Building Permit

Permit Number: 2005099

Issue Date: 7/12/2005

Town of Telluride
Building Department
P.O. Box 397, Telluride, CO 81435

Title: Willow House Phase II — **Project Valuation:** $1,900,000.00

Address: 240 E. Pacific — **Legal Description:** Bk:31, Lot:7A, OT,

Owner:	Marsim Development LLC	P.O. Box 1421 Telluride CO 81435		**Phone:** (970) 728-3317
Architect/Designer:	Herbst, Tony	**Cellular:**		**Phone:** (970) 728-0890
Contractor:	Chandler Homes, Mike Chandle	**Cellular:**	(970) 708-2380	**Phone:** (970) 728-4006
Agent:	Chandler Mike	**Cellular:**	(970) 708-2380	**Phone:** (970) 728-4006

Fee Summary:

Building Permit	$8,893.75
Plan Check	$6,780.94
Town Use Tax	$34,200.00
County Use Tax	$7,600.00
Building License	$13,300.00
Water Tap	$20,376.32
Sewer Tap	$47,544.74
Flood Plain Pmt	$417.44
Mechanical Pmt	$665.63
Total Fees:	**$139,778.82**

Type of Work: New
Type of Construct: V N
Use Zone: CR

Occupancy Groups:

#	Occ Grp	Unit ID	sq. ft.
	U-1	4 spaces	1417
1	R-1	4 (1st fl)	534
1	R-1	3 (3rd fl)	3048
1	R-1	2 (2nd fl)	1760
1	R-1	1 (2nd fl)	1644
1	B		1818
Total Units	5		

# of Stories: 3
Occupant Load:
Total Area: 10201
Floor Area: 8784
Basement Area: 0
Garage Area: 1417
Decks: 875

Scope of Work:

New 3 story fully fire sprinklered building Consisting of one commercial space, 4 garage spaces (including common mechanical & trash) and a residential unit (4) on the 1st floor, 2 residential units (1 & 2) on the 2nd floor and 1 residential unit (3) on the 3rd floor. Non code compliant 3rd fl exit(NE corner) crossing property line Ok'd by Town Attorney (legal agreement on file) and Building Dept. via area separation wall (97 UBC sect. 504-63) fire protection.
Water/Sewer tap fees:
Commercial base up to 14 fixture units
$7,580.86
Residential units 1,2 & 4
<2500sf ea $12,887.46 38,662.38
Unit 3 3334 sf
base -2500 sf 12,887 46

add sf 834 x 10.59 8,790.36

Total $67,921.06
70 % Sewer $47,544.74
30 % Water 20,376.32
Plan ck fee pd 3/14/05 #24206 $5780.94

Permit is approved for work described above in accordance with the approved plans and specifications.

By: Helen Schumacher Date: 7/12/2005

Fees Collected: 132997.88 + 1800.00 Check #: 1422 1423

Rec'd by: Date: 7/15/05

Signature of Owner/Contractor/or Agent Date 7/15/05

Notice to Permit Holder

This permit becomes null and void if the work or construction authorized is not commenced with-in 180 days or if work or construction is suspended or abandoned for 180 days at any time after the work is commenced.

All contractors and subcontractors are required to have a Town of Telluride business license to perform work within Town limits.

All work shall be done in accord with the approved plans, except where such approval is in conflict with other codes The approved plan shall not be construed as permission to vindicate any applicable codes, violations found in any phase of a project shall be rectified.

It is the responsibility of the permitted to obtain the required inspections Failure to notify this department that the work is ready for inspection may necessitate the removal of some of the contruction materials at the Owner's expense in order to perform such inspection The following inspections are required by Section 305 of the UNIFORM BUILDING CODE and local ordinance:

1) FOOTER- When forms are in place, prior to placement of concrete.
2) FOUNDATION- All rebar in place, prior to placement of concrete
3) DAMPPROOFING, PERIMETER DRAINS- Prior to backfilling
4) CONCRETE SLAB, GROUNDWORK- When all service equipment and piping is in but prior to placement of concrete
5) FRAMING- After all framing, bracing, blocking, piping, wiring, and ducting are complete but prior to covering and after approval by state electrical and plumbing inspectors
6) INSULATION
7) DRYWALL- After drywall is in place, prior to taping or covering fasteners
8) FINAL- Work completed, but prior to occupancy Final electrical and plumbing approvals required by inspectors.

FOR INSPECTIONS CALL 728-2175

I hereby certify that I have read and examined this permit and know the same to be true and correct All provisions of laws and ordinances governing this type of work will be complied with whether specified herein or not The granting of a permit does not presume to give authority to violate or cancel the provisions of any other State or local law regulating construction or the performance of construction

Town of Telluride

Owner of Building

Marsim Development LLC
P.O. Box 1421
Telluride CO 81435

Certificate of Occupancy

Department of Building Inspection

1997 Uniform Building Code

This Certificate, issued pursuant to the requirements of Section 109 certifies that at the time of issuance this structure was in compliance with the various ordinances of the city regulating building construction or use for the following:

Bldg. Permit No: **2005099**

Title: Willow House Phase II

Bldg Address: 240 E. Pacific ; Lot 7A Bk 31 OT

Occupancy Group:

#	Occ Grp	Unit ID	sq. ft.
	U-1	4 spaces	1417
1	R-1	4 (1st fl)	534
1	R-1	3 (3rd fl)	3048
1	R-1	2 (2nd fl)	1760
1	R-1	1 (2nd fl)	1644
1	B		1818
Total Units	5		

Type of Work: New
Type of Construction: V N
Use Zone: CR

Status: **Final CO**
Restrictions:

Issued By: David Samuelson
CO Date: 3/21/2007

Building Official

1 of 2

Building Permit
Inspection Record
For Inspections call
Building Dept.
(970) 728-2175

TOWN OF TELLURIDE

Permit No. 2005099

Date Issued 7-12-05

Job Address 240 E. Pacific (728 3071 JOHN OR SAM) Willow House II

Owner MARSIM Development, LLC Phone 728-3317

Contractor Chandler Homes Phone 728-4006, 708-2380

Type of Permit ☐ S F RES ☒ MULT RES ☒ COMM ☐ CHURCH/SCHOOL ☐ GRADING ☐ OTHER

Class of Work ☐ NEW ☐ ADDITION ☐ ALTERATION ☐ REPAIR ☐ MOVE ☐ DEMOLITION

Description of work See permit Type IV Occupancy R-1, B, U

THESE INSPECTIONS ARE REQUIRED BY LAW
DO NOT PROCEED UNTIL PREVIOUS INSPECTIONS ARE SIGNED

		Date	Inspector
ELEC.	Temp. Power		
	Underground Elec.		
	Rough Elec.	8/14/06	
PLUMBING	Under Ground Plumbing	9/13/06	
	Rough Plumbing		
	Gas piping pressure test	8/17/06	
	Heat Tubing P.S.I.		
	Shower Pans		
	Roof Drains		
MECH	Furn/Boiler UNITS 1, 2, 3, APT ONLY	8/16/06	JF
	Combust/Venting		
	OK to set Gas/ Meter UNITS 1, 2, 3, APT ONLY	8/16/06	JF
	Gas Fireplace/Stove		
	Hood/Balance Report		
	H.V.A.C. Ducts		
FOUNDATION	Footings		
	SonoTubes/Piers		
	Foundation Walls		
	Location Survey		
	Damp Proofing/Found Ins		
	Slab Insulation/ Vapor Barrier	9/28/05	JF

		Date	Inspector
FRAMING	Water Meter 728-6075	12/19/06	W. Nichols
	Rough Frame		
	Shear Nailing	11/17/06	JF
	Insulation	9/12/06	JF
	Drywall Nailing		
	Elev./Ridge Height	12/11/06	
	Fire Sprinklers		
	FEMA Elev. Cert. Req'd ☒	2/10/06	

ALL CATEGORIES BELOW MUST BE SIGNED PRIOR TO SCHEDULING BLDG. DEPT. FINAL

FINALS	Elec. Final 728-1392	3/15/07	07
	Plumbing Final 728-1392	3/15/07	07
	Mech. Final 728-2175 ☐ Cert. Req'd	3/14/07	DS
	Planning 728-3071	3/21/07	CH
	H.A.R.C. 728-3071	3/21/07	C.H.
	Public Works 728-3516	12/18/06	
	Town Engineer 728-2177	12/18/06	
	W.W.T.P. Meter/ Back Flow 728-6075	12/19/06	W. Nichols
	Fire Dept. 728-3801	12/15/06	3/13/07
	Bldg Department 728-2175 OK to issue C.O.	3/21/07	

THIS CARD MUST BE POSTED ON JOB AT ALL TIMES
A LOST CARD WILL COST $150 MINIMUM TO RE-DUPLICATE

8/10/05 Partial Underground Plumbing Grid 3.8 ok [initials]
8/22/05 PARTIAL GRADE BEAM NORTH EAST OK-JF
8/25/05 PARTIAL GRADE BEAMS OK CENTER PORTION -JF
8/31/05 -REMAINDER GRADE BEAMS OK-JF
9/20/05= PARTIAL SLAB SOUTH WEST OK TUBING 60 PSI -OK TO POUR-JF
12/21/05 ~~to~~ Empty Unit Under slab OK [initials]
1/19/06 - INSUL. AT CEILINGS OK AT DROPPED CEILINGS OK JF
2/03/06 - EXTERIOR GYP. SHEATING OK-JF
3/7/06 - exterior decks - waterproofing & drains OK to cover - DS
3/23/06 Rough Plumbing on Gas in Entire Complex OK [initials]
4/11/06 - 1 elevator shaft 1st LAYER OK to cover - DS
2 MECH ROOM EXT. WALL - INSULATION & DRYWALL - OK - DS
3 exterior decks - OK to foam insulate - Long deck tie from TJI to lams - needs engineer OK - DS
TJI TO LVL OKAY AT DECK - J.G 4.27.06
4/19/06 - ~~2nd~~ 3rd FLOOR CANT. DECKS INSULATION OK-JF
4/20/06 - HEAT TUBING DECKS (7) OK 80 PSI - JF
5/2/06 (Waste & Vent) OK To Fix pipe in Bath 2 Unit & will check pressure on water inspection [initials]
5/3/06 Waste & Vent OK [initials]
5/3/06 Electrical R/I Level [illegible] [illegible] OK [initials]
6/8/06 - UPPER FLOOR TUBING 60 PSI OK -JF
6/14/06 - Rough Plumbing OK For Unit 3 [initials]
6/15/06 - Electrical R/I on Unit 3 OK [initials]
6/22/06 - TUBING UNIT 1 OK 100 PSI - JF
6/29/06 - Rough FRAME ~~Roof~~ FLOOR - STRUCTURAL WELDING REPORT NEEDED OK TO INSUL. ~~check~~ PROVIDE REPORT TO BLDG DEPT. WHEN,

8-22-06 - CURB + GUTTER HEAT TUBE 60 PSI - JF
SHEARWALL MAIN FLOOR OK-JF

7/11/06 Electrical Rough on 2nd Floor Only OK [initials]
7/12/06 ~~[illegible]~~ Plumbing on 2nd Floor Only OK [initials]
7/12/06 - INSULATION TOP FLOOR OK-JF
7/18/06 - FRAME 3RD FLOOR/CEILING (2nd LEVEL) ok mech OK-JF
8/02/06 - DRYWALL, 3 SHOWER PANS 3rd FLOOR OK. 2nd FLOOR INS OK-JF
8/03/06 - 1ST LAYER DRYWALL 2nd FLOOR UD OK-JF
8/8/06 - UNIT 2 DRYWALL OK-JF
8/21/06 - 2nd FLOOR UNIT 2, 2 SHOWER PANS OK-JF

CARD #2

Building Permit
Inspection Record
For Inspections call
Building Dept.
(970) 728-2175

TOWN OF TELLURIDE

Permit No. 2005099
Date Issued 7-12-05

Job Address 240 E PACIFIC
Owner MARSIM DEVELOPMENT LLC Phone 728-3317
Contractor CHANDLER HOMES Phone 728-4006, 708-2380
Type of Permit ☐ S F RES ☐ MULT RES ☐ COMM ☐ CHURCH/SCHOOL ☐ GRADING ☐ OTHER
Class of Work ☒ NEW ☐ ADDITION ☐ ALTERATION ☐ REPAIR ☐ MOVE ☐ DEMOLITION
Description of work SEE PERMIT Type V-THR Occupancy R-1, B, U

THESE INSPECTIONS ARE REQUIRED BY LAW
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		Date	Inspector
ELEC.	Temp. Power		
	Underground Elec.		
	Rough Elec.		
PLUMBING	Under Ground Plumbing		
	Rough Plumbing		
	Gas piping pressure test		
	Heat Tubing P.S.I.		
	Shower Pans		
	Roof Drains		
MECH	Furn/Boiler		
	Combust/Venting		
	OK to set Gas/ Meter		
	Gas Fireplace/Stove		
	Hood/Balance Report		
	H.V.A.C. Ducts		
FOUNDATION	Footings		
	SonoTubes/Piers		
	Foundation Walls		
	Location Survey		
	Damp Proofing/Found Ins		
	Slab Insulation/ Vapor Barrier		

		Date	Inspector
FRAMING	Water Meter 728-6075		
	Rough Frame		
	Shear Nailing		
	Insulation		
	Drywall Nailing		
	Elev./Ridge Height		
	Fire Sprinklers		
	FEMA Elev. Cert. Req'd ☐		

ALL CATEGORIES BELOW MUST BE SIGNED PRIOR TO SCHEDULING BLDG. DEPT. FINAL

FINALS	Elec. Final 728-1392		
	Plumbing Final 728-1392		
	Mech. Final 728-2175 ☐ Cert. Req'd		
	Planning 728-3071		
	H.A.R.C. 728-3071		
	Public Works 728-3516		
	Town Engineer 728-2177		
	W.W.T.P. Meter/ Back Flow 728-6075		
	Fire Dept. 728-3801		
	Bldg Department 728-2175 OK to issue C.O.		

THIS CARD MUST BE POSTED ON JOB AT ALL TIMES
A LOST CARD WILL COST $150 MINIMUM TO RE-DUPLICATE

8/29/06 — HEAT TUBE APT. OK — JF
8/30/06 — SIDEWAK TUBING OK — JF REBAR/INS OK JF
9/20/06 - 1ST LAYER DRYWALL LOWER FLOOR OK - INS UNIT 1 OK — JF
9/27/06 - LOWER LEVEL DRYWALL SOUTH PART OK JF
9/28/06 - UNIT 1 CEILING OK DRYWALL 1ST LAYER JF
10/4/06 — UNIT 1 DRYWALL OK - JF
10/10/06 — EXIT ENCLOSURE STAIR AREA DRYWALL OK JF
10/13/06 - 1ST LAYER COMMERCIAL LID OK JF
10/18/06 - 2ND LAYER LID + WALLS DRYWALL OK JF
12-15-06 OK C.O. Commercial and 3rd Floor Penthouse [signature]
12/12/06 Electrical + Plumbing Final For PentHouse Only OK. CJ
Plumbing Finish Kitchen Sink + Access Panel For Bath
Electrical Install Panels for lighting Panels

12/18/06 ① Submit an as-built of utilities.
PW ② submit a written summary of the plan for moving the electric.

1/31/07 Finals For Plumbing + Electrical for Comm. Area OK CJ
2/22/07 Finals For Unit 2 on Electrical and Plumbing OK CJ
3/2/07 Elevator, Inspected tested by National Elevator Services - NAESA #1007 (Bill Hughes)
3/8/07 Planning & HARC inspection - Building is Complete & ready for signature, Pending Affordable Housing approval. DLM
3/13/07 Unit 5 Final OK For Plumbing & Electric. CJ
3/14/07 Unit #1 final did not pass on Plumbing due to no Hot Water and final Electric No Pass on Closet light to close shelf + one not installed. CJ
3/16/07 — FINAL for C.O. FROM BLDG OK — WAITING ON PLANNING/HARC — DS

blu ink
p.o. box 28
rico, colorado 81332

(970) 967-3528 tel./fax
tylapp@attglobal.net
ARCHITECTURAL DESIGN

December 12, 2006

Re: Willow House Phase II – Commercial Space Occupancy

This letter is to confirm the occupant load and egress requirements for the commercial space for the Willow House Phase II project. The original occupancy classification for the project was either Group B or M with the space being designed for Group M (retail store). Using the 1997 UBC, Table 10-A the occupant load for the space (957 s.f. space) using the occupant load factor of 30 s.f. per person is 32 persons. Concerning the egress requirement only one means of egress shall be required base on Table 10-A.

Tyler Lapp

FILE COPY
RECEIVED
2005
2005-12
& ASSOCIATES

ATTN TODD KALWEIT

BUCKHORN GEOTECH

Civil, Structural & Geotechnical Engineers

222 South Park Ave.
(970) 249-6828

Montrose, CO 81401
FAX (970) 249-0945

L G Barcus + Sons
Jim Steding
1430 State Ave
KC Kansas 66102
800 255 0180

Western Piling + Co 510 A-H0
970 243 8938
Gordon Buford

Ken Heuman
Barkus Bowington
Colorado Piling
H0 Jim Scheade
970 243 2304

soils Report
pile layout
4 wks out

SOIL REPORT
CAL WILBOURNE
LOTS 5A & 7A, BLOCK 31
TOWN OF TELLURIDE
COLORADO

On March 6, 2002, Buckhorn Geotech, Inc., conducted an investigation of soil and site conditions on Lots 5A and 7A, Block 31, in Telluride, Colorado. This work was performed at the request of Cal Wilbourne, architect, on behalf of the property owner, Spencer Simmons. The purpose of the investigation was to evaluate the property for construction of a two similar commercial and residential structures. The investigation consisted of a site inspection, drilling of two boreholes, logging and testing of materials encountered, and analysis of available data. The following report presents the findings of our investigation and our geotechnical engineering recommendations for site preparation and foundation design.

FILE COPY

Construction Plans

We understand from plans provided to us by Mr. Wilbourne that two similar structures comprising approximately 7,400 square feet each are proposed for construction on the property. The three-story structures will contain retail occupancy on the first floor, with residences on the upper floors. The structures will be built with conventional wood framing and metal roofs. It is anticipated that each structure will transfer approximately 3,000 to 4,000 pounds per linear foot to a continuous footing with concentrated loads of 20,000 to 50,000 pounds.

Site Conditions

Lots 5A and 7A, Block 31, are located at the southwest corner of Pacific and Willow Streets in Telluride, as shown on the attached Vicinity Map. The property is bounded by streets on the north and east, a parking lot to the west, and a wetlands/open space to the south. The lot slopes gently to the south into the wetlands at grades of less than 4 percent. Although the ground

drilling logs. The SPT N-values were found to vary from 9 to 15 blows per foot (bpf) to a cobble layer found at 17 or 18 feet in AH#1 and 25 feet in AH#2, where the blow counts increased to 27 to 31 bpf. The blow counts decreased below this, but remained between 16 and 22 bpf. The blow counts indicate compact to slightly dense conditions.

AH#1 was terminated at a depth of 50, and AH#2 was terminated at a depth of 54. No bedrock was encountered in either hole.

CONCLUSIONS AND RECOMMENDATIONS

The soil conditions encountered in our drilling indicate the site is underlain by alluvial sand and gravels with interbedded layers of cobbles, existing in compact to dense conditions.

Given the scale of the proposed development, several foundation options may be considered for the buildings. These options may be classified as shallow and deep foundations, and are described below.

Shallow Spread Footings

The foundation soils are considered adequate for a lightly-loaded shallow spread footing system. However, some post-construction settlement should be expected, especially if the groundwater table at this site drops significantly.

The shallow spread footing foundation components should rest upon a minimum of 2 feet of structural fill placed on the prepared native soil, as described below. It is recommended the footing trenches extend to strata below the fill encountered on the western portion of the site, and footings should be extended into the soil a minimum depth below finished grade as prescribed by the local building official to reduce the negative effects of frost heave. After excavating to a minimum of 2 feet below foundation depth, the exposed soil surface should be compacted and proof-rolled using vibratory soil compaction equipment to assure uniform bearing conditions. The footing trenches should extend a minimum of one-half the depth of overexcavation beyond the outside edge of the footings. The presence of groundwater at a shallow depth may require site dewatering during foundation preparation. If soft or yielding soils are encountered during proof-rolling, these soils should be removed and replaced with compacted structural fill. A layer of geotextile may be necessary to facilitate stabilization of soft areas. Once the subgrade preparation is complete, structural fill may be placed to the desired footing elevation. Both the disturbed native soil and the structural fill should be compacted to at least 95% of their respective Modified Proctor maximum dry densities at ±2% of optimum moisture content prior to placing the foundation forms. The structural fill should consist of either ¾-inch minus roadbase or 3-inch minus pit run approved by the foundation engineer, placed in 6-inch lifts and compacted as just described. Footings may then be placed directly on this prepared surface.

Footings and any retaining walls erected may be designed using the following parameters:

Allowable bearing capacity	1500 psf*

Active earth pressure	36 pcf**
Passive earth pressure	200 pcf
At rest earth pressure	55 pcf
Unit weight of soil	125 pcf
Coefficient of friction	0.32***

* pounds per square foot
** pounds per cubic foot (fluid equivalent)
*** concrete on dry soil conditions

The allowable bearing capacity is based on placing the footers directly on the prepared native soil, as described above. The lateral pressure values are based upon the use of the excavated material behind the retaining structures, with no hydrostatic build-up, a horizontal backfill, and no surcharging of the backfill. These values must be adjusted if other material is used for backfill, the backslope angle is increased, or loads are applied behind the wall.

Footings for bearing components of the structure should be sized to balance applied loads to within plus or minus 300 psf using full dead load plus one-half live loads. Pads under concentrated loads should be similarly balanced using full dead load plus one-third live loads. A shallow foundation designed in compliance with these recommendations should not experience settlement of over one inch.

Based on the elevation of 8,753 feet above msl, the Structural Engineers Association of Colorado recommends that the Basic Snow Design Load be a minimum of 74 psf. It is recommended that the local building official be contacted to verify the required snow design load for these lots.

Foundation walls should be designed with sufficient strength to resist lateral earth pressures and to bridge an unsupported span of at least 10 feet. The positive and negative reinforcing steel should have the same cross-sectional area. The components of the foundation should be sufficiently interconnected to ensure that they act as a unit.

Slabs-on-grade should be placed on 4 inches of ¾-inch to 1½-inch washed rock placed on the prepared native soil with the vegetation and topsoil removed to provide a capillary break. The subgrade material should be proof-compacted and soft spots removed and replaced with washed rock. If any fill is needed to elevate the slab area to the desired foundation grade, this can be accomplished using ¾-inch minus roadbase compacted as prescribed above. Due to the presence of shallow groundwater, an unpunctured vapor barrier between the gravel and the floor slab is also recommended. To facilitate proper concrete curing, a 2- to 4-inch layer of moistened sand should be placed on the vapor barrier prior to placement of concrete.

Because of the potential sulfates in the soil and their corrosive qualities, Type I/II sulfate-resistant cement should be used.

Exterior concrete flatwork should be designed and constructed so that it drains freely away from the structure. If fill is needed, it should consist of washed rock or gravelly soil free of clay placed in 6-inch lifts and compacted to 95 percent of Standard Proctor maximum dry density at ±2 percent of optimum moisture content.

Final grading around the perimeter of the foundation should slope downward with at least one (1) foot of drop within the first 10 feet of horizontal distance. Concrete flatwork adjacent to the foundation should fall away at a rate of at least ¼-inch per foot. The site drainage plans should ensure that surface water is removed and not allowed to accumulate or stand anywhere near the building foundation either during or after completion of construction. This includes water from landscaped areas, patios, decks, and roofs. Plans should also ensure that snowmelt and rain runoff are conveyed around the buildings as well as the driveway. This runoff should be dispersed (not concentrated) in a manner consistent with the natural, pre-construction drainage pattern.

The native soil excavated from the site is suitable for use as non-structural backfill and landscaping purposes. It may be considered for use as structural fill with the approval and direction of the foundation engineer.

Deep Foundations

Due to the saturated conditions near the ground surface, a deep foundation system may be opted for. The deep foundation system may consist of either pressure-grouted auger piles or helical piers extended to approximate depths described below. Design parameters and recommendations for pressure-grouted auger pile and helical pier foundation systems are outlined below.

Option 1: Pressure-Grouted Auger Piles

Pressure-grouted auger piles are constructed by drilling into the alluvium using a large-diameter hollow-stem continuous flight auger (typically 12 to 22 inches O.D.). A Portland cement grout is then injected under pressure through the auger as it is withdrawn, filling the void left by drilling. The grout under pressure creates irregular contact surfaces between the pile and the surrounding soils, as well as densifying the soils in the immediate vicinity of the pile. Grade beams are erected upon and spanning the piles, once cured, to distribute the building's loads to the piles. The design and construction details presented below should be observed if a pressure-grouted auger pile system is chosen.

Based on load tests conducted in the Telluride area, pressure-grouted auger piles placed in the alluvial soils typically generate skin frictions of 2,250 psf with a minimum penetration of 30 feet into the alluvium. End-bearing is not considered with these piles. Generally the top 10 feet of embedment is not credited for carrying load. Allowable design loads depend on pile diameter and depth. A static pile capacity equation should be used for selecting the optimum pile size and length, which should be determined between the foundation engineer, the geotechnical engineer, and the piling contractor. Typical pile diameters range from 12 to 22 inches. Based on our investigation, we anticipate pile depths on the order of 30 to 50 feet.

A factor of safety of 3:1 (failure load : design load) should restrict differential settlement to less than 0.5 inches. However, the load-settlement relationship obtained from a pile load test will provide a much more reliable estimate of pile settlement under design loads. For preliminary

planning purposes, the following capacities can be assumed for 50-foot pressure grouted auger piles:

Pile Diameter (Inches)	Pile Capacity (lbs.)
12	23,500
14	32,200
16	41,600
18	53,000
20	65,700
22	78,900

A pile load test is recommended to verify the actual load capacity in the field.

Piles should be spaced a minimum of 3 diameters on center to prevent interference with an adjacent pile's load carrying capacity. Piles spaced closer than 3 diameters will require group action reduction in capacity. Piles should be constructed alternately if the adjacent pile is within 4 feet, allowing the grout to cure at least 8 hours before drilling an adjacent shaft.

A piling contractor with demonstrated successful experience performing pressure-grouted auger pile work with qualified personnel in similar conditions should be chosen to perform the pile installations. A representative of Buckhorn Geotech should be present to observe and document all pile installation operations.

Option 2: Helical Piers

Helical piers may be considered as an alternative to the pressure-grouted auger piles. The piers typically consist of 5- to 10-foot long sections of solid square high-strength steel bar with flanged connections at one end, with ultimate compressive carrying capacities of up to 55,000 pounds. The lead (deepest) section has one or more 6- or 8-inch helix welded to the bar near the end. These piers are "screwed" into the ground using a torque head which stops driving the pier when the head reaches a design torque. The torque is pre-selected by the designer based on correlations with bearing capacity. Once these are installed in the ground, reinforced concrete grade beams spanning the helical piers are cast on void forms that will separate the beams from the surficial soils. The structure and flooring is then constructed on these grade beams.

Based on the subsurface testing results, these piers would likely not extend beyond the dense cobbles encountered at 25 feet in AH#1 and 17 feet in AH#2.

The property owner should be aware that these piers can meet refusal prematurely (that is, before reaching the specified torque) in unknown bearing conditions. This condition usually necessitates a relocation of the affected piers and subsequent foundation design changes. Should this foundation system be chosen, a written agreement with the contractor should be entered into, specifying that only piers meeting the required torque will be accepted as successfully installed piers. Additionally, we recommend that the owner request several test piers be installed on the

provide a much more reliable estimate of pile settlement under design loads. For preliminary planning purposes, the following capacities can be assumed for 50-foot pressure grouted auger piles:

Pile Diameter (inches)	Pile Capacity (lbs.)
12	94,000
14	110,000
16	125,000
18	141,000
20	157,000
22	172,000

A pile load test is recommended to verify the actual load capacity in the field.

Piles should be spaced a minimum of 3 diameters on center to prevent interference with an adjacent pile's load carrying capacity. Piles spaced closer than 3 diameters will require group action reduction in capacity. Piles should be constructed alternately if the adjacent pile is within 4 feet, allowing the grout to cure at least 8 hours before drilling an adjacent shaft.

A piling contractor with demonstrated successful experience performing pressure-grouted auger pile work with qualified personnel in similar conditions should be chosen to perform the pile installations. A representative of Buckhorn Geotech should be present to observe and document all pile installation operations.

Option 2: Helical Piers

Helical piers may be considered as an alternative to the pressure-grouted auger piles. The piers typically consist of 5- to 10-foot long sections of solid square high-strength steel bar with flanged connections at one end, with ultimate compressive carrying capacities of up to 55,000 pounds. The lead (deepest) section has one or more 6- or 8-inch helix welded to the bar near the end. These piers are "screwed" into the ground using a torque head which stops driving the pier when the head reaches a design torque. The torque is pre-selected by the designer based on correlations with bearing capacity. Once these are installed in the ground, reinforced concrete grade beams spanning the helical piers are cast on void forms that will separate the beams from the surficial soils. The structure and flooring is then constructed on these grade beams.

Based on the subsurface testing results, these piers would likely not extend beyond the dense cobbles encountered at 25 feet in AH#1 and 17 feet in AH#2.

The property owner should be aware that these piers can meet refusal prematurely (that is, before reaching the specified torque) in unknown bearing conditions. This condition usually necessitates a relocation of the affected piers and subsequent foundation design changes. Should this foundation system be chosen, a written agreement with the contractor should be entered into, specifying that only piers meeting the required torque will be accepted as successfully installed piers. Additionally, we recommend that the owner request several test piers be installed on the site prior to acceptance of this foundation option. Certification by the helical pier manufacturer

REVISED PILE CAPACITIES
12.9.04

site prior to acceptance of this foundation option. Certification by the helical pier manufacturer should be obtained specifying that the piers will maintain their integrity in Telluride's mineralized groundwater for the design life of the structure.

A helical pier contractor with demonstrated successful experience installing helical piers with qualified personnel in similar conditions should be chosen to perform the installations.

Continuous observation of the installation should be performed by Buckhorn Geotech as a representative of the owner. A log should be maintained detailing the depth and final torque of each pier installation.

Irrespective of the foundation type chosen, crawl spaces, the gravel lenses beneath floor slabs, and confined areas above concrete floor slabs should be well ventilated to allow for the release of radon gas. Recommendations for design and construction techniques found effective in the control and/or reduction of radon gas can be found in the pamphlets entitled *Radon Resistant Techniques for New Residential Construction* (EPA/625/2-91/032) and *Radon Reduction Methods, a Homeowner's Guide* (EPA Bulletin RD-681). The Radiation Control Division can be contacted in Denver at (303) 692-3030 for more information.

We look forward to providing you further assistance in selection of the foundation system that will suit your needs. If soil and groundwater conditions are discovered that vary from these discussed herein, construction should be stopped until the situation has been assessed by a representative of Buckhorn Geotech. Construction should be resumed only when remedies or design adjustments, as necessary, have been prescribed.

Thank you for the opportunity to perform this soil investigation for you. Buckhorn Geotech is a full-service engineering firm providing foundation, site drainage, structural, and retaining structure design services, as well as construction materials testing. If you require any of these services or have any questions regarding this report, please do not hesitate to give us a call.

Respectfully Submitted,
April 17, 2002

Shane Duckworth, EIT

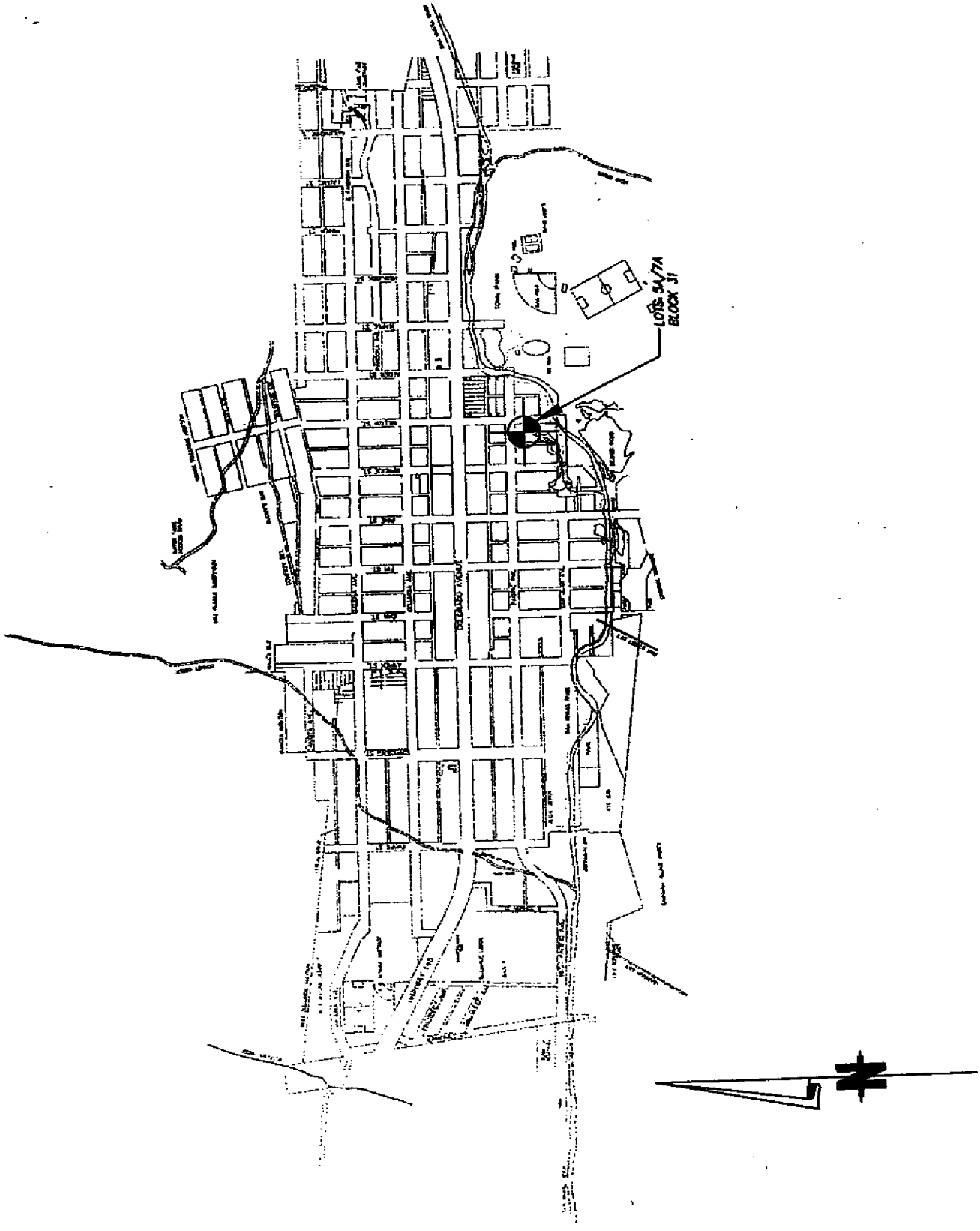
Reviewed by:
April 17, 2002

Thomas E. Griepentrog, PE

THOMAS E. GRIEPENTROG
REGISTERED
PROFESSIONAL ENGINEER
STATE OF COLORADO

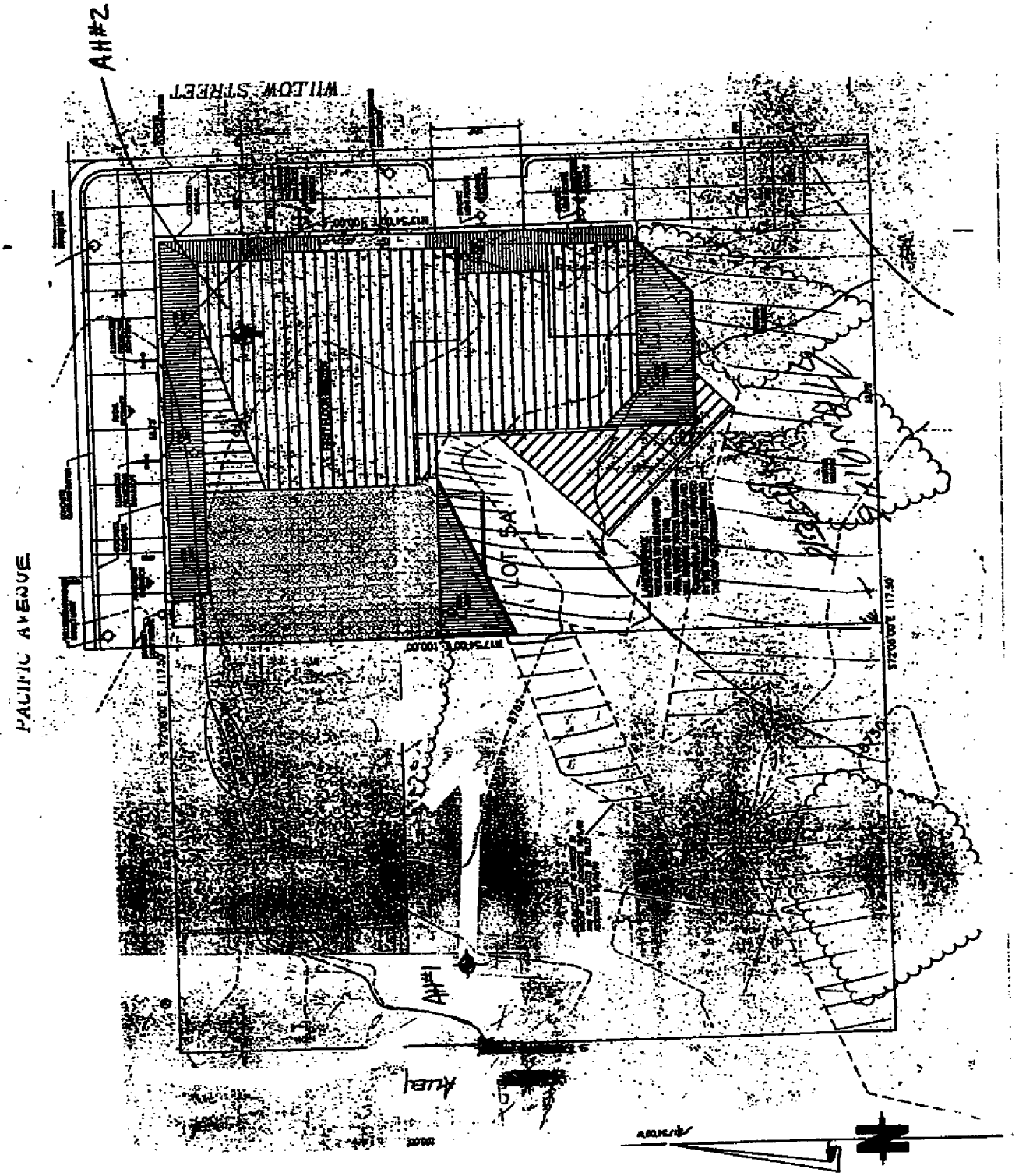
Enclosures: Vicinity Map, Site Plan, Drill Logs

VICINITY MAP



Sheet	Field Investigation: Duckworth	CAL WILBOURNE	BUCKHORN GEOTECH
1	Drafting: Duckworth	Lots 5A & 7A, Block 31	Civil, Structural & Geotechnical Engineers
	Date: March 6, 2002	Telluride, Colorado	222 South Park Ave. Montrose, Colorado 81401
	Project #: 02-052		970-249-6828 Fax. No. 970-249-0845

SITE PLAN



Sheet 1 OF 1	Field Investigation: Duckworth Drafting: Duckworth Date: March 6, 2002 Project #: 02-052	CAL WILBOURNE Lots 5A & 7A, Block 31 Telluride, Colorado	BUCKHORN GEOTECH Civil, Structural & Geotechnical Engineers 222 South Park Ave. Montrose, Colorado 81401 970-249-6828 Fax No. 970-249-0945

LOG OF EXPLORATORY DRILLING – AUGER HOLE #1

SURFACE ELEVATION: 8752 ft. (approx.)
DRILLER: D.A. Smith
DRILL RIG: Diedrich D50-T Track mounted
NOTES: SPT N-values not corrected for energy or depth; stratigraphic transitions are approximate and are inferred from cuttings and drillers comments

DRILL STEM: 3 1/4" I.D. 6 3/4" O.D. Hollow stem continuous flight auger
SAMPLER: STD Split Spoon 1.375" I.D.
CASING: None used

DEPTH (ft.)	GRAPHIC	WATER LEVEL	SAMPLE TYPE	SAMPLE NUMBER	SPT BLOW COUNTS	SPT 'N' VALUE (bpf)	RECOVERY (in.)	SOIL DESCRIPTION	FIELD & LABORATORY TEST RESULTS
0								*dark brown loose to compact silty SAND and fine GRAVEL with little clay, bits of glass and leather [FILL] (0–4.5'), water @3.5' immediately after drilling*	
5				DS1	6 6 3	9/12	9		
10				DS2	10 7 6	15/12	17	*wet brown–red silty SAND and 1" minus subrounded GRAVEL, loose–easy drilling* *larger gravels @12–13'*	
15									
20									
25				DS3	12 15 16	31/12	18	*cobbles @25–27'* *soft from 27–32'* *cobbles @32–35'*	
30									
35									
40								*coarse SAND and fine to coarse GRAVEL Estimated SPT ~20 to 30 bpf*	
45								*few cobbles from 45–50', easy drilling*	
50				DS4	6 10 6	16/12	18	*reddish brown wet compact SAND and subrounded GRAVEL trace to little silt; soft between 50–54'* *Auger Hole terminated @54'; no bedrock encountered*	
55									
60									

Sheet 1

Field Testing S.Duckworth
Lab/Drafting J.Griffin
DATE March 6, 2002
PROJECT #

Simmons/Wilbourne
Lots 5A & 7A, Block 31
Town of Telluride, Colorado

BUCKHORNGEOTECH
Civil, Structural & Geotechnical Engineers
222 South Park Ave. Montrose, Colorado 81401
970-249-6828 Fax. No. 970-249-0845

SAN JUAN
SURVEYING INC.

POB 3730
160-D SOCIETY DRIVE
TELLURIDE, COLORADO

PHONE 970.728.1128 FAX 970.728.9201
SJS@TELLURIDECOLORADO.NET

March 13, 2006
File: 02060

Town of Telluride
P.O. Box 397
Telluride, CO 81435

Re: Lot 7A, Blk. 31 TOT Willow House II
240 E Pacific

This letter is to certify that on March 13, 2006 San Juan Surveying measured the elevation of the roof ridge to the plywood sheathing and found that elevation to be 8793.2'.

COLORADO REGISTERED
CHRISTOPHER R. KENNEDY
36577
PROFESSIONAL LAND SURVEYOR

Christopher R. Kennedy

Christopher R. Kennedy, PLS 36577

03/13/06

HARC approved plans show a ridge of 8793.4'

Building height ok.

11/20/06