



TRANSMITTAL

Marco Zaccaro
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 zarchitects@alaska.net

Firm Name	Anchorage Municipality Community Development Services	Project	Zellmer Townhouse-style Multifamily Residential Conditional Use Permit
Attention	Francis McLaughlin	Date	April 13, 2015
Phone No.		From	Marco Zaccaro

We are sending you the following information indicated:

- | | | |
|--|--|---|
| <input checked="" type="checkbox"/> Attached | <input type="checkbox"/> Original | <input type="checkbox"/> Drawings |
| <input type="checkbox"/> Draft | <input checked="" type="checkbox"/> Prints | <input type="checkbox"/> Specifications |

ACTION REQUIRED

- | | | |
|---------------------------------------|---|--|
| <input type="checkbox"/> For Approval | <input checked="" type="checkbox"/> For
Review/Comment | <input type="checkbox"/> For Your
Information |
|---------------------------------------|---|--|

# Copies	Date	Description
36	4-9-2015	Title 21 Code Selection
36	3-30-2015	Signed Conditional Use Permit Application and application narrative.
36	5-6-2011	Site Photos.
36	5-1-1972	Plat 72-180
36	4-10-2015	Map of surrounding area within 500' showing zoning
36	4-14-2011	WMS Watercourse Mapping Summary
36	3-30-2015	Ownership and Beneficial Interest Disclosure
36	4-2-2015	Letter of Authorization to Represent
1	4-2015	Girdwood Land Use Committee and Girdwood Board of Supervisors April 2015 agendas showing Zellmer Townhouse.
36	3-30-2015	Drawing Sets Architectural and Civil at Quarter Scale 8½ x11 (16 sheets total)

Copy To: _____ Signed: _____

Via: Mail Fax Courier

36	7-11-2011	Municipality of Anchorage Planning and Zoning Commission Resolution No. 2011-023
1	2-2011	Geotechnical Report

Remarks/Comments:

**Thank you,
Marco Zaccaro**

MUNICIPALITY OF ANCHORAGE



Community Development Department

Phone: 907-343-7931

Fax: 907-343-7927

Mayor Dan Sullivan

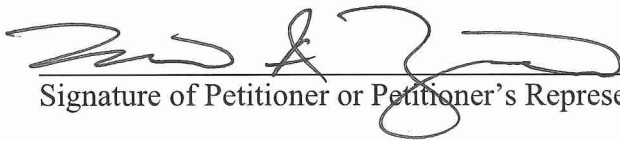
Title 21 Code Selection

For review and approval of my project, ZELLMER TOWNHOUSES,
I choose to be regulated by:

"Old" Title 21 (expires December 31, 2015)

"New" Title 21 (becomes effective January 1, 2014)

I understand that my application will be reviewed and acted on using the provisions of the code version I have selected, and that this selection is final.*



Signature of Petitioner or Petitioner's Representative

APRIL 9, 2015

Date

MARCO ZACCARO

Printed Name

*Should the petitioner wish to switch the applicable version of code at any time after this form is submitted, a new application is required and new application fees will be assessed. The case will then be scheduled as a new application in accordance with the cut-off date schedule.

For office use only:

2015-0041

Permit/Case Number

10/30/14

Joshua Zellmer
Bethany Zellmer
PO Box 1951
Girdwood, Alaska 99587
(907) 717-3482

April 2, 2015

To whom it may concern,

This letter is to confirm that Mr. Marco Zaccaro is authorized to represent us in the permitting for the Zellmer Townhouse project located at 180 Taos Road in Girdwood, Alaska.

Sincerely,

A handwritten signature in blue ink, appearing to read "Joshua Zellmer". The signature is fluid and cursive, with the first name "Joshua" being more prominent and the last name "Zellmer" following in a similar style.

Joshua Zellmer, Owner

Girdwood Land Use Committee Notice of Meeting on April 13, 2015

The following items have been submitted as agenda items for consideration at the meeting of the Girdwood Land Use Committee / Girdwood Community Association. A voting member is any person eighteen (18) years of age or older who has been a resident and/or property owner, business owner or designated representative of a non-profit association who has resided in, owned property in, owned a business located in, or operated as a non-profit association for ninety (90) days or longer in Girdwood Valley.

What: Regular meeting of the Girdwood Land Use Committee / Girdwood Community Association
Where: Girdwood Community Center, 250 Egloff Drive
Date: Monday, April 13, 2015
Time: 7:00 pm

Agenda Item LUC 1504-01:

Call to order
Agenda Approval for April Meeting
Minutes Approval for March Meeting
LUC Officer reports
LUC comments and actions as necessary.

Agenda Item LUC 1054-02: Public Comment

Persons offering public comment must state their full name and address.
Public Comment is limited to three (3) minutes per person and must be on subjects not listed on the agenda.

Agenda Item LUC 1504-03: Committee reports:

Trails Committee Report (Brian Burnett)
Girdwood Area Plan Review Committee (Lewis Leonard)
Cemetery Committee (Tommy O'Malley)

Old Business:

Agenda Item LUC 1502-06: Representative from The Boutet Company to present Girdwood Tennis Court rehabilitation project update. Encroachment issue resolved with Girdwood Fire Department. Request for motion of support for construction plans to be presented at this meeting.

Agenda Item LUC 1502-08: Review of LUC Operating Principles as they relate to Girdwood Community Council responsibilities.

Agenda Item LUC 1503-07: Discussion of Law Enforcement in Girdwood.

New Business:

Agenda Item LUC 1504-04: Zellmer Townhouses, initial presentation for Conditional Use Permit.
Presentation by Marco Zaccaro, Z Architects.



Municipality of Anchorage



P.O Box 390
Girdwood, Alaska 99587
<http://www.muni.org/gbos>
Dan Sullivan, Mayor

GIRDWOOD VALLEY SERVICE AREA BOARD OF SUPERVISORS
Erin Eker & David Chadwick, Co-Chairmen
Tommy O'Malley, Robert Snitzer, Sam Daniel

April 20, 2015 **GBOS Monthly Meeting** **DRAFT AGENDA** **7:00 p.m. Girdwood Community Room**

Call to Order 7:00 p.m. Erin Eker, Co-Chair

Minutes Changes, additions, revisions and final approval

GBOS April 2015 Agenda
GBOS Work Session on Girdwood Public Safety 4.6.15 Meeting Minutes
GBOS March 2015 Regular Meeting Minutes

Announcements:

- Public is encouraged to ask questions and provide comment. Please raise your hand, and wait to be acknowledged
Please take side conversations to the Foyer.
- GBOS 2016 Non-Profit Recreational Grants Announcement. Grant applications will be available starting on May 1, 2015. Applications are due by Thursday, June 25 at 3PM. Applications will be available at the Post Office, Gerrish Library and Girdwood Parks and Rec Office Bulletin boards, as well as on line at www.muni.org/gbos.
- Alaska DOT is requesting comments on long range planning for the Seward Highway. Learn more and submit your comments at www.sewardhighwayplan.com. Official comment period ends May 31, 2015.

Introductions, Presentations and Reports:

1. Sub-Committee Reports:
 - a. Trails Committee – Brian Burnett
 - b. T.A.S.C. – Lynne' Doran
 - c. Cemetery Committee – Tommy O'Malley
 - d. Girdwood Tennis Court Committee – Frans Weits
2. Assembly Report - Sue Kennedy
3. Liaison Report - Margaret Tyler

GBOS Meeting Agendas and minutes are available on line: <http://www.muni.org/gbos>



4. Supervisor Reports
 - A) Land Use – David Chadwick/Brian Burnett
 - B) Roads- Erin Eker/Liaison Report
 - C) Parks & Rec – Robert Snitzer/Liaison Report
 - D) Public Safety & Fire – Tommy O'Malley/Chief Chadwick
 - E) Utilities- Sam Daniel

Public Comment:

Persons offering public comment must state their full name and address. Public Comment is limited to three (3) minutes per person and must be on subjects not listed on the agenda.

OLD BUSINESS:

5. Update on status of Girdwood Public Safety discussion
6. Update of status of Girdwood Community Council discussion
7. Set meeting date for GBOS 2014 budget review
8. Girdwood Forest Fair 2015 Update (Gus O'Malley)
9. Topics for April 27 Municipal Manager/GBOS Quarterly Meeting
 - Girdwood Law Enforcement (AST/APD Coverage)
 - Crow Creek Road Ownership
 - Fire Station Remodel (remove?)
 - Girdwood Cemetery
 - Election update (add?)
10. Girdwood Forest Fair 2015 Update (Gus O'Malley)
11. Agenda Item LUC 1502-08
GBOS review of addition of meeting frequency, change in voting requirement to LUC Operating Principles
12. Trails Committee Operating Procedures changes
GBOS review of addition of treasurer to executive committee; change in voting requirements, addition of language clarifying who can vote.
13. GBOS Review of Girdwood Fire Department request for approval of spending 406 capital funds
14. Agenda Item LUC 1502-06. Girdwood Tennis Court project. Review of engineering plans. Request for Resolution of Support for project construction.
15. Temporary Appointments to handle GBOS Responsibility areas until new GBOS members are confirmed (ie Roads Supervisor and Land Use Supervisors).
16. Resolutions of Thanks for service for departing GBOS members Erin Eker and David Chadwick.

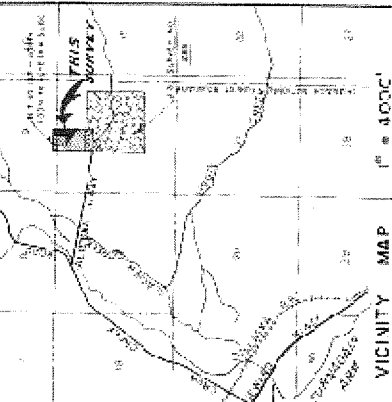
NEW BUSINESS:

17. LUC Item 1504-04. Zellmer Townhouses Conditional Use Permit.
Presentation by Marco Zaccaro, Z Architects
18. Set meeting date in September to discuss 2016 Non Profit Recreation grant applications.

Action Item Updates as assigned:

Request for Executive Session:

Adjourn



VICINITY MAP

CERTIFICATE OF OWNERSHIP & DEDICATION

We hereby certify that we are the owners of the property shown and described herein. We hereby request approval of this plat, showing such easements for public utilities, roadways and alleys indicated by us for public use.

Date: _____, 1972.

LESSOR: *[Signature]*
 LESSOR: *[Signature]*
 LESSOR: *[Signature]*
 LESSOR: *[Signature]*

NOTARY'S ACKNOWLEDGEMENT

Subscribed and sworn to before me this _____ day of _____, 1972.

My commission expires _____, 1972.

PLAT APPROVAL

Plat approved by the Borough Planning Commission this _____ day of _____, 1972.

By: *[Signature]*
 AUTHORIZED OFFICIAL

PLAT APPROVAL

Plat approved by the Borough Planning Commission this _____ day of _____, 1972.

By: *[Signature]*
 AUTHORIZED OFFICIAL

PLAT APPROVAL

Plat approved by the Borough Planning Commission this _____ day of _____, 1972.

By: *[Signature]*
 AUTHORIZED OFFICIAL

PLAT APPROVAL

Plat approved by the Borough Planning Commission this _____ day of _____, 1972.

By: *[Signature]*
 AUTHORIZED OFFICIAL

PLAT APPROVAL

Plat approved by the Borough Planning Commission this _____ day of _____, 1972.

By: *[Signature]*
 AUTHORIZED OFFICIAL

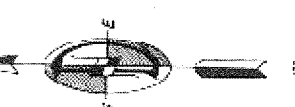
PLAT APPROVAL

Plat approved by the Borough Planning Commission this _____ day of _____, 1972.

By: *[Signature]*
 AUTHORIZED OFFICIAL

PLAT APPROVAL

Plat approved by the Borough Planning Commission this _____ day of _____, 1972.



LEGAL DESCRIPTION

From Corner of U.S. Survey No. 4969; thence North 132.00 ft. to the NE Corner of Tract "A", Second Addition to Alyeska Subdivision; thence East, 495.00 ft. to the True Point of Beginning; thence East 23° 53' E., 164.97 ft. to a point; thence S 09° 51' 30" E., 60.00 ft. to a point; thence Northwest, along a curve to the right, (R=270.00 ft., distance of 80.00 ft. to a point); thence N. 57° 30' 00" E., 60.00 ft. to a point; thence N. 52° 30' 00" W., 295.23 ft. to a point; thence Northwest, along a curve to the right, (R=240.00 ft., tangent bearing N. 52° 30' 00" W., through an angle of 52° 30' 00"), for a distance of 219.51 ft. to a point; thence North 38.49 ft. to a point; thence East, 125.00 ft. to a point; thence North, 500.00 ft. to the Point of Beginning. Contains 7.005 Acres.

NOTE

No structure or building will be constructed until water and sewer service is available.

LEGEND

- Existing Blm Cross Lopped Monument
- 0/0 Brass Capstac Monument Existing
- Existing 5/8" Steel rebar with Aluminum Cap
- All other corners are 5/8" Paver set this survey

OWNERSHIP CERTIFICATE

I, the undersigned hereby certify that I am the director, Alaska Division of Lands and that the State of Alaska is the owner of 7.005 Acres of A.D. Land No. 12800 as shown hereon. I hereby approve this survey and plat for the State of Alaska.

Date: _____, 1972.

NOTARY'S ACKNOWLEDGEMENT

Subscribed and sworn to before me this _____ day of _____, 1972.

My commission expires _____, 1972.

SURVEYOR'S CERTIFICATE

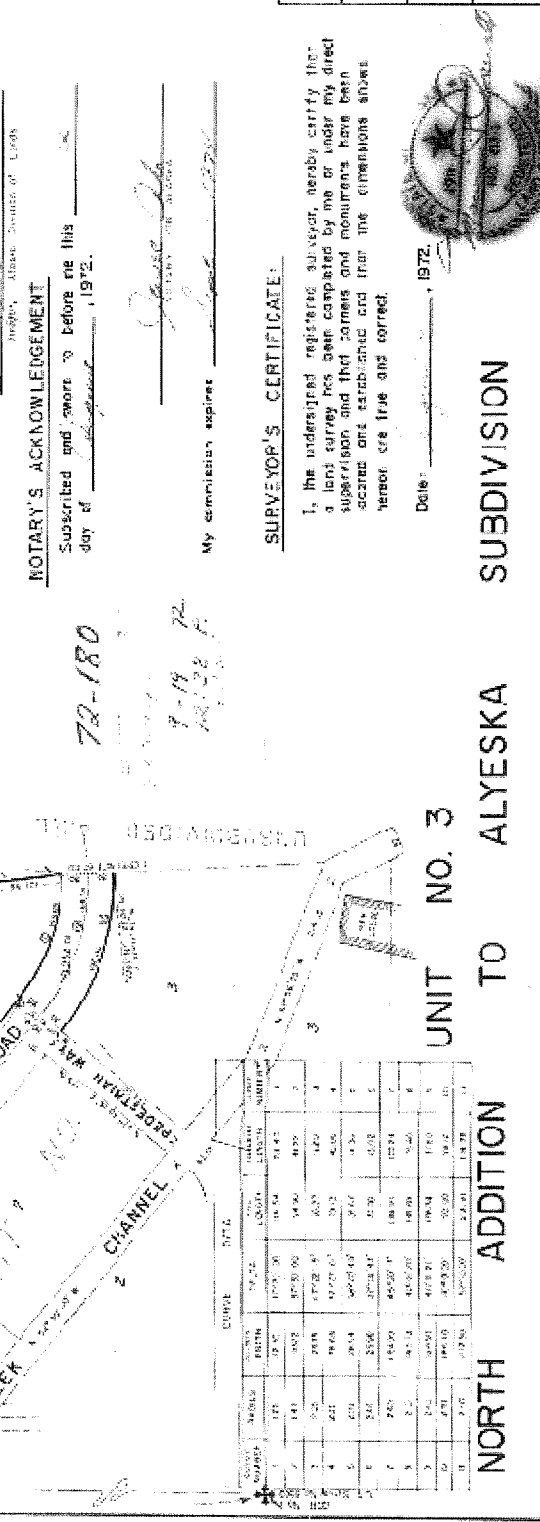
I, the undersigned registered surveyor, hereby certify that a land survey has been completed by me or under my direct supervision and that corners and monuments have been accurate and established and that the dimensions shown hereon are true and correct.

Date: _____, 1972.

UNIT NO. 3

NORTH ADDITION TO ALYESKA SUBDIVISION

LOCATED IN PROTRACTED SECS 9 & 15, T.10N., R.2E., S.M. ALASKA



UNIT NO. 3
 NORTH ADDITION TO ALYESKA SUBDIVISION
 LOCATED IN PROTRACTED SECS 9 & 15, T.10N., R.2E., S.M. ALASKA

Application for Conditional Use

Municipality of Anchorage
 Planning Department
 PO Box 196650
 Anchorage, AK 99519-6650

Please fill in the information asked for below.

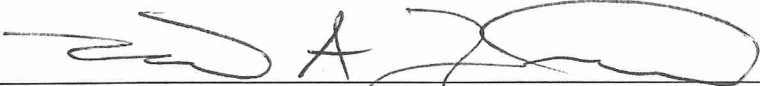
PETITIONER*	PETITIONER REPRESENTATIVE (IF ANY)
Name (last name first) Zellmer, Joshua	Name (last name first) Zaccaro, Marco
Mailing Address PO Box 1951 Girdwood, AK 99587	Mailing Address PO Box 842 Girdwood, AK 99587
Contact Phone: Day: 717-3482 Night: 717-3017	Contact Phone: Day: 783-1090 Night: 230-3044
FAX:	FAX: 783-1095
E-mail: joshzellmer@hotmail.com	E-mail: marco@zarch-ak.com

*Report additional petitioners or disclose other co-owners on supplemental form. Failure to divulge other beneficial interest owners may delay processing of this application.

PROPERTY INFORMATION		
Property Tax #(000-000-00-000): 076-015-40-005		
Site Street Address: 180 Taos Road, Girdwood, Alaska		
Current legal description: (use additional sheet if necessary) Alyeska North #3, Block 6, Lot 5		
Zoning: GR-4	Acreage: .285	Grid # SE 4817

CONDITIONAL USE APPROVAL REQUESTED		
Petitioning for: Conditional Use for town home at density greater then 8/acre		
Final:	<input checked="" type="checkbox"/> New	<input type="checkbox"/> Amendment
Concept:	<input type="checkbox"/> New	<input type="checkbox"/> Amendment

I hereby certify that (I am)(I have been authorized to act for) owner of the property described above and that I petition for a conditional use permit in conformance with Title 21 of the Anchorage Municipal, Code of Ordinances. I understand that payment of the application fee is nonrefundable and is to cover the costs associated with processing this application, and that it does not assure approval of the conditional use. I also understand that assigned hearing dates are tentative and may have to be postponed by Planning Department staff, the Planning and Zoning Commission or the Hearing Officer for administrative reasons.

3/30/2015	
Date	Signature (Agents must provide written proof of authorization)

Accepted by:	Poster & Affidavit:	Fee	Case Number 2015-0041
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COMPREHENSIVE PLAN INFORMATIONAnchorage 2020 Urban/Rural Services: Urban RuralAnchorage 2020 West Anchorage Planning Area: Inside Outside

Anchorage 2020 Major Urban Elements: Site is within or abuts:

- Major Employment Center Redevelopment/Mixed Use Area Town Center
 Neighborhood Commercial Center Industrial Center
 Transit - Supportive Development Corridor

Eagle River-Chugiak-Peters Creek Land Use Classification:

- Commercial Industrial Parks/opens space Public Land Institutions
 Marginal land Alpine/Slope Affected Special Study
 Residential at _____ dwelling units per acre

Girdwood- Turnagain Arm

- Commercial Industrial Parks/opens space Public Land Institutions
 Marginal land Alpine/Slope Affected Special Study
 Residential at _____ dwelling units per acre

ENVIRONMENTAL INFORMATION (All or portion of site affected)

- Wetland Classification: None "C" "B" "A"
Avalanche Zone: None Blue Zone Red Zone
Floodplain: None 100 year 500 year
Seismic Zone (Harding/Lawson): "1" "2" "3" "4" "5"

RECENT REGULATORY INFORMATION (Events that have occurred in last 5 years for all or portion of site)

- Rezoning - Case Number:
 Preliminary Plat Final Plat - Case Number(s):
 Conditional Use - Case Number(s):
 Zoning variance - Case Number(s):
 Land Use Enforcement Action for
 Building or Land Use Permit for
 Wetland permit: Army Corp of Engineers Municipality of Anchorage

DOCUMENTATION

- Required: One copy of original, signed application
 35 copies of site plan to scale depicting: building footprints; parking areas; vehicle and pedestrian circulation; lighting; grading; landscaping; signage; drainage and project location.
 35 copies of building plans to scale depicting: floor plans; building elevations; exterior colors and textures.
 35 copies of original application and narrative: explaining the project; planning objectives; construction and operation schedule; final ownership; PUD's only: gross and net density; private and common open space areas.
 Watershed sign off form, completed
 Ownership and beneficial interest form, completed
- Optional: Air quality impact Traffic impact analysis Economic impact analysis
 Soils Analysis Noise impact analysis Holding capacity of the land analysis

GENERAL CONDITIONAL USE STANDARDS (AMC 21.50.020)

The Planning and Zoning Commission may only approve the conditional use if the Commission finds that all of the following 4 standards are satisfied. Each standard must have a response in as much detail as it takes to explain how your project satisfies the standard. The burden of proof rests with you. Use additional paper if needed.

Explain how the proposed conditional use furthers the goals and policies of the comprehensive development plan and conforms to the comprehensive development plan in the manner required by AMC 21.05.

This project is in line with the goals and objectives of the Girdwood Area Plan and the Girdwood Land Use Regulations in that it takes advantage of views, solar exposure, and limits impermeable surfaces to the greatest extent possible and has a pleasing mountain resort aesthetic.

Explain how the proposed conditional use conforms to the standards for that use in this title and regulations promulgated under this title.

This project has met all requirements of Chapter 9, Title 21 of the Anchorage Municipal Code (Girdwood Land Use Regulations)

Explain how the proposed conditional use will be compatible with existing and planned land uses in the surrounding neighborhood and with the intent of its use district.

The GR-4 district is an established district of multi-family dwellings on fairly small lots. Most of the lots surrounding this site have already been developed at densities equal to or greater than this proposed project.

Explain how the proposed conditional use will not have a permanent negative impact on the items listed below substantially greater than that anticipated from permitted development:

1. Pedestrian and vehicular traffic circulation and safety.
This project is an infill in an established neighborhood of similar uses. There will be no substantial changes to established traffic or pedestrian circulation patterns. There are no pedestrian trails or sidewalks on Taos. This project proposes only pedestrian connections from individual entries to associated parking spaces.
2. The demand for and availability of public services and facilities.
Adequate public services and facilities are available to the site for this project. There will be no negative impacts on public services and facilities.
3. Noise, air, water or other forms of environmental pollution.
This residential development will not generate environmental pollution
4. The maintenance of compatible and efficient development patterns and land use intensities.
This multifamily town house development is consistent with the adjacent land uses and densities. It is specifically designed to fit in well with the neighboring multi-family dwellings and limits its impact on their view sheds and solar exposure. Density and total constructed area is similar or less than adjacent properties to the north and south.

CONDITIONAL USE STANDARDS (AMC 21.50)

Certain conditional uses have detailed standards that relate only to that type of conditional use. When there are detailed standards the Planning and Zoning Commission may only approve the conditional use if the Commission finds that all general standards listed in the previous section and detailed standards listed for that conditional use in AMC 21.50 are satisfied. Each detailed standard must have a response in as much detail as it takes to explain how your project satisfies the standard. The burden of proof rests with you. Use additional paper if needed.

Please see attached narrative addressed to Mr. Francis McLaughlin dated March 30, 2015.



PO Box 842
Girdwood, AK 99587

(907) 783-1090
(907) 783-1095 fax
(907) 230-3044 cell
zarchitects@alaska.net

April 13, 2015

Francis McLaughlin, Senior Planner
Municipality of Anchorage
Community Development
4700 Elmore Road,
Anchorage, AK 99507

Re: Zellmer Townhouse-Style Multifamily Residential Conditional Use Permit Narrative

Request for Approval:

We are requesting a Conditional Use Permit approval for a new four unit townhouse-style multifamily residential project at 180 Taos Road in Girdwood.

Project Description / Explanation:

Zellmer Townhouses is a residential condominium project consisting of one building with 4 units. Project legal description: Lot 5, Block 6, Alyeska North No. III. Property size: 12,414.65 square feet (.285 acre).

Specific units proposed are: two identical two bedroom units; one owner's unit with three bedrooms; and one single bedroom unit. All units have a garage and entry on the first floor. The two bedroom units are 18'x36', three stories, 1,424 S.F. (1,944 S.F. including garage); the three bedroom unit is 20'x36', three stories, 1,577 S.F. (2,160S.F. including garage); and the one bedroom unit is 18'x36', two stories, 776 S.F. (1,296 S.F. including garage).

Planning Objectives:

Building and site design have been oriented to comply with the site and townhouse design requirements in the Girdwood Land Use Regulations. Special attention has been paid to maximizing views up valley and minimizing site and neighbor impacts by stepping the units back from Taos Road, following the natural contour lines, and avoiding the steep south east corner of the site. The townhouse-style units have been laid out on the site so as to not block the south-west views and sun of the existing multifamily housing development to the north. The lower two story unit is located at the north end of the townhouse row to further reduce visual impacts on these neighbors. The multifamily development to the south faces south and its north walls have a very few small windows so the 180 Taos project should have minimal impact on this neighbor.

To reduce total driveway area and further minimize site impact we are proposing a one way drive with two connections to Taos Rd. (which we have determined has less total driveway area then a two way drive with one crossing of the front yard setback). This also provides for maximum natural vegetation retained in the front yard setback and reduces neighbor impact across Taos.

Construction and Operation Schedule:

Construction is to begin in June 2015 and final completion is expected to be February 2016.

Final Ownership:

Final ownership will be individual privately owned condominiums anticipated to be governed by an HOA. The project developer/owner will retain two units.

Density and Zoning:

The property is zoned gR-4, Multifamily Residential. The project requires a conditional use permit due to the proposed density of 14 dwelling units per acre which exceeds the outright permitted use of 8 per acre.

Planning Division Pre-Application Meeting and Public Presentations:

This project was introduced to the Planning Division at a pre-application meeting on March 18, 2015. The project is also on the agendas, for introduction and public hearings, on the April 13 and May 11, 2015 meetings of the Girdwood Land Use Committee and the April 20, and May 18, 2015, meetings of the Girdwood Board of Supervisors.

Project and Conditional Use Permitting History:

On June 13, 2011, this property received a Conditional Use Permit for a four unit townhouse-style project with a site plan almost identical to what is being proposed in this application. No work was done to resolve the conditions of the 2011 permit which expired after 18 months. The property and building plans were subsequently purchased by a new owner, Mr. Zellmer, who is submitting for a new Conditional Use Permit for a project based on the previous effort.

While the site layout is similar and the number of units are the same, this new project is substantially smaller than the previously approved project. The new project has 7,344 total square feet of floor area as compared to the previous 8,913 square feet. The new project is also about ten feet lower in height than the old project. The old project had three identical three story units and one very large owner's unit. The new project proposes three similar three story units and one smaller two story unit. The units have all been shortened from 40 feet to 36 feet in length to make on site parking outside the units' garages easier to achieve.

We have included from the previous conditional use permit the following documents: Municipality of Anchorage Planning and Zoning Commission Resolution No. 2011-023, geotechnical report and the WMS Watercourse Mapping Summary.

Title 21.090.080.E.2 Building Design Standards – Multiple Family:

The Zellmer Townhouse building has been designed to fit in well with the existing style and scale of the adjacent multifamily housing developments as well as the area's alpine resort aesthetic. The mass and roofs have been broken up by using offsets and roof line changes. The front and rear walls have been stepped so that no walls are longer than 40' without a change of at least four feet, the building is under the maximum length of 120' as specified in the title. The roofs are all sloping except for the small, flat, 40 square foot roofs above each entry deck. Roofs have minimum overhangs of 24" from exterior walls and are designed to protect doorways, garage entries, and driveways.

Roofing material is asphalt shingles and all projections from the roof are designed to mitigate damage from sliding snow. Landings will be a minimum of 6' above the adjacent driveways. Exterior building materials will be primarily cedar or similar. None of the prohibited materials listed in this section will be utilized. Principal exterior building colors will be neutral tones with some brighter colors, not exceeding 15% of a façade, for trim and highlighting details.

Please see attached floor plans, elevations, building sections and color building renderings.

Title 21.090.070.E.2 Site Development Design Standards:

See the attached site plan with zoning analysis, property survey, civil grading and drainage plan.

Sheet A0.1 shows the zoning analysis including snow storage areas, permeable surfaces, lot coverage, and vegetation retention. We are applying for a permit under old Title 21. The base parking requirement is calculated to be 7.5 and the overflow parking requirement at 1.5 spaces for a project total of 9 spaces on site. These spaces have been accommodated via four standard 9'x20' spaces in the garages, four standard spaces outside of each of the garages, and one parking space next to the north property setback.

Pedestrian circulation is limited to concrete entry decks to the units' associated parking and will conform to the requirements of Title 21.09.070.H.2.

There will be no dumpster on site as residents will transport their trash to the Girdwood transfer station or keep trash containers within their garages until pick up day if they chose to use Alaska Waste services. This is preferable to having exterior trash containers.

There is no planned site lighting beyond what is on the building for private entry and these fixtures will be full cut off. No light will spill onto adjacent properties or the street. Exterior building lighting will conform to the requirements of Title 21.09.070.G.2.

The roof geometries are designed to hold the snow on the roof form and to prevent snow from sliding onto pedestrian pathways or driveways where it will become an inconvenience or hazard to residents.

Areas designated as natural vegetation on the site plan will be maintained as natural through the course of construction and will not be disturbed. All disturbed areas (and setbacks not required for natural vegetation area) will be re-vegetated with native species and per Title 21.09.070.E.8.

Existing vegetation Disturbance in Setbacks:

All setbacks adjacent to the proposed building footprint have been cleared of trees and heavily disturbed by construction on the properties to the north, south, and by the installation of utilities in the easement to the east. Please see attached photos. Vegetation in these areas consists of second growth brush. On the site plan we have not counted areas in the setbacks adjacent to the building towards our retained natural vegetation requirements - however it is not intended that this vegetation be disturbed or removed during construction

The only setback not already disturbed is the front which is shown as natural vegetation area in the site plan.

Explanation of photos:

1. South setback looking east: This is taken in alignment with the south west corner of unit 1. Stake is at property line and cone is at setback line. There are trees in the setback west of where photo is taken but these are marked on site plan as natural vegetation area.
2. South setback looking east 2: Cone is approximate south east corner of unit 1. Trunk of small tree beyond is outside setback and within area marked as natural vegetation on site plan.
3. North setback looking east: Stake in snow patch in drainage ditch is at property line and cone is at setback line. Cone is also approximate northwest corner of unit 4. Utility boxes are at property corner.
4. North setback looking west: Taken from property corner. Cone in distance is approximate northwest corner of unit 4. It is intended that trees in setback beyond (west of) cone are to remain.
5. East setback looking south: Taken from property corner. The ten foot width of the utility easement on 180 Taos has been cleared and utilities installed. Note that building beyond is built up to the easement and the large tree with the sun on it in the right foreground is just outside the (easement/setback).

If any areas in the setback are disturbed they will re-vegetated as described in section 21.09.070.E.8 or 21.09.070.E.4.c as applicable.

If you have any questions please do not hesitate to give me a call.

Sincerely,



Z Architects

Marco Zaccaro, AIA NCARB













My Neighborhood

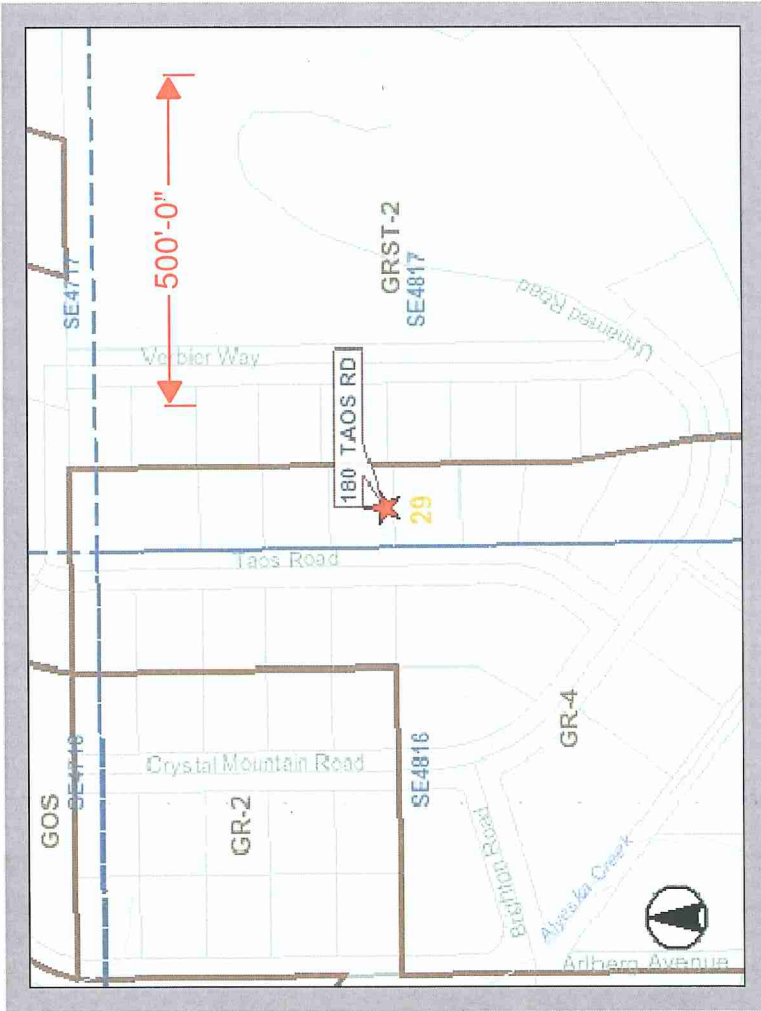
Municipality of Anchorage, Alaska



www.muni.org

- Education
- Health & Family
- Local Services
- Political
- Property Info**
- Public Safety
- Recreation

- New Search
- Help / FAQs
- About My Neighborhood



Property Info

- Parcel
- Zoning
- Zip Codes 99587
- Census Tracts
- Map Grid



Property Info results for **180 TAOS RD, Girdwood, AK 99587**

Parcel Information:
 Parcel number: 07601540000
 Block: 6 Lot: 5
 Map Grid: SE4817

Demographic Information:
 Census Tract: 29
 Zip Code: 99587

Supplemental Form: OWNERSHIP AND BENEFICIAL INTEREST DISCLOSURE

PETITIONER: CORPORATE OFFICERS OR PARTNERS

Applicants for an entitlement that will be in possession and the responsibility of more than one individual, such as a co-owner, joint venture, partnerships, corporations, company, or other similar form of ownership, are required to disclose a full and complete list of the name and address of each principal. (use additional paper if necessary)

Name	Title or Office(if any)	Address

PROPERTY OWNER: CORPORATE OFFICERS OR PARTNERS

The petitioner of a property owned by more than one individual that will benefit from an entitlement is required to disclose a full and complete list of the name and address of each partner, officer, or co-owner. The other owner interest to be reported is co-owner, joint venture, partnership, corporation, company, or other similar form of ownership. (use additional paper if necessary)

Name	Title or Office(if any)	Address
Joshua A. Zellmer		PO Box 1951, Girdwood AK 99597

Attach this sheet to your application form

Accepted by: _____	Date _____	Application for _____	Case Number _____
--------------------	------------	-----------------------	-------------------

WMS WATERCOURSE MAPPING SUMMARY

Per the requirements for watercourse verification outlined in Project Management and Engineering Operating Policy and Procedure #8 and Planning Department Operating Policy and Procedure #1 (effective June 18, 2007), MOA Watershed Management Services has inspected the following location for the presence or absence of stream channels or other watercourses, as defined in Anchorage Municipal Code (21.35).

- Project Case Number or Subdivision Name: Alyeska North Sub LFS BIKC
- Project Location, Tax ID, or Legal Description: 076-015-40-000
- Project Area (if different from the entire parcel or subdivision): _____

In accordance with the requirements and methods identified, WMS verifies that this parcel, project area, or application:

_____ **DOES NOT** contain stream channels and/or drainageways, as identified in WMS field or archival mapping information.*

X **DOES** contain ~~stream channels~~ and/or drainageways **AND** these are located and identified on submittal documents in general congruence with WMS field and archival mapping information.
*New or additional mapping **IS NOT REQUIRED**.**

_____ Contains stream channels and/or drainageways **BUT** one or more streams or other watercourses:

- are **NOT** shown on submittal documents, or
- are **NOT** depicted adequately on submittal documents for verification, or
- are **NOT** located or identified on submittal documents in general congruence with WMS field and archival mapping information.

*New or additional mapping **IS REQUIRED** and must be re-submitted for further review and verification.**

_____ Presence of stream channels and/or drainageways is unknown **AND** field verification is not possible at this time. WMS will verify as soon as conditions and prioritized resources allow.

* Streams omitted in error by WMS or others remain subject to MOA Code and must be shown in new mapping upon identification of the error.

ADDITIONAL INFORMATION:

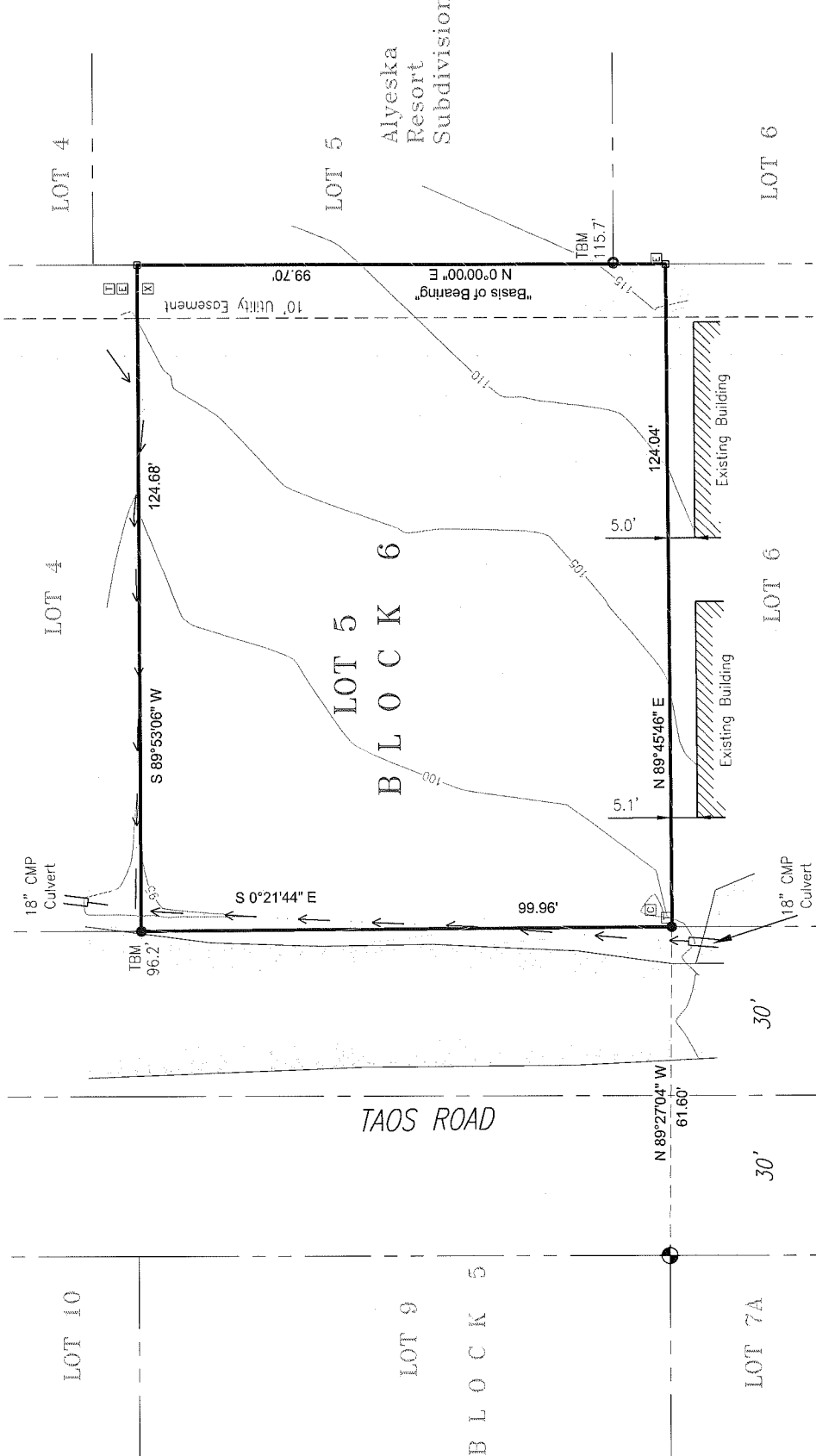
- Y N WMS written drainage recommendations are available. Preliminary Final
- Y N WMS written field inspection report or map is available. Preliminary Final
- Y N Field flagging and/or map-grade GPS data is available.

Inspection Certified By:

Date:

Kyle Cunningham
Kyle Cunningham

4/14/11



SENTEC

Surveying • Engineering
 2525 Gambell Street, Suite 200, Anchorage, Alaska 99503
 Tele: (907) 563-3635 Fax: (907) 563-3817

TOPOGRAPHIC SURVEY OF: LEGAL DESCRIPTION
 Lot 5, Block 6, North Add. to Alyeska
 Subdivision Unit No. III, Girdwood, Alaska

DATE: Nov. 20, 2009
 DRAWN BY: JAH
 CHECKED BY: MJH
 SCALE: 1"=70'
 PROJECT NUMBER: 09-5394
 SHEET NUMBER: 61/4-5

LEGEND

- ☐ Cable TV
- ☐ Telecom. pedestal
- ☐ Electric pedestal
- ☒ Electric transformer
- Found YPC "LANTEC"
- Found "AL" cap
- Found "DOWL"
- Found YPC "LANTEC"
- Found 5/8" rebar
- Found "AL" Mon.
- Found "LANTEC"

SURVEY CERTIFICATION: SENTEC has conducted a physical survey of this property as shown on this drawing and that the improvements situated thereon are within the property lines and no encroachments exist other than noted.

EXCLUSION NOTES: It is the owners responsibility to determine the existence of any easements, covenants, or restrictions which do not appear on the recorded subdivision plat. NOTES: Under no circumstances should any data thereon be used for the construction or for the establishing of property lines.



NOTE: 1) Basis of Bearing is as per Plat No. 72-180, elevations are based on an assumed datum.
 2) This is NOT a Boundary Survey.
 3) Even though 4 corners have been located, small boundary discrepancies have been observed.
 4) Due to issues from Note 3, if a structure is to be built within 1 foot of the required setback, a Record of Survey is recommended.

OLD CODE:

ZONING INFORMATION GROWWOOD ZONING DISTRICT	RP-4
ANGIE PARKING REQUIRED PER 21.05.060: 1.5 FOR EACH ONE BEDROOM UNIT 1.5 X 1 = 1.5 1.75 FOR EACH TWO BEDROOM UNIT OVER 800 S.F. 1.75 X 2 = 3.5 2.5 FOR EACH THREE BEDROOM UNIT OVER 900 S.F. 2.5 X 2 = 5.0 BASE ON SITE PARKING REQUIRED:	1.5 3.5 7.5
OVERFLOW PARKING PER 21.05.033 (20% OF ON-SITE) TOTAL PROJECT PARKING REQUIRED	1.5 9.0
PARKING PROVIDED ON SITE	9 SPACES
BUILDING HEIGHT ALLOWABLE PER TABLE 21.09.060-1: 35 FEET BUILDING HEIGHT ACTUAL:	25 FEET
FRONT YARD SETBACK PER TABLE 21.05.060-1	20 FEET
SIDE YARD SETBACK (FLEXIBLE: 5' MINIMUM) MINIMUM FRONT YARD PER TABLE 21.05.060-1 NOTE 2:	10 FEET
REAR YARD SETBACK: 10 FEET (FLEXIBLE: 5' MIN PER TABLE 21.05.060-1 NOTE 2)	10 FEET
LOT SIZE:	12,500.00 S.F.
MAXIMUM LOT COVERAGE BY BUILDING PER TABLE 21.05.060-1	40%
ACTUAL LOT COVERAGE BY BUILDING (INCLUDING DECKS) IS 3,464 S.F.	28%
MAXIMUM FLOOR AREA RATIO:	N/A
ACTUAL FLOOR AREA RATIO:	N/A
REQUIRED NATURAL VEGETATION AREA PER TABLE 21.09.070-1 (20% OF LOT SIZE):	2,500.00 S.F.
NATURAL VEGETATION AREA PROVIDED:	3,150 S.F.
REQUIRED PERMEABLE SURFACE AREA PER TABLE 21.09.070-1 (40% OF LOT SIZE):	5,000 S.F.
PERMEABLE SURFACE AREA PROVIDED: LOT SIZE: 12,500 S.F. BUILDING FOOT PRINT: -2,644 S.F. CONCRETE ENTRY LANDINGS: -116 S.F. DRIVEWAY AREA: -2,200 S.F. TOTAL PERMEABLE SURFACE PROVIDED: 7,040 S.F.	
REQUIRED SNOW STORAGE PER 21.09.070.1.c:	2465 S.F.
PLOWED AREA:	483 S.F.
REQUIRED SNOW STORAGE AREA:	840 S.F.
SNOW STORAGE AREA PROVIDED:	
MINIMUM DRIVEWAY WIDTH PER TABLE 21.09.070-2:	12 FEET
MAXIMUM ONE-WAY DRIVEWAY WIDTH PER TABLE 21.09.070-2:	14 FEET

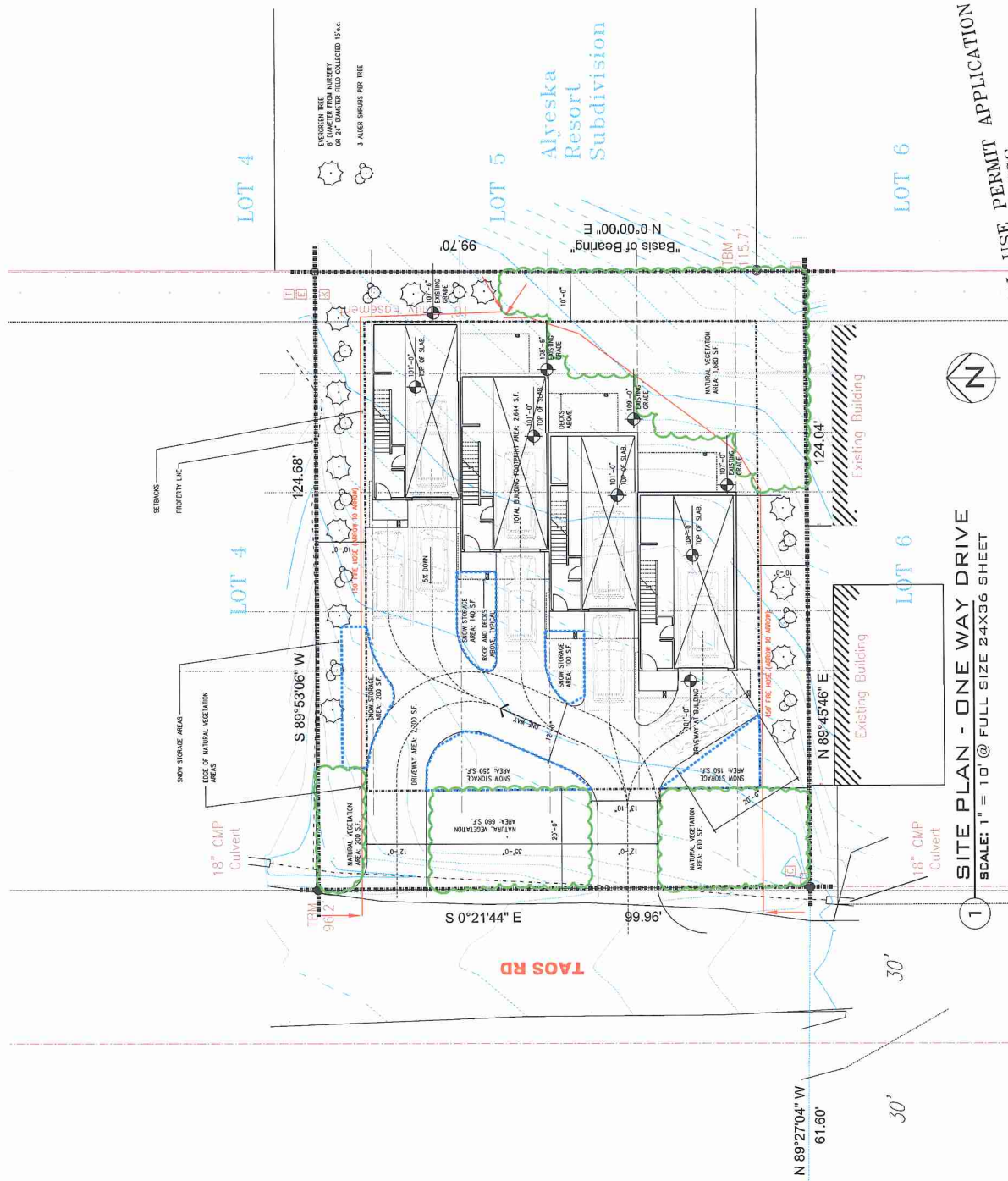


SITE PLAN - ONE WAY DRIVE

GROWWOOD, ALASKA
ZELLMER TOWNHOUSES

SUBMITTAL: 3-30-15
DATE PREPARED BY: MAZ
CHECKED BY:
REVISIONS:
JOB NUMBER: 15-13
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AD.1



N
CONDITIONAL
USE PERMIT APPLICATION
DRAWINGS
NOT FOR CONSTRUCTION

1
SITE PLAN - ONE WAY DRIVE
SCALE: 1" = 10' @ FULL SIZE 24X36 SHEET



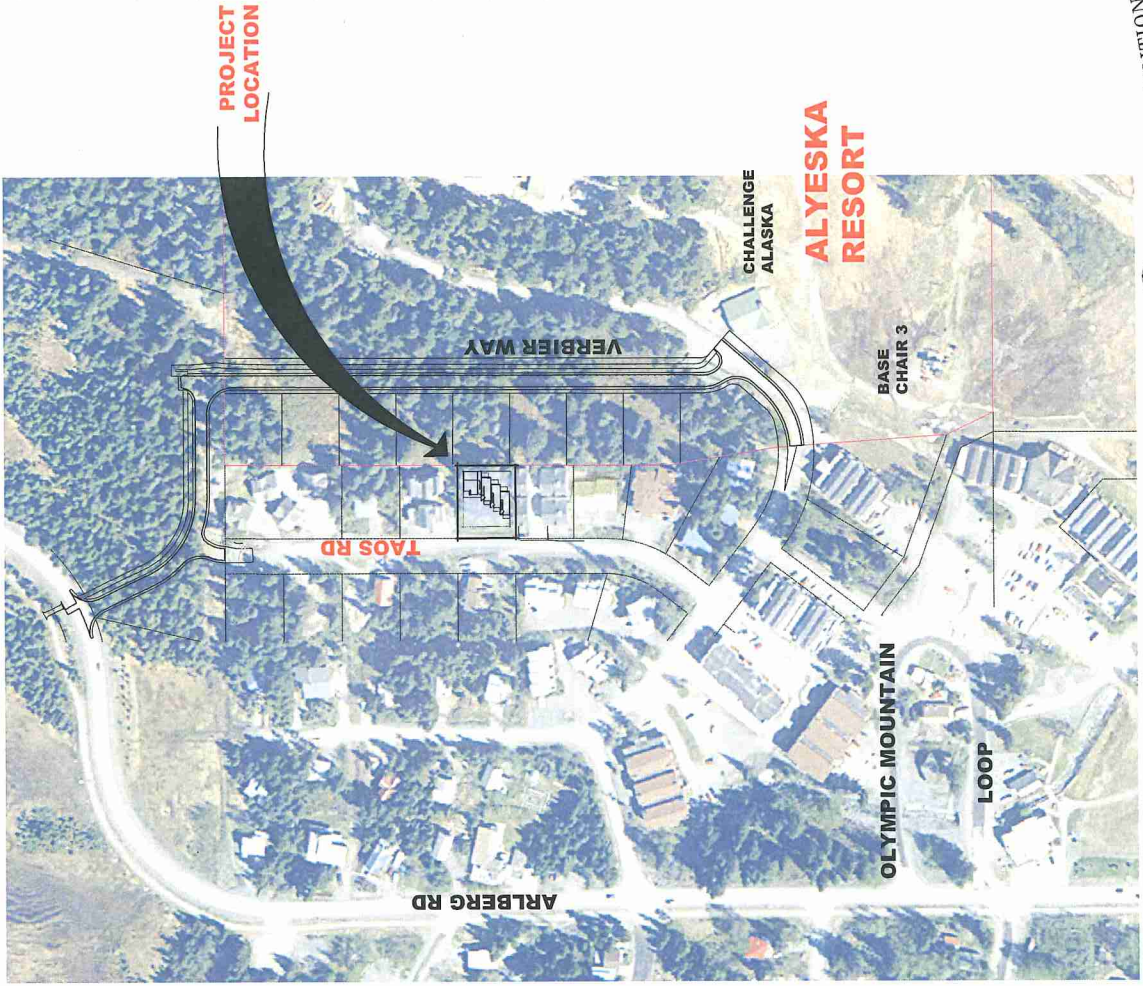
LOCATION IN GIRDWOOD

ZELLMER TOWNHOUSES
GIRDWOOD, ALASKA

SUBMITTAL: 3-30-15
DATE: 3-30-15
CHECKED BY: MAZ
REVISIONS:

JOB NUMBER: 15-1-3
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AD.2



CONDITIONAL USE PERMIT APPLICATION
DRAWINGS
NOT FOR CONSTRUCTION



1 LOCATION IN GIRDWOOD
SCALE: 1" = 100' @ FULL SIZE 24X36 SHEET



1 RENDERING - FROM SOUTHWEST
SCALE: N.T.S.

APPLICATION
CONDITIONAL USE PERMIT
DRAWINGS
NOT FOR CONSTRUCTION



Z ARCHITECTS
ARCHITECTS • INTERIORS • LANDSCAPE ARCHITECTS

RENDERING - FROM SOUTHWEST

ZELLMER TOWNHOUSES
GIRDWOOD, ALASKA

SUBMITTAL: 3-30-15
DRAWN BY: MAZ
CHECKED BY: MAZ
REVISIONS:

JOB NUMBER: 15-13
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AD.3



Z ARCHITECTS
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RENDERING - FROM WEST

ZELLMER TOWNHOUSES
BIRWOOD, ALASKA

SUBMITTAL: 3-30-15
DATE: 3-30-15
CHECKED BY: MAZ
REVISIONS:

JOB NUMBER: 15-13
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AD.4



CONDITIONAL USE PERMIT APPLICATION
DRAWINGS
NOT FOR CONSTRUCTION

1 RENDERING - FROM WEST
SCALE: N.T.S.



ZARCHITECTS
ARCHITECTS • INTERIORS • LANDSCAPE ARCHITECTS

RENDERING - OVERHEAD FROM SOUTHWEST

ZELLMER TOWNHOUSES
GIRWOOD, ALASKA

DATE: 11-15-13
JOB NUMBER: 13-13
DRAWN BY: MAZ
CHECKED BY: MAZ
REVISIONS:
DATE: 11-15-13

AD.5



NOT FOR CONSTRUCTION
CONDITIONAL USE PERMIT APPLICATION
DRAWINGS

RENDERING - OVERHEAD FROM WEST
SCALE: N.T.S.

1

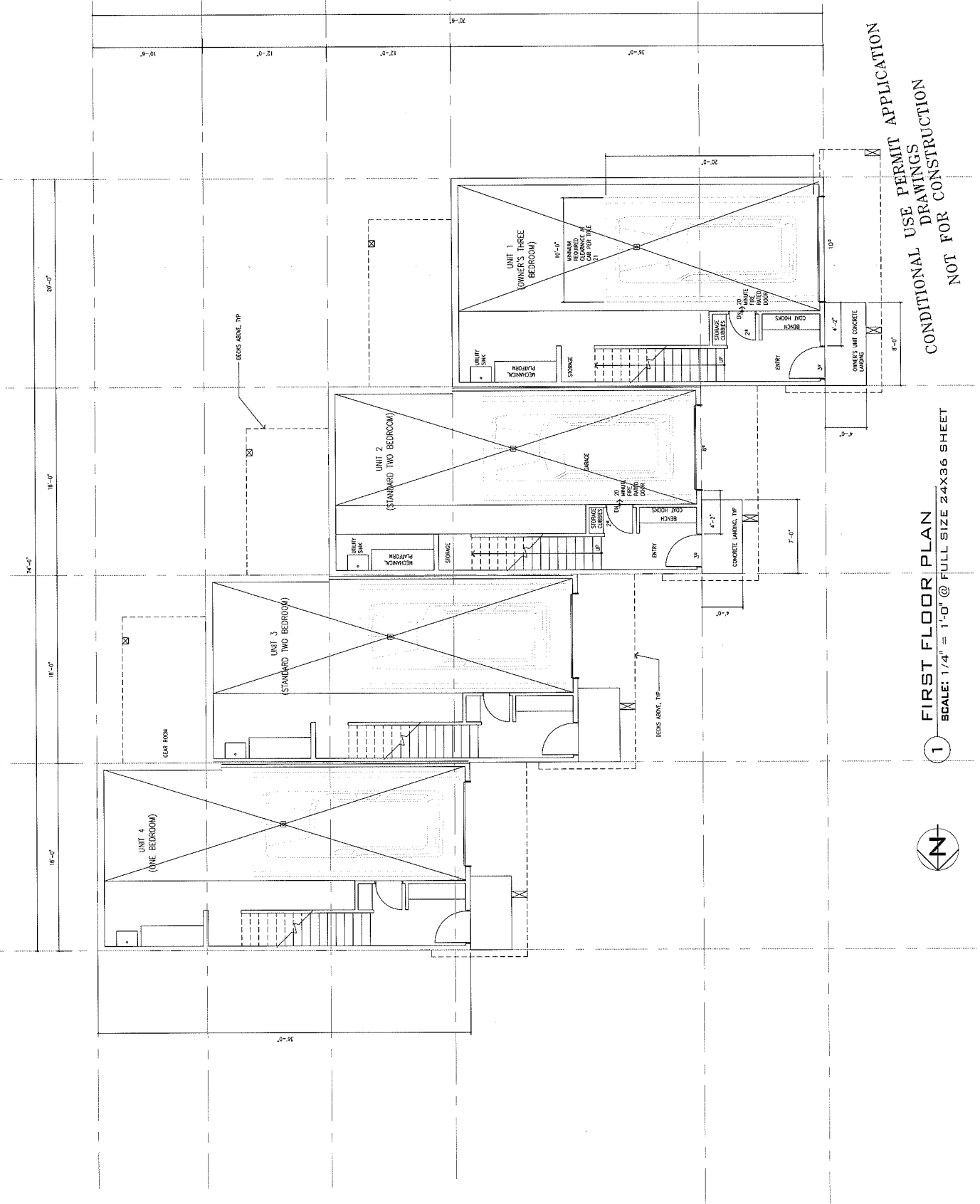


ZELMER TOWNHOUSES
GIRWOOD, ALASKA
FIRST FLOOR PLAN

SUBMITTAL: 03-30-15
DESIGNED BY: MAZ
REVISIONS:

JOB NUMBER: 15-113
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A1.1



CONDITIONAL USE PERMIT APPLICATION
DRAWINGS
NOT FOR CONSTRUCTION

1 FIRST FLOOR PLAN
SCALE: 1/4" = 1'-0" @ FULL SIZE 24X36 SHEET





Z ARCHITECTS
ARCHITECTS INC. 140001
STATE OF ALASKA

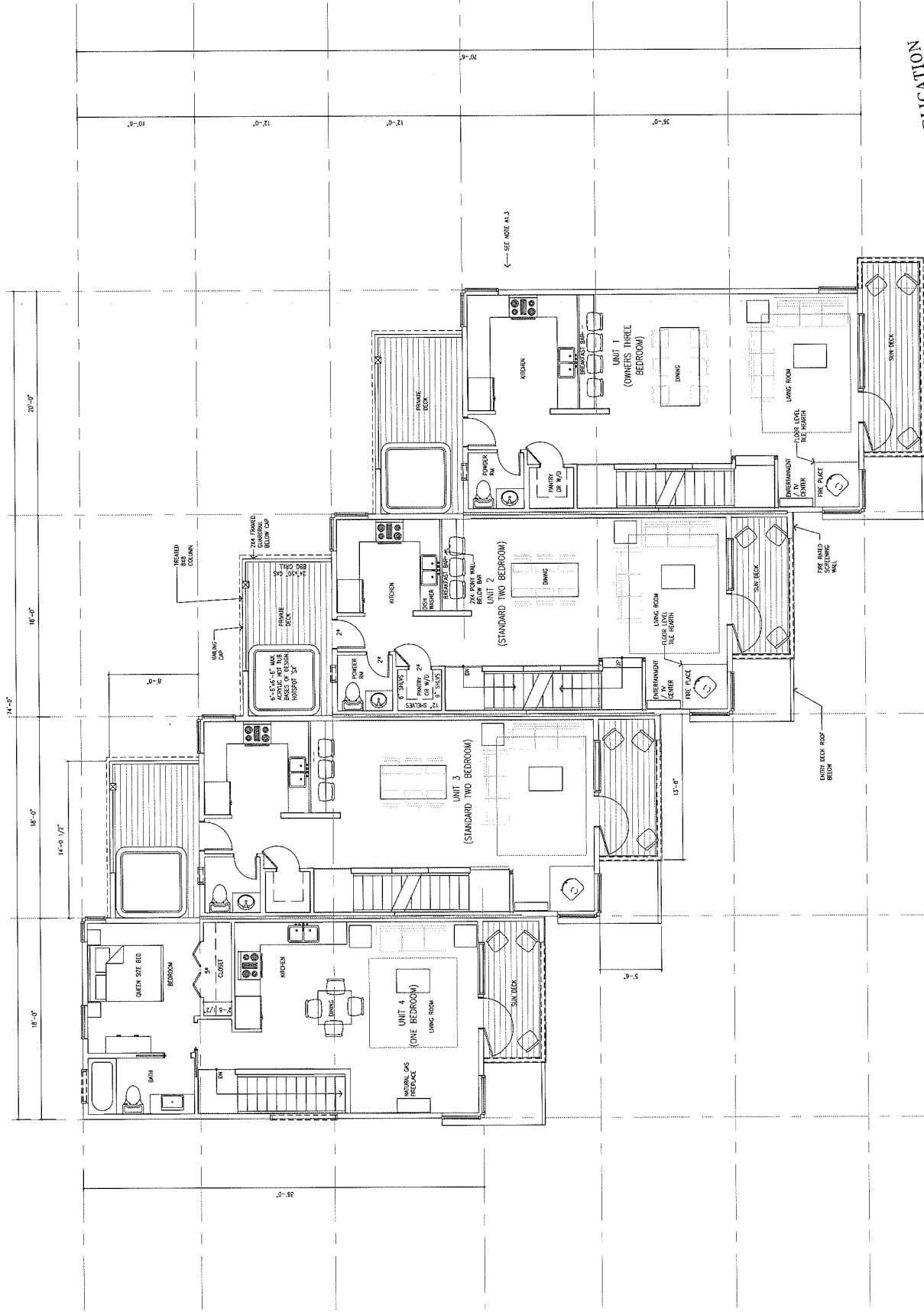
SECOND FLOOR PLAN

ZELLMER TOWNHOUSES
GIRDWOOD, ALASKA

..... SUBMITTAL: GSP 03.15
..... CHECKED BY: MAZ
..... REVISIONS:

..... JOB NUMBER: 15-13
..... COPYRIGHT 2015

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NOT FOR CONSTRUCTION
CONDITIONAL DRAWINGS
USE PERMIT APPLICATION

1 SECOND FLOOR PLAN
SCALE: 1/4" = 1'-0" @ FULL SIZE 24X36 SHEET





Z ARCHITECTS
INCORPORATED
1000 W. 10TH AVENUE
ANCHORAGE, ALASKA 99501

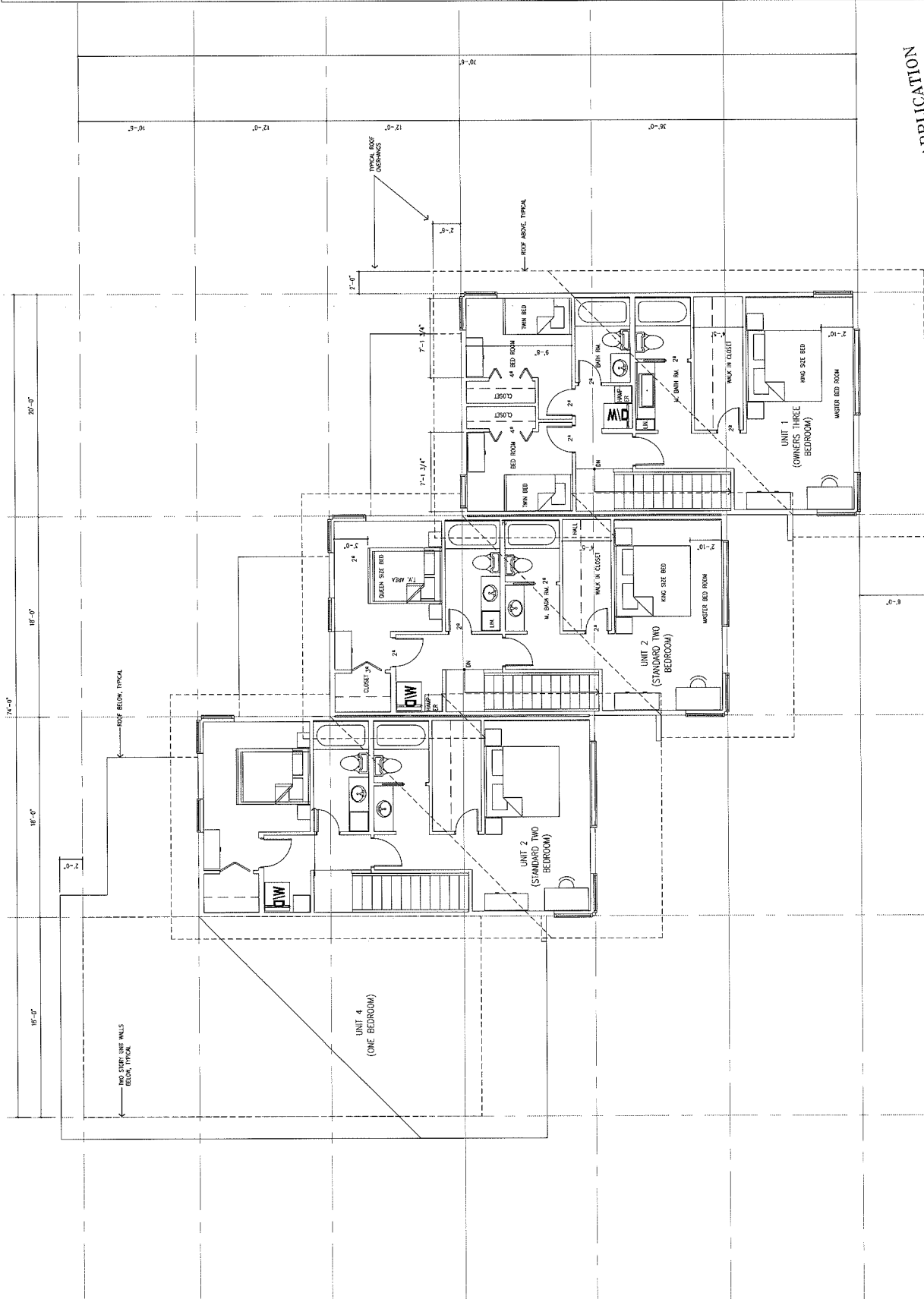
ZELMER TOWNHOUSES
GIRDWOOD, ALASKA

THIRD FLOOR PLAN

•••••
SUBMITTAL: 03-03-2015
•••••
CHECKED BY: MAZ
REVISIONS:
•••••

•••••
JOB NUMBER: 15-13
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•••••

A1.3



CONDITIONAL
DRAWINGS
NOT FOR CONSTRUCTION

1 THIRD FLOOR PLAN
SCALE: 1/4" = 1'-0" @ FULL SIZE 24X36 SHEET





WEST ELEVATION

ZELLMER TOWNHOUSES
GIRWOOD, ALASKA

SUBMITTAL: 03-20-15
DRAWN BY: MAZ
CHECKED BY:
REVISIONS:

JOB NUMBER: 13-13
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A2.1



NOT FOR CONSTRUCTION
DRAWINGS
PERMIT APPLICATION

1 WEST ELEVATION
SCALE: 1/4" = 1'-0" @ FULL SIZE 24X36 SHEET



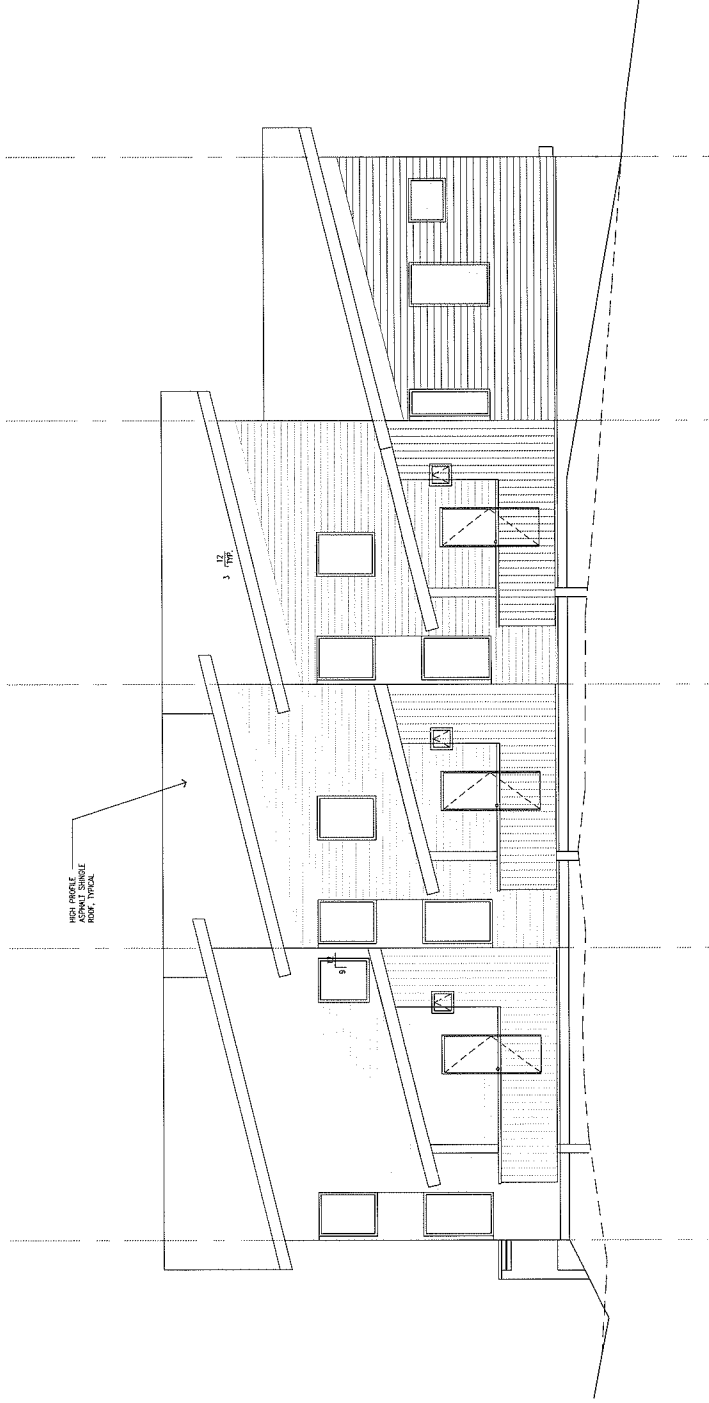
EAST ELEVATION

ZELLMER TOWNHOUSES
GIRDWOOD, ALASKA

SUBMITTAL: 03-30-15
DESIGNED BY: MAZ
CHECKED BY:
REVISIONS:

JOB NUMBER: 15-13
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A2.2



1 EAST ELEVATION @ FULL SIZE 24X36 SHEET CONDITIONAL USE PERMIT APPLICATION DRAWINGS NOT FOR CONSTRUCTION
SCALE: 1/4" = 1'-0"



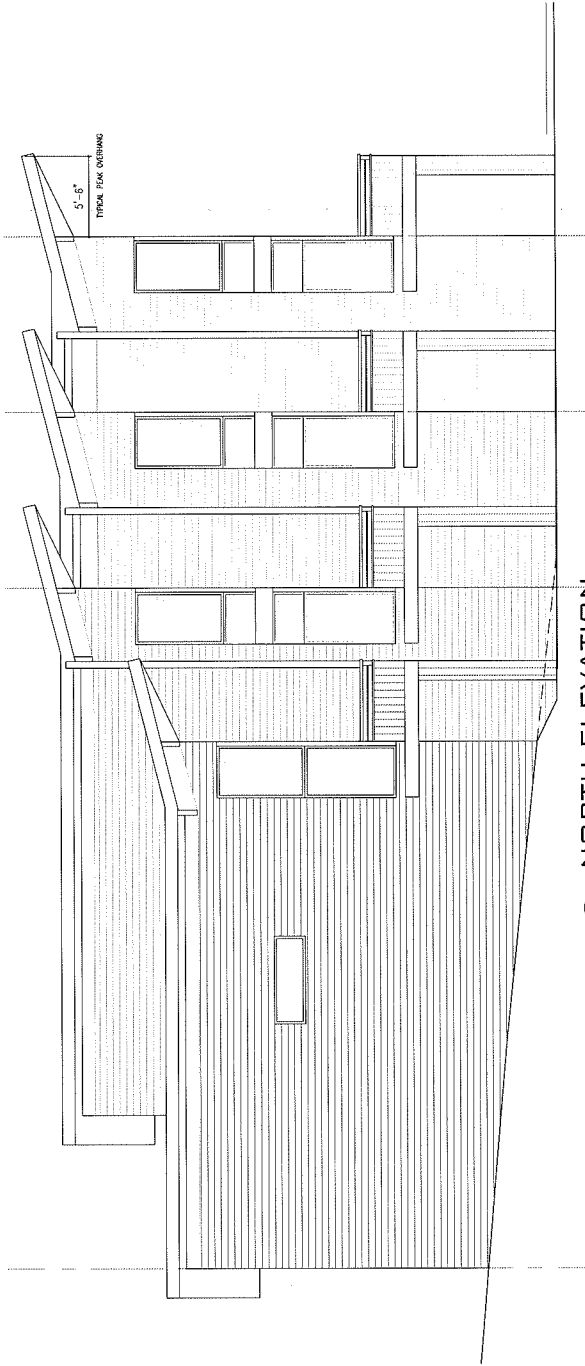
NORTH & SOUTH ELEVATIONS

ZELLMER TOWNHOUSES
GIRWOOD, ALASKA

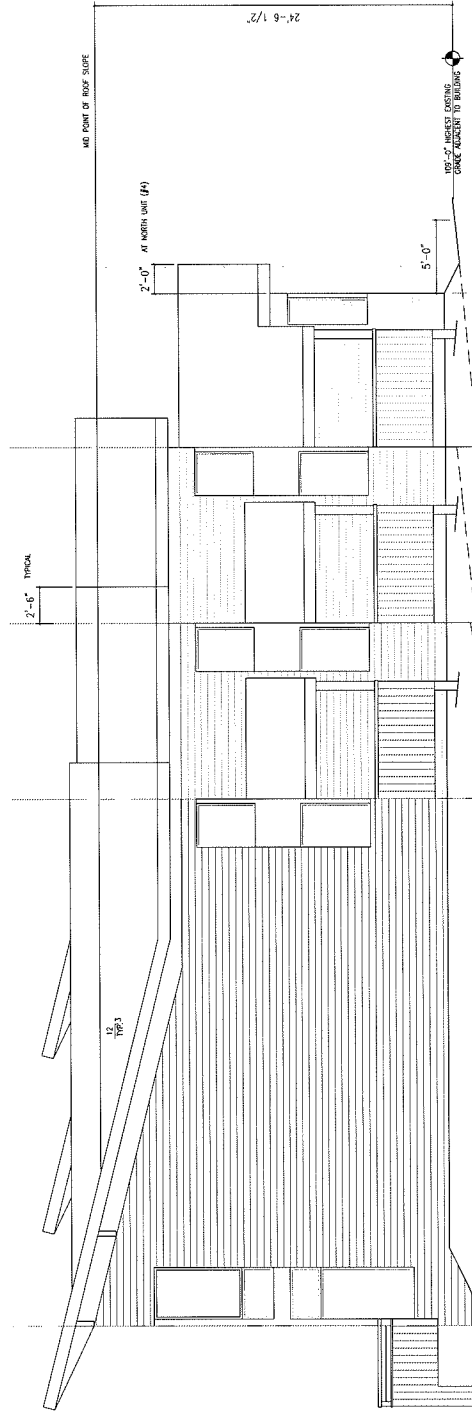
SUBMITTAL: 03.30.15
DRAWN BY: MAZ
CHECKED BY:
REVISIONS:

JOB NUMBER: 15-13
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A2.3



1 NORTH ELEVATION
SCALE: 1/4" = 1'-0" @ FULL SIZE 24X36 SHEET



2 SOUTH ELEVATION
SCALE: 1/4" = 1'-0" @ FULL SIZE 24X36 SHEET

CONDITIONAL USE PERMIT APPLICATION
DRAWINGS
NOT FOR CONSTRUCTION



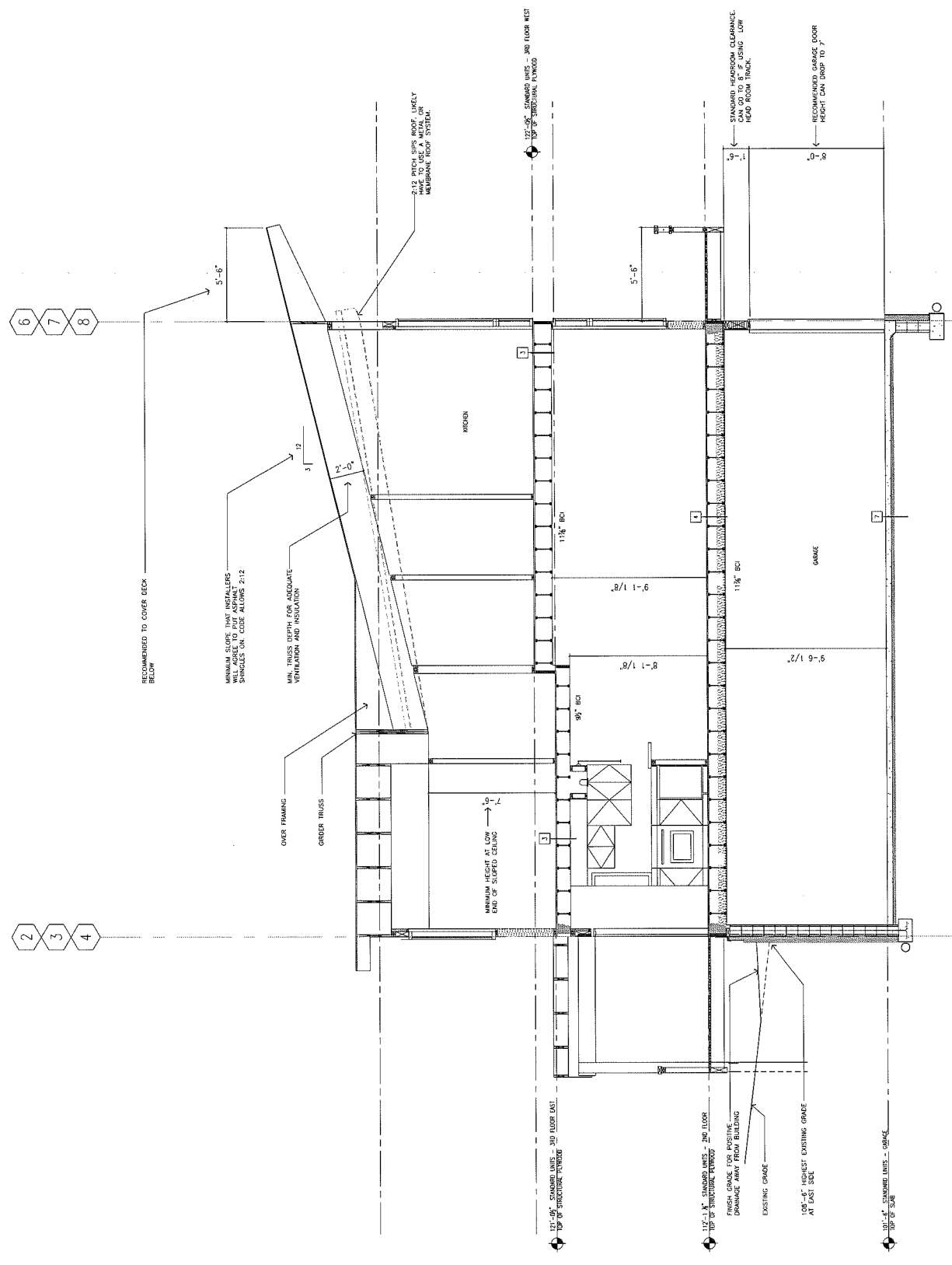
EAST-WEST BUILDING SECTION AT 3 STORY UNITS

ZELLMER TOWNHOUSES
GIRDWOOD, ALASKA

SUBMITTAL: 03.03.19
 CHECKED BY: MAZ
 REVISIONS:

JOB NUMBER 18-13
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A3.1



1 EAST-WEST BUILDING SECTION AT 3 STORY UNITS
 SCALE: 3/8" = 1'-0" @ FULL SIZE 24X36 SHEET



Z ARCHITECTS
INCORPORATED IN ALASKA
18071

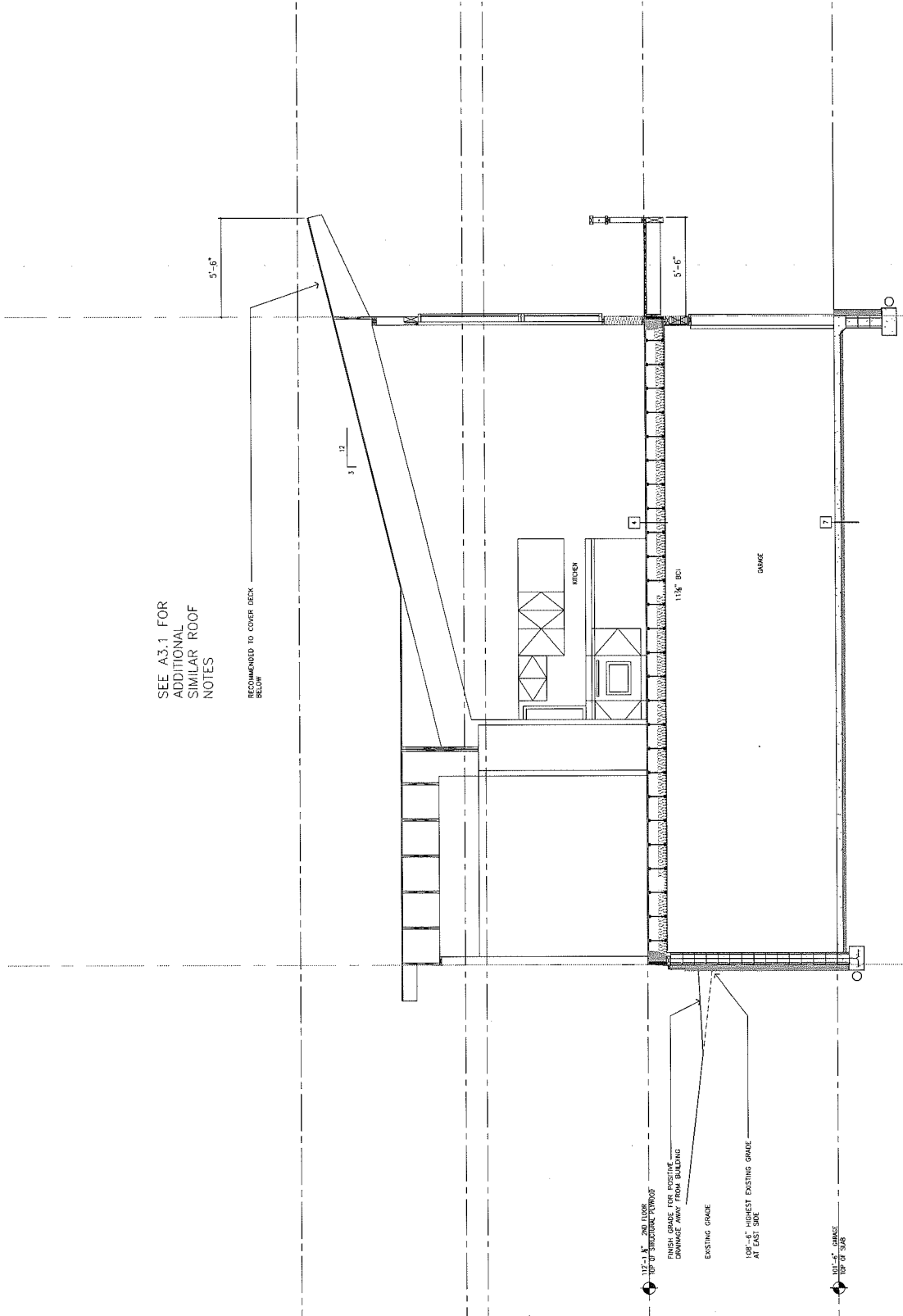
EAST-WEST BUILDING SECTION AT 2 STORY UNIT

ZELLNER TOWNHOUSES
GIRWOOD, ALASKA

SUBMITTAL: 03.30.15
CHECKED BY: MAZ
REVIEWER:

JOB NUMBER: 15-13
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A3.2



1 EAST-WEST BUILDING SECTION AT 2 STORY UNIT (#4)
SCALE: 3/8" = 1'-0" @ FULL SIZE 24X36 SHEET

MUNICIPALITY OF ANCHORAGE
PLANNING AND ZONING COMMISSION
RESOLUTION NO. 2011-023

A RESOLUTION APPROVING A FINAL CONDITIONAL USE TO EXCEED PERMITTED DENSITY WHICH WILL ALLOW A MULTIFAMILY DEVELOPMENT CONSISTING OF FOUR DWELLING UNITS IN ONE BUILDING, ON A LOT OF 12,500 SQUARE FEET, A DENSITY EQUIVALENT OF 14 UNITS PER ACRE, IN THE GR-4 ZONE (GIRDWOOD MULTIPLE FAMILY RESIDENTIAL DISTRICT), BLOCK 6, LOT 5, ALYESKA North #3 SUBDIVISION, GENERALLY LOCATED AT 180 TAOS ROAD.

(Case 2011-057; Tax I.D. No. 076-015-40)

WHEREAS, a request has been received from Robert King, owner, for a conditional use to allow a multifamily development consisting of four dwelling units in one building to exceed a density equivalent of eight units per acre in the gR-4 zone (Girdwood multiple family residential) district, Block 6, Lot 5, Alyeska North #3 Subdivision, generally located at 180 Taos Road, and

WHEREAS, the proposed density of the development is approximately 14 dwelling units per acre, four units on a lot of 12,500 square feet, and a conditional use review is required when density exceeds 8 units per acre; the Girdwood Area Plan and the gR-4 district allow for densities from 9 to 20 dwelling units per acre with an approved conditional use, and

WHEREAS, the intent of the gR-4 district is to continue the existing pattern of multi-family residential development where sewer service is available, and there is a need for additional residential construction in Girdwood and this project proposes a density of 14 dwelling units per acre, and

WHEREAS, a revised site plan and public comments were laid on the table at the June 13th meeting, and the Commission took time as a committee of the whole to review this new information, and

WHEREAS, the Planning and Zoning Commission held a public hearing on this item on June 6 and approved this application on June 13, 2011.

NOW, THEREFORE, BE IT RESOLVED, by the Municipal Planning and Zoning Commission that:

A. The Commission makes the following findings of fact:

1. The proposal as conditioned and shown on the site plan is consistent with the Girdwood Area Plan and compatible with nearby uses. The area is developed as single and multi-family.
2. The proposal has been reviewed by the Girdwood Land Use Committee and the Girdwood Board of Supervisors. A letter of support from them was included in the application.
3. The conditions of approval are sufficient to safeguard the nearby residential areas and maintain the character of the area. The project will provide required and overflow parking on site. Overflow parking will no longer be needed on Taos Road, which had a been a major concern of the neighborhood and the Commission.
4. The site plan change, laid on the table on June 13, enlarging the two southern most garages, is a minor change when compared to the overall building footprint. Public comments laid on the table raised concerns about density, tandem parking, and overflow parking. These issues had been discussed at the June 6 public hearing and if there were additional concerns, those concerns should have been discussed at the time. The issue now is the 80 square foot increase in garage size.
5. The issue of off site over flow parking has been addressed with a creative, if unorthodox, redesign of the garages. The current code parking requirement for condominiums is onerous and excessive. The parking solution proposed by the applicant is appropriate.
6. The density of this project is larger than one of the adjacent properties, but is somewhat mitigated by the staggered design of the building and the overall architecture.

The Commission approves the conditional use to allow four dwelling units in one building on a lot of 12,500 square feet, a density equivalent of 14 dwelling units per acre, in the GR-4 district (Girdwood multiple family residential), subject to the conditions below:

1. A notice of zoning action and a copy of the Resolution shall be filed with the State Recorder's Office and proof of such shall be submitted to the Planning Department.

2. This approval is for a final conditional use for one, four unit condominium building, essentially as shown on the submitted site plan, in the GR-4 zone, per AMC 21.09.050, 21.09.060, 21.09.070, 21.09.080 and AMC 21.50.020, and the Girdwood Area Plan, plus the petitioner's application, narrative, and all submittals; Alyeska North #3 Subdivision, Block 5, Lot 6, generally located at 180 Taos Road.
3. This approval is for the layout and design of the buildings, parking areas, driveways, shared access, landscaping, etc. essentially as shown on the site plan labeled – "Site plan - one way drive," sheet A0.1, and other drawings, prepared by Z Architects, dated 4-14-11, and revised 06-08-11, scale 1:10, as modified by this conditional use. Internal driveways and parking, including the enclosed parking, must conform to Municipal standards and policies and procedures, details will be finalized with Traffic, Fire and PM&E.
4. Wood shingles shall not be used for the roof material.
5. If exterior lighting is limited to individual entry lights, a lighting plan is not required. Otherwise, exterior site lighting shall comply with applicable sections of AMC 21.09.070 G.
6. The homeowners association is responsible for snow storage and removal. Individual unit owners are responsible for garbage containers. Language regarding snow removal and garbage container requirements shall be included in the association covenants.
7. No signs are shown or proposed. Otherwise, sign standards of AMC 21.47 shall apply.
8. Landscaping per AMC 21.09.070 E. is required as supplemented herein. Existing vegetation in the required setback areas is not to be disturbed except as minimally necessary to provide approved access to the property. Portions of the side and rear yards that were previously disturbed, or do not contain the required vegetation, shall be supplemented to the standards of AMC 21.09.070 E.4.c.

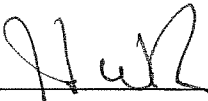
Prior to any land clearing activity or the issuance of a land use permit the applicant shall: (a) provide a plot plan with required landscaping and non-disturbance areas shown; (b) install fencing or other sturdy barriers to protect the non-disturbance areas (to be installed in accordance with AMC 21.09.070.E.7.b) and (c) request an inspection by Code Enforcement to document and verify protective measures.

All supplemental landscaping is to be installed within 12 months of issuance of a Conditional Certificate of Occupancy and applicant will request a final zoning inspection within that 12 month period to verify compliance with the above standards.

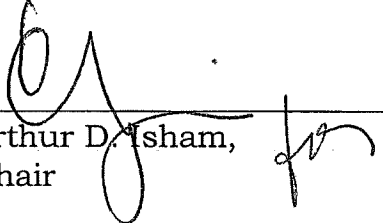
9. Record a 10 foot wide drainage easement along the north and south side yard lot lines. The easement can be recorded by book and page, it does not need to be shown on the plat.

PASSED AND APPROVED by the Municipal Planning and Zoning Commission on the 13th day of June 2011.

ADOPTED by the Anchorage Municipal Planning and Zoning Commission this 11th day of July 2011. This written decision/resolution of the Planning and Zoning Commission is final and any party may appeal it within twenty (20) days to the Board of Adjustment pursuant to Anchorage Municipal Code 21.30.030.



Jerry T. Weaver, Jr.,
Secretary



Arthur D. Tsham,
Chair

(Case No. 2011-057 Tax ID 076-015-40)

**Geotechnical Engineering Report
180 Taos Road Townhouses
Z Architects
Girdwood, Alaska**

February 2011

Submitted To:

Z Architects
PO Box 842
Girdwood, Alaska 99587
Phone: (907)783-1090
Fax: (907)783-1095

By:

Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518
Phone: (907)561-2120
Fax: (907)561-4483
E-mail: glj@shanwil.com

32-1-02153

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FIGURES

1	Vicinity Map
2	Site Plan
3	Soil Classification Legend
4	Frost Classification Legend
5	Log of Test Pit TP-1
6	Log of Test Pit TP-2
7	Log of Test Pit TP-3
8	Log of Test Pit TP-4
9	Grain Size Classification
10	Atterberg Limits Results
11	Floor Slab and Footing Detail
12	Utility Trench Detail
13	Gradation Requirements

APPENDIX

A	Important Information About Your Geotechnical/Environmental Report
---	--

GEOTECHNICAL ENGINEERING REPORT
180 TAOS ROAD TOWNHOUSES
Z ARCHITECTS
GIRDWOOD, ALASKA

1.0 INTRODUCTION

This report presents the results of subsurface explorations, laboratory testing and geotechnical engineering studies for the proposed new townhouses to be located at 180 Taos Road in Girdwood, Alaska. The purpose of this study is to gather geotechnical data and to make engineering recommendations for the design of a proposed new building.

To gain data for our analyses, four test pits were advanced in the project area. The primary goal of the explorations was to characterize soils beneath or near the proposed building footprint to explore for possible shallow bedrock, and to evaluate the density or compactness of the subsurface conditions. This effort was supported by laboratory testing on select soil samples to estimate index properties of the materials. Engineering studies were then performed to develop design recommendations for the structure. Our report for this work contains descriptions of the proposed project, field explorations, laboratory testing, interpretation of subsurface conditions and conclusions and recommendations regarding foundation support.

Written authorization to proceed with this project was received in the form of an email from Mr. Marco Zaccaro, of Z Architects on January 14, 2011.

2.0 SITE AND PROJECT DESCRIPTION

The project site is an undeveloped lot located at 180 Taos Road in Girdwood, Alaska. A vicinity map indicating the general project location is presented as Figure 1. A site plan is included as Figure 2, and provides a view of the project area and the approximate location of our test pits.

The topography within the property generally slopes down from the southeast corner to the northwest and has an approximate elevation change of 16 feet. At the time of our explorations, the site was covered with one to two feet of snow and vegetation included large spruce, small brush, and grasses. According to drawings provided by you, the new structure will consist of three, approximately 16 foot by 40 foot units and one 30 foot by 40 foot unit in a connected townhouse building with an associated driveway. We understand that, due to topography, the east portion of the townhouses will have a finished grade approximately 6 feet below the existing

ground surface. The finished grade on the west side of the townhouse structure will be at approximately the current ground surface.

3.0 SUBSURFACE EXPLORATION

The field work for this project consisted of excavating four test pits, designated Test Pits TP-1 through TP-4 on January 17, 2011. The test pits were excavated to evaluate the general subsurface conditions at the site. The approximate locations of the test pits are shown on Figure 2.

Excavating services for this project were provided by HR Redmond Co. with a Volvo EC140B tracked excavator under contract to Z Architects. An experienced geologist from our firm was present during excavation to log subsurface conditions, collect soil samples, and observe groundwater if appropriate. At the completion of our explorations, the holes were backfilled with cuttings removed during excavation. The test pit locations shown on Figure 2 were approximated using cloth tape measurement from existing site features. Elevations were estimated using drawings provided by Z Architects. Test pit locations and elevations should be considered approximate.

Soils encountered in the test pits were visually classified in the field using the Unified Soil Classification System (USCS), presented in Figure 3. These classifications were then verified through selective laboratory analysis. USCS group names and symbols are provided for those soils confirmed by laboratory testing on the grain size classification sheets. Frost classifications were also estimated for selected samples based on laboratory evaluations. The frost classification system is presented as Figure 4.

4.0 LABORATORY TESTING

Laboratory tests were performed on select soil samples from the test pits to verify our field classifications and to estimate the index properties of the typical materials encountered at the site. Results of the soil tests performed on samples from each test pit are presented on the summary logs (Figures 5 through 8) and in the laboratory test results on Figures 9 and 10.

Water content tests were performed on samples collected from the test pits. Water content tests were generally conducted according to procedures described in ASTM International (ASTM) D2216. The results of the water content measurements are presented graphically on the test pit logs.

Grain size classification tests were conducted on select samples to confirm the field classification of the soils encountered. The gradation testing generally followed the mechanical sieve procedures described in ASTM C136. The grain size testing results are presented in Figure 9 and summarized on the test pit logs as percent gravel, percent sand, and percent fines. Percent fines on the test pit logs are equal to the sum of the silt and clay fractions indicated by the percent passing the Number 200 sieve.

Tests were conducted on select samples to estimate the amount of material passing the Number 200 sieve (P-200). This test was performed in general accordance with ASTM C117. The P-200 test provides an estimate of the fines (silt and clay) content. The results of this test are presented on the test pit logs, indicated as percent fines.

Atterberg limits were evaluated for one sample from the native, fine-grained soils encountered in the explorations. The test was performed in accordance with ASTM D4318. This analysis provides information on the plasticity characteristics of the silt or clay. The result of this test is summarized on Figure 10 as well as on the test pit log.

5.0 SUBSURFACE CONDITIONS

Subsurface conditions at the site are presented graphically in the test pit logs presented in Figures 5 through 8. Our test pits encountered fine grained materials and silty, granular material.

Test Pits TP-1 and TP-2 encountered approximately one foot of peat at the surface overlying 5 to 6 feet of gravelly, sandy silt over 6 to 7 feet of sandy, silty gravel with cobbles and occasional boulders to the bottom of the excavation. The consistency of the silt layer ranged from medium stiff to hard and the relative density of the gravel ranged from medium dense to very dense. In Test Pit TP-3, we encountered approximately one foot of peat overlying medium dense to dense, gravelly, silty sand. In Test Pit TP-4, we found 8 inches of peat overlying approximately 11 feet of medium stiff to hard, gravelly, sandy clay and 1.5 feet of very dense, gravelly, silty sand.

In Test Pits TP-1 through TP-3, the maximum grain size observed ranged from approximately 8 to 14 inches. The approximate percentage of cobble and boulder size material encountered in the gravel layer ranged from 5 to 15 percent by visual observation. In addition, a boulder of unknown size was encountered in Test Pit TP-3. For constructability and budget purposes, it should be noted that there is potential for very large boulders and/or bedrock to be encountered during construction.

Moisture contents ranged from approximately 7 to 22 percent for coarse grained soils and approximately 8 to 17 percent for fine grained soils. Although groundwater was generally not encountered during our test pit explorations, occasional layers of silty, granular material may contain some perched water that may leach out if exposed.

6.0 ENGINEERING CONCLUSIONS AND RECOMMENDATIONS

The design of foundations for support of the proposed new structure must consider the bearing support capabilities of the soils as well as the expected settlements and the effects of seasonal frost action. Site explorations generally encountered silty and/or granular soils that are relatively compact. With proper site preparation, we believe the conditions encountered in the test pits are adequate to support the proposed site improvements. We assume that conventional shallow foundations are desired for the site development, which, in our opinion, should be appropriate for this project.

6.1 Site Preparation

Site preparation should include removal of the organic-rich surface material, which generally ranged from 8 inches to 1 foot thick (but could be thicker in isolated areas). Excavation could be difficult due to the presence of cobbles or boulders and the density of the material. During earthwork, we recommend that the subgrade soils be probed by a qualified engineer to verify that unsuitable soils have been removed and compact native soils are exposed at the limits of excavation. To reduce the risk of future settlement, deep unsuitable soils (unsuitable soils extending deeper than recommended depths of structures) that are found should be over-excavated to firm, unyielding native soils, and replaced with compacted structural fill. If sub cutting is required, it should extend out a minimum distance equal to the sub-cut depth from the outer edge of the footings.

Native soils may be both moisture and frost sensitive and could locally be soft and compressible. They may become soft by disturbance or wetting during construction, or naturally due to the presence of groundwater. If work in the bottom area of the excavation is carried out with a backhoe, a smooth bucket edge or a flat steel plate covering the web space between the backhoe teeth will reduce ground disturbance and also minimize hand work at this grade. We recommend that we be retained to observe excavations and that a contingency be maintained to allow for localized over-excavation and replacement beyond the minimum depth beneath the proposed structure.

Prior to fill placement, the exposed grade should be proof-rolled to produce a firm, unyielding surface for construction. Classified fill placed beneath footings should be placed and compacted in accordance with the recommendations in Section 6.8.

6.2 Building Foundation

We recommend that the proposed new townhouses be supported on spread or continuous strip footings bearing directly on firm, unyielding native materials. The recommended minimum width is 16 inches for continuous strip footings and 24 inches for spread footings. The base of exterior footings and unheated interior footings should be buried sufficiently to prevent structural damage resulting from frost action. We recommend that perimeter footings in heated buildings be placed a minimum of 4 feet below the ground surface. For interior footings in heated areas, footings may be placed directly below the floor slab such that embedment is 14 inches or more. If portions of the proposed building are to be unheated, the minimum burial depth for footings should be increased to 5 feet bgs for frost protection. We recommend that a subdrain be installed to direct subsurface water away from the footing walls. A typical footing detail with subdrain is included in Figure 11. The figure presented shows details for a basement because we understand that finished grade for the rear portion of the townhouses will be below the existing ground surface.

Based on the expected footing dimensions, depths, and site preparation recommendations, we recommend that foundations for the proposed building additions be designed with an allowable soil bearing pressure of 2,000 psf. The above bearing value may be increased by one-third for short-term wind or seismic loading.

6.3 Estimated Building Settlements

The total settlements that could develop at the building site are dependent upon the actual loads that are applied, the footing sizes, and the properties of the soils below the footings. Based on the anticipated behavior of the native soils and allowable bearing pressures we estimate total settlements of about 1-inch could occur and that differential settlements could be about one-half of the total over a distance of 50 feet. Long term differential settlements of the building should be relatively small and within tolerable limits.

6.4 Floor Slab Support

Floor slabs for the proposed addition should be placed generally as shown on Figure 11. If loose or soft areas are encountered, we recommend they be excavated and replaced. Unclassified fill

may be used to replace loose soils below a minimum of 18 inches of compacted, classified fill from the bottom of the slab as described above. We recommend a 4 to 6-inch drainage blanket be constructed beneath the slab to maintain a dry floor. Where floor coverings are expected, we recommend installing a vapor retarder directly beneath the concrete slab. Figure 11 shows a footing detail with a typical concrete slab design section.

6.5 Drainage

Groundwater was not encountered during explorations, which extended to approximately 13 feet bgs; therefore, in our opinion, groundwater should not be encountered during construction. However, due to the proximity of higher ground at the back of the property, we expect that shallow water could occur seasonally. We recommend that site grading be carefully designed such that surface water and roof run-off are directed away from the proposed building, so that it cannot pond against or infiltrate the soils near the building walls. The subdrain will need an outlet to drain water away from footings. It may be day lighted at a lower elevation with insulation or heat tape to prevent freezing.

6.6 Lateral Earth Pressures and Lateral Resistance

Building walls below ground which support earth fills and floor slabs should be designed to resist lateral earth pressures. The magnitude of the pressures is dependent on the method of placement of backfill, the type of backfill material, drainage provisions, and whether the wall is allowed to deflect after or during placement of backfill.

If the walls are allowed to deflect laterally or rotate an amount equal to about 0.001 times the height of the wall, an active earth pressure condition under static loading would prevail and an equivalent fluid weight of 47 pounds per cubic foot (pcf) is recommended for design of walls backfilled with Type II/IIA classified fill. For rigid walls that are restrained from deflecting at the top, an at-rest earth pressure condition would prevail and an equivalent fluid weight of 67 pcf is recommended. To simulate seismic loading, a rectangular pressure prism with a magnitude of 14 pounds per square foot (per foot of wall height) should be applied to the entire height of the wall.

Lateral forces from wind or seismic loading may be resisted by passive earth pressures against the sides of footings, exterior walls below grade and grade beams. In our opinion, these resisting pressures can be estimated using an equivalent fluid weight of 300 pcf. This value assumes that backfill around the footings and stem walls are densely compacted.

Lateral resistance may also be developed in friction against sliding along the base of foundations placed on grade such as footings or floor slabs. These forces may be computed using a coefficient of 0.4 between concrete and soil.

6.7 Utility Trenches

Buried pipes and cables may be needed to tie the new building into utilities. Trenches excavated for installation of these new utilities should be constructed as presented in Figure 12. The bedding and structural fill material around the buried utility should be densely compacted to support and hold the pipe firmly in place.

Groundwater was not observed in our explorations, but typical utility trenches may encounter water seepage during excavation. Sumps and pumps should be sufficient to remove and discharge any trench water, provided trenching activities are planned for rapid excavation, utility construction, and backfill.

Since the native soils in this area are moist and contain moderate amounts of silt, excavation slopes will initially tend to stand steeply. The slope and excavation bottom conditions should be made the responsibility of the contractor, who will be present on a day to day basis and can adjust efforts to obtain the needed stability and meet the applicable Alaska and Federal (OSHA) safety regulations.

Below areas to receive pavements or support foundations, trench backfill should be placed in maximum 12-inch loose lifts and compacted to at least 95 percent of the Modified Proctor maximum dry density, as discussed in the following section. In areas where no structures or paving are planned, less compaction is required and material may be placed in thicker lifts (up to 18 inches) and moderately compacted to achieve at least 90 percent compaction. Utility trenches should be backfilled with existing inorganic native soils as much as practical between the top of the pipe bedding and the bottom of the road subgrade, or to original ground surface in areas where no pavement is needed. Bulking of backfill into the trench should be discouraged as this can cause voids and could lead to large future surface settlements.

6.8 Structural Fill and Compaction

Backfill will be required behind the foundation walls and under asphalt pavements. Structural fill that is placed should be clean, well-graded, granular soil to provide drainage and frost protection. These soils should contain less than about 6 percent passing the No. 200 sieve, with no more than 15 percent passing the No. 4 sieve. Generally, Type II or Type II-A material as

defined by the Municipality of Anchorage Standard Specifications (MASS) meets these requirements and may be placed in both wet and dry conditions. The on-site native soils are generally high in silt content and do not meet the gradation requirements for Type II or IIA structural fill as shown on Figure 13.

Structural fills below pavements and beneath footings and floor slabs should be placed in lifts not to exceed 12 inches loose thickness, and compacted to 95 percent of the maximum density as determined by the Modified Proctor compaction procedure (ASTM D1557). Non-structural fills should be placed in similar lifts and compacted to at least 90 percent of the Modified Proctor maximum density as well. During fill placement, we recommend that large cobbles or boulders with dimensions in excess of 8 inches be removed from any structural fills. We recommend that our services be retained to inspect the quality of fill compaction during construction.

When backfilling within 18 inches of the building walls where the wall is not supported on both sides, material should be placed in layers not to exceed 6 inches loose thickness and densely compacted with hand operated equipment. Heavy equipment should not be used as it could cause increased lateral pressures and damage walls.

7.0 CLOSURE AND LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives for evaluating the site as it relates to the geotechnical aspects discussed herein. The conclusions contained in this report are based on information provided from the observed site conditions and other conditions described herein. The analyses and conclusions contained in this report are based on site conditions as they presently exist. It is assumed that the exploratory test pits are representative of the subsurface conditions throughout the site, i.e., the subsurface conditions everywhere are not significantly different from those disclosed by the explorations.

If, during construction, subsurface conditions different from those encountered in these explorations are observed or appear to be present, Shannon & Wilson, Inc. should be advised at once so that these conditions can be reviewed. If there is a substantial lapse of time between the submittal of this report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, it is recommended that this report be reviewed to determine the applicability of the conclusions considering the changed conditions and time lapse.

We recommend that we be retained to review those portions of the plans and specifications pertaining to earthwork to determine if they are consistent with our recommendations. In

addition, we should be retained to observe construction, particularly the compaction of structural fill, installation of shoring and site excavations, and also to make field measurements of ground displacements and such other field observations as may be necessary.

Unanticipated soil conditions are commonly encountered and cannot fully be determined by merely taking soil samples or excavating test pits. Such unexpected conditions frequently require that additional expenditures be made to attain a properly constructed project. Therefore, some contingency fund is recommended to accommodate such potential extra costs. Shannon & Wilson has prepared the attachments in Appendix A *Important Information About Your Geotechnical/Environmental Report* to assist you and others in understanding the use and limitations of the reports.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) that are signed or sealed by Shannon & Wilson with a wet, blue ink signature. Files provided in electronic media format are furnished solely for the convenience of the client. Any conclusion or information obtained or derived from such electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, or you question the authenticity of the report please contact the undersigned.

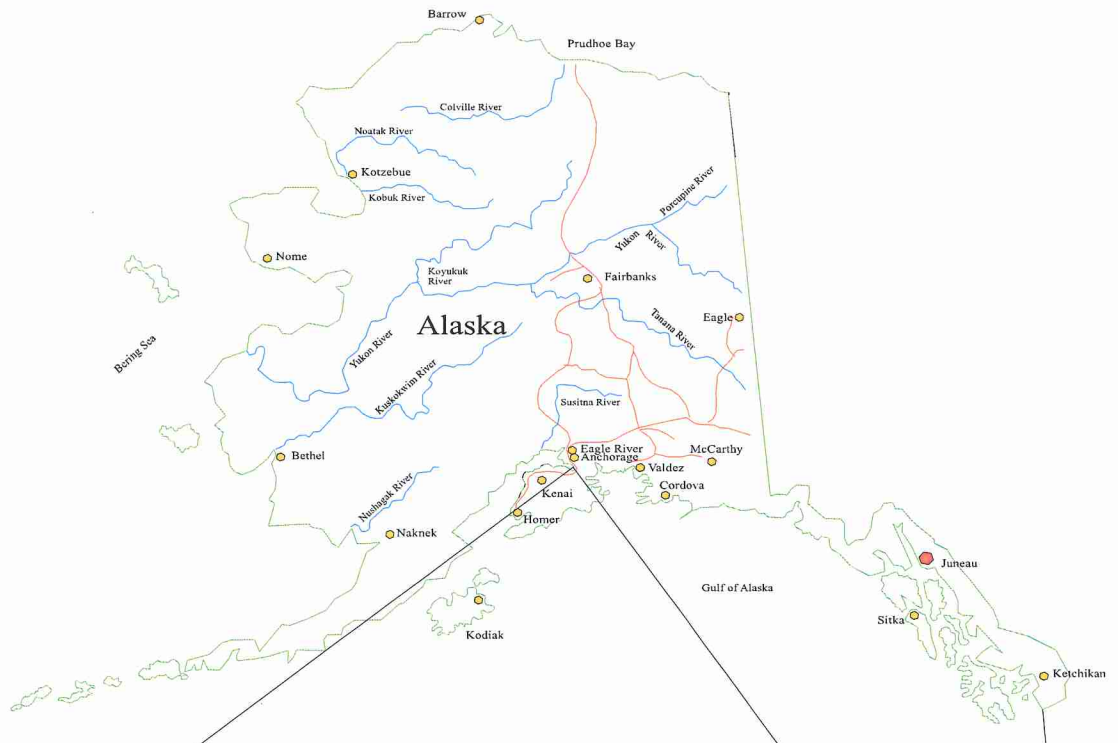
SHANNON & WILSON, INC.

Katra Wedeking
Geologist III

KVW:GLJ



Grover L. Johnson, P.E.
Senior Principal Engineer



**Approximate
Project
Location**



Map adapted from aerial imagery provided by Google Earth Pro, reproduced by permission granted from Google Earth Mapping Service.

180 Taos Road Townhouses
Girdwood, Alaska

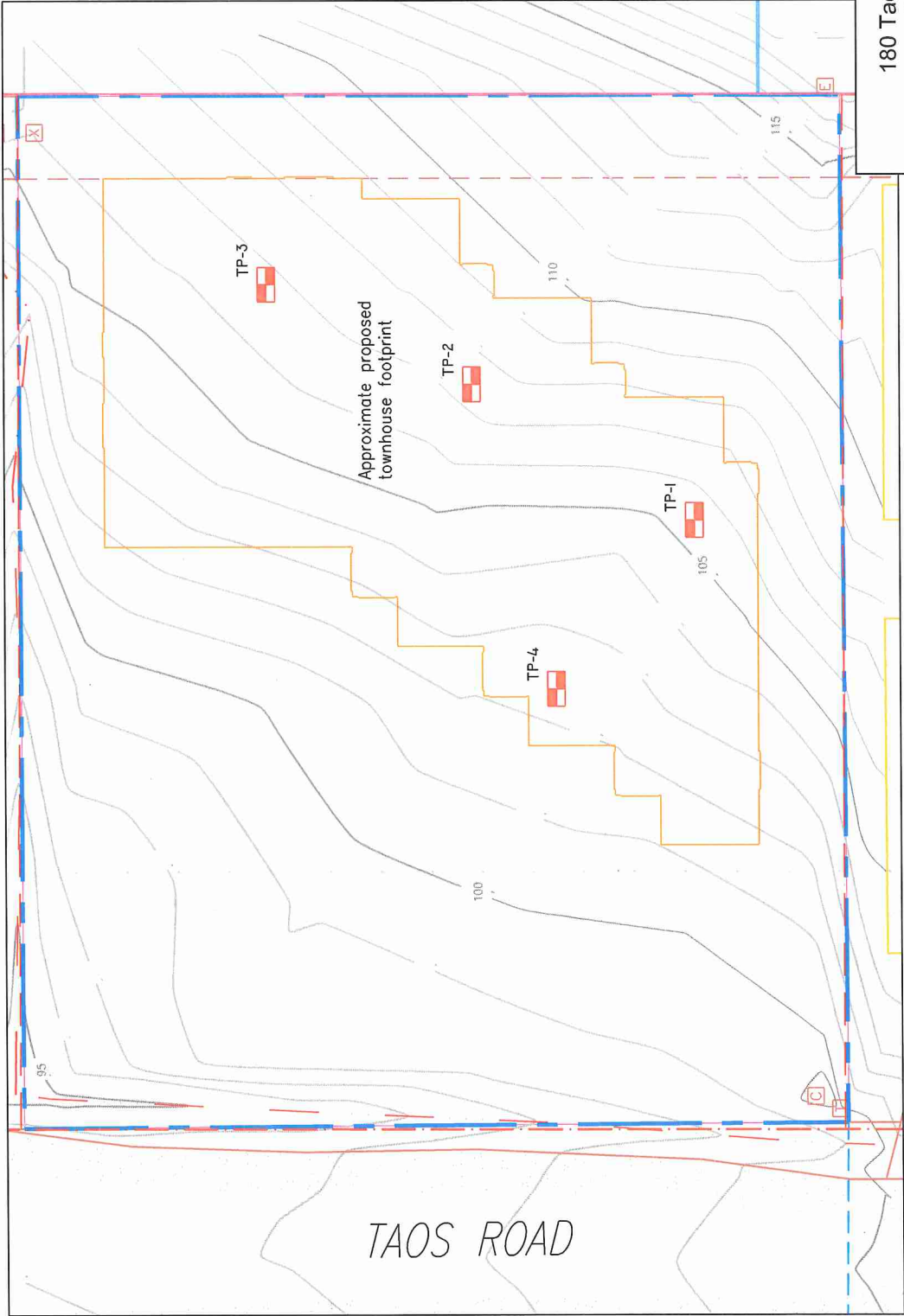
VICINITY MAP

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FIG. 1



Adapted from drawing provided by Z Architects.

LEGEND

TP-1  Approximate Location of Test Pit TP-1, Advanced by Shannon & Wilson, January 2011

Contour intervals in feet.

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SITE PLAN

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FIG. 2

Unified Soil Classification System

GROUP NAME Criteria for Assigning Group Names and Group Symbols			Soil Classification Group Symbol with Generalized Group Descriptions				
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	Clean GRAVELS Less than 5% fines		GW	Well-graded Gravels		
		GRAVELS with fines More than 12% fines		GP	Poorly-graded Gravels		
		SANDS More than 50% of coarse fraction passes No. 4 sieve	Clean SANDS Less than 5% fines		SW	Well-graded Sands	
			SANDS with fines More than 12% fines		SP	Poorly-graded Sands	
	FINE-GRAINED SOILS 50% or more passes the No. 200 sieve	SILTS AND CLAYS Liquid limit 50% or less	INORGANIC		ML	Non-plastic & Low-plasticity Silts	
			ORGANIC		OL	Non-plastic and Low-plasticity Organic Clays Non-plastic and Low-plasticity Organic Silts	
			SILTS AND CLAYS Liquid limit greater than 50%	INORGANIC		CH	High-plasticity Clays
				ORGANIC		MH	High-plasticity Silts
HIGHLY ORGANIC SOILS		Primarily organic matter, dark in color, and organic odor	INORGANIC		PT	Peat	
			ORGANIC		PT	Peat	

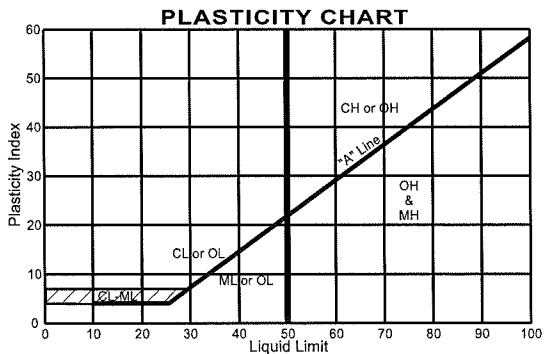
Descriptive Terminology Denoting Component Proportions

Description	Range of Proportion
Add the adjective "slightly"	5 - 12%
Add soil adjective ^(a)	12 - 50%
Major proportion in upper case, (e.g., SAND)	>50%

(a) Use gravelly, sandy, or silty as appropriate
 NOTE: The soil descriptions used in the boring logs lists constituents from smallest percentage to largest percentage.

Organic Content

Adjective	Percent by Volume
Occasional	0-1
Scattered	1-10
Numerous	10-30
Organic	30-50, minor constituent
Peat	50-100, MAJOR constituent



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SOIL CLASSIFICATION LEGEND

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FIG. 3

FROST CLASSIFICATION

(after Municipality of Anchorage)

GROUP		0.02 Mil.	P-200	USC SYSTEM (based on P-200 results)
NFS	Sandy Soils	0 to 3	0 to 6	SW, SP, SW-SM, SP-SM
	Gravelly Soils	0 to 3	0 to 6	GW, GP, GW-GM, GP-GM
F1	Gravelly Soils	3 to 10	6 to 13	GM, GW-GM, GP-GM
F2	Sandy Soils	3 to 15	6 to 19	SP-SM, SW-SM, SM
	Gravelly Soils	10 to 20	13 to 25	GM
F3	Sands, except very fine silty sands**	Over 15	Over 19	SM, SC
	Gravelly Soils	Over 20	Over 25	GM, GC
	Clays, PI>12			CL, CH
F4	All Silts			ML, MH
	Very fine silty sands**	Over 15	Over 19	SM, SC
	Clays, PI<12			CL, CL-ML
	Varved clays and other fined grained, banded sediments			CL and ML CL, ML, and SM; SL, SH, and ML; CL, CH, ML, and SM

P-200 = Percent passing the number 200 sieve
 0.02 Mil. = Percent material below 0.02 millimeter grain size

*Approximate P-200 value equivalent for frost classification.
 Value range based on typical, well-graded soil curves.

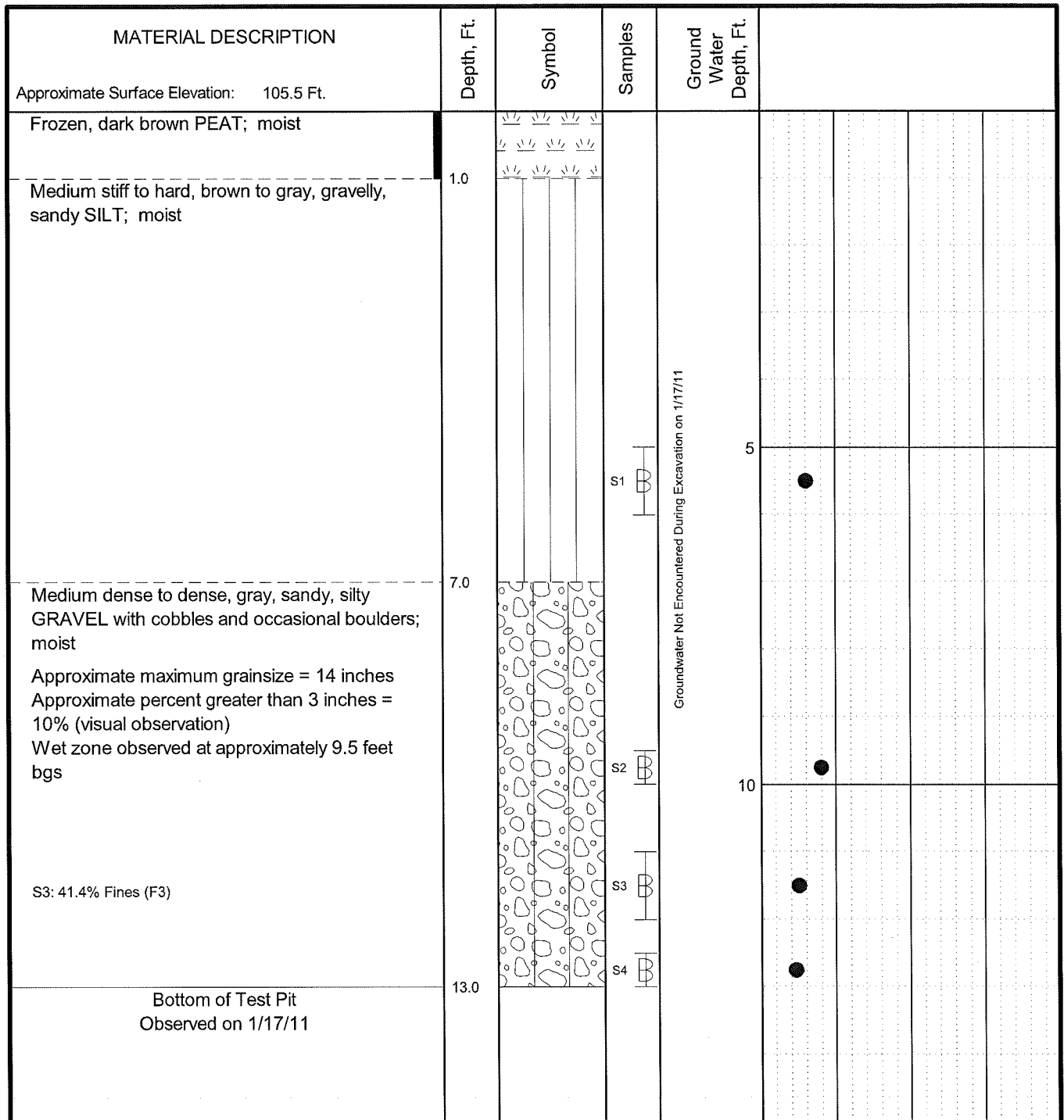
** Very fine sand : greater than 50% of sand fraction passing the number 100 sieve

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FROST CLASSIFICATION LEGEND

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LEGEND

Grab Sample

Frozen

● % Water Content
 Plastic Limit —●— Liquid Limit
 Natural Water Content

NOTES

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-1

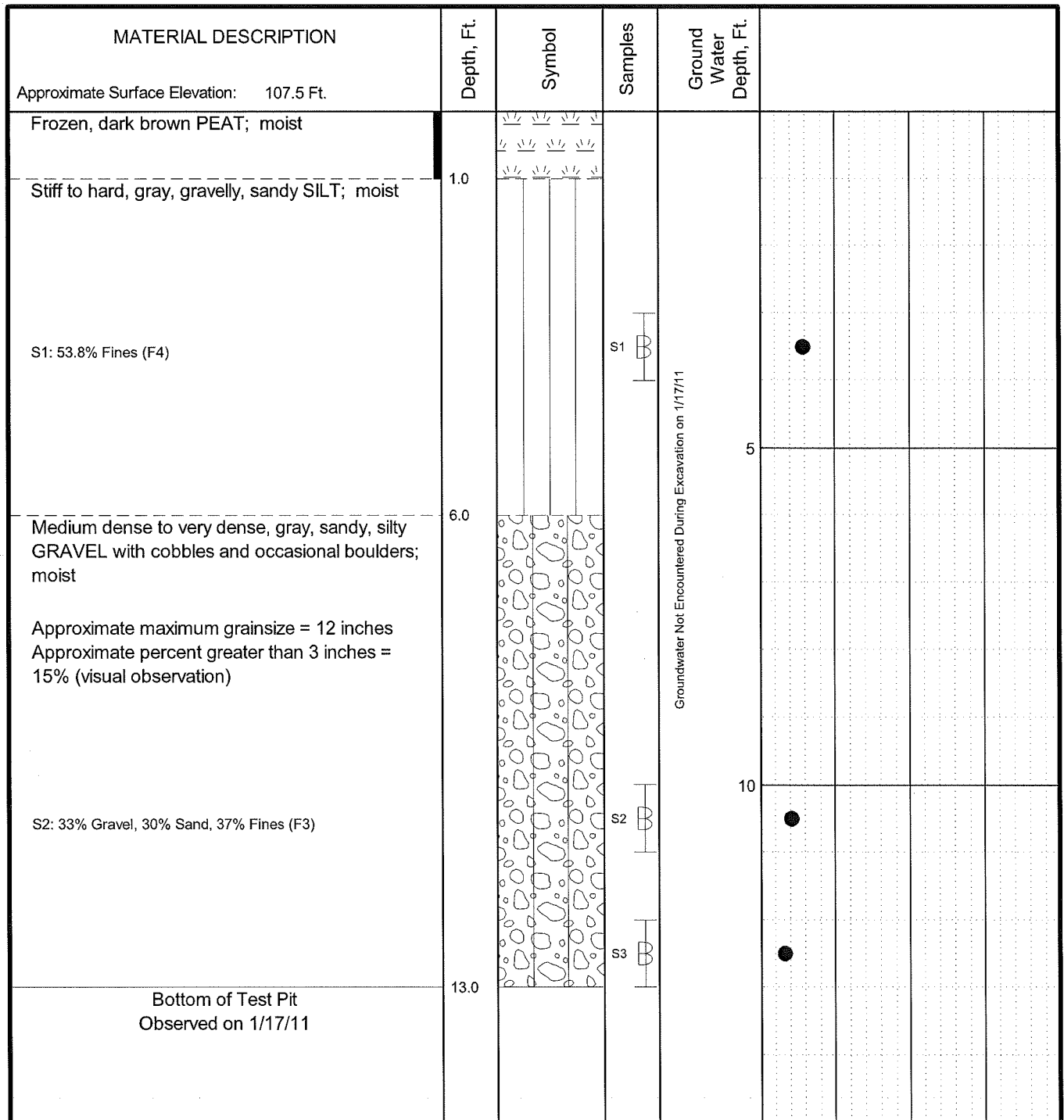
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FIG. 5

TEST PIT 02153 GINT.GPJ S&W GEO.GDT 2/16/11



0 25 50 75 100

LEGEND

Grab Sample

Frozen

● % Water Content

Plastic Limit —●— Liquid Limit
Natural Water Content

NOTES

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-2

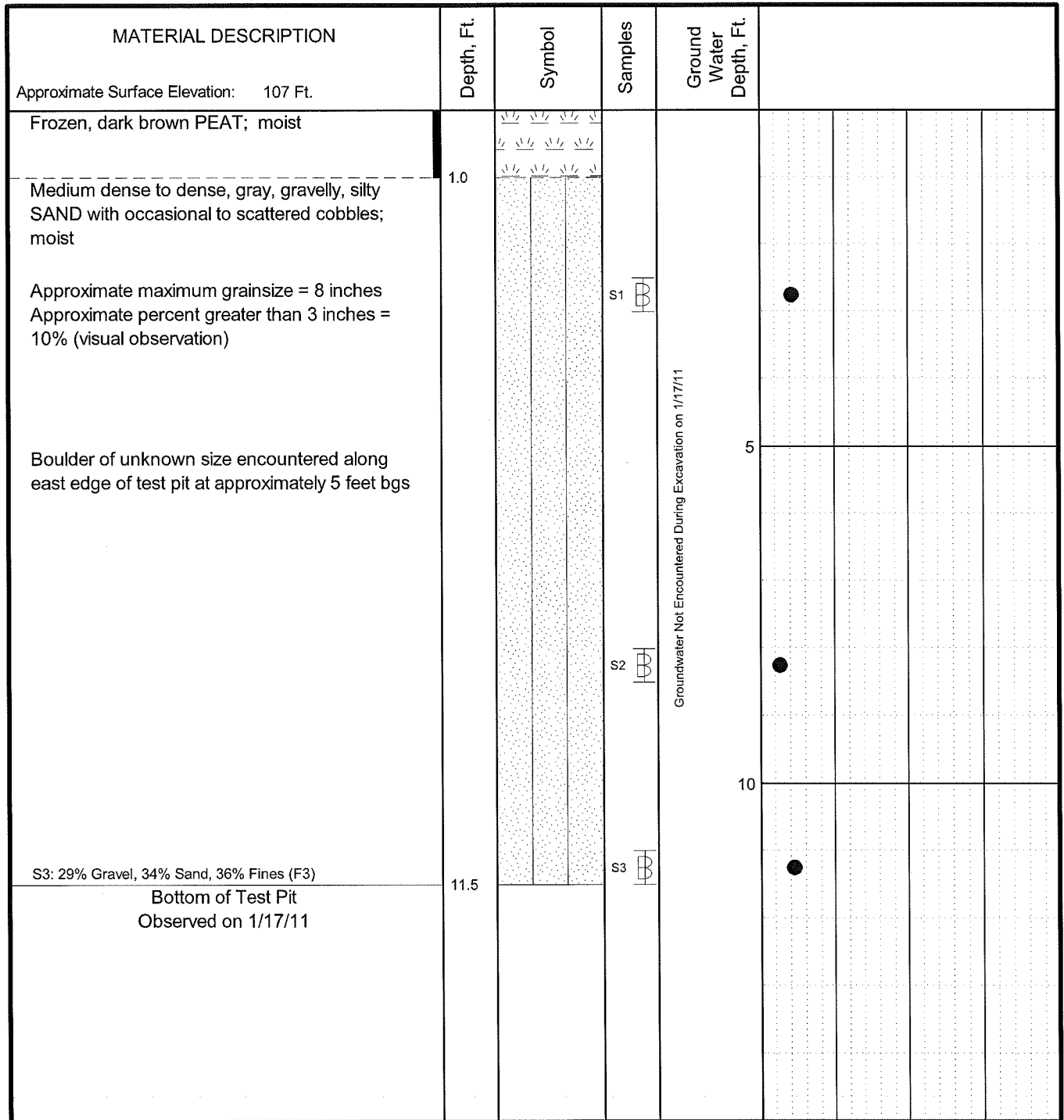
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FIG. 6

TEST PIT 02153 GINT.GPJ S&W GEO.GDT 2/16/11



LEGEND

Grab Sample

Frozen

● % Water Content
 Plastic Limit |—●—| Liquid Limit
 Natural Water Content

NOTES

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-3

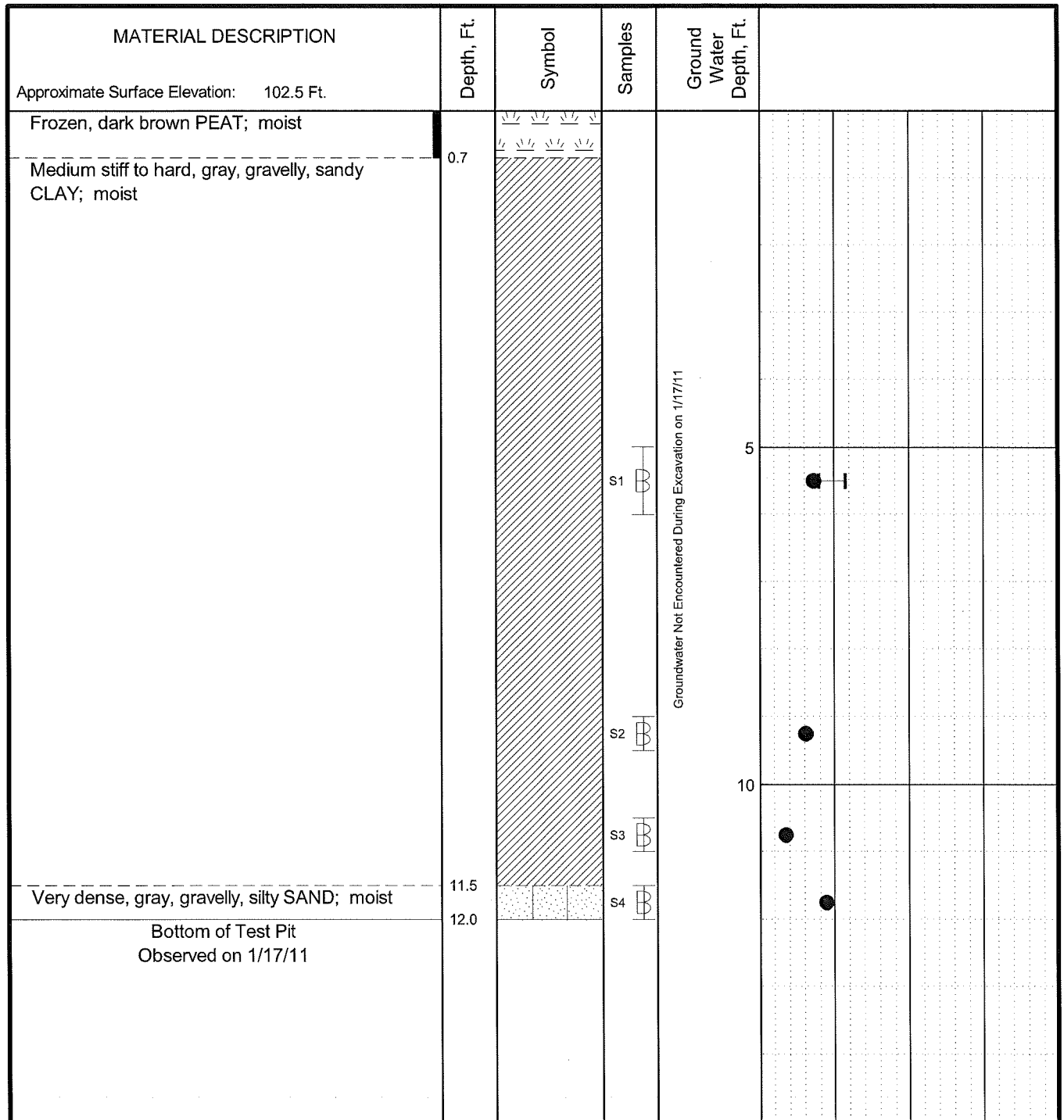
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FIG. 7

TEST PIT 02153 GINT.GPJ S&W GEO.GDT 2/16/11



LEGEND

Grab Sample

Frozen

● % Water Content
 Plastic Limit |—●—| Liquid Limit
 Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-4

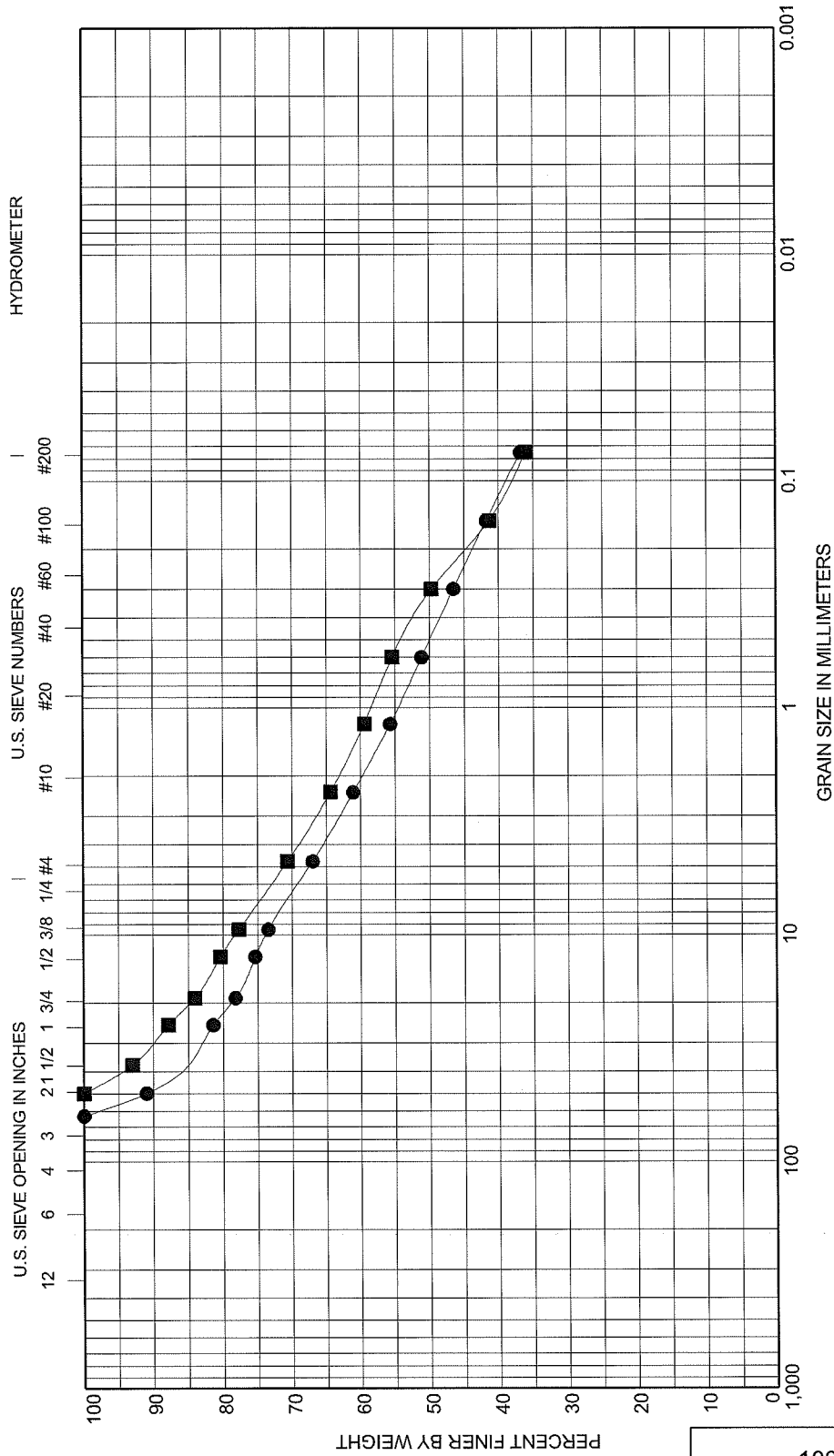
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FIG. 8

TEST PIT_02153_GINT.GPJ_S&W_GEO.GDT_2/16/11



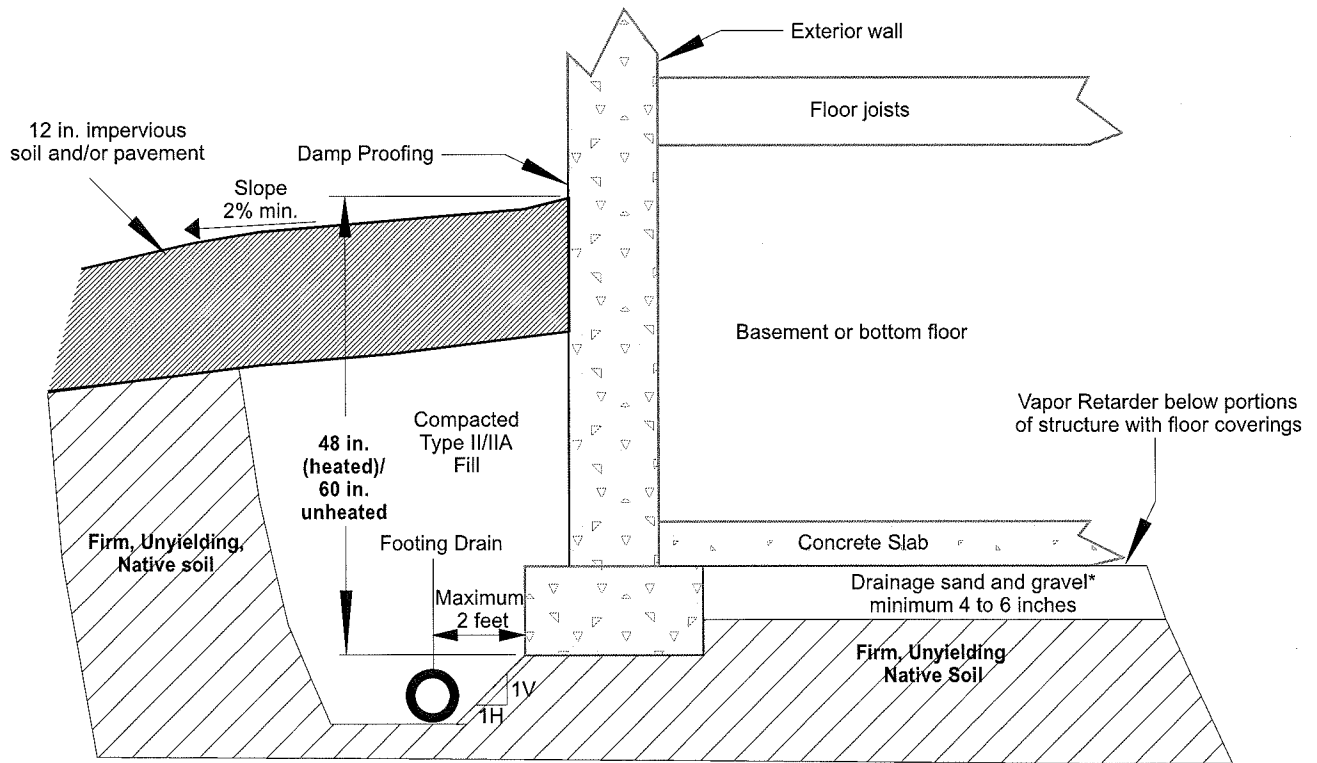
COBBLES	GRAVEL		SAND			SILT OR CLAY				
	coarse	fine	coarse	medium	fine	LL	PL	PI	Cc	Cu
Sample	Depth, Ft	Classification								
● TP-2 S2	10.0 - 11.0	Sandy, silty GRAVEL (GM)								
■ TP-3 S3	11.0 - 11.5	Gravelly, silty SAND (SM)								
Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
● TP-2 S2	10.0 - 11.0	63	2.05			33	30		37	
■ TP-3 S3	11.0 - 11.5	50	1.27			29	34		36	

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GRAIN SIZE CLASSIFICATION

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FIG. 9



NOTES:

1. All backfill should be placed in layers not exceeding 10 to 12 inches loose thickness and densely compacted. Structural fill should be compacted to 95% minimum, non-structural fill compacted to 90%, of ASTM D1557.
2. Backfill within 18 inches of the wall should be placed in layers not exceeding 6 inches and densely compacted with hand-operated equipment. Heavy equipment should not be used for backfill, as such equipment operated near the wall could increase lateral earth pressures and possibly damage the wall.

* Sand and gravel below the floor slab should be well-graded, free-draining, and contain less than 6% fines (material passing the No. 200 sieve based on the minus 3/4-inch portion). It should be placed in maximum 6-inch loose lifts and compacted to 95% of its maximum density as determined by the Modified Proctor compaction procedure (ASTM D1557).

DRAWING NOT TO SCALE

OSHA requires slope protection and support for all trenches greater than 4 feet deep. Side slope requirements are variable depending upon soil type and the duration of time in which the trench remains open. The contractor should be made responsible for compliance to these regulations as they are at the project site on a day to day basis and are aware of changing conditions.

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FLOOR SLAB AND FOOTING DETAIL

February 2011

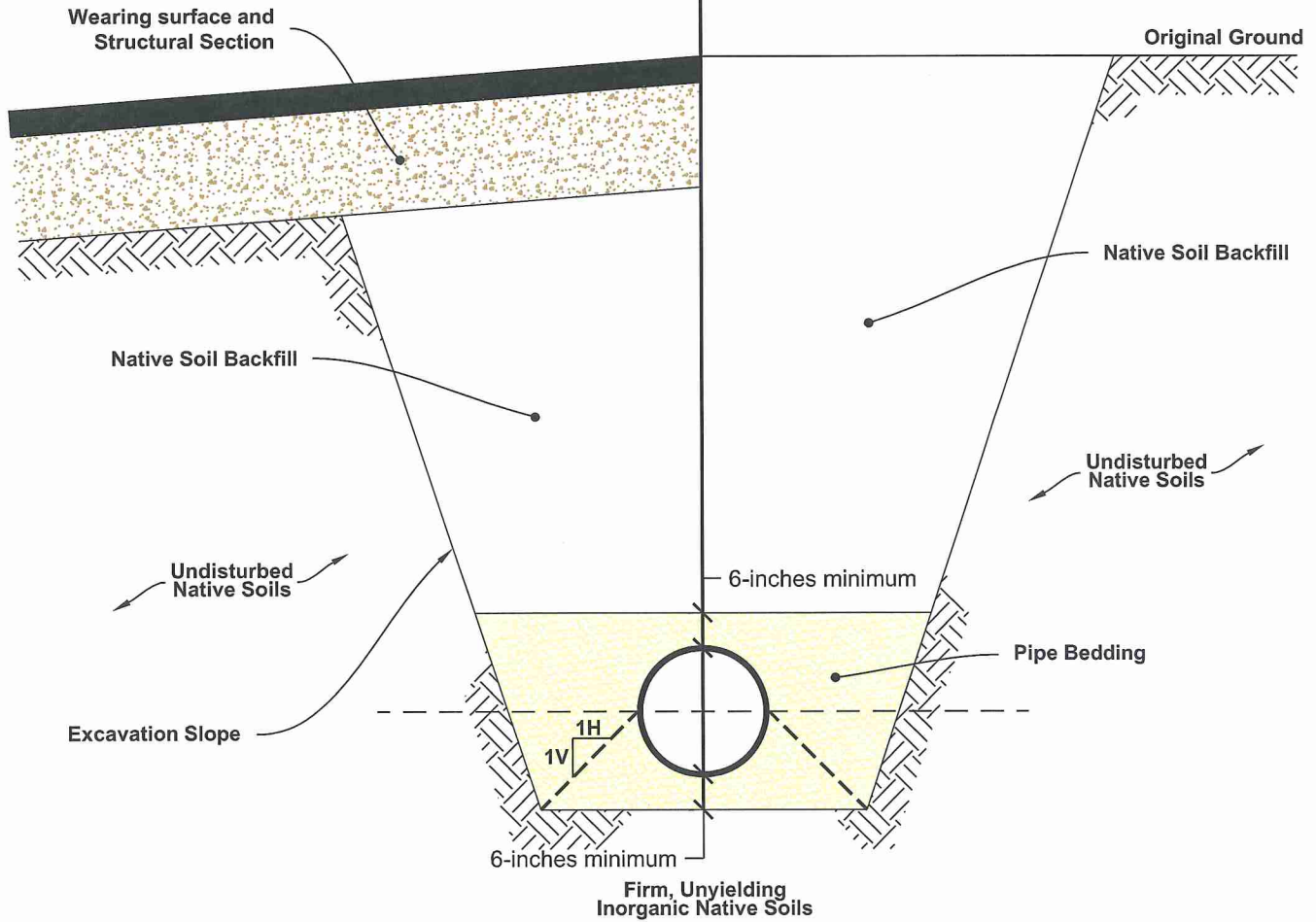
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FIG. 11

Trench Under Paved Areas

Trench Under Non-Structural Areas



NOTES

1. Trench backfill under paved areas should be placed in loose lifts not to exceed 12 inches and compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557.
2. Trench backfill under non-structural areas should be placed in loose lifts not to exceed 18 inches and compacted to at least 90 percent of its maximum dry density as determined by ASTM D-1557.
3. Pipe bedding should conform to MOA Class C bedding material or as recommended by pipe manufacturer.
4. Pipe bedding and cover thickness shown above should be used absent pipe manufacturer requirements.

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UTILITY TRENCH DETAIL

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FIG. 12

GRADATION REQUIREMENTS

(Adapted from Municipality of Anchorage Standard Specifications, 2009)

LEVELING COURSE

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
English	Metric	
1 in.	25.0 mm	100
3/4 in.	19.0 mm	70 - 100
3/8 in.	9.5 mm	50 - 80
No. 4	4.75 mm	35 - 65
No. 8	2.36 mm	20 - 50
No. 50	0.30 mm	10 - 30
No. 200	0.075 mm	3 - 8*

TYPE II BASE

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
8 in.	-	100
3 in.	75 mm	70 - 100
1-1/2 in.	37.5 mm	55 - 100
3/4 in.	19.0 mm	45 - 85
No. 4	4.75 mm	20 - 60
No. 10	2.00 mm	12 - 50
No. 40	0.425 mm	4 - 30
No. 200	0.075 mm	2 - 6**

TYPE II-A BASE

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
3 in.	75 mm	100
3/4 in.	19.0 mm	50 - 100
No. 4	4.75 mm	25 - 60
No. 10	2.00 mm	15 - 50
No. 40	0.425 mm	4 - 30
No. 200	0.075 mm	2 - 6***

* The fraction passing the No. 200 sieve shall not exceed 75 percent of the fraction passing the No. 50 sieve.

** The fraction passing the No. 200 sieve shall not exceed 15 percent of the fraction passing the No. 4 sieve.

*** The fraction passing the No. 200 sieve shall not exceed 20 percent of the fraction passing the No. 4 sieve.

180 Taos Road Townhouses
Girdwood, Alaska

GRADATION REQUIREMENTS

February 2011

32-1-02153

 **SHANNON & WILSON, INC.**
Geotechnical & Environmental Consultants

FIG. 13

APPENDIX A

**IMPORTANT INFORMATION ABOUT YOUR
GEOTECHNICAL/ENVIRONMENTAL REPORT**



Date: February 2011
To: Z Architects
Re: 180 Taos Road Townhouses, Girdwood,
Alaska

Important Information About Your Geotechnical/Environmental Report

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors, which were considered in the development of the report, have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

**Geotechnical Engineering Report
180 Taos Road Townhouses
Z Architects
Girdwood, Alaska**

February 2011

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32-1-02153

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APPENDIX

A	Important Information About Your Geotechnical/Environmental Report
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GEOTECHNICAL ENGINEERING REPORT
180 TAOS ROAD TOWNHOUSES
Z ARCHITECTS
GIRDWOOD, ALASKA

1.0 INTRODUCTION

This report presents the results of subsurface explorations, laboratory testing and geotechnical engineering studies for the proposed new townhouses to be located at 180 Taos Road in Girdwood, Alaska. The purpose of this study is to gather geotechnical data and to make engineering recommendations for the design of a proposed new building.

To gain data for our analyses, four test pits were advanced in the project area. The primary goal of the explorations was to characterize soils beneath or near the proposed building footprint to explore for possible shallow bedrock, and to evaluate the density or compactness of the subsurface conditions. This effort was supported by laboratory testing on select soil samples to estimate index properties of the materials. Engineering studies were then performed to develop design recommendations for the structure. Our report for this work contains descriptions of the proposed project, field explorations, laboratory testing, interpretation of subsurface conditions and conclusions and recommendations regarding foundation support.

Written authorization to proceed with this project was received in the form of an email from Mr. Marco Zaccaro, of Z Architects on January 14, 2011.

2.0 SITE AND PROJECT DESCRIPTION

The project site is an undeveloped lot located at 180 Taos Road in Girdwood, Alaska. A vicinity map indicating the general project location is presented as Figure 1. A site plan is included as Figure 2, and provides a view of the project area and the approximate location of our test pits.

The topography within the property generally slopes down from the southeast corner to the northwest and has an approximate elevation change of 16 feet. At the time of our explorations, the site was covered with one to two feet of snow and vegetation included large spruce, small brush, and grasses. According to drawings provided by you, the new structure will consist of three, approximately 16 foot by 40 foot units and one 30 foot by 40 foot unit in a connected townhouse building with an associated driveway. We understand that, due to topography, the east portion of the townhouses will have a finished grade approximately 6 feet below the existing

ground surface. The finished grade on the west side of the townhouse structure will be at approximately the current ground surface.

3.0 SUBSURFACE EXPLORATION

The field work for this project consisted of excavating four test pits, designated Test Pits TP-1 through TP-4 on January 17, 2011. The test pits were excavated to evaluate the general subsurface conditions at the site. The approximate locations of the test pits are shown on Figure 2.

Excavating services for this project were provided by HR Redmond Co. with a Volvo EC140B tracked excavator under contract to Z Architects. An experienced geologist from our firm was present during excavation to log subsurface conditions, collect soil samples, and observe groundwater if appropriate. At the completion of our explorations, the holes were backfilled with cuttings removed during excavation. The test pit locations shown on Figure 2 were approximated using cloth tape measurement from existing site features. Elevations were estimated using drawings provided by Z Architects. Test pit locations and elevations should be considered approximate.

Soils encountered in the test pits were visually classified in the field using the Unified Soil Classification System (USCS), presented in Figure 3. These classifications were then verified through selective laboratory analysis. USCS group names and symbols are provided for those soils confirmed by laboratory testing on the grain size classification sheets. Frost classifications were also estimated for selected samples based on laboratory evaluations. The frost classification system is presented as Figure 4.

4.0 LABORATORY TESTING

Laboratory tests were performed on select soil samples from the test pits to verify our field classifications and to estimate the index properties of the typical materials encountered at the site. Results of the soil tests performed on samples from each test pit are presented on the summary logs (Figures 5 through 8) and in the laboratory test results on Figures 9 and 10.

Water content tests were performed on samples collected from the test pits. Water content tests were generally conducted according to procedures described in ASTM International (ASTM) D2216. The results of the water content measurements are presented graphically on the test pit logs.

Grain size classification tests were conducted on select samples to confirm the field classification of the soils encountered. The gradation testing generally followed the mechanical sieve procedures described in ASTM C136. The grain size testing results are presented in Figure 9 and summarized on the test pit logs as percent gravel, percent sand, and percent fines. Percent fines on the test pit logs are equal to the sum of the silt and clay fractions indicated by the percent passing the Number 200 sieve.

Tests were conducted on select samples to estimate the amount of material passing the Number 200 sieve (P-200). This test was performed in general accordance with ASTM C117. The P-200 test provides an estimate of the fines (silt and clay) content. The results of this test are presented on the test pit logs, indicated as percent fines.

Atterberg limits were evaluated for one sample from the native, fine-grained soils encountered in the explorations. The test was performed in accordance with ASTM D4318. This analysis provides information on the plasticity characteristics of the silt or clay. The result of this test is summarized on Figure 10 as well as on the test pit log.

5.0 SUBSURFACE CONDITIONS

Subsurface conditions at the site are presented graphically in the test pit logs presented in Figures 5 through 8. Our test pits encountered fine grained materials and silty, granular material.

Test Pits TP-1 and TP-2 encountered approximately one foot of peat at the surface overlying 5 to 6 feet of gravelly, sandy silt over 6 to 7 feet of sandy, silty gravel with cobbles and occasional boulders to the bottom of the excavation. The consistency of the silt layer ranged from medium stiff to hard and the relative density of the gravel ranged from medium dense to very dense. In Test Pit TP-3, we encountered approximately one foot of peat overlying medium dense to dense, gravelly, silty sand. In Test Pit TP-4, we found 8 inches of peat overlying approximately 11 feet of medium stiff to hard, gravelly, sandy clay and 1.5 feet of very dense, gravelly, silty sand.

In Test Pits TP-1 through TP-3, the maximum grain size observed ranged from approximately 8 to 14 inches. The approximate percentage of cobble and boulder size material encountered in the gravel layer ranged from 5 to 15 percent by visual observation. In addition, a boulder of unknown size was encountered in Test Pit TP-3. For constructability and budget purposes, it should be noted that there is potential for very large boulders and/or bedrock to be encountered during construction.

Moisture contents ranged from approximately 7 to 22 percent for coarse grained soils and approximately 8 to 17 percent for fine grained soils. Although groundwater was generally not encountered during our test pit explorations, occasional layers of silty, granular material may contain some perched water that may leach out if exposed.

6.0 ENGINEERING CONCLUSIONS AND RECOMMENDATIONS

The design of foundations for support of the proposed new structure must consider the bearing support capabilities of the soils as well as the expected settlements and the effects of seasonal frost action. Site explorations generally encountered silty and/or granular soils that are relatively compact. With proper site preparation, we believe the conditions encountered in the test pits are adequate to support the proposed site improvements. We assume that conventional shallow foundations are desired for the site development, which, in our opinion, should be appropriate for this project.

6.1 Site Preparation

Site preparation should include removal of the organic-rich surface material, which generally ranged from 8 inches to 1 foot thick (but could be thicker in isolated areas). Excavation could be difficult due to the presence of cobbles or boulders and the density of the material. During earthwork, we recommend that the subgrade soils be probed by a qualified engineer to verify that unsuitable soils have been removed and compact native soils are exposed at the limits of excavation. To reduce the risk of future settlement, deep unsuitable soils (unsuitable soils extending deeper than recommended depths of structures) that are found should be over-excavated to firm, unyielding native soils, and replaced with compacted structural fill. If sub cutting is required, it should extend out a minimum distance equal to the sub-cut depth from the outer edge of the footings.

Native soils may be both moisture and frost sensitive and could locally be soft and compressible. They may become soft by disturbance or wetting during construction, or naturally due to the presence of groundwater. If work in the bottom area of the excavation is carried out with a backhoe, a smooth bucket edge or a flat steel plate covering the web space between the backhoe teeth will reduce ground disturbance and also minimize hand work at this grade. We recommend that we be retained to observe excavations and that a contingency be maintained to allow for localized over-excavation and replacement beyond the minimum depth beneath the proposed structure.

Prior to fill placement, the exposed grade should be proof-rolled to produce a firm, unyielding surface for construction. Classified fill placed beneath footings should be placed and compacted in accordance with the recommendations in Section 6.8.

6.2 Building Foundation

We recommend that the proposed new townhouses be supported on spread or continuous strip footings bearing directly on firm, unyielding native materials. The recommended minimum width is 16 inches for continuous strip footings and 24 inches for spread footings. The base of exterior footings and unheated interior footings should be buried sufficiently to prevent structural damage resulting from frost action. We recommend that perimeter footings in heated buildings be placed a minimum of 4 feet below the ground surface. For interior footings in heated areas, footings may be placed directly below the floor slab such that embedment is 14 inches or more. If portions of the proposed building are to be unheated, the minimum burial depth for footings should be increased to 5 feet bgs for frost protection. We recommend that a subdrain be installed to direct subsurface water away from the footing walls. A typical footing detail with subdrain is included in Figure 11. The figure presented shows details for a basement because we understand that finished grade for the rear portion of the townhouses will be below the existing ground surface.

Based on the expected footing dimensions, depths, and site preparation recommendations, we recommend that foundations for the proposed building additions be designed with an allowable soil bearing pressure of 2,000 psf. The above bearing value may be increased by one-third for short-term wind or seismic loading.

6.3 Estimated Building Settlements

The total settlements that could develop at the building site are dependent upon the actual loads that are applied, the footing sizes, and the properties of the soils below the footings. Based on the anticipated behavior of the native soils and allowable bearing pressures we estimate total settlements of about 1-inch could occur and that differential settlements could be about one-half of the total over a distance of 50 feet. Long term differential settlements of the building should be relatively small and within tolerable limits.

6.4 Floor Slab Support

Floor slabs for the proposed addition should be placed generally as shown on Figure 11. If loose or soft areas are encountered, we recommend they be excavated and replaced. Unclassified fill

may be used to replace loose soils below a minimum of 18 inches of compacted, classified fill from the bottom of the slab as described above. We recommend a 4 to 6-inch drainage blanket be constructed beneath the slab to maintain a dry floor. Where floor coverings are expected, we recommend installing a vapor retarder directly beneath the concrete slab. Figure 11 shows a footing detail with a typical concrete slab design section.

6.5 Drainage

Groundwater was not encountered during explorations, which extended to approximately 13 feet bgs; therefore, in our opinion, groundwater should not be encountered during construction. However, due to the proximity of higher ground at the back of the property, we expect that shallow water could occur seasonally. We recommend that site grading be carefully designed such that surface water and roof run-off are directed away from the proposed building, so that it cannot pond against or infiltrate the soils near the building walls. The subdrain will need an outlet to drain water away from footings. It may be day lighted at a lower elevation with insulation or heat tape to prevent freezing.

6.6 Lateral Earth Pressures and Lateral Resistance

Building walls below ground which support earth fills and floor slabs should be designed to resist lateral earth pressures. The magnitude of the pressures is dependent on the method of placement of backfill, the type of backfill material, drainage provisions, and whether the wall is allowed to deflect after or during placement of backfill.

If the walls are allowed to deflect laterally or rotate an amount equal to about 0.001 times the height of the wall, an active earth pressure condition under static loading would prevail and an equivalent fluid weight of 47 pounds per cubic foot (pcf) is recommended for design of walls backfilled with Type II/IIA classified fill. For rigid walls that are restrained from deflecting at the top, an at-rest earth pressure condition would prevail and an equivalent fluid weight of 67 pcf is recommended. To simulate seismic loading, a rectangular pressure prism with a magnitude of 14 pounds per square foot (per foot of wall height) should be applied to the entire height of the wall.

Lateral forces from wind or seismic loading may be resisted by passive earth pressures against the sides of footings, exterior walls below grade and grade beams. In our opinion, these resisting pressures can be estimated using an equivalent fluid weight of 300 pcf. This value assumes that backfill around the footings and stem walls are densely compacted.

Lateral resistance may also be developed in friction against sliding along the base of foundations placed on grade such as footings or floor slabs. These forces may be computed using a coefficient of 0.4 between concrete and soil.

6.7 Utility Trenches

Buried pipes and cables may be needed to tie the new building into utilities. Trenches excavated for installation of these new utilities should be constructed as presented in Figure 12. The bedding and structural fill material around the buried utility should be densely compacted to support and hold the pipe firmly in place.

Groundwater was not observed in our explorations, but typical utility trenches may encounter water seepage during excavation. Sumps and pumps should be sufficient to remove and discharge any trench water, provided trenching activities are planned for rapid excavation, utility construction, and backfill.

Since the native soils in this area are moist and contain moderate amounts of silt, excavation slopes will initially tend to stand steeply. The slope and excavation bottom conditions should be made the responsibility of the contractor, who will be present on a day to day basis and can adjust efforts to obtain the needed stability and meet the applicable Alaska and Federal (OSHA) safety regulations.

Below areas to receive pavements or support foundations, trench backfill should be placed in maximum 12-inch loose lifts and compacted to at least 95 percent of the Modified Proctor maximum dry density, as discussed in the following section. In areas where no structures or paving are planned, less compaction is required and material may be placed in thicker lifts (up to 18 inches) and moderately compacted to achieve at least 90 percent compaction. Utility trenches should be backfilled with existing inorganic native soils as much as practical between the top of the pipe bedding and the bottom of the road subgrade, or to original ground surface in areas where no pavement is needed. Bulking of backfill into the trench should be discouraged as this can cause voids and could lead to large future surface settlements.

6.8 Structural Fill and Compaction

Backfill will be required behind the foundation walls and under asphalt pavements. Structural fill that is placed should be clean, well-graded, granular soil to provide drainage and frost protection. These soils should contain less than about 6 percent passing the No. 200 sieve, with no more than 15 percent passing the No. 4 sieve. Generally, Type II or Type II-A material as

defined by the Municipality of Anchorage Standard Specifications (MASS) meets these requirements and may be placed in both wet and dry conditions. The on-site native soils are generally high in silt content and do not meet the gradation requirements for Type II or IIA structural fill as shown on Figure 13.

Structural fills below pavements and beneath footings and floor slabs should be placed in lifts not to exceed 12 inches loose thickness, and compacted to 95 percent of the maximum density as determined by the Modified Proctor compaction procedure (ASTM D1557). Non-structural fills should be placed in similar lifts and compacted to at least 90 percent of the Modified Proctor maximum density as well. During fill placement, we recommend that large cobbles or boulders with dimensions in excess of 8 inches be removed from any structural fills. We recommend that our services be retained to inspect the quality of fill compaction during construction.

When backfilling within 18 inches of the building walls where the wall is not supported on both sides, material should be placed in layers not to exceed 6 inches loose thickness and densely compacted with hand operated equipment. Heavy equipment should not be used as it could cause increased lateral pressures and damage walls.

7.0 CLOSURE AND LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives for evaluating the site as it relates to the geotechnical aspects discussed herein. The conclusions contained in this report are based on information provided from the observed site conditions and other conditions described herein. The analyses and conclusions contained in this report are based on site conditions as they presently exist. It is assumed that the exploratory test pits are representative of the subsurface conditions throughout the site, i.e., the subsurface conditions everywhere are not significantly different from those disclosed by the explorations.

If, during construction, subsurface conditions different from those encountered in these explorations are observed or appear to be present, Shannon & Wilson, Inc. should be advised at once so that these conditions can be reviewed. If there is a substantial lapse of time between the submittal of this report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, it is recommended that this report be reviewed to determine the applicability of the conclusions considering the changed conditions and time lapse.

We recommend that we be retained to review those portions of the plans and specifications pertaining to earthwork to determine if they are consistent with our recommendations. In

addition, we should be retained to observe construction, particularly the compaction of structural fill, installation of shoring and site excavations, and also to make field measurements of ground displacements and such other field observations as may be necessary.

Unanticipated soil conditions are commonly encountered and cannot fully be determined by merely taking soil samples or excavating test pits. Such unexpected conditions frequently require that additional expenditures be made to attain a properly constructed project. Therefore, some contingency fund is recommended to accommodate such potential extra costs. Shannon & Wilson has prepared the attachments in Appendix A *Important Information About Your Geotechnical/Environmental Report* to assist you and others in understanding the use and limitations of the reports.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) that are signed or sealed by Shannon & Wilson with a wet, blue ink signature. Files provided in electronic media format are furnished solely for the convenience of the client. Any conclusion or information obtained or derived from such electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, or you question the authenticity of the report please contact the undersigned.

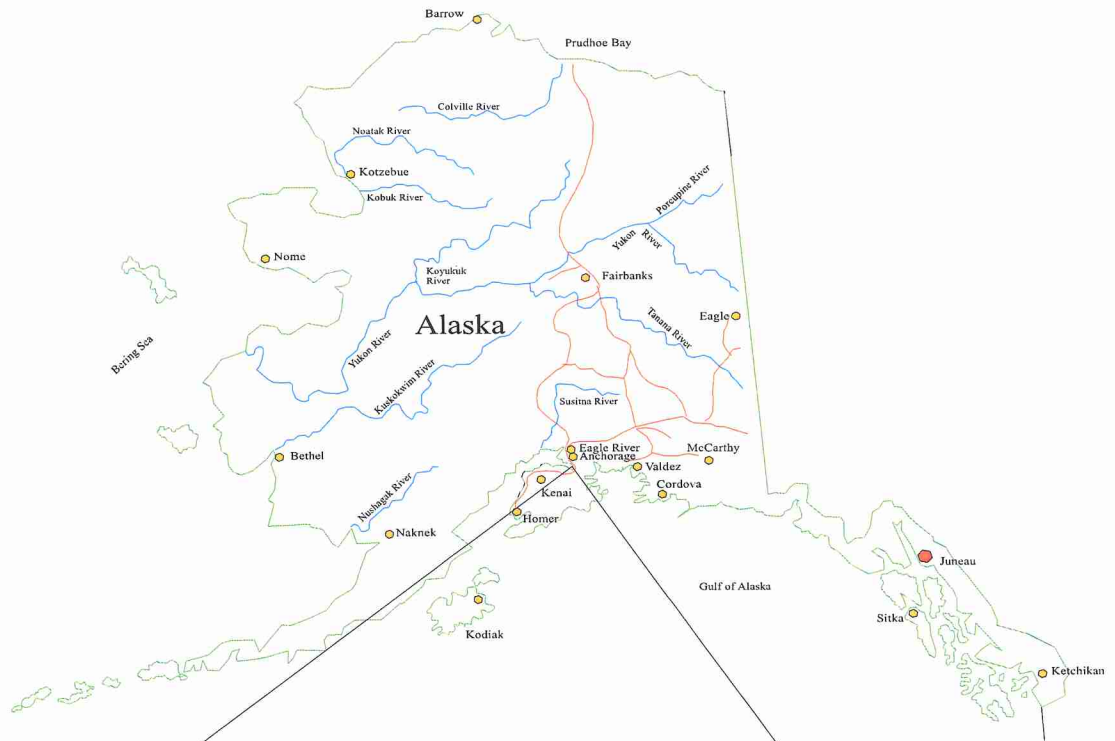
SHANNON & WILSON, INC.

Katra Wedeking
Geologist III

KVW:GLJ



Grover L. Johnson, P.E.
Senior Principal Engineer



Approximate
Project
Location



Map adapted from aerial imagery provided by Google Earth Pro, reproduced by permission granted from Google Earth Mapping Service.

180 Taos Road Townhouses
Girdwood, Alaska

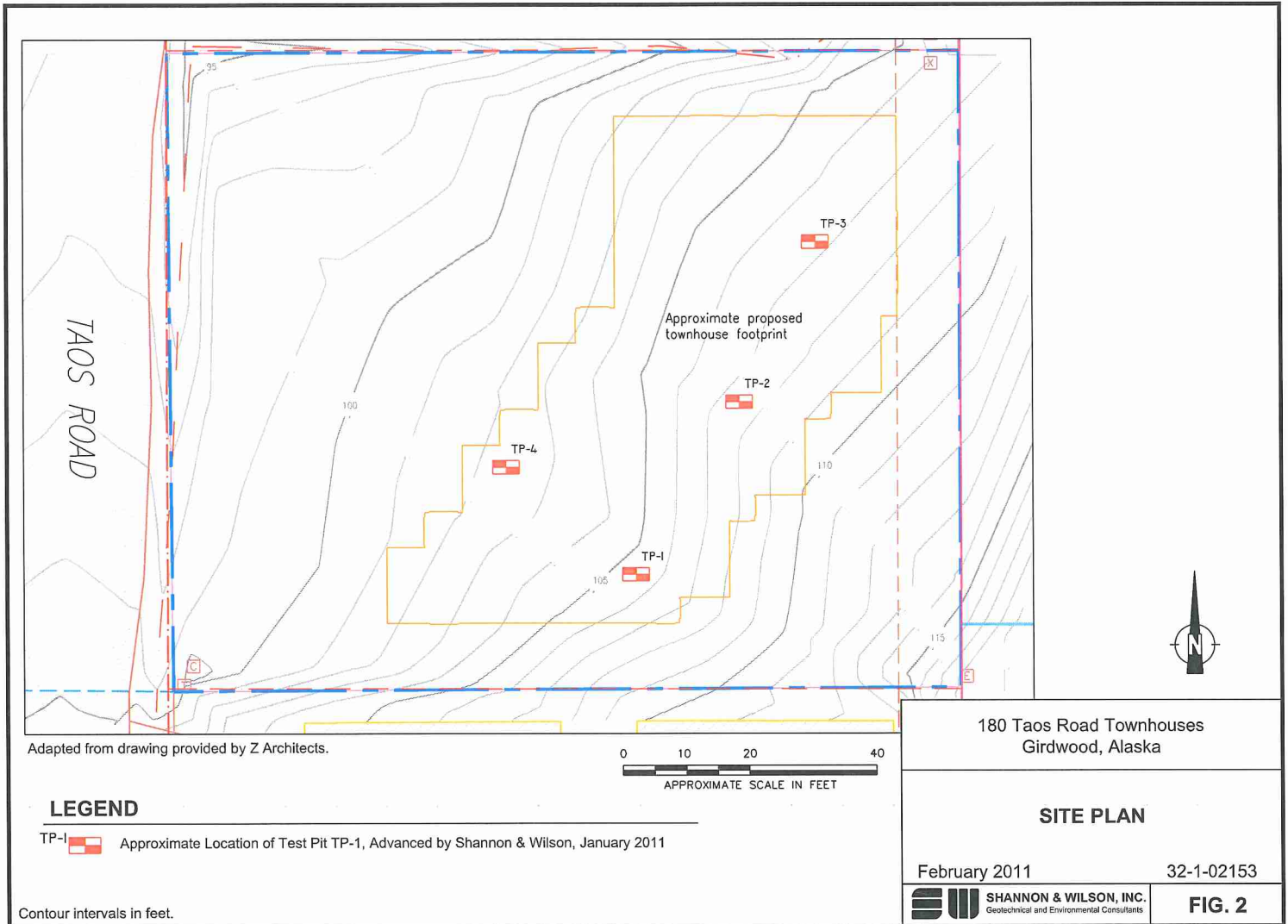
VICINITY MAP

February 2011

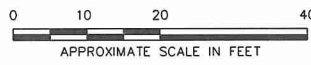
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FIG. 1



Adapted from drawing provided by Z Architects.



LEGEND

TP-1  Approximate Location of Test Pit TP-1, Advanced by Shannon & Wilson, January 2011

Contour intervals in feet.

180 Taos Road Townhouses
Girdwood, Alaska

SITE PLAN

February 2011

32-1-02153

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FIG. 2

Unified Soil Classification System

GROUP NAME Criteria for Assigning Group Names and Group Symbols			Soil Classification Group Symbol with Generalized Group Descriptions				
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	Clean GRAVELS Less than 5% fines		GW	Well-graded Gravels		
		GRAVELS with fines More than 12% fines		GP	Poorly-graded Gravels		
		SANDS More than 50% of coarse fraction passes No. 4 sieve	Clean SANDS Less than 5% fines		SW	Well-graded Sands	
			SANDS with fines More than 12% fines		SP	Poorly-graded Sands	
	FINE-GRAINED SOILS 50% or more passes the No. 200 sieve	SILTS AND CLAYS Liquid limit 50% or less	INORGANIC		ML	Non-plastic & Low-plasticity Silts	
			ORGANIC		OL	Non-plastic and Low-plasticity Organic Clays Non-plastic and Low-plasticity Organic Silts	
			SILTS AND CLAYS Liquid limit greater than 50%	INORGANIC		CH	High-plasticity Clays
				ORGANIC		MH	High-plasticity Silts
HIGHLY ORGANIC SOILS		Primarily organic matter, dark in color, and organic odor			PT	Peat	

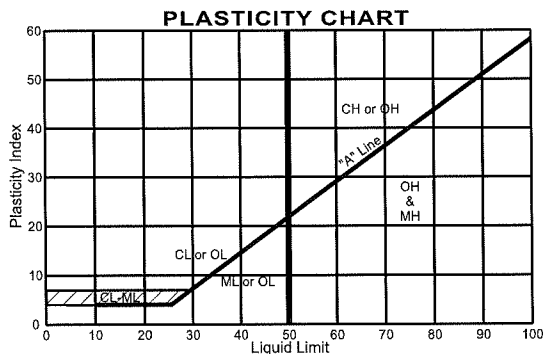
Descriptive Terminology Denoting Component Proportions

Description	Range of Proportion
Add the adjective "slightly"	5 - 12%
Add soil adjective ^(a)	12 - 50%
Major proportion in upper case, (e.g., SAND)	>50%

(a) Use gravelly, sandy, or silty as appropriate
 NOTE: The soil descriptions used in the boring logs lists constituents from smallest percentage to largest percentage.

Organic Content

Adjective	Percent by Volume
Occasional	0-1
Scattered	1-10
Numerous	10-30
Organic	30-50, minor constituent
Peat	50-100, MAJOR constituent



180 Taos Road Townhouses
 Girdwood, Alaska

SOIL CLASSIFICATION LEGEND

February 2011

32-1-02153

SHANNON & WILSON, INC.
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FIG. 3

FROST CLASSIFICATION

(after Municipality of Anchorage)

GROUP		0.02 Mil.	P-200	USC SYSTEM (based on P-200 results)
NFS	Sandy Soils	0 to 3	0 to 6	SW, SP, SW-SM, SP-SM
	Gravelly Soils	0 to 3	0 to 6	GW, GP, GW-GM, GP-GM
F1	Gravelly Soils	3 to 10	6 to 13	GM, GW-GM, GP-GM
F2	Sandy Soils	3 to 15	6 to 19	SP-SM, SW-SM, SM
	Gravelly Soils	10 to 20	13 to 25	GM
F3	Sands, except very fine silty sands**	Over 15	Over 19	SM, SC
	Gravelly Soils	Over 20	Over 25	GM, GC
	Clays, PI>12			CL, CH
F4	All Silts			ML, MH
	Very fine silty sands**	Over 15	Over 19	SM, SC
	Clays, PI<12			CL, CL-ML
	Varved clays and other fined grained, banded sediments			CL and ML CL, ML, and SM; SL, SH, and ML; CL, CH, ML, and SM

P-200 = Percent passing the number 200 sieve
0.02 Mil. = Percent material below 0.02 millimeter grain size

*Approximate P-200 value equivalent for frost classification.
Value range based on typical, well-graded soil curves.

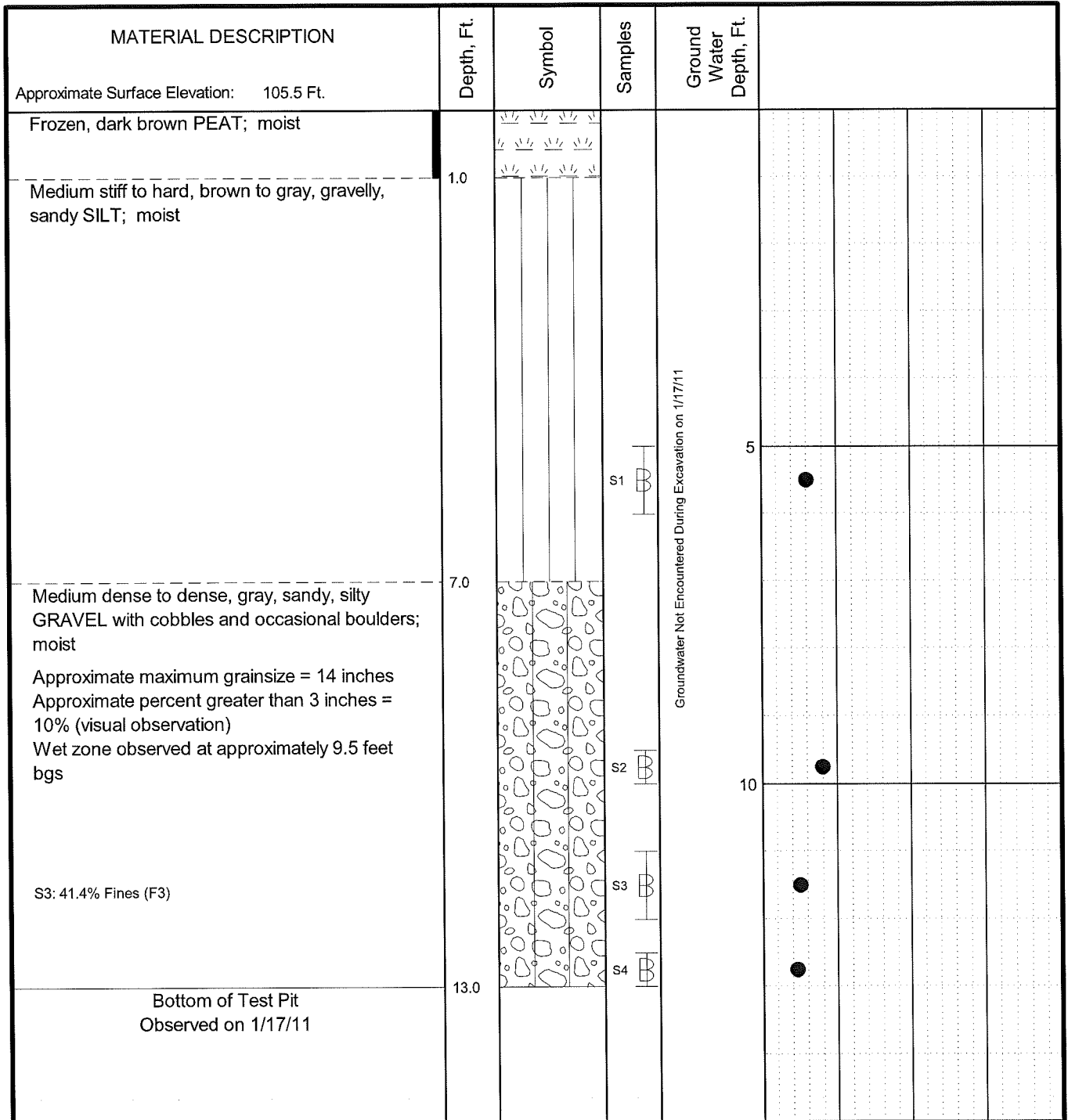
** Very fine sand : greater than 50% of sand fraction passing the number 100 sieve

180 Taos Road Townhouses
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FROST CLASSIFICATION LEGEND

February 2011

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LEGEND

Grab Sample

Frozen

● % Water Content
 Plastic Limit —●— Liquid Limit
 Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-1

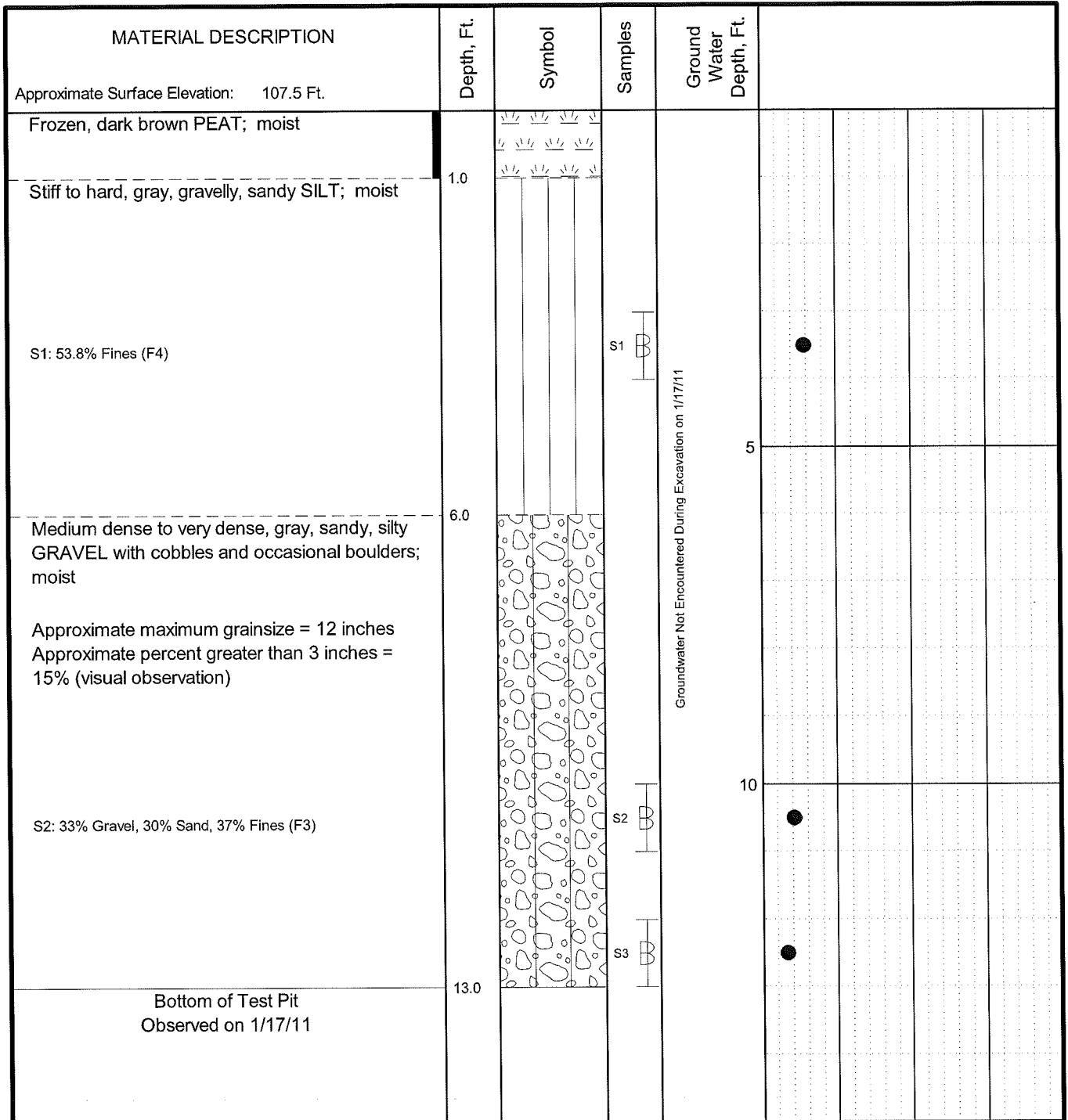
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FIG. 5

TEST PIT 02153 GINT.GPJ S&W GEO.GDT 2/16/11



LEGEND

Grab Sample

Frozen

● % Water Content
 Plastic Limit —●— Liquid Limit
 Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-2

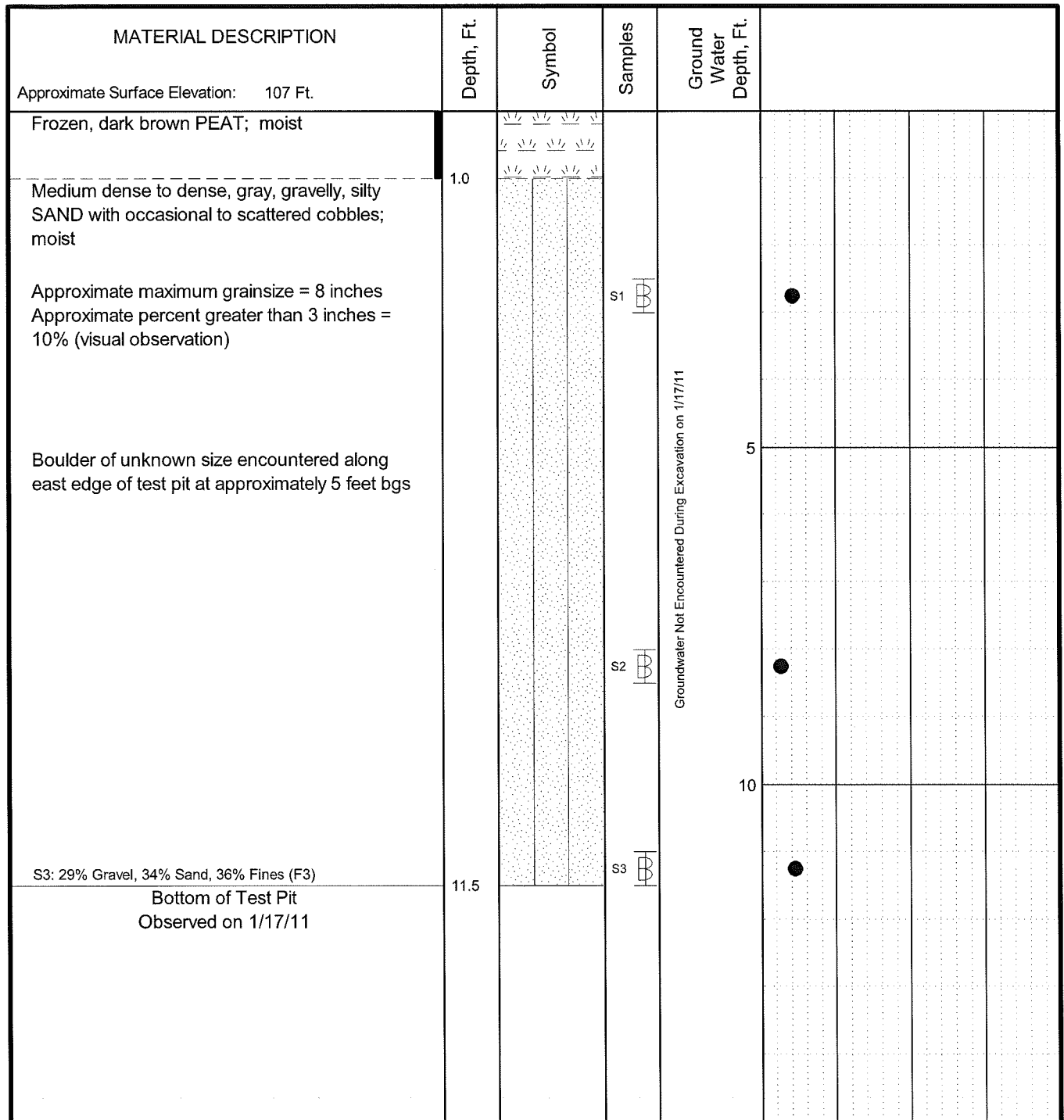
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FIG. 6

TEST PIT: 02153.GINT.GPJ S&W GEO.GDT 2/16/11



LEGEND

Grab Sample

Frozen

● % Water Content
 Plastic Limit —●— Liquid Limit
 Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-3

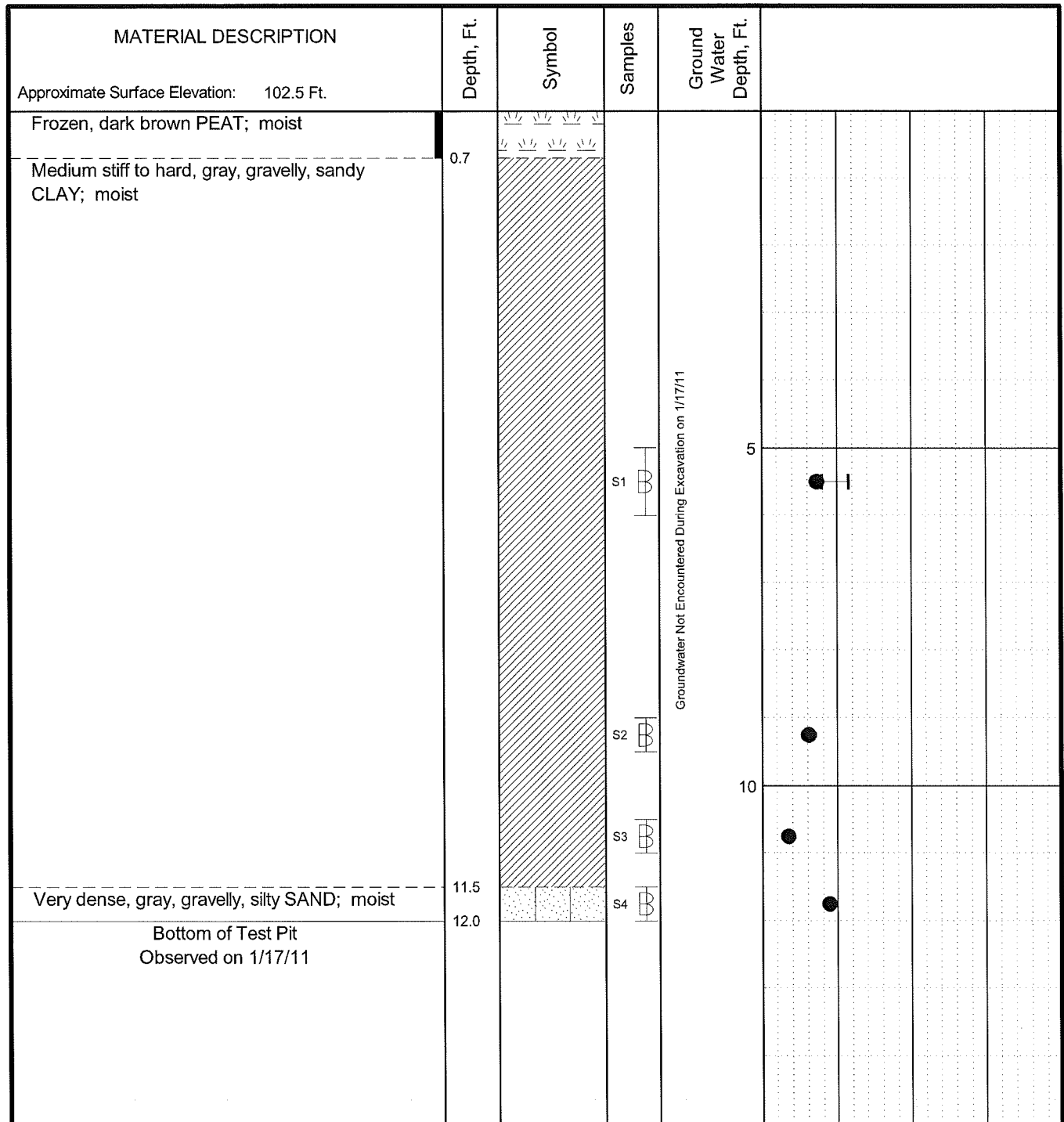
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FIG. 7

TEST PIT 02153 GINT.GPJ S&W GEO.GDT 2/16/11



LEGEND

Grab Sample

Frozen

● % Water Content
 Plastic Limit —●— Liquid Limit
 Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

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LOG OF TEST PIT TP-4

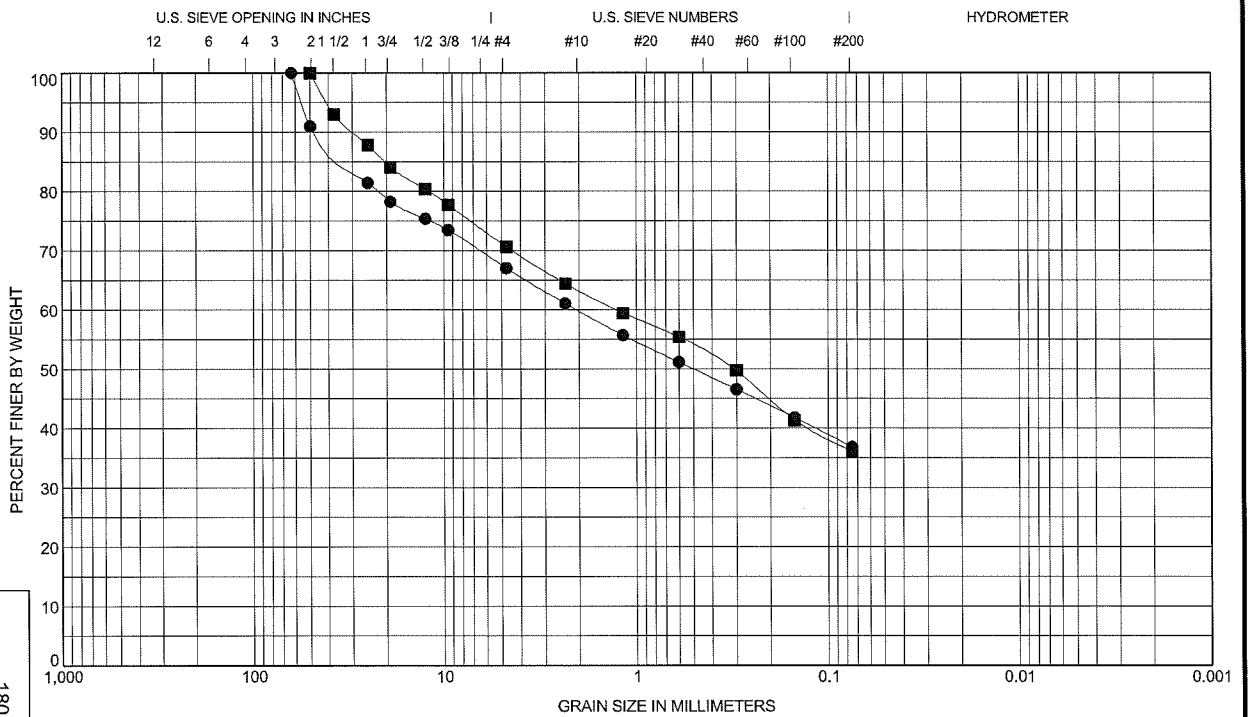
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FIG. 8

TEST PIT_02153 GINT.GPJ S&W GEO.GDT 2/16/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample	Depth, Ft	Classification					LL	PL	PI	Cc	Cu
● TP-2 S2	10.0 - 11.0	Sandy, silty GRAVEL (GM)									
■ TP-3 S3	11.0 - 11.5	Gravelly, silty SAND (SM)									
Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● TP-2 S2	10.0 - 11.0	63	2.05			33	30	37			
■ TP-3 S3	11.0 - 11.5	50	1.27			29	34	36			

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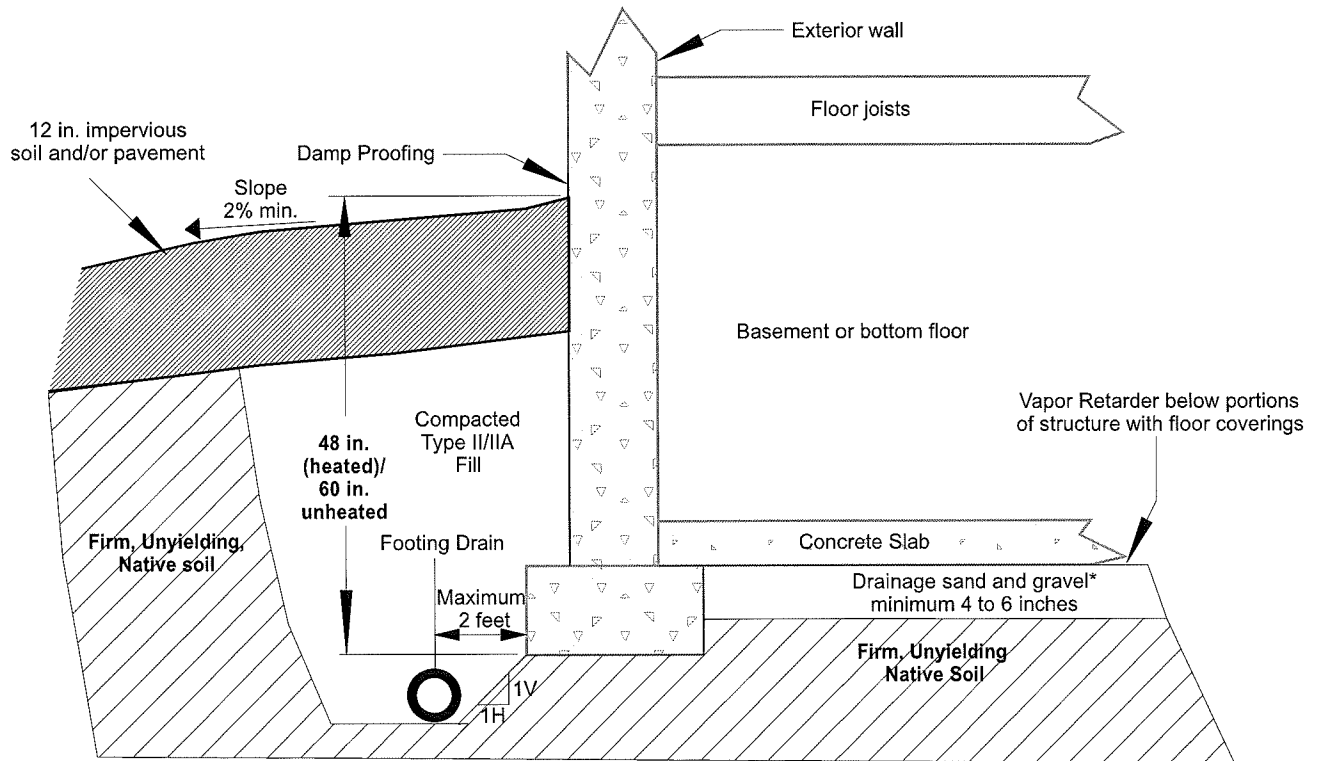
GRAIN SIZE CLASSIFICATION

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FIG. 9

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NOTES:

1. All backfill should be placed in layers not exceeding 10 to 12 inches loose thickness and densely compacted. Structural fill should be compacted to 95% minimum, non-structural fill compacted to 90%, of ASTM D1557.
2. Backfill within 18 inches of the wall should be placed in layers not exceeding 6 inches and densely compacted with hand-operated equipment. Heavy equipment should not be used for backfill, as such equipment operated near the wall could increase lateral earth pressures and possibly damage the wall.

* Sand and gravel below the floor slab should be well-graded, free-draining, and contain less than 6% fines (material passing the No. 200 sieve based on the minus 3/4-inch portion). It should be placed in maximum 6-inch loose lifts and compacted to 95% of its maximum density as determined by the Modified Proctor compaction procedure (ASTM D1557).

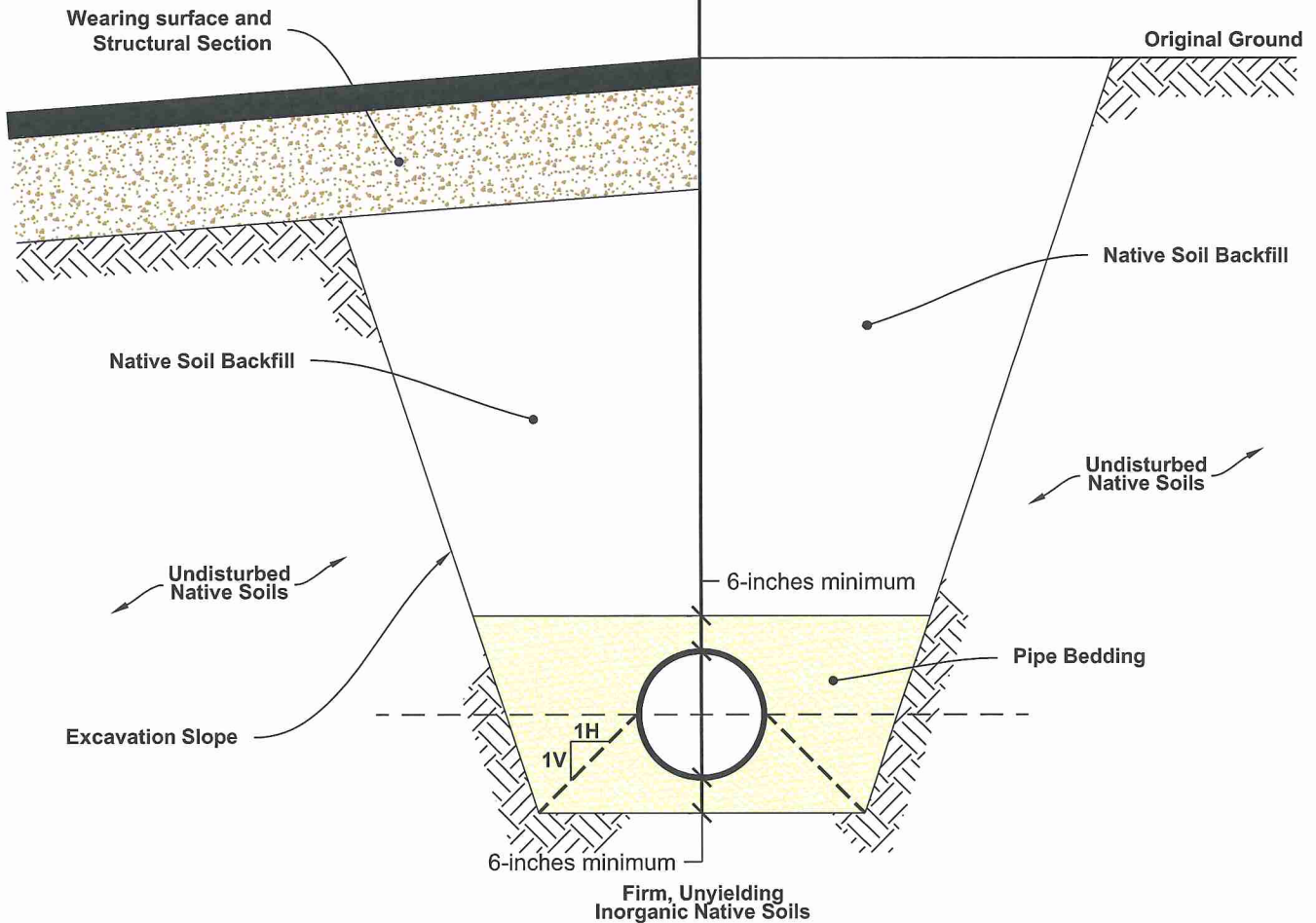
DRAWING NOT TO SCALE

OSHA requires slope protection and support for all trenches greater than 4 feet deep. Side slope requirements are variable depending upon soil type and the duration of time in which the trench remains open. The contractor should be made responsible for compliance to these regulations as they are at the project site on a day to day basis and are aware of changing conditions.

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FLOOR SLAB AND FOOTING DETAIL	
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Trench Under Paved Areas

Trench Under Non-Structural Areas



NOTES

1. Trench backfill under paved areas should be placed in loose lifts not to exceed 12 inches and compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557.
2. Trench backfill under non-structural areas should be placed in loose lifts not to exceed 18 inches and compacted to at least 90 percent of its maximum dry density as determined by ASTM D-1557.
3. Pipe bedding should conform to MOA Class C bedding material or as recommended by pipe manufacturer.
4. Pipe bedding and cover thickness shown above should be used absent pipe manufacturer requirements.

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Girdwood, Alaska

UTILITY TRENCH DETAIL

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FIG. 12

GRADATION REQUIREMENTS

(Adapted from Municipality of Anchorage Standard Specifications, 2009)

LEVELING COURSE

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
English	Metric	
1 in.	25.0 mm	100
3/4 in.	19.0 mm	70 - 100
3/8 in.	9.5 mm	50 - 80
No. 4	4.75 mm	35 - 65
No. 8	2.36 mm	20 - 50
No. 50	0.30 mm	10 - 30
No. 200	0.075 mm	3 - 8*

TYPE II BASE

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
8 in.	-	
3 in.	75 mm	70 - 100
1-1/2 in.	37.5 mm	55 - 100
3/4 in.	19.0 mm	45 - 85
No. 4	4.75 mm	20 - 60
No. 10	2.00 mm	12 - 50
No. 40	0.425 mm	4 - 30
No. 200	0.075 mm	2 - 6**

TYPE II-A BASE

U.S. STANDARD SIEVE SIZE		PERCENT PASSING BY WEIGHT
3 in.	75 mm	
3/4 in.	19.0 mm	50 - 100
No. 4	4.75 mm	25 - 60
No. 10	2.00 mm	15 - 50
No. 40	0.425 mm	4 - 30
No. 200	0.075 mm	2 - 6***

* The fraction passing the No. 200 sieve shall not exceed 75 percent of the fraction passing the No. 50 sieve.

** The fraction passing the No. 200 sieve shall not exceed 15 percent of the fraction passing the No. 4 sieve.

*** The fraction passing the No. 200 sieve shall not exceed 20 percent of the fraction passing the No. 4 sieve.

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GRADATION REQUIREMENTS

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FIG. 13

APPENDIX A

**IMPORTANT INFORMATION ABOUT YOUR
GEOTECHNICAL/ENVIRONMENTAL REPORT**



Date: February 2011
To: Z Architects
Re: 180 Taos Road Townhouses, Girdwood,
Alaska

Important Information About Your Geotechnical/Environmental Report

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors, which were considered in the development of the report, have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland