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MEMORANDUM

Date: December 8, 2016

To: TRPA Hearings Officer

From: TRPA Staff

Subject: Reed Land Capability Challenge; 24 Somers Loop, Washoe County, NV;
Assessor's Parcel No: 123-033-02 and 123-033-06, TRPA File No: LCAP2016-0406

Proposed Action: Hearings Officer review and approval of the proposed Land Capability Challenge.

Staff Recommendation: Staff recommends the TRPA Hearings Officer approve this land capability challenge which would change the land capability from Class 1a (1% allowable land coverage) to Class 2 (each 1% allowable coverage), Class 4 (20% allowable land coverage) and Class 6 (30% allowable land coverage).

Background: The subject parcel is shown as Class 1a on TRPA Land Capability Overlay Maps (aka Bailey Land Capability maps, Attachment A). The Soil Conservation Service Soil Survey of Tahoe Basin Area, California-Nevada (Rogers, 1974) identifies the entire parcel as Rock outcrop-Toem complex, 30 to 50% slopes (RtF). The RtF soil often has 25 to 50% rock outcrops and bedrock 17 to 26 inches below the surface. The soil component is typically loamy coarse sand or coarse sand. The vicinity of this parcel has a geomorphic mapping of C-1 for Stream-cut granitic mountain slopes-granitic foothills (high hazard lands). This geomorphic mapping reflects the steep escarpment along the nearby shores of Lake Tahoe for the north Stateline peninsula.

A detailed soil investigation was conducted for this property on September 25, 2008 by soil scientist Sidney W. Davis (Davis2 Consulting Earth Scientists, Inc.). Such work involved 5 hand auger holes and was done for three lots in anticipation of a future residential expansion and development (on vacant lots). Since 2008, the westerly lot was sold and not considered part of this land capability challenge. A TRPA land capability verification was conducted for these two parcels on April 11, 2016 (Attachment A). The verification determined the study area contained only Class 1a soils (Rock outcrop-Toem complex, RtF). A land capability challenge (LCAP2016-0406) was submitted by the property owner on October 19, 2016. TRPA contractor Phil Scoles (Terra Science, Inc.) conducted site visits on October 24 and 25, 2016 to verify the 2008 findings and refine the land capability boundaries.

Findings: TRPA's contractor soil consultant examined three locations originally described by the applicant's soil consultant. In addition, the TRPA contractor hand augured 3 additional holes to refine the land capability boundaries. The supplemental auger holes were situated on the north and south sides of the residence. The field investigation and subsequent analysis found the soil

on the northwest side of the residence to have loamy coarse sand textures to a depth of 55 inches or more. Coarse fragments were typically less than 10 percent. Such soil was found to be somewhat excessively drained (no evidence of seasonal high water table in upper 55 inches). The soil also lacked root-restricting layers in the upper 55 inches, as evident by fine roots observed at the bottom of the soil profile. Instead of the mapped RtF map unit, soils in the west-center of the study area formed from colluvium atop residuum (soil derived from granodiorite bedrock in this case). These deep soils are unnamed (XXX) and they are unlike Toem and Cagwin soils, which have bedrock at approximately 17 and 26 inches, respectively. The soils are also different from the Umpa series, (common in this vicinity), which form from andesite (rather than granodiorite). These unnamed soils have similar matrix color and textures as the Cagwin soil, but they are significantly deeper (hence greater soil functioning, as evident by dense shrub and tall tree growth. These textures do not form root-restricting layers, and they are considered Hydrologic Soil Group A.

In contrast, the supplemental auger hole on the south side of the residence, as well as the soil consultant's sample plots 4 and 5, were found to have bedrock at 13 to 28 inches. While somewhat excessively drained, these shallow, granodiorite soils qualify as Cagwin-Rock outcrop complex, 15 to 30% slope. The Toem mapping is appropriate where the soils are less than 20 inches deep, while Cagwin for soils 20 to 40 inches deep. While there are some larger trees within this map unit, the predominant plants are either smaller diameter trees or shrubs that can tolerate the shallow soils. A small portion of this map unit has been leveled for landscaping and/or recreational use.

There are no Stream Environment Zones (SEZs) present. The subject land is shown on the TRPA geomorphic hazard map as severe; however, field conditions are substantially different. First, all of the slopes onsite are 30% or less. Second, the subject lots are situated in a natural hollow between three rocky slopes. The soils have weathered to 43 to 55 inches in the areas proposed for Class 4 and 6. Third, the proximity to Lake Tahoe and elevation of the property is similar to many low hazard areas in nearby Incline Village. As such, this location better resembles the low hazard lands designation.

The 1974 soil series recognized that areas mapped as RtF and Cagwin have inclusions ("unmapped pockets") with deeper soils. Such pockets were too small for soil survey mapping, but can be identified on site-specific analyses (such as this land capability challenge). From Page 20, Table 4 of Land-Capability Classification of the Lake Tahoe Basin, California-Nevada (Bailey, 1974), the unnamed XXX soil having 0 to 16% slopes qualify as Class 4 (20% allowable land coverage), while 15 to 30% slopes qualify as Class 6. The land capability polygons shown on Attachment B are based on field observations, topographic survey and reflect pre-disturbance soil conditions. That is, land beneath the house and deck was mapped by connecting contours flanking each side of the residence. The table below summarizes the changes in land capability as concluded by this field investigation and analysis.

Land Capability District	Area (sq. ft.) TRPA Land Cap. Map	Area (sq. ft.) LCAP2016-0406	Net Change (sq. ft.)
Class 1a (RtF, >30% slopes)	14,702	0	-14,702
Class 2 (CaE, 15 to 30% slopes)	0	9,190	+9,190
Class 4 (XXX, 16 to 30% slopes)	0	2,039	+2,039
Class 6 (XXX, 0 to 16% slopes)	0	3,473	+3,473
Total Parcel Area	14,702	14,702	0

This memorandum was jointly prepared by TRPA contractor Phil Scoles (Terra Science, Inc.) and TRPA Associate Planner, Julie Roll. If you have questions on this Hearings Officer item, please contact Julie Roll at 775-589-5247 (jroll@trpa.org).

Attachments:

- A. Vicinity map and TRPA land capability map
- B. Existing conditions map showing topography and land capability challenge recommendation
- C. Applicant's soil consultant report with soil profile descriptions (3 auger holes) and TRPA contractor soil profiles (3 auger holes)

BAILEY LAND CAPABILITY CHALLENGE FINDINGS

Site Information	
Assessor's Parcel Numbers: (APN)	123-033-02 and 123-033-06.
TRPA File No. / Submittal Date:	LCAP2016-0406 / October 19, 2016.
Owner or Applicant:	Darren Reed, Post Office Box 386, Crystal Bay, NV 89402.
Address:	24 Somers Loop, Crystal Bay, Washoe County, NV.

Environmental Setting	
Bailey Soil Mapping Unit¹ / Hydrologic Soil Group (HSG) / Land Class / Geomorphic Hazard Unit	RtF (Rock outcrop-Toem complex, 30-50% slopes) / HSG C / C-1 Stream-cut granitic mountain slopes-granitic foothills (high hazard).
Soil Parent Material	Granodiorite residuum and colluvium.
Slopes and Aspect	5% slope along west edge up to 30% on east edge
Elevation and Datum	6290 to 6311 ft., from Resource Concepts Engineering-Planning (Lake Tahoe datum).
Rock Outcrops and Surface Configuration	Hillside with exposed boulders, steeper slope in upper (east) part of study area (two parcels).
SEZ and Hydrology Source	None present.
Vegetation	Jeffrey pine, greenleaf manzanita, currant, snowbush, bitterbrush, grasses and forbs, plus ornamental shrubs.
Ground Cover Condition	Good (veg. cover 70%, duff >25%, bare ground <5%)
Site Features	Residence, driveway, deck, patio, stairways and landscaping.

¹ TRPA currently relies upon the Soil Survey of Tahoe Basin, California-Nevada (Rogers and Soil Conservation Service, 1974), which the Bailey Land Capability system is predicated upon.

Field Investigation and Procedures	
Consultant and Address	Phil Scoles (TRPA contractor) Post Office Box 2100; Portland, OR 97208-2100
Consultant Field Date(s)	October 24 and 25, 2016
SEZ Mapping / NRCS Hydric Soil	None present.
Number of Soil Pits or Auger Holes and Description Depth	3 auger holes dug to 18 to 41 inches (labeled 2, 4 and 5 on proposed land capability map).
Additional or Repetitive TRPA Sample Locations	3 auger additional holes dug to 13 to 55 inches (labeled AH-1, AH-2 and AH-3 on map).
Representative Soil Profile Descriptions	3 standard profile descriptions from soil consultant and 3 abbreviated soil profile descriptions from TRPA contractor (Terra Science, Inc.)
Areas Not Examined	Residence, driveway, deck, patio, stairways and landscape planter boxes.

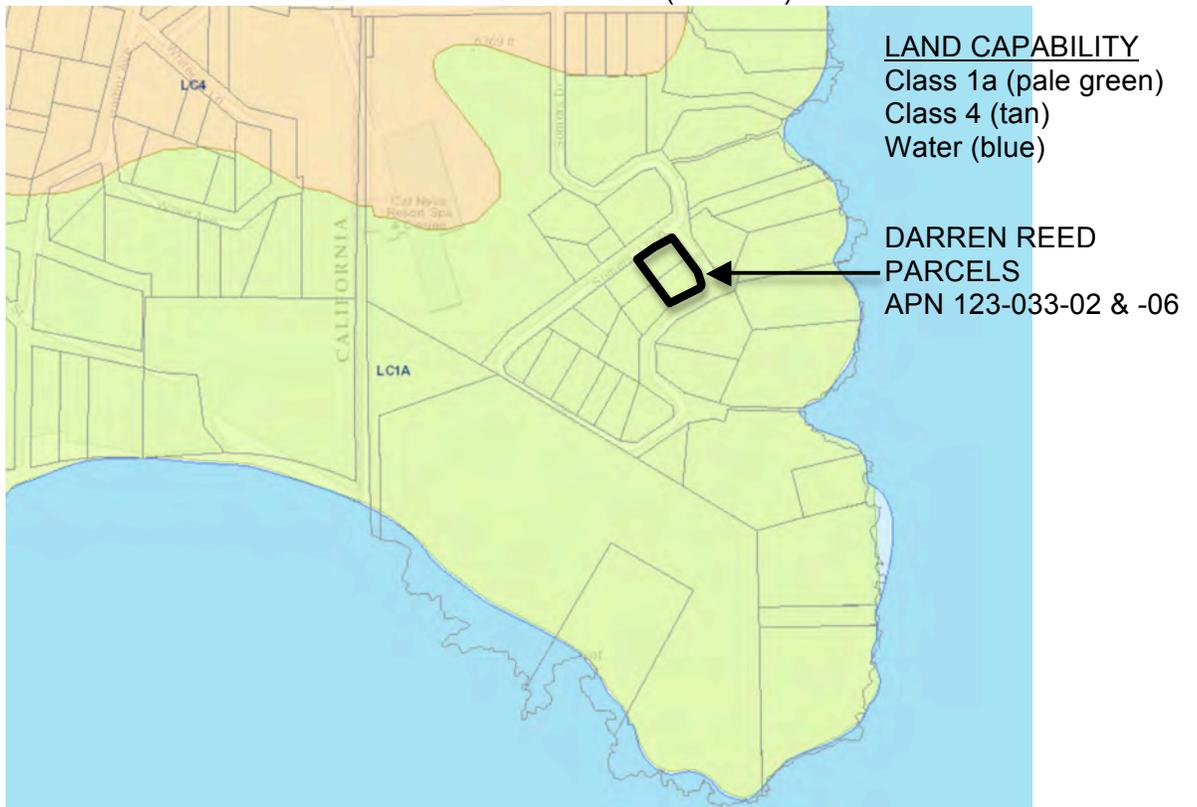
TRPA Findings	
2006 Soil Survey Map Unit	Cagwin-Rock outcrop complex, 15 to 30% slopes, extremely stony (mapping unit 7412, Class 3, HSG C)
Consultant Soil Mapping Determination and Rationale	West-center of study area: XXX, HSG A. Soil is deep, somewhat excessively drained, and formed from colluvium and residuum. It has loamy coarse sand textures throughout. Soil is significantly deeper than the mapped Toem and Cagwin soils. It is similar, but not within the Cassenai series concept (residuum soil described in 2006 soil survey). No evidence of perched water table. East and Southeast part of study area: Cagwin-Rock Outcrop, 15 to 30% slopes (CaE). This soil is shallow to bedrock (13 to 28 inches).
Slope Determination	0 to 16% for lower part (west-center), 16 to 30% for small segment in the north-center, and 15 to 30% for the upper part (east and southeast).
TRPA Conclusion(s)	XXX Soil, HSG A, Class 4 for 16 to 30% slopes, Class 6 for 15 to 30% slopes, and Class 2 for shallow soils on 15 to 30% slopes.
Applicable Area	Entire site (14,702 sf.). See map (Attachment B, December 2016)

Attachment A
Vicinity map and TRPA Land Capability map

VICINITY MAP (no scale)



TRPA LAND CAPABILITY MAP (no scale)



EXISTING ON-SITE COVERAGE FOR

APN: 123-03-02

ASPHALT (Asph/veg/dirt)	=	249 S.F.
HOUSE	=	977 S.F.
LATTICED WOOD DECK & STEPS	=	988 S.F. 72B
CONCRETE/BLOCK/PAVERS	=	764 S.F. 05
SOFT COVER	=	110 S.F.
TOTAL COVERAGE	=	3,088 S.F. 2039
PARCEL AREA	=	7,371 S.F.

EXISTING OFF-SITE COVERAGE FOR

APN: 123-03-02

ASPHALT	=	134 S.F.
CONCRETE (CURB)	=	49 S.F.
SOFT COVER	=	41 S.F.
TOTAL (OFF-SITE)	=	224 S.F.

EXISTING ON-SITE COVERAGE FOR

APN: 123-03-01

= 0 S.F.

EXISTING ON-SITE COVERAGE FOR

APN: 123-03-06

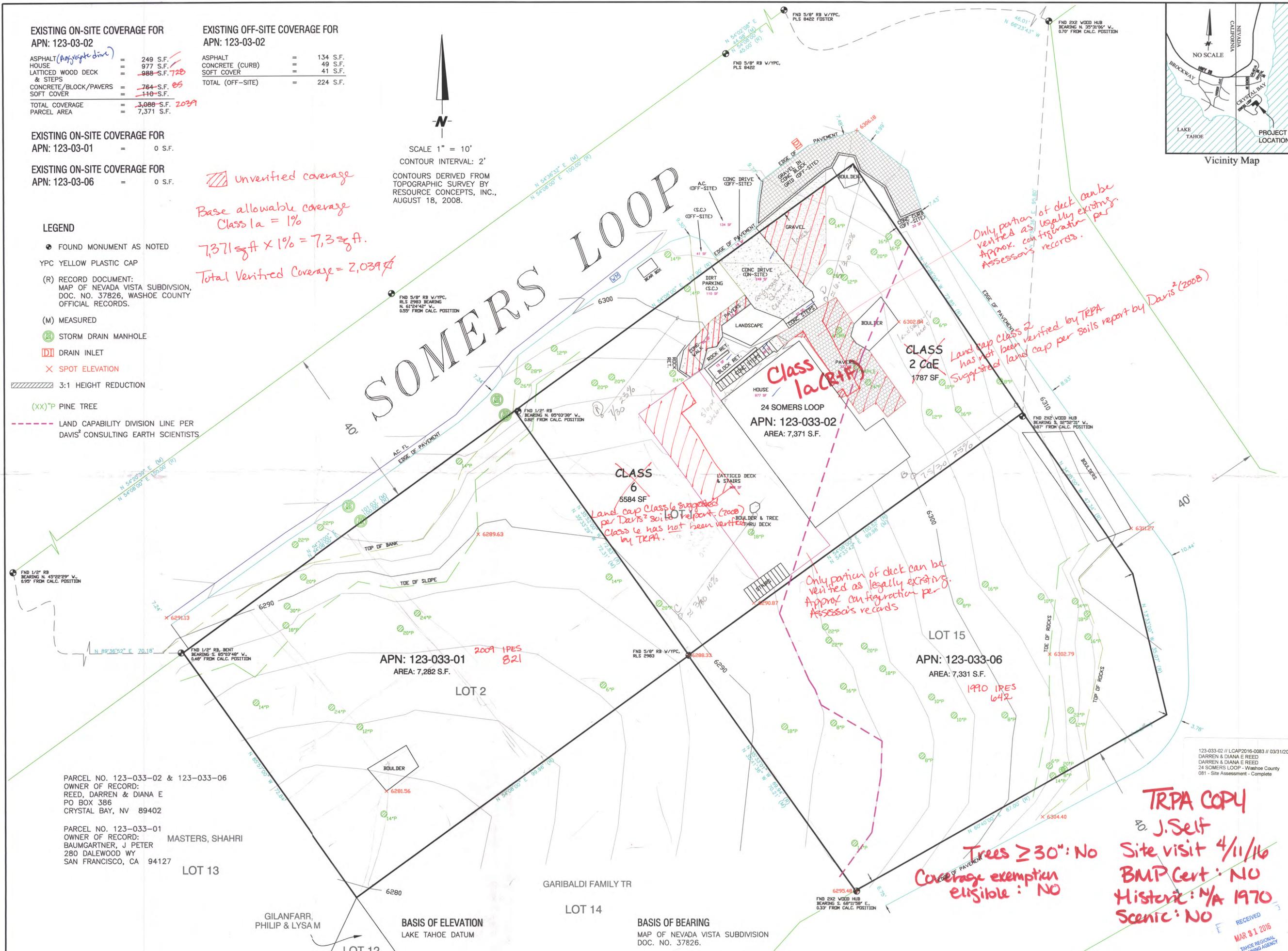
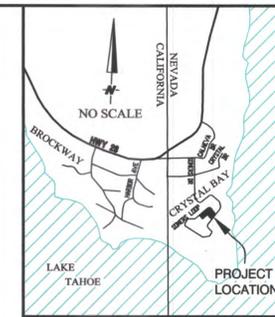
= 0 S.F.

LEGEND

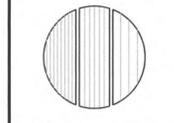
- FOUND MONUMENT AS NOTED
- YPC YELLOW PLASTIC CAP
- (R) RECORD DOCUMENT: MAP OF NEVADA VISTA SUBDIVISION, DOC. NO. 37826, WASHOE COUNTY OFFICIAL RECORDS.
- (M) MEASURED
- ⊕ STORM DRAIN MANHOLE
- ⊕ DRAIN INLET
- × SPOT ELEVATION
- ▨ 3:1 HEIGHT REDUCTION
- (XX)*P PINE TREE
- - - LAND CAPABILITY DIVISION LINE PER DAVIS CONSULTING EARTH SCIENTISTS

Unverified coverage
Base allowable coverage Class 1a = 1%
7,371 sq ft x 1% = 7,371 sq ft.
Total Verified Coverage = 2,039 sq ft

SCALE 1" = 10'
 CONTOUR INTERVAL: 2'
 CONTOURS DERIVED FROM TOPOGRAPHIC SURVEY BY RESOURCE CONCEPTS, INC., AUGUST 18, 2008.

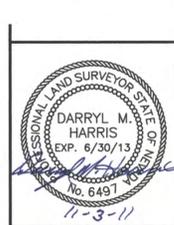


ENGINEERING · PLANNING · RESOURCE MANAGEMENT
RESOURCE CONCEPTS, INC.
 212 ELKS POINT ROAD, STE. 443
 P.O. BOX 11798
 ZEPHYR COVE, NEVADA 89448
 PHONE: 775-688-7500



DATE	REVISION

TOPOGRAPHIC AND EXISTING COVERAGE FOR
DARREN & DIANA E REED
 APN: 123-033-01, 123-033-02 & 123-033-06
 24 SOMERS LOOP
 POR. SEC. 30, T. 16 N., R. 18 E., M.D.B.M.
 WASHOE, NEVADA



JOB NO.: 08-197.1
 DATE: 11/01/11
 DESIGNED:
 DRAWN: CNJ
 CHECKED: DMH
 SHEET 1 OF 1

TRPA COPY
J. Self Site visit 4/11/16
BMP Cert: NO
Historic: N/A 1970
Scenic: NO
Trees >= 30": No Coverage exemption eligible: NO



Attachment B
Existing conditions map showing topography and Land
Capability Challenge recommendation

EXISTING ON-SITE COVERAGE FOR
APN: 123-03-02

ASPHALT	=	249 S.F.
WOOD DECK & STEPS	=	877 S.F.
CONCRETE (CURB)	=	886 S.F.
(S1 REDUCT)	=	714 S.F.
CONCRETE/BLOCK/PAVERS	=	704 S.F.
TOTAL COVERAGE	=	2,934 S.F.
PARCEL AREA	=	7,371 S.F.

EXISTING ON-SITE COVERAGE FOR
APN: 123-03-01

ASPHALT	=	0 S.F.
CONCRETE	=	0 S.F.
TOTAL COVERAGE	=	0 S.F.
PARCEL AREA	=	0 S.F.

EXISTING ON-SITE COVERAGE FOR
APN: 123-03-06

ASPHALT	=	134 S.F.
CONCRETE (CURB)	=	49 S.F.
TOTAL (OFF-SITE)	=	224 S.F.

EXISTING OFF-SITE COVERAGE FOR
APN: 123-03-02

ASPHALT	=	134 S.F.
CONCRETE (CURB)	=	49 S.F.
TOTAL (OFF-SITE)	=	224 S.F.

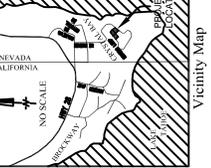
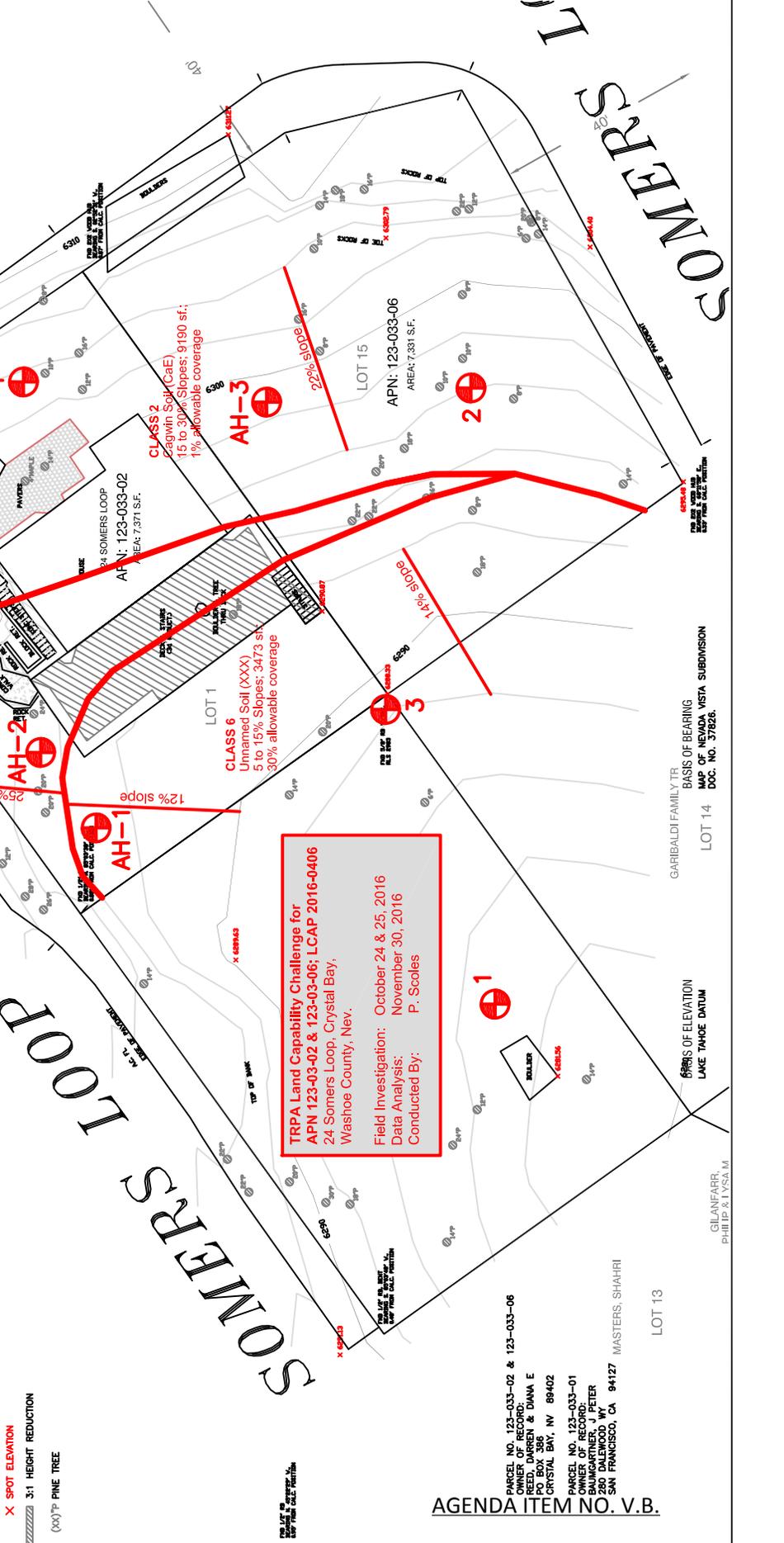
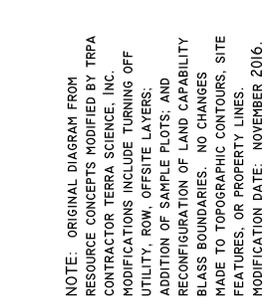
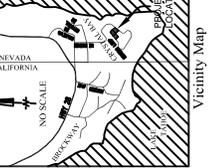
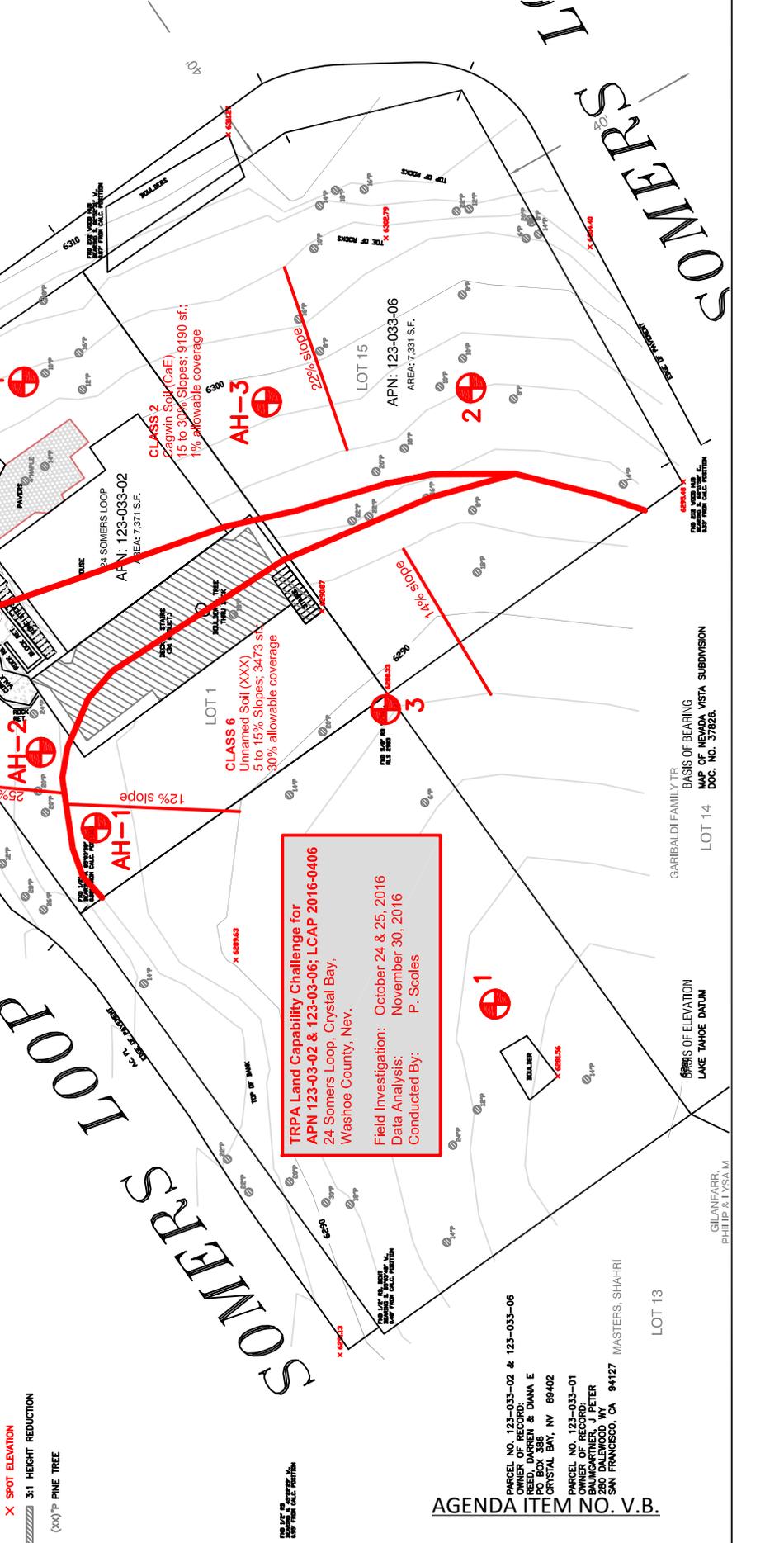
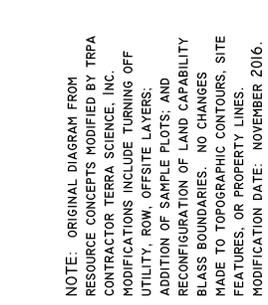
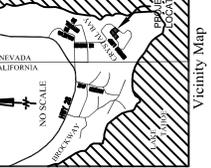
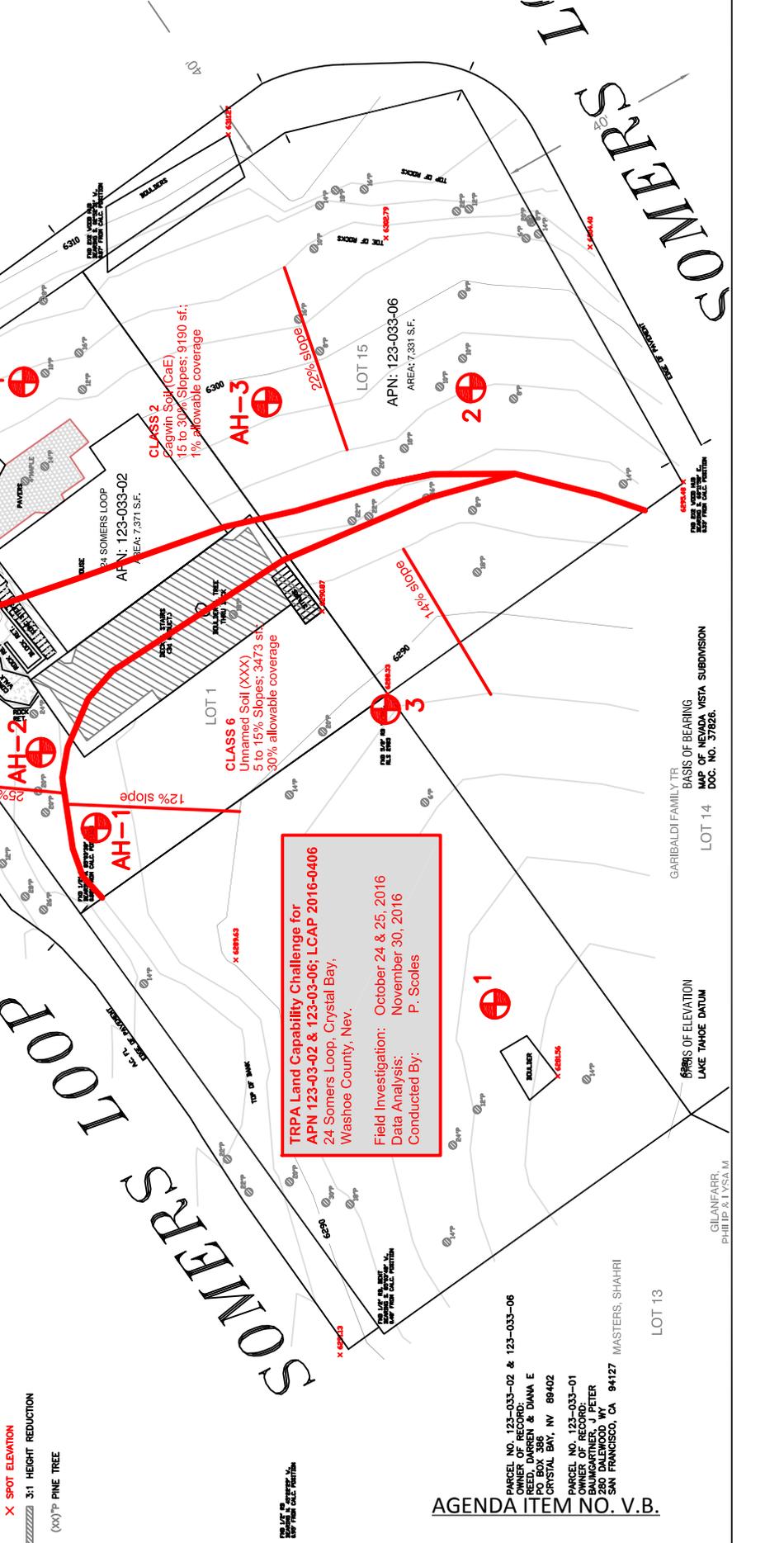
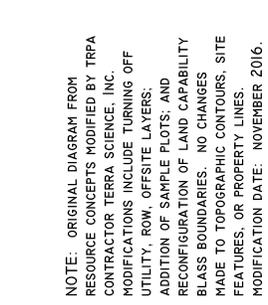
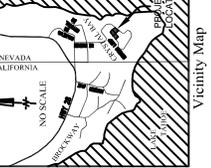
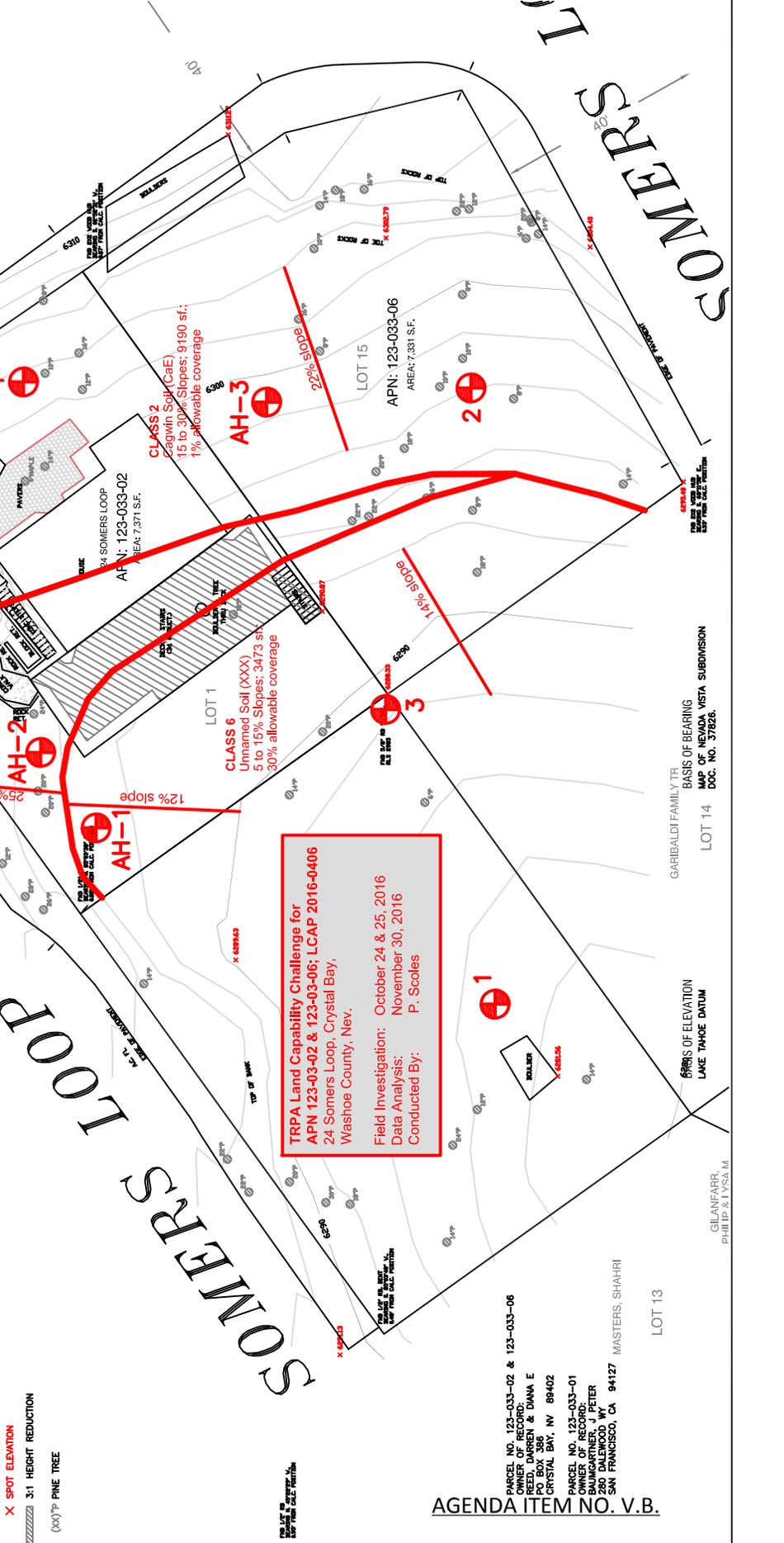
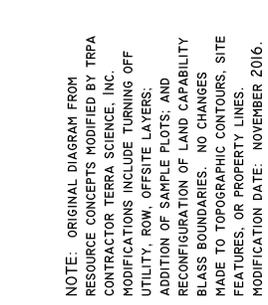
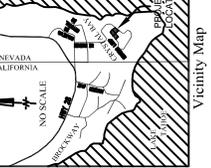
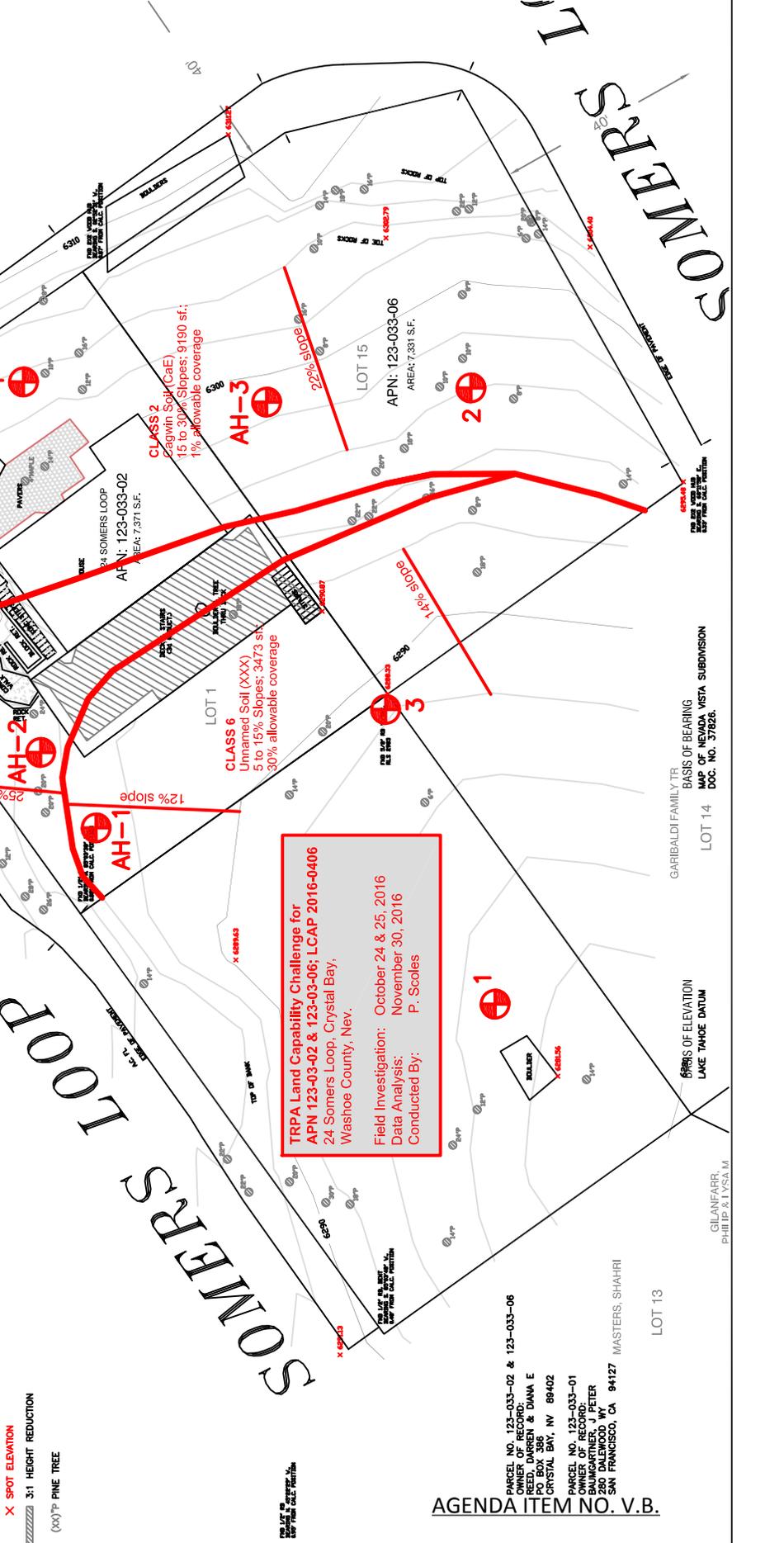
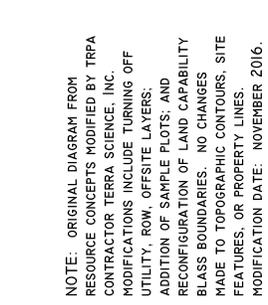
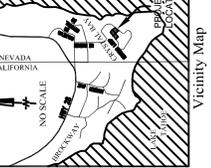
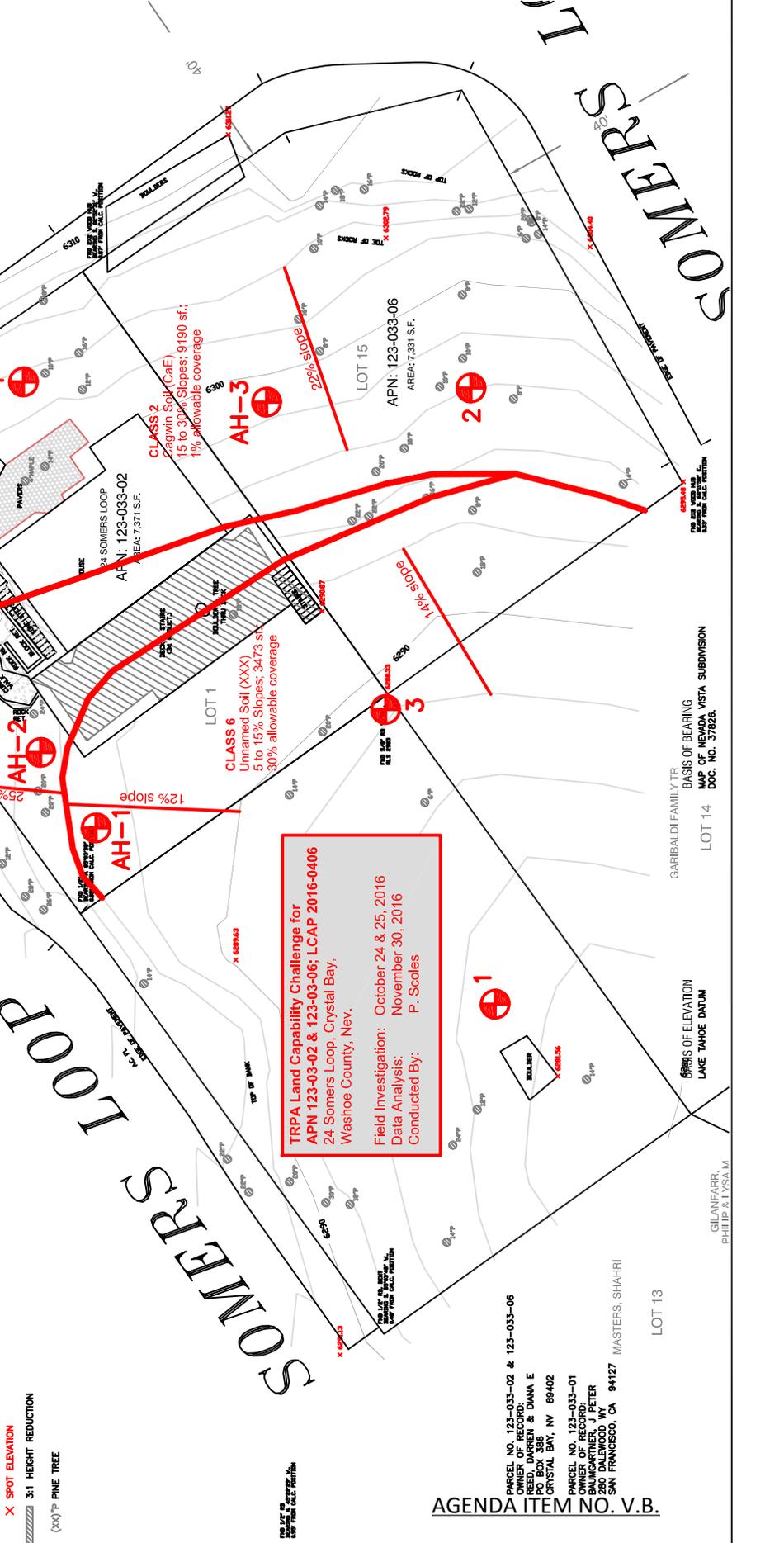
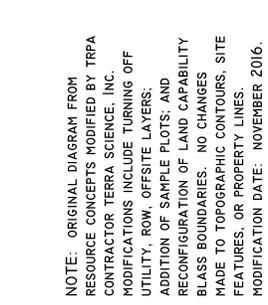
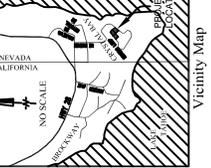
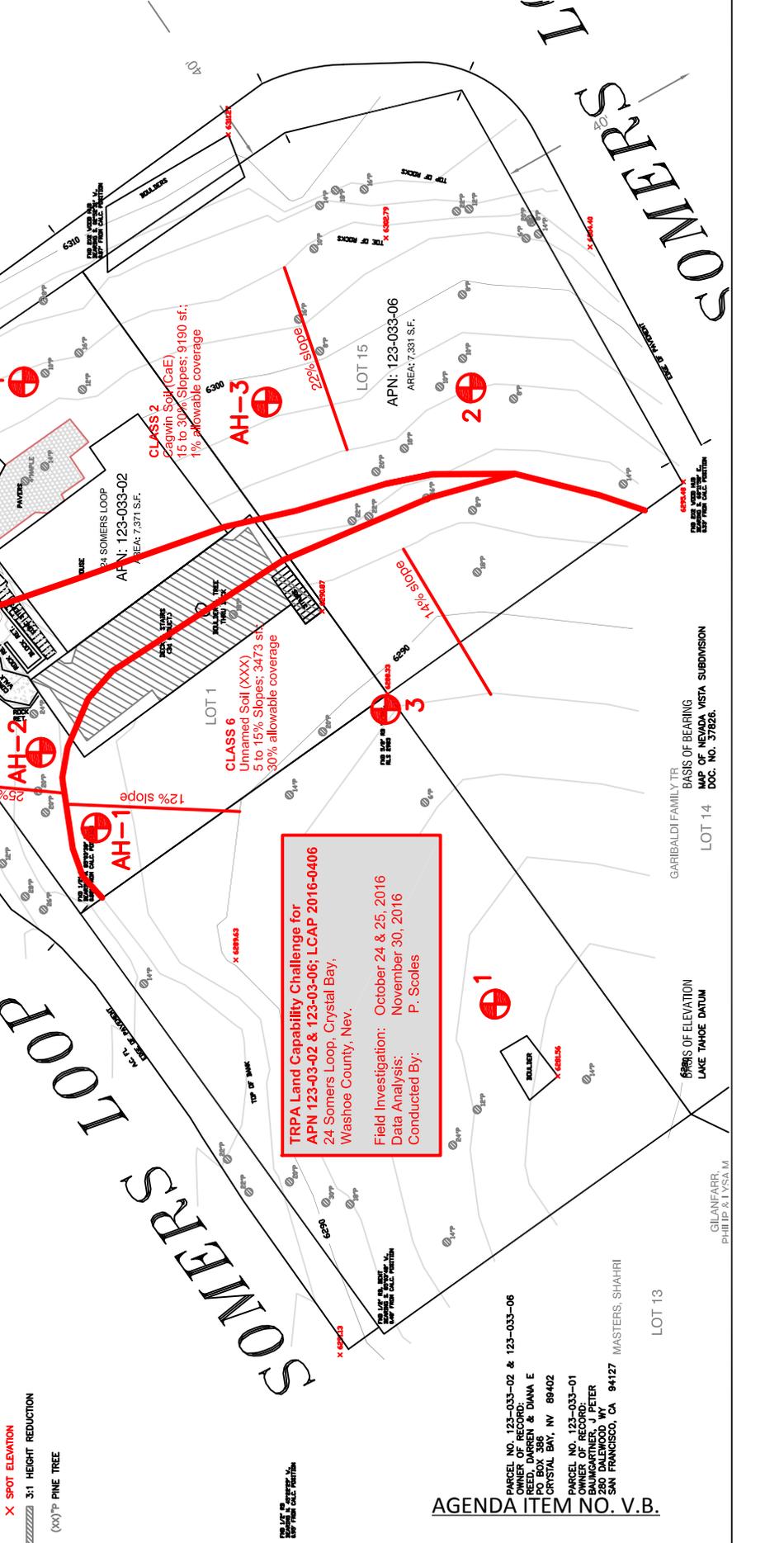
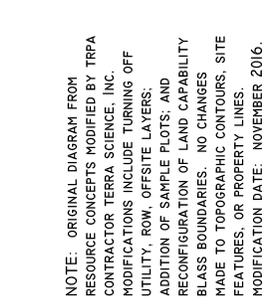
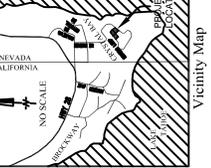
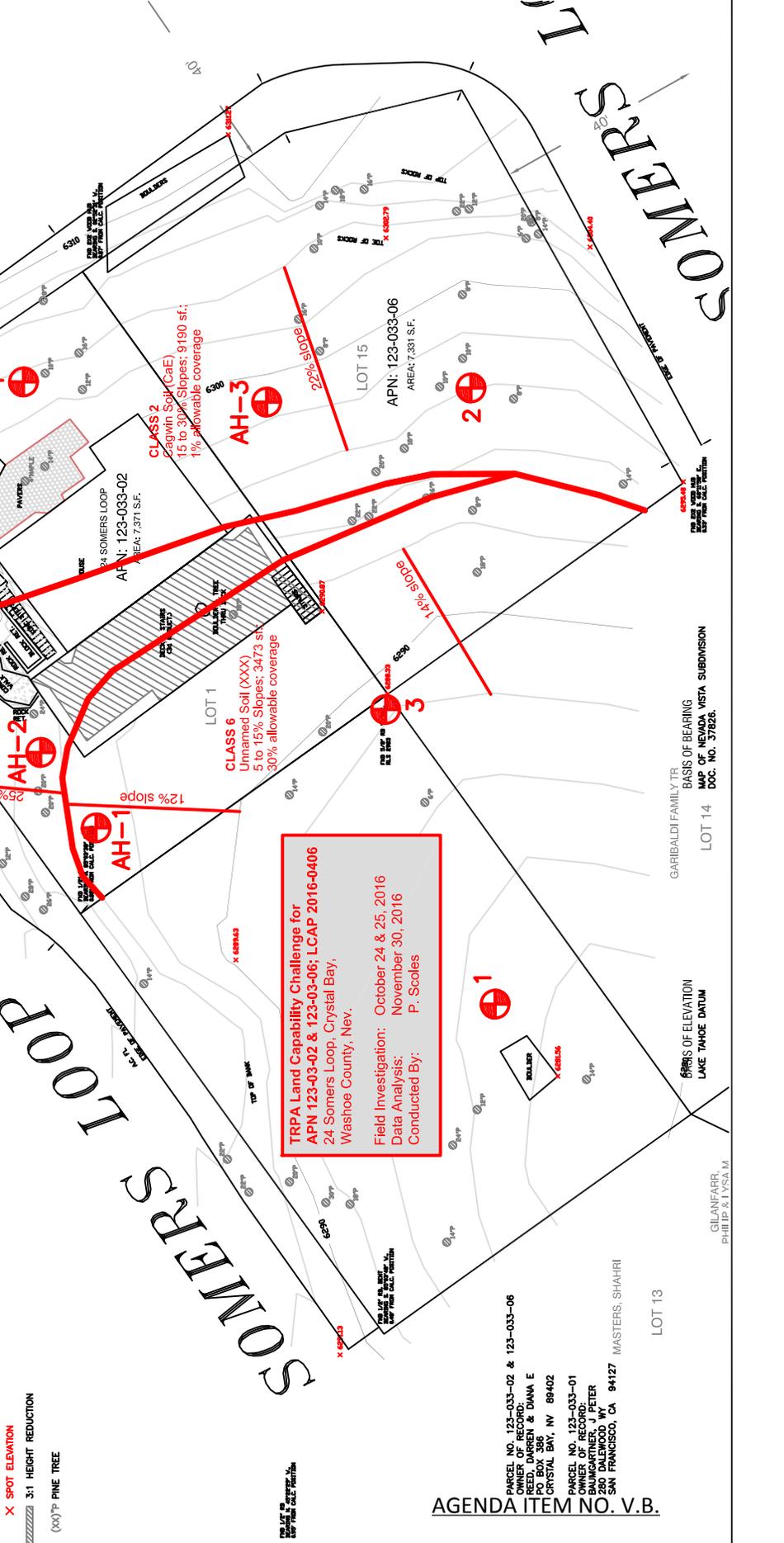
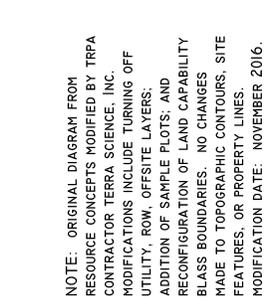
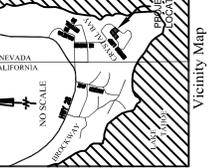
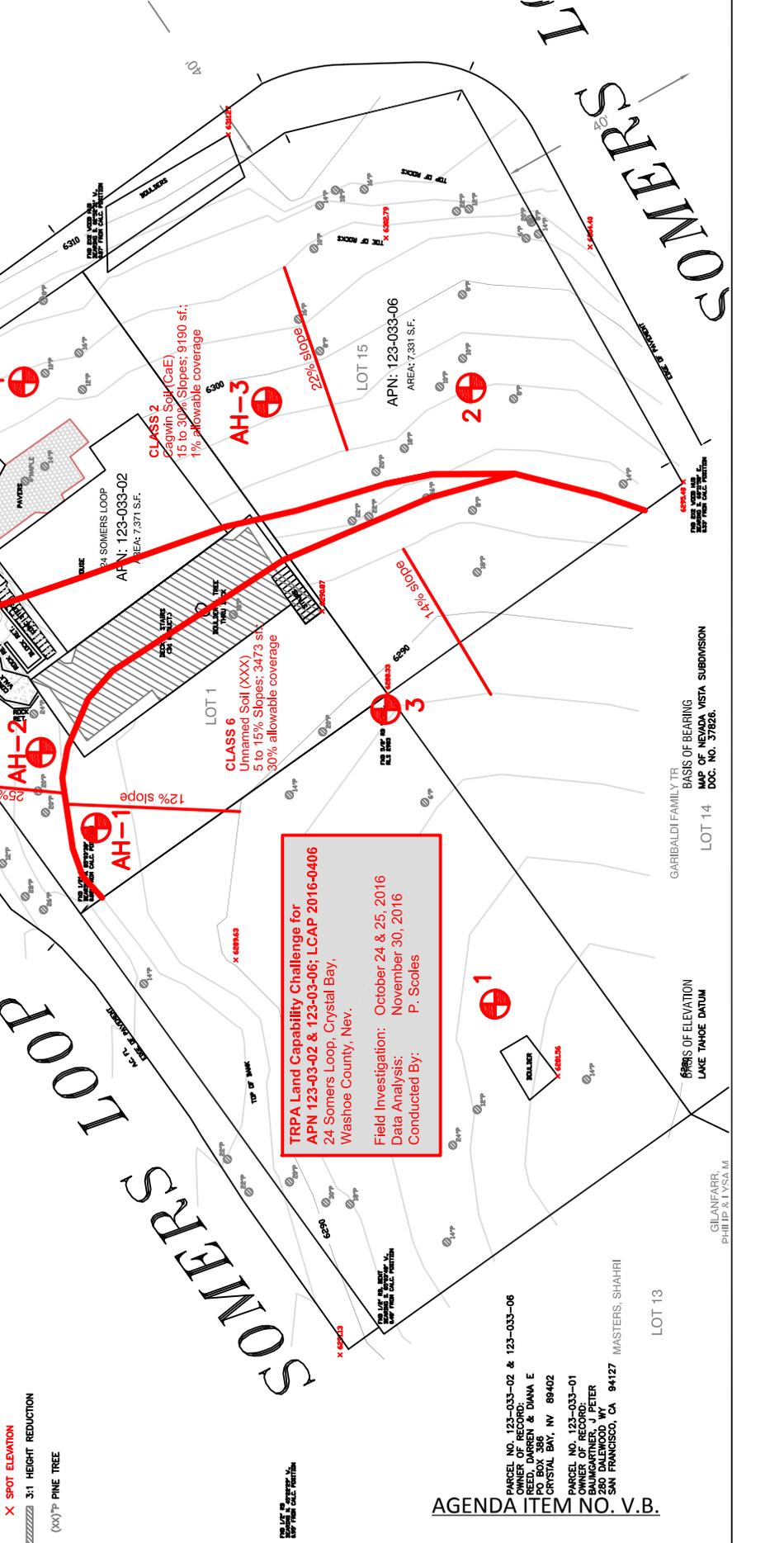
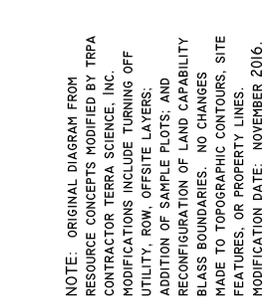
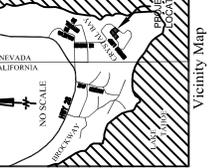
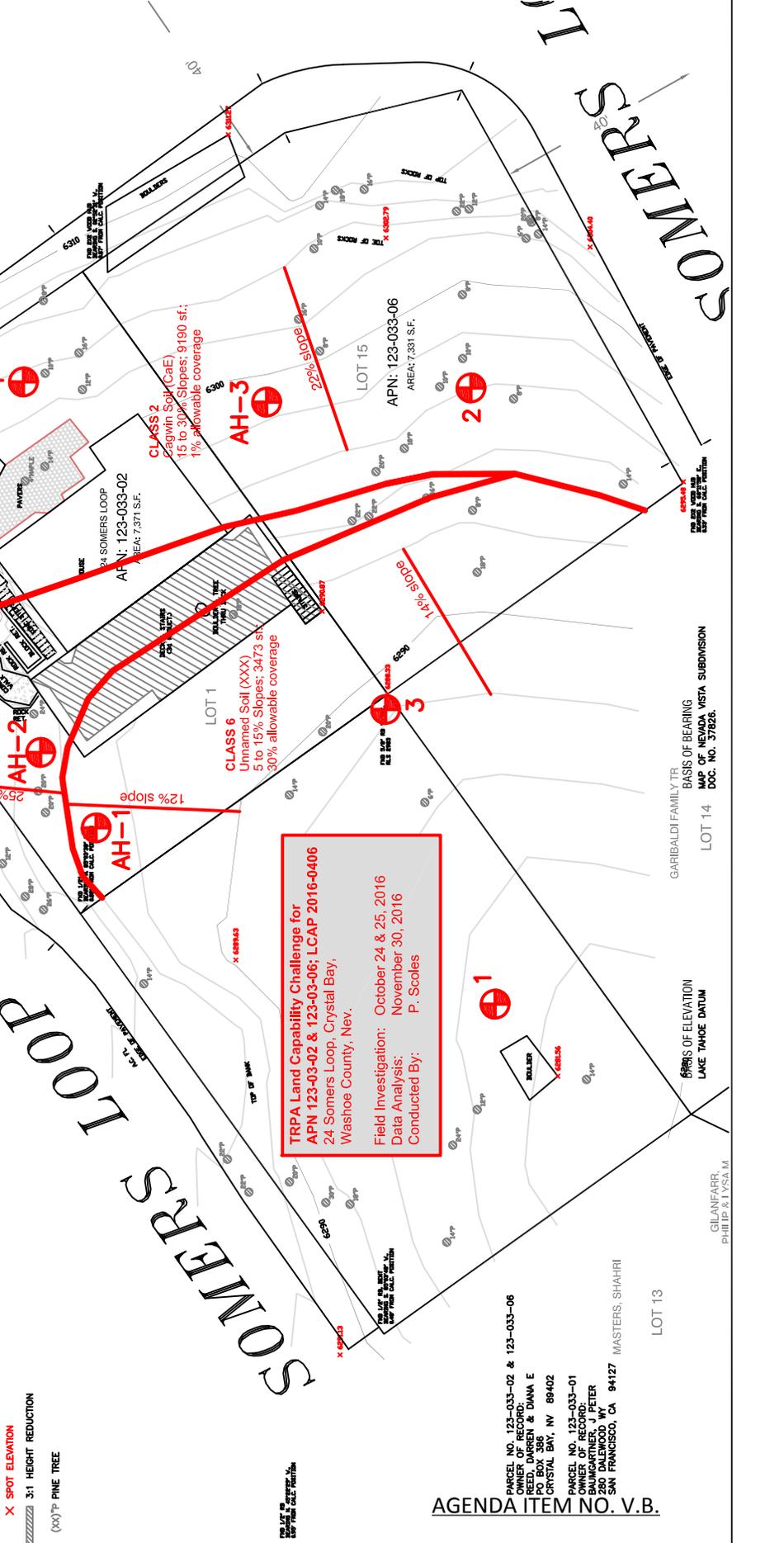
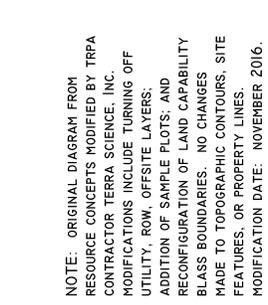
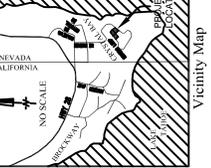
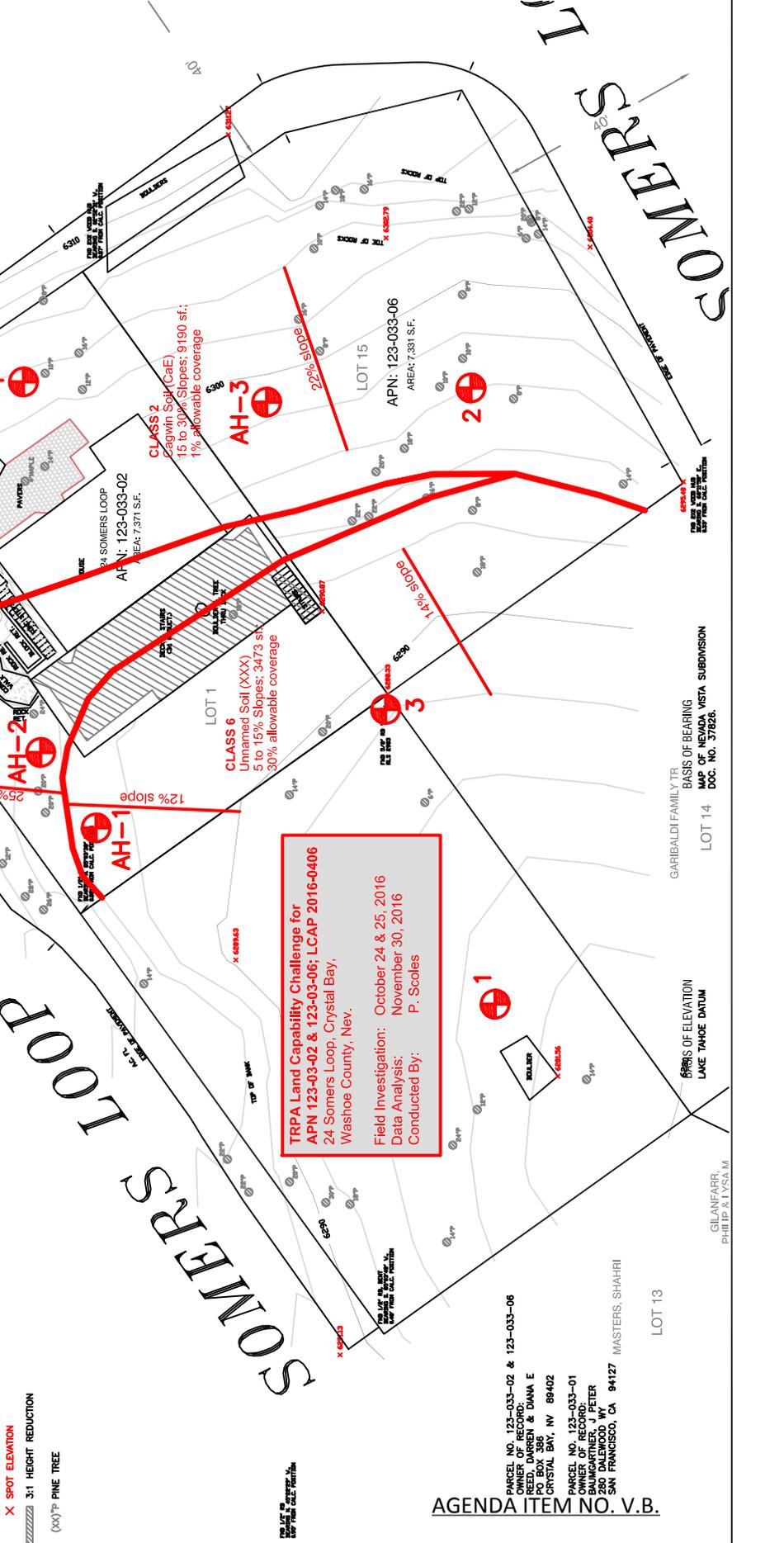
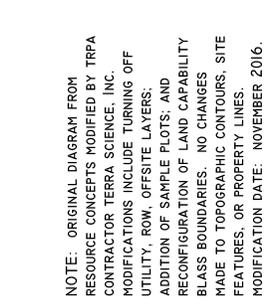
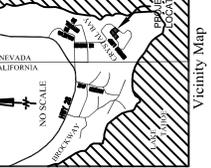
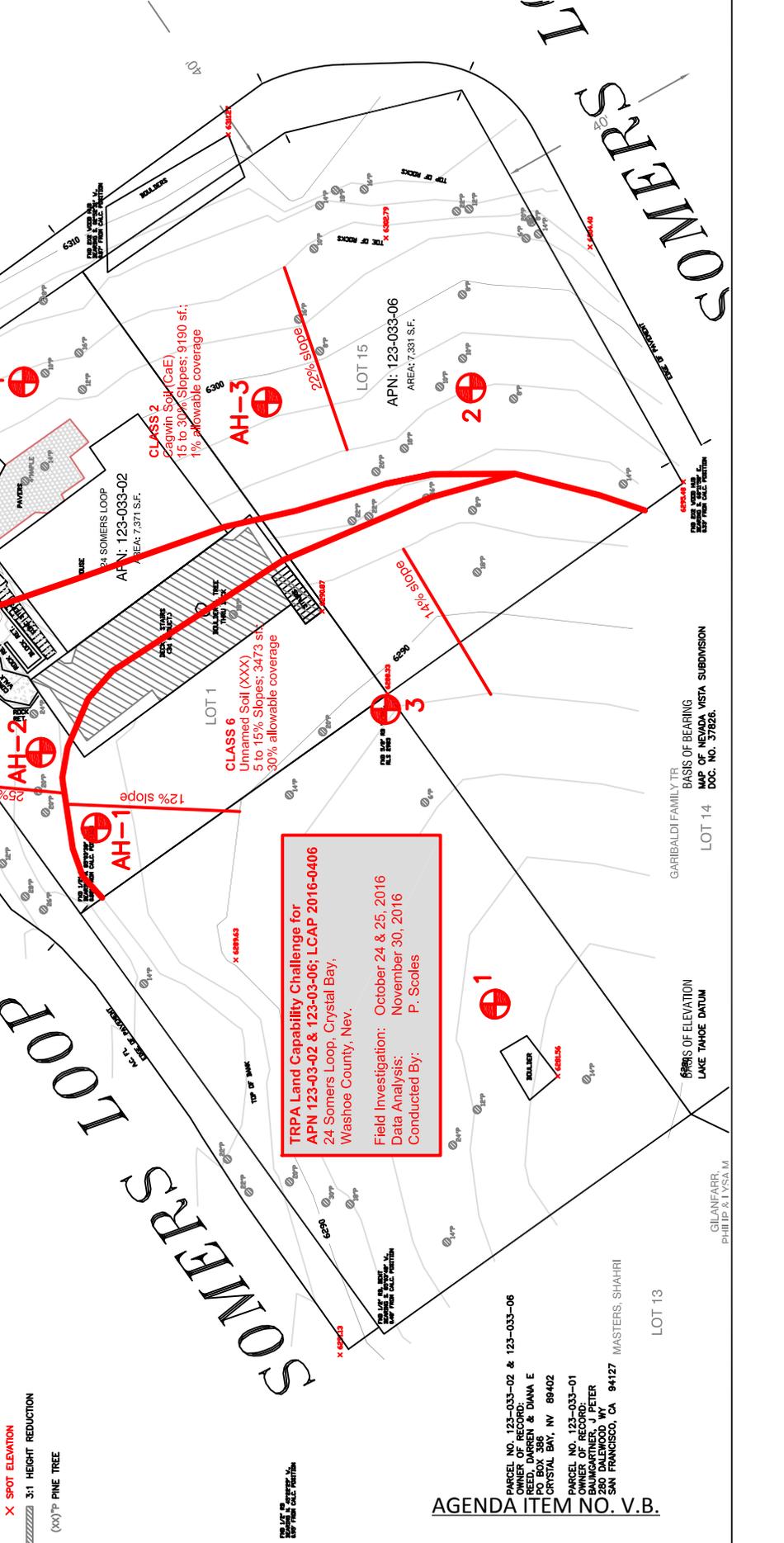
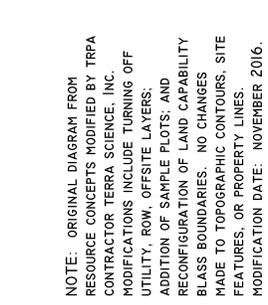
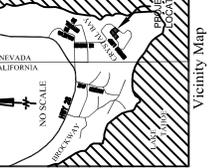
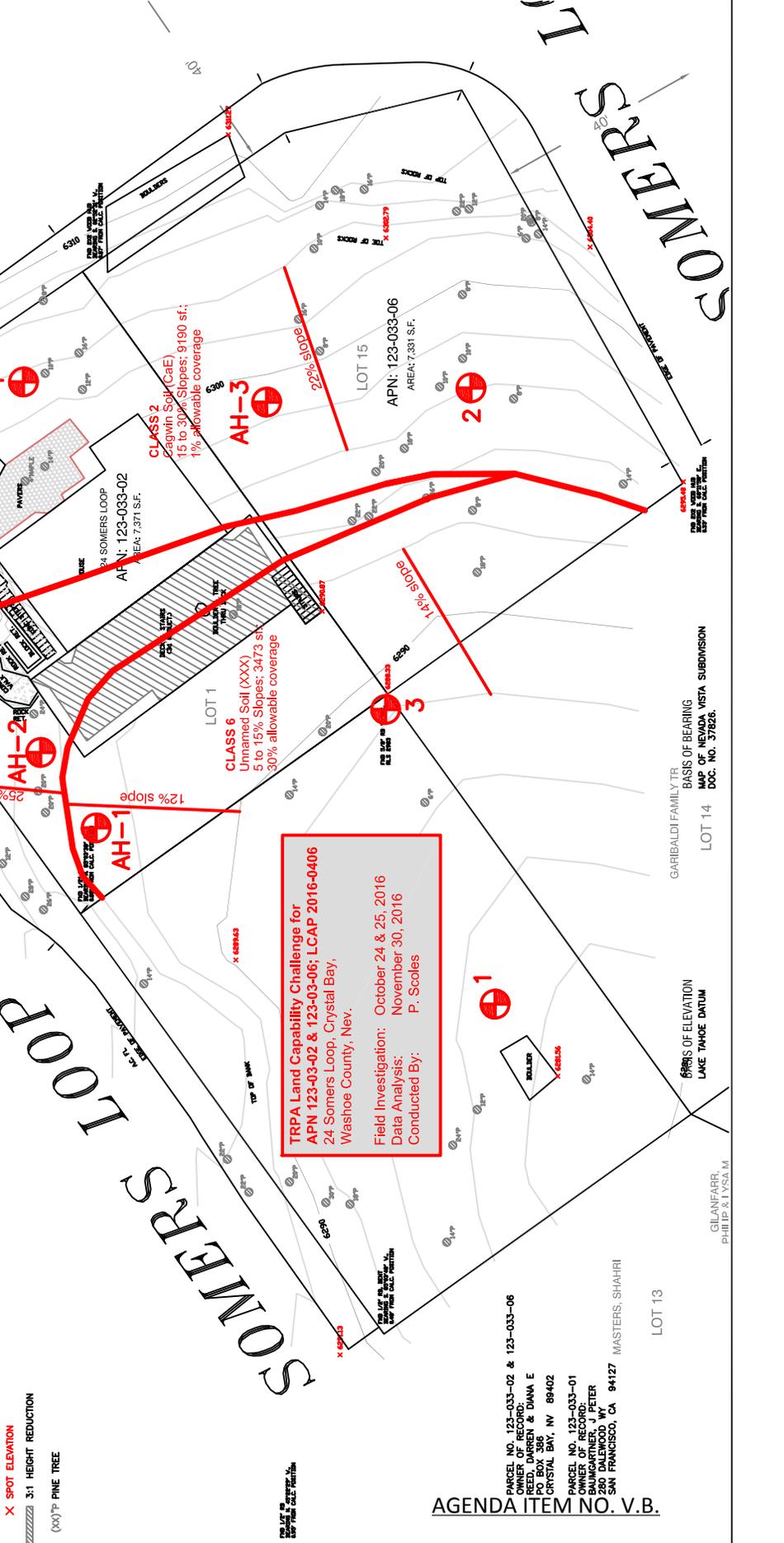
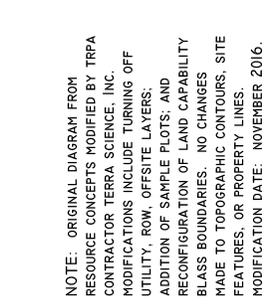
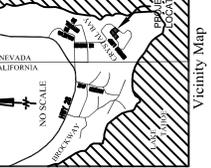
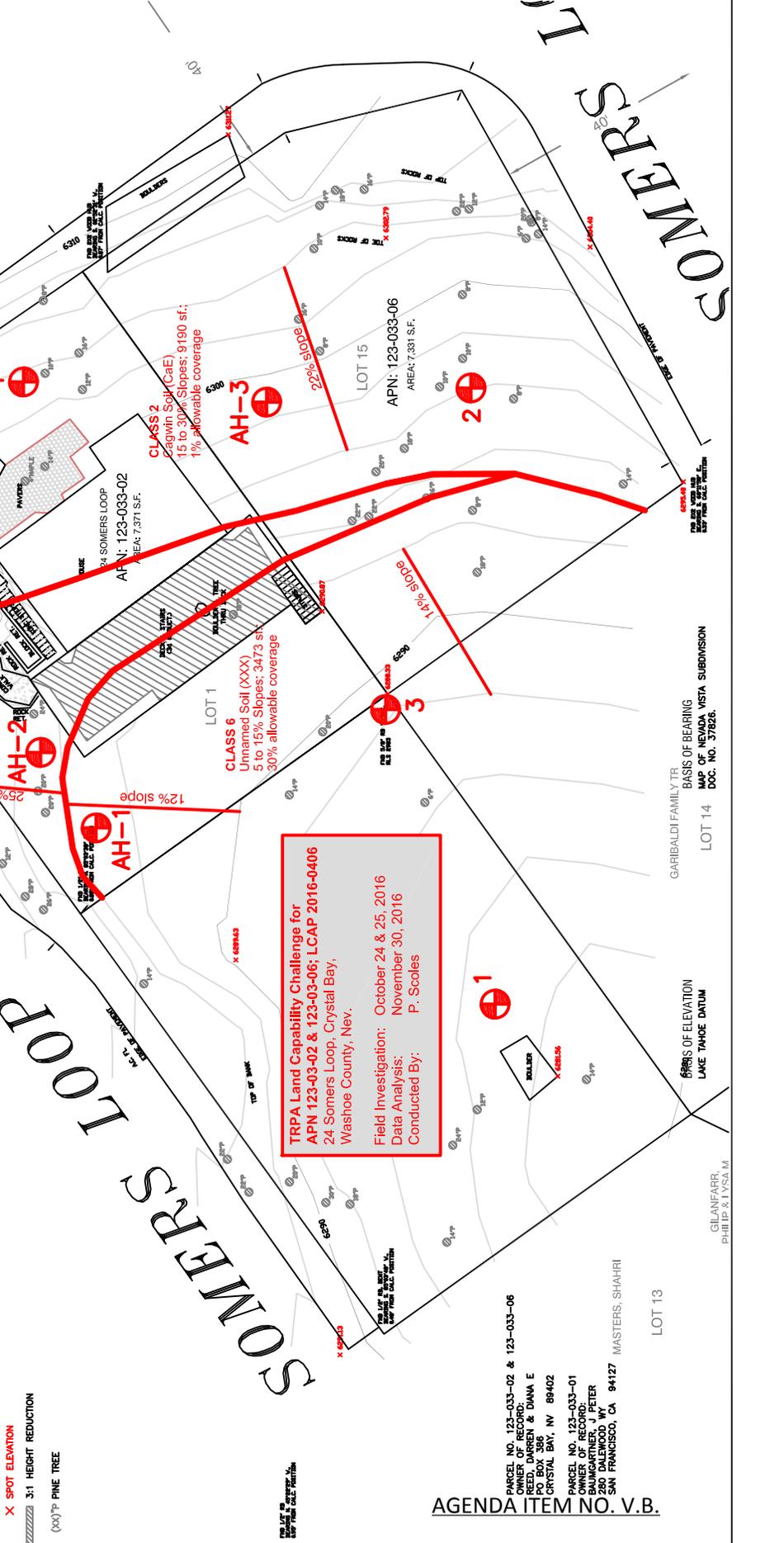
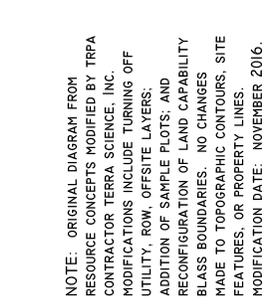
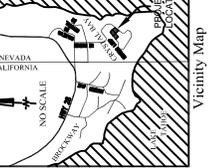
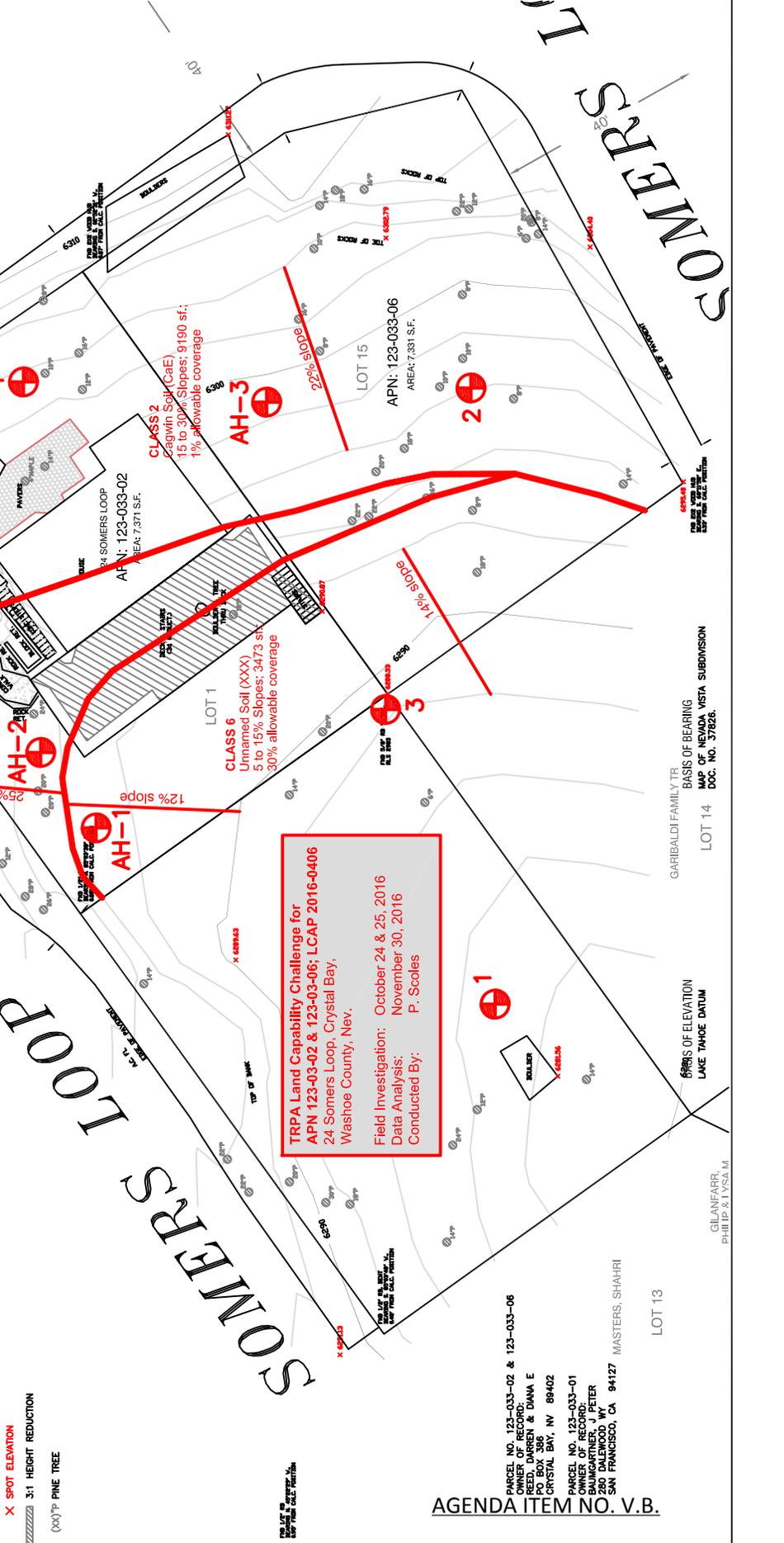
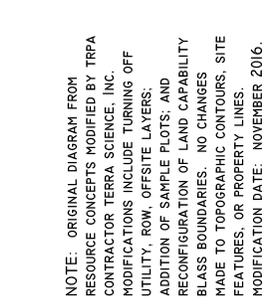
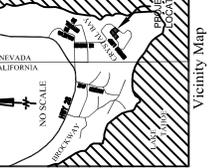
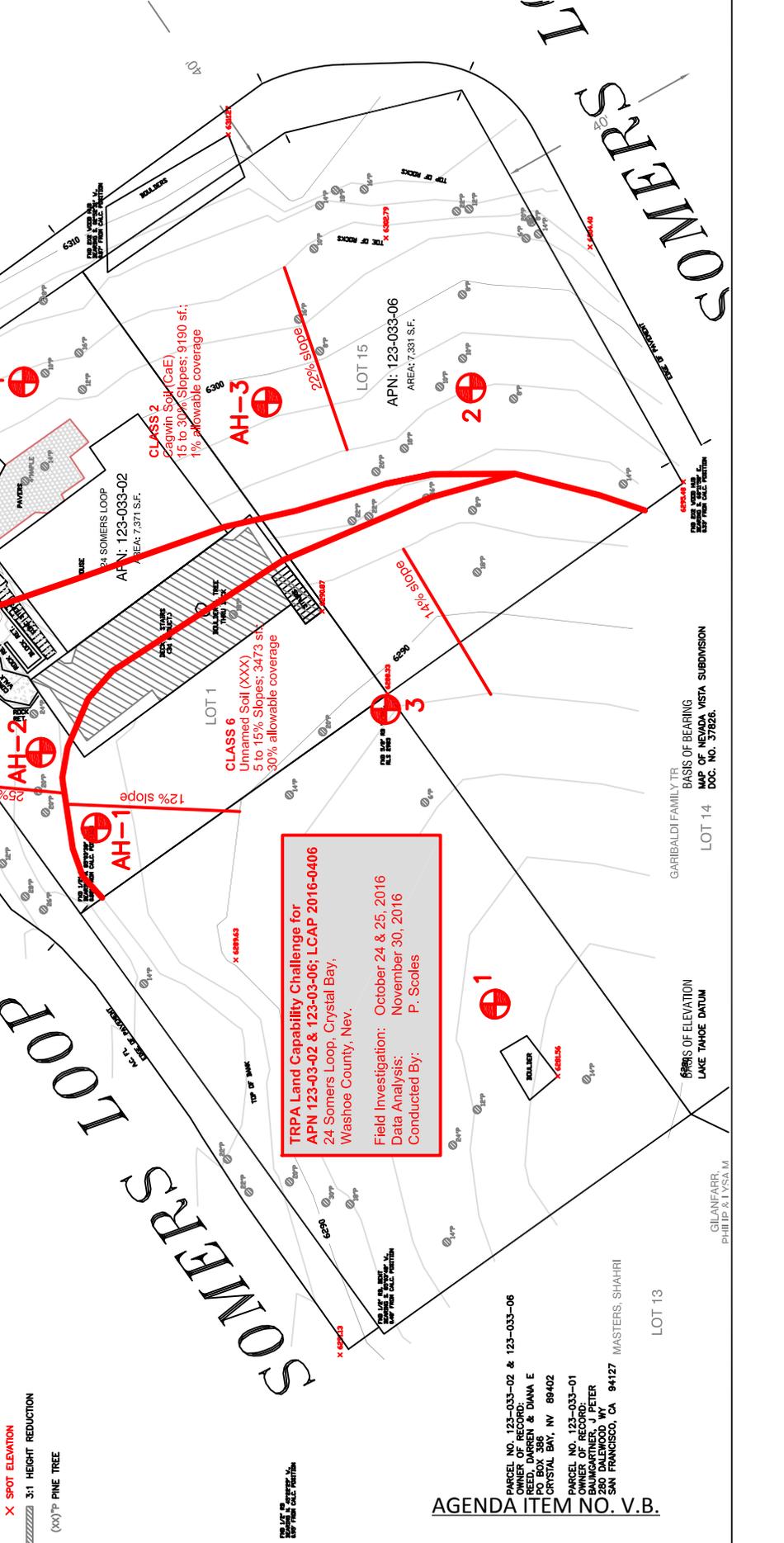
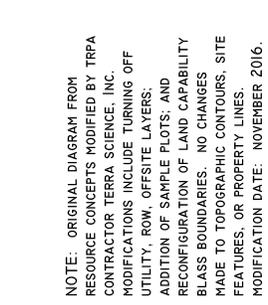
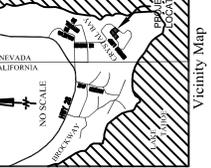
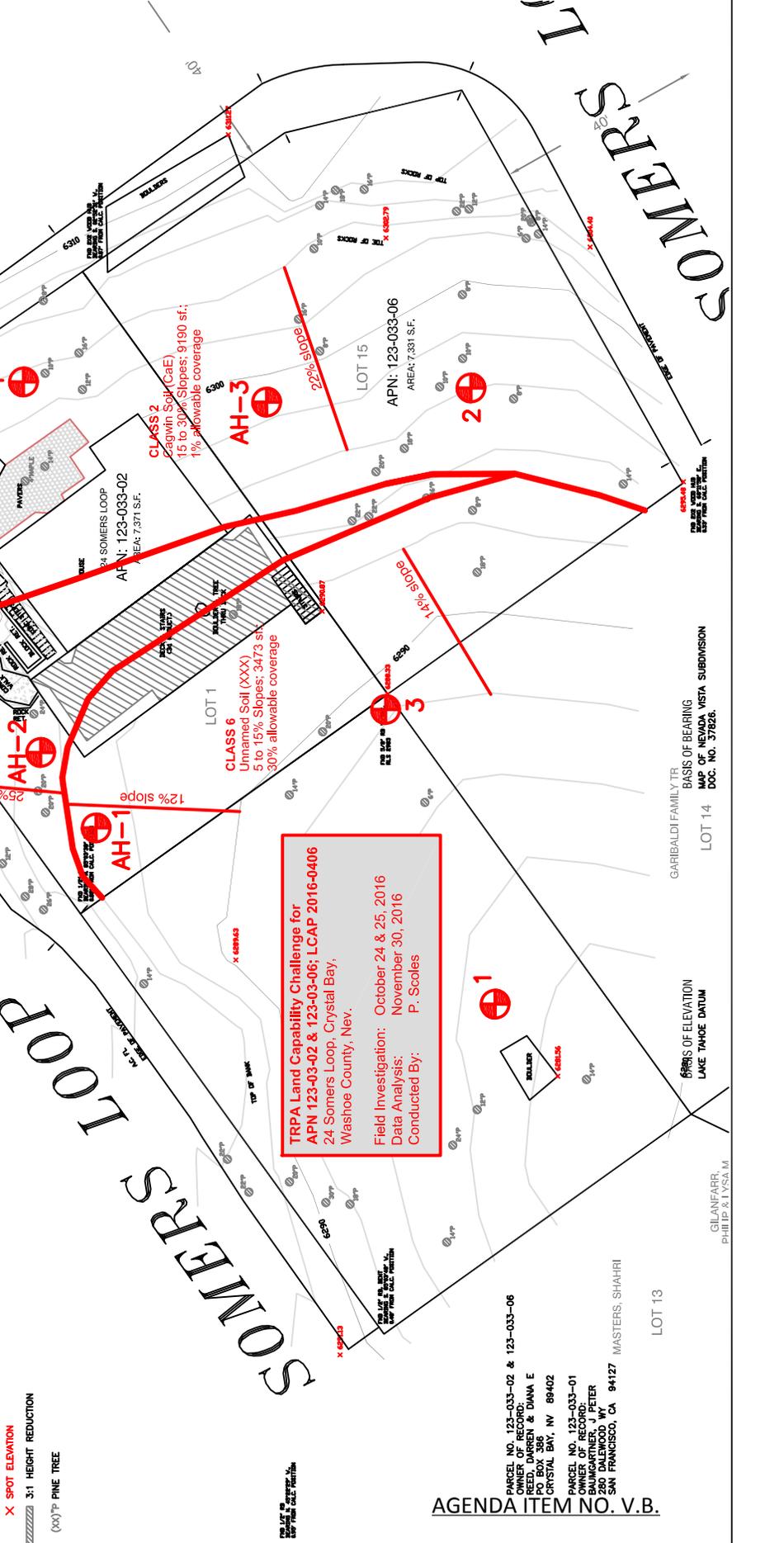
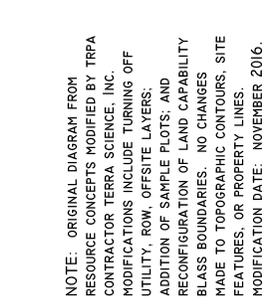
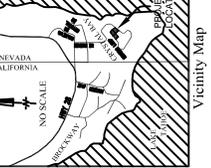
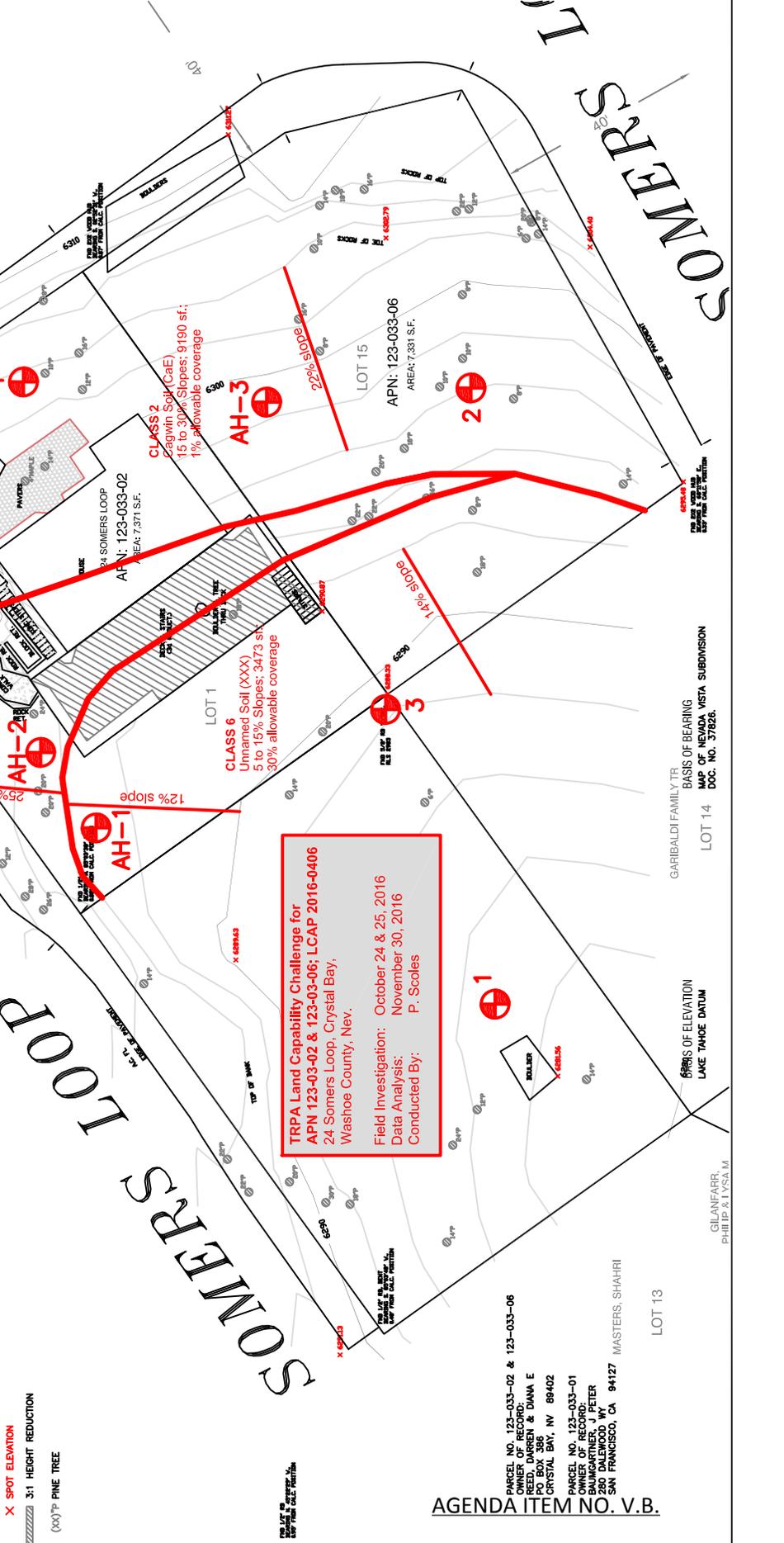
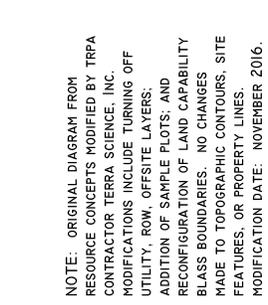
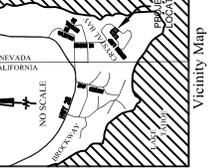
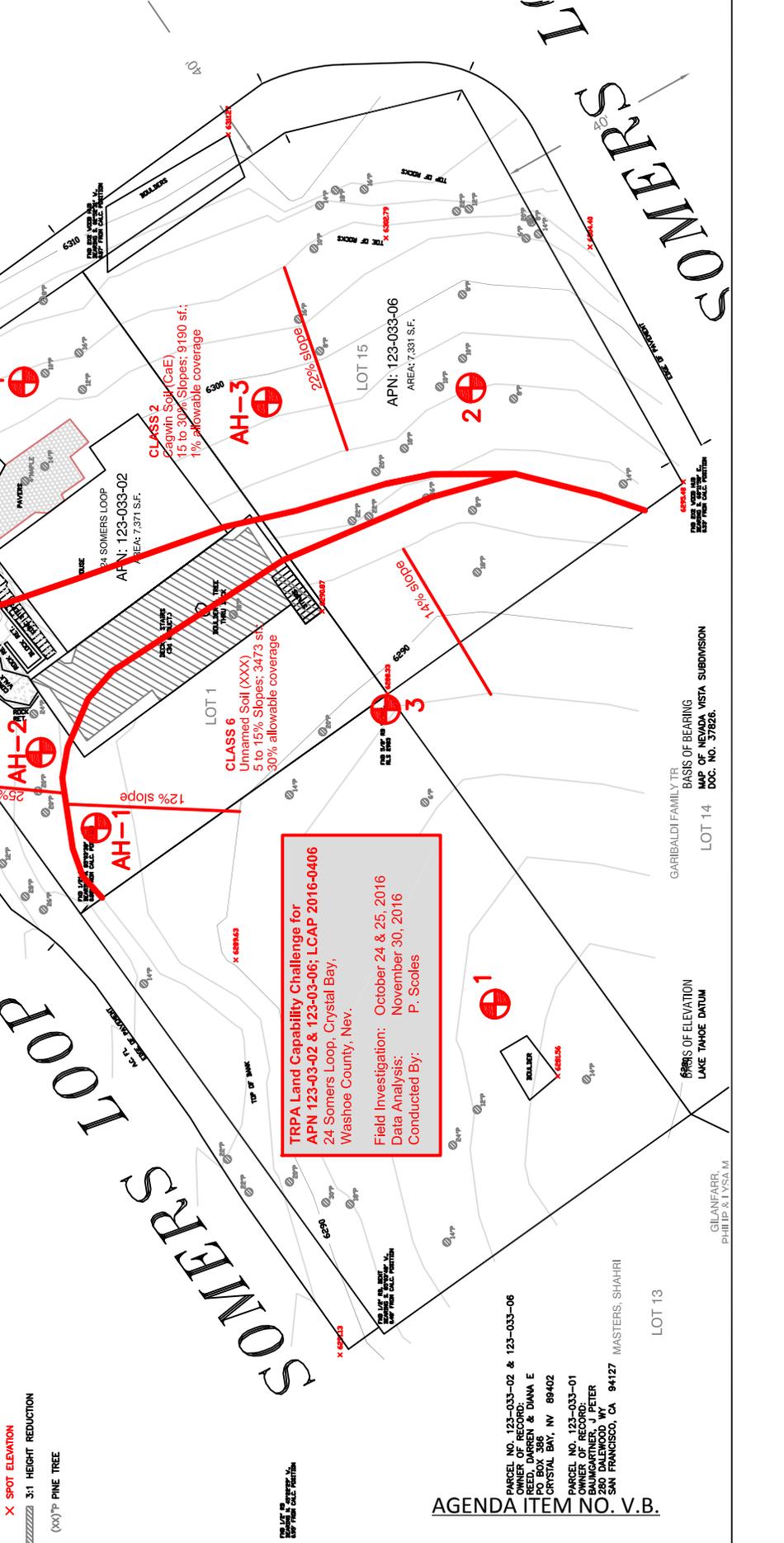
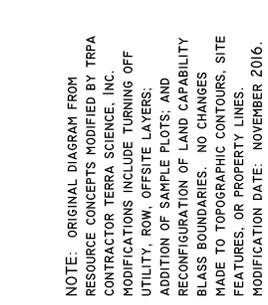
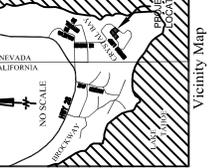
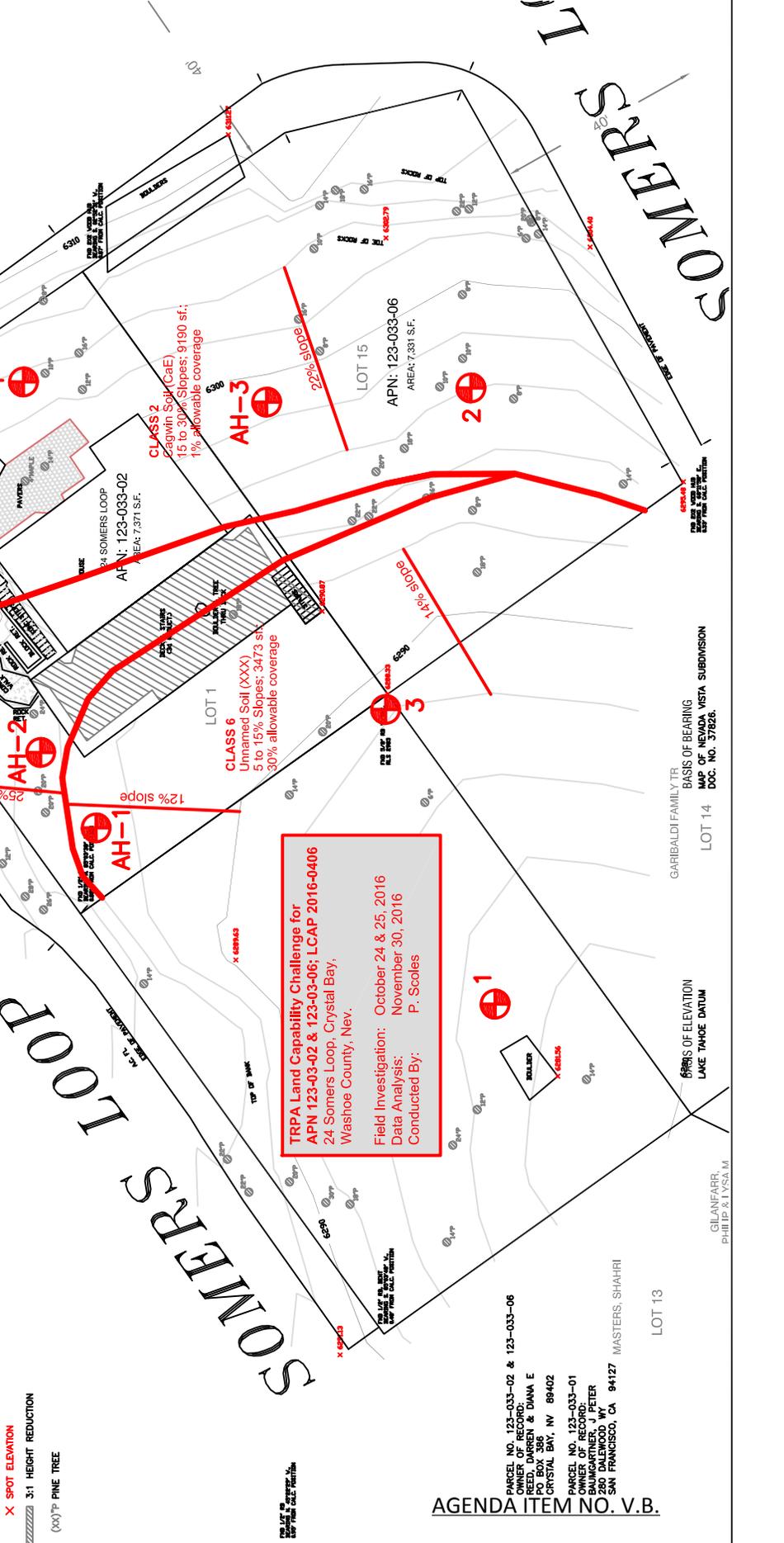
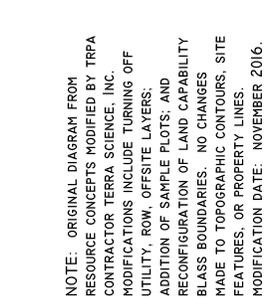
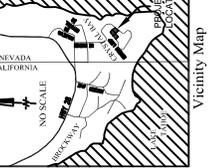
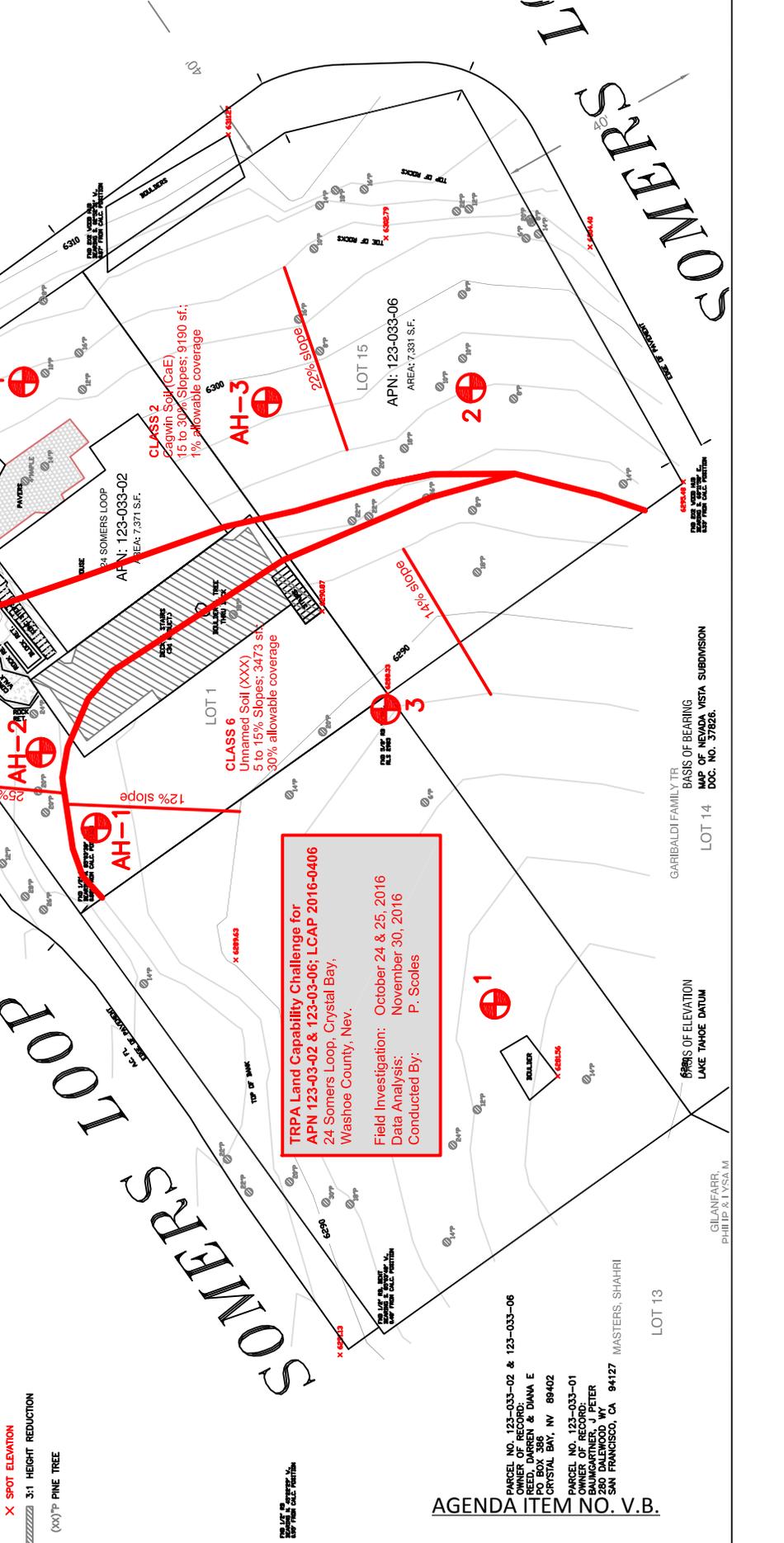
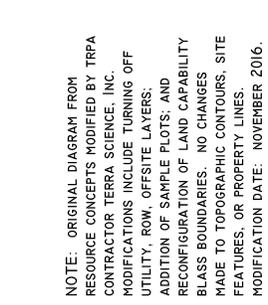
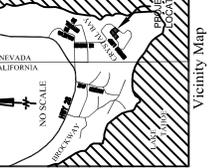
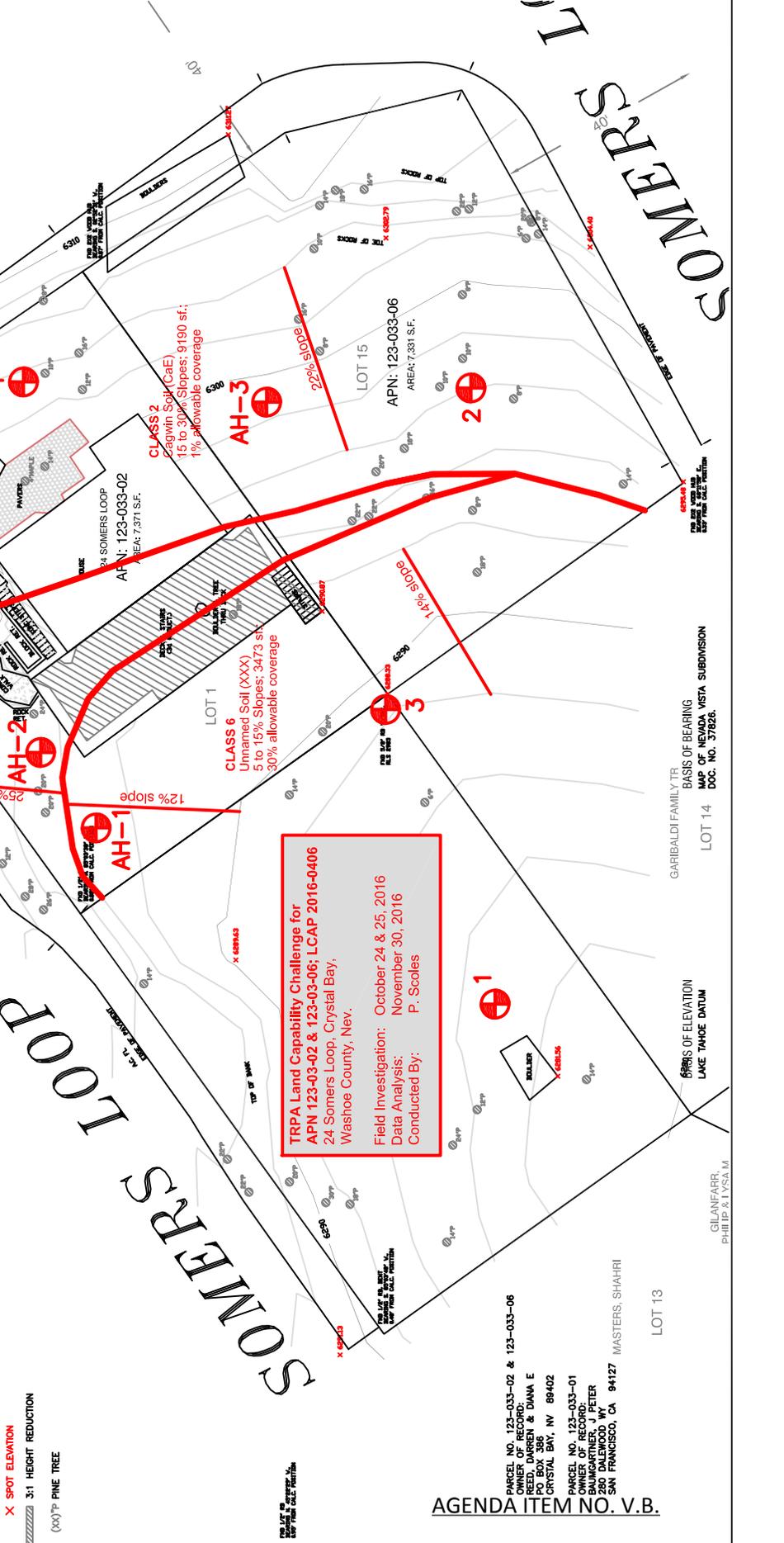
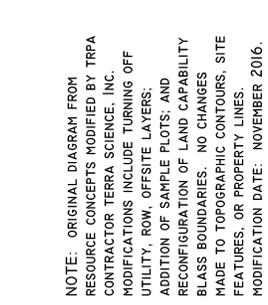
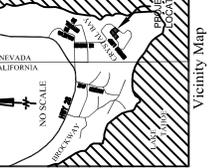
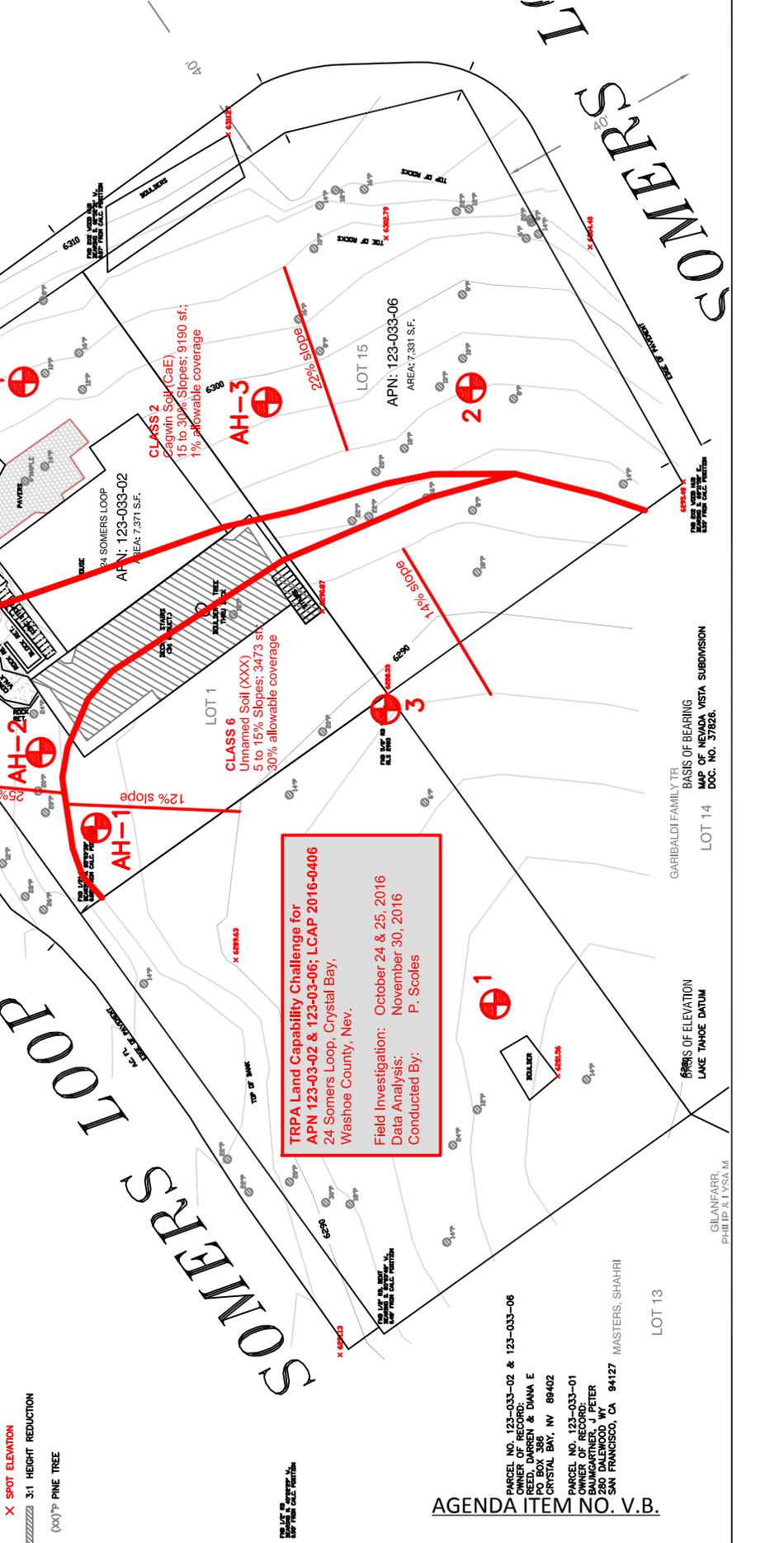
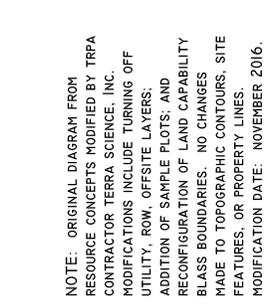
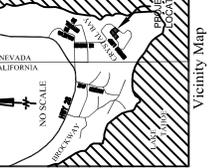
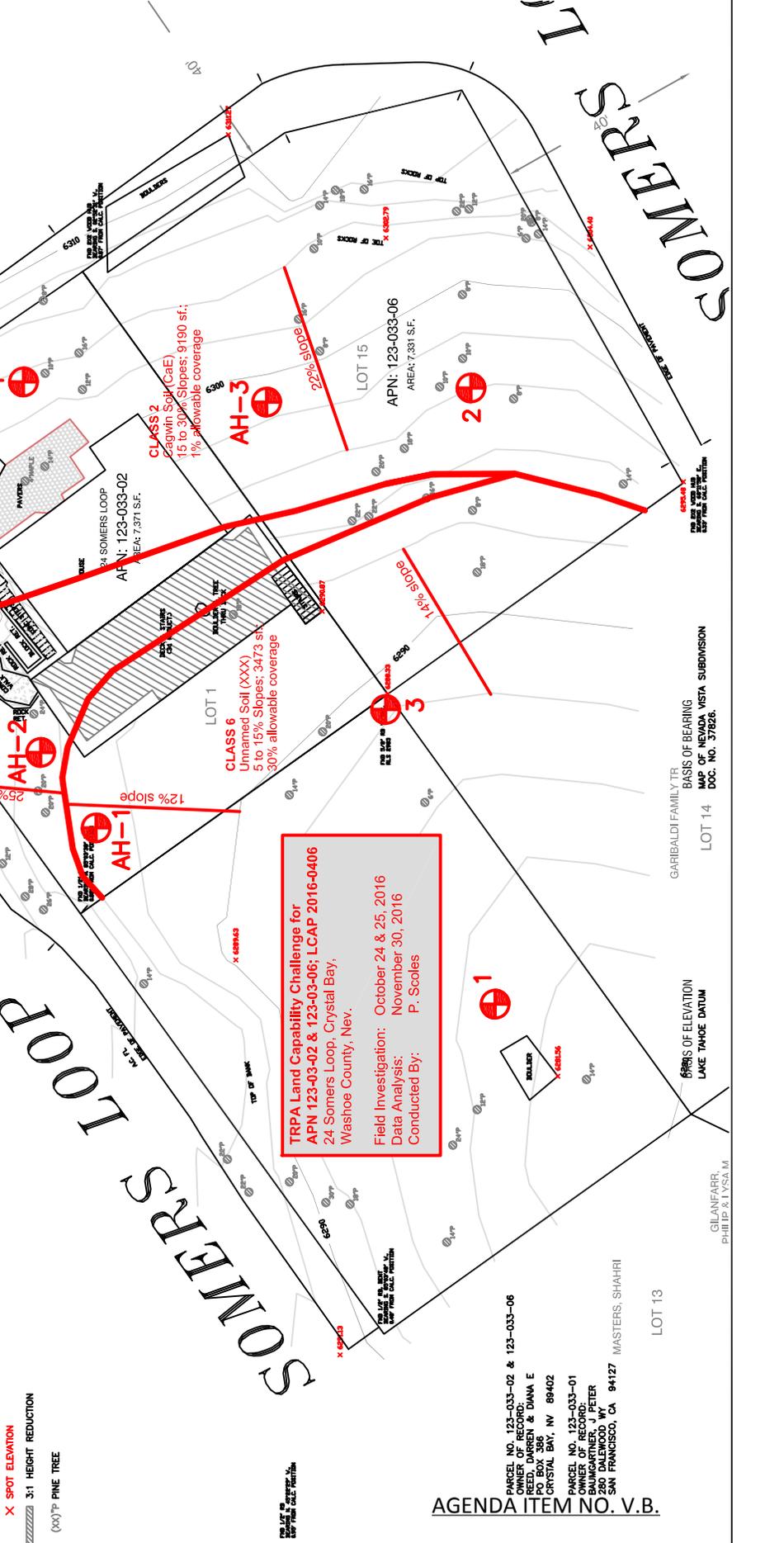
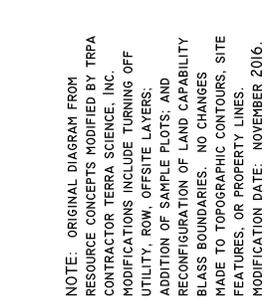
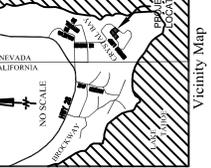
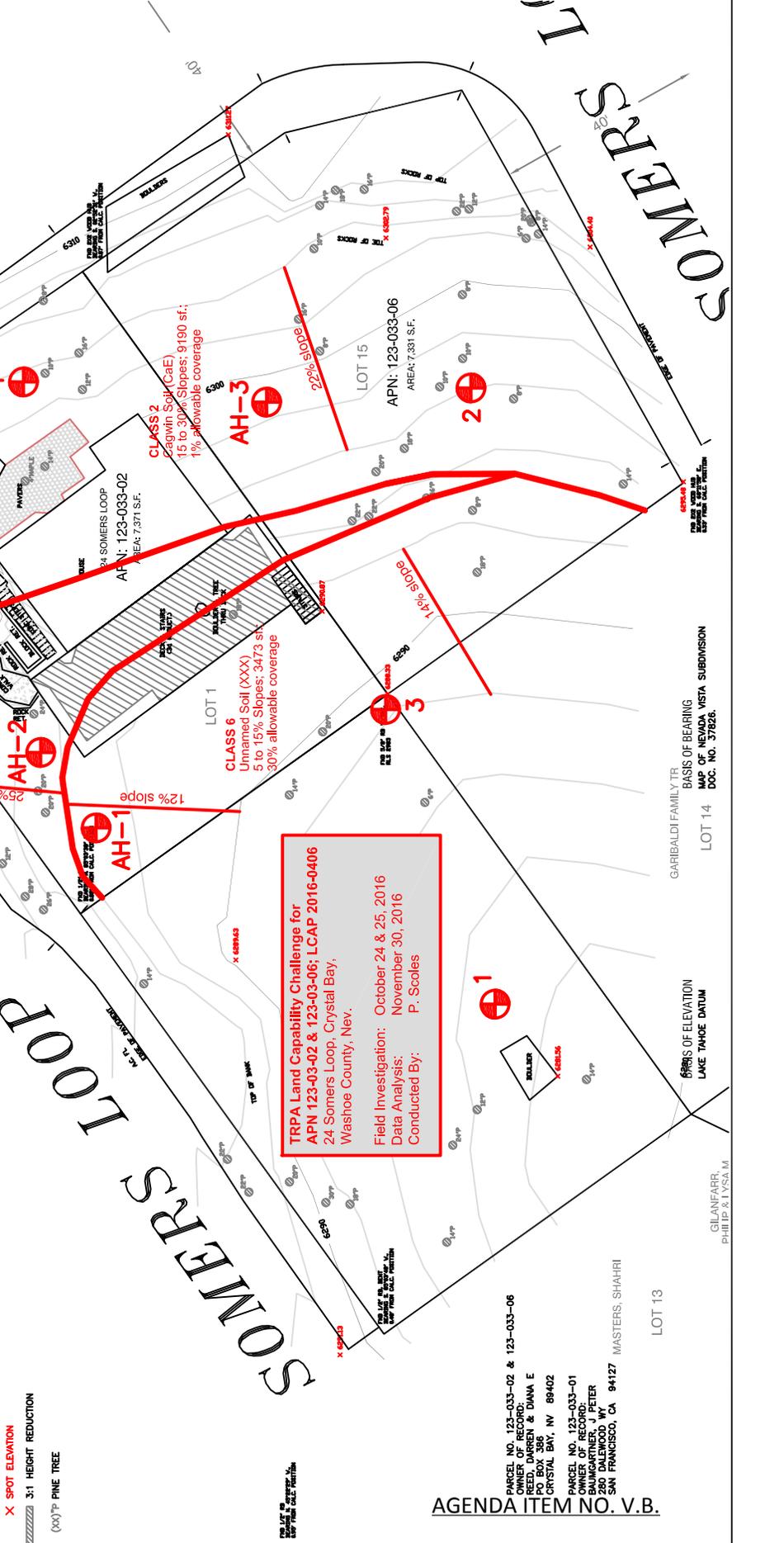
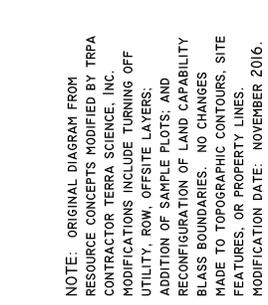
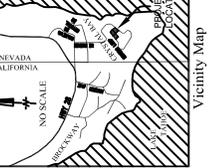
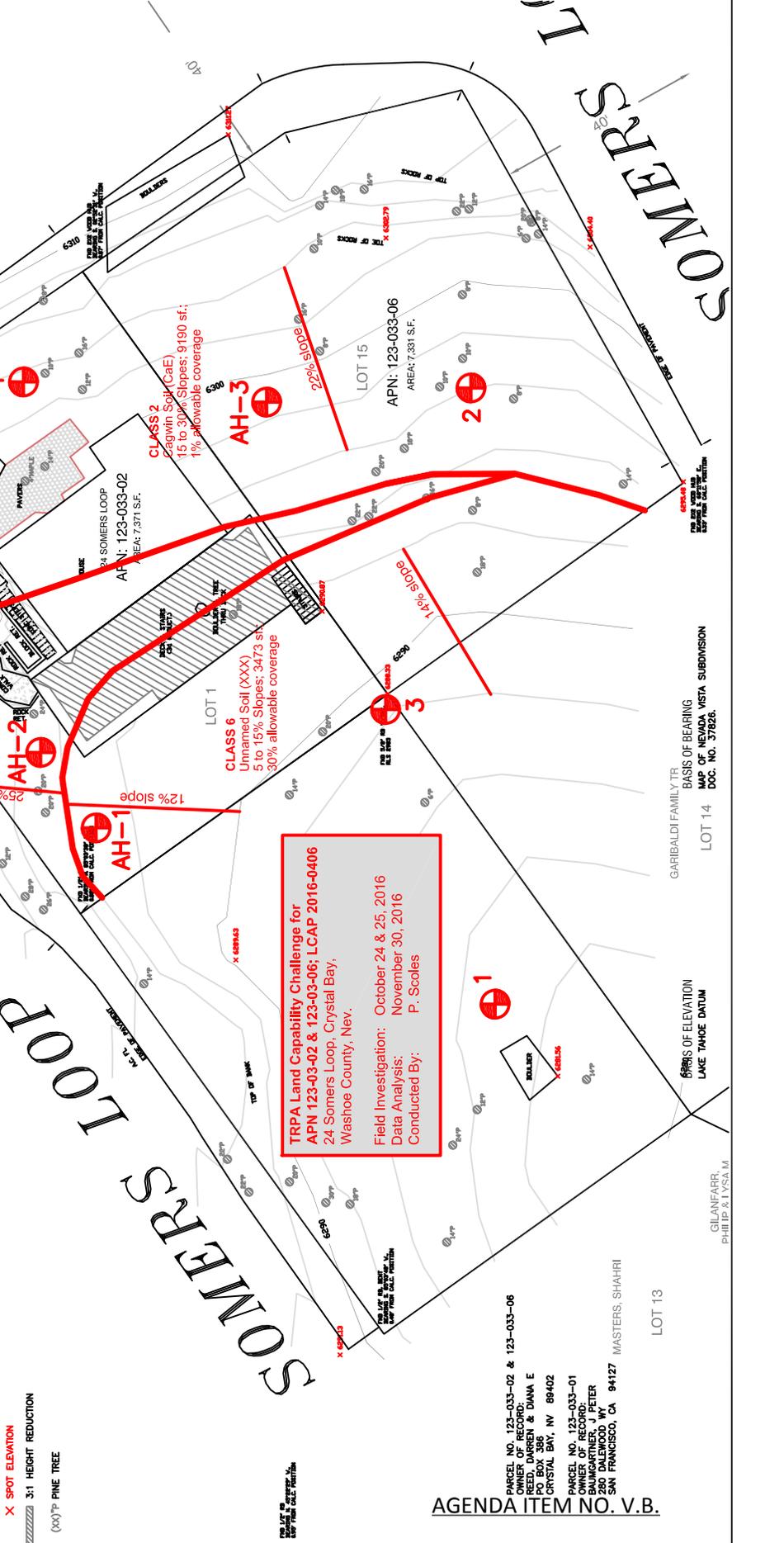
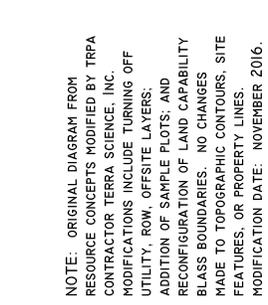
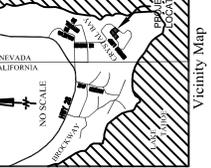
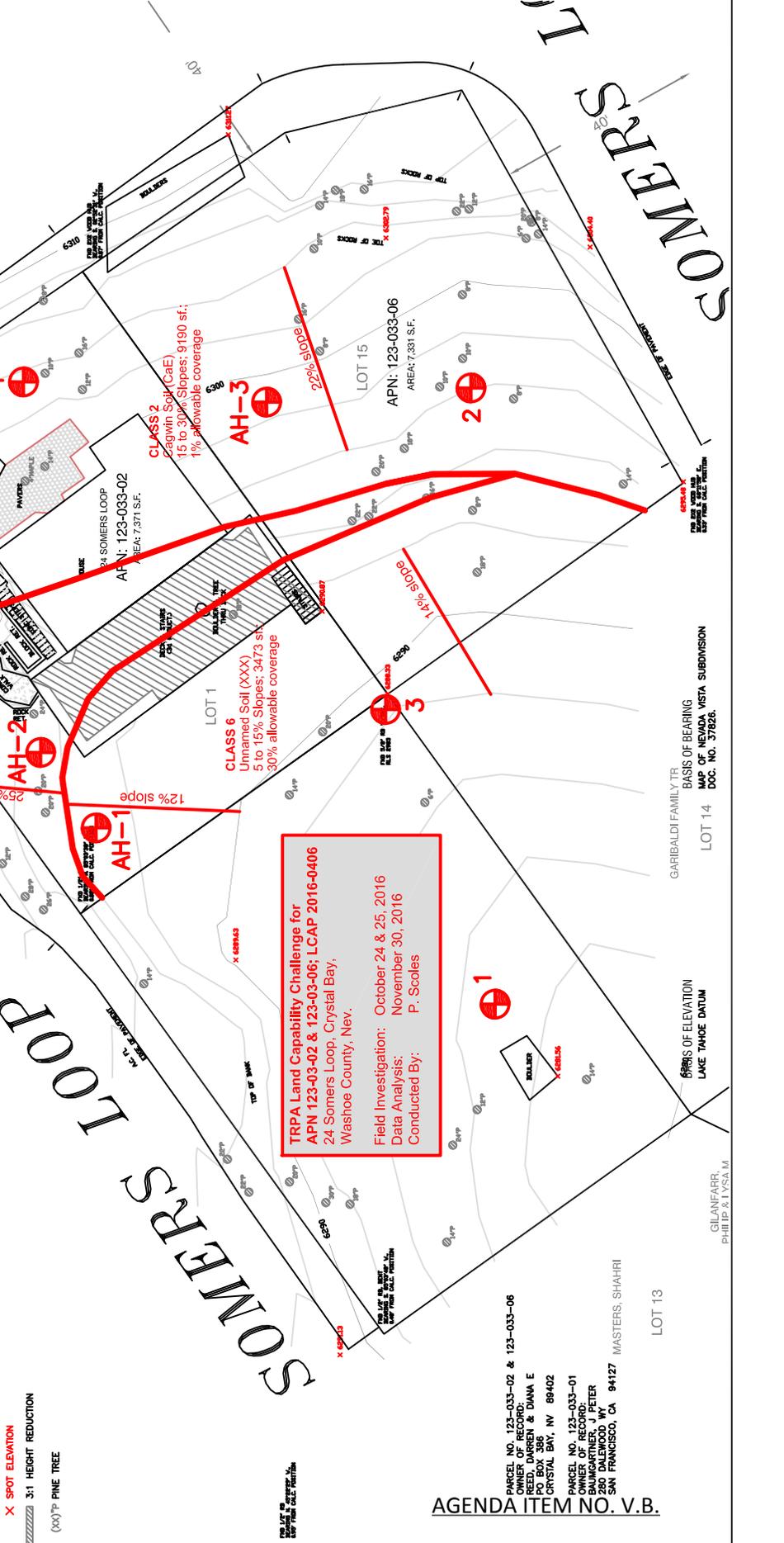
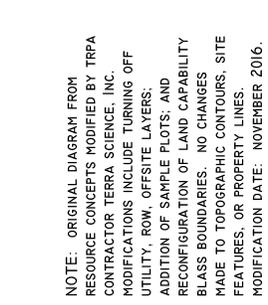
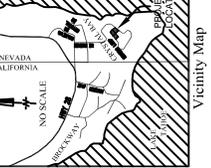
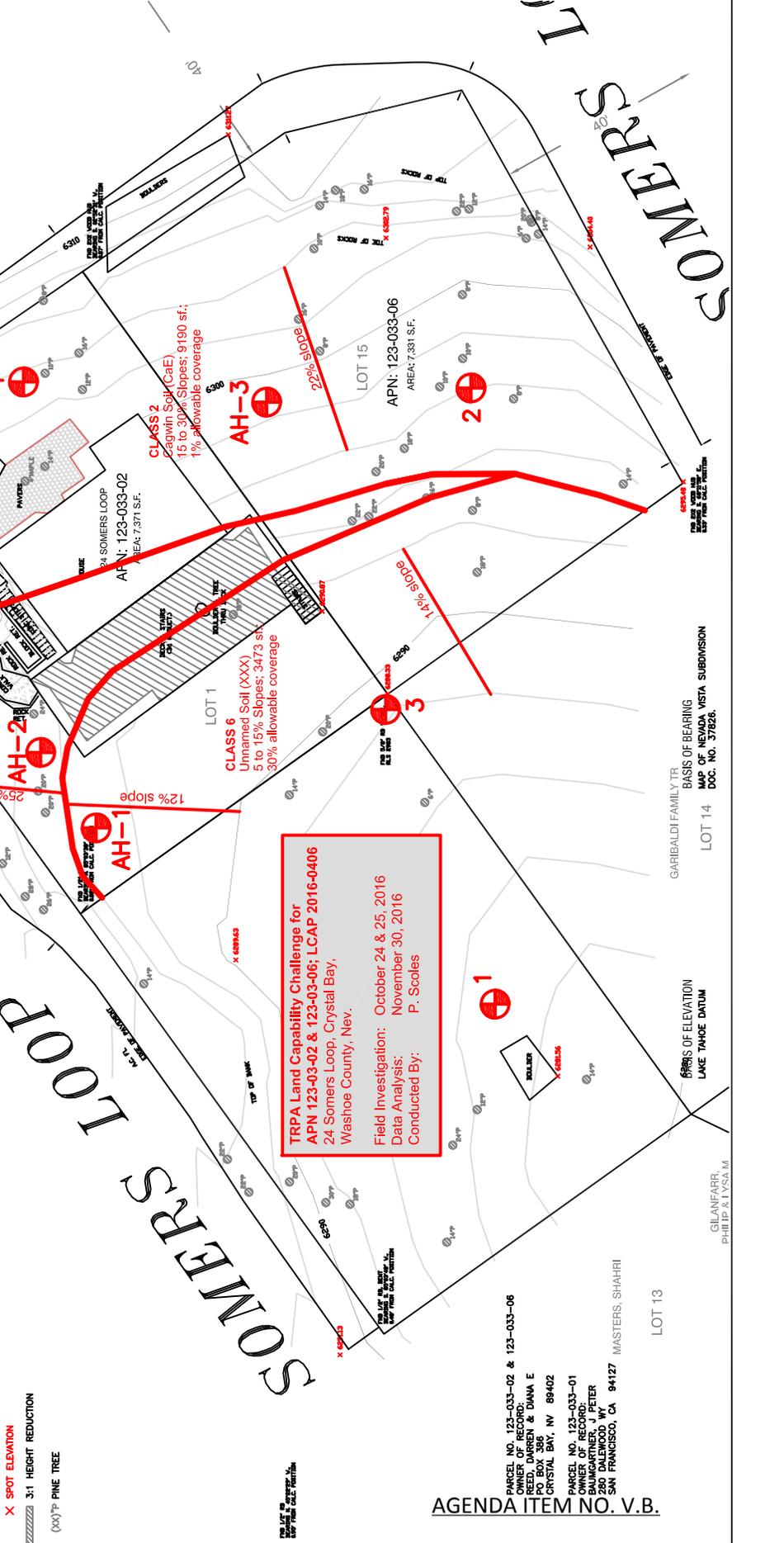
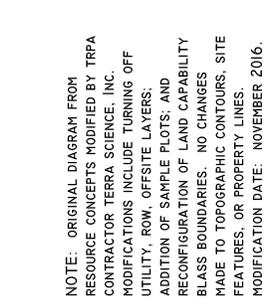
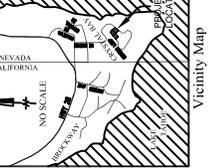
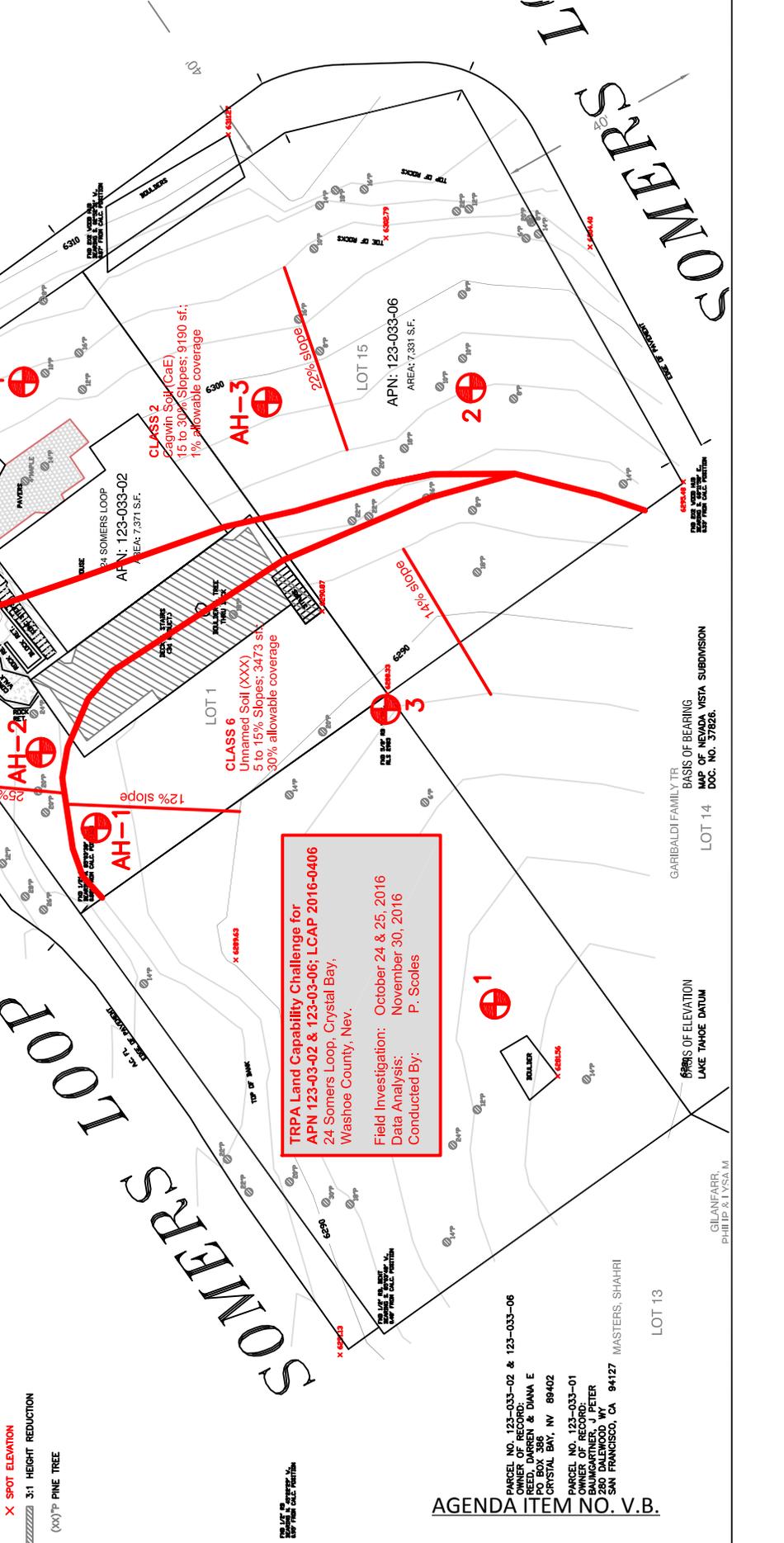
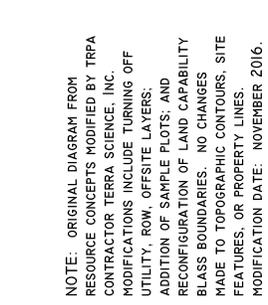
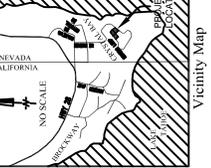
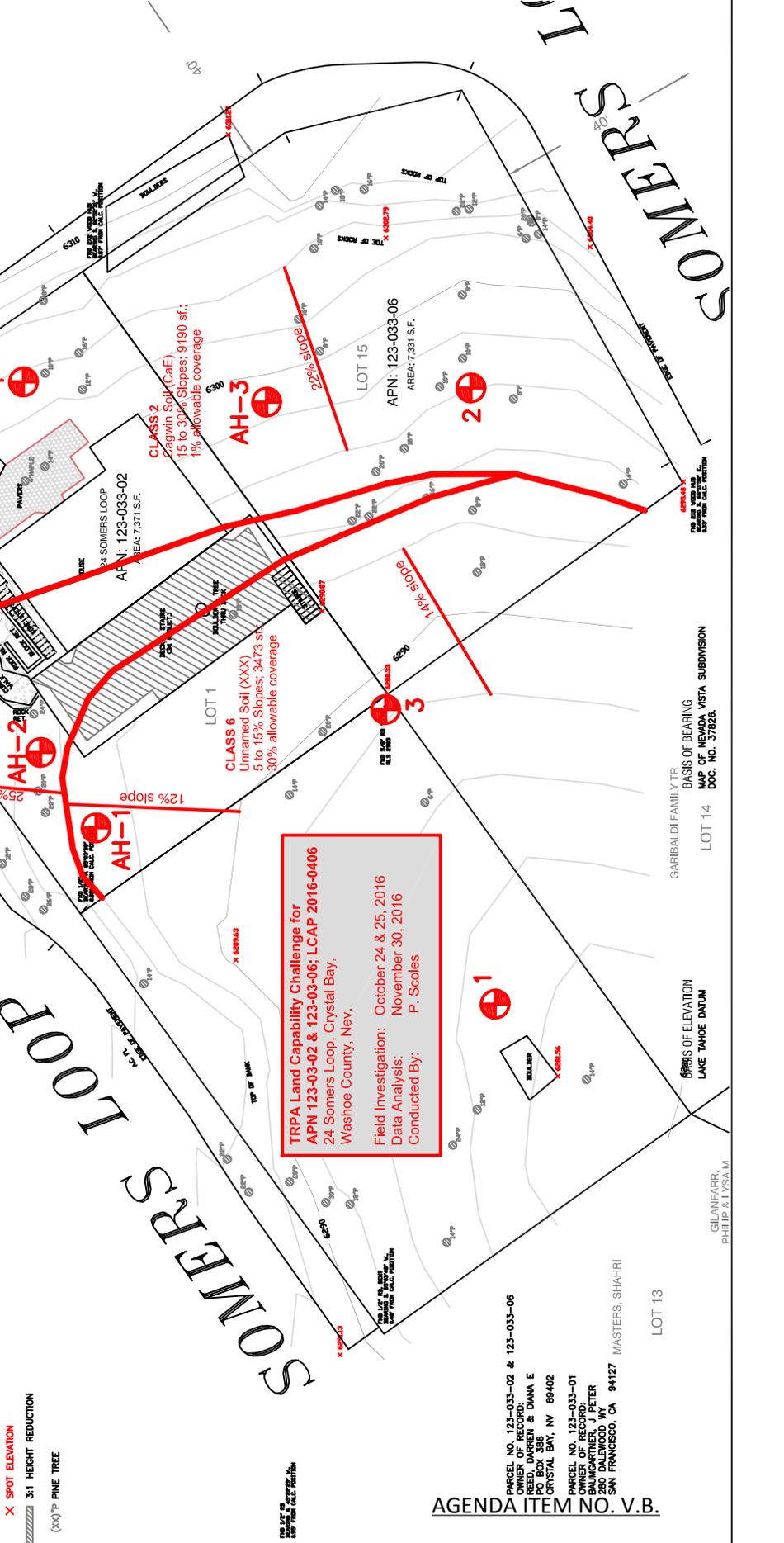
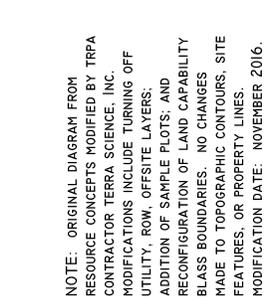
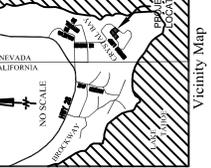
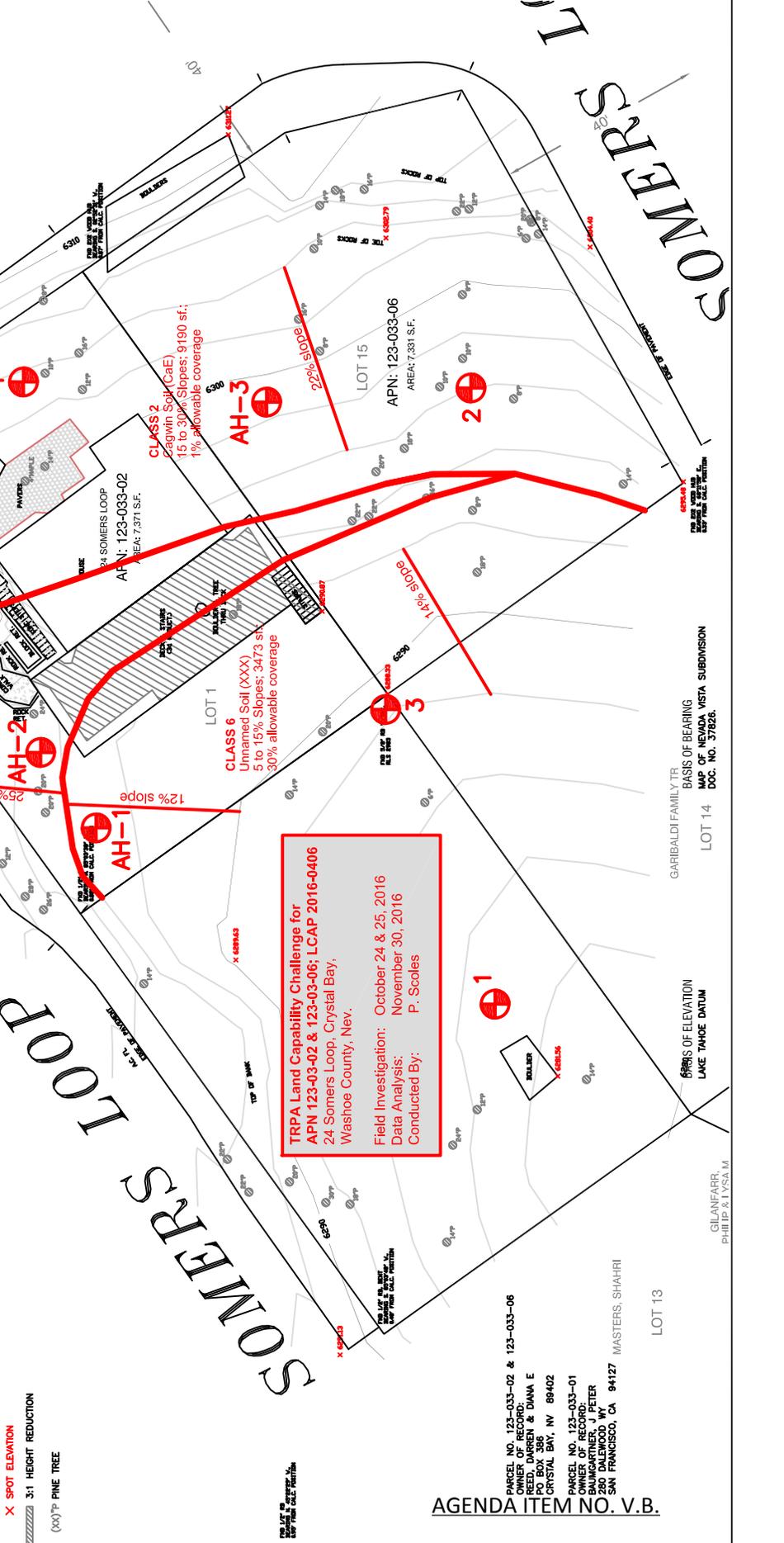
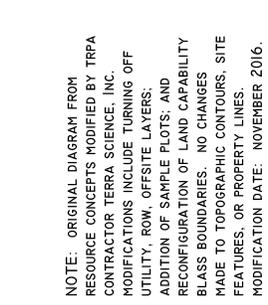
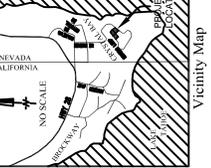
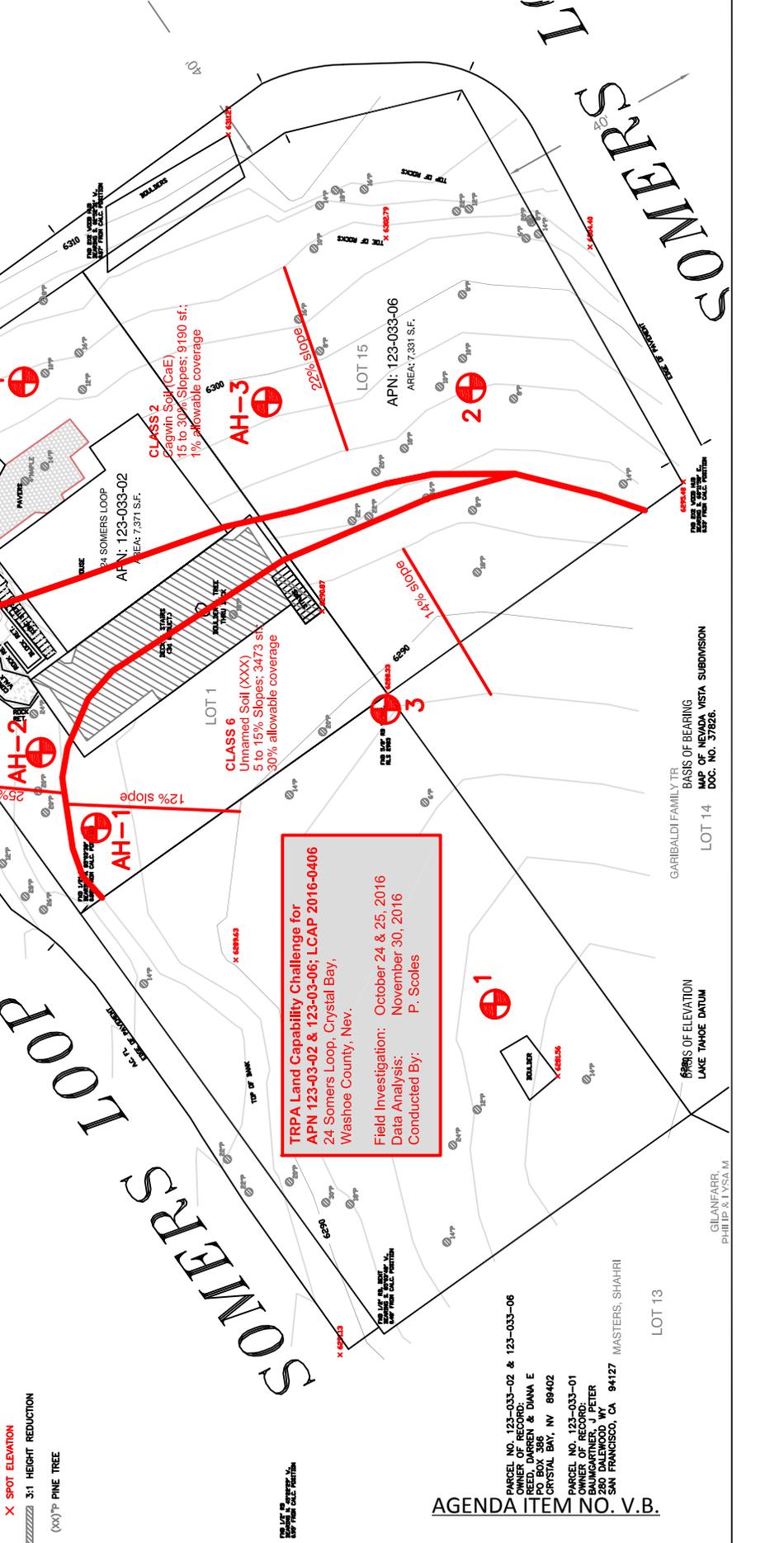
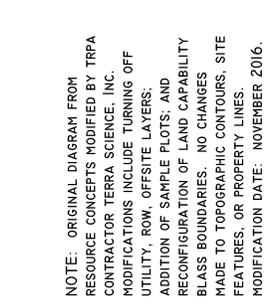
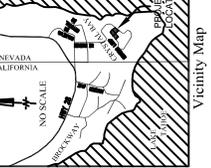
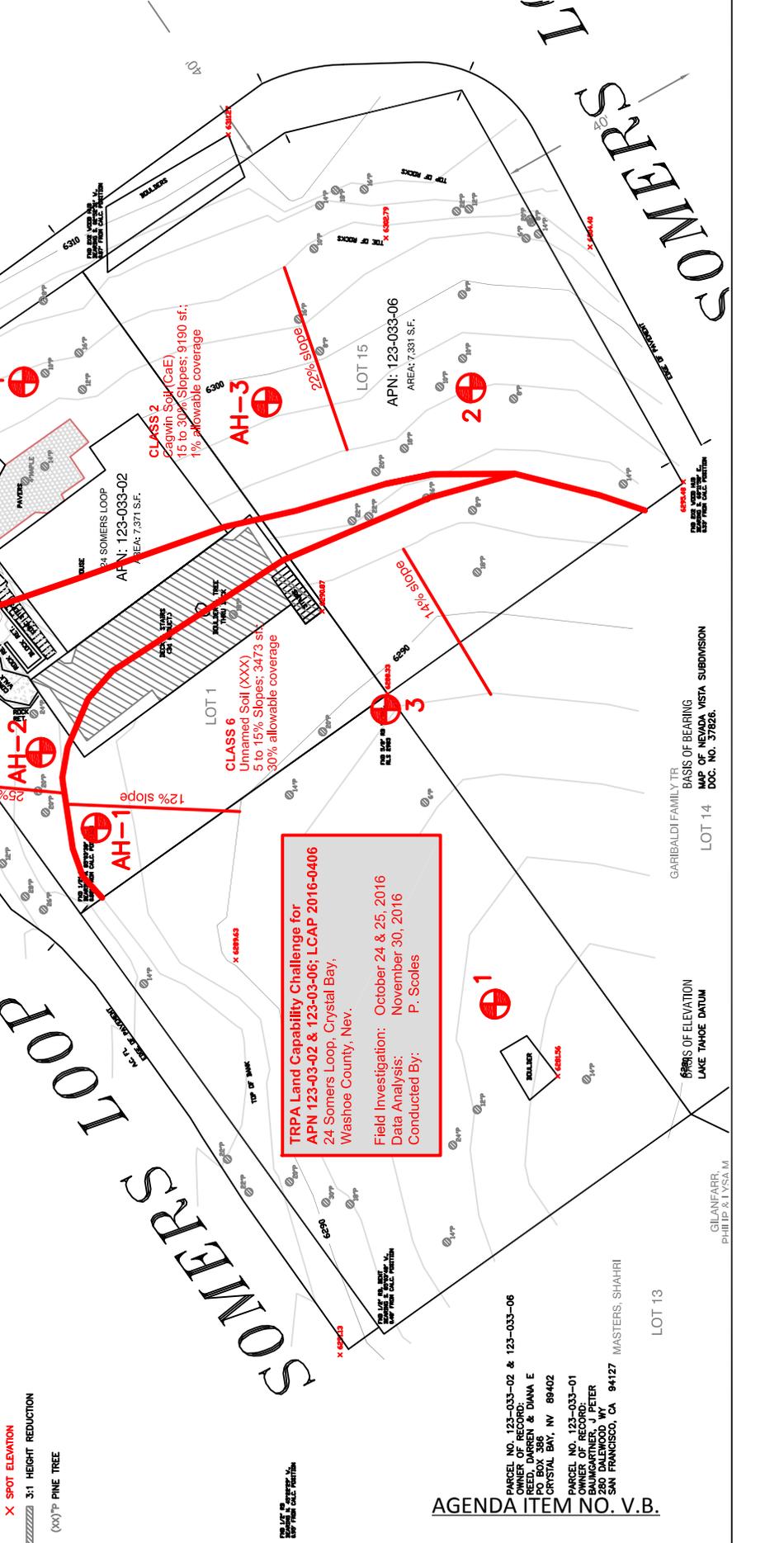
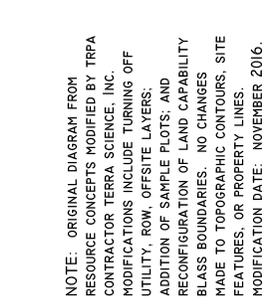
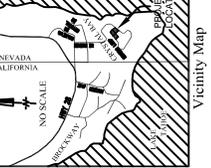
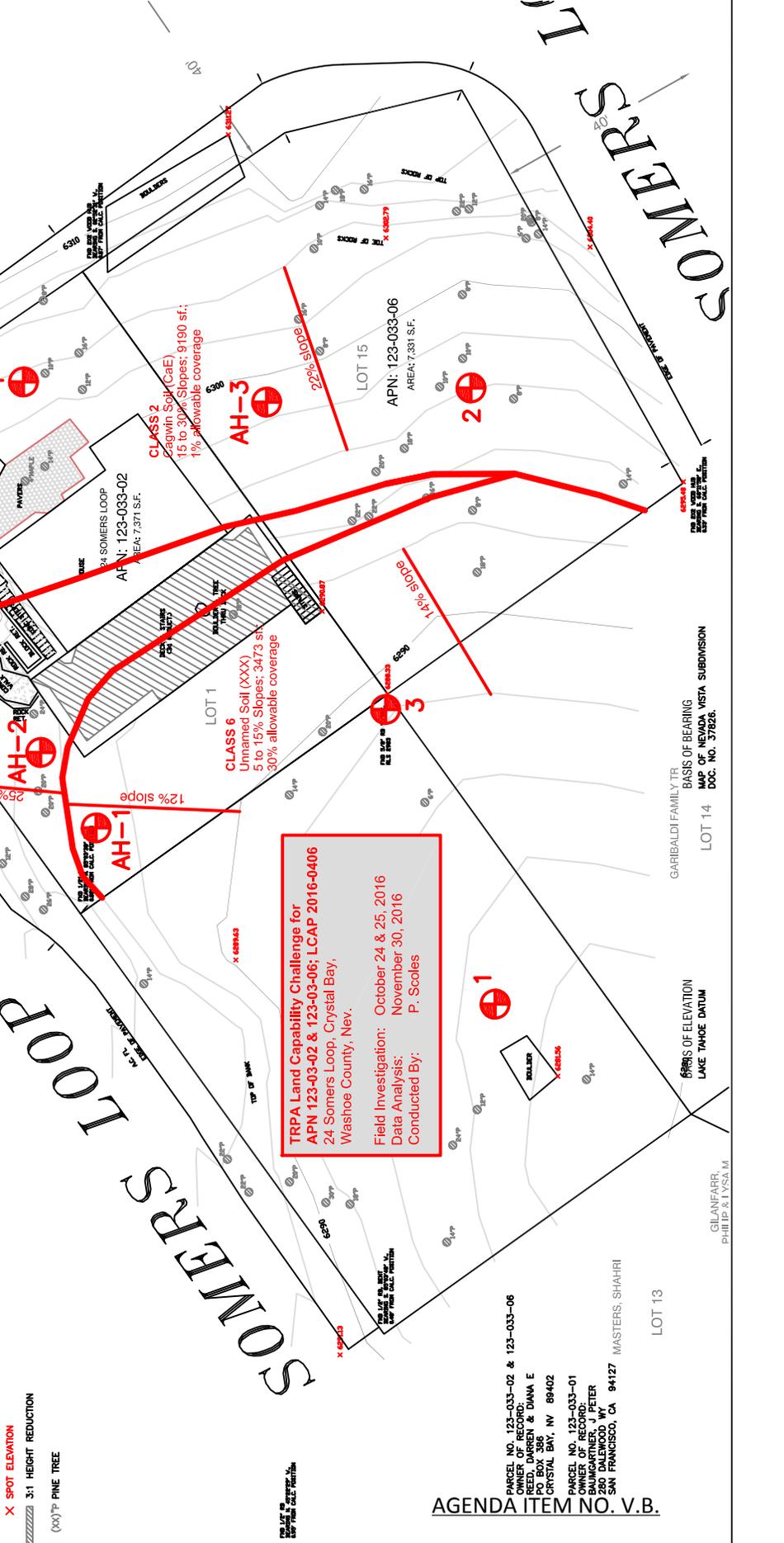
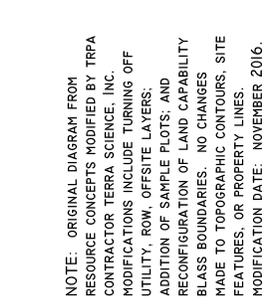
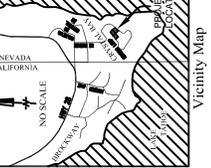
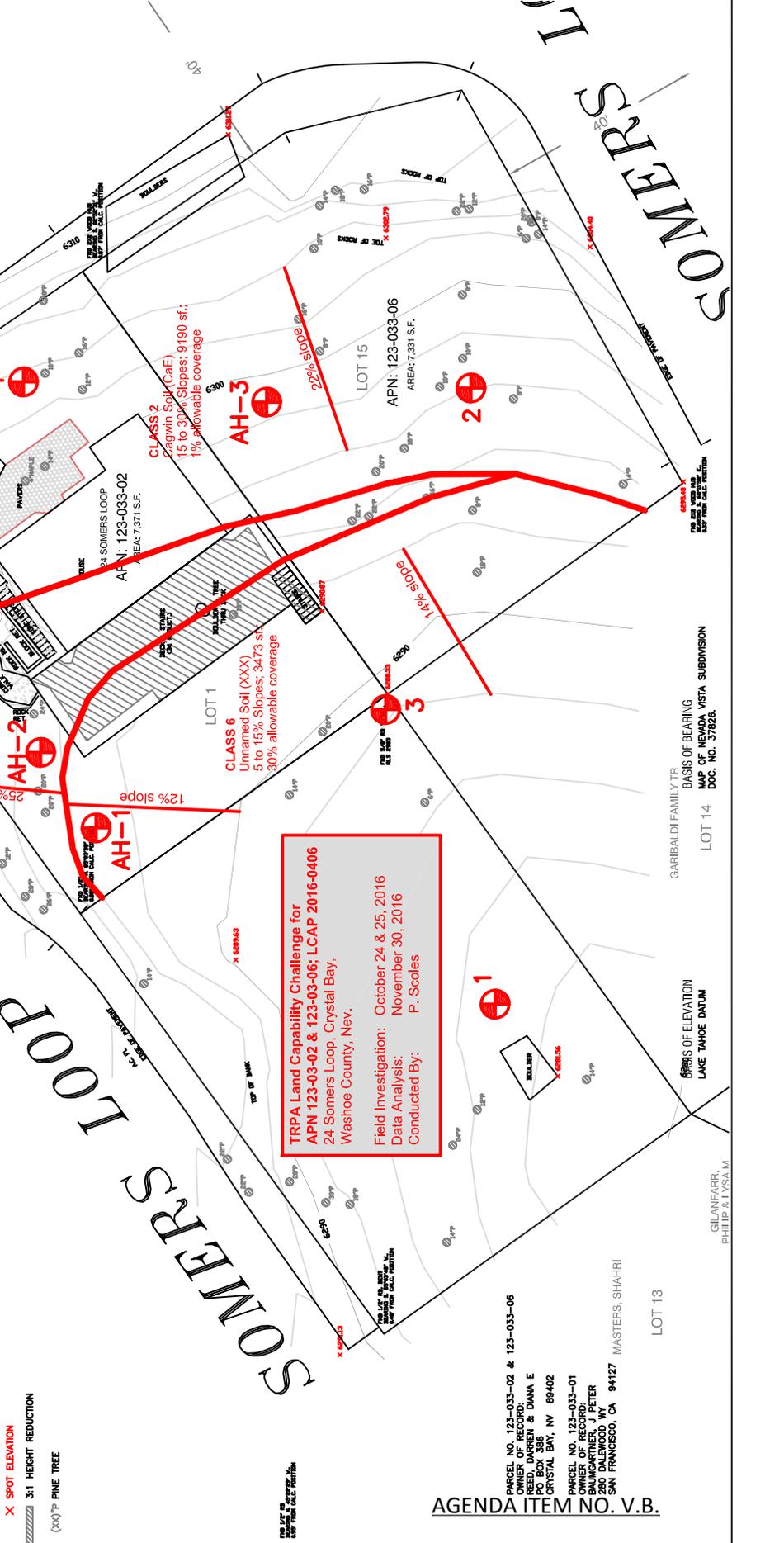
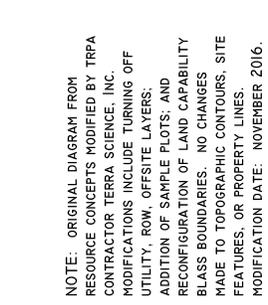
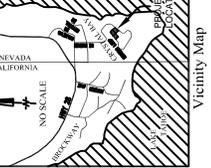
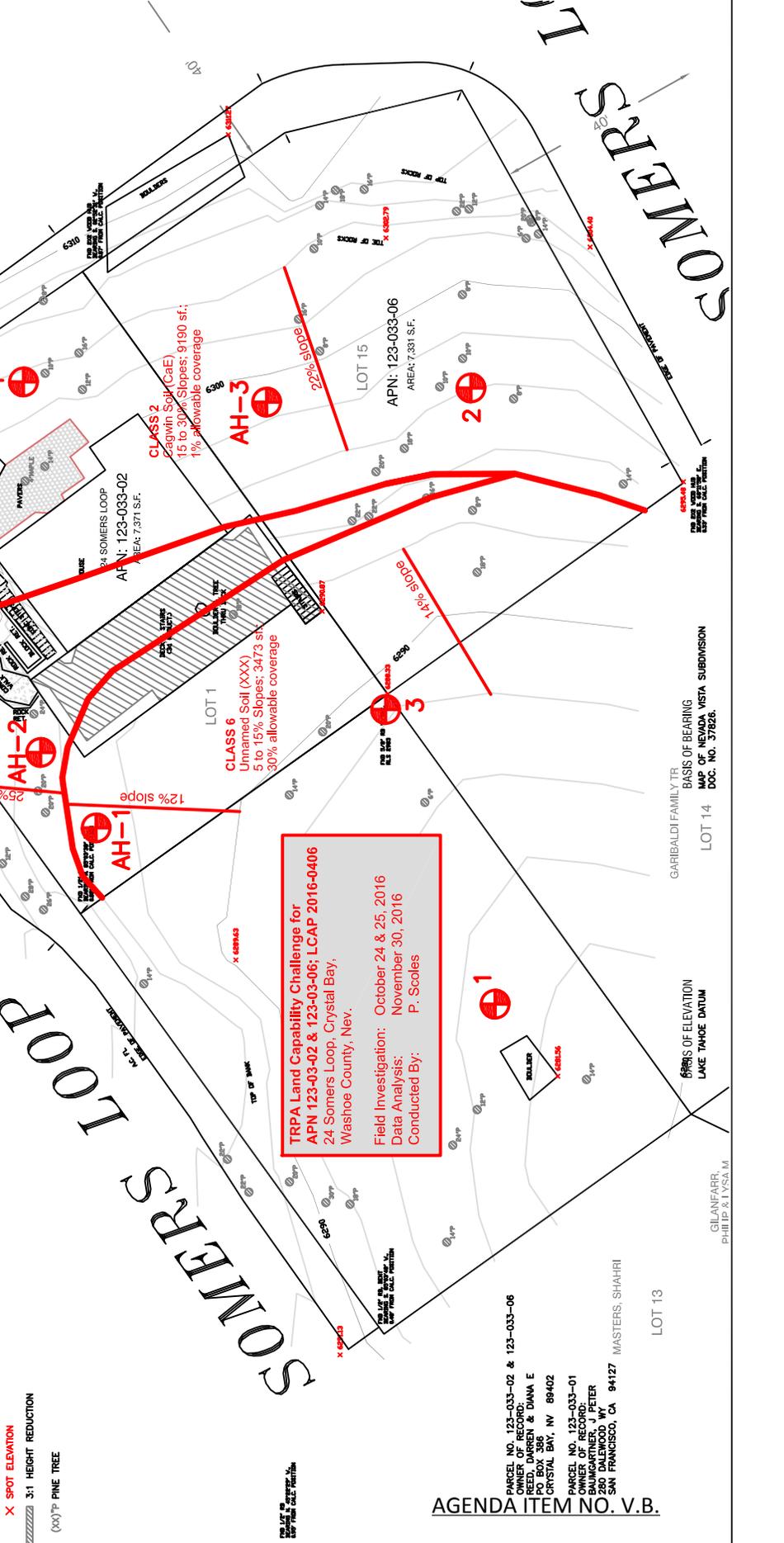
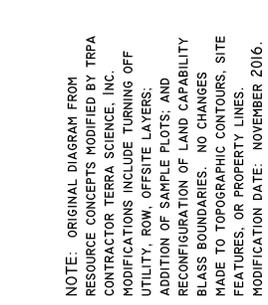
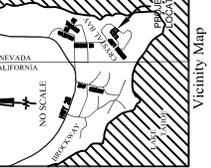
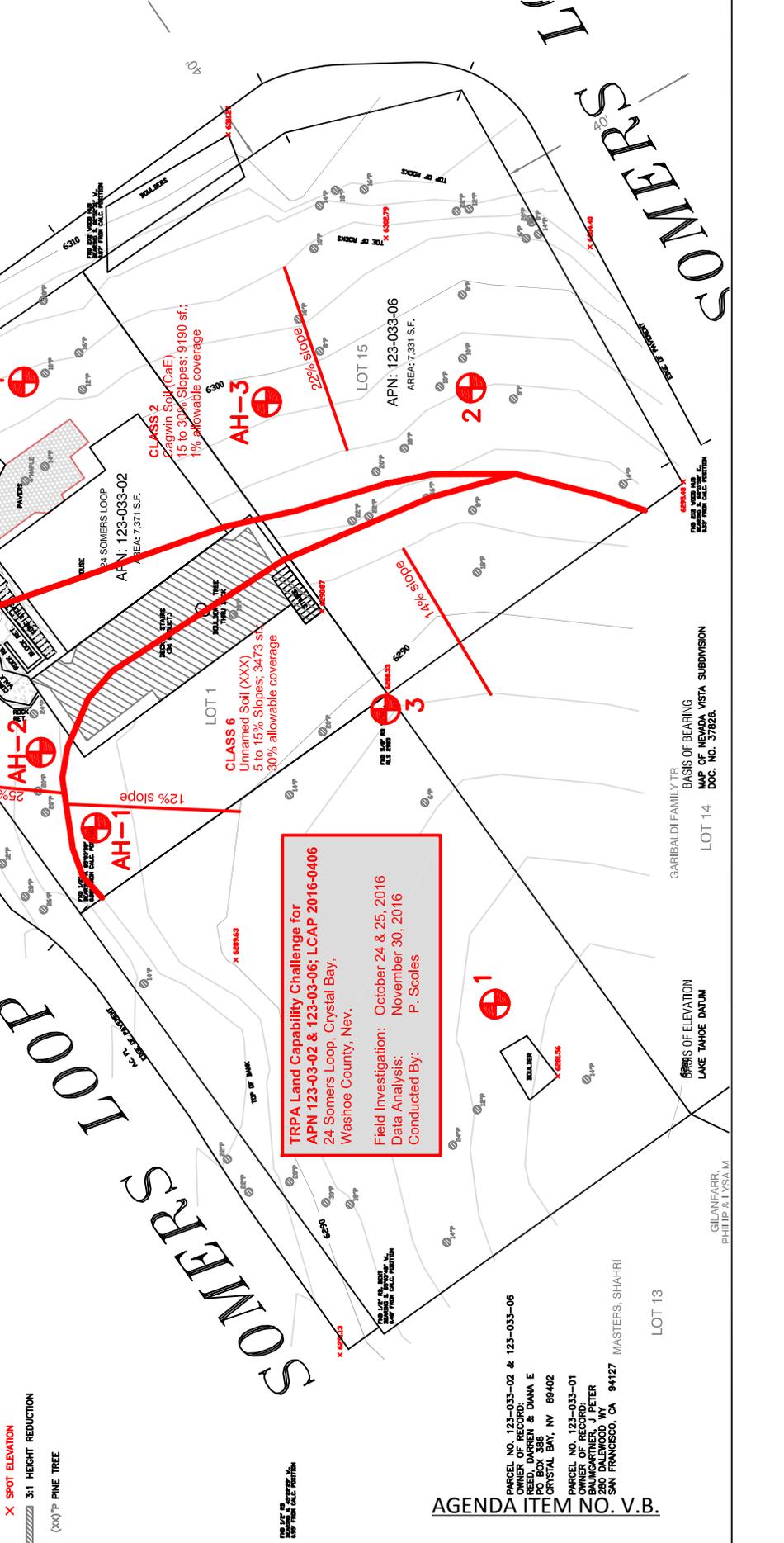
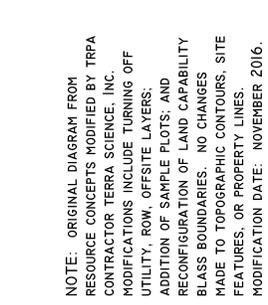
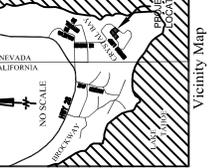
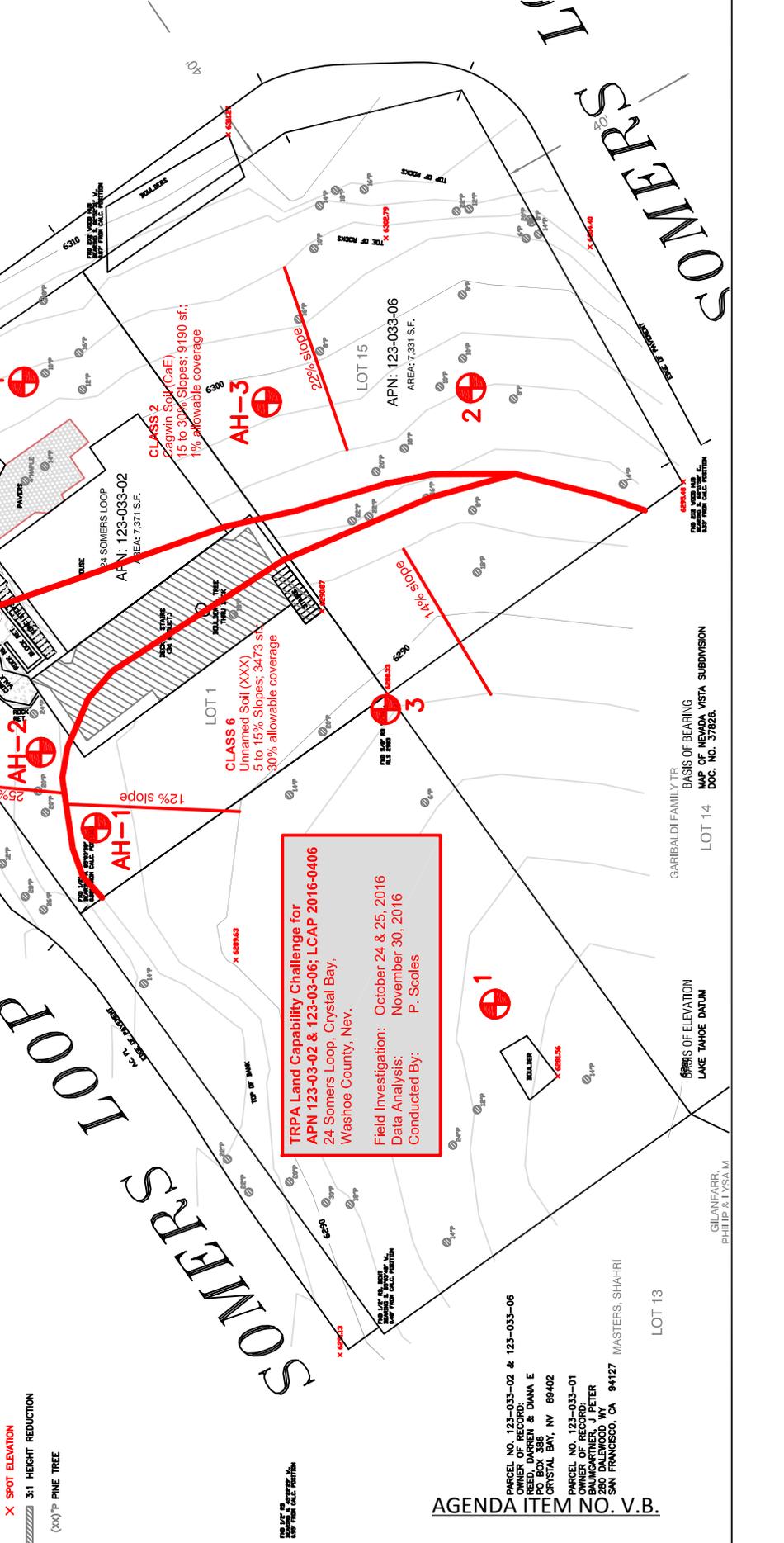
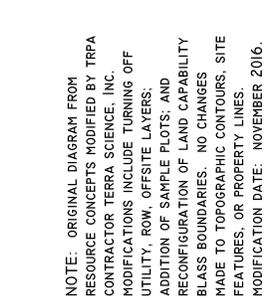
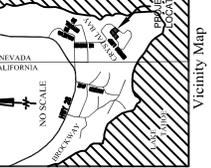
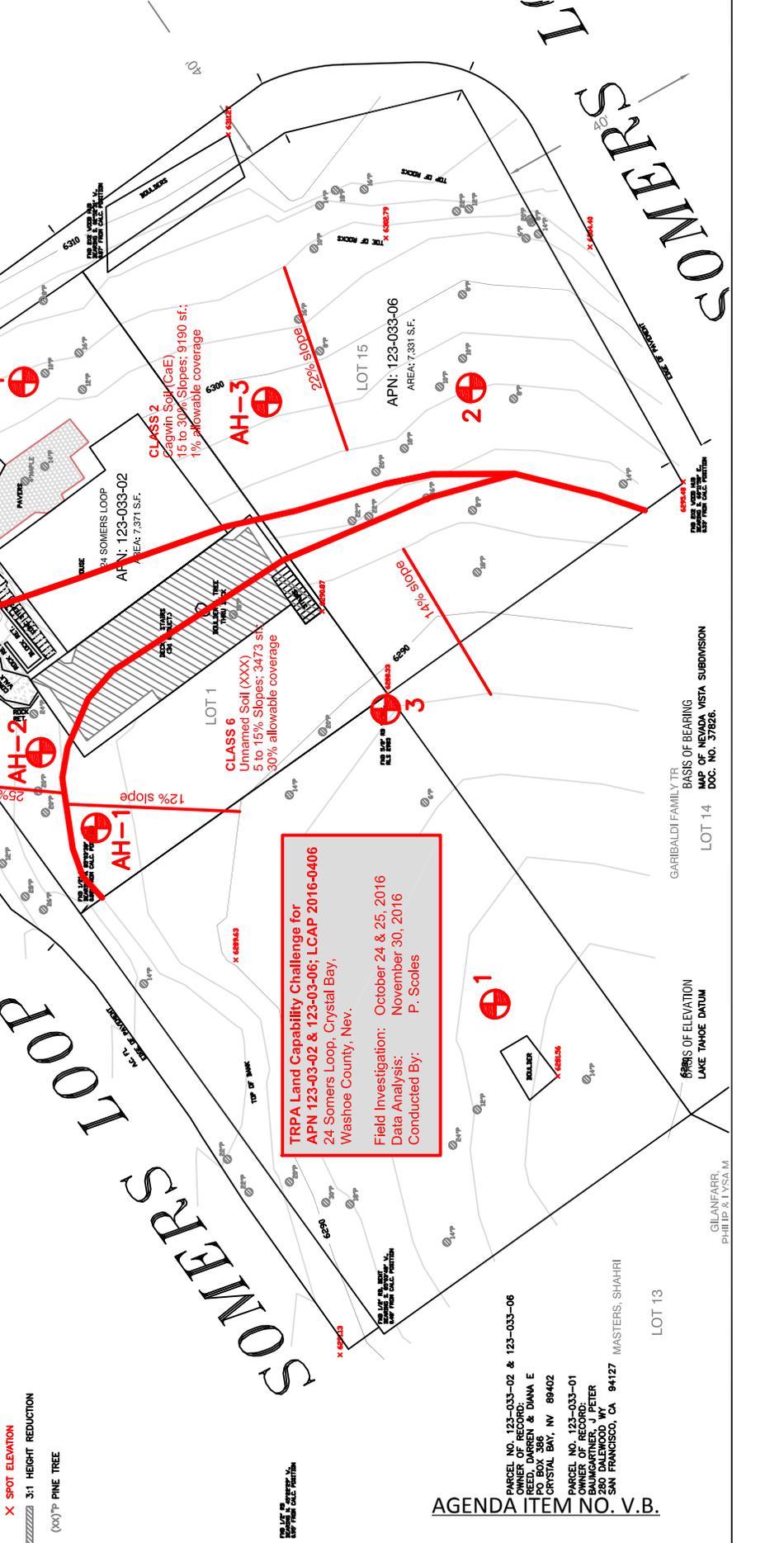
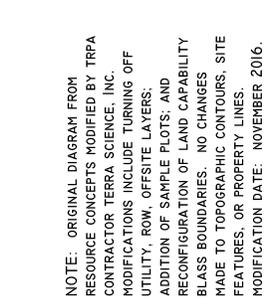
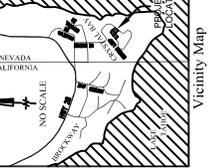
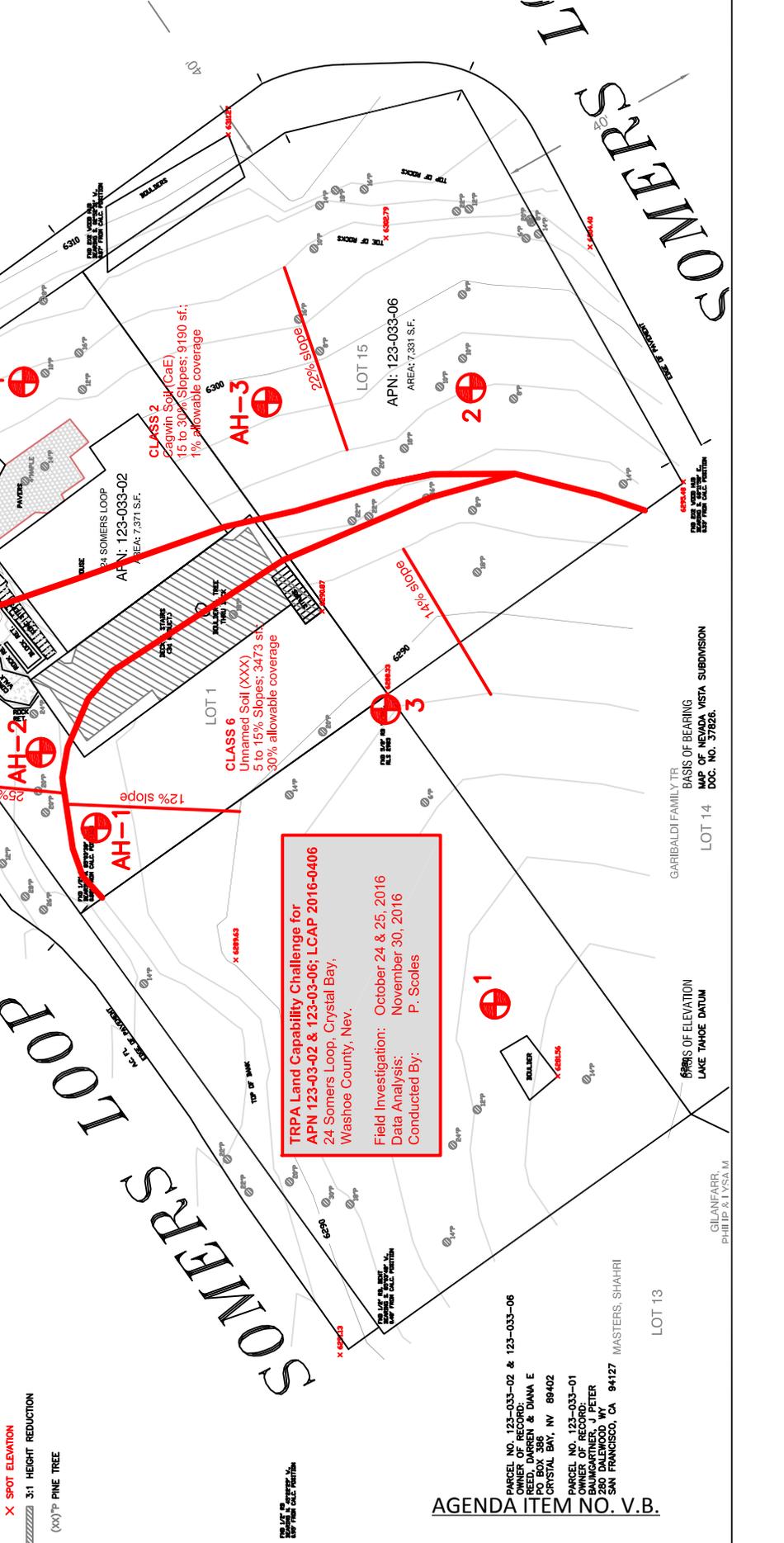
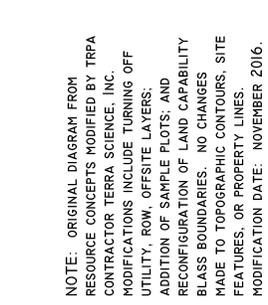
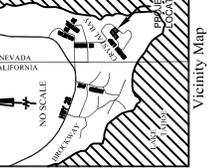
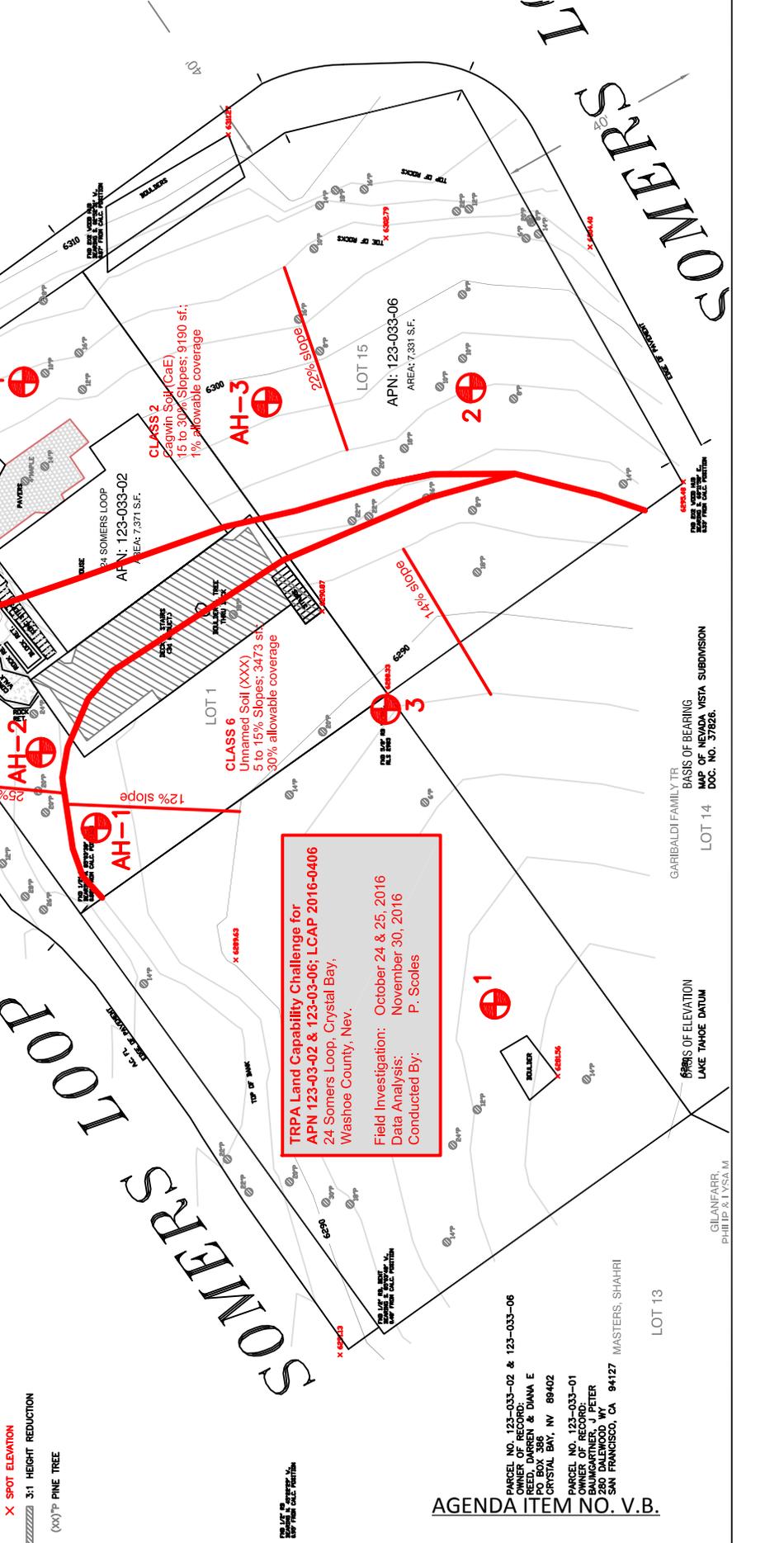
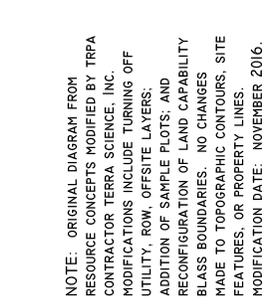
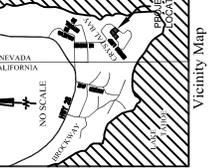
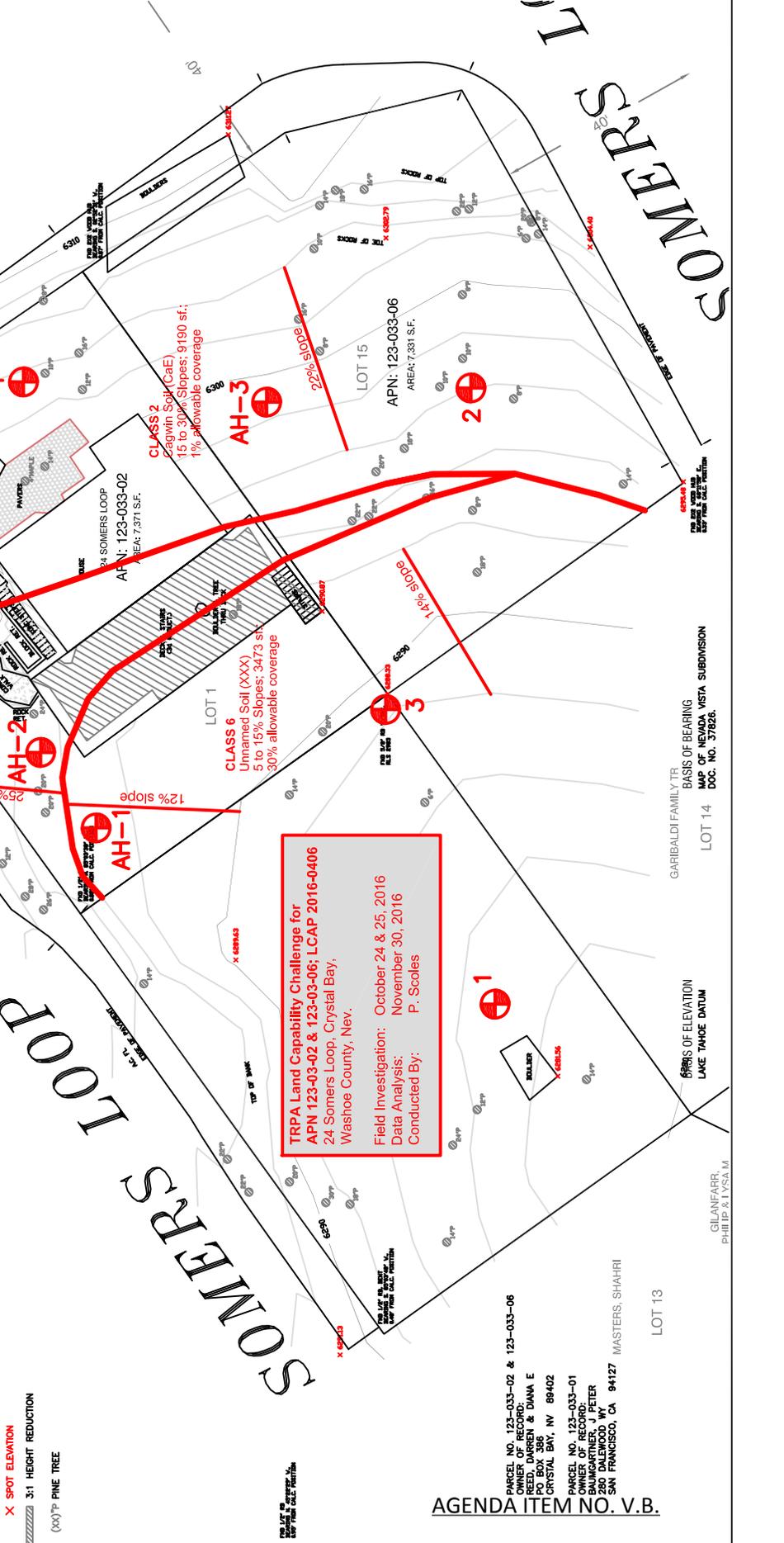
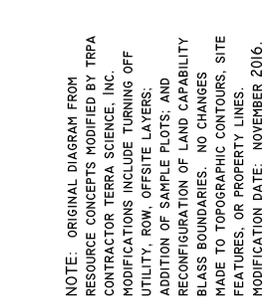
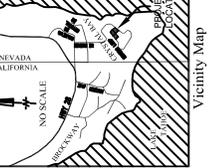
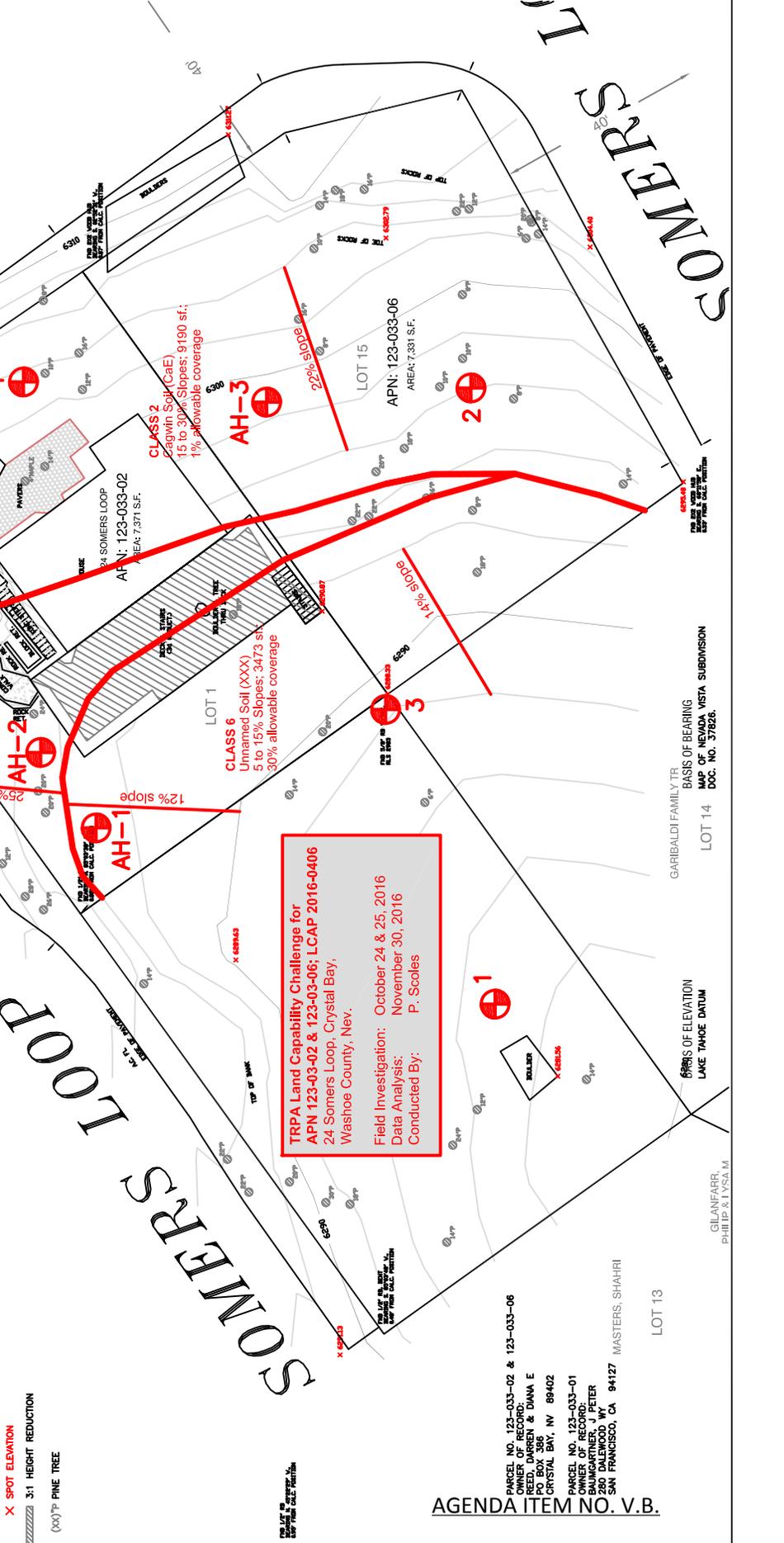
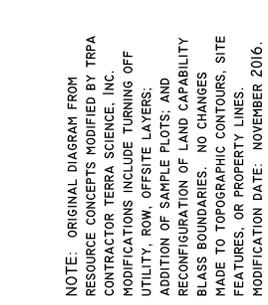
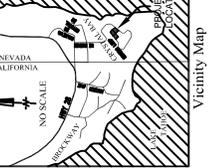
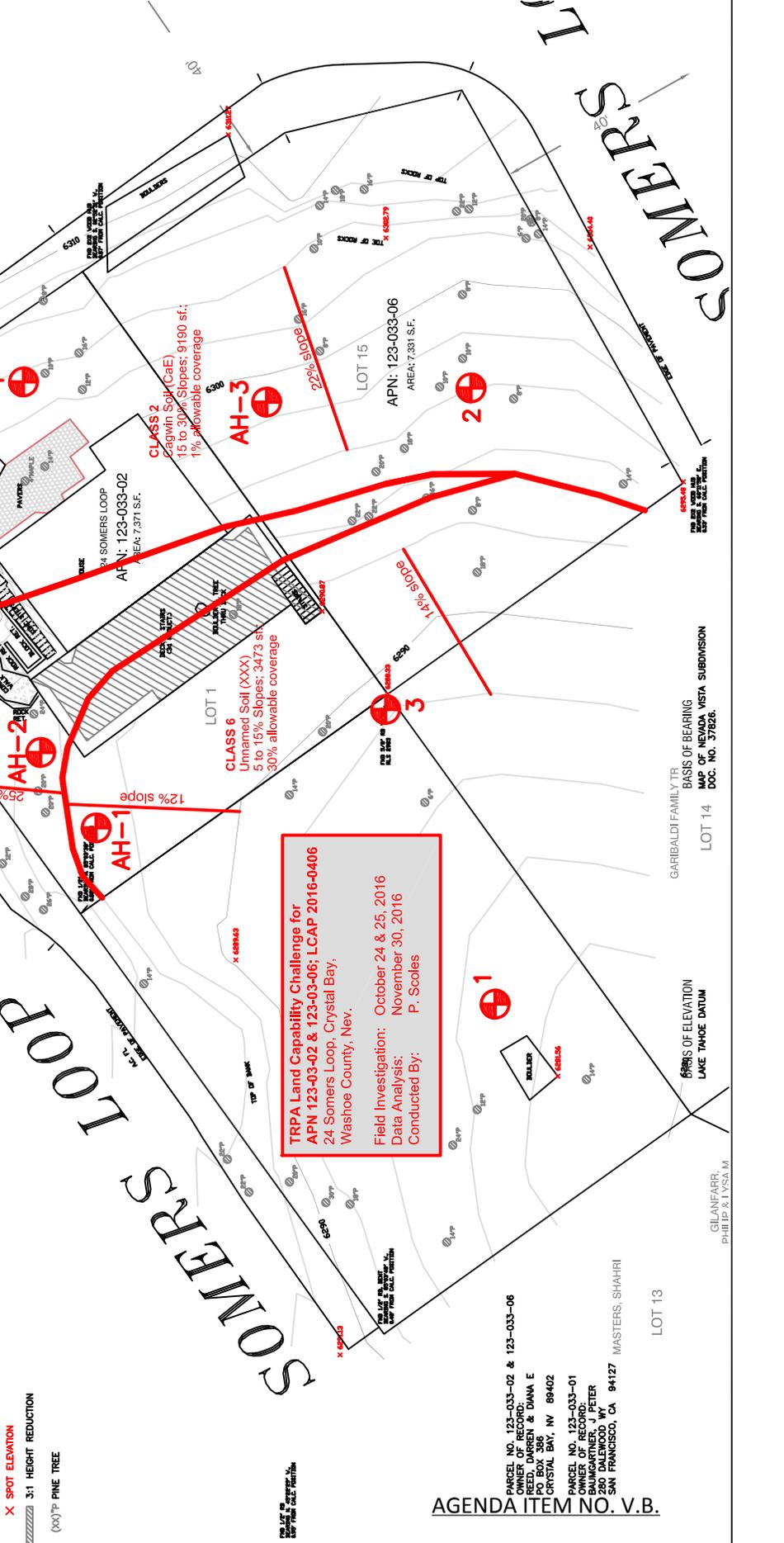
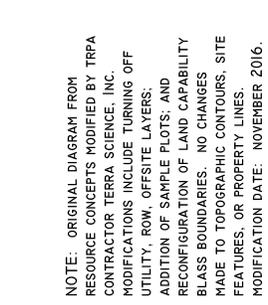
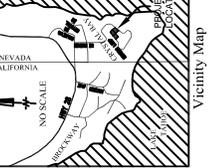
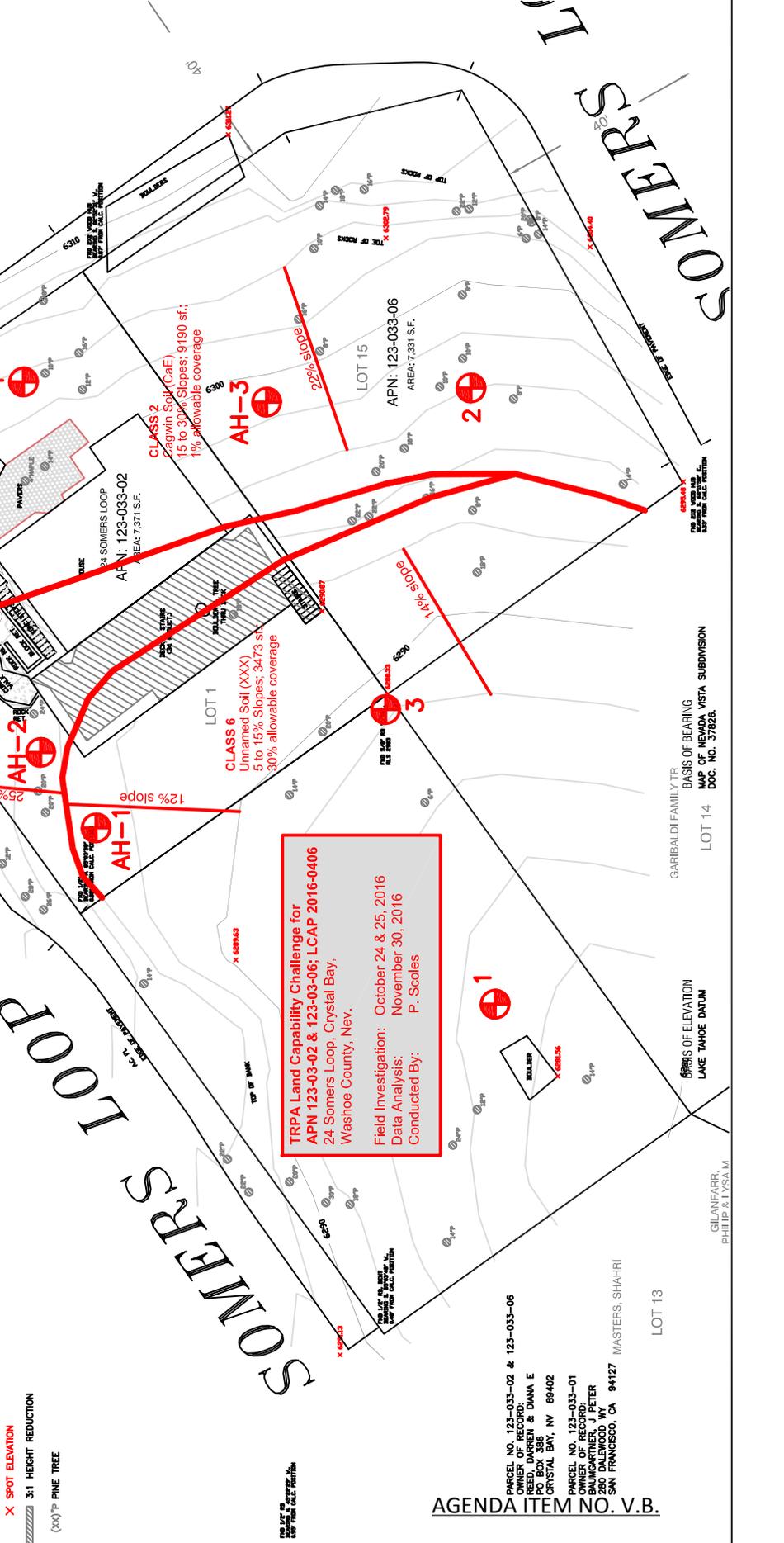
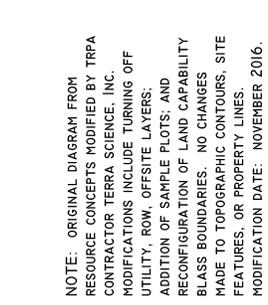
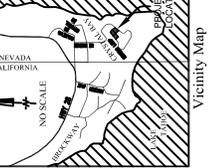
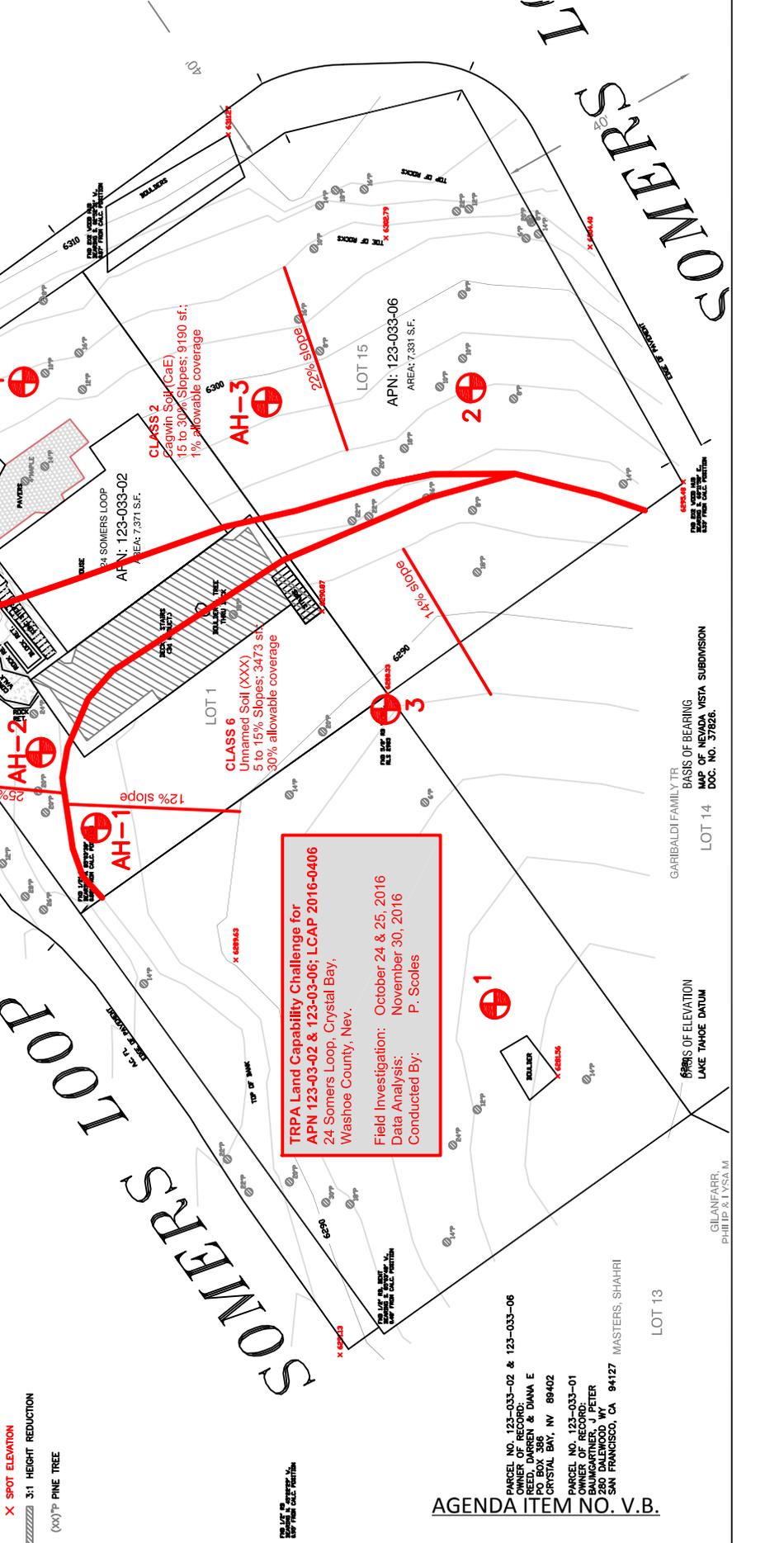
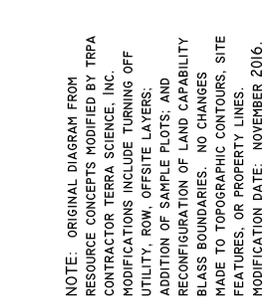
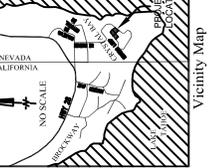
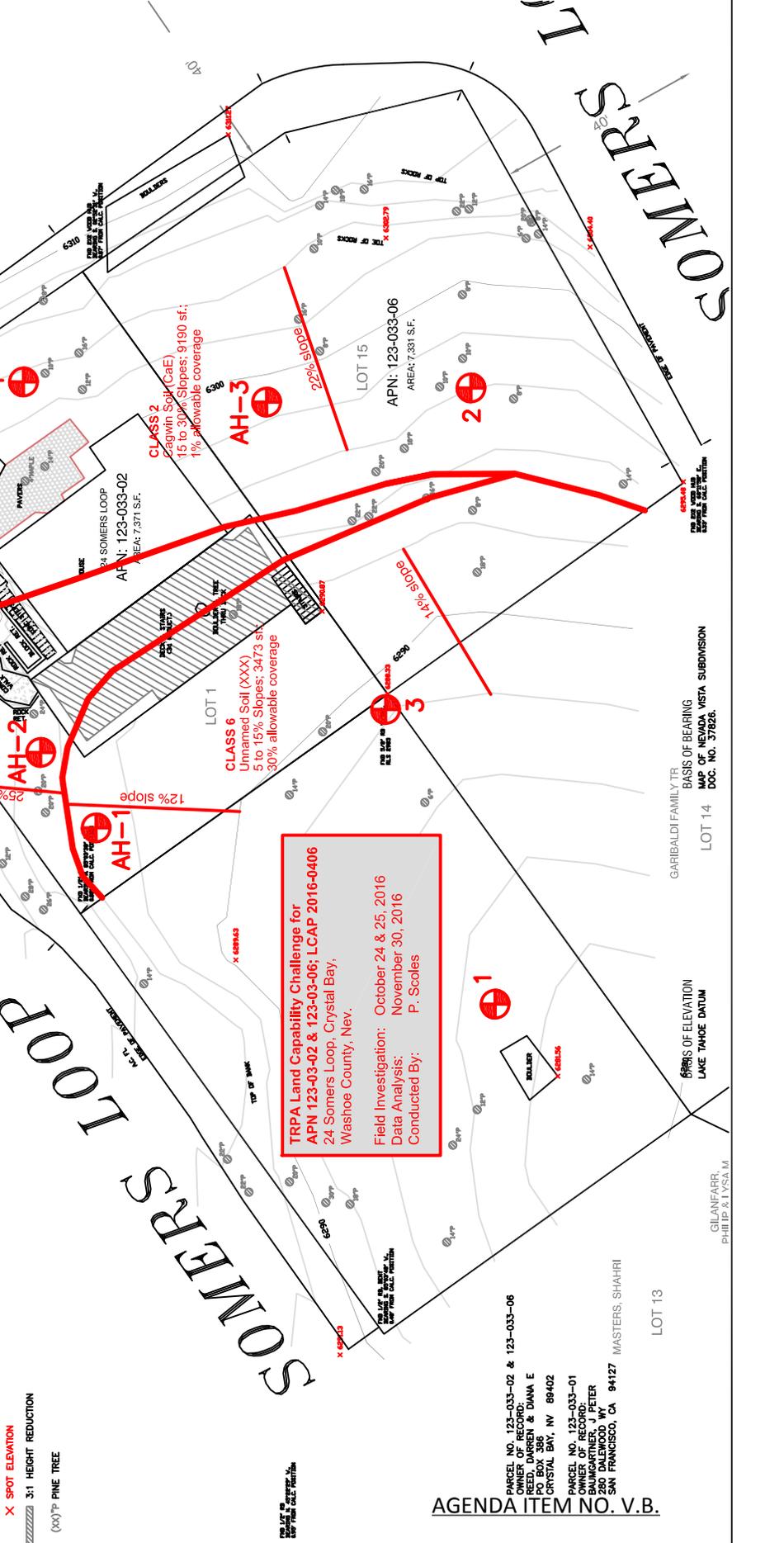
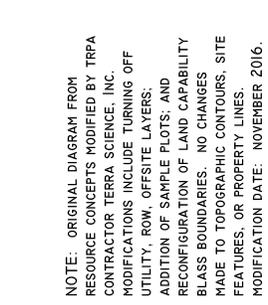
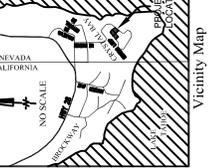
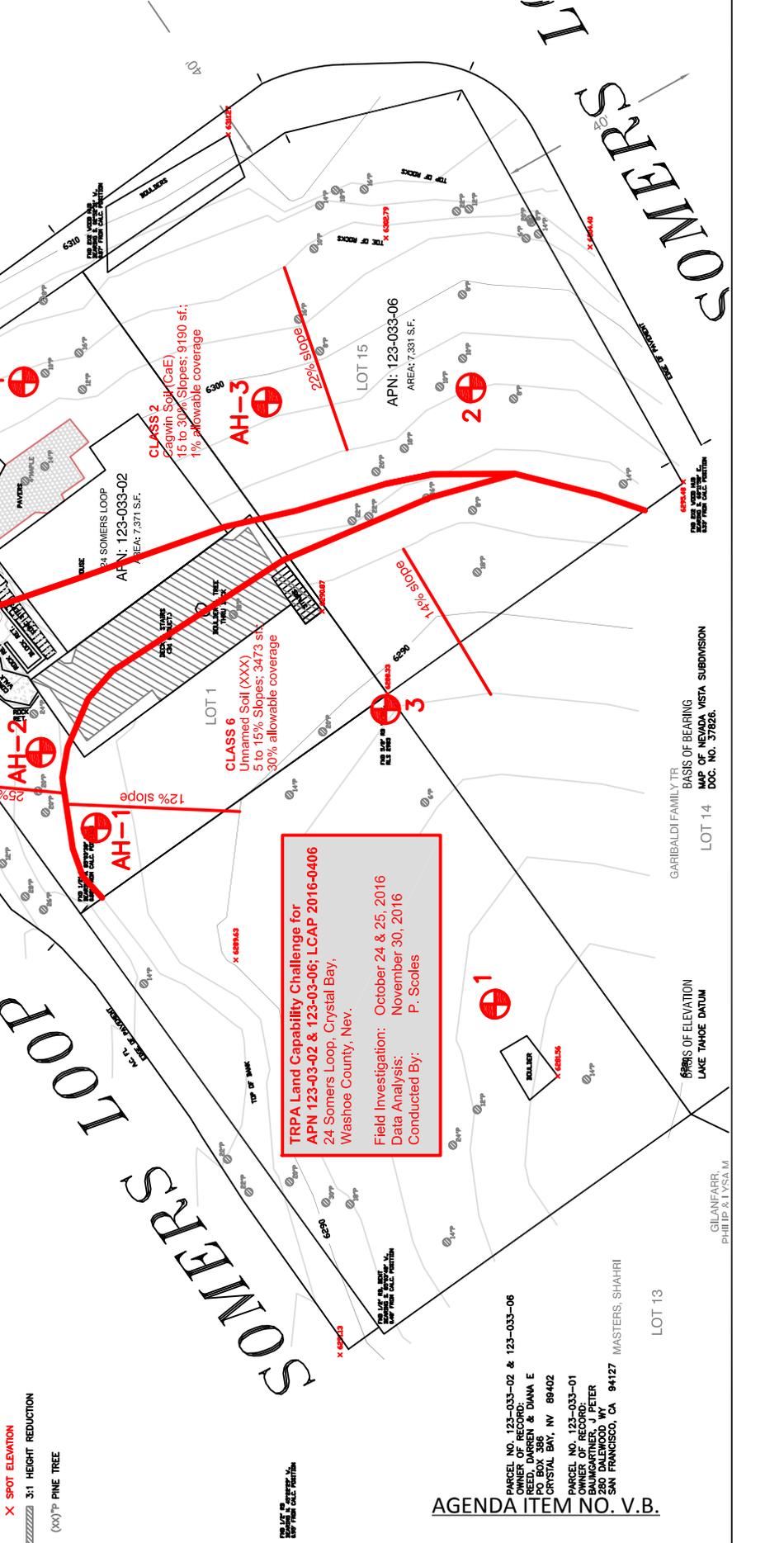
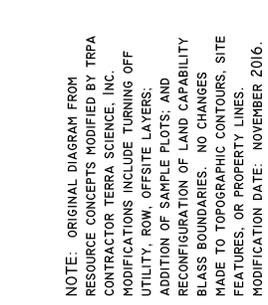
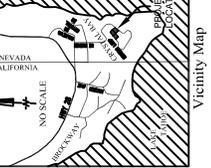
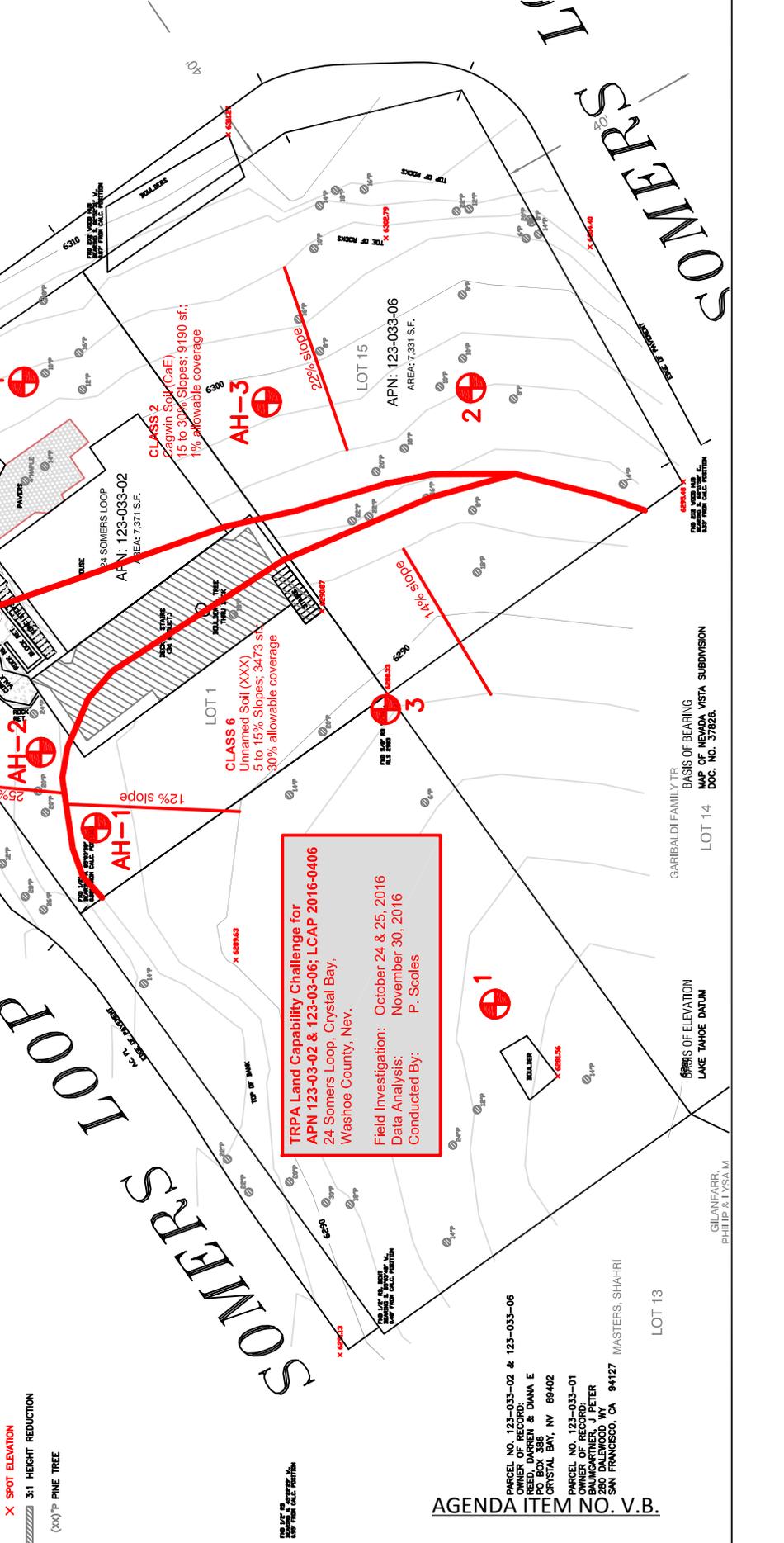
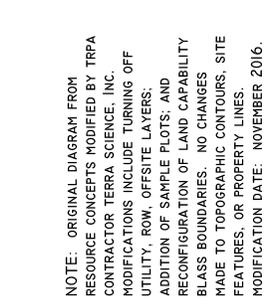
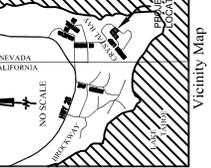
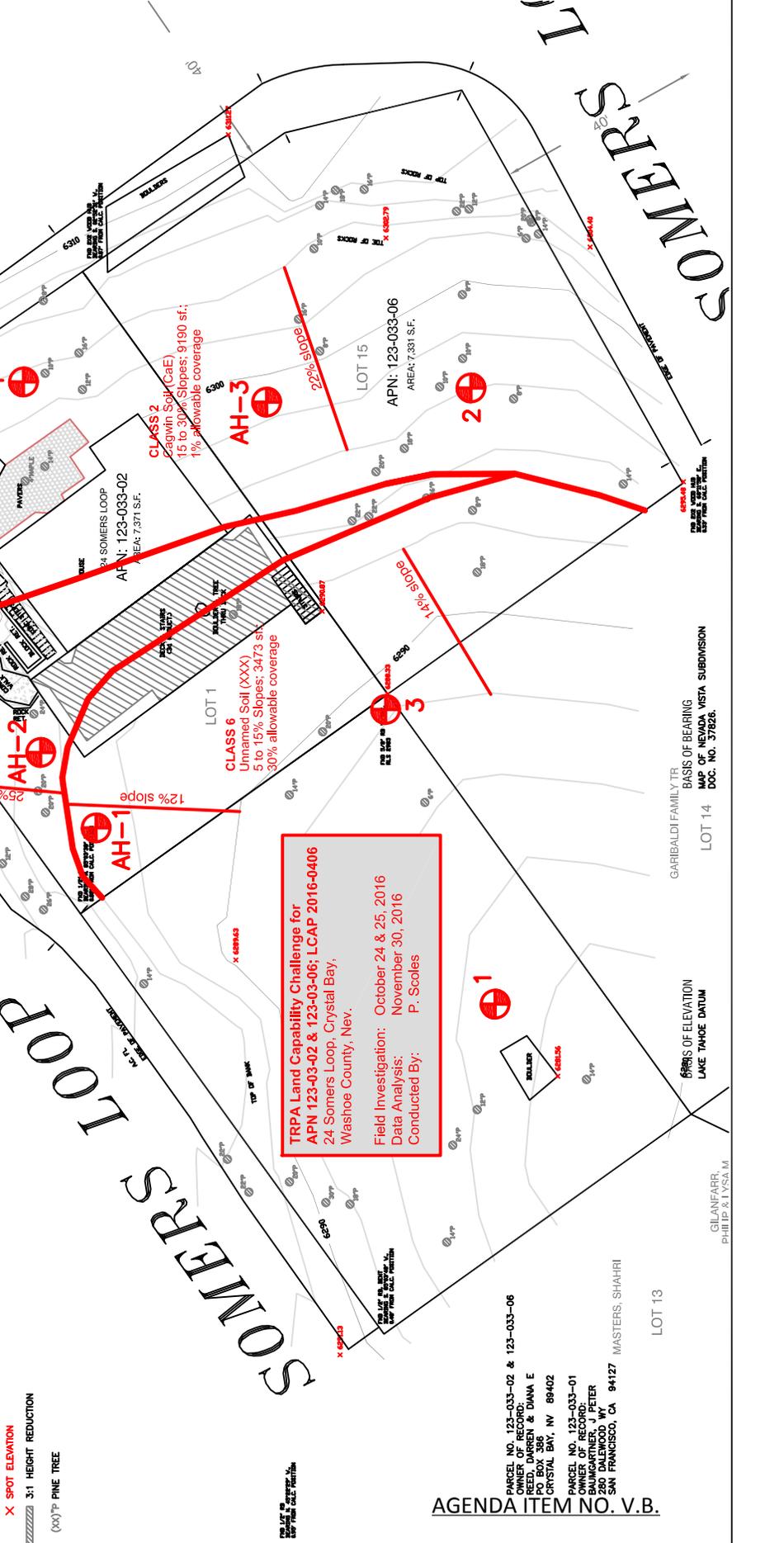
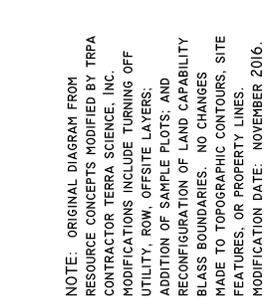
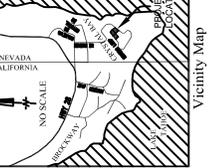
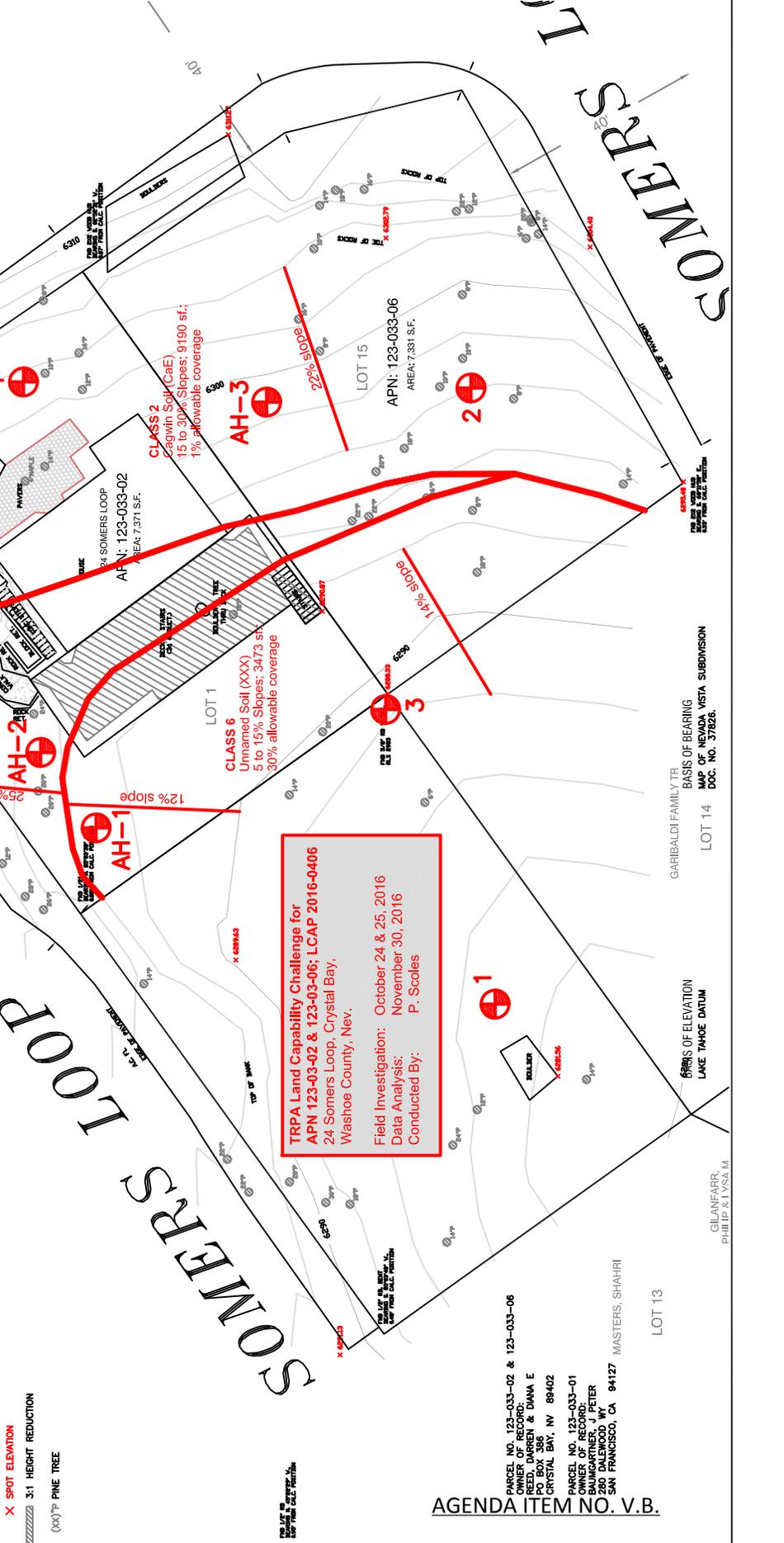
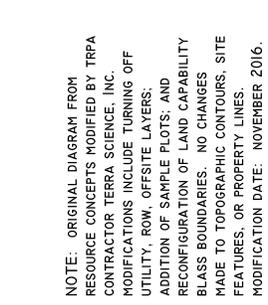
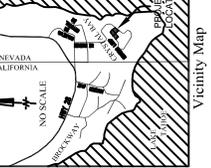
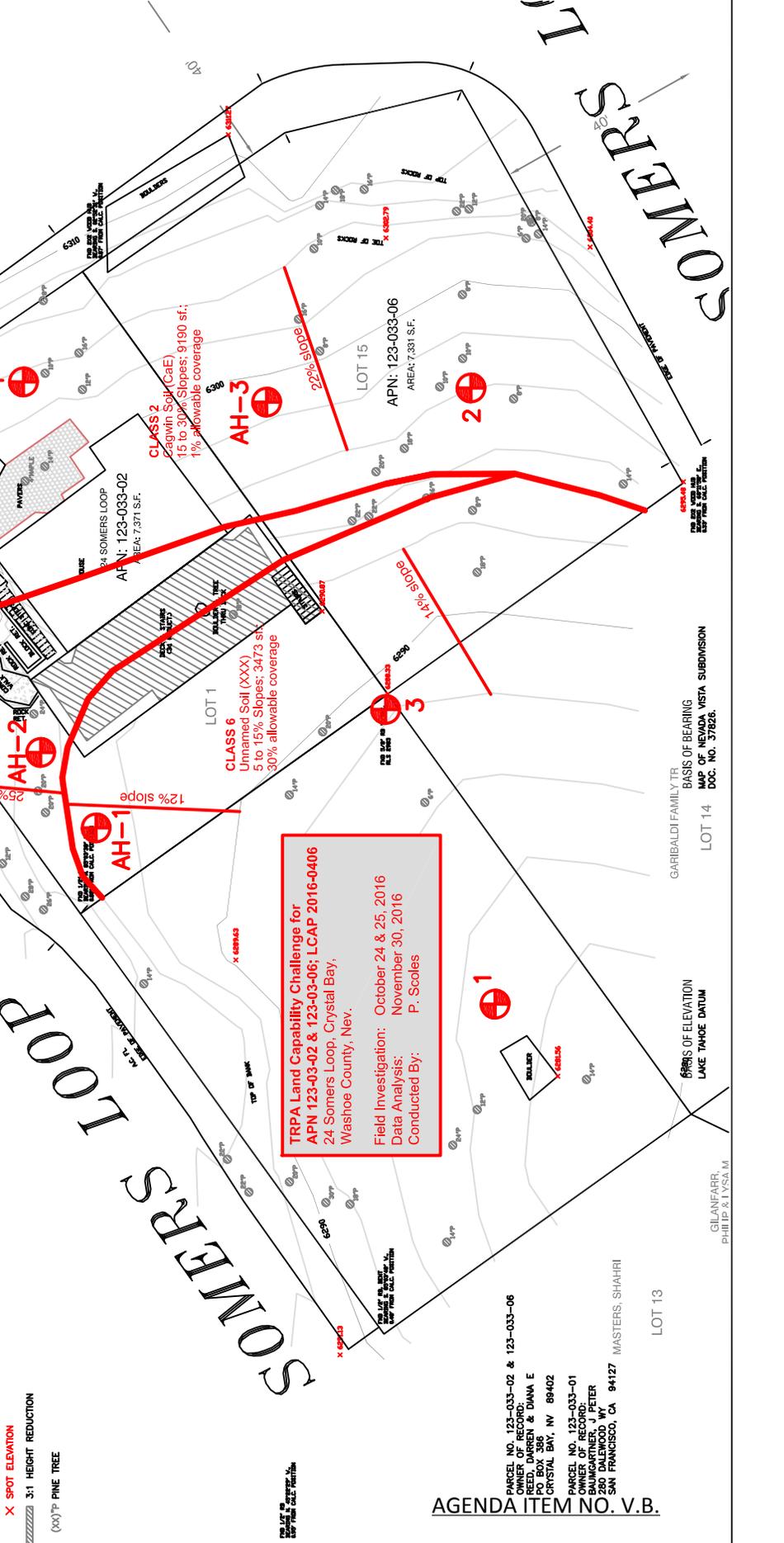
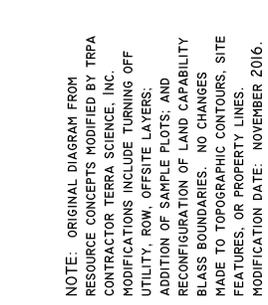
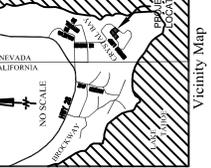
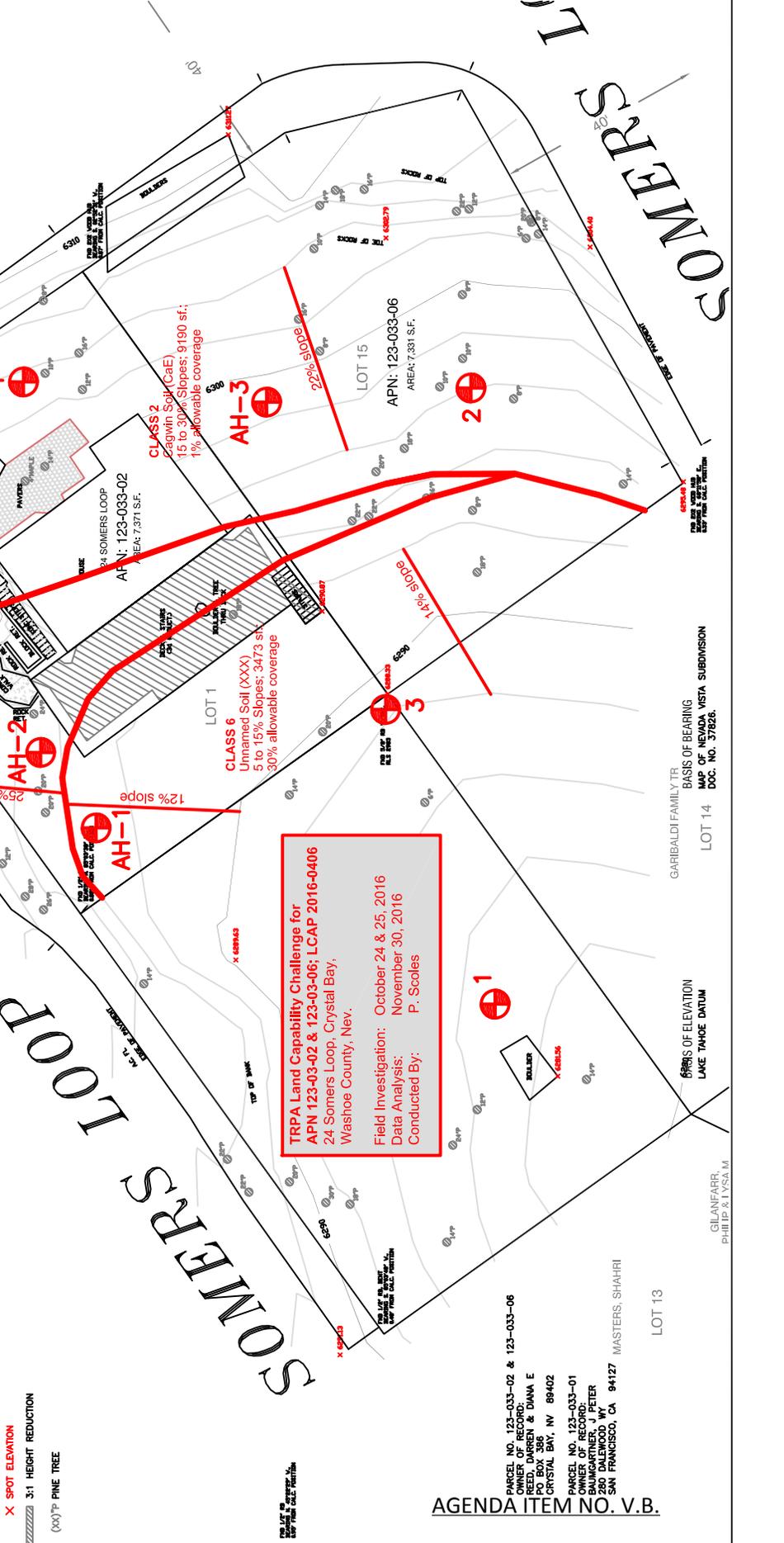
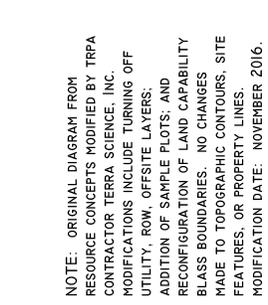
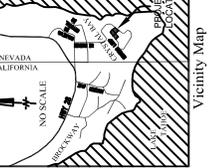
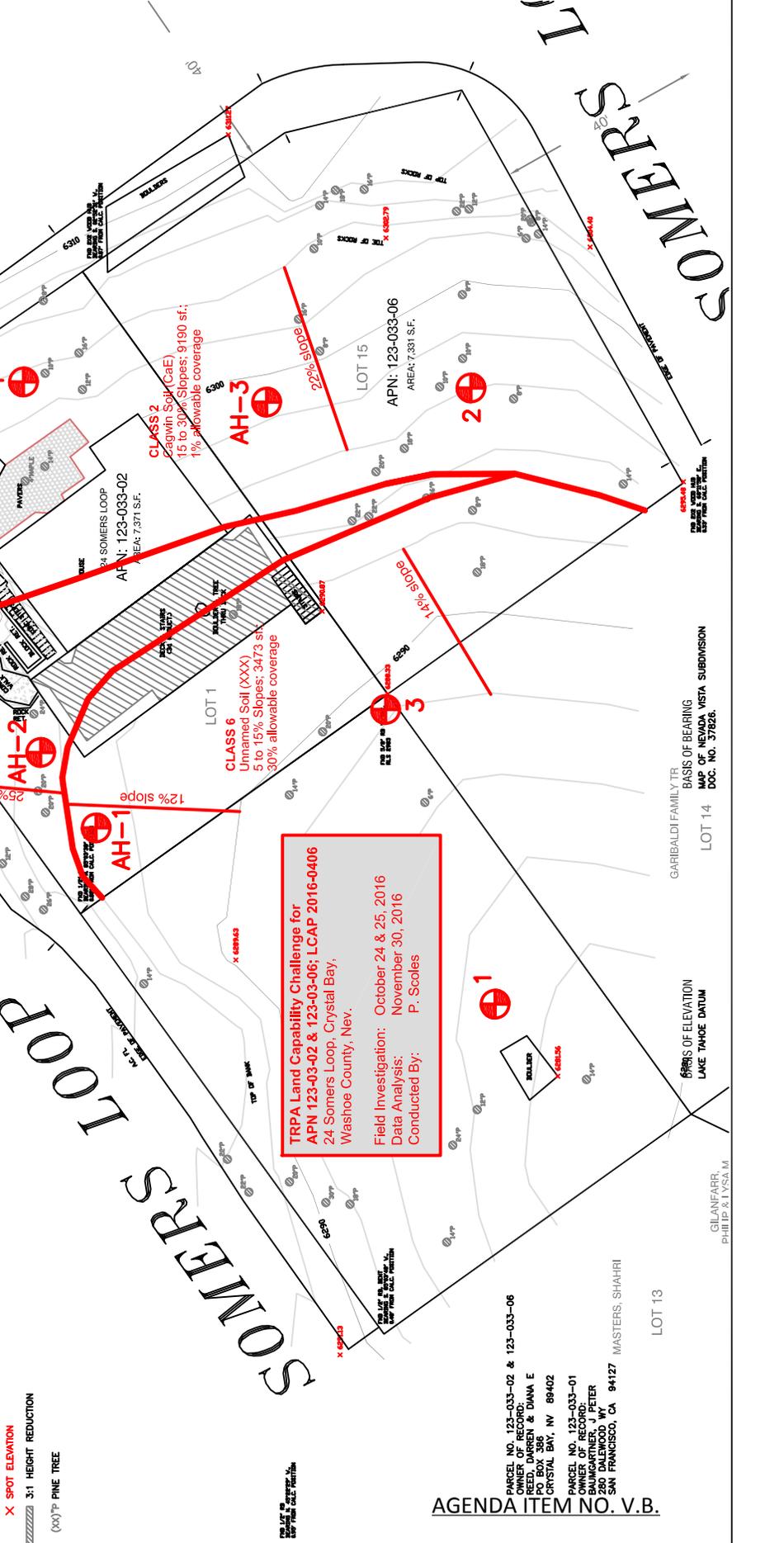
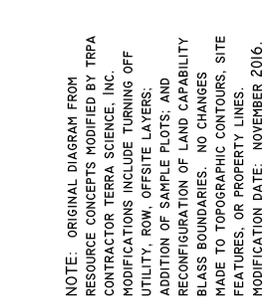
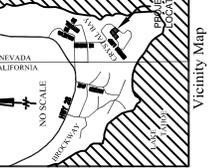
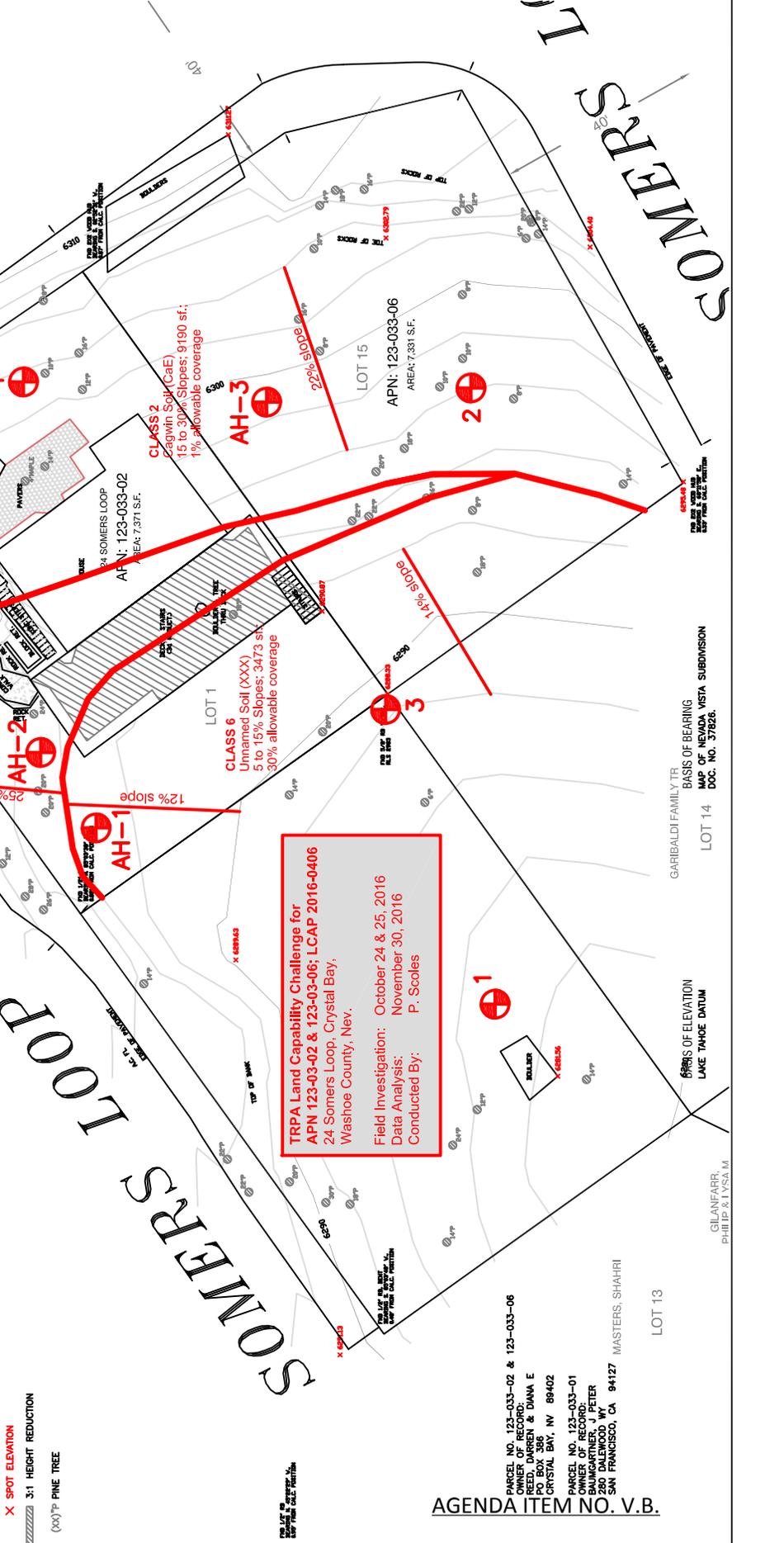
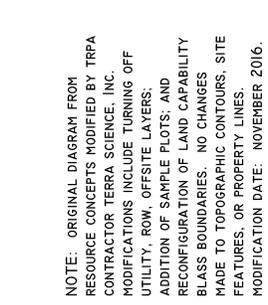
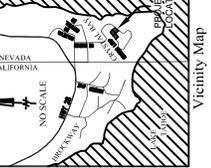
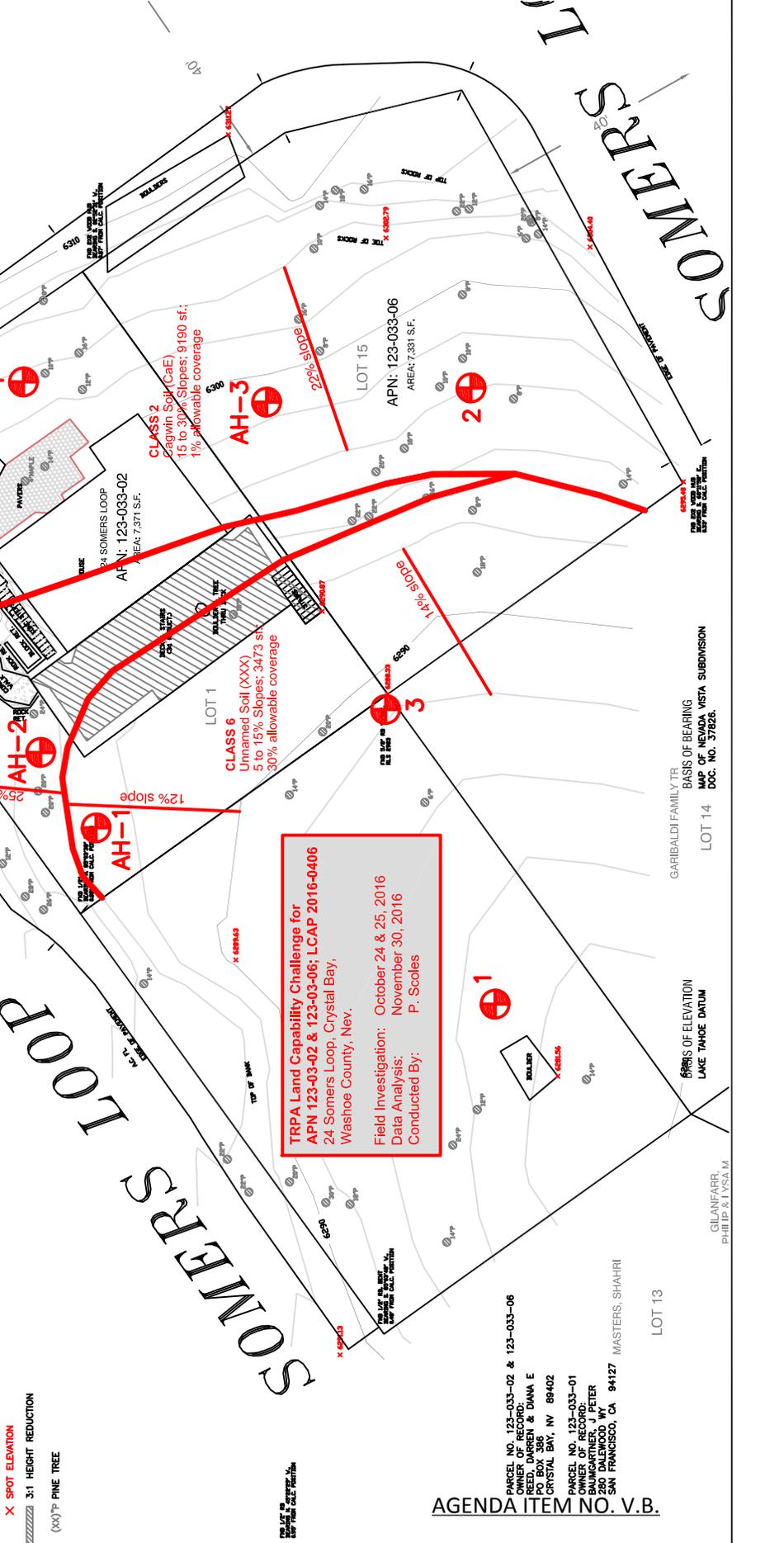
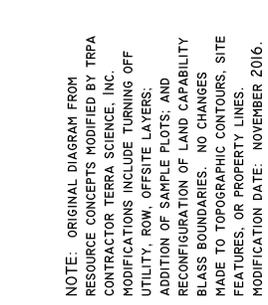
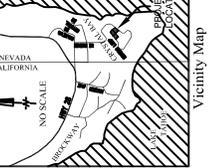
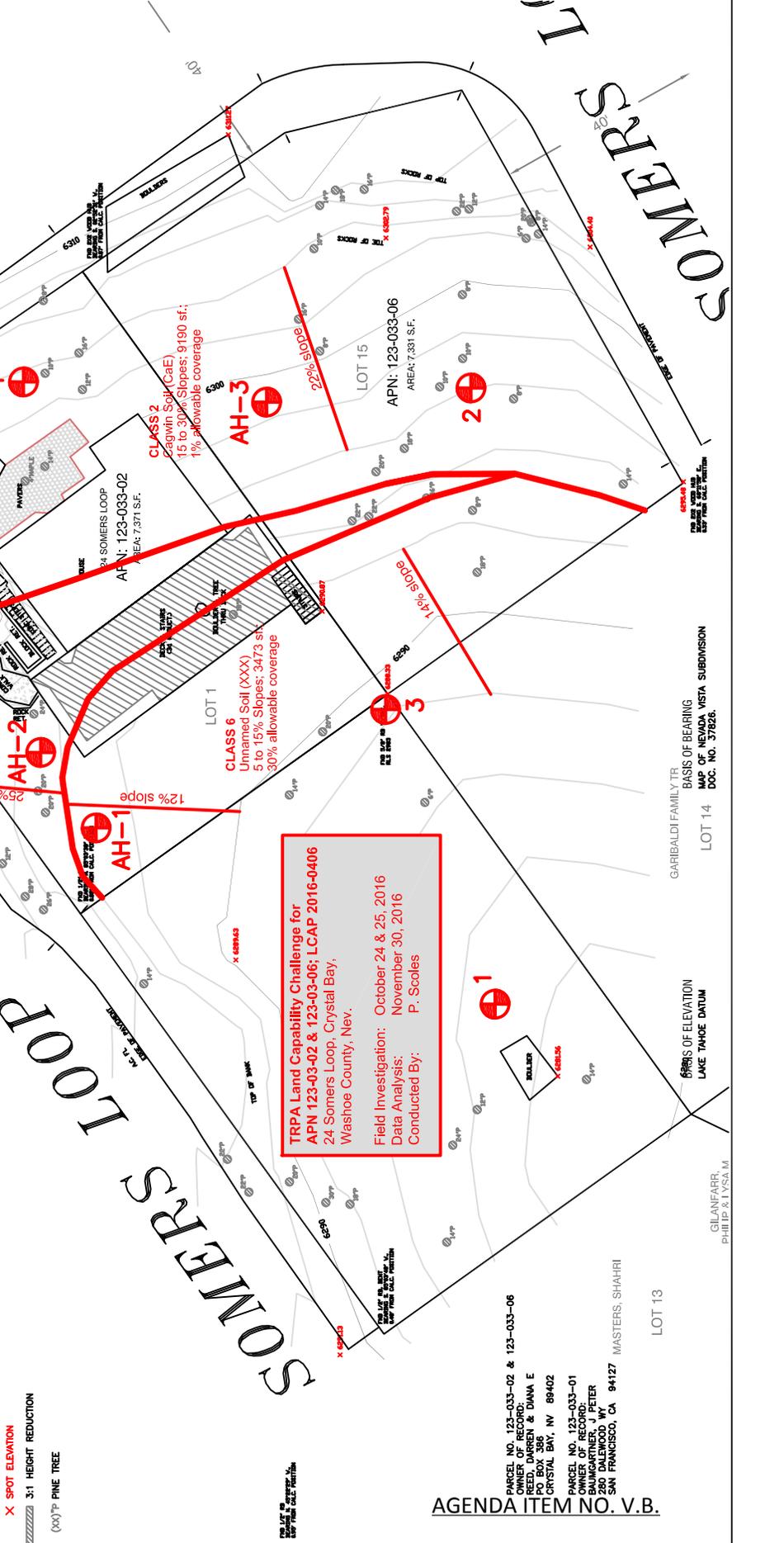
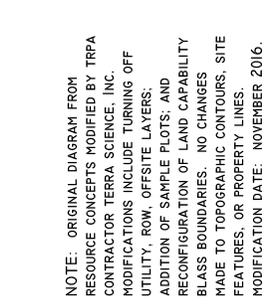
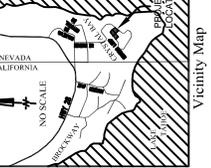
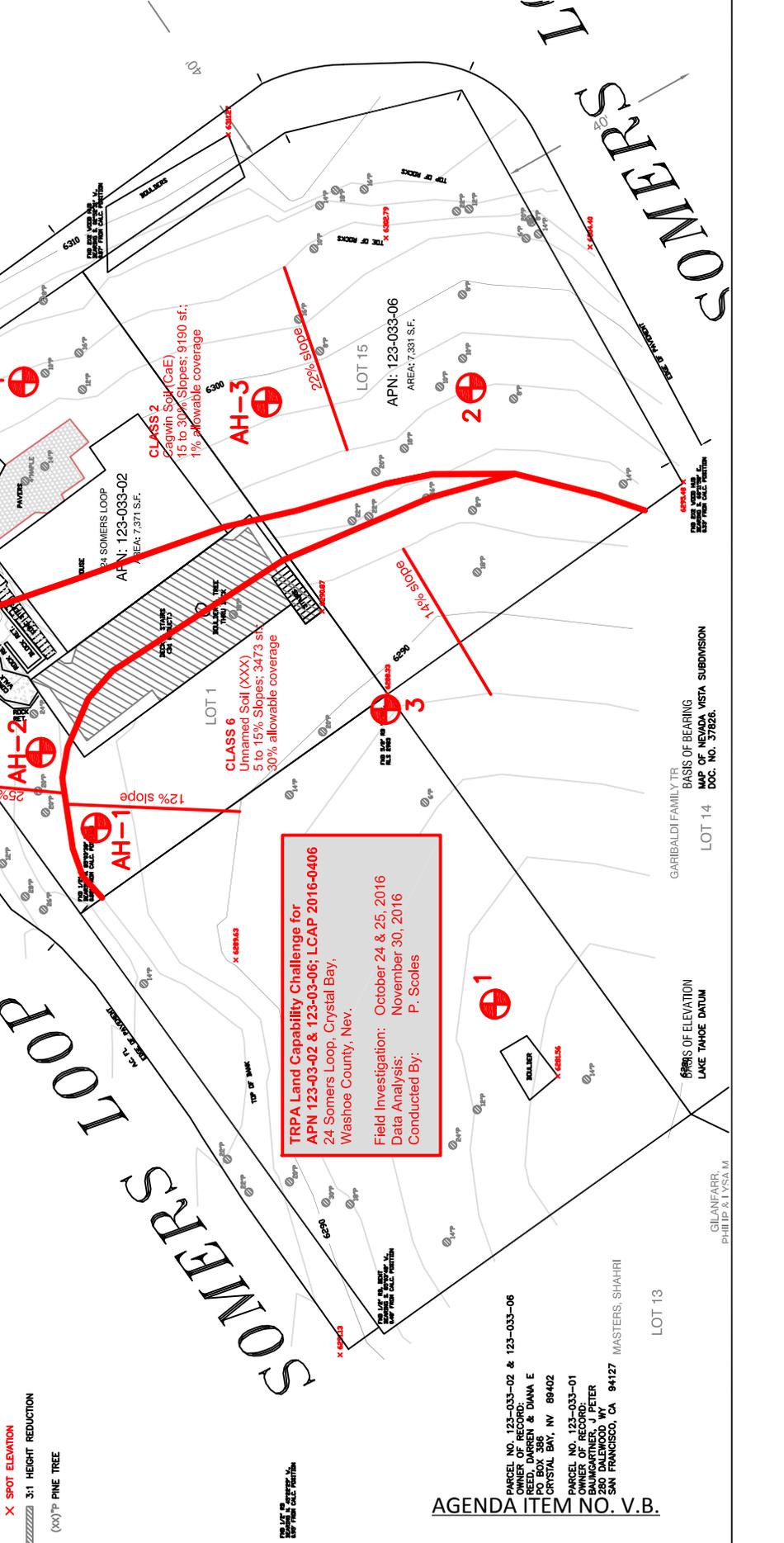
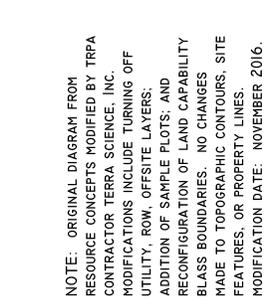
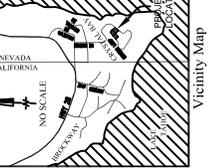
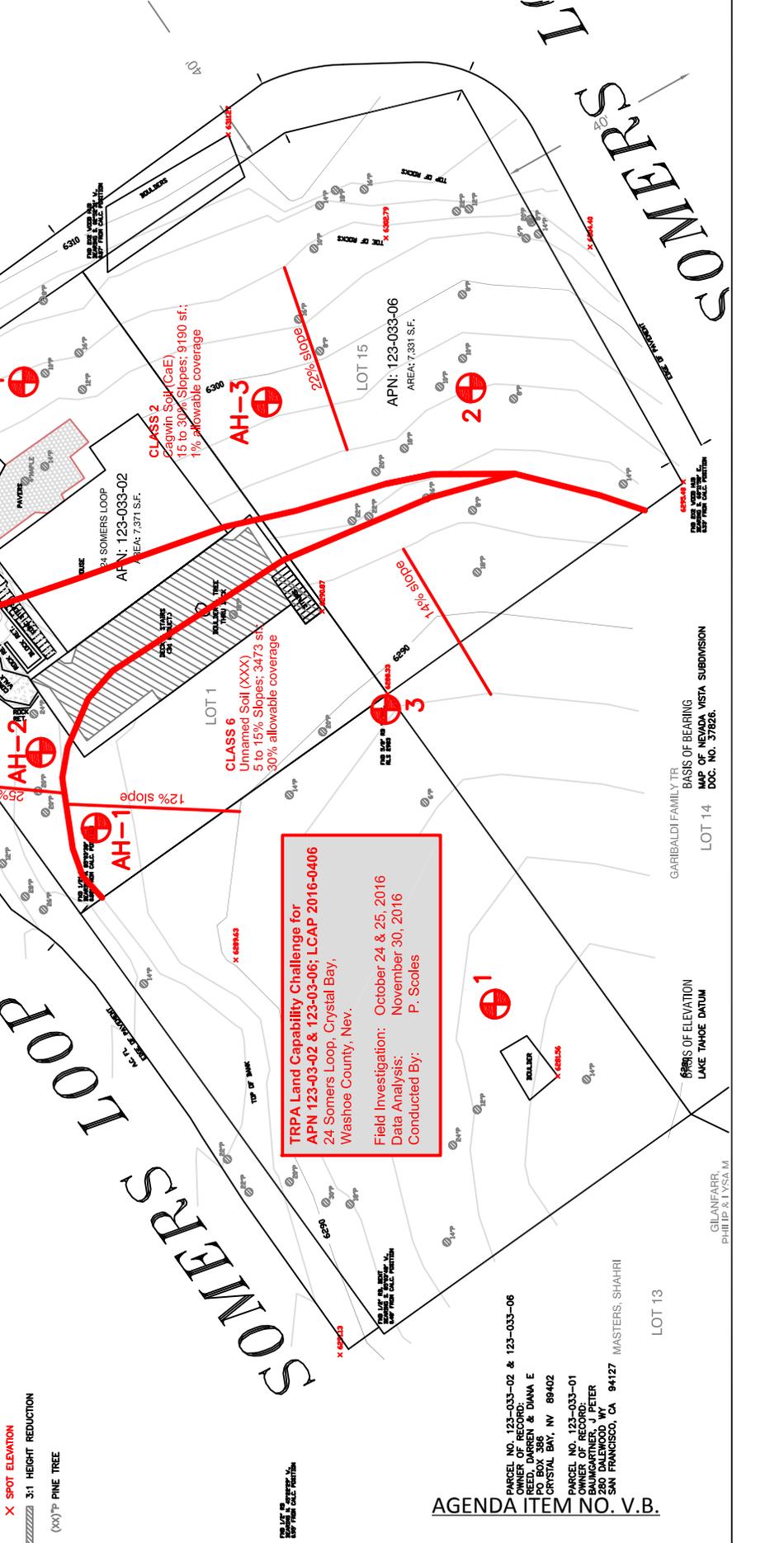
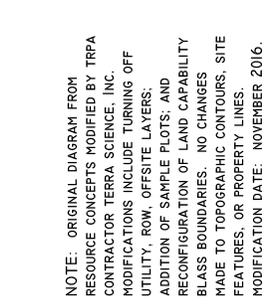
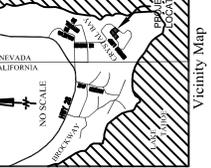
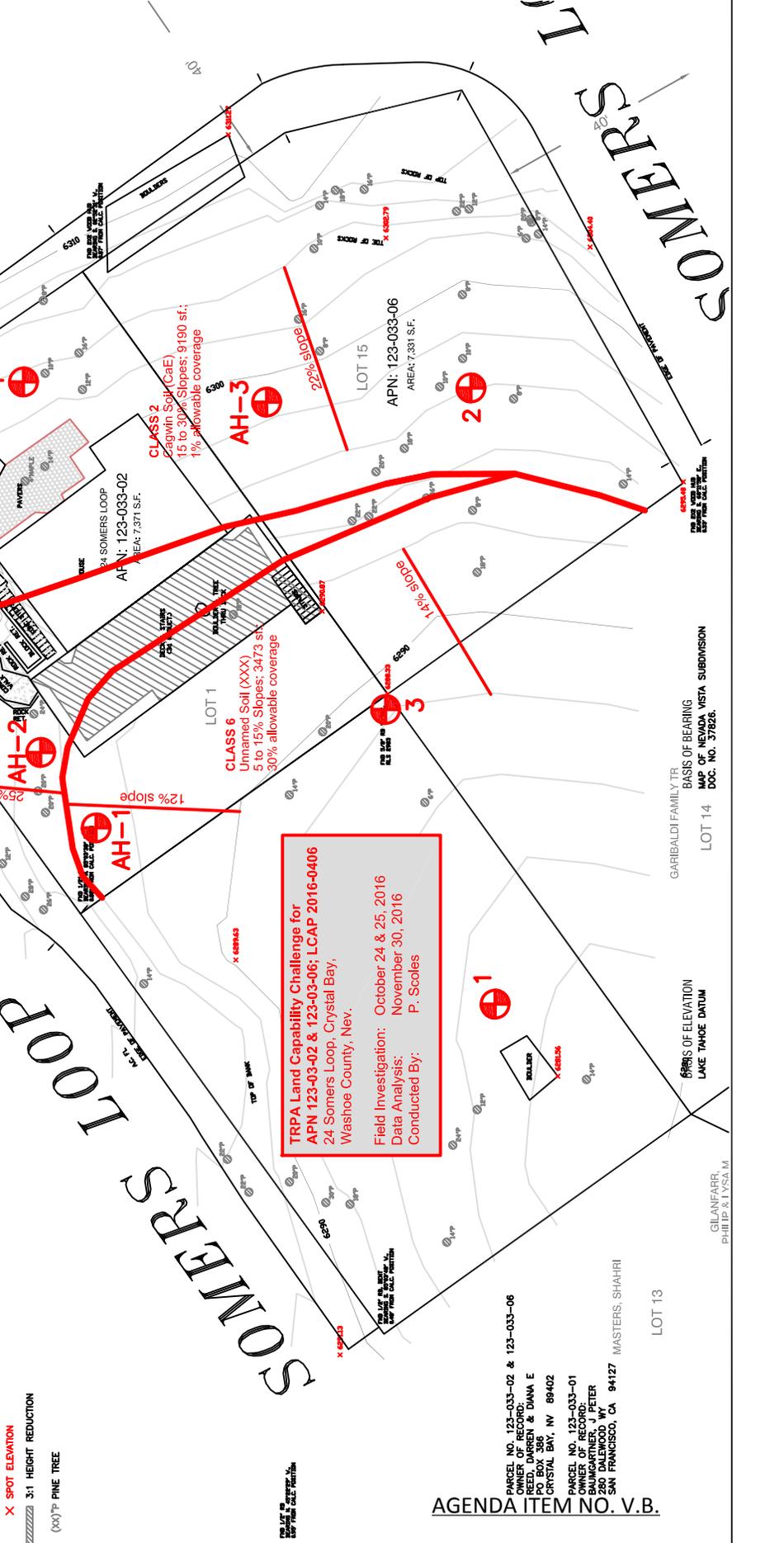
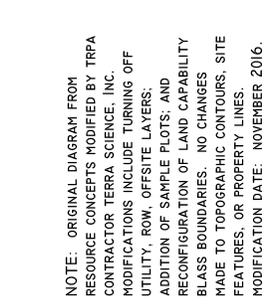
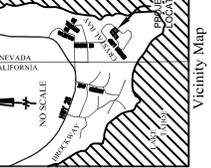
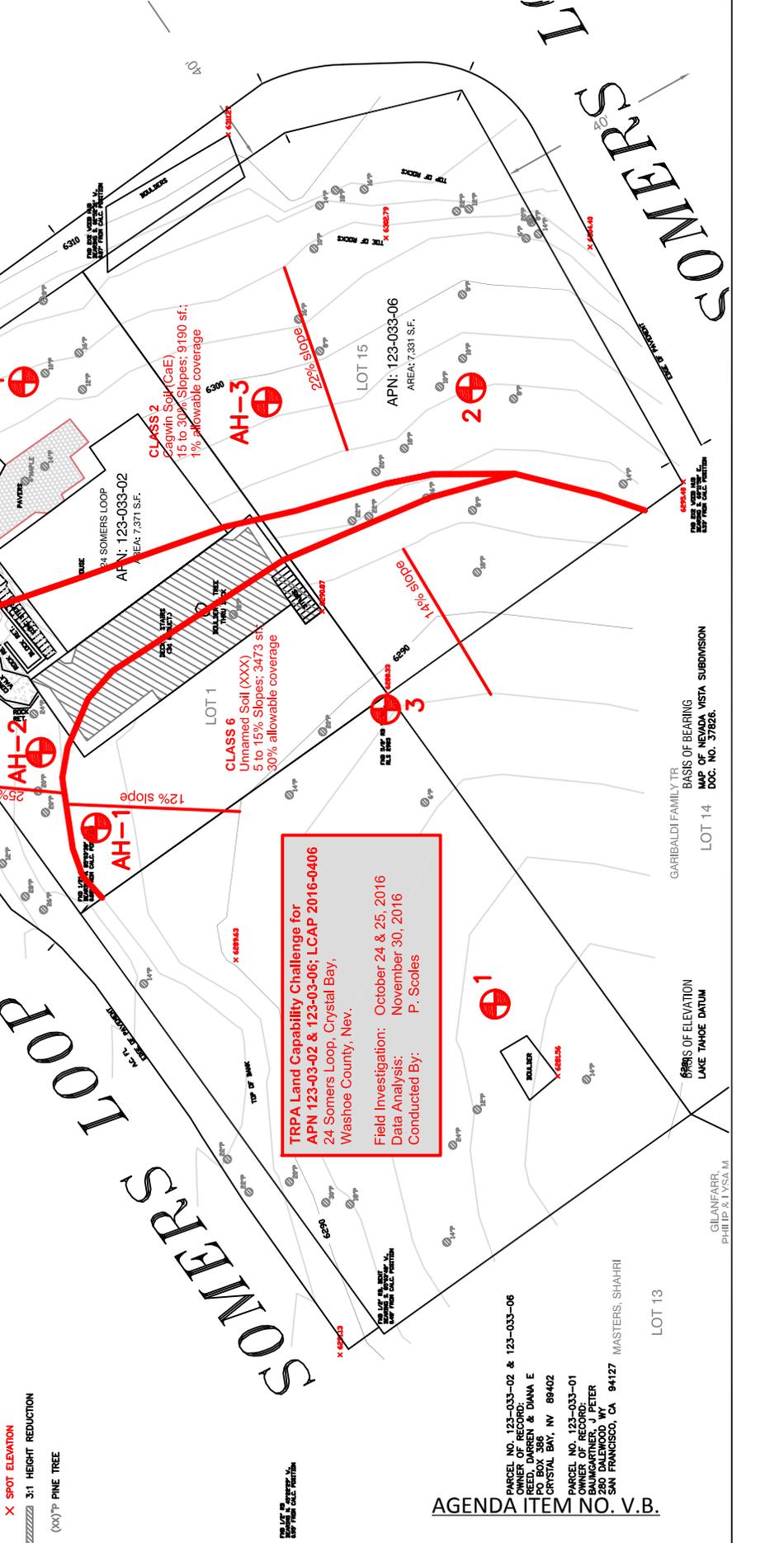
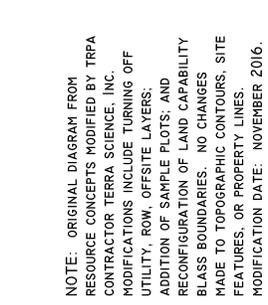
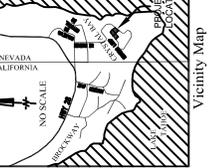
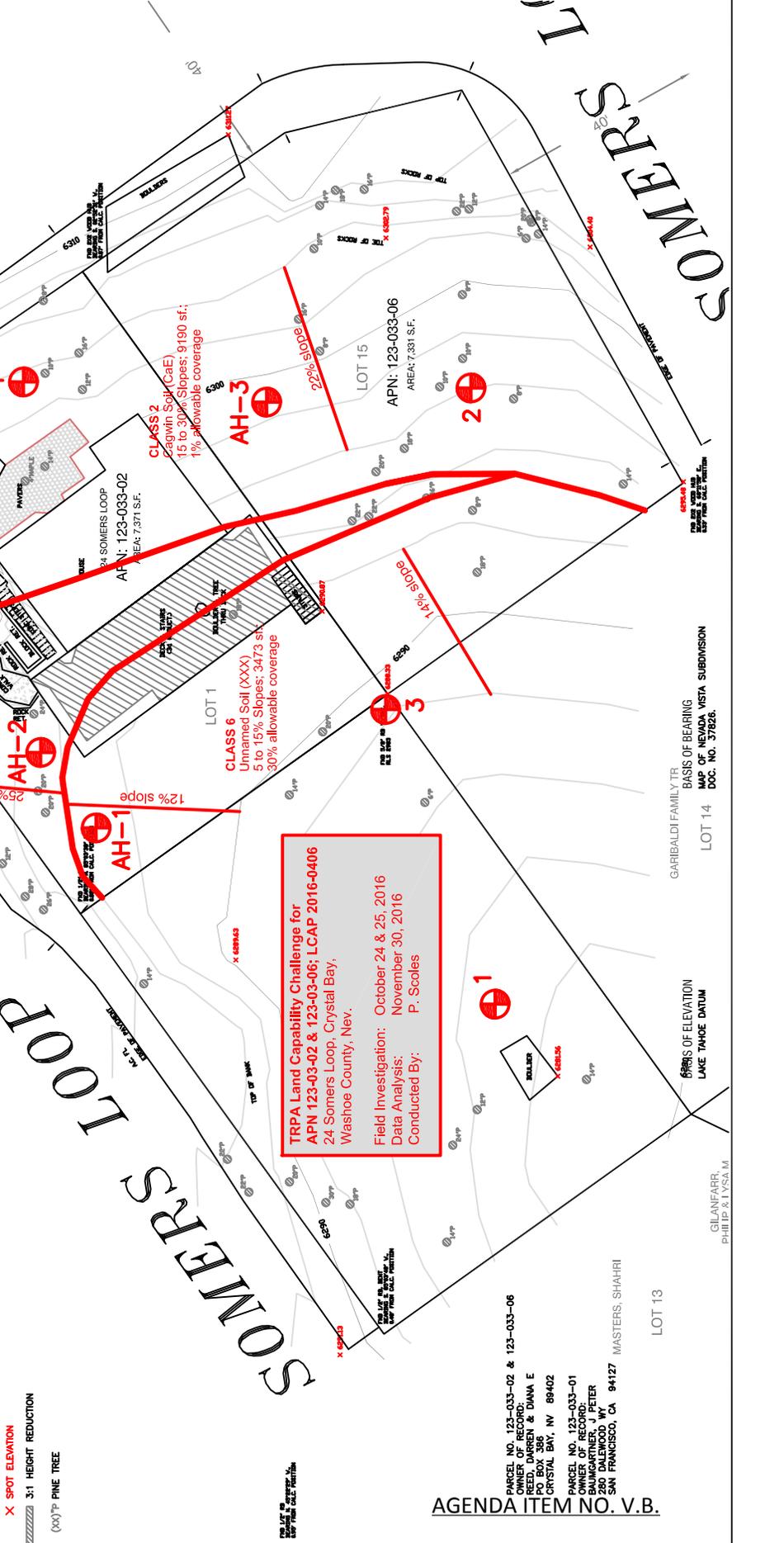
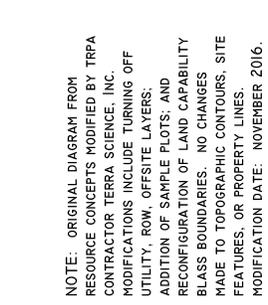
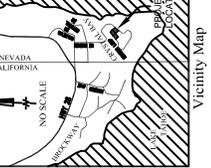
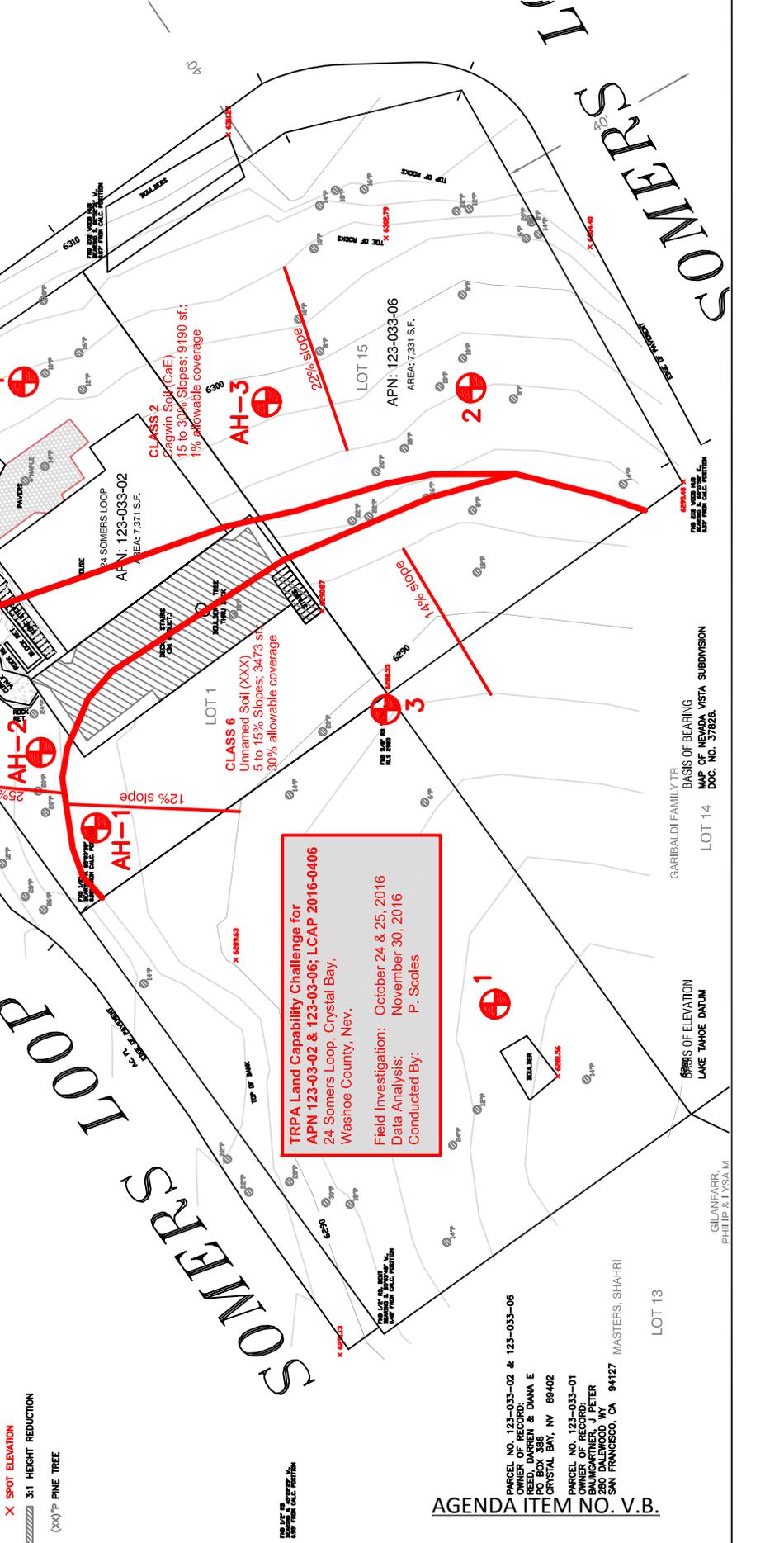
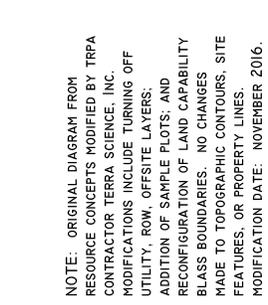
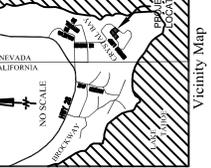
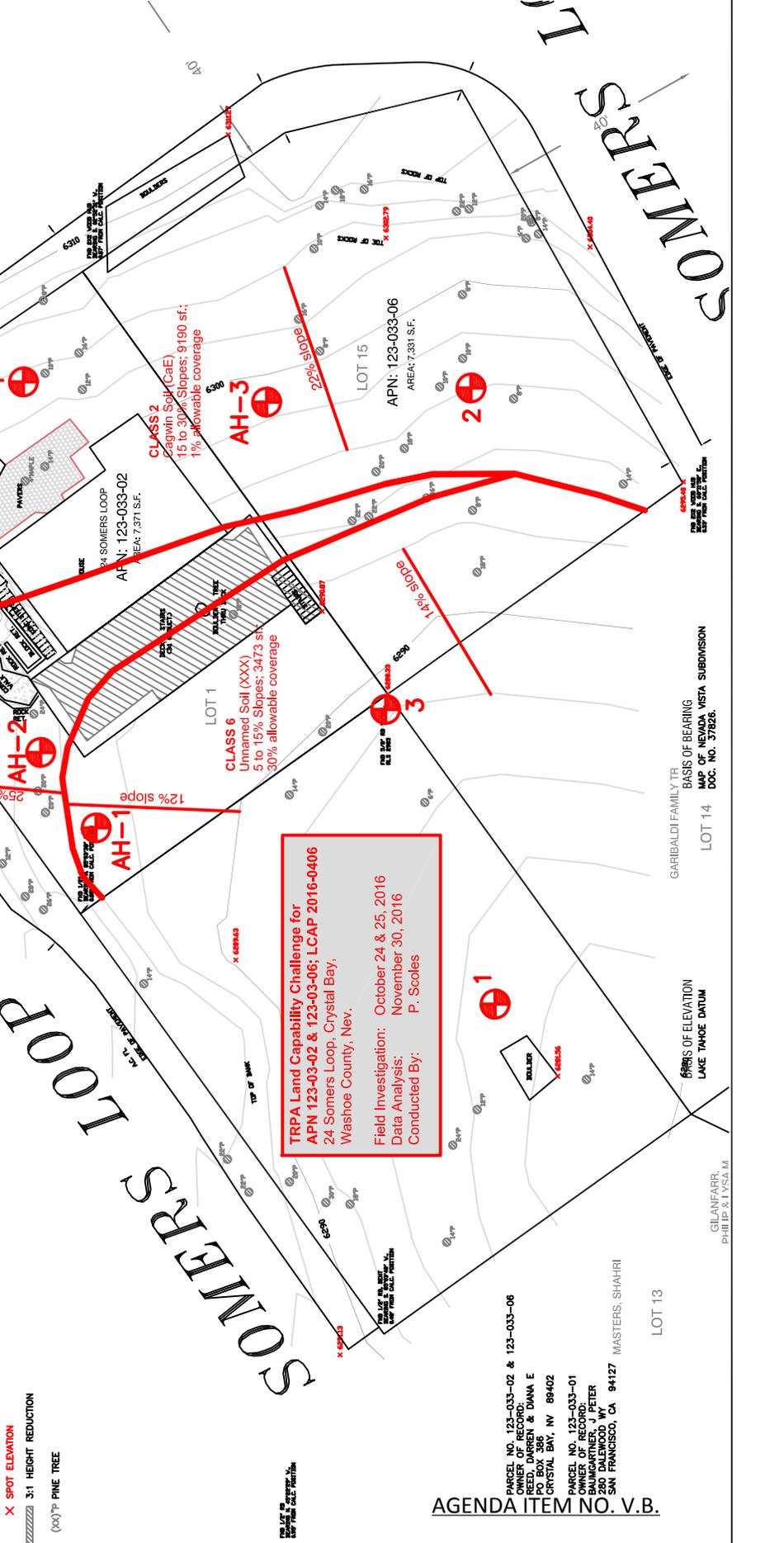
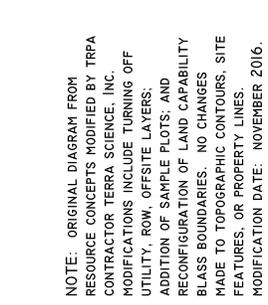
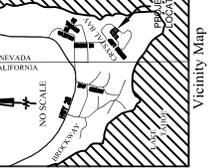
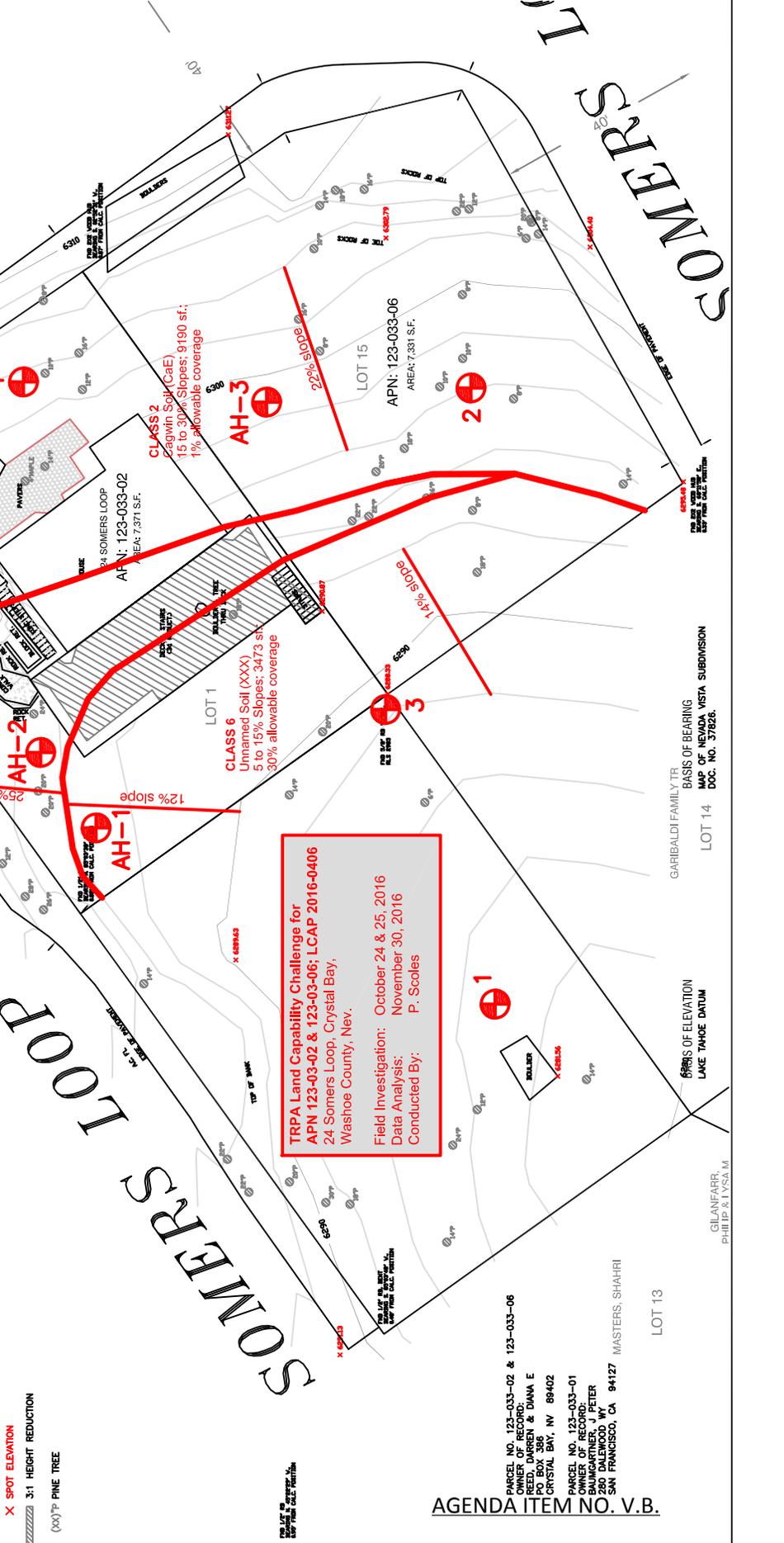
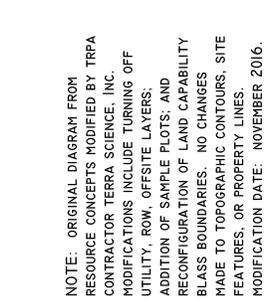
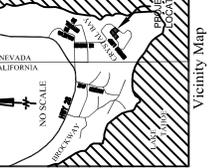
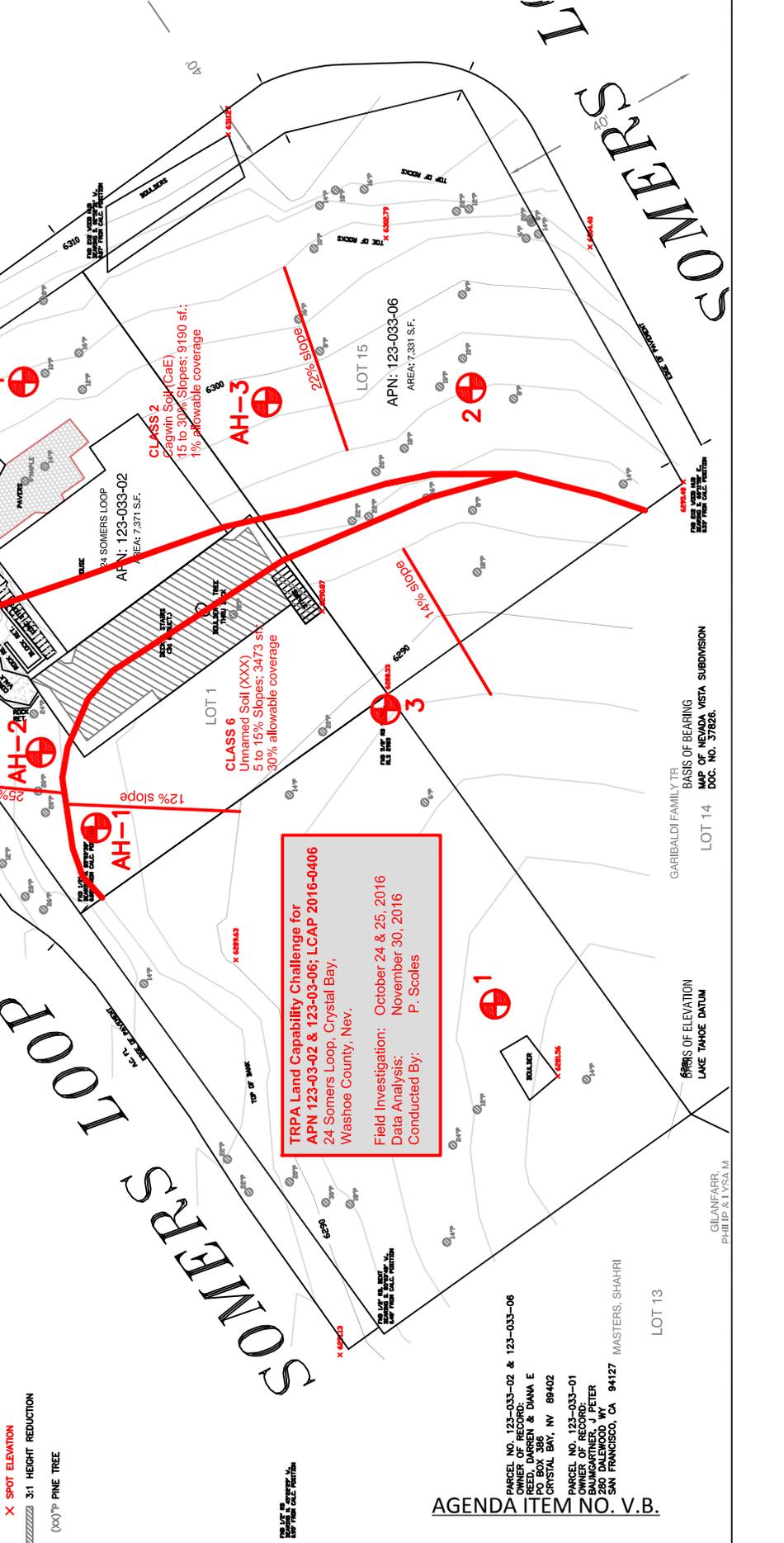
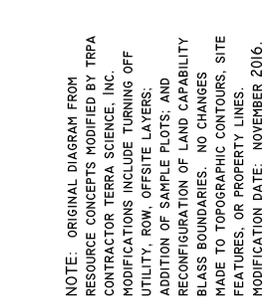
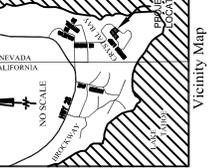
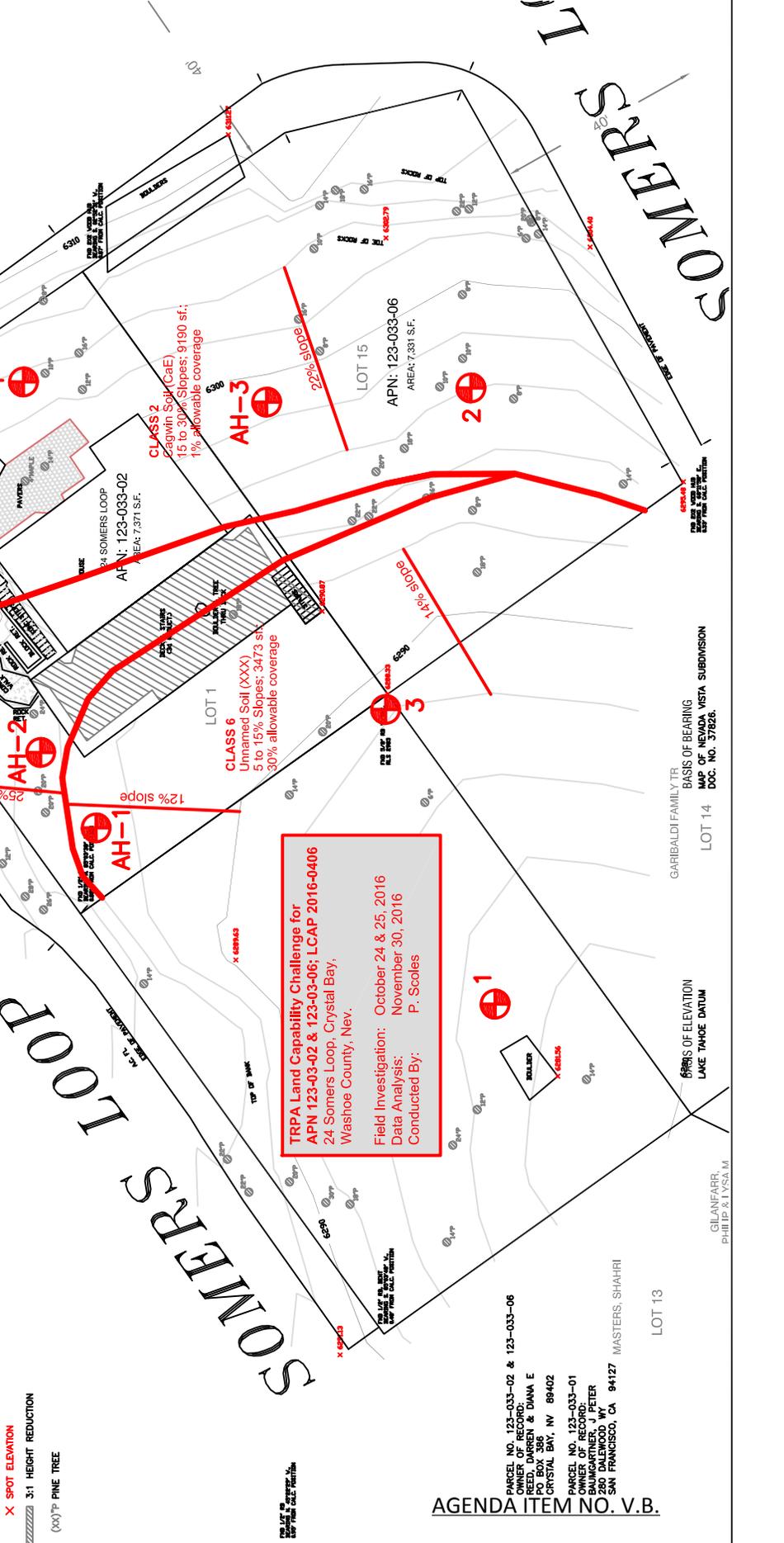
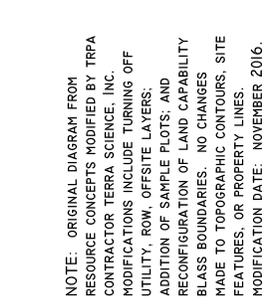
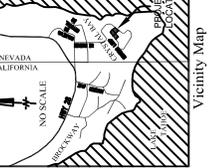
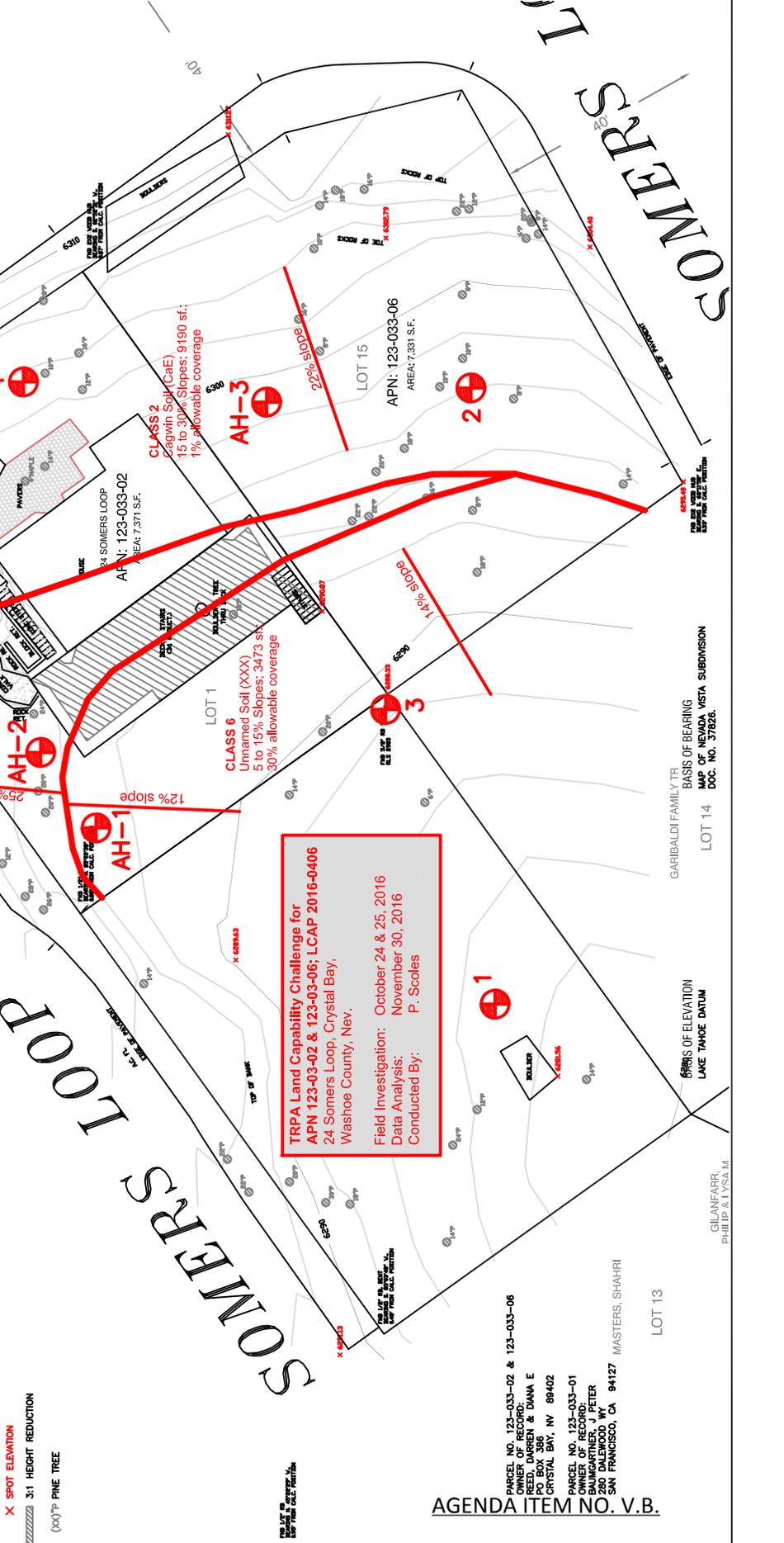
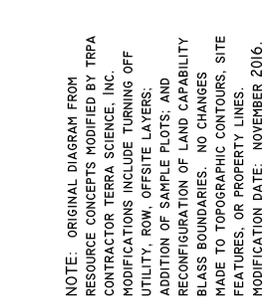
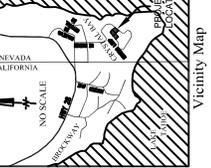
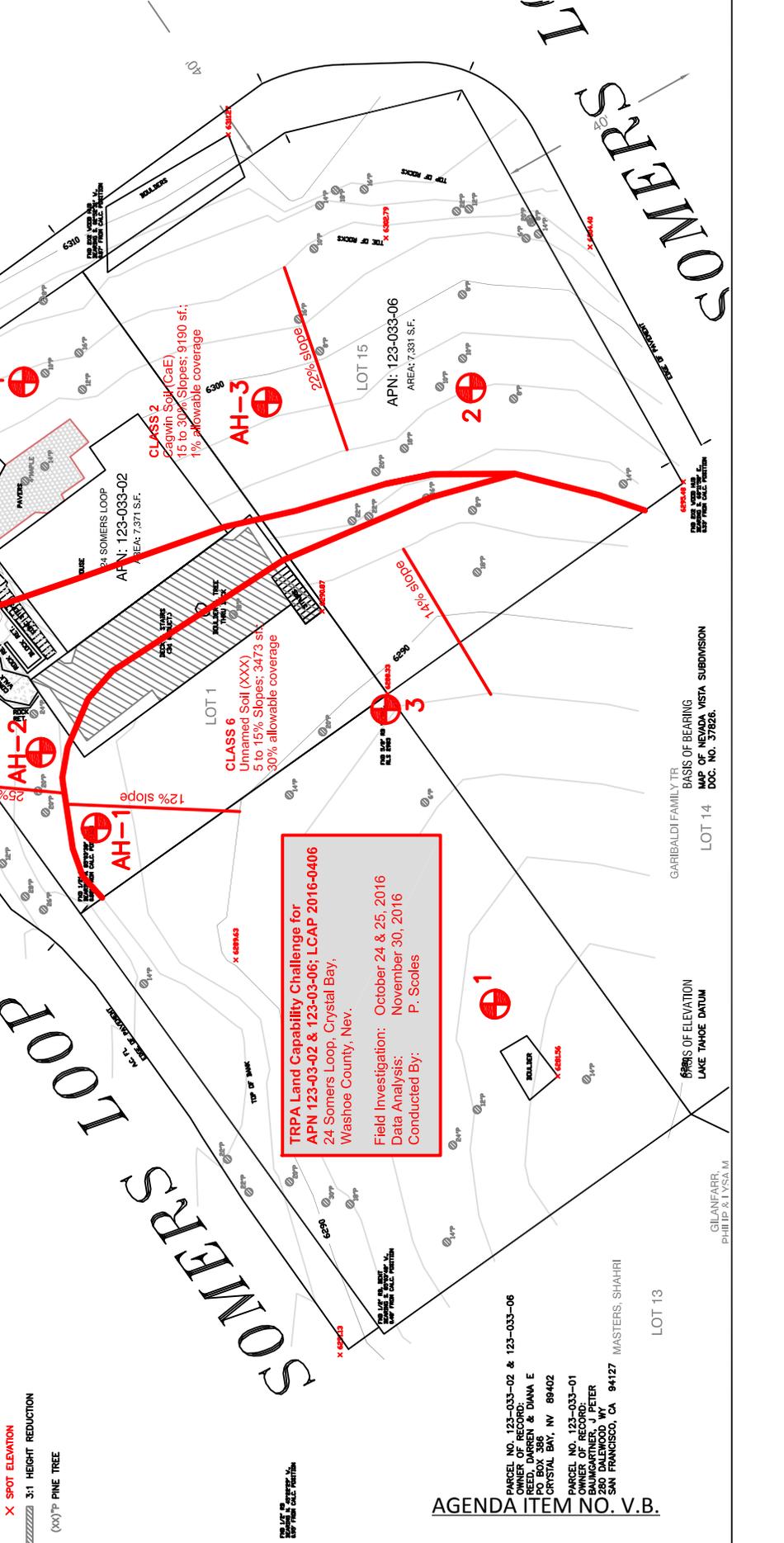
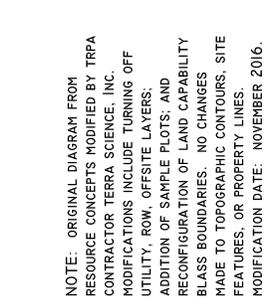
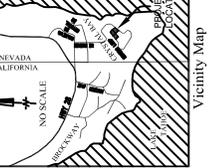
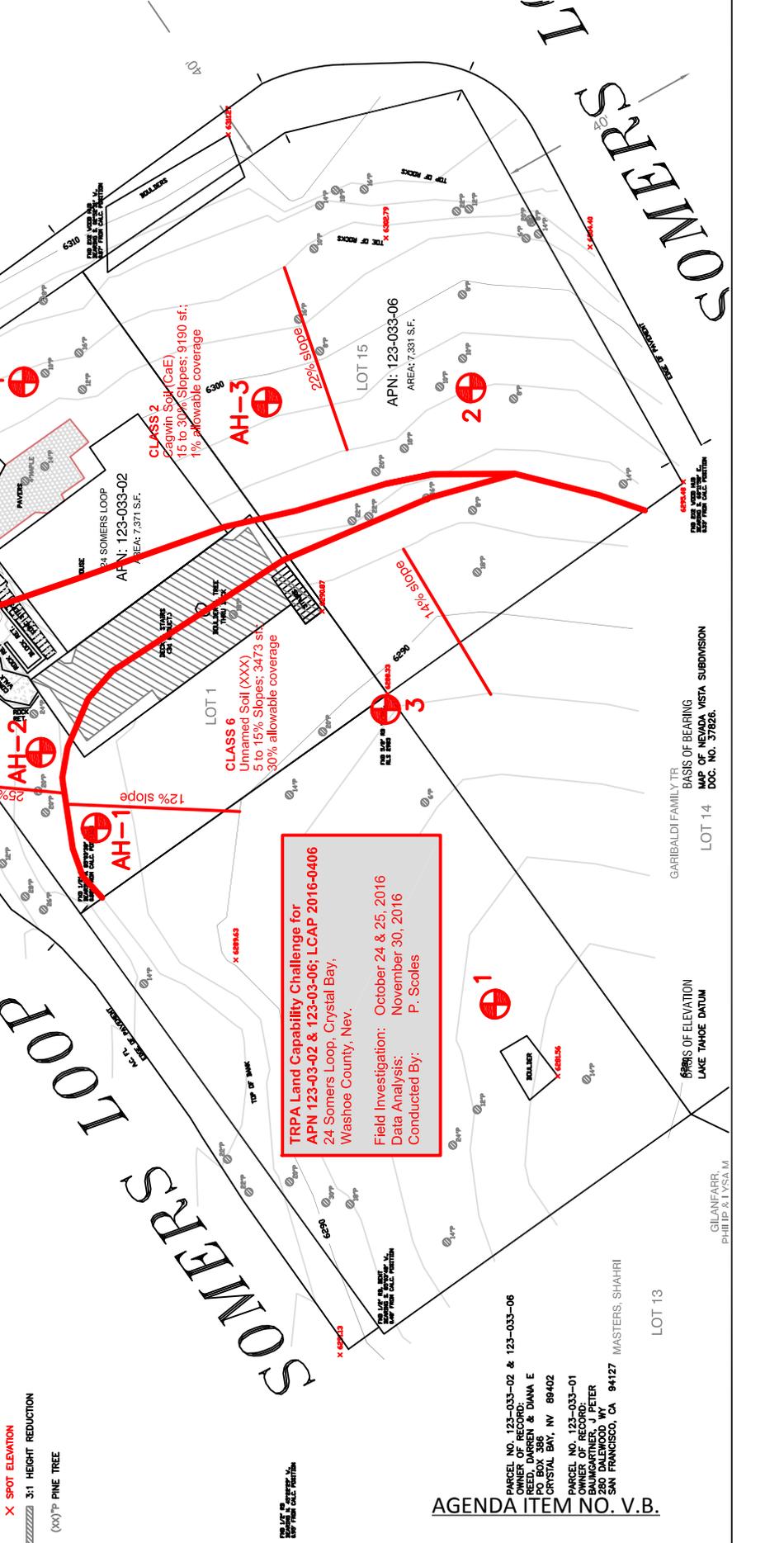
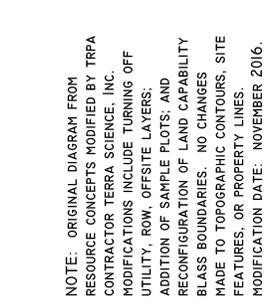
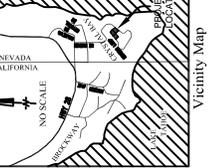
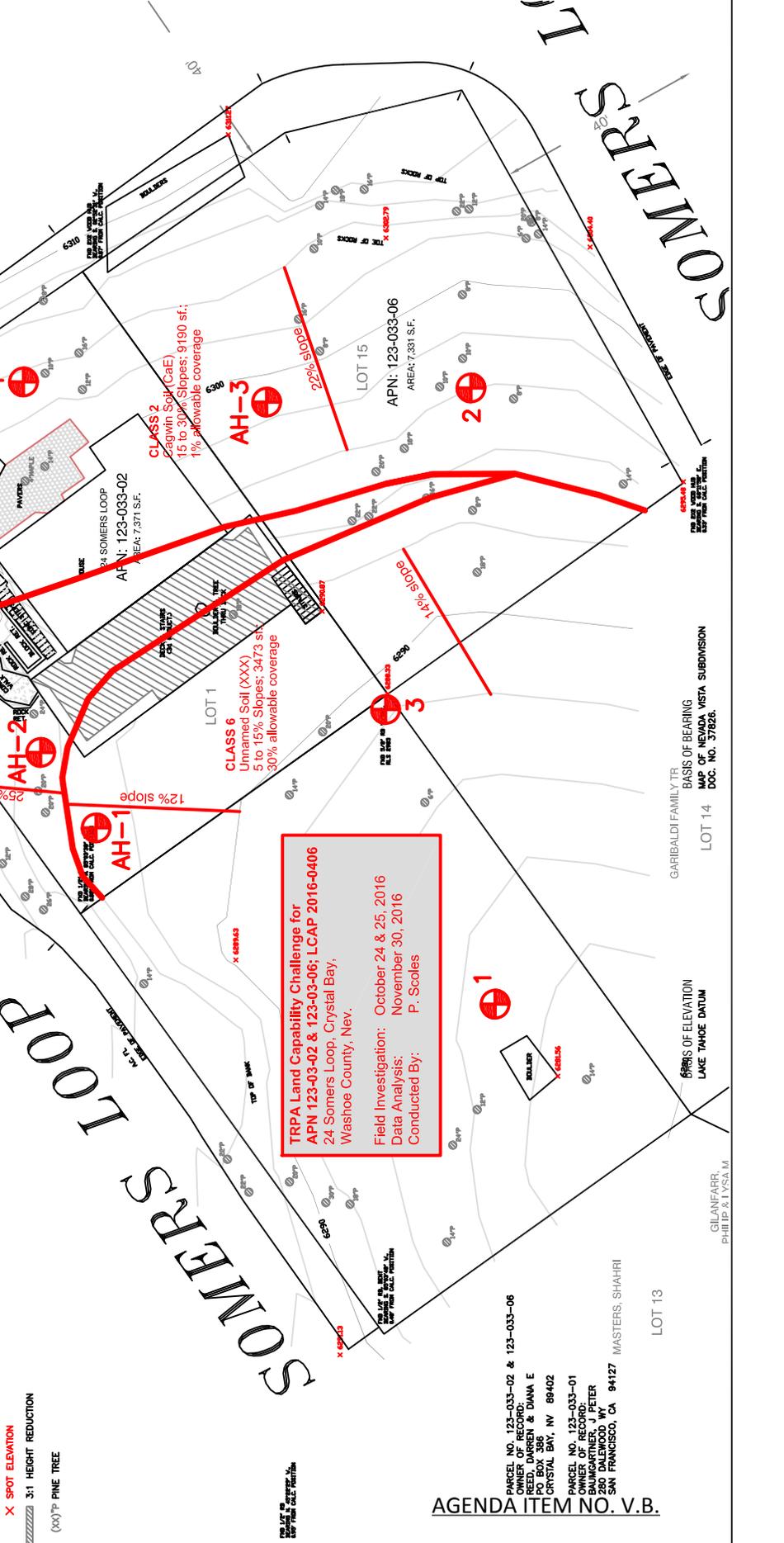
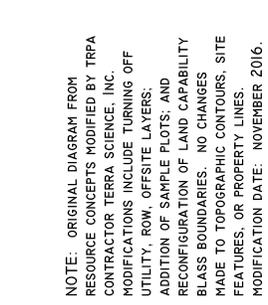
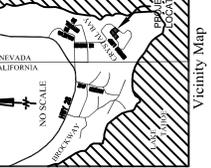
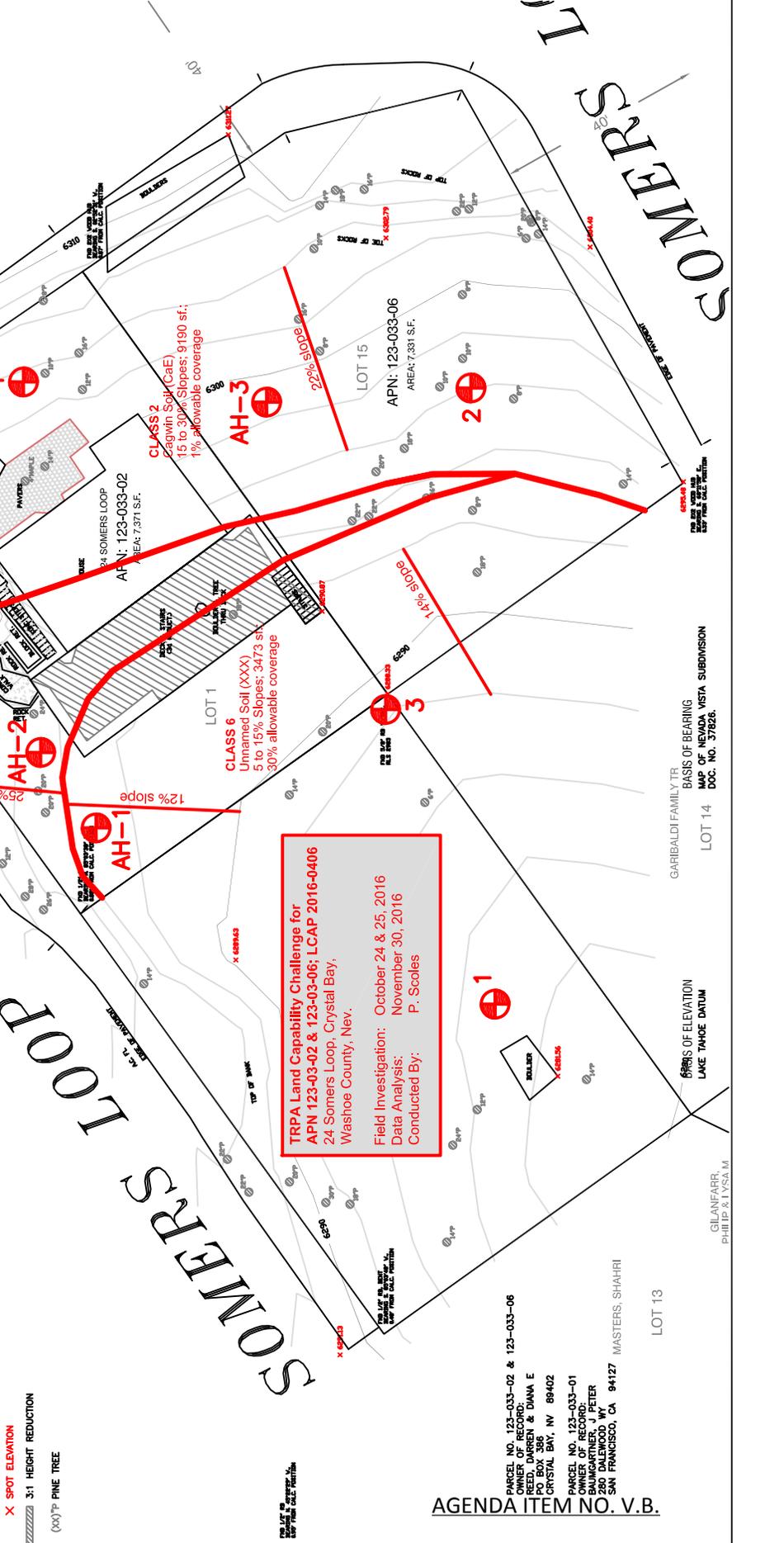
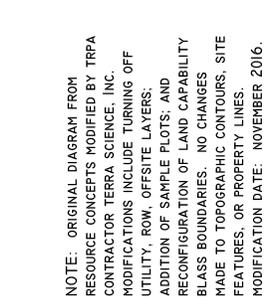
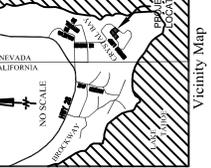
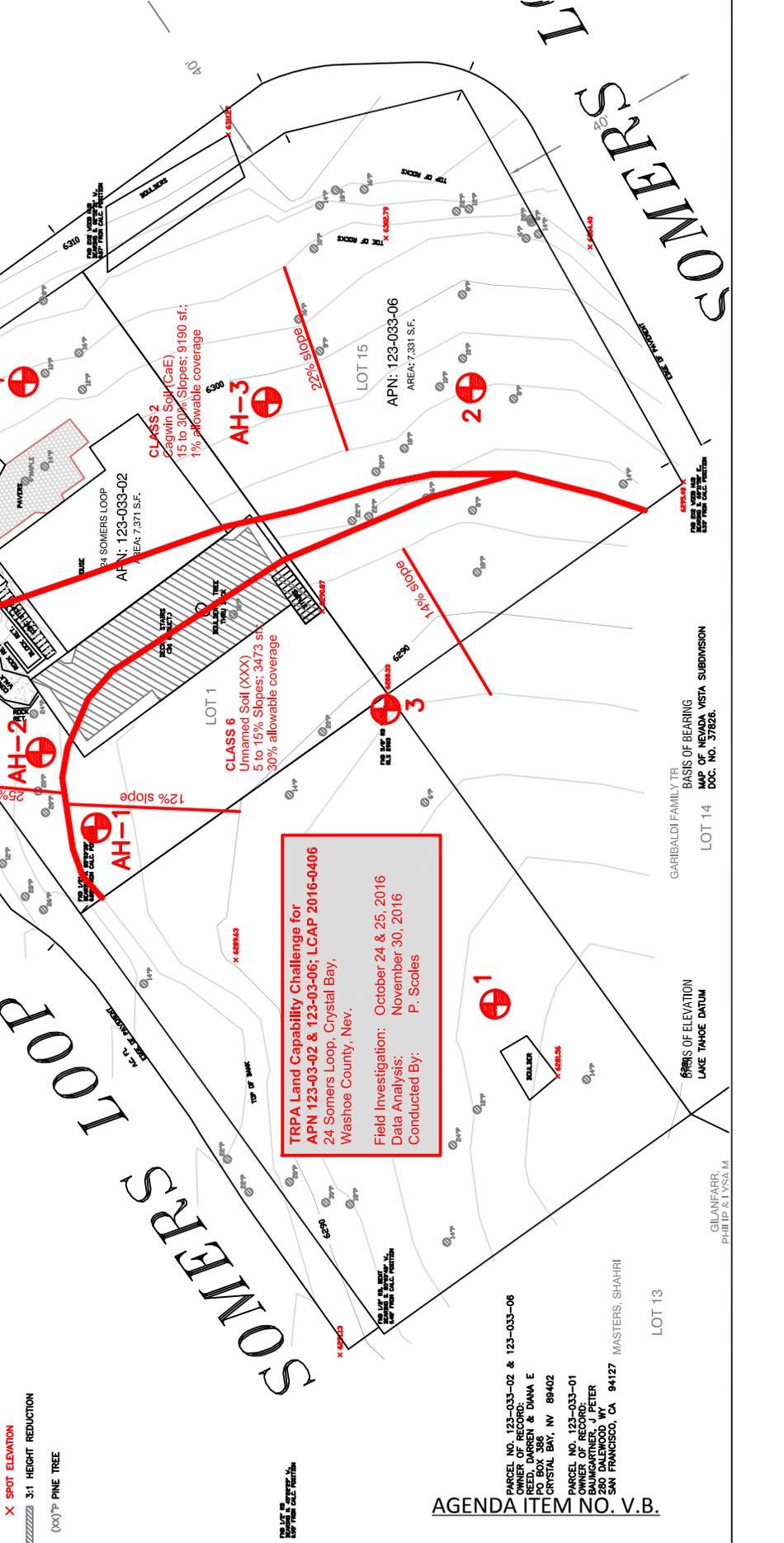
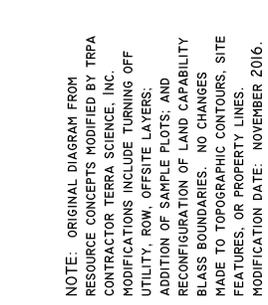
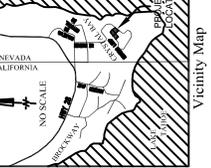
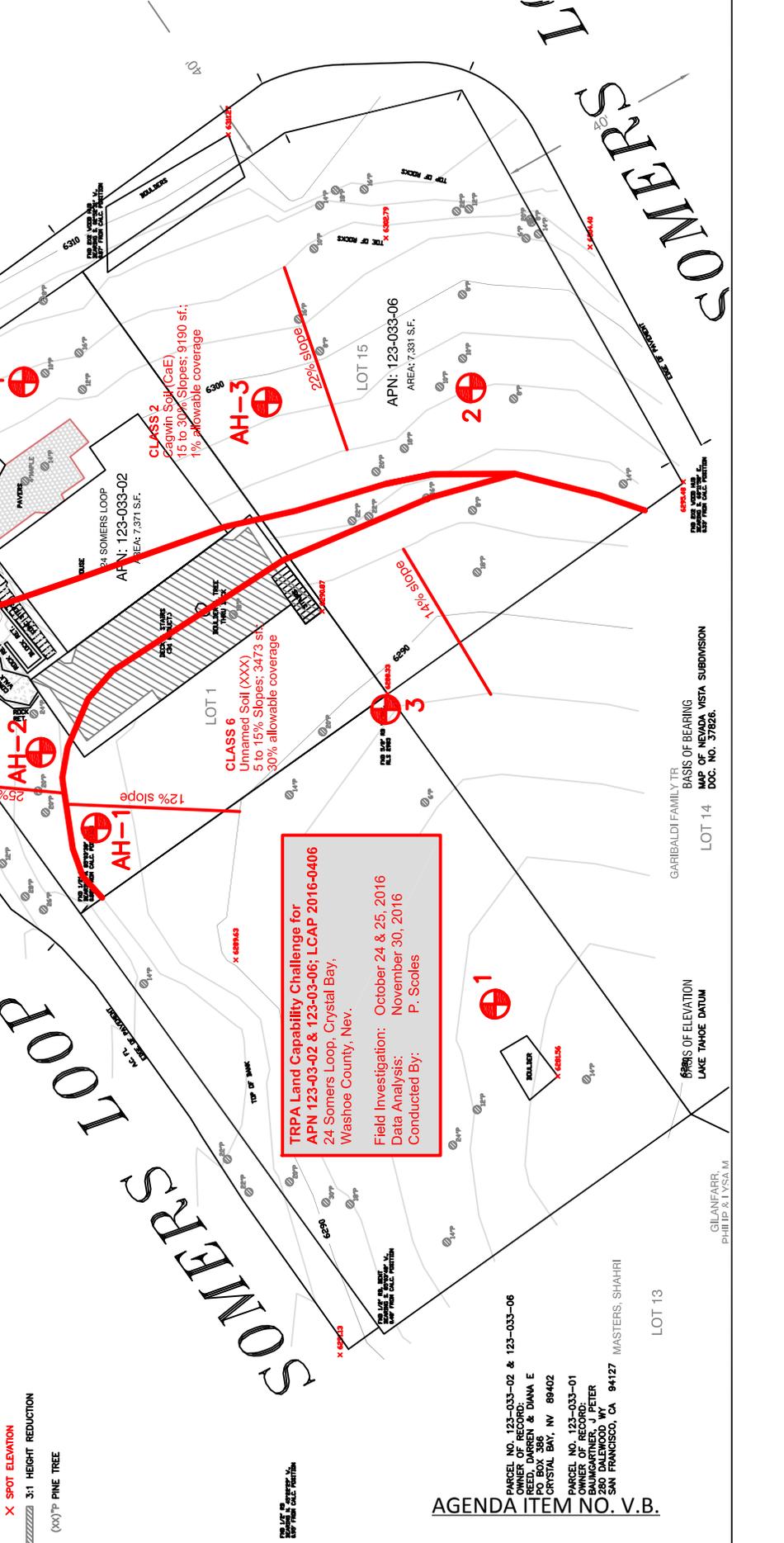
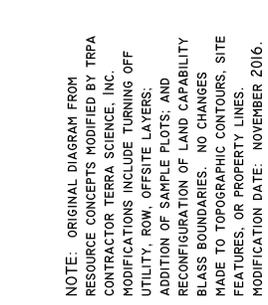
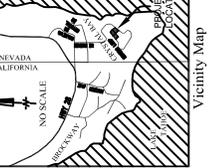
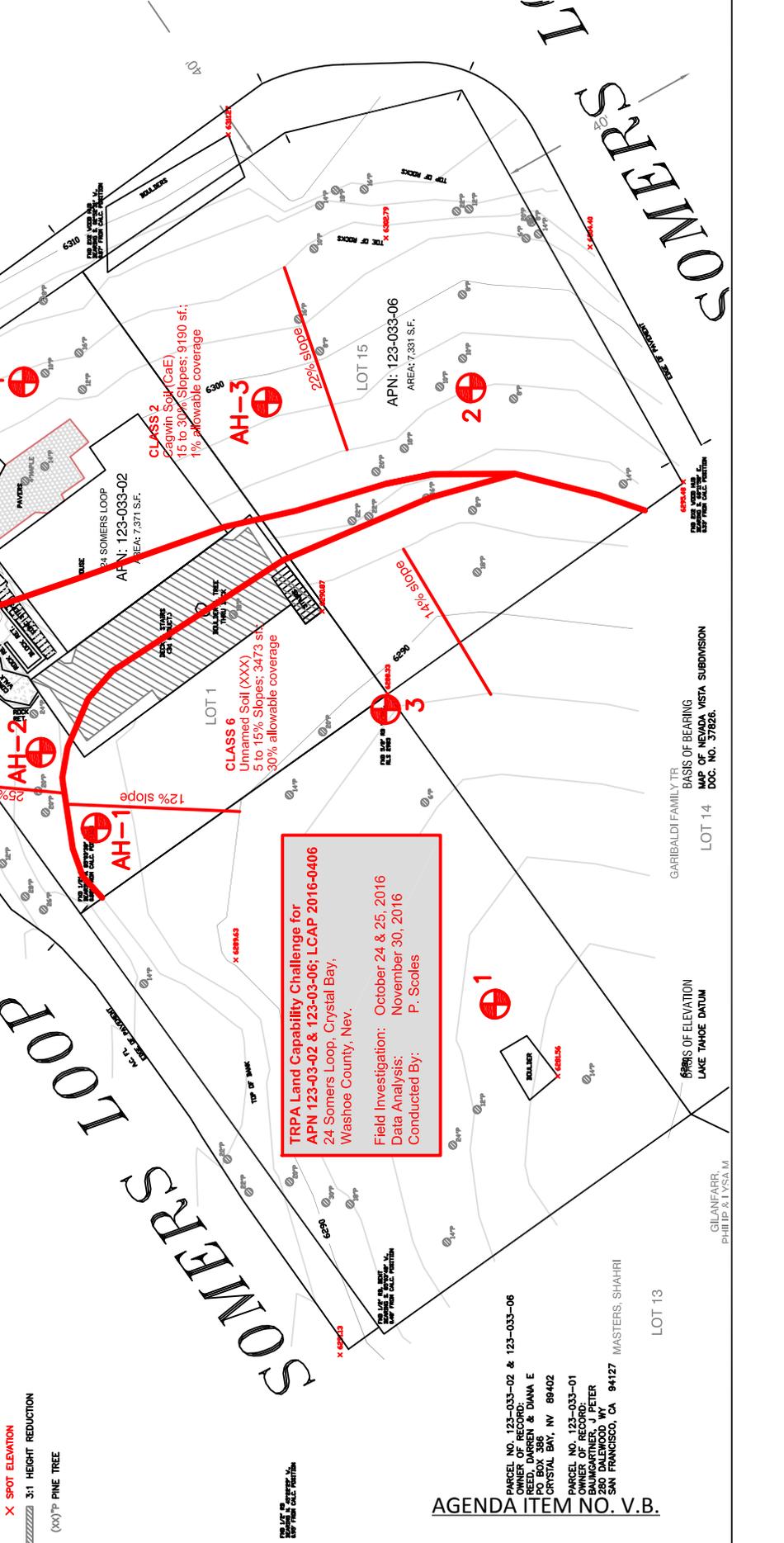
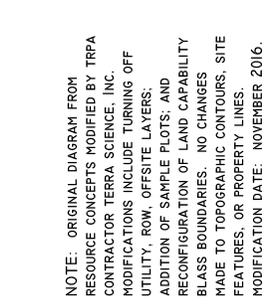
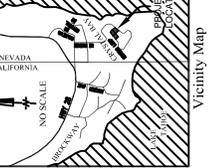
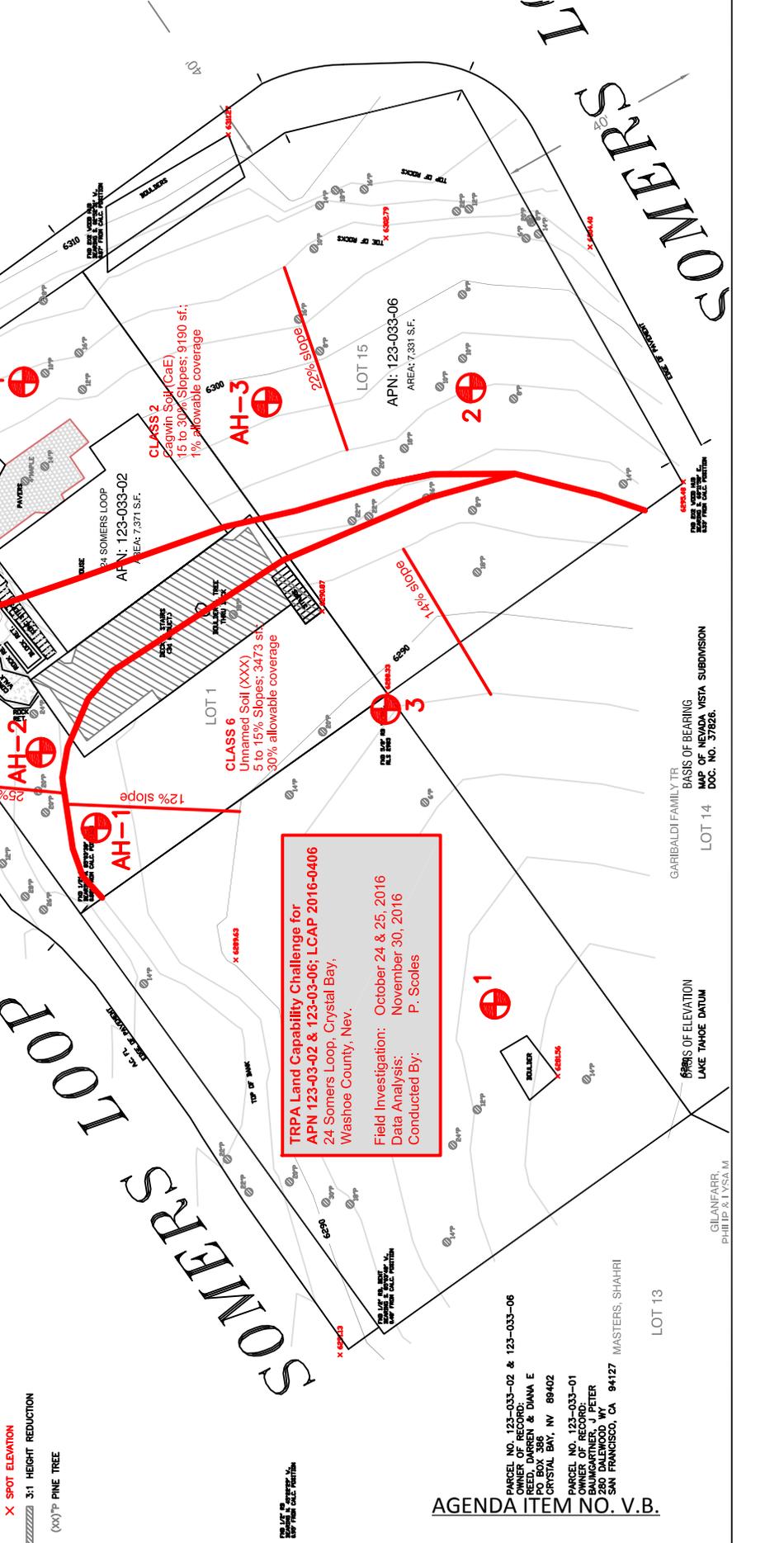
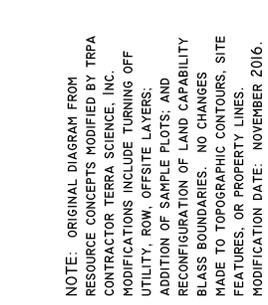
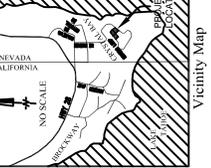
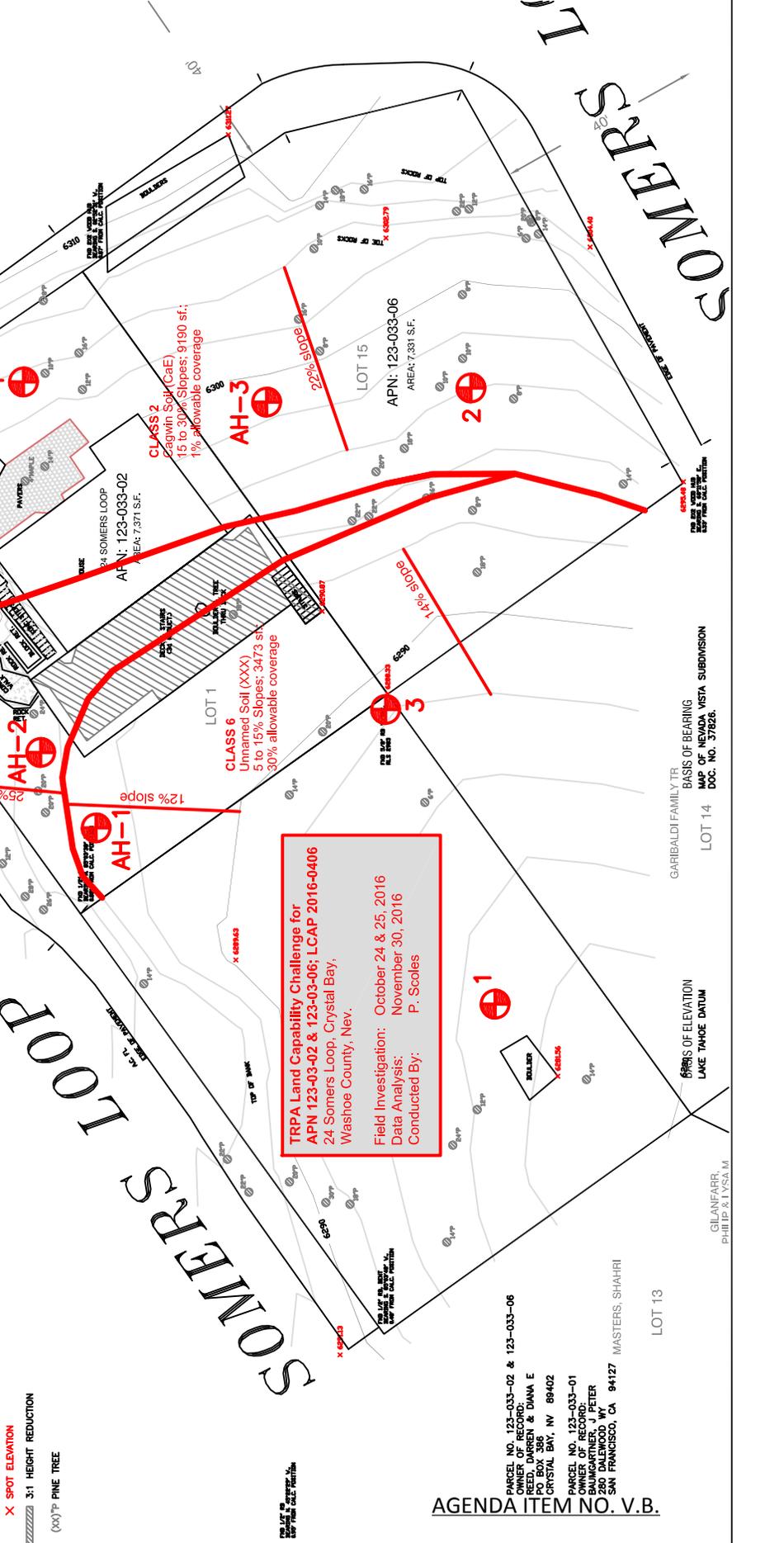
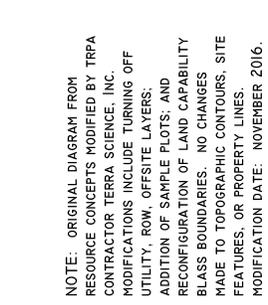
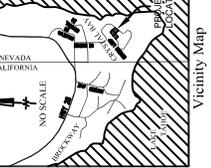
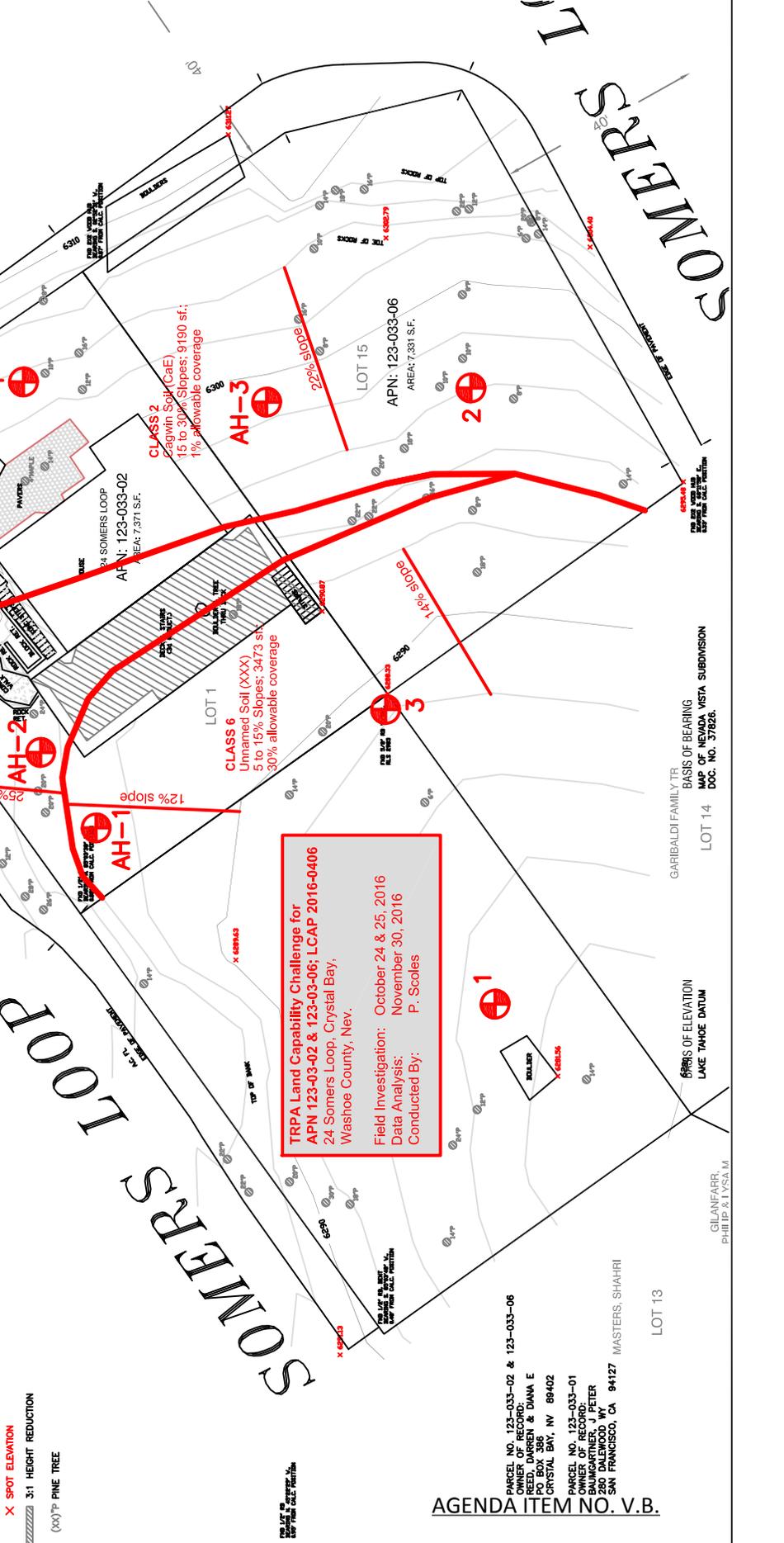
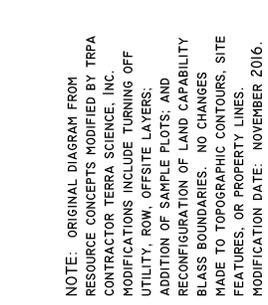
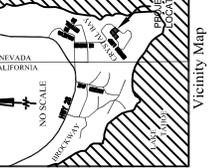
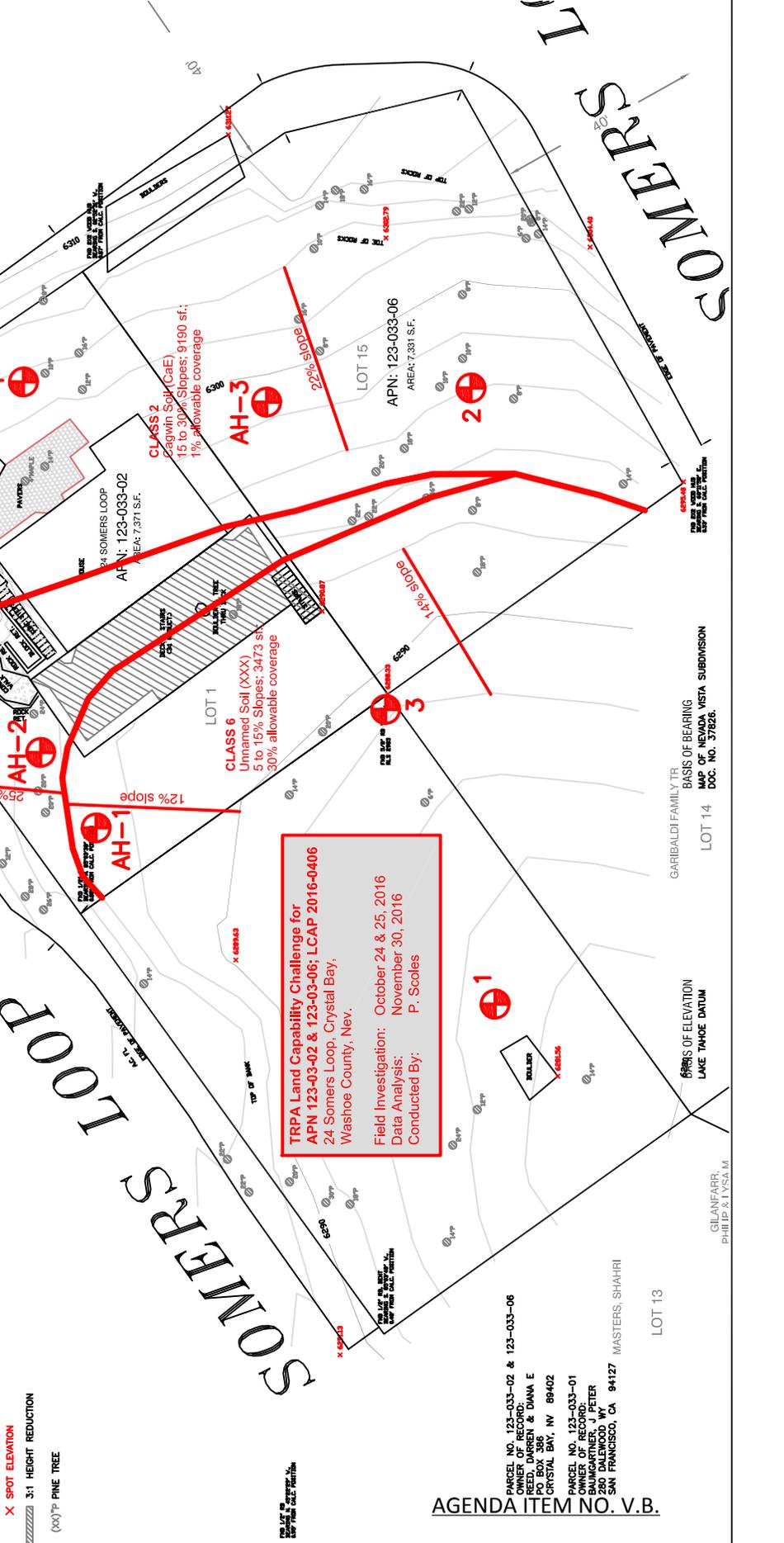
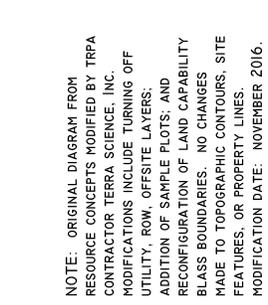
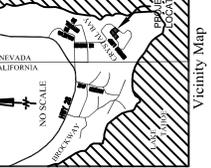
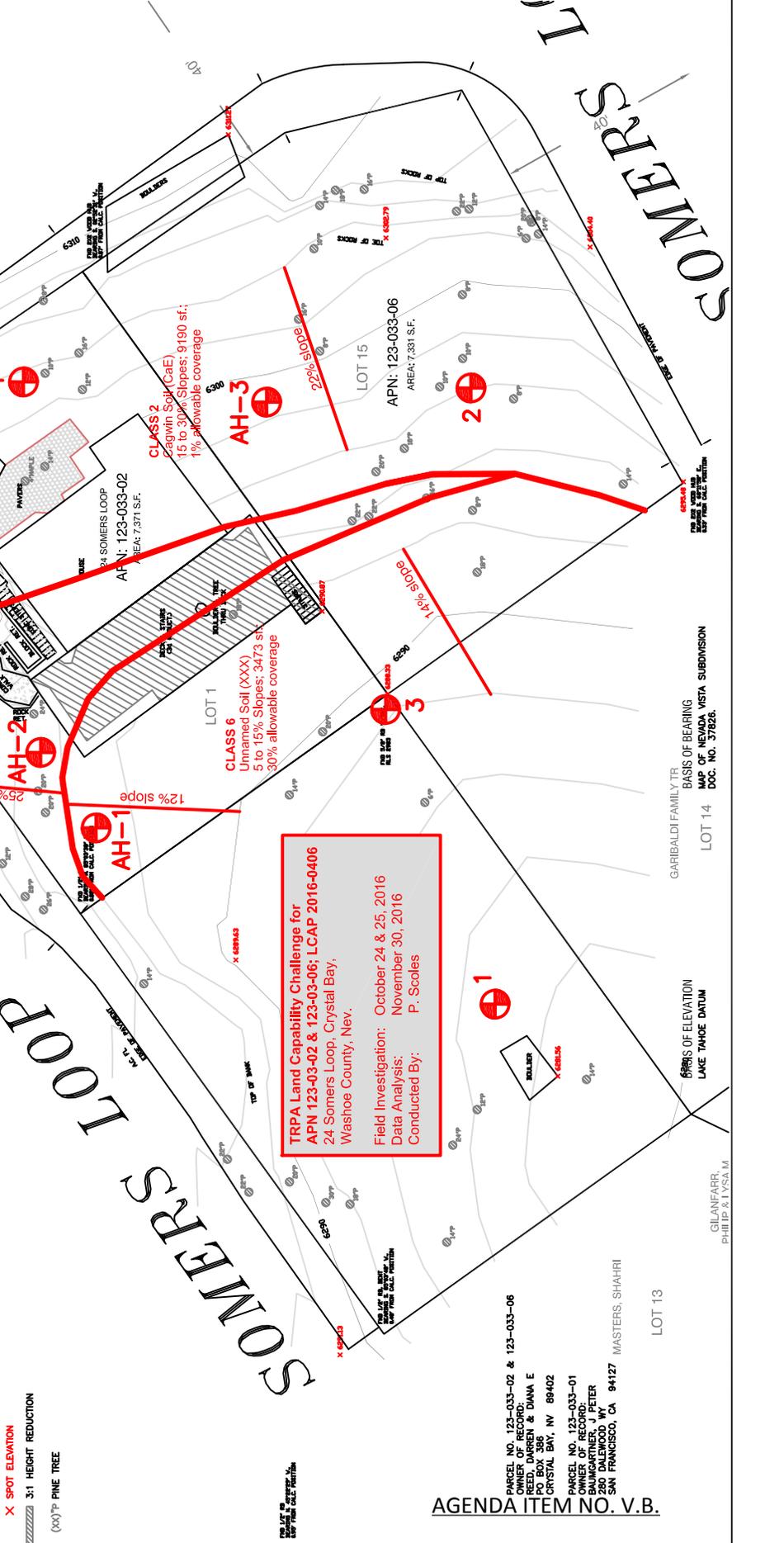
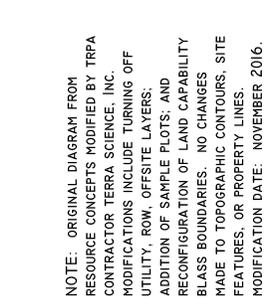
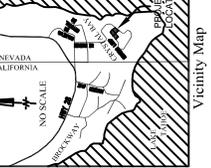
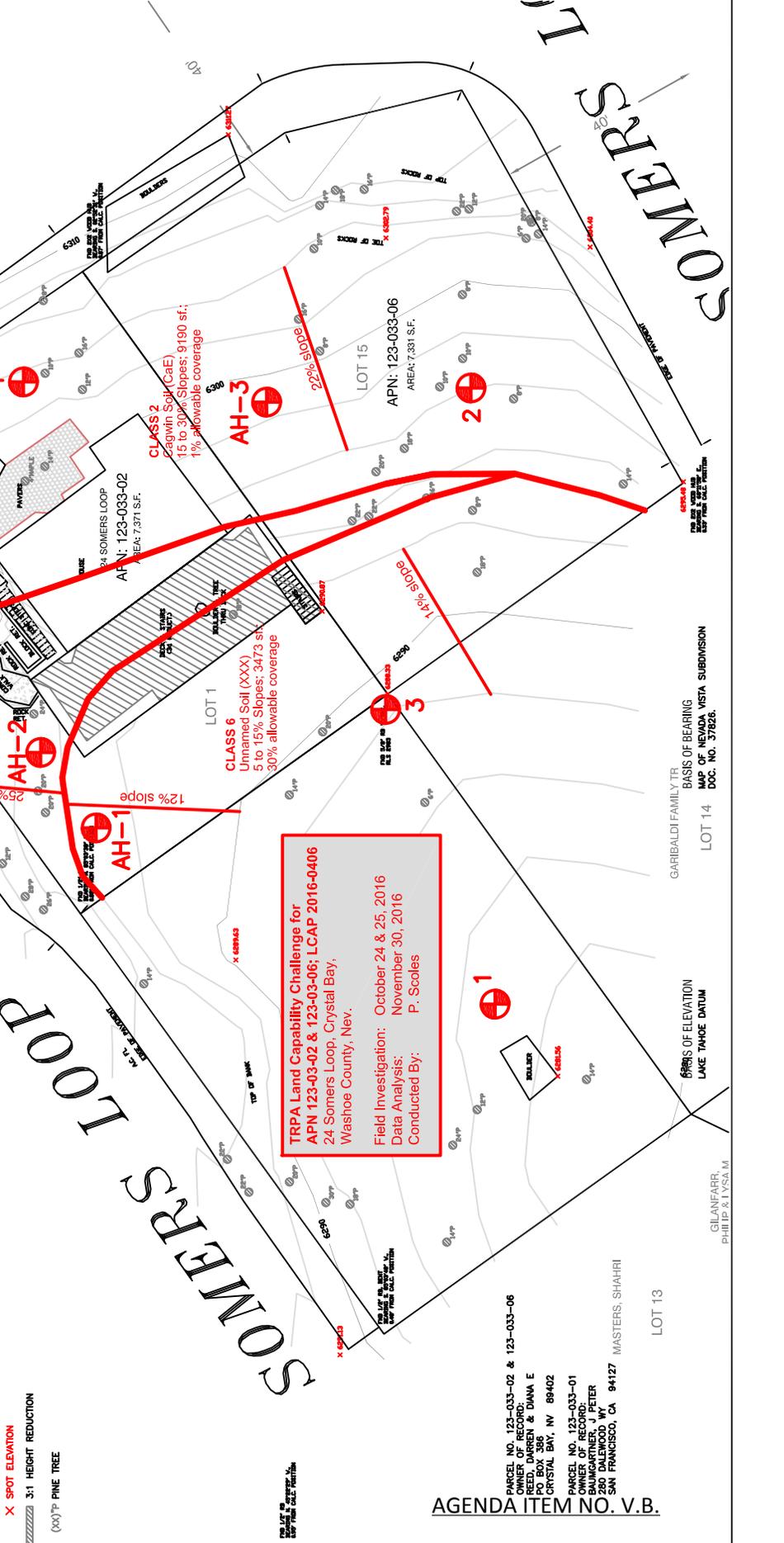
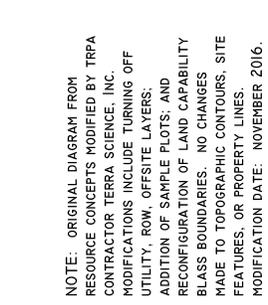
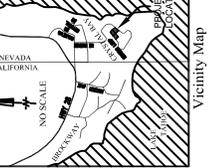
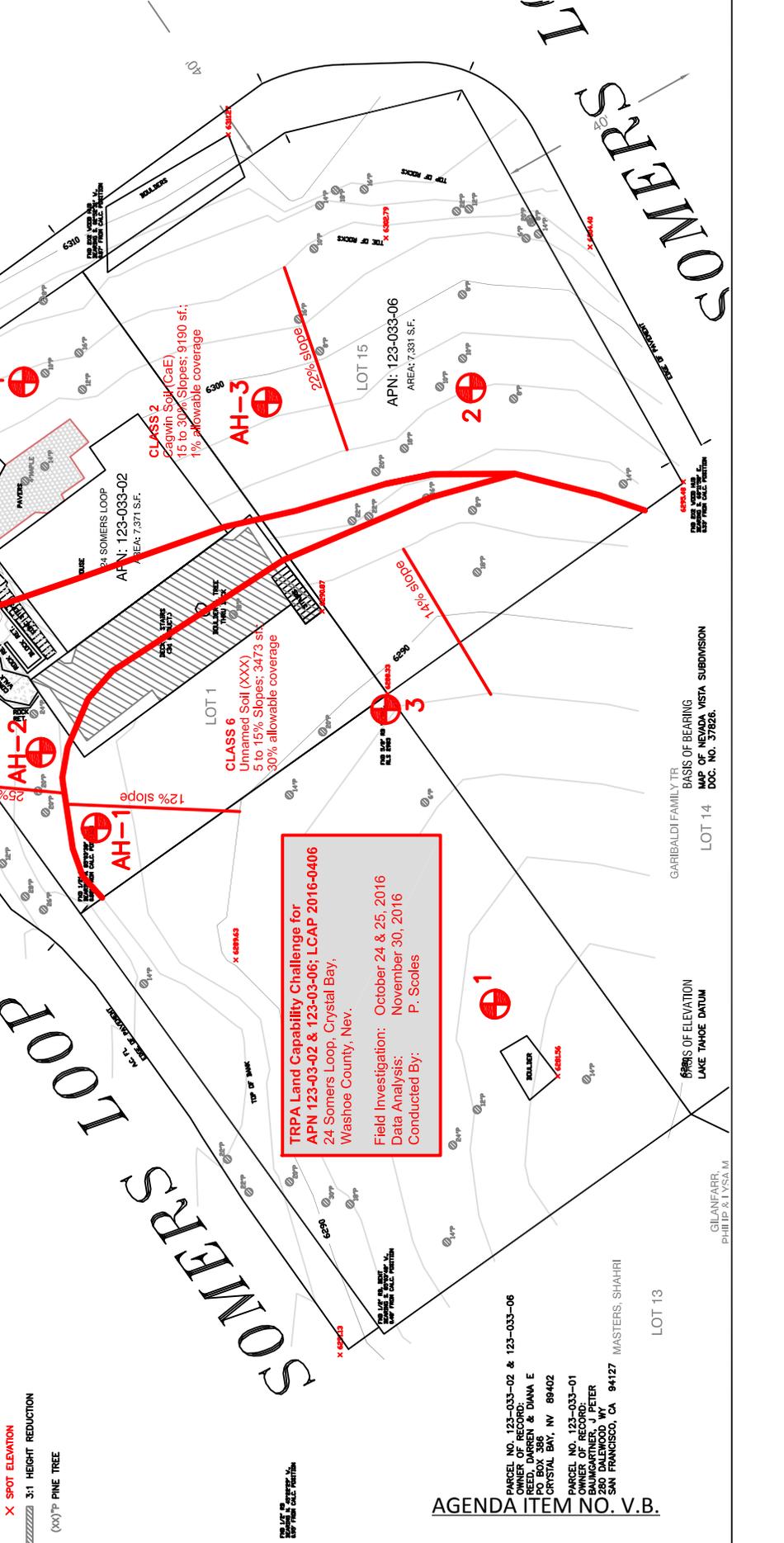
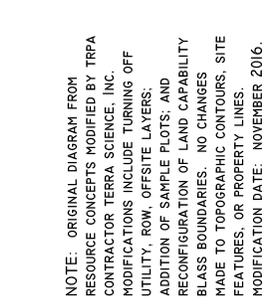
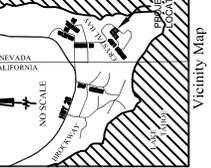
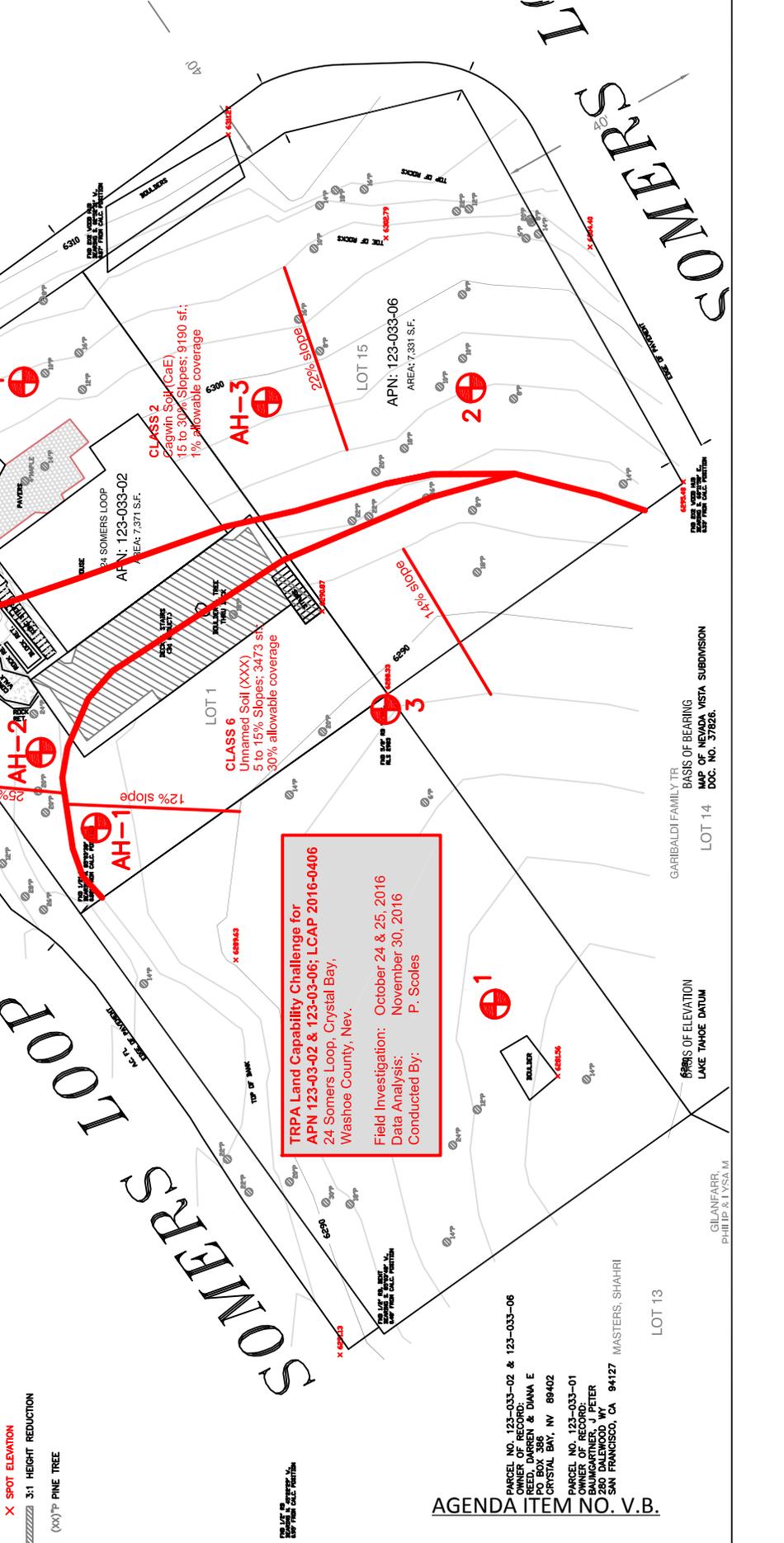
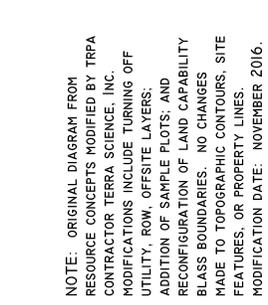
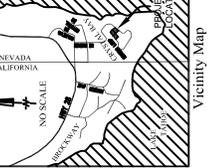
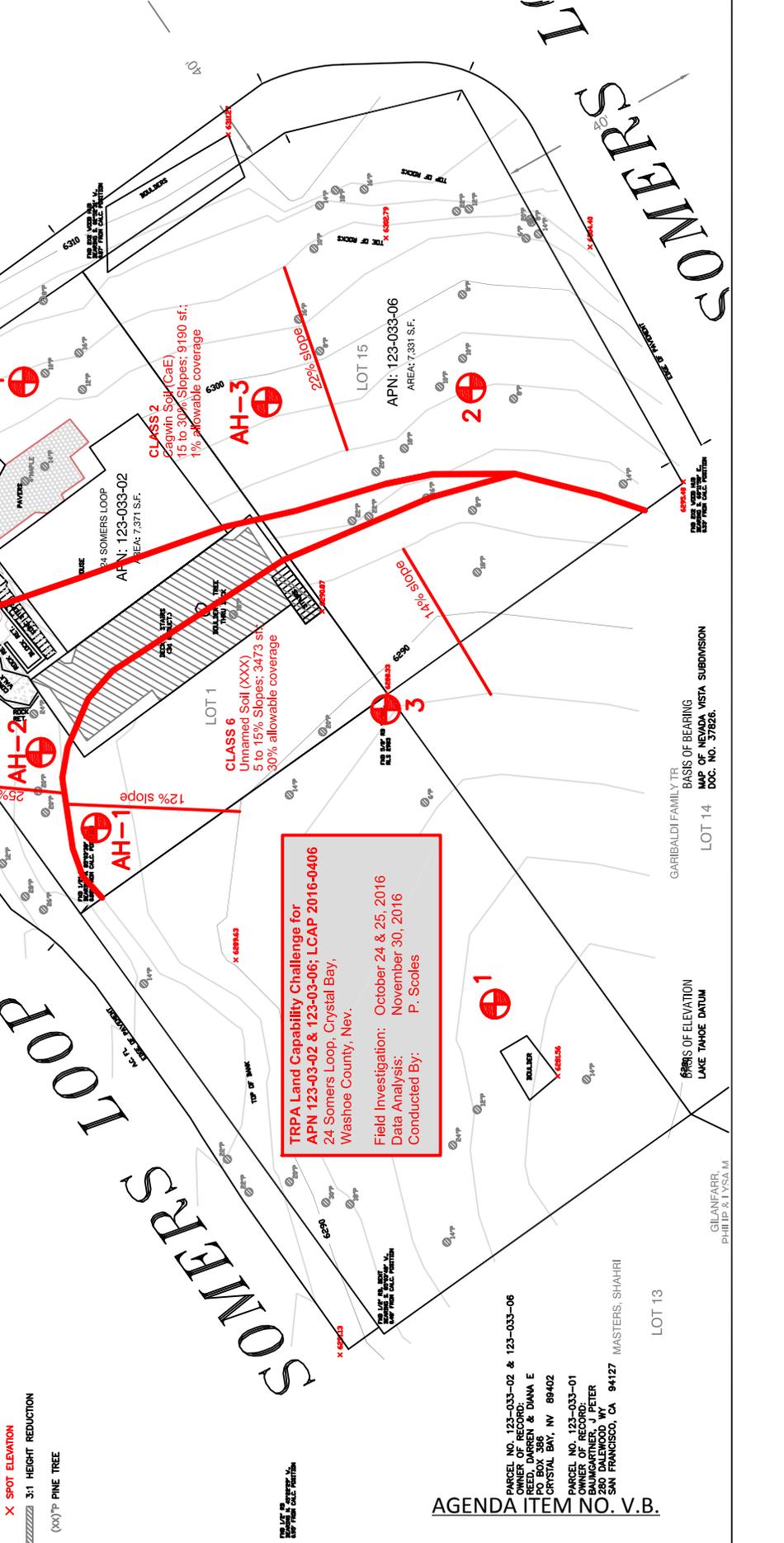
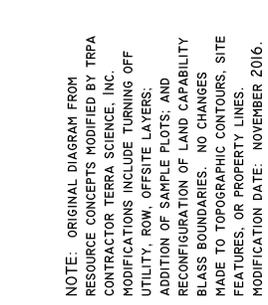
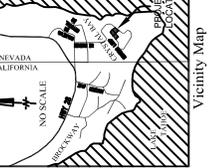
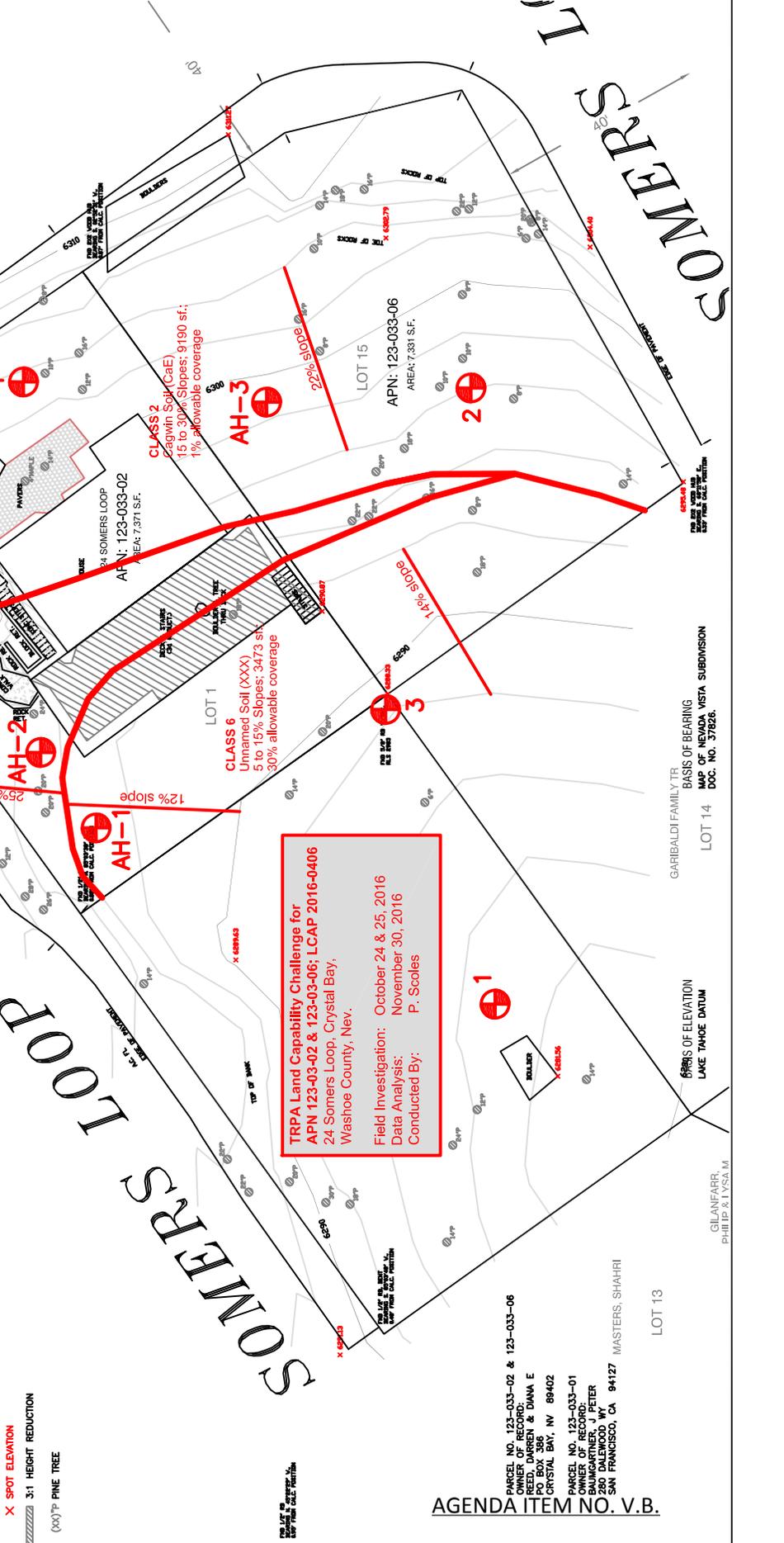
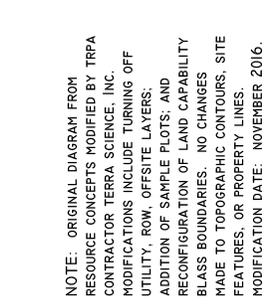
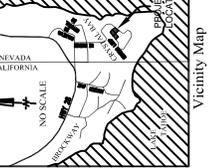
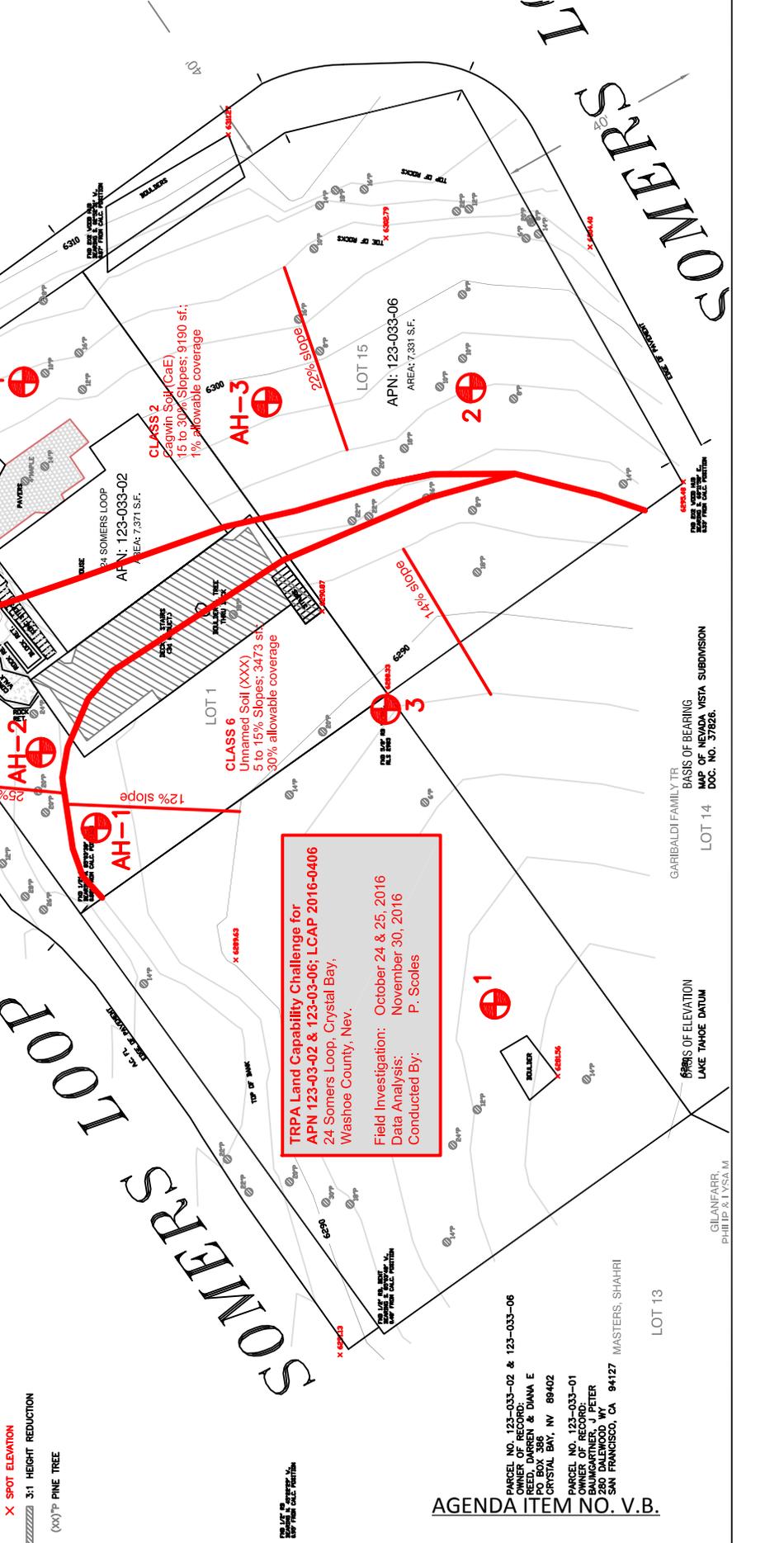
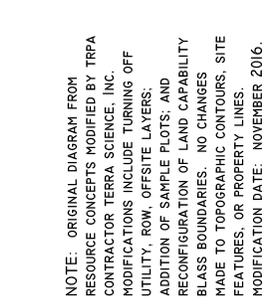
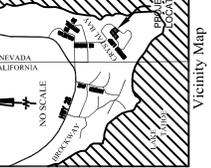
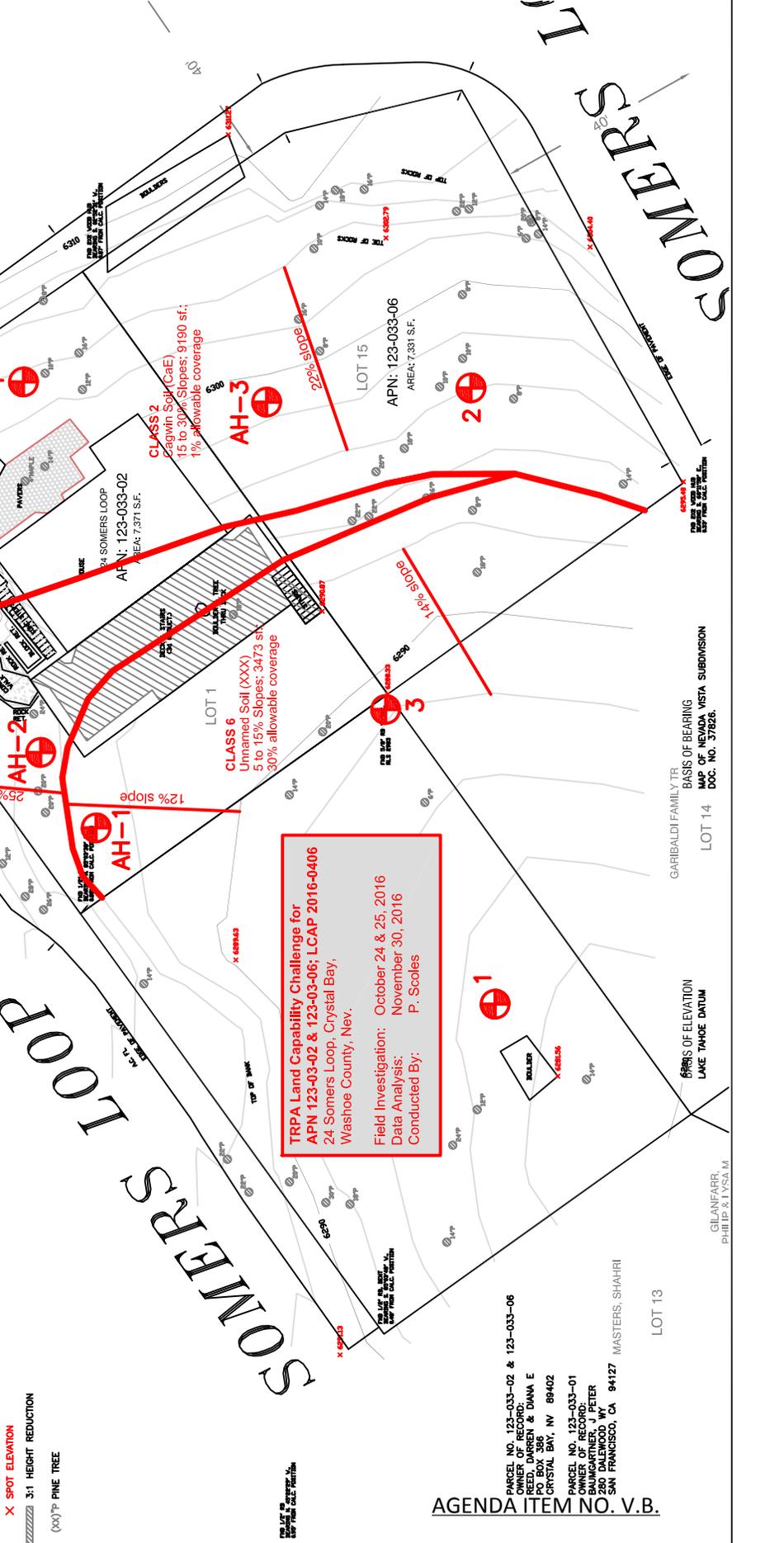
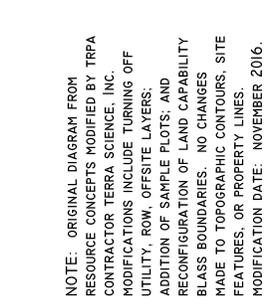
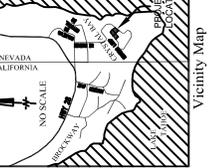
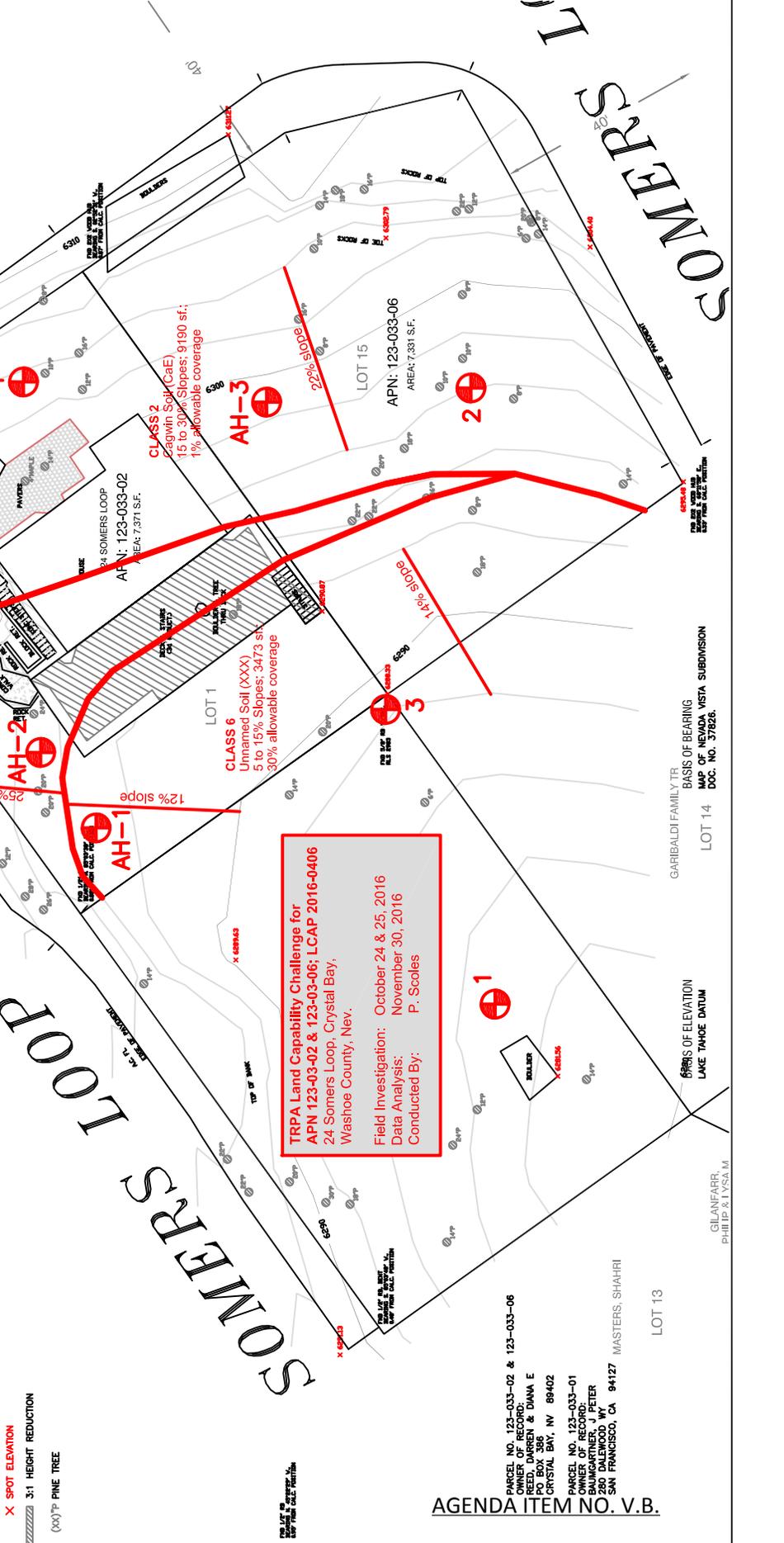
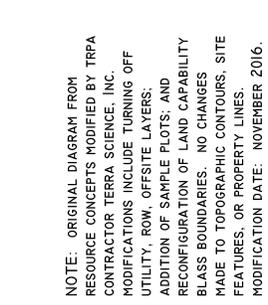
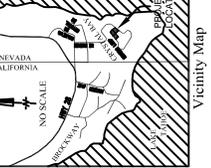
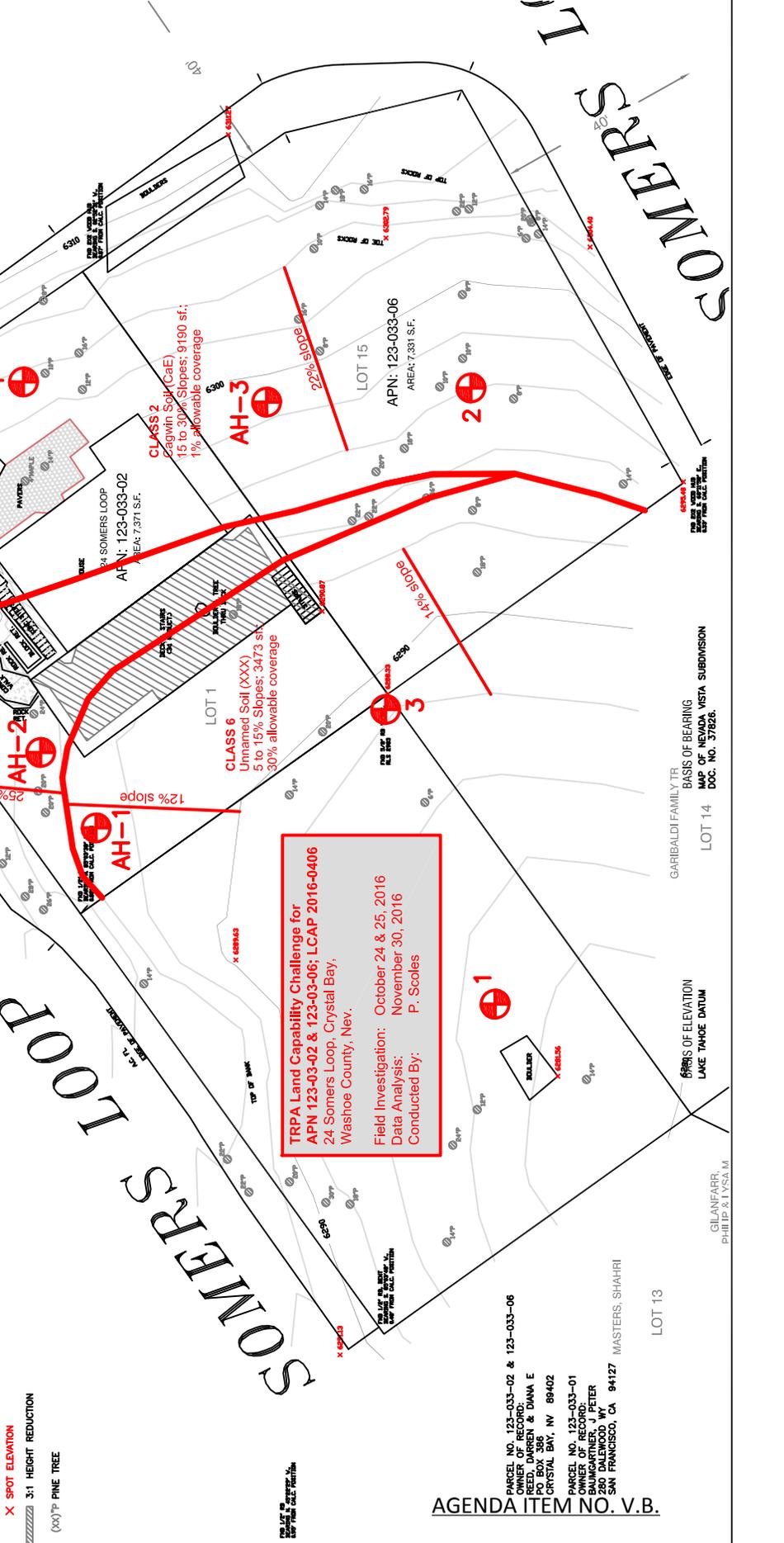
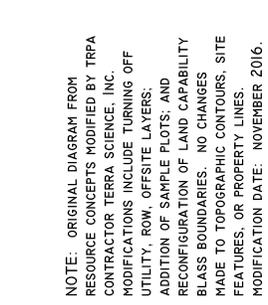
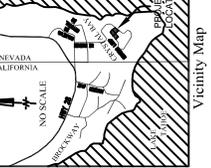
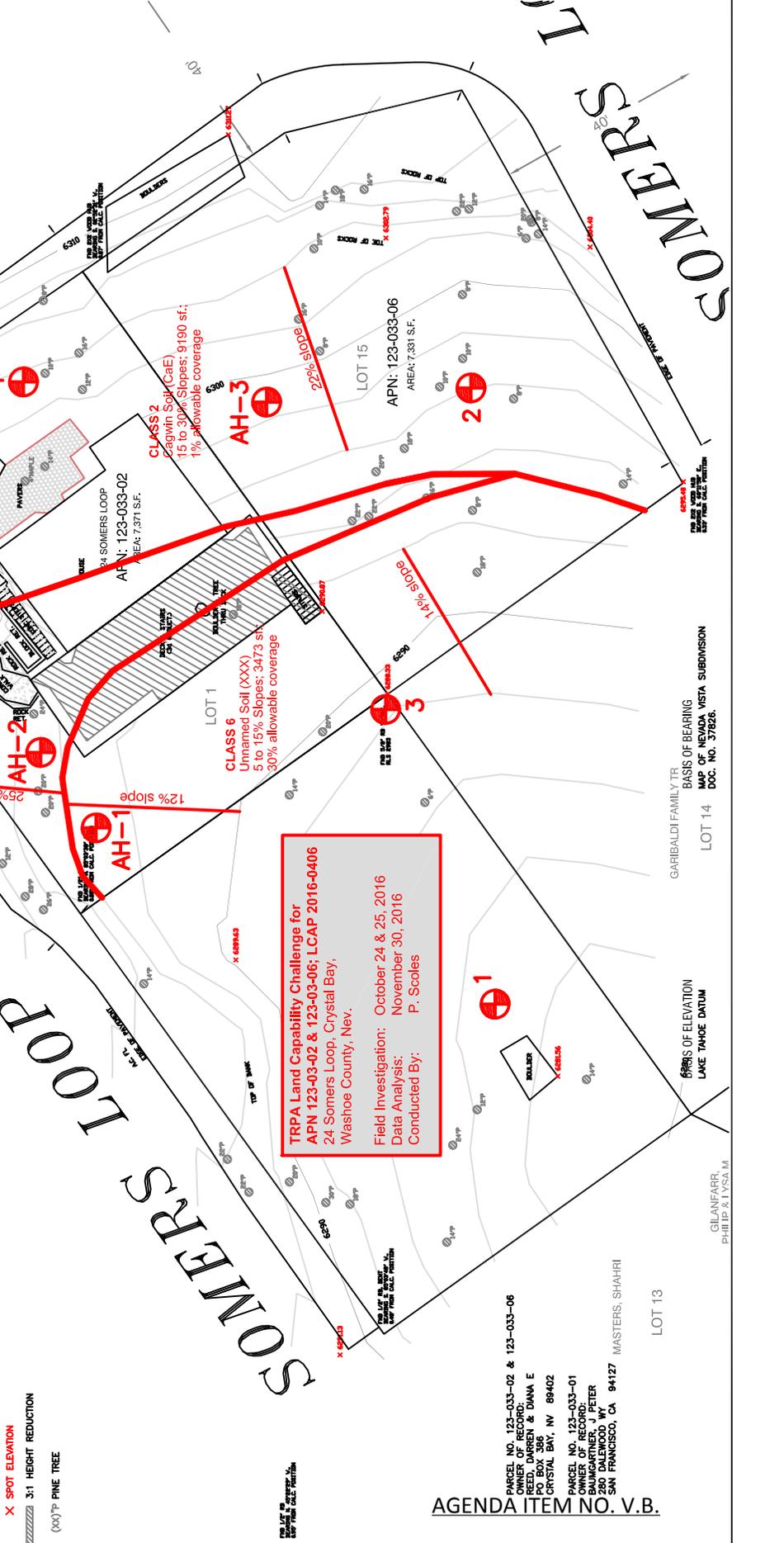
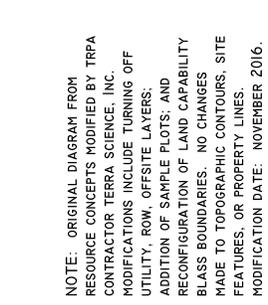
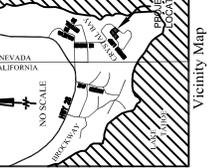
LEGEND

- FOUND MONUMENT AS NOTED
- PC YELLOW PLASTIC CAP
- (R) RECORD DOCUMENT
- MAP NO. 37826, VISTA SUBDIVISION
- DOC. NO. 37826, WASHOE COUNTY
- OFFICIAL RECORDS.
- (M) MEASURED
- STORM DRAIN MANHOLE
- DRAIN INLET
- X SPOT ELEVATION
- ||||| 3:1 HEIGHT REDUCTION
- (XX) PINE TREE

SCALE 1" = 10'
CONTOUR INTERVAL: 2'
CONTOURS DERIVED FROM
TOPOGRAPHIC SURVEY BY
RESOURCE CONCEPTS, INC.,
AUGUST 18, 2006.

NOTE: ORIGINAL DIAGRAM FROM
CONTRACTOR TERRA SCIENCE, INC.
MODIFICATIONS INCLUDE TURNING OFF
UTILITY, ROW, OFFSITE LAYERS;
ADDITION OF SAMPLE PLOTS; AND
RECONFIGURATION OF LAND CAPABILITY
CLASS BOUNDARIES. NO CHANGES
MADE TO TOPOGRAPHIC CONTOURS, SITE
FEATURES, OR PROPERTY LINES.
MODIFICATION DATE: NOVEMBER 2016.

TRPA Land Capability Challenge for
APN 123-03-02 & 123-03-06; LCAP 2016-0406
24 Somers Loop, Crystal Bay,
Washoe County, Nev.
Field Investigation: October 24 & 25, 2016
Data Analysis: November 30, 2016
Conducted By: P. Scoles



Attachment C

Applicant's soil consultant report with soil profile descriptions
(3 auger holes) and TRPA contractor soil profiles (3 auger holes)

DAVIS²
CONSULTING EARTH SCIENTISTS, INC.
P.O. Box 734, Georgetown, CA 95634 · (530) 333-1405; FAX (530) 333-1009

September 25, 2008

IPES Analysis
Darren & Diana Reed
24 Somers Loop
Washoe County, Nevada
(APN 123-033-01 & 123-033-06)

INTRODUCTION

A soil investigation was conducted on the Reed parcels on September 25, 2008. The objective of the study was to evaluate soil physical properties as they relate to Land Capability, which is administered by the Tahoe Regional Planning Agency (TRPA) for impervious coverage regulation on developed residential lots in the Lake Tahoe basin. The project consists of two adjacent lots on Somers Loop at Crystal Bay, Nevada.

This work is advanced at the request of Mr. Gary Midkiff, Midkiff and Associates, agent for the Reeds. Soil information contained in this report is for the strict use of land capability. It should not be used for building foundation design, slope stability or seismic analysis.

ENVIRONMENTAL SETTING

The Reed parcels are located on Somers Loop, at the point where the road circles to the west and becomes a one-way road. This is a concave landform supporting Jeffrey pine, manzanita, bitterbrush, huckleberry oak and tobacco bush. There are no stream environment zones (SEZ) influencing the project.

Soils are shown on TRPA map sheet F3 as TrF (Toem – rock outcrop complex, 30 to 50 percent slopes). Geology (Mathews, 1968) is characterized as gr (Granitic intrusive rocks). Bailey's (1974) geomorphic analysis places this site in C₁, (Granitic foothills).

METHODOLOGY

The parcels were surveyed as well as areas nearby. Hand equipment augers were used to excavate and expose the soil for detailed description and interpretation following standards of the National Cooperative Soil Survey. Information gathered at the site was compared to *Soils Survey of the Lake Tahoe Basin, California-Nevada* (Rogers et al, 1974) for correlation to known series. Unnamed soil series were rated for Land Capability level according to *Table 4 – Basis for capability of Lake Tahoe basin lands* (Bailey, 1974).

FINDINGS

The project site supports two different soil types, one similar to what is mapped, and another that is deeper, each of which formed from granitic residuum. The Toem series is

identified on the southeasterly portion, which is plainer landscape configuration, and deeper soils are described in the more convex part of the topography.

The Cagwin series is characterized as somewhat excessively drained, and a member of Soil Hydrologic Group C. It displays dark grayish brown loamy coarse sand topsoil about 6 inches thick over dark yellowish brown loamy coarse sand subsoil to 18 inches depth, underlain by weathered granite.

The unnamed soil is characterized with very dark grayish brown loamy coarse sand topsoil approximately 13 inches thick over dark yellowish brown subsoil greater than 55 inches deep. This soil is a member of Soil Hydrologic Group A. It is unnamed in the soil survey area.

The Cagwin series places in soil map units CaE, Class 2. The deep unnamed soil places in Class 6.

CONCLUSIONS AND RECOMMENDATIONS

Soils found on the Reed site are other than the TrF soil map unit as presently shown on the TRPA land capability overlays. Soils found best fit with CaE (Class 2) and Class 6 as shown on the attached map. Class 2 receives 1 percent allowable impervious coverage. The unnamed soil of Class 6 receives 30 percent allowable impervious coverage.

Please refer to the following soil profile descriptions that justify the proposed changes to land capability on the Reed parcels. The location of soil description sites is shown on the attached map.

Respectfully submitted,

**Sidney W.
Davis**

Sidney W. Davis,
Certified Professional
Soil Scientist No. 1031

Digitally signed by Sidney W. Davis
DN: cn=Sidney W. Davis, o=Davis2
Consulting Earth Scientists, Inc.,
email=davis2consulting@sbcglobal.net, c=US
Date: 2008.11.21 10:01:56 -08'00'

Representative Soil Profile Descriptions:

Stop 1

- Oi 1 to 0 inches, conifer needles and duff
- A 0 to 7 inches, grayish brown (10YR 5/2) gravelly loamy coarse sand, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, loose, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; fifteen percent gravel; clear smooth boundary.
- AC 7 to 13 inches, brown (10YR 5/3) gravelly loamy coarse sand, dark brown (10YR 3/3) moist; weak fine granular structure; soft, loose, nonsticky and nonplastic; many fine, medium and coarse roots; many very fine and fine interstitial pores; fifteen percent gravel; gradual smooth boundary.
- C1 13 to 24 inches, pale brown (10YR 6/3) gravelly loamy coarse sand, dark brown (10YR 4/3) moist; single grain, soft, loose, nonsticky and nonplastic; common fine, medium and coarse roots; many very fine and fine interstitial pores; fifteen percent gravel; gradual wavy boundary.
- C2 24 to 42 inches, light yellowish brown (10YR 6/4) gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; soft, loose, nonsticky and nonplastic; common fine medium and coarse roots; many very fine and fine interstitial pores; fifteen percent gravel; gradual smooth boundary.
- C3 42 to 55 inches, very pale brown (10YR 8/3) coarse sand, pale brown (10YR 6/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common fine medium roots; many very fine and fine interstitial pores; fifteen percent gravel.

Note: Hydrologic Group A. Too deep for Cagwin.

Soil Series: Unnamed

Soil Classification: Sandy, mixed, frigid, Humic Dystraxepts

Soil drainage class: Excessive

Soil Hydrologic Group: A

Stop No. 2

- Oi 1 to 0 inches,
- A 0 to 6 inches, brown (10YR 5/3) loamy coarse sand, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, loose, nonsticky and nonplastic; common fine medium roots; many very fine and fine interstitial pores; clear smooth boundary.
- C 6 to 18 inches, light yellowish brown (10YR 6/4) loamy coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; soft loose, nonsticky and

nonplastic; many fine medium and coarse roots; many very fine and fine interstitial pores; gradual wavy boundary.

Cr 18+ inches, weathered granite.

Soil Series: Cagwin

Soil classification: Sandy, mixed, frigid, Shallow Dystric Xerorthents

Soil drainage class: Excessive

Soil Hydrologic Group: C

Stop No. 3

- A 0 to 7 inches, brown (10YR 5/3) loamy coarse sand, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, loose, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; fifteen percent gravel; clear smooth boundary.
- AC 7 to 13 inches, yellowish brown (10YR 5/4) loamy coarse sand, dark yellowish brown (10YR 3/4) moist; weak fine granular structure; soft, loose, nonsticky and nonplastic; many fine medium and coarse roots; many very fine and fine interstitial pores; twenty-five percent gravel; gradual smooth boundary.
- C1 13 to 42 inches, light yellowish brown (10YR 6/4) loamy coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; soft, loose, nonsticky and nonplastic; common fine medium roots; many very fine and fine interstitial pores; twenty-five percent gravel; gradual wavy boundary.
- C2 42 to 48 inches, very pale brown (10YR 7/4) loamy coarse sand, yellowish brown (10YR 5/4) moist; single grain; soft, loose, nonsticky and nonplastic; common fine medium roots; many very fine and fine interstitial pores.

Cr 48+ inches, grus

Soil Series: Unnamed

Soil Classification: Sandy, mixed, frigid, Humic Dystrocherepts

Soil drainage class: Excessive

Soil Hydrologic Group: A

Stop No. 4

- A 0 to 7 inches, brown (10YR 5/3) loamy coarse sand, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, loose, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; twenty percent gravel; clear smooth boundary.

- AC 7 to 13 inches, yellowish brown (10YR 5/4) loamy coarse sand, dark yellowish brown (10YR 3/4) moist; weak fine granular structure; soft, loose, nonsticky and nonplastic; many fine medium and coarse roots; many very fine and fine interstitial pores; twenty percent gravel; clear smooth boundary.
- C 13 to 28 inches, light yellowish brown (10YR 6/4) loamy coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; soft, loose, nonsticky and nonplastic; common fine medium roots; many very fine and fine interstitial pores; twenty-five percent gravel; gradual wavy boundary.
- Cr 28+ inches, grus

Soil Series: Cagwin

Soil classification: Sandy, mixed, frigid, Shallow Dystric Xerorthents

Soil drainage class: Excessive

Soil Hydrologic Group: C

Stop No. 5

- A 0 to 6 inches, brown (10YR 5/3) loamy coarse sand, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, loose, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; twenty percent gravel; clear smooth boundary.
- AC 6 to 14 inches, pale brown (10YR 6/3) loamy coarse sand, dark yellowish brown (10YR 3/4) moist; weak fine granular structure; soft, loose, nonsticky and nonplastic; many fine, medium and coarse roots; many very fine and fine interstitial pores; twenty percent gravel; gradual smooth boundary.
- C1 14 to 28 inches, light yellowish brown (10YR 6/4) loamy coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; soft, loose, nonsticky and nonplastic; common fine medium roots; many very fine and fine interstitial pores; twenty percent gravel; gradual wavy boundary.
- C2 28 to 42 inches, very pale brown (10YR 7/4) loamy coarse sand, yellowish brown (10YR 5/4) moist; single grain; soft, loose, nonsticky and nonplastic; common fine medium roots; many very fine and fine interstitial pores; thirty percent gravel; gradual wavy boundary.
- Cr 41+ inches, grus

Soil Series: Unnamed

Soil Classification: Sandy, mixed, frigid, Humic Dystric Xerorthents

Soil drainage class: Excessive

Soil Hydrologic Group: A

**APN 123-033-02 -- 24 Somers Loop (Darren Reed Residence),
Crystal Bay, Washoe County, Nev. – Auger Hole 1 (AH-1)**



Photo 1 – View of soil profile. Auger hole depth 43 inches.

Photo 2 – View to northeast toward AH-1, located on 12% slope (about 25 feet southeast of Somers Loop and 20 feet west of residential deck).

Layer	Depth (In.)	Color (moist)	Soil Properties / Features
O	0 to 1	N/A	DUFF, decomposed leaves, conifer needles, branches.
A	1 to 11	Very dark brown (10YR 2/2)	LOAMY COARSE SAND, weak granular structure, 20% gravel; no redox features, many fine, few medium roots, many fine interstitial pores, abrupt boundary.
AC	11 to 24	Very dark grayish brown (10YR 3/2)	LOAMY COARSE SAND, weak granular structure, 15% gravel; no redox features, many fine and common med. roots, many fine interstitial pores, clear boundary.
C1	24 to 37	Dark brown (10YR 3/3)	LOAMY COARSE SAND, massive structure, 20% gravel; no redox features, common fine and medium roots, few coarse roots, many fine interstitial pores, clear boundary.
C2	37 to 43	Dark grayish brown (2.5Y 4/2)	LOAMY COARSE SAND (GRUS), massive structure, 25% gravel; no redox features, few fine and medium roots, many fine interstitial pores.

Soil is significantly deeper than mapped soil (Rock outcrop-Toem complex, 30-50% slopes-RtF) – see report discussion. Soil has similar textures and depth as Cassenai series (2006 NRCS soil survey), hence it is an inclusion. Thus, it is an unnamed soil (XXX) in the 1974 SCS soil survey. For low hazard lands, slopes 0 to 16% qualify as Class 6 (30% allowable coverage). The soil condition beneath the residential deck was visually inspected – it was previously excavated and graded. Similar, but deeper soil observed at sample plot AH-2 and at the applicant’s soil consultant’s plot 3 (just beyond southwest corner of APN 123-033-02).

**APN 123-033-02 -- 24 Somers Loop (Darren Reed Residence),
Crystal Bay, Washoe County, Nev. – Auger Hole 2 (AH-2)**



Photo 3 – View of soil profile. Auger hole depth 56 inches.

Photo 4 – View to south toward AH-2, located on 25% slope (about 30 feet southeast of Somers Loop and 10 feet north of residential deck).

Layer	Depth (In.)	Color (moist)	Soil Properties / Features
O	0 to 1	N/A	DUFF, decomposed leaves, conifer needles, branches.
A	1 to 13	Very dark brown (10YR 2/2)	LOAMY COARSE SAND, weak granular structure, 15% gravel; no redox features, many fine roots, many fine interstitial pores, abrupt boundary.
AC	13 to 31	Very dark grayish brown (10YR 3/2)	LOAMY COARSE SAND, weak granular structure, 15% gravel; no redox features, many fine and common med. roots, many fine interstitial pores, clear boundary.
C1	31 to 39	Dark brown (10YR 3/3)	LOAMY COARSE SAND, massive structure, 15% gravel; no redox features, common fine and medium roots, few coarse roots, many fine interstitial pores, clear boundary.
C2	39 to 50	Dark grayish brown (2.5Y 4/2)	LOAMY COARSE SAND, massive structure, 25% gravel; no redox features, few fine, medium and coarse roots, many fine interstitial pores, clear boundary.
C3	50 to 56	Light brownish gray (10YR 6/2)	GRUS, massive structure, 30% gravel (pebble-size); no redox features, few fine to very fine roots, many medium interstitial pores.

Soil is significantly deeper than mapped soil (Rock outcrop-Toem complex, 30-50% slopes-RtF) – see report discussion. Soil has similar textures and depth as Cassenai series (2006 NRCS soil survey), hence it is an inclusion. Thus, it is an unnamed soil (XXX) in the 1974 SCS soil survey. For low hazard lands, slopes 16 to 30% slopes qualify as Class 4 (20% allowable coverage). Soils situated further east become shallower and qualify for Cagwin-Rock outcrop complex, 15 to 30% slopes (CaE) or Toem-Rock outcrop complex, 15 to 30+% (RtF). Both are 1% allowable coverage.

**APN 123-033-02 -- 24 Somers Loop (Darren Reed Residence),
Crystal Bay, Washoe County, Nev. – Auger Hole 3 (AH-3)**



Photo 5 – View of soil profile. Auger hole depth 13 inches.	Photo 6 – View to southeast toward AH-3, located on 22% slope (about 45 feet southwest of Somers Loop and 25 feet south of residence).
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Layer	Depth (In.)	Color (moist)	Soil Properties / Features
O	0 to 1	N/A	DUFF, decomposed leaves, conifer needles, branches.
A	1 to 6	Very dark brown (10YR 2/2)	LOAMY COARSE SAND, weak granular structure, 15% gravel; no redox features, many fine roots, many fine interstitial pores, abrupt boundary.
AC	6 to 13	Dark brown (10YR 3/3)	LOAMY COARSE SAND, massive structure, 15% gravel; no redox features, many fine and common med. roots, many fine interstitial pores, clear boundary.
R	>13	N/A	ROCK REFUSAL

Soil is similar to mapped soil (Rock outcrop-Toem complex, 30-50% slopes-RtF) – see report discussion. Soil depth in the east and southeast part of study area (two lots) varies from 13 to 28 inches deep. Where these granitic soils are less than 20 inches to bedrock, they qualify as Toem soils. When they are 20 to 40 inches deep (above bedrock), they qualify as Cagwin soils. TRPA contractor Terra Science determined soil depth for applicant’s soil consultant plots 4 and 5 to have 24 to 28 inches of soil above bedrock. Both Toem and Cagwin soils are Class 2 (1% allowable coverage). Portions of this map unit have been graded for landscaping and recreation (see background in photo above).