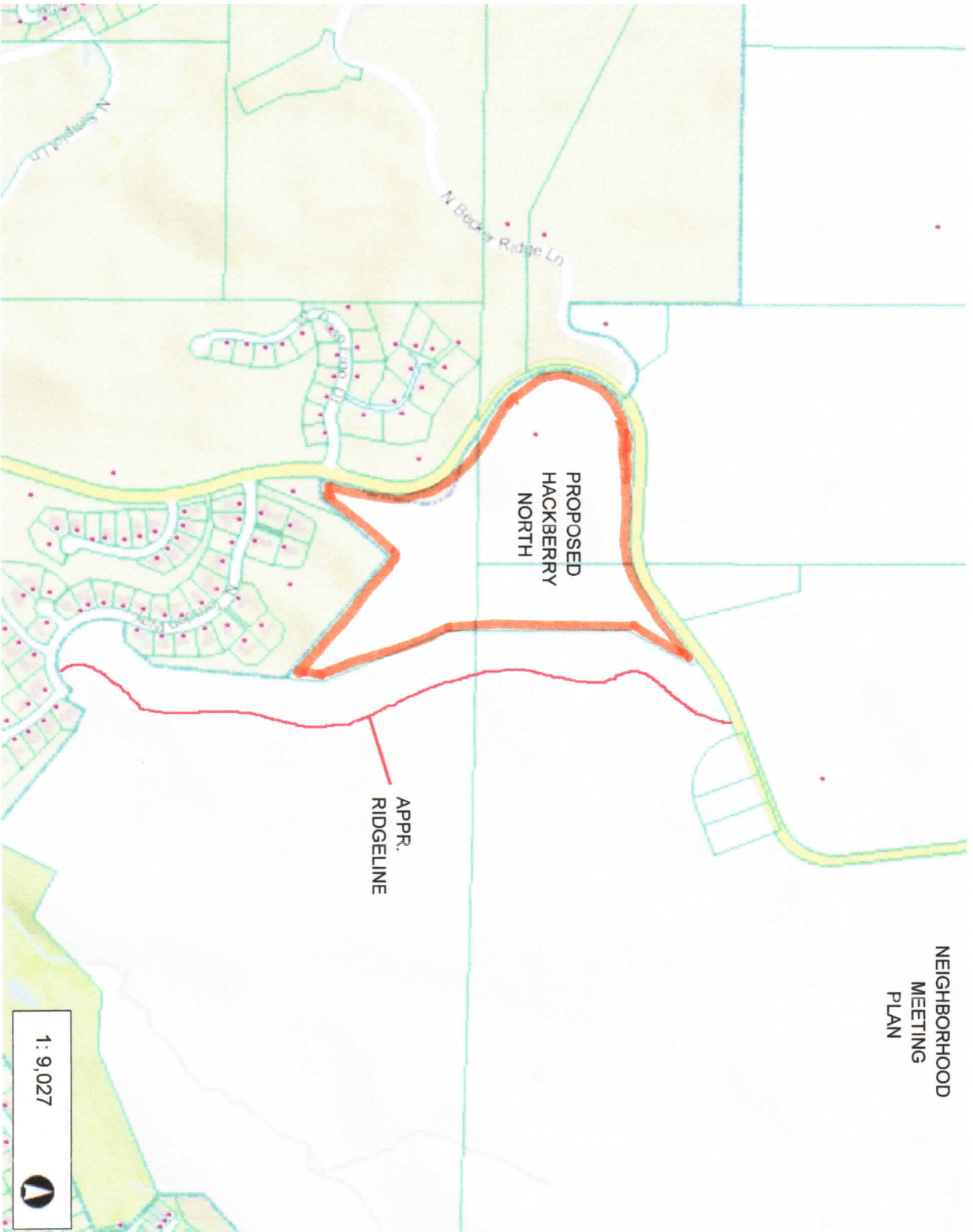
BoiseMaps

NEIGHBORHOOD
MEETING
PLAN

PROPOSED
HACKBERRY
NORTH

N Becker Ridge Ln

APPR.
RIDGELINE



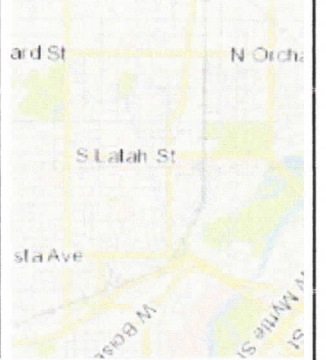
NAD_1983_Transverse_Mercator
Date Generated: 3/9/2016 12:02:31 PM

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This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION



- Legend**
- Addresses
 - Preliminary Lots
 - Parcels

Notes

S1/18

CENTERLINE PER ROS 4022

ADA COUNTY APPROVED PERMIT

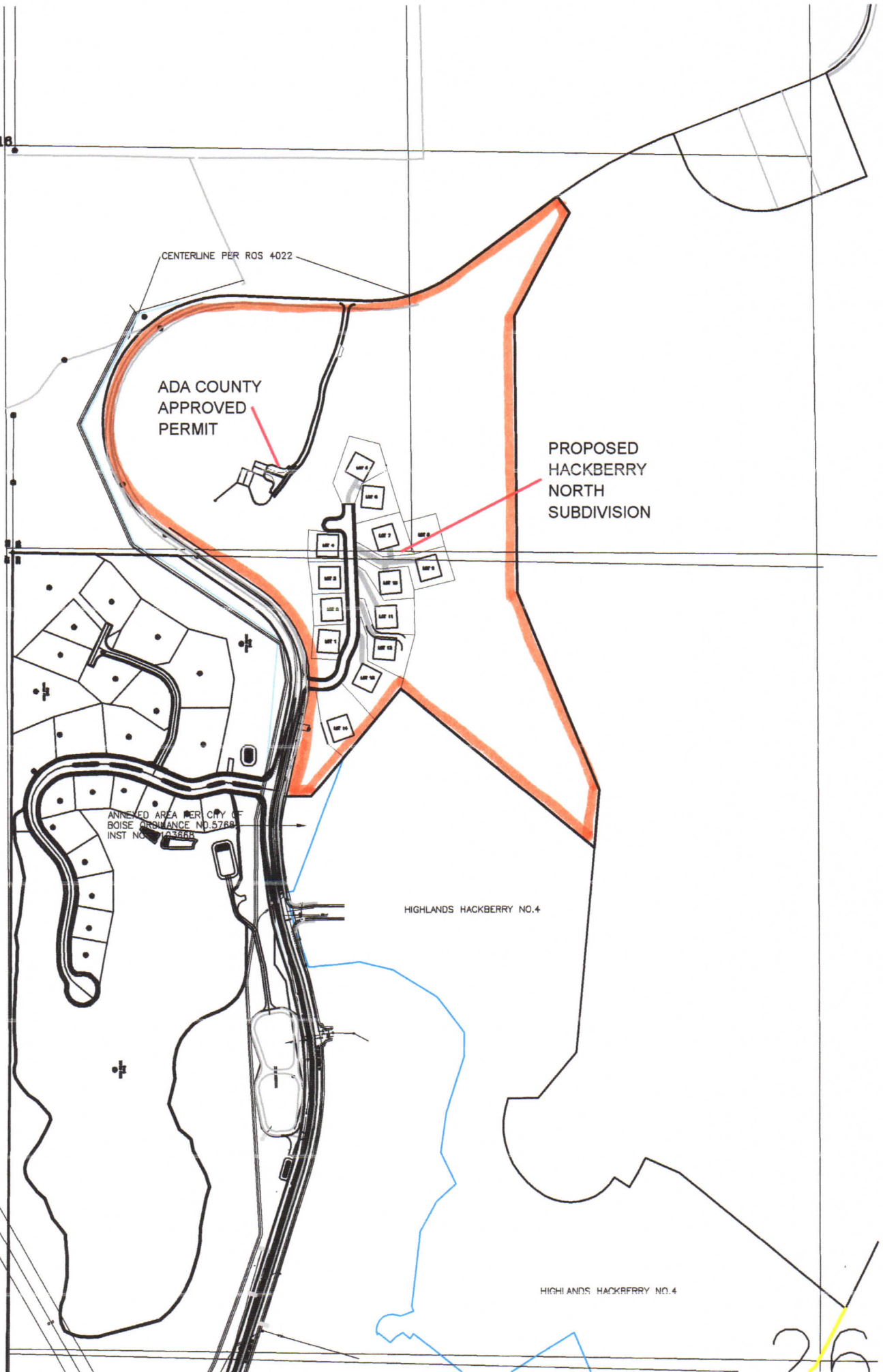
PROPOSED HACKBERRY NORTH SUBDIVISION

ANNEXED AREA PER CITY OF BOISE ORDINANCE NO. 57889 INST NO. 133848

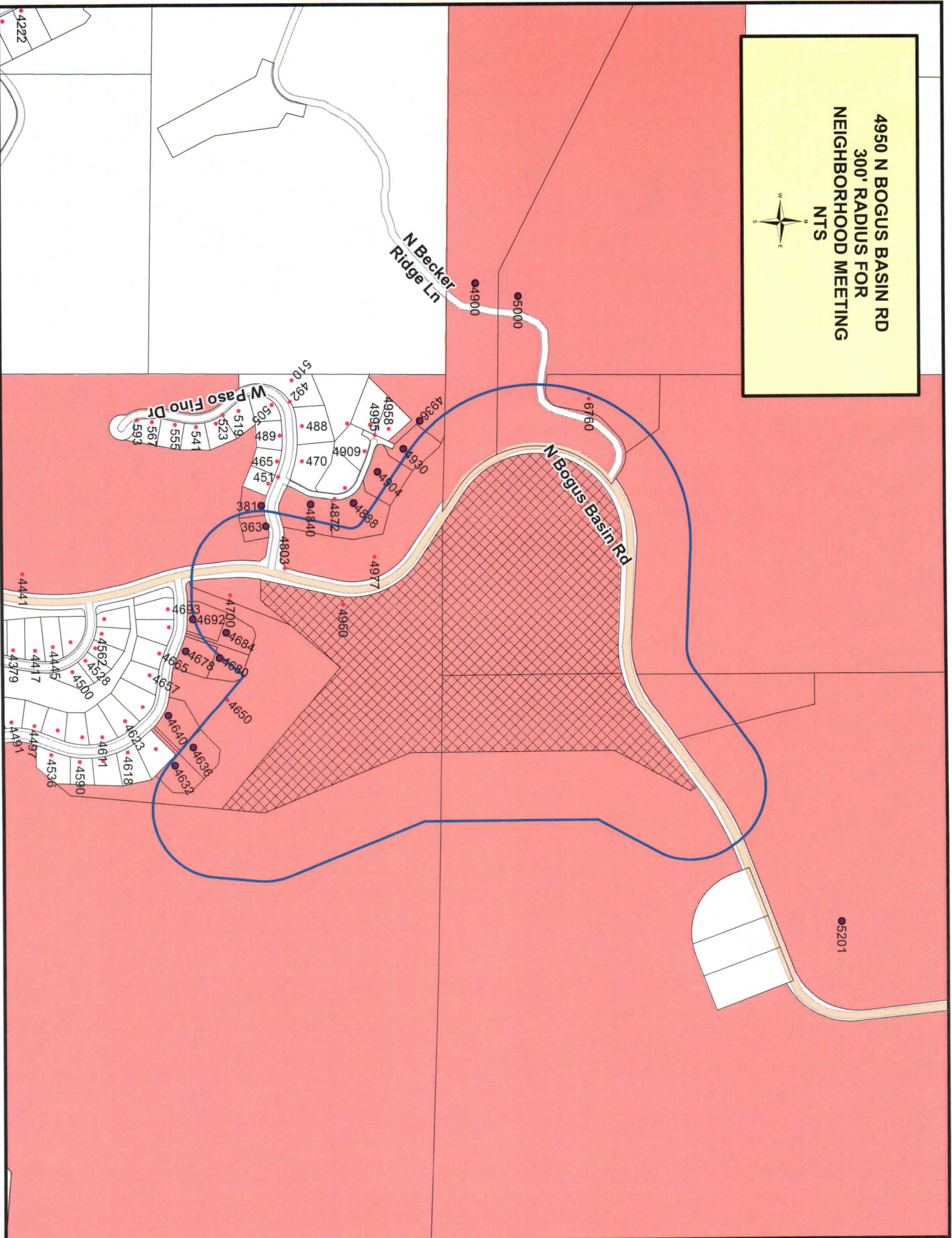
HIGHLANDS HACKBERRY NO. 4

HIGHLANDS HACKBERRY NO. 4

2/16



4950 N BOGUS BASIN RD
300' RADIUS FOR
NEIGHBORHOOD MEETING
NTS



4950 N BOGUS BASIN RD
ADDRESS LIST
24 RECORDS-03/08/16

R3369360240
BUCHER MATTHEW BOONE
BUCHER CURRIE JOHNSON
4930 N MOUNTAIN SIDE LN
BOISE ID 83702-5081

CENTRAL FOOTHILLS N.A.
JOANIE FAUCI
2944 W HILLWAY DR
BOISE ID 83702-0942

R3616460470
CHRISTENSON ADAM
CHRISTENSON COURTNEY
4678 N TORRIDON WAY
BOISE ID 83702-1672

S0623314900
CITRONE MICHAEL & MADELENE FAMILY TRUST
CITRONE MICHAEL J TRUSTEE
11845 W TIDEWATER DR
BOISE ID 83713-6639

R3616460430
FERGUSON RICHARD D
FRARY MEGAN
4632 N TORRIDON WAY
BOISE ID 83702-1672

S0623335550
GIBSON CHARLES L
5125 N BOGUS BASIN RD
BOISE ID 83702-1548

R3369360040
GWIN JOHN CHRISTOPHE
381 W PASO FINO DR
BOISE ID 83702-5144

R3369360280
HACKBERRY RANCH CORPORATION
PO BOX 1436
BOISE ID 83701-1436

R3616460490
HAIR MARK
HAIR BARBARA
4684 N TORRIDON WAY
BOISE ID 83702-1672

R3616460460
HIGHLANDS HACKBERRY NO 4 HOMEOWNERS ASSO
137 W THORNBERRY CT
BOISE ID 83702-1665

HIGHLANDS N.A.
PHIL MASSER
901 E CHARDIE RD
BOISE ID 83702-1813

S0626213050
HIGHLANDS THE INC
7225 W BETHEL ST
BOISE ID 83704-9226

S0623336100
HILVERS ROBERT
9260 W BEACHSIDE LN
BOISE ID 83714-6712

S0623315000
JONES CHARLEY
JONES NANCY
5201 N BOGUS BASIN RD
BOISE ID 83702-1548

R3369360220
JONES DEAN P
CUSACK JENNIFER L
745 REVERE RD
GLEN ELLYN IL 60137-5515

S0622438600
KIMBALL CHILDREN'S IRREVOCABLE TRUST
GREGG ELIZABETH KIMBALL TRUSTEE
489 W PASO FINO DR
BOISE ID 83702-5142

R3616460500
MALVICK JUSTIN D
MALVICK KIMBERLY J
4692 N TORRIDON WAY
BOISE ID 83702-1672

R3616460480
NYGARD DEAN J
HAMLIN SUSAN A
4680 N TORRIDON WAY
BOISE ID 83702-1672

S0622438500
PADDOCK INVESTMENT PROPERTIES LLC
12641 N HUMPHREYS WAY
BOISE ID 83714-9307

R3616460440
ROSS MICHAEL C
ROSS CLARE P
4636 N TORRIDON WAY
BOISE ID 83702-1672

R3369360260
STUART JAMES A
STUART KIMBERLY D
4888 N MOUNTAIN SIDE LN
BOISE ID 83702-5139

R3616460450
SWEAT BENJAMIN J
SWEAT JUDITH A
4640 N TORRIDON WAY
BOISE ID 83702-1672

R3369360250
WALI DAVID S
WALI KATHY K
1317 S ARCADIA ST
BOISE ID 83705-6050

R3369360030
WR GANN CO LLC
PO BOX 7461
BOISE ID 83707-1461



RIVER RIDGE ENGINEERING COMPANY
 2447 S. Vista Ave. - Boise, Idaho 83705
 208/344-1180 - FAX 208/344-1182

NEIGHBORHOOD MEETING ATTENDEES

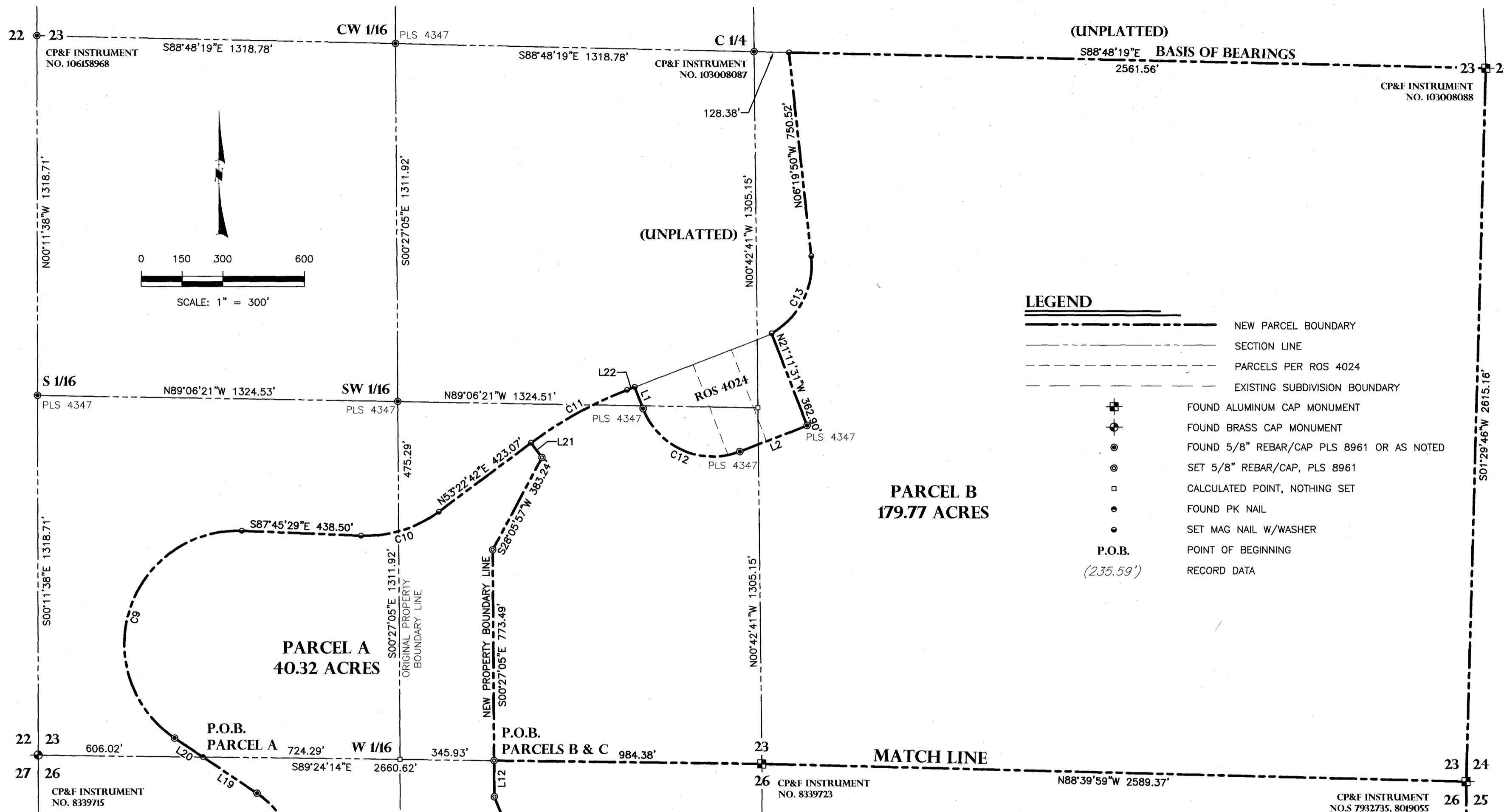
Project: Hackberry Ranch - July 26, 2012 - 6:00 PM

Name/Company	Address	Phone	Fax	E-mail
SCOTT KIMBALL	PO Box 1436 Boise ID	870-0025		BULLBASK555@CUMMINS.COM
NICK SCHUITEMAKER	1313 N EASTMAN ST BOISE, ID	465-7975		nischuitemaker@gmail.com
JUDY RICHARDSON	852 E. HIGHLAND VIEW DR	(904) 254-6033		elghundi@cubeone.net
BILL RICHMAN	" "	" "		" "
Mark Hair	4684 N. Torrison Way	208 629 4233		mhair@compagnywebshots.com
M. Wins	PO Box 9165 Boise			
Janette Ehrlichman	4497 N Torrison Way	37-654-1568		ajeidabo@gmail.com
Dean Nygaard	4680 N. Torrison Way	343-5011		dcan.nygaard@yahoo.com
Maddy Citrone	11845 W Boise Tidewater, Boise	890-8536		MCITRONE@COX.NET

205 9966

RECORD OF SURVEY

A PROPERTY BOUNDARY ADJUSTMENT SURVEY FOR THE HIGHLANDS, INC.
LOCATED IN THE S1/2 OF SECTION 23 AND THE N1/2 OF SECTION 26, TOWNSHIP 4 NORTH, RANGE 2 EAST,
BOISE MERIDIAN, ADA COUNTY, IDAHO
2014



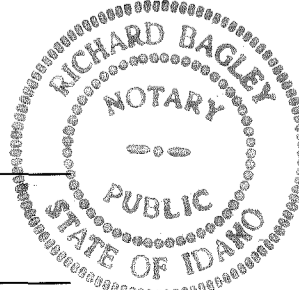
ACKNOWLEDGMENT

STATE OF IDAHO } S.S.
 COUNTY OF ADA }
 ON THIS 20th DAY OF November, 2014, BEFORE ME, THE UNDERSIGNED,
 A NOTARY PUBLIC IN AND FOR SAID STATE, PERSONALLY APPEARED DIANE M.
 BAGLEY, KNOWN OR IDENTIFIED TO ME TO BE THE PRESIDENT OF THE
 HIGHLANDS, INC, WHO EXECUTED THE INSTRUMENT OR THE PERSON WHO
 EXECUTED THE INSTRUMENT ON BEHALF OF SAID CORPORATION, AND
 ACKNOWLEDGED TO ME THAT SAID CORPORATION EXECUTED THE SAME.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND AFFIXED MY
 OFFICIAL SEAL THE DAY AND YEAR IN THIS CERTIFICATE FIRST ABOVE WRITTEN

MY COMMISSION EXPIRES 7/26/20

Richard Bagley
 NOTARY PUBLIC FOR THE STATE OF IDAHO



CERTIFICATE OF OWNER'S

KNOWN BY ALL MEN THESE PRESENTS, THAT THE UNDERSIGNED OWNER OF THE
 PARCELS SHOWN ON THIS SURVEY AS PARCELS A, B, AND C, ADA COUNTY, IDAHO,
 HEREBY AGREES TO THIS PROPERTY BOUNDARY ADJUSTMENT SUBJECT TO THE
 EASEMENTS SHOWN AND ANY OTHERS EXISTING OR OF RECORD.

Diane M. Bagley
 DIANE M. BAGLEY--PRESIDENT, THE HIGHLANDS, INC.

CERTIFICATE OF SURVEYOR

I, STEVEN J. FRISBIE, DO HEREBY CERTIFY THAT I AM A LICENSED PROFESSIONAL
 LAND SURVEYOR IN THE STATE OF IDAHO, AND THAT THIS MAP REPRESENTS AN
 ACTUAL SURVEY MADE ON THE GROUND UNDER MY DIRECT SUPERVISION AND
 COMPLIES WITH ACCEPTED STANDARDS OF SURVEYING. I FURTHER CERTIFY THAT I
 HAVE COMPLIED WITH TITLE 55, CHAPTER 16, IDAHO CODE.



REFERENCES

REFERENCE IS MADE TO THE FOLLOWING :
 -RECORD OF SURVEY NO. 1456
 -RECORD OF SURVEY NO. 4022
 -RECORD OF SURVEY NO. 4023
 -RECORD OF SURVEY NO. 4024
 -RECORD OF SURVEY NO. 6276
 -RECORD OF SURVEY NO. 6486
 -RECORD OF SURVEY NO. 8939
 -AMENDED PLAT OF HIGHLANDS HACKBERRY NO.4
 -CRANE CREEK HOLLOW SUBDIVISION
 -HACKBERRY RANCH SUBDIVISION

RECORDERS CERTIFICATE

STATE OF IDAHO } S.S.
 COUNTY OF ADA }
 FILED FOR RECORD AT THE REQUEST OF THE HIGHLANDS, INC.
 AT 2 MINUTES PAST 4 O'CLOCK P.M. THIS 20 DAY OF
November, 2014.
 CHRISTOPHER D. RICH, ADA-COUNTY RECORDER
 BY [Signature] DEPUTY
 INSTRUMENT NO. 2014-094490



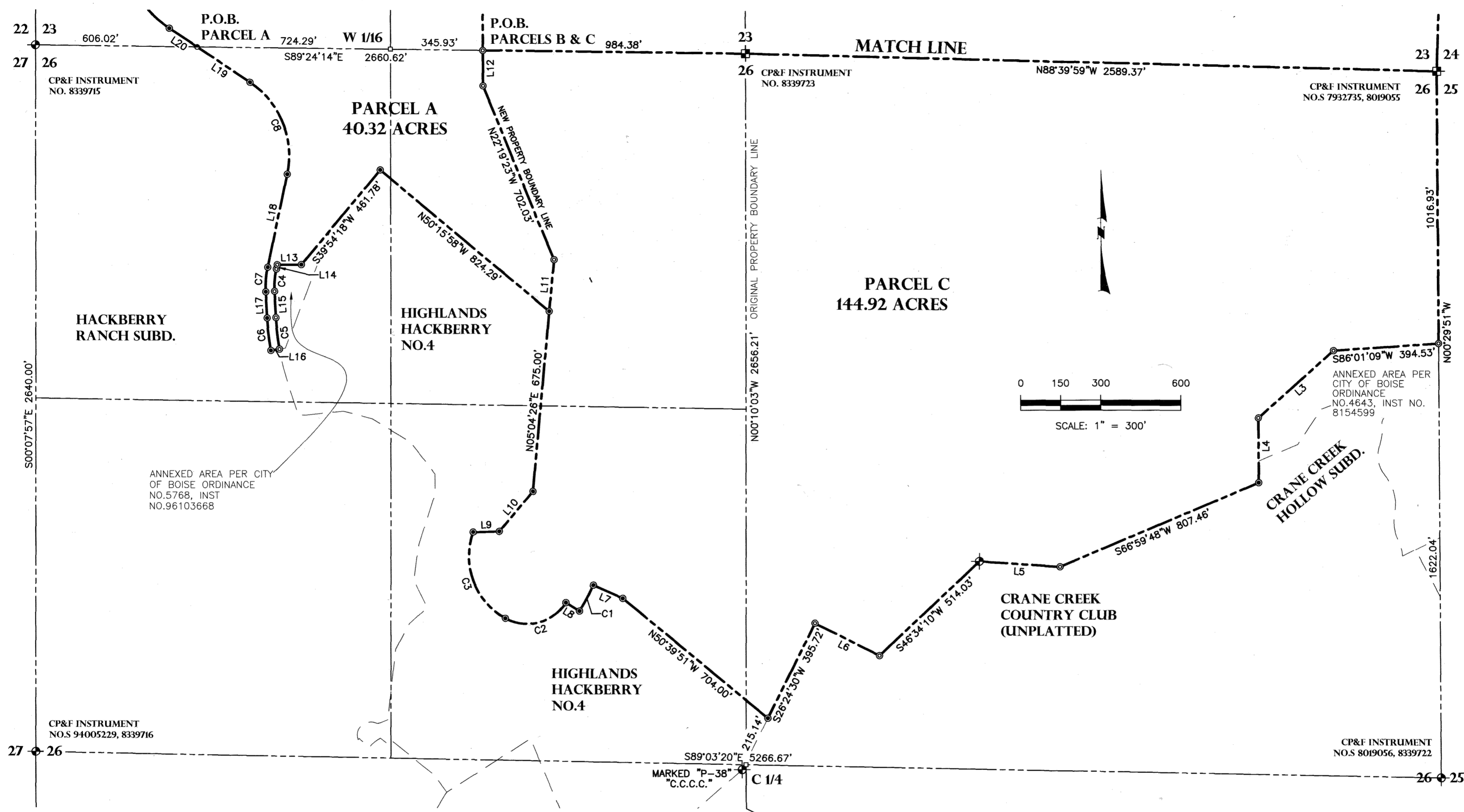
9777 CHINDEN BOULEVARD
 BOISE, IDAHO 83714-2008
 PHONE: (208) 323-2288 FAX: (208) 323-2399

SURVEY INDEX NO. 421-23-02-000
 SURVEY INDEX NO. 421-23-03-000
 SURVEY INDEX NO. 421-26-01-000
 SURVEY INDEX NO. 421-26-04-000

SHEET NO. 1 OF 2

RECORD OF SURVEY

A PROPERTY BOUNDARY ADJUSTMENT SURVEY FOR THE HIGHLANDS, INC.
 LOCATED IN THE S1/2 OF SECTION 23 AND THE N1/2 OF SECTION 26, TOWNSHIP 4 NORTH, RANGE 2 EAST,
 BOISE MERIDIAN, ADA COUNTY, IDAHO
 2014



CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	BEARING	CHORD
C1	110.62'	820.00'	7°43'45"	S27°58'28"W	110.53'
C2	258.00'	170.00'	86°57'16"	S75°18'58"W	233.94'
C3	375.29'	265.00'	81°08'32"	N20°38'08"W	344.71'
C4	83.70'	317.00'	15°07'45"	S4°23'01"W	83.46'
C5	118.24'	967.00'	7°00'20"	S6°41'02"E	118.16'
C6	122.27'	1000.00'	7°00'20"	N6°41'02"W	122.20'
C7	92.42'	350.00'	15°07'45"	N4°23'01"E	92.15'
C8	393.30'	330.00'	68°17'09"	N22°11'41"W	370.43'
C9	1076.18'	415.00'	148°34'47"	N17°57'08"E	798.99'
C10	305.19'	450.00'	38°51'30"	N72°48'39"E	299.38'
C11	403.91'	1500.00'	15°25'41"	N61°05'32"E	402.69'
C12	431.97'	275.00'	90°00'00"	S66°11'30"E	388.91'
C13	336.80'	288.00'	67°00'12"	N27°10'16"E	317.93'

LINE TABLE		
LINE	BEARING	DISTANCE
L1	S21°11'31"E	84.99'
L2	N68°48'29"E	265.00'
L3	S48°01'09"W	377.35'
L4	S0°27'55"E	240.99'
L5	N86°21'28"W	303.09'
L6	N63°36'30"W	269.68'
L7	N65°53'25"W	121.16'
L8	N58°09'41"W	60.00'
L9	N88°26'55"E	97.99'
L10	N39°57'25"E	195.45'
L11	N5°04'26"E	193.71'
L12	S0°27'05"E	132.15'

LINE TABLE		
LINE	BEARING	DISTANCE
L13	S89°53'28"W	90.18'
L14	S11°56'53"W	16.70'
L15	S3°10'51"E	98.50'
L16	S79°48'47"W	33.00'
L17	N3°10'51"W	98.50'
L18	N11°56'53"E	355.31'
L19	N56°20'16"W	238.24'
L20	N56°20'16"W	126.24'
L21	S36°37'18"E	66.48'
L22	N68°48'23"E	30.18'

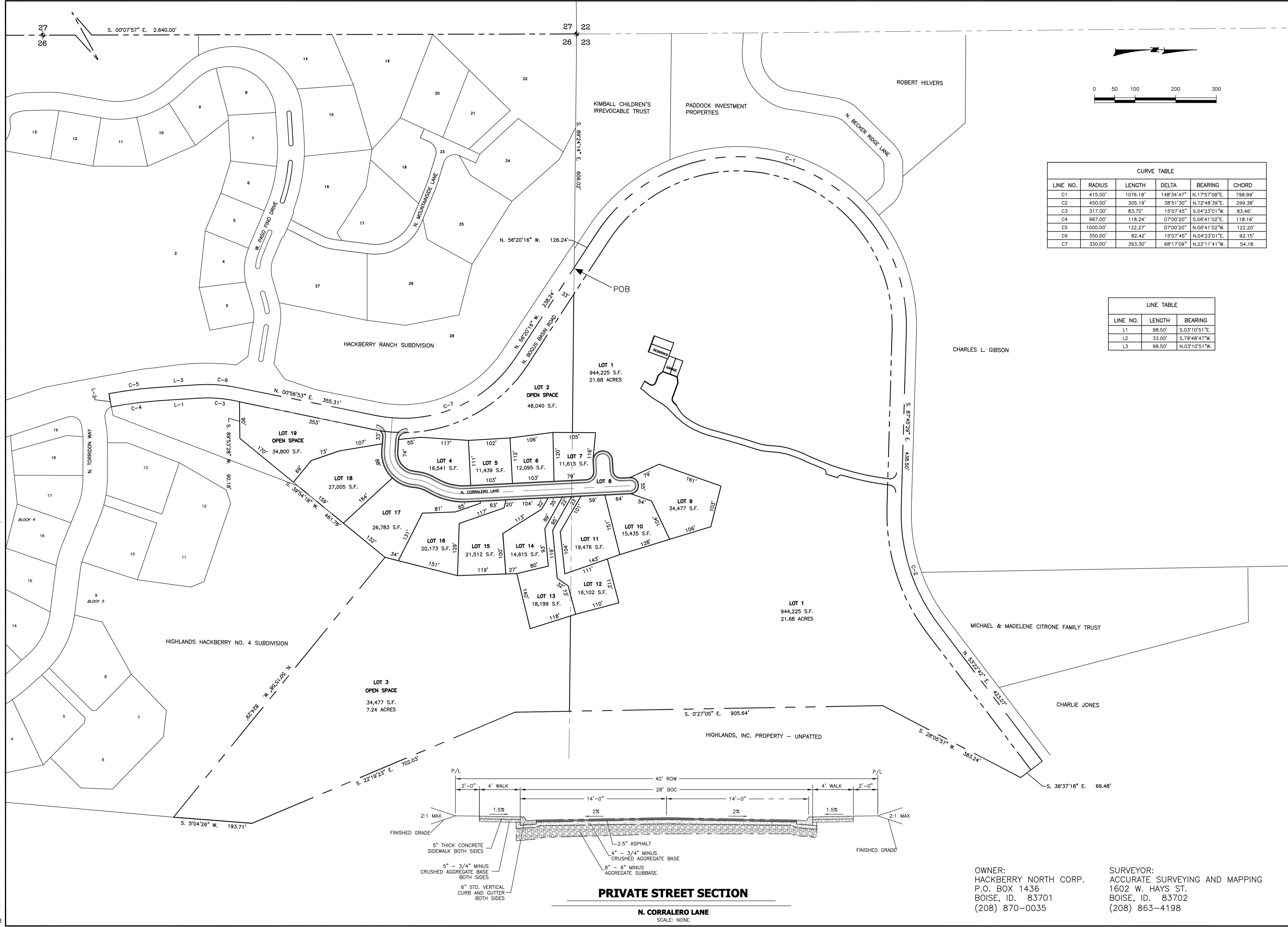
LEGEND

- NEW PARCEL BOUNDARY
- SECTION LINE
- PARCELS PER ROS 4024
- EXISTING SUBDIVISION BOUNDARY
- FOUND ALUMINUM CAP MONUMENT
- FOUND BRASS CAP MONUMENT
- FOUND 5/8" REBAR/CAP PLS 8961 OR AS NOTED
- SET 5/8" REBAR/CAP, PLS 8961
- CALCULATED POINT, NOTHING SET
- FOUND PK NAIL
- SET MAG NAIL W/WASHER
- P.O.B.
- POINT OF BEGINNING
- RECORD DATA



T-O ENGINEERS
 9777 CHINDEN BOULEVARD
 BOISE, IDAHO 83714-2008
 PHONE: (208) 323-2288 FAX: (208) 323-2399

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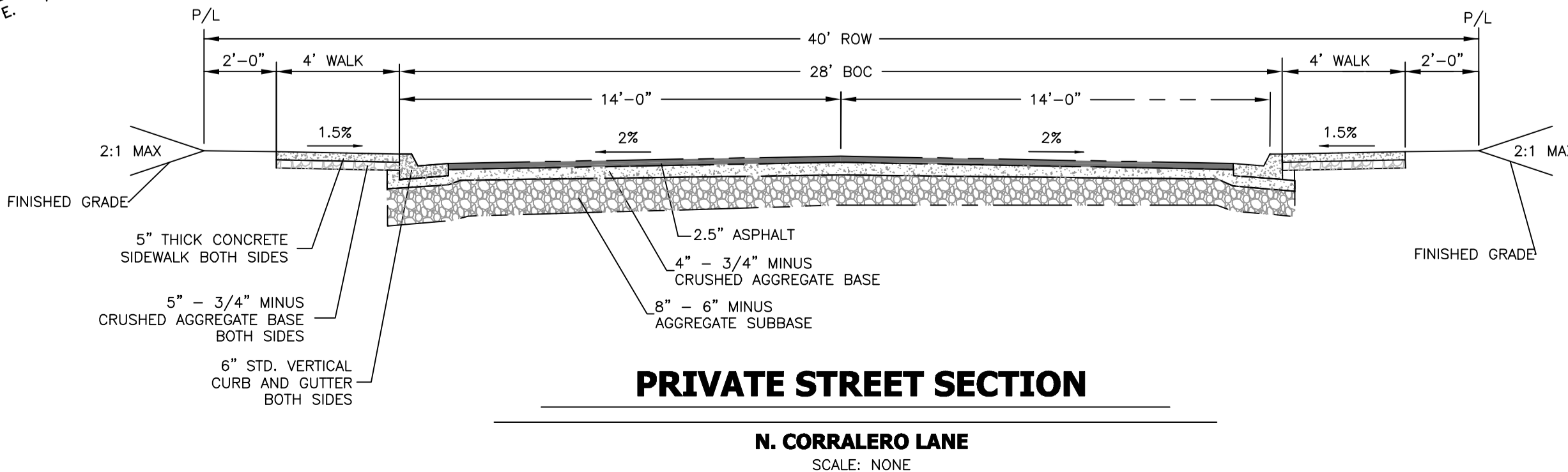


CURVE TABLE

LINE NO.	RADIUS	LENGTH	DELTA	BEARING	CHORD
C1	415.00'	1076.18'	148°34'47"	N.17°57'08"E.	796.99'
C2	450.00'	305.19'	38°51'30"	N.72°48'39"E.	299.38'
C3	317.00'	83.70'	15°07'45"	S.04°23'01"W.	83.46'
C4	967.00'	118.24'	07°00'20"	S.06°41'02"E.	118.16'
C5	1000.00'	122.27'	07°00'20"	N.06°41'02"W.	122.20'
C6	350.00'	82.42'	15°07'45"	N.04°23'01"E.	92.15'
C7	330.00'	393.30'	68°17'09"	N.22°11'41"W.	54.18'

LINE TABLE

LINE NO.	LENGTH	BEARING
L1	98.50'	S.03°10'51"E.
L2	33.00'	S.79°48'47"W.
L3	98.50'	N.03°10'51"W.



OWNER:
HACKBERRY NORTH CORP.
P.O. BOX 1436
BOISE, ID. 83701
(208) 870-0035

SURVEYOR:
ACCURATE SURVEYING AND MAPPING
1602 W. HAYS ST.
BOISE, ID. 83702
(208) 863-4198

R/R

RiveRidge Engineering Company
24447 S. Vista Ave. Boise, Idaho 83705
Ph. (208) 344-1180, Fax (208) 344-1182



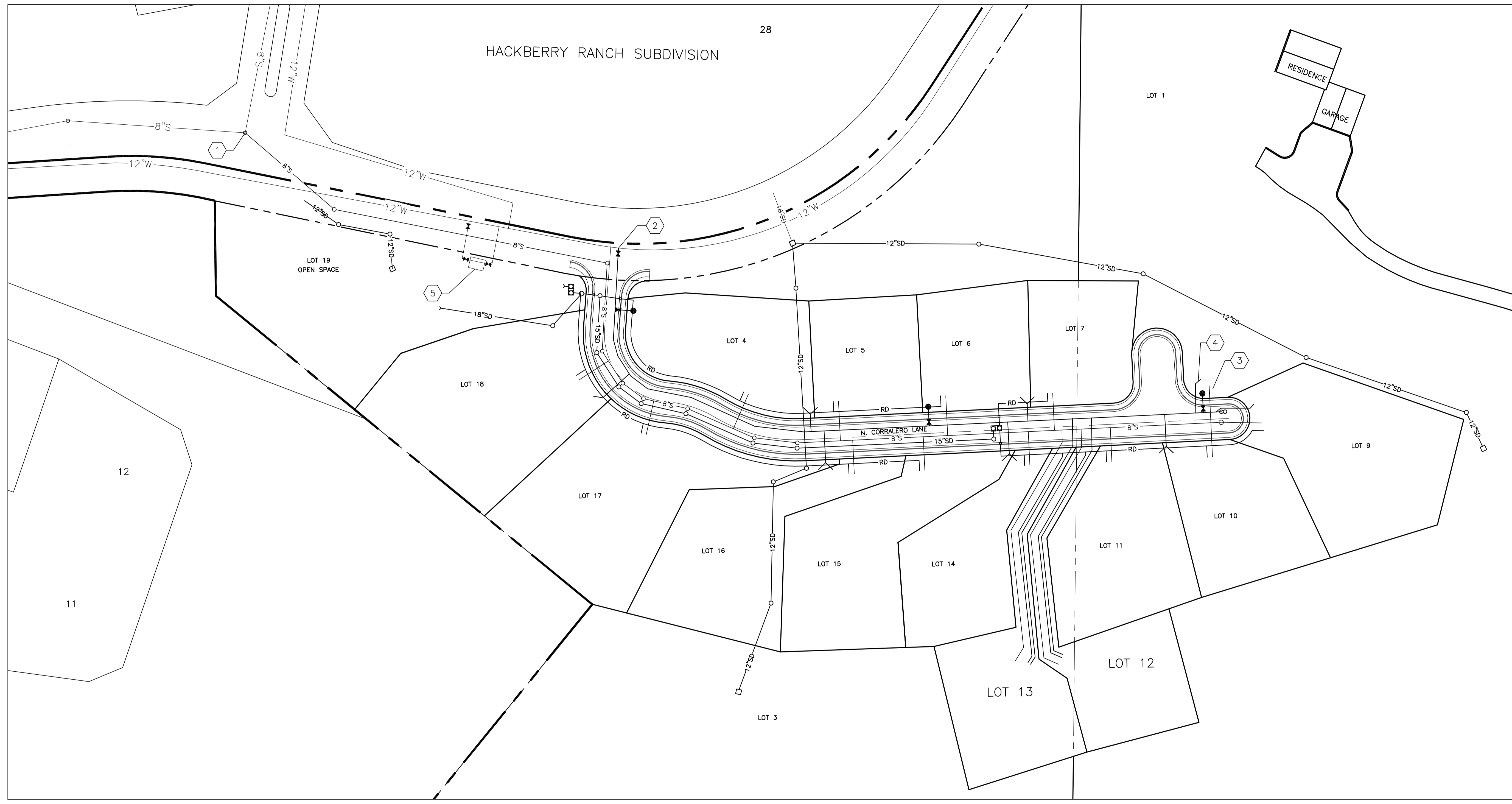
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**HACKBERRY NORTH SUBDIVISION
PRELIMINARY PLAT
SITE LAYOUT PLAN**

NO.	REVISIONS	DATE

DATE: APRIL 22, 2016
PROJECT: 15024
SHEET 1 OF 6

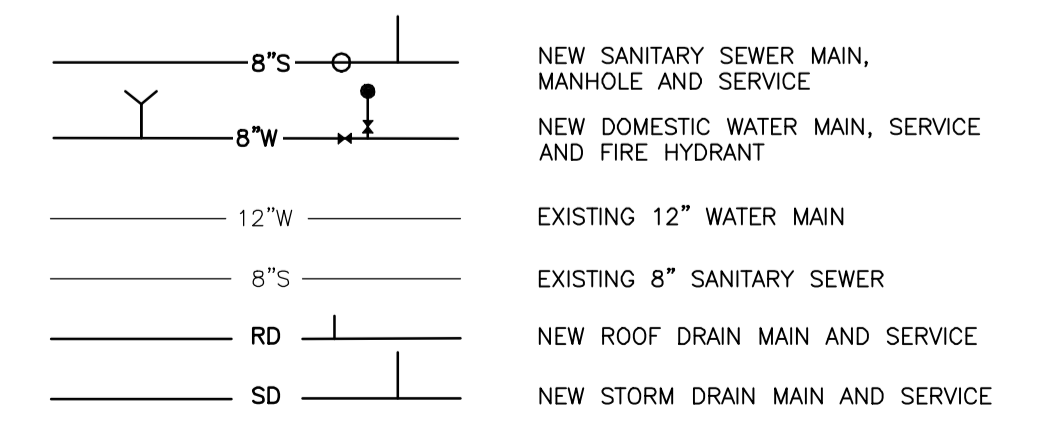
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KEY NOTES

- ① CONNECT NEW SEWER MAIN TO EXISTING SEWER
- ② CONNECT NEW WATER MAIN TO EXISTING WATER MAIN
- ③ LOT 1 SEWER SERVICE
- ④ LOT 1 WATER SERVICE
- ⑤ EXISTING SUEZ PRESSURE REDUCING STATION

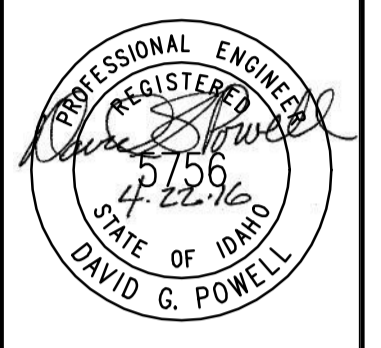
LEGEND



OWNER:
 HACKBERRY NORTH CORP.
 P.O. BOX 1436
 BOISE, ID. 83701
 (208) 870-0035

SURVEYOR:
 ACCURATE SURVEYING AND MAPPING
 1602 W. HAYS ST.
 BOISE, ID. 83702
 (208) 863-4198

R/R
RiveRidge Engineering Company
 2447 S. Vista Ave. Boise, Idaho 83705
 Ph. (208) 344-1180, Fax (208) 344-1182

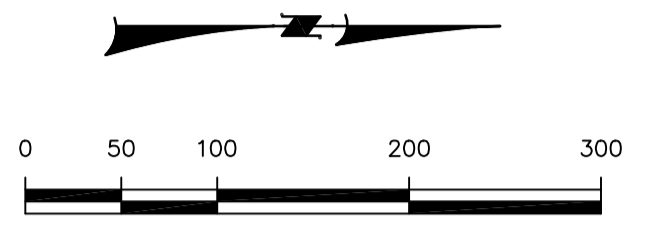
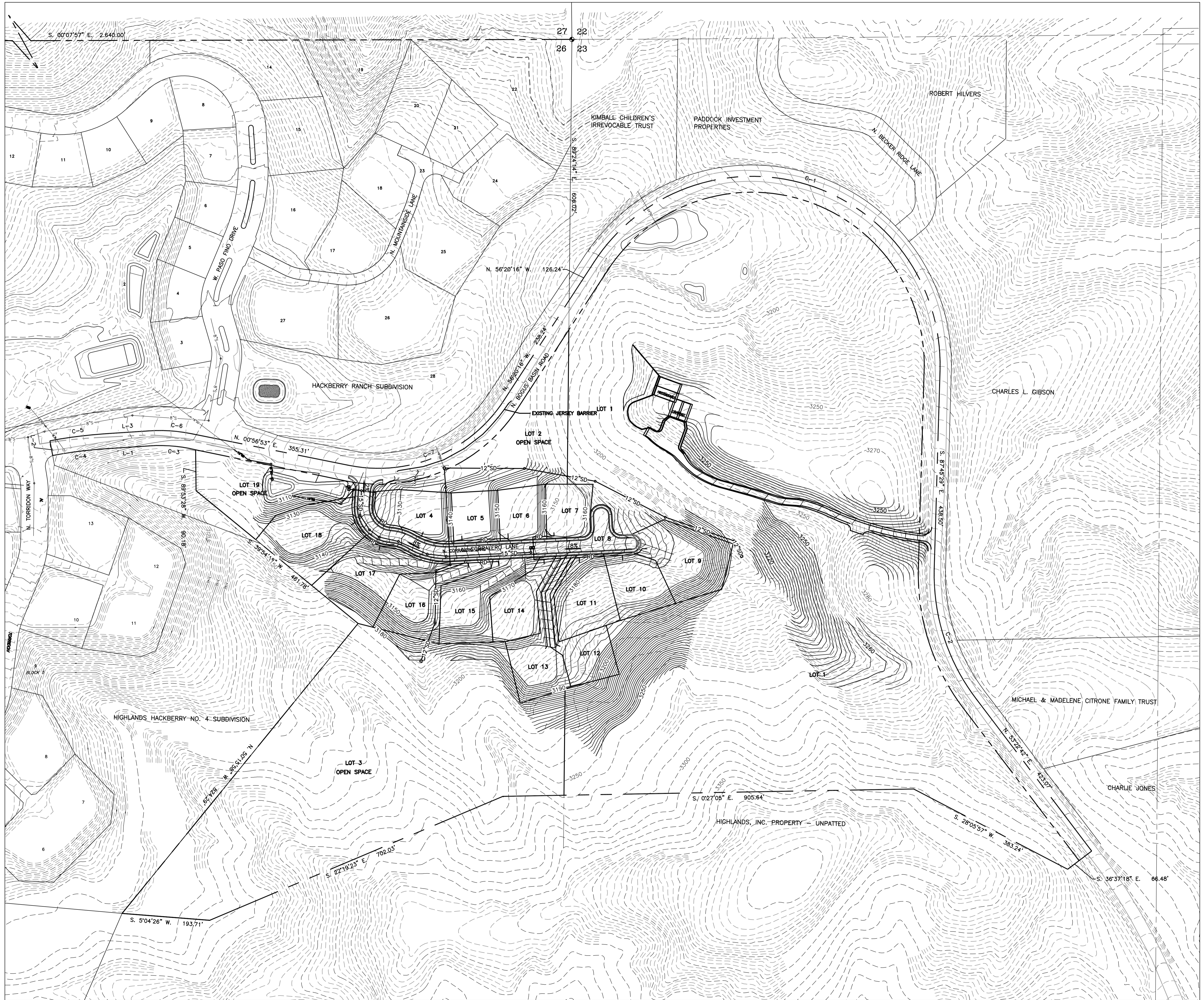


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**HACKBERRY NORTH SUBDIVISION
 PRELIMINARY PLAT
 SITE UTILITY PLAN**

DATE: APRIL 22, 2016
 PROJECT: 15024
SHEET 2 OF 6

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LEGEND

- 3080 EXISTING CONTOURS - 2 FT
- 3080 NEW CONTOURS - 2 FT
- SAND AND GREASE TRAP
- DROP INLET
- 12" SD NEW STORM DRAIN PIPE
- 12" SD EXISTING STORM DRAIN PIPE
- RD NEW ROOF DRAIN PIPE
- 8% FLOW DIRECTION AND GRADE

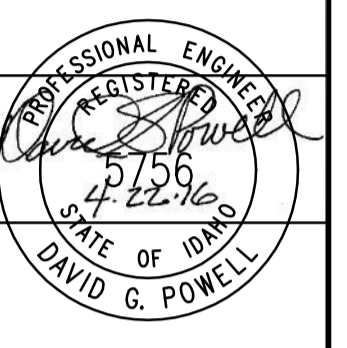
GRADING NOTES

1. ALL PROPOSED BUILDING PADS SHALL BE LOCATED ON EXISTING SLOPED AREAS THAT DO NOT EXCEED 25% SLOPES.
2. ALL AREAS OF THE SITE WITHIN THE LIMITS OF GRADING ARE TO BE STRIPPED OF ALL LARGE BRUSH, TRASH, CONCRETE STRUCTURE, MISCELLANEOUS DEBRIS AND DISPOSED OFFSITE.
3. ALL AREAS OF THE SITE WITHIN THE LIMITS OF GRADING ARE TO HAVE TOPSOIL STRIPPED TO THE DEPTH OF VEGETATION AND STOCKPILED WITHIN THE LIMITS OF GRADING FOR REPLACEMENT UPON COMPLETION OF GRADING.
4. ALL BARBED WIRE FENCING AND FENCE POSTS WITHIN THE LIMITS OF THE PROJECT ARE TO BE REMOVED AND DISPOSED OFFSITE.
5. ALL FILL AREAS ARE TO BE BENCHED PRIOR TO PLACEMENT OF FILL MATERIAL AND COMPACTED TO 95% MAXIMUM DENSITY.
6. ALL CLAY SOILS THAT MAY BE ENCOUNTERED WITH EXCAVATION ARE TO BE PLACED WITHIN THE NON-STRUCTURAL LIMITS OF THE SITE.
7. CONTRACTOR TO PLACE STOCKPILED TOPSOIL ON ALL COMPLETED SLOPES UPON COMPLETION OF MASS GRADING.
8. ALL IMPACTED AREAS WITHIN THE LIMITS OF GRADING SHALL BE STABILIZED EITHER WITH A SOILS TACKLER ON FLAT LOT PADS, OR HYDROSEEDING ON ALL FINISHED SLOPES IN ACCORDANCE WITH THE REVEGETATION PLAN.
9. AT THE TIME OF THIS APPLICATION, THERE ARE NO INTENDED IMPROVEMENTS TO N. BOGUS BASIN ROAD AND JUST NORTH OF THE ENTRANCE 1 PROPOSED TO BE REMOVED AT TIME OF FINAL PROJECT DESIGN WITH ACHD APPROVAL OF SITE GRADING.
10. THE EXISTING JERSEY BARRIER LOCATED ALONG THE EAST SIDE OF BOGUS BASIN ROAD AND JUST NORTH OF THE ENTRANCE 1 PROPOSED TO BE REMOVED AT TIME OF FINAL PROJECT DESIGN WITH ACHD APPROVAL OF SITE GRADING.

DRAINAGE NOTES

1. WHERE POSSIBLE AND AS SHOWN ON THIS PLAN, EXISTING PRE-DEVELOPMENT RUNOFF WILL BE ROUTED AROUND THE NEWLY DEVELOPED LOTS AND DISCHARGED OFF-SITE AS PRE-DEVELOPMENT FLOWS. THESE FLOWS WILL BE LESS THAN THE EXISTING POTENTIAL RUNOFF DUE TO THIS DEVELOPMENT. THE DOWNSTREAM OPEN AREAS ACCOUNT FOR THIS RUNOFF.
2. ALL ONSITE RUNOFF FROM THE IMPROVED LOTS AND ROADWAY WILL BE COLLECTED, TREATED AND WILL DISCHARGE FROM THE SITE AT PRE-DEVELOPMENT DISCHARGE RATES. TO THE EXTENT POSSIBLE, THE MAXIMUM AMOUNT OF SAID RUNOFF WILL BE RETAINED ON SITE AND ALLOWED TO PERCOLATE INTO THE DRAINAGE POND SUBSOILS. THE PROJECT DESIGN STORM WILL BE THE BOISE CITY DESIGNATED 100-YEAR EVENT.
3. ALL DRAINAGE DESIGN ELEMENTS WILL CONFORM TO THE REQUIREMENTS OF THE BOISE CITY DRAINAGE DESIGN MANUAL.
4. THERE ARE NO PUBLIC ROADWAY IMPROVEMENTS ANTICIPATED AT THE TIME OF APPLICATION AND THEREFORE, THERE ARE NO STORM DRAIN FACILITIES THAT REQUIRE ACHD REVIEW AND APPROVAL.

Riveridge Engineering Company
 2447 S. Vista Ave. Boise, Idaho 83705
 Ph. (208) 344-1180, Fax (208) 344-1182

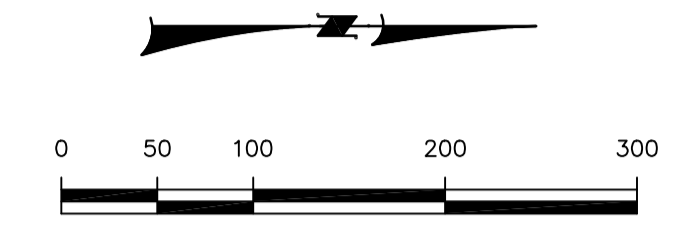
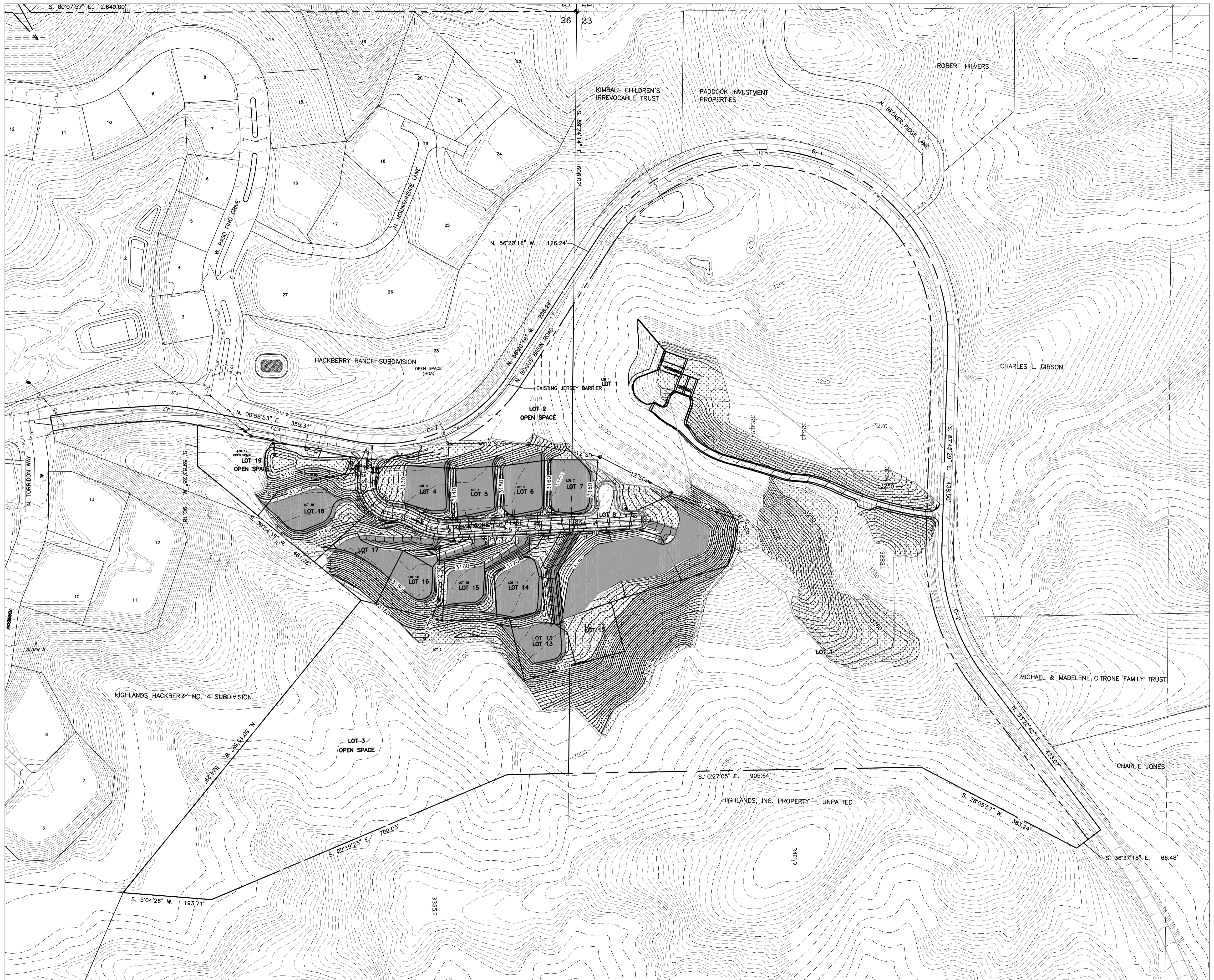


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**HACKBERRY NORTH SUBDIVISION
 PRELIMINARY PLAT
 GRADING AND DRAINAGE PLAN**

DATE:	APRIL 22, 2016
PROJECT:	15024

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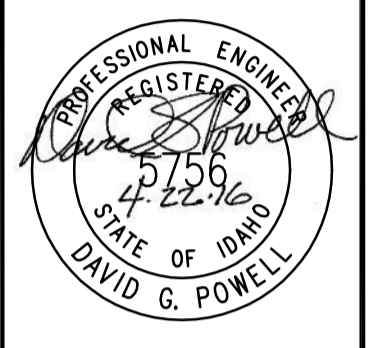


LEGEND

	EXISTING CONTOURS - 2 FT
	NEW CONTOURS - 2 FT
	TACKIFIED ONLY AREAS
	REVEGETATED AREAS

- SITE REVEGETATION NOTES**
1. ALL PROPOSED BUILDING PADS SHALL BE LOCATED ON EXISTING SLOPED AREAS THAT DO NOT EXCEED 25% SLOPES.
 2. ALL AREAS OF THE SITE WITHIN THE LIMITS OF GRADING ARE TO BE STRIPPED OF ALL LARGE BRUSH, TRASH, CONCRETE STRUCTURE, MISCELLANEOUS DEBRIS AND DISPOSED OF OFFSITE.
 3. ALL AREAS OF THE SITE WITHIN THE LIMITS OF GRADING ARE TO HAVE TOPSOIL STRIPPED TO THE DEPTH OF VEGETATION AND STOCKPILED WITHIN THE LIMITS OF GRADING FOR REPLACEMENT UPON COMPLETION OF GRADING.
 4. ALL BARBED WIRE FENCING AND FENCE POSTS WITHIN THE LIMITS OF THE PROJECT ARE TO BE REMOVED AND DISPOSED OF OFFSITE.
 5. ALL FILL AREAS ARE TO BE BENCHED PRIOR TO PLACEMENT OF FILL MATERIAL AND COMPACTED TO 95% MAXIMUM DENSITY.
 6. ALL CLAY SOILS THAT MAY BE ENCOUNTERED WITH EXCAVATION ARE TO BE PLACED WITHIN THE NON-STRUCTURAL LIMITS OF THE SITE.
 7. CONTRACTOR TO PLACE STOCKPILED TOPSOIL ON ALL COMPLETED SLOPES UPON COMPLETION OF MASS GRADING.
 8. ALL IMPACTED AREAS WITHIN THE LIMITS OF GRADING SHALL BE STABILIZED EITHER WITH A SOILS TACKIFIER ON FLAT LOT PADS, OR HYDROSEEDED ON ALL FINISHED SLOPES IN ACCORDANCE WITH THE REVEGETATION PLAN.
 9. AT THE TIME OF THIS APPLICATION, THERE ARE NO INTENDED IMPROVEMENTS TO N. BOGUS BASIN ROAD, EXCEPT AT THE ENTRANCE TO THIS DEVELOPMENT.
 10. THE EXISTING JERSEY BARRIER LOCATED ALONG THE EAST SIDE OF BOGUS BASIN ROAD AND JUST NORTH OF THE ENTRANCE 1 PROPOSED TO BE REMOVED AT TIME OF FINAL PROJECT DESIGN WITH ACHD APPROVAL OF SITE GRADING.

Riveridge Engineering Company
 2447 S. Vista Ave. Boise, Idaho 83705
 Ph. (208) 344-1180, Fax (208) 344-1182

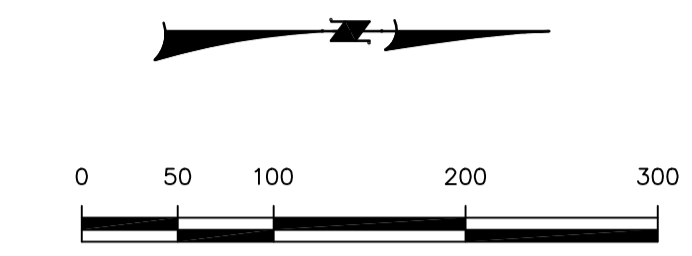
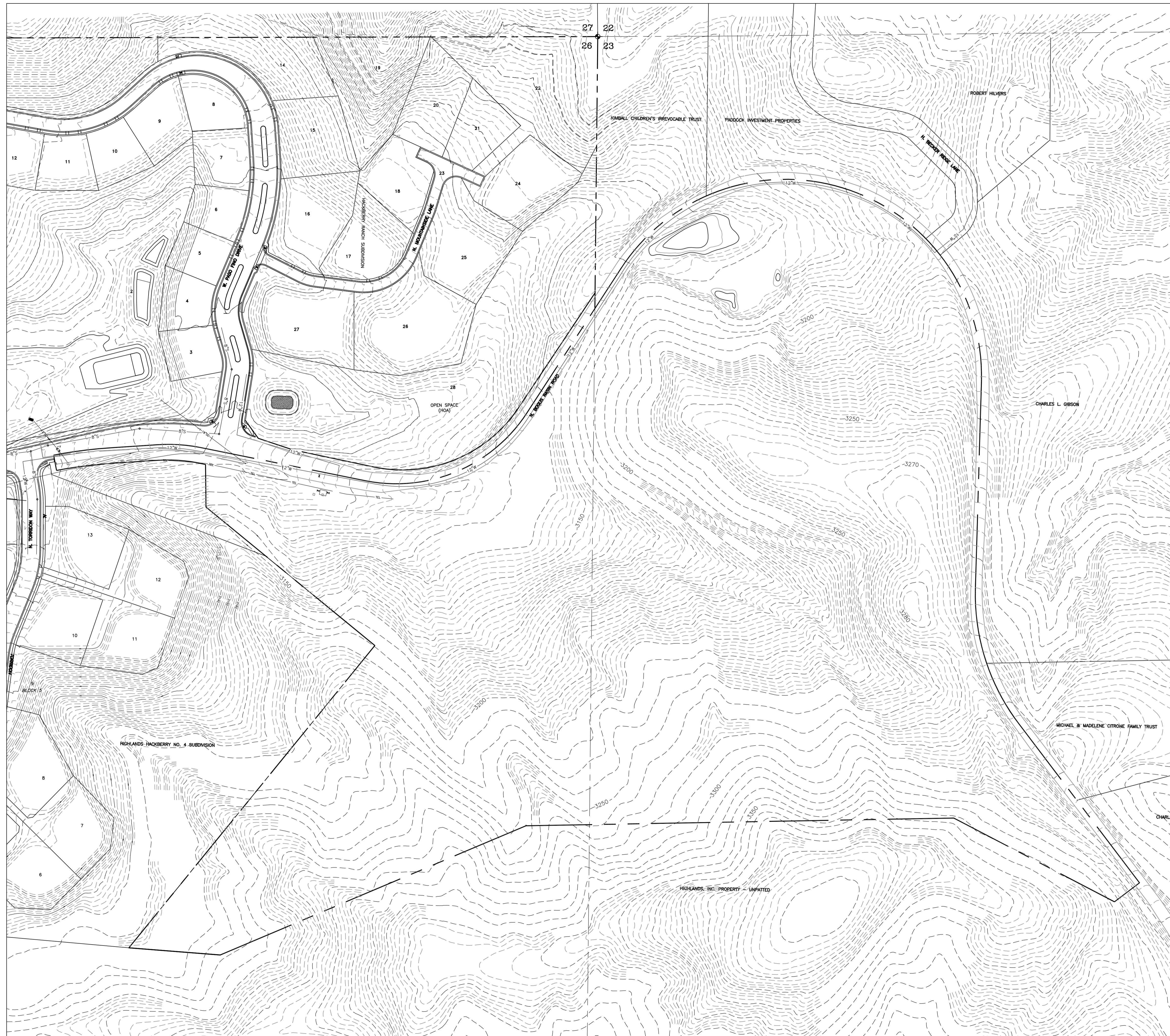


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**HACKBERRY NORTH SUBDIVISION
 PRELIMINARY PLAT
 REVEGETATION PLAN**

DATE:	APRIL 22, 2016
PROJECT:	15024
SHEET 3 OF 6	

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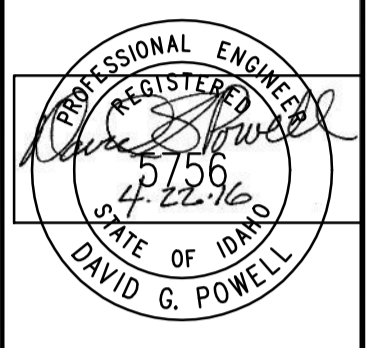
LEGEND

- — — — — PROPERTY BOUNDARY
- - - - - EXISTING 10' CONTOUR LINE
- - - - - EXISTING 2' CONTOUR LINE

EXISTING FEATURES NOTES

1. THIS PROPERTY IS LOCATED WITHIN ADA COUNTY AND HAS A CURRENT ZONE OF "RP", RURAL PRESERVATION.
2. THE DEVELOPER IS REQUESTING ANNEXATION OF THE PROPERTY WITH ALL RESIDENTIAL LOTS HAVING THE NEW BOISE CITY ZONE OF R-1A AND FOR ALL COMMON AREA PROPERTY TO HAVE THE BOISE CITY ZONE OF A-1.
3. THE ENTIRE WEST AND NORTH BOUNDARIES OF THIS PROJECT ARE BOUND BY N. BOGUS BASIN ROAD, A PUBLIC ROADWAY. THE EXISTING JERSEY BARRIER ALONG THE EAST SIDE OF THE ROADWAY IS PROPOSED TO BE REMOVED WITH IMPROVED SITE GRADING ASSOCIATED WITH THIS DEVELOPMENT. BOGUS BASIN ROAD IS A RURAL ROADWAY SECTION WITH SEGMENTS OF JERSEY BARRIERS AND ASPHALT CURBING IN SPECIFIC AREAS. THERE IS NO CURB, GUTTER, OR SIDEWALKS WITHIN THE PROJECT BOUNDARIES.
4. THIS SITE CONSISTS OF SLOPES RANGING FROM 0% TO NEAR 50%. THERE ARE OVER 14 ACRES OF LAND WITH SLOPES LESS THAN 25%. THE SITE IS VEGETATED BY NATIVE GRASSES AND BRUSH.
5. PHYSICAL FEATURES TO BE RETAINED AND PROTECTED INCLUDE DRAINAGE PIPES, A DOMESTIC WATER SUBSURFACE PRESSURE REDUCING STATION AND ABOVE GROUND VENTILATION PIPES, CONTROL PANEL AND IDAHO POWER TRANSFORMER.
6. ALL EXISTING BARBED WIRE FENCING WILL BE REMOVED WITH THE DEVELOPMENT.
7. THERE ARE NO ACTIVE TRAILS WITHIN THE LIMITS OF THIS PROPERTY.
8. THERE IS A SINGLE EQUESTRIAN TRAIL AND EASEMENT IN FAVOR OF RUBY RIDGE THAT WILL BE RETAINED AND PROTECTED WITH THIS DEVELOPMENT.

Riveridge Engineering Company
 2447 S. Vista Ave. Boise, Idaho 83705
 Ph. (208) 344-1180, Fax (208) 344-1182

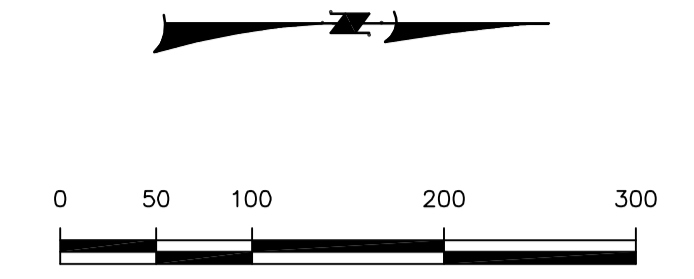


E-FILE NAME	DESIGNED	WH	DRAWN	WH	CHECKED	DGP	DGP

REVISIONS	DATE	DESCRIPTION
NO.		

**HACKBERRY NORTH SUBDIVISION
 PRELIMINARY PLAT
 EXISTING FEATURES PLAN**

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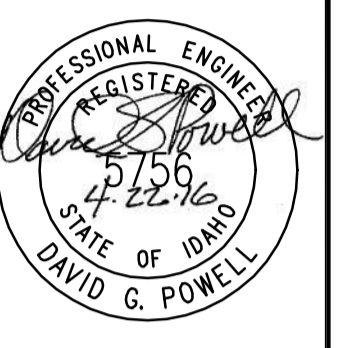


LEGEND

— EP —	EXIST. EDGE OF PAVEMENT
---	EXISTING DRAINAGE CHANNEL
- - - - - 3080	EXISTING CONTOURS - 2 FT - 10 FT
- - - - - 3080	NEW CONTOURS - 2 FT - 10 FT
█	SLOPE ANALYSIS AREA LESS THAN OR EQUAL TO 25% AND BOUNDARY

- NOTES**
1. THE HACKBERRY NORTH SITE CONTAINS IN EXCESS OF 14 ACRES OF SLOPES THAT ARE EQUAL TO, OR LESS THAN 25%.
 2. THERE ARE 14 NEW HOMES SITES PROPOSED TO BE PLACED WITHIN THE LIMITS OF SLOPES LESS THAN 25%.
 3. LOT 1 THAT COMPRISES 21.68 ACRES, IS PROPOSED TO BE A SINGLE RESIDENTIAL LOT WITH THE BUILDING LOCATED WITHIN SLOPED AREAS OF LESS THAN 25% AS SHOWN ON THIS DRAWING. ACCESS TO THIS RESIDENCE IS ALSO SHOWN ON THE PLAN AND ORIGINATES FROM N. BOGUS BASIN ROAD AS A SINGLE 20' WIDE PAVED DRIVEWAY WITH APPROVED EMERGENCY ACCESS AND TURN AROUND.
 4. THERE ARE NO EXISTING BUILDINGS, TRAILS ON THE SITE.
 5. EXISTING VEGETATION IS LIMITED TO GRASSES AND NATIVE BRUSH.

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E-FILE NAME	DESIGNED	WH	DRAWN	WH	CHECKED	DGP	APPROVED	DGP

**HACKBERRY NORTH SUBDIVISION
 PRELIMINARY PLAT
 SLOPE ANALYSIS PLAN**

DATE: APRIL 22, 2016
 PROJECT: 15024
 SHEET 6 OF 6