Appendix H

Preliminary Hydrogeologic Investigation

Preliminary Drainage Study

Storm Water Pollution Prevention Plan

SIERRA GEOTECHNICAL SERVICES INC.

March 31, 2006 Project No. 3.30644.1

Mammoth Mountain Ski Area
PO Box 24
Mammoth Lakes, Ca, 93546

Attention: Mr. Tom Hodges

Subject: **PRELIMINARY HYDROGEOLOGIC INVESTIGATION**
MMSA Eagle Base Lodge
Mammoth Lakes, California

Reference: **PRELIMINARY GEOTECHNICAL INVESTIGATION**
MMSA Eagle Base Lodge
Sierra Geotechnical Services Project No. 3.30644; December 1, 2005
Mammoth Lakes, California

Dear Mr. Hodges:

In accordance with your authorization of our proposal and the MMSA Agreement for Professional Services dated February 20th, 2006, we herein submit the results of our preliminary hydrogeologic investigation for the proposed project. The purpose of this study was to assess the on-site hydrologic characteristics and provide conclusions regarding the impacts of construction dewatering (if any) to the surrounding vegetation areas.

We appreciate the opportunity to be of service to you. Should you have any questions regarding this report, please do not hesitate to contact us.

Respectfully,

SIERRA GEOTECHNICAL SERVICES, INC.

Joseph A. Adler
Principal Geologist
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PRELIMINARY HYDROGEOLOGIC INVESTIGATION

FOR

MMSA EAGLE BASE LODGE DEVELOPMENT

MAMMOTH LAKES, CALIFORNIA

MARCH 31, 2006
PROJECT NO. 3.30644.1

Prepared By:

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LIST OF ATTACHMENTS

1. PURPOSE AND SCOPE

This report presents the results of a preliminary hydrogeologic investigation for the proposed commercial/residential project to be located west to northwest of the intersection of Meridian Boulevard and Majestic Pines Road, adjacent to the Juniper Ridge Development in Mammoth Lakes, Mono County, California (Figures 1, 2 and 3). The purpose of this investigation was to investigate the site's existing hydrogeologic conditions in order to provide professional opinions and recommendations concerning the following:

- Assessment of existing hydrologic setting and groundwater budget.
- Potential impacts of dewatering during construction and operation to surrounding vegetation.
- Monitoring and Mitigation measures to reduce dewatering impacts.

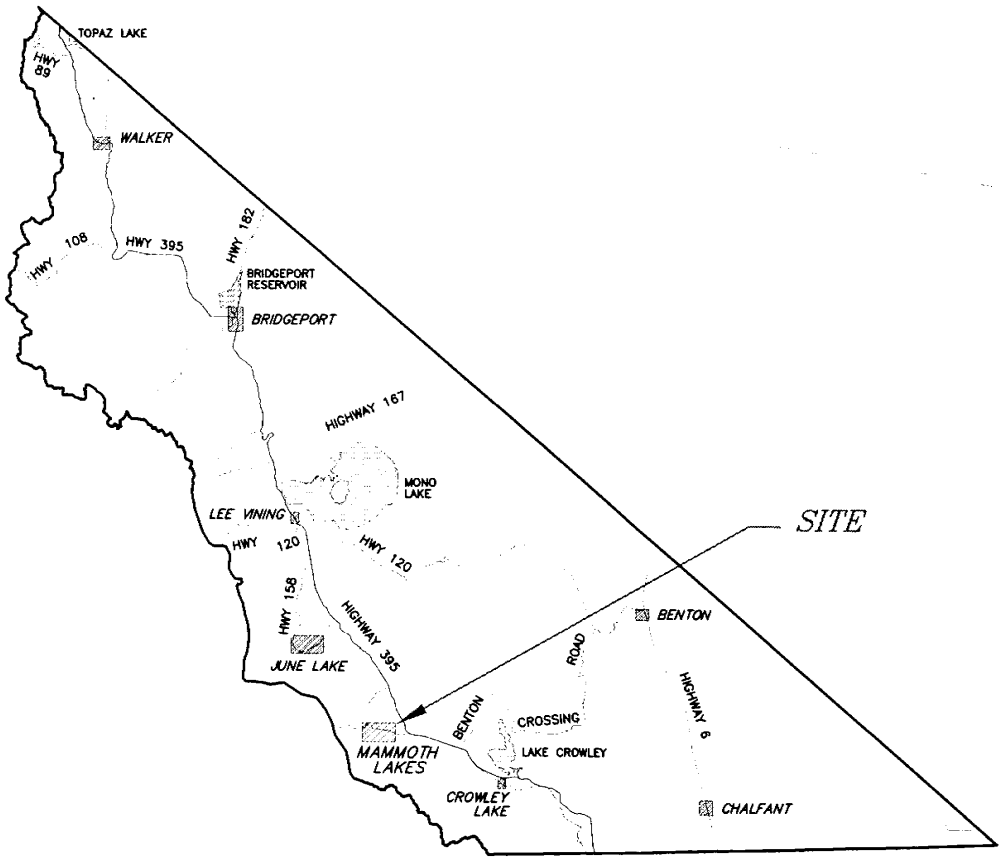
The scope of this investigation included a review of available geologic, hydrologic and hydrogeologic literature as well as field work which included water level monitoring and pump testing of on-site existing piezometers.

2. SITE DESCRIPTION

The semi-rectangular to "shoe" shaped site is located west to northwest of the intersection of Meridian Boulevard and Majestic Pines Road, adjacent to the Juniper Ridge Development in Mammoth Lakes, Mono County, California (37.6362° N, 118.9890° W). The majority of the site is occupied by a privately owned asphalt paved parking area with associated utilities. However, portions of the site to the northwest and west include undeveloped and lightly improved property owned by the United States Forest Service (USFS).

In general, the subject site slopes gradually toward the east/northeast. Ground surface elevations range from approximately 8081' MSL in the northwest corner of the site to approximately 8064' MSL in the northeast. Details of the topography are shown on Figure 4. Drainage is controlled by the topography such that site runoff flows east at approximately 5.3 percent.

Vegetation surrounding the parking area consists of a light growth of shrubs with few trees. Whereas vegetation within the USFS property consists of a light to moderate growth of grasses, shrubs and trees. This site is **not** located on a wetland. It is also not on a water of the state as identified by a blue line on the USGS Quad maps.



MONO COUNTY

CALIFORNIA

SITE REGIONAL MAP PROPOSED EAGLE LODGE DEVELOPMENT	
SCALE: NTS	DATE: 3/2006
DRAWING: 3.30644.1_FIG1.DWG	DRAWN BY: HDD
JOB NO.: 3.30644.1	FIGURE: FIGURE 1

3. PROPOSED DEVELOPMENT

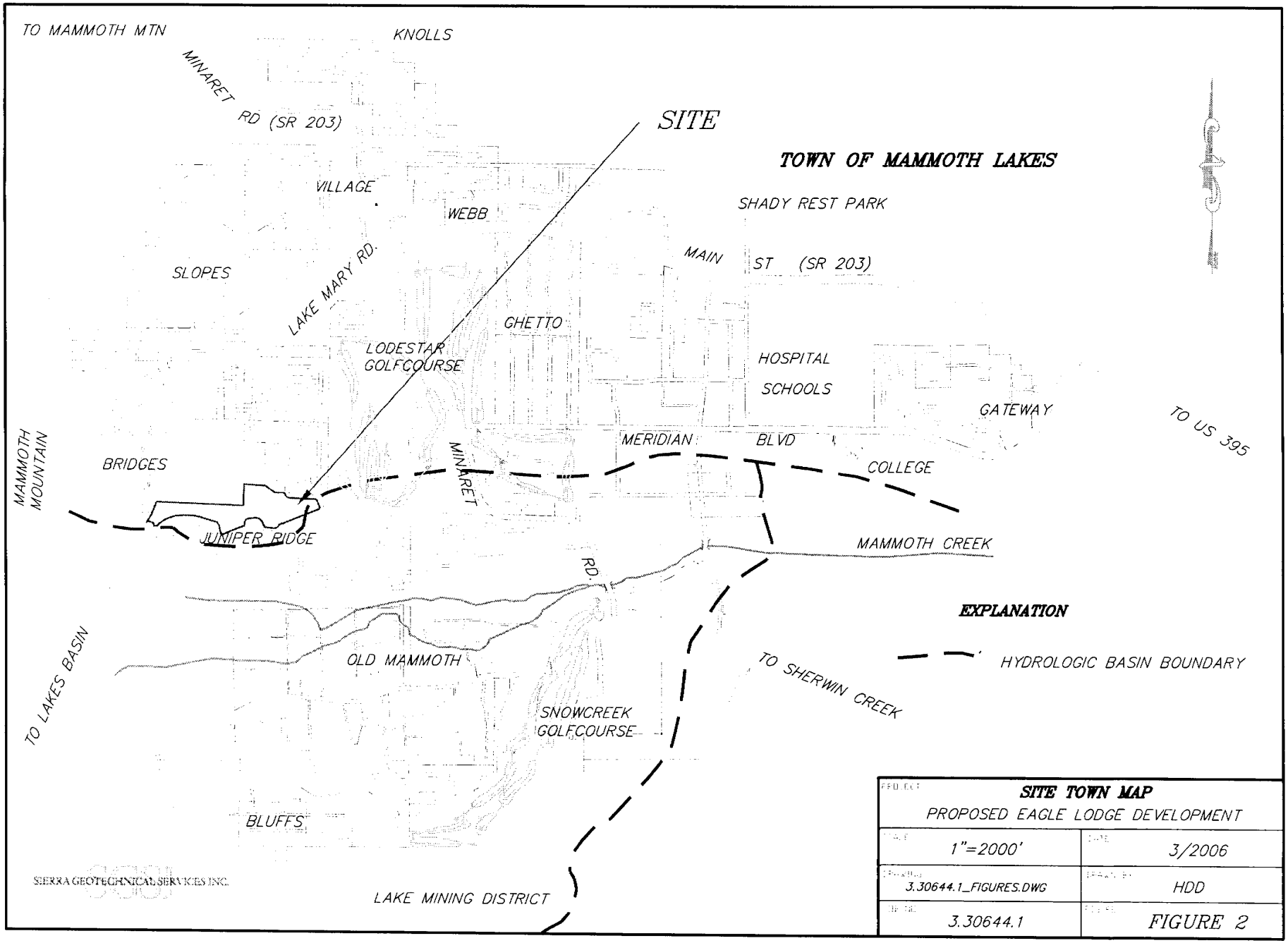
Based upon a review of the Request for Proposal distributed by the Mammoth Mountain Ski Area as well as the Eagle Lodge Base Area Development preliminary design prepared by Gensler Architecture, it is our understanding that the proposed project will likely include the construction of a 40,000 sqft. day lodge, 135,000 sqft. of mixed use residential and commercial facilities, structured parking, an ice rink, paved access drives and vehicular drop off areas, as well as associated utilities and other appurtenances. At least 1 to 2½ levels of underground parking are anticipated.

Foundations systems, although not yet designed, will likely consist of concrete perimeter footings with a concrete slab-on-grade, supporting either reinforced concrete block or reinforced concrete walls below grade, with either a concrete or conventional framing superstructure. Grading will likely include a maximum excavation to approximately 30-feet below ground level for the garage area. As previously noted, this project is in the design process and detailed plans for construction are currently not available. SGSI should review grading and foundation plans prior to construction in order to assure that they will be in conformance with our recommendations.

4. GEOLOGIC AND HYDROLOGIC CONDITIONS

The project site is located within the Sierra Nevada province, a generally north to northwesterly trending, asymmetric, and tilted fault-block, bordered on the east by the Sierra Nevada frontal-fault system. Predominant basement rock types of the Sierra Nevada include Cretaceous granitics with associated Paleozoic roof pendants along the west margin of Mono Basin, and to a lesser degree, Paleozoic meta-sedimentary formations mantled by Pleistocene glacial tills.

More specifically, the project site is located at the southwestern edge of the Long Valley caldera near the eastern flank of the Sierra Nevada. The caldera (collapsed volcano) is an east-west elongate, oval depression formed approximately 760,000 years ago with continued volcanic activity to the present (Bailey, 1989). The pre-volcanic basement rock in the Mammoth Lakes area is predominantly Mesozoic granitic rocks of the Sierra Nevada batholith. The batholith is a series of intrusions that displaced overlying ancient sedimentary sea floor rocks (roof pendants) during the Jurassic and Cretaceous Periods. Piedmont glaciation occurred throughout the Pleistocene leaving a mantle of glacial till covering the basement and volcanic rocks throughout the area now occupied by the Town of Mammoth Lakes.



SITE TOWN MAP	
PROPOSED EAGLE LODGE DEVELOPMENT	
1"=2000'	3/2006
3.30644.1_FIGURES.DWG	HDD
3.30644.1	FIGURE 2

Review of the exploratory geothermal well data and preliminary interpretations published by Diment and Urban (1990) indicates that glacial till with minor interbeds of basalt extend down to approximately 350-feet below the ground surface in close proximity to the subject site. Based on a lithologic log of Mammoth Lakes Geothermal Reservoir Assessment Project (MLGRAP) Well #2, volcanic basalt and rhyolite material were found in the remainder of the well to an approximate depth of 1,610-feet. The approximate location of MLGRAP Well #2 is 37.6456° north, 118.9733° west, and elevation 7861-feet mean sea level (Figure 5).

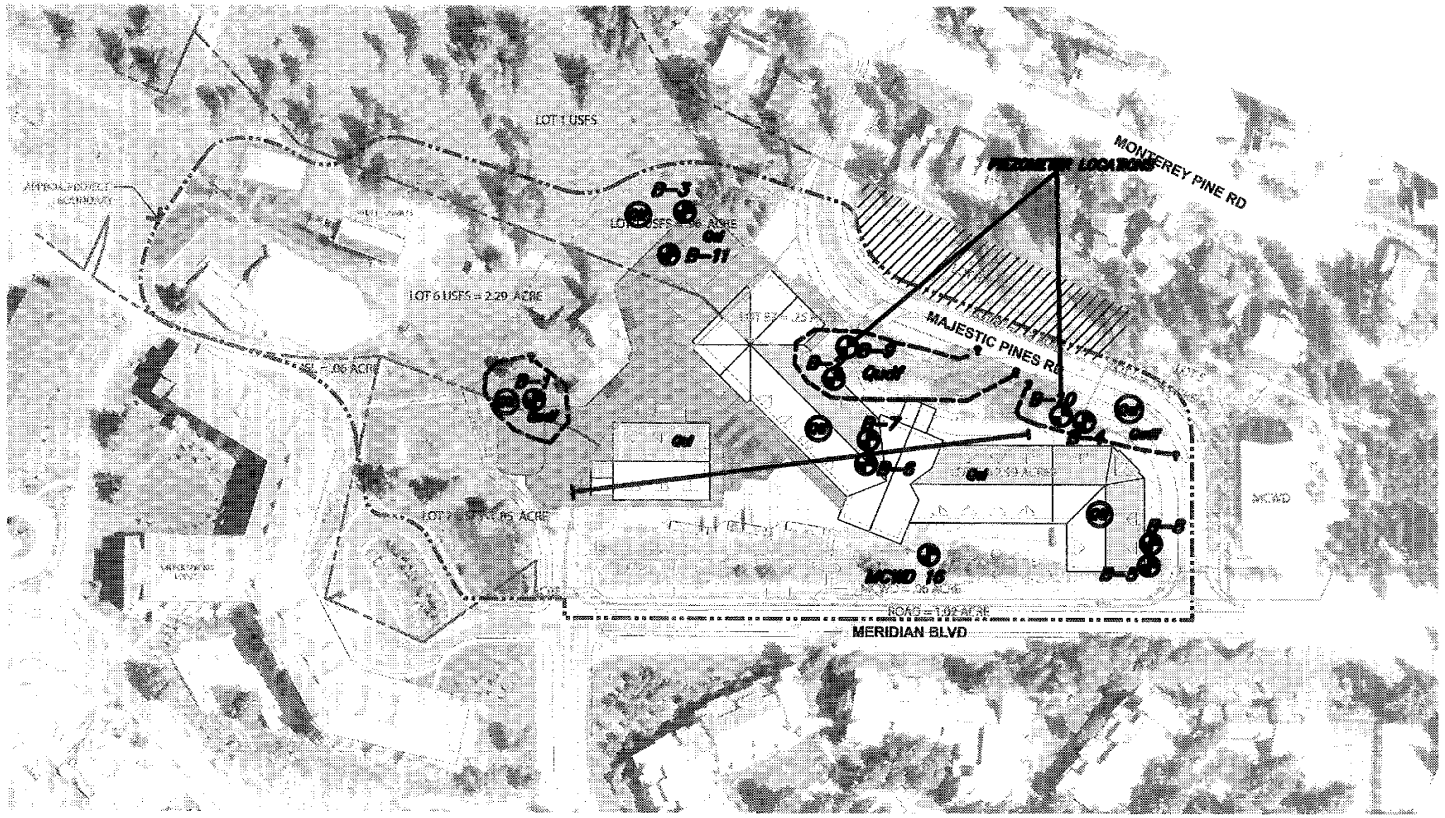
Based upon a review of the above referenced report the site is not located within any "Earthquake Fault Zones" or Alquist-Priolo Hazard Zones. The closest active fault to the site is the Hartley Springs fault (M_w~6.6) located approximately 0.2 mi (0.4 km) west/northwest of the subject site (SGSI, 2005).

4.1 Regional Hydrologic Setting

The subject site is regionally located within the surface waters of Mammoth Basin, which is composed of six smaller drainage basins, or watersheds, that are ultimately tributaries to both the Owens River and Crowley Lake (CDWR, 1973). More specifically the site is located in the Upper Mammoth Creek watershed (MCWD, 2005a). According to the California's State Water Quality Resources Control Board, Mammoth Basin is part of Section 603.10 of Long Subunit No. 10 of Owens Hydrologic Unit No. 3, located upstream of Crowley Lake (Lahontan, 1994). Crowley Lake is listed as a water body having impaired water quality according to the List of Water Quality Limited Segments, as outlined in Section 303(d) of the federal Clean Water Act (P.L. 92-500, as amended).

4.2 Local Groundwater

Groundwater underlying the site generally trends in the direction of the topographic gradient, which in this case is east/northeast. According to *USGS Water Resources Investigations Report 85-4183* (Farrar et al., 1985), depth to groundwater beneath the site was approximated at 250 feet below the ground surface (bgs). However, according to Mammoth Community Water District (MCWD) water well records, the depth to the permanent static groundwater aquifer is approximately 450 feet bgs (MCWD, 2005a) as recorded from MCWD Well No. 16, which is located within an easement adjacent the southern property line (Figure 3).



LEGEND

Qudf	UNDOCUMENTED FILL
Qal	ALLUVIUM (CIRCLED WHERE BURIED)
Qti	GLACIAL TILL (CIRCLED WHERE BURIED)
	GEOLOGIC CONTACT QUERIED WHERE UNCERTAIN
B--11	APPROXIMATE LOCATION OF EXPLORATORY BORING
S--1	APPROXIMATE LOCATION OF SEISMIC TRAVERSE BY KLEINFELDER (1986)
MCWD 16	APPROXIMATE LOCATION OF MCWD WATER WELL NO. 16

Sierra Geotechnical Services

PROJECT: **SUBSURFACE GEOTECHNICAL MAP** MMSA EAGLE BASE LODGE	
SCALE: N.T.S	DATE: 7/2006
DRAWING: FIG3.DWG	DRAWN BY: BM
JOB NO.: 3.30644.1	FIGURE: FIGURE 3

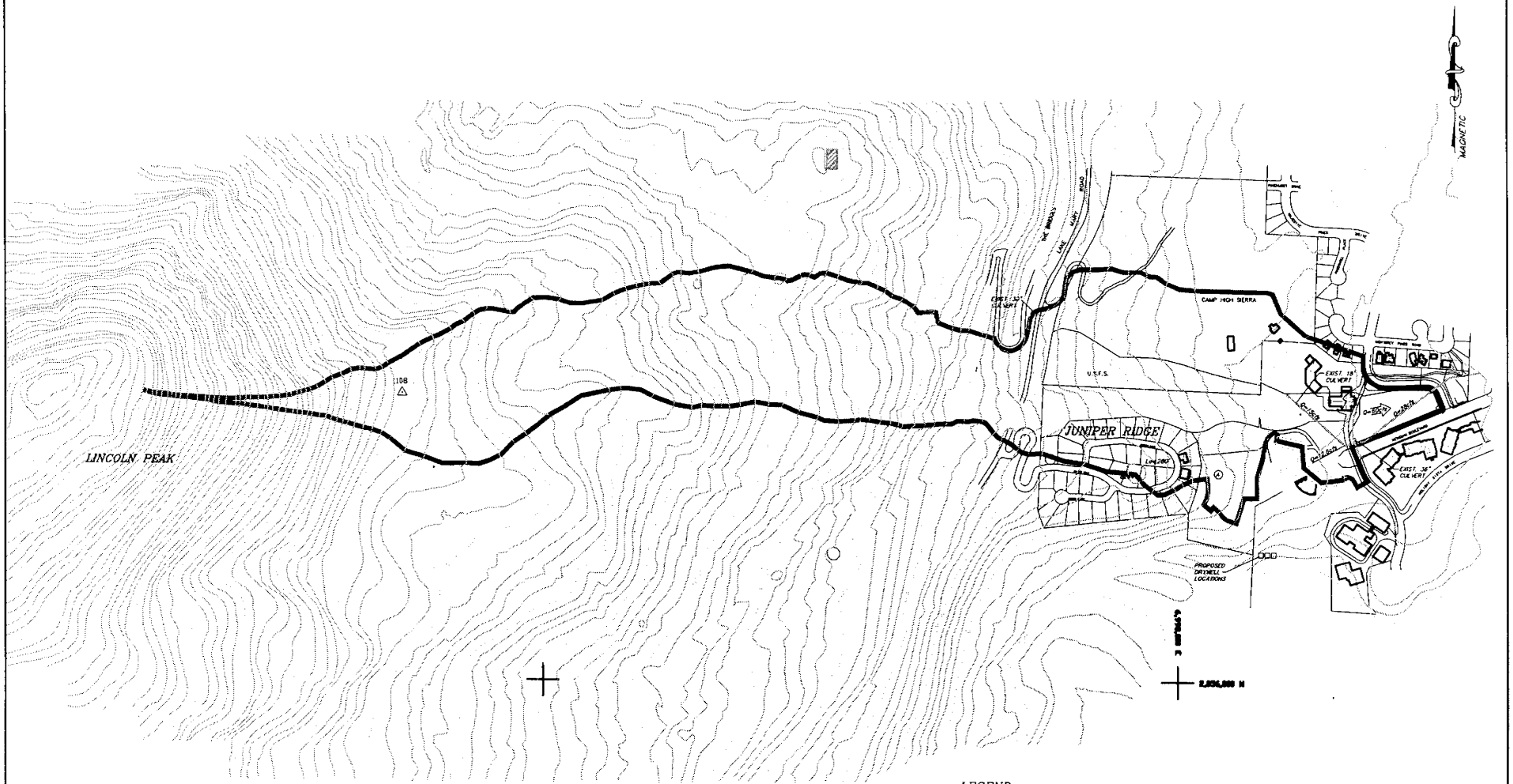
During the exploratory drilling conducted for the above referenced investigation light to heavy perched groundwater seepage was encountered in borings B-1, B-3, B-6 through B-7, and B-9 through B-11 at depths varying from approximately 4½-feet to 21-feet below grade (Appendix A). Zones of seepage varied based upon the subsurface lithology. In general, seepage occurred above and/or below the well cemented zones where the grain size as well as the amount gravels and cobbles increased.

Two thirty-foot deep piezometers with two-inch diameter casings were installed within Borings B-9 and B-10. Depth to perched groundwater observed in the wells was approximately 2 to 4 feet bgs. The locations of each well are shown on Figure 3.

4.3 Preliminary Groundwater Budget

An estimate of the preliminary groundwater budget for the site is based primarily on the relatively small hydrographic basin, or catchment area, that surrounds the site (Figure 4). The area of this basin measures approximately 128.8 acres. Based on estimated precipitation and evapotranspiration data provided by CDWR (1973), approximately 210 acre-feet per year of precipitation is available to recharge the basin surrounding the site, but approximately 357 acre-feet per year of water is removed by the MCWD. Removal is from two of their horizontal wells that are located beneath Lake Mary Road, directly upslope and to the west of the site, and from MCWD Well No.16.

Between 1995 and 2000 Well 16 has been reported to have static levels ranging from 414 to 484 feet bgs, pumping levels between 471 and 492 feet bgs, pumping discharge rates of 350 to 500 gallons per minute (gpm), and a projected annual pumping rate of approximately 0 acre-feet during normal conditions and 135 acre-feet during drought conditions (MCWD, 2005b). Water within the well and therefore the surrounding area is likely replenished from deep recharge emanating from the fractured Lincoln Peak volcanics underlying the glacial material as opposed to percolation from shallow run-off (MCWD 2005a).



LEGEND

EXISTING GROUND CONTOUR

DRAINAGE BASIN AREA BOUNDARY

Q=10cfs — ESTIMATED FLOW FROM TRIBUTARY AREA OR within STORMDRAIN FROM A 100-YEAR, WINTER STORM
cfs = CUBIC FEET PER SECOND

G:\SGIDocs\Brochure\SGILogo.jpg

SITE HYDROGRAPHIC BASIN MAP PROPOSED EAGLE LODGE DEVELOPMENT	
1"=600'	3/2006
3.30644.1_FIG4.DWG	HDD
3.30644.1	FIGURE 4

5. FIELD TESTING

SGSI performed a pump test with an Envirotech ES-200 Purger with a power booster on March 24, 2006 within Boring B-9 at the site. This test yielded a sustained pumping rate of 1.62 gallons per minute (gpm) for a duration of 35 minutes. Drawdown in the well was estimated at 3 feet, and the well water recharged to its static level at 4.05 feet bgs within 4.5 minutes of measured recovery time. Based on these data, the groundwater underflow through the proposed Eagle Lodge building footprint was estimated using the following formula: $Q = kia$.

Where: Q = flow rate (gpd) through the excavation footprint
k = hydraulic conductivity
i = hydraulic gradient (vertical/horizontal)
a = area of the building excavation footprint
Δs = change in drawdown per one log cycle of time
b = saturated thickness of the aquifer penetrated by the well

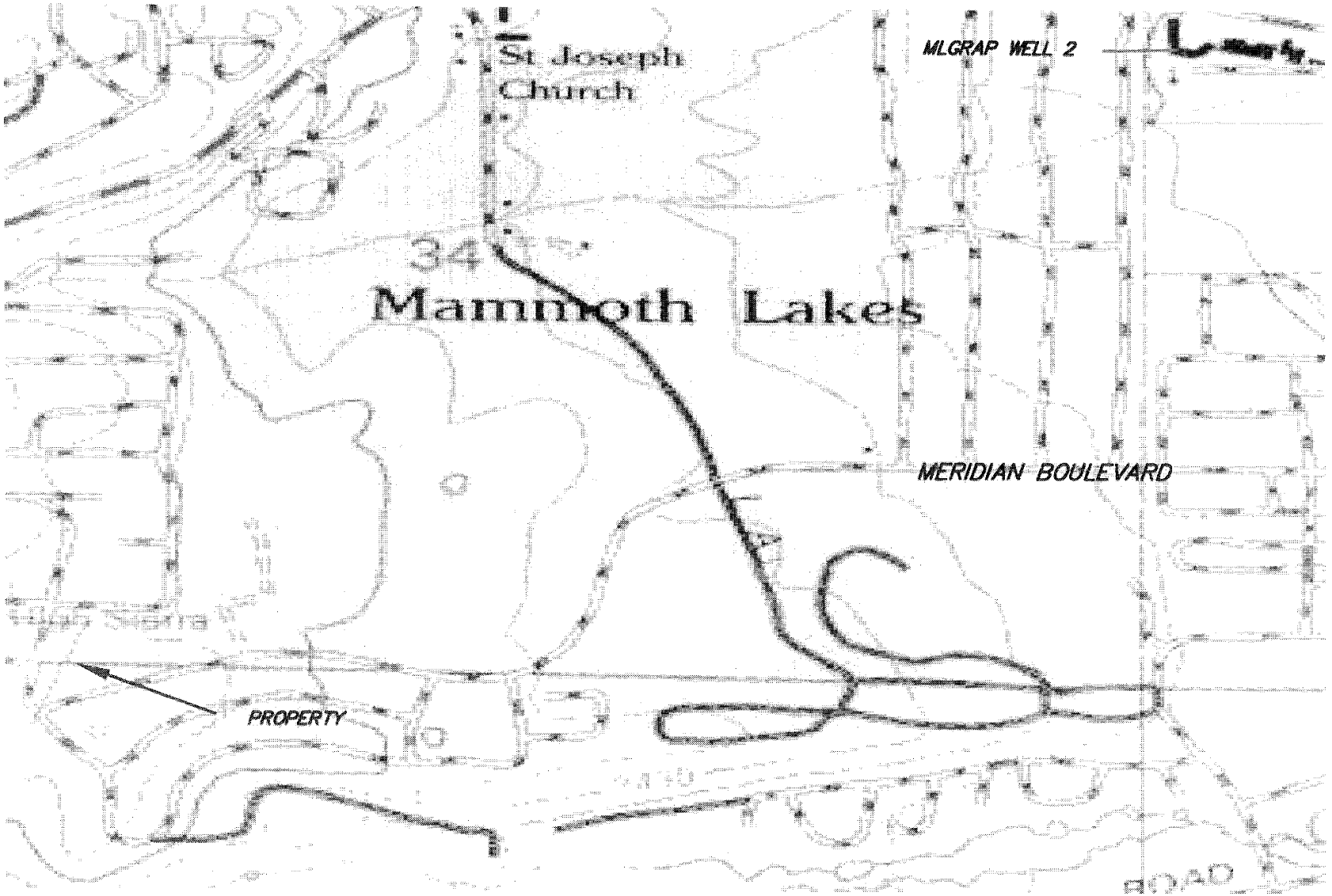
Substituting the measurements obtained in the field:

T = transmissivity (gpd/ft^2) $T = 264 \cdot Q / \Delta s = 143$ gpd/ft = 19 ft^2/day
$k = T/b = 0.63$ ft/day
$i = 0.33$
$a = 100{,}154$ ft^2

$Q = 1{,}312$ ft^3/day = 9,815 gpd

The recorded underflow is comparative to results obtained by SGSI in the fall of 1997 from a monitoring well (B-4, 1997) adjacent the Juniper Springs Lodge development. The results of this pump test indicated a sustained pumping flow of 1.2 gallons per minute (gpm), which yielded a hydraulic conductivity of 0.5 to 0.7 feet per day. This well along with the 3 others placed prior to development of Juniper Springs were unfortunately destroyed during construction of the lodge. The approximate location of well B-4 is shown on Figure 6.

It can be anticipated that approximately 9,815 gpd of water will move into the excavation every day, subject to seasonal variation and to local precipitation events. Please note that these readings were collected prior to the beginning of the spring/summer snowmelt run-off season. Groundwater flows are anticipated to be considerably higher during the run-off period. Additional testing should be performed on a monthly basis during the run-off period in order to acquire maximum flow rate data.



SOURCE: US GEOLOGICAL SURVEY
OLD MAMMOTH, CALIFORNIA 7.5 QUADRANGLE MAP, 1994

Sierra Geotechnical Services

SUBJECT SITE LOCATED AT:
LATITUDE 37.6362° NORTH, LONGITUDE −118.9890° WEST

PROJECT: GEOTHERMAL WELL LOCATION MMSA EAGLE BASE LODGE	
SCALE: 1"=2400'	DATE: 3/2006
DRAWING: FIGURE 5.DWG	DRAWN BY: jaa
JOB NO.: 3.30644.1	FIGURE: FIGURE 5

5.1 Drawdown

During the pump test, water levels were continuously recorded in boring B-10, located "down stream" and to the east (Figure 3), to ascertain whether removal of water from B-9 would have an affect on water levels in B-10. Prior to the test water levels in B-10 were recorded at approximately 2 feet bgs. During the testing period the change in water levels in B-10 were negligible (Appendix B).

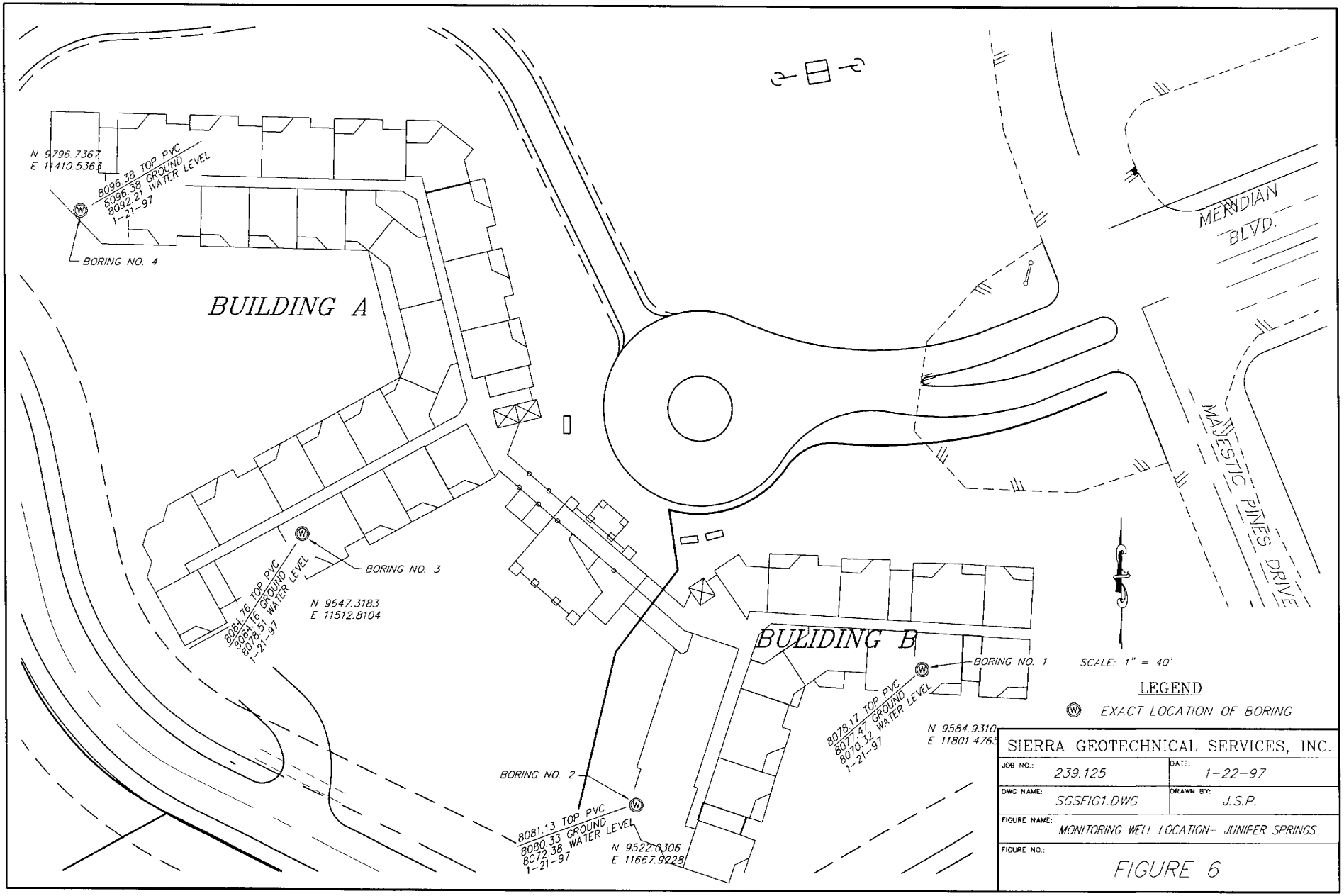
6. DEVELOPMENT IMPACT

The field data acquired for this study was limited to the use of the existing 2 inch diameter piezometers and their relative distance to each other for acquiring measurements. As previously noted additional monitoring wells surrounding the site had been destroyed. Although no drawdown impact was observed during the field testing, the use of just two piezometers to assess drawdown may not accurately reflect dewatering conditions during construction.

However, based upon the calculated flow rates dewatering during construction should not adversely impact the up-gradient wetland vegetation located outside the project boundary to the northwest of the ski area. Although flow rates will vary depending upon seasonal conditions shallow groundwater flow through the site area should be continuous and not static. Because flow rates are relatively large, and the water condition is not static the bypass/removal of water from the proposed down-gradient construction area should not adversely affect any up-gradient vegetation.

6.1 Monitoring and Mitigation

The water levels within the existing wells should be monitored on a monthly basis (especially during the snow melt run-off periods) to further assess seasonal flow rates. In addition, prior to construction, we recommend that at least 2 monitoring wells be installed adjacent or up gradient of the proposed construction area to aid in the recording of groundwater depths and flow rates. In the event that groundwater drawdown from construction is observed, appropriate mitigation measures shall be designed to protect proximal vegetated areas and employed in conformance with Regional Water Quality Control Board criteria.



SIERRA GEOTECHNICAL SERVICES, INC.	
JOB NO.: 239.125	DATE: 1-22-97
DWG NAME: SGSFIG1.DWG	DRAWN BY: J.S.P.
FIGURE NAME: MONITORING WELL LOCATION- JUNIPER SPRINGS	
FIGURE NO.: FIGURE 6	

We further recommend that the dewatering and prevention of moisture intrusion recommendations contained within the above referenced geotechnical investigation report be adhered to during site development.

Please note that all water removed from the site should be re-introduced back into the down stream drainage system (provided it is free of contaminants and silt) so that down-gradient vegetation and recharge are not negatively affected.

7. LIMITATIONS

This report has been prepared for the sole use and benefit of our client. The conclusions of this report pertain only to the site investigated. The intent of the report is to advise our client of the geologic and geotechnical recommendations relative to the future development of the proposed project. It should be understood that the consulting provided and the contents of this report are not perfect. Any errors or omissions noted by any party reviewing this report, and/or any other geotechnical aspects of the project, should be reported to this office in a timely fashion. The client is the only party intended by this office to directly receive this advice. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Sierra Geotechnical Services Incorporated from and against any liability, which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Sierra Geotechnical Services Incorporated.

Conclusions and recommendations presented herein are based upon the evaluation of technical information gathered, experience, and professional judgment. Other consultants could arrive at different conclusions and recommendations. Final decisions on matters presented are the responsibility of the client and/or the governing agencies. No warranties in any respect are made as to the performance of the project.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings within this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

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APPENDIX A

EXPLORATORY BORING LOGS

A subsurface field investigation was performed on October 6th, and November 8th and 9th 2005, which included the excavation of eleven 8-inch diameter hollow stem and air rotary continuous flight borings in the proposed development areas. Logs of the exploratory borings are presented herein. The approximate locations of the exploratory borings are shown on Subsurface Geotechnical Map (Figure 3).

Six borings were excavated by a CME-55 truck mounted drill rig on October 6th 2005 (B-1 through B-6). Rock refusal was encountered at relatively shallow depths prior to the anticipated foundation depth. Following this drilling a Schramm T660H Rotodrill air rotary drill rig was brought in on November 8th and 9th, 2005 to complete an additional 5 borings to the anticipated foundation depths (B-7 through B-11).

SIERRA GEOTECHNICAL SERVICES INC

BORING LOG

Project Name: MMSA Eagle Base Lodge
Boring No: B-1
Drill Rig Type: CME 55 8-inch Hollow Auger Stem Auger
Driller: Andressen Exploration Drilling
Boring Loc: Northwest end of parking lot

Date: 10/6/05
Project No: 3.30644
Elevation: 8079' MSL
Logged By: PS

Depth (ft.)	Sample Type	Graphic Log	Blow Count	U.S.C.S	DESCRIPTION	Laboratory Tests
0				SP	**Undocumented Fill** Brown, moist, loose to medium dense, fine to coarse grained SAND.	
5	SPT		82/3"	SP-SM	**Glacial Deposits** Grayish brown, moist to wet, very dense, fine to coarse SAND, abundant gravels and boulders. Rock refusal.	
8	SPT		57/1"		Drill rate - 2 inches per 30 min.	
					Total depth = 8' 1". Groundwater encountered at approximately 4-½ feet. Backfilled 10/6/05.	

BORING LOG

Project Name: MMSA Eagle Base Lodge
Boring No: B-2
Drill Rig Type: CME 55 8-inch Hollow Auger Stem Auger
Driller: Andressen Exploration Drilling
Boring Loc: North end of parking lot within dirt area

Date: 10/6/05
Project No: 3.30644
Elevation: 8074' MSL
Logged By: PS

Depth (ft.)	Sample Type	Graphic Log	Blow Count	U.S.C.S	DESCRIPTION	Laboratory Tests
0				SP	**Undocumented Fill** Grayish brown, loose, fine to coarse grained SAND, few cobble clasts, boulders and asphalt debris. Rock refusal at 3-feet. Drill rate - 0 inches per 20 min. *Total depth = 3-feet. No groundwater encountered.* *Backfilled 10/6/05*	

MITAKA GEOTECHNICAL SERVICES INC.

BORING LOG

Project Name: MMSA Eagle Base Lodge
Boring No: B-3
Drill Rig Type: CME 55 8-inch Hollow Auger Stem Auger
Driller: Andressen Exploration Drilling
Boring Loc: Northwest area of site within USFS property

Date: 10/6/05
Project No: 3.30644
Elevation: 8080' MSL
Logged By: PS

Depth (ft.)	Sample Type	Graphic Log	Blow Count	U.S.C.S	DESCRIPTION	Laboratory Tests
0				SP	**Alluvium** Dark gray to black, moist to wet, silty, loose to medium dense, very fine to medium grained SAND. Few gravels and cobbles.	
5	SPT		9 50/4"		Abundant boulders. Rock refusal at 6-feet.	
					Total depth = 6-feet. Groundwater encountered at approximately 5-feet. Backfilled 10/6/05	

BORING LOG

Project Name: MMSA Eagle Base Lodge | **Date:** 10/6/05
Boring No: B-4 | **Project No:** 3.30644
Drill Rig Type: CME 55 8-inch Hollow Auger Stem Auger | **Elevation:** 8065' MSL
Driller: Andressen Exploration Drilling | **Logged By:** PS
Boring Loc: Northeast corner of site north of pavement

Depth (ft.)	Sample Type	Graphic Log	Blow Count	U.S.C.S	DESCRIPTION	Laboratory Tests
0				SP	**Undocumented Fill** Grayish brown, loose, fine to coarse grained SAND, few cobble clasts, boulders and asphalt debris. Rock refusal at 3-feet. Drill rate - 0 inches per 30 min.	
					Total depth = 3-feet. No groundwater encountered. *Backfilled 10/6/05*	

BORING LOG

Project Name: MMSA Eagle Base Lodge
Boring No: B-5
Drill Rig Type: CME 55 8-inch Hollow Auger Stem Auger
Driller: Andressen Exploration Drilling
Boring Loc: Southeast corner of site south of pavement

Date: 10/6/05
Project No: 3.30644
Elevation: 8066' MSL
Logged By: PS

Depth (ft.)	Sample Type	Graphic Log	Blow Count	U.S.C.S	DESCRIPTION	Laboratory Tests
0	SPT		50/1"	SP-SM	**Asphalt Concrete 3"+ 3" Base** **Alluvium** Brown, moist, medium dense, silty, fine to coarse SAND, few cobble clasts, few boulders. Slow drilling at approximately 3-feet. Rock refusal at 4' 1"	
					Total depth = 4' 1". No groundwater encountered. *Backfilled 10/6/05*	

SIERRA GEOTECHNICAL SERVICES INC

BORING LOG

Project Name: MMSA Eagle Base Lodge
Boring No: B-6
Drill Rig Type: CME 55 8-inch Hollow Auger Stem Auger
Driller: Andressen Exploration Drilling
Boring Loc: East central area of site in pavement

Date: 10/6/05
Project No: 3.30644
Elevation: 8070' MSL
Logged By: PS

Depth (ft.)	Sample Type	Graphic Log	Blow Count	U.S.C.S	DESCRIPTION	Laboratory Tests
0					**Asphalt Concrete 3"+ 3" Base**	
					Alluvium	
				SP	Grayish brown to brown, moist to wet, medium dense, fine to coarse grained SAND, few cobble clasts, few boulders.	
5	SPT		42			
			50/5"		Slow drilling at 5'. Rock refusal at 6-feet.	
					Total depth = 6-feet. Groundwater encountered at 4½-feet.	
					Backfilled 10/6/05	

BORING LOG

Project Name: MMSA Eagle Base Lodge
Boring No: B-7
Drill Rig Type: Schramm T660H
Driller: Test America Drilling Corp.
Boring Loc: South central area of site in pavement

Date: 11/8/05
Project No: 3.30644
Elevation: 8070' MSL
Logged By: PS

Depth (ft.)	Sample Type	Graphic Log	Blow Count	U.S.C.S	DESCRIPTION	Laboratory Tests
0	CAL		38	SM	**Alluvium** Grayish brown, moist to wet, medium dense, silty, fine to coarse SAND, with few cobble clasts and large boulders minor debris. Minor seepage at approximately 4½-feet.	NR
5	SPT		32 50/5"	SP	**Glacial Deposits** Reddish brown to olive brown, moist, medium dense to very dense, fine to coarse SAND, with cobble clasts and few small boulders. Moderately indurated.	
10	BULK				Moderate groundwater seepage at approximately 10-feet.	Sieve
15	CAL		50/4"			NR
20					Well indurated at approximately 16-feet. Slow drilling. Drill rate 1½-feet in 20 minutes. Moderately indurated at approximately 21-feet. Heavy groundwater seepage.	
25	SPT CAL		30 50/4" 50/1"	SP-SM	Very dense, silty, fine to coarse SAND with abundant gravels, few cobble clasts and boulders.	NR
30	SPT		50/3"			
					Total depth = 30-feet. Groundwater encountered at approximately 4½, 10, and 21-feet. Good air circulation from 12 to 27-feet. Lost air at 27-feet. Total drill time 3 hours 10 min. Backfilled 11 8 05.	

SIERRA GEOTECHNICAL SERVICE, INC.

BORING LOG

Project Name: MMSA Eagle Base Lodge
Boring No: B-8
Drill Rig Type: Schramm T660H
Driller: Test America Drilling Corp.
Boring Loc: Southeast end of parking lot

Date: 11/8/05
Project No: 3.30644
Elevation: 8066' MSL
Logged By: PS

Depth (ft.)	Sample Type	Graphic Log	Blow Count	U.S.C.S	DESCRIPTION	Laboratory Tests
0				SP	**Alluvium** Brown, moist, medium dense, fine to coarse SAND with abundant gravels. Large boulder at 3-feet.	Corrosivity, Sieve R-value
5	SPT		36 50			
	BULK			SP-SM	**Glacial Deposits** Grayish-brown to gray, moist, very dense, silty, very fine to coarse SAND with cobble clasts and few boulders.	
10	SPT		50/4"			
15	SPT		50/5"			
					Total depth = 15'5". Groundwater not encountered. Total drill time = 40 min. Backfilled 11 9 05.	

BORING LOG

Project Name: MMSA Eagle Base Lodge
Boring No: B-9
Drill Rig Type: Schramm T660H
Driller: Test America Drilling Corp.
Boring Loc: North end of parking lot within dirt area

Date: 11/8/05
Project No: 3.30644
Elevation: 8076' MSL
Logged By: PS

Depth (ft.)	Sample Type	Graphic Log	Blow Count	U.S.C.S	DESCRIPTION	Laboratory Tests
0				SP	**Undocumented Fill** Grayish-brown, moist, medium dense, fine to coarse SAND, with cobble clasts and boulders. Minor debris. Boulder at 3 to 4½-feet	
5	SPT		9 50/6"	SP-SM	**Glacial Deposits** Light grayish-brown to brown, moist, very dense, silty, very fine to coarse SAND with cobble clasts and boulders. Approximate 8 to 10-inch well inurdated bed at 7-feet.	
10	SPT		50/4"			
15	BULK			SM	Gray, moist, very dense, silty, fine to coarse SAND, with cobbles, and boulders. Groundwater seepage at approximately 17-feet.	Direct Shear Max. Density, Sieve
20	BULK				Well indurated from approximately 17 to 23-feet.	Sieve
25	SPT		50/5"	SP	Dense to very dense, fine to coarse SAND.	
30	BULK			SM	Gray, moist, very dense, silty, very fine to coarse SAND. Well indurated.	Direct Shear Max. Density Corrosivity Sieve
					Total depth = 30-feet. Groundwater seepage encountered at 17-feet. *Piezometer installed to 30-feet. Total drill time 2 hours. Backfilled 11 9 05.*	

BORING LOG

Project Name: MMSA Eagle Base Lodge
Boring No: B-10
Drill Rig Type: Schramm T660H
Driller: Test America Drilling Corp.
Boring Loc: Northeast end of site north of pavement, south of Majestic Pines

Date: 11/9/05
Project No: 3.30644
Elevation: 8065' MSL
Logged By: PS

Depth (ft.)	Sample Type	Graphic Log	Blow Count	U.S.C.S	DESCRIPTION	Laboratory Tests
0				SP-SM	**Undocumented Fill** Brown, moist, medium dense, silty, fine to coarse SAND, with cobble clasts, and boulders. Minor debris.	NR
5	SPT		26 50/6"	SP-SM	**Alluvium** Medium brown to light grayish brown, moist, medium dense. to dense, silty, fine to coarse SAND with cobble clasts and boulders. Boulder 3 to 6-feet.	
10	CAL BULK		50/3"	SP-SM	**Glacial Deposits** Grayish-brown to brown, moist to wet, very dense, silty, very fine to coarse SAND with cobble clasts and boulders. Heavy groundwater seepage at approxmately 8-feet.	
15	SPT		50/5"			
					Total depth 15'5" Heavy groundwater seepage encountered at approximately 8-feet. Piezometer installed to 30-feet. Drill time 1hr 30 min. Backfilled 11 10 05.	

BORING LOG

Project Name: MMSA Eagle Base Lodge
Boring No: B-11
Drill Rig Type: Schramm T660H
Driller: Test America Drilling Corp.
Boring Loc: Northwest end of parking lot within dirt, south of USFS property

Date: 11/9/05
Project No: 3.30644
Elevation: 8080' MSL
Logged By: PS

Depth (ft.)	Sample Type	Graphic Log	Blow Count	U.S.C.S	DESCRIPTION	Laboratory Tests
0				SM	**Alluvium** Dark grayish-brown, moist to wet, medium dense to dense, silty, fine to coarse SAND, with cobble clasts and boulders.	
					Large boulder at approximately 3 to 5-feet.	
5	SPT		23 50/5"		Groundwater seepage at approximately 5-feet.	
				SM	**Glacial Deposits** Grayish-brown, moist, very dense, silty, very fine to coarse SAND with abundant gravels, and few cobble clasts.	
10	SPT		50/6"		Well indurated bed to approximately 12-inches.	
					Few boulders.	
15	BULK					Sieve
20					Well indurated from approximately 19 to 22-feet.	
25	SPT		50/4"	SP-SM	Gray, moist, very dense, silty, fine to coarse SAND with cobble clasts.	
	BULK				Well indurated from approximately 27 to 30-feet.	Direct Shear Max. Density
30						
					Total depth 30-feet. Groundwater seepage encountered at approximately 5-feet. Drill time 2hrs 10 min. Backfilled 11 10 05	

APPENDIX B

PUMP TEST RESULTS

SIERRA GEOTECHNICAL SERVICES INC.
P.O. BOX 5024, MAMMOTH LAKES, CA 93546
(760) 934-3992; (760) 934-8832 Fax

PUMP TEST WORKSHEET

Site Name: Eagle Base Lodge Date: 3/24/06 Page: 1 of 1
Job No. 3.30644.14 Well No. B-9 Observer DD/BM

Time	Depth to Water	Pump Rate	Notes	Time	Depth to Water	Pump Rate	Notes
12:05	4.05'	-					
12:25	4.05'	-	Static				
12:40	NA	-					
12:50	NA	-					
12:58	NA	1.62					Pump Removed
0.00	6.2	Recovery (R)					
0.5 min	6.0	R					
1.5 min	5.5	R					
2 min	5.1	R					
2.5 min	4.95	R					
3 min	4.85	R					
3.5 min	4.7	R					
4 min	4.4	R					
4.5 min	4.05	R					

SIERRA GEOTECHNICAL SERVICES INC.

Site Name: Eagle Base Lodge

Job No. 3.30644.1

Location Code	Date	Time	Depth to Water	Previous Depth to Water	Measured By	Description of Measuring Point
B-10	3/24/06	12:25	2.1'	-	BM	Top of Pipe
B-10	3/24/06	12:30	2.11'	-	BM	Top of Pipe
B-10	3/24/06	12:35	2.1'	-	BM	Top of Pipe
B-10	3/24/06	12:40	2.1'	-	BM	Top of Pipe
B-10	3/24/06	12:45	2.11'	-	BM	Top of Pipe
B-10	3/24/06	12:50	2.1'	-	BM	Top of Pipe
B-10	3/24/06	12:55	2.1'	-	BM	Top of Pipe
B-10	3/24/06	12:58	2.1'	-	BM	Top of Pipe

SIERRA GEOTECHNICAL SERVICES INC. SGSI

TRANSMITTAL

To: MMSA
PO BOX 24
MAMMOTH LAKES, CA 93546

Date: March 31, 2006 Job No. 3.30644.1
Attention: Mr. Tom Hodges
Subject: Eagle Base Lodge

We are sending you: ☒ Attached ☐ Under Separate Cover
via: ☐ Mail ☐ Express Mail ☐ Federal Express ☐ Overnight ☒ Courier ☐ Pick Up

☐ Facsimile (total pages including this sheet -) Fax No.

the following items:	Description
2	Bound **Wet** Stamped Copies – Preliminary Hydro. Investigation
1	Unbound Xerox copy – Preliminary Hydro. Investigation

☐ For your review and comment ☒ For your files ☐ For approval ☐ For your signature

☐ For information and coordination ☐ For processing ☒ As requested For _____

Remarks:

Copies to:

By: Joe Adler

P.O. BOX 5024 • MAMMOTH LAKES, CALIFORNIA 93546 • (760) 934-3992 • FAX (760) 934-8832
214 W. LINE STREET, SUITE E • BISHOP, CALIFORNIA 93514 • (760) 873-4273 • FAX (760) 873-8024
sgsi@thainc.com

Preliminary Drainage Study

FOR

EAGLE LODGE

Owner Mailing Address:

Mammoth Mountain Ski Area
Post Office Box 24
Mammoth Lakes, CA 93546
Phone: (760) 934-2571
Attn: Tom Hodges x3243

Construction Project Address:

Eagle Lodge
Meridian Boulevard & Majestic Pines
Mammoth Lakes, Ca 93546

Date of Amended Report: August 2006

Job No. 1737.2

Engineer:
triad/holmes associates

Post Office Box 1570
Mammoth Lakes, Ca 93546
Phone: (760) 934-7588
Fax: (760) 934-5619
triad@THAinc.com
David Laverty, LS, Principal
Tom Platz, RCE, Principal

REGISTERED PROFESSIONAL ENGINEER
PAUL EDWARD ROTEN
NO. C 56891
EXP. 6/30/07
CIVIL
STATE OF CALIFORNIA

Paul E. Roten, P.E. C56891

August 11, 2006
Date

Eagle Lodge

Table of Contents

APPENDIX

[1]Mammoth Lakes Storm Drainage Master Plan, Prepared for Mono County Public Works Department, July 1984, Brown and Caldwell and Triad Engineering, Plate 8 and portion of Table 6-1

[2]Design Manual, Mammoth Lakes Storm Drainage and Erosion Control, Prepared for Mono County Public Works Department, July 1984, Brown and Caldwell and Triad Engineering, excerpts as referenced

[3]Water Quality Control Plan for the Lahontan Region, North and South Basins, prepared by the State of California, Regional Water Quality Control Board, Lahontan Region, Chapter 4.8

Preliminary Drainage Study – Eagle Lodge

1 - Project Description

The Eagle Lodge project is located at the west end of Meridian Boulevard. Refer to Vicinity Maps in Appendix A.

The project site encompasses approximately 8.68 acres. This includes the area of the existing temporary Eagle Lodge Base Facility (tent), the existing parking area, parts of Meridian Boulevard, and Majestic Pines Road, the Bike Path route, as well as areas where utilities may be installed. Since this project is in its conceptual phase, the area identified may be revised during the design process, but should stay within the acreage we have considered.

Presently this site is almost completely disturbed. It includes Majestic Pines Road, Meridian Boulevard, a 2 acre parking lot, the temporary Eagle Lodge Base Facility, lift towers and other miscellaneous facilities. Areas that do not include improvements are generally disturbed. The project site drainage sheets from west to east along slopes of 1% to 10%. Site elevations range between 8,100 feet and 8060 feet above mean sea level.

The proposed project consists of the removal of the temporary Eagle Lodge Base Facility and parking lot, reconstruction of portions of Majestic Pines Road and Meridian Boulevard, construction of new Base Lodge Facilities and paved surfaces in an area that includes the existing parking lot, plus utility work, and grading in the surrounding area. The new Base Lodge Facility will include an underground parking structure, commercial property, condominium project, associated transportation, parking and utilities. Large earthmoving equipment will be used in this construction.

A sketch of the proposed development is shown on Exhibit 5 in Appendix A.

2 - Watershed and Hydrologic Conditions

The project is located completely within the Town of Mammoth lakes Tributary Subarea III-5 as identified in the Mammoth Lakes Storm Drainage Master Plan[1]. Offsite storm water enters the site in sheet flow and in a natural swale from the west. The area tributary used in the calculations for this report has been determined using the Mammoth Lakes Storm Drainage Master Plan[1] and new topographic information from the Town aerial photo maps prepared in the year 2000. Also a portion of this subarea bypasses the site and is therefore not tributary. Final tributary areas will be determined during final design as inlets are placed in their final locations.

Runoff from this site is tributary to the Town of Mammoth Lakes Separate Storm Sewer System (TMLSSS). This system is made up of underground and surface storm drainage facilities. On and Offsite flow from this site is conveyed in an existing 36 inch CMP that outlets at the southwest corner of the Sierra Star (also known as Loadstar) Golf Course. From the Golf Course runoff crosses Meridian Boulevard twice, enters a storm drain in Jaoquin to Dorrance, where it outflows into a natural channel in the Shady Rest Parcel. A large inlet is located adjacent to Center Street that collects the runoff from this location. The runoff is conveyed to Main Street then into natural and manmade channels that outlet into Murphy Gulch. Runoff through Murphy Gulch goes through two desiltation basins, prior to entering a pipe that crosses under Highway 203 and entering Mammoth Creek.

At the south west side of this property is an existing retention / infiltration pond that is for the existing Juniper Springs facilities. This facility will not be used for this project.

A soils investigation by Sierra Geotechnical Services, Inc. in December, 2005 encountered light to heavy groundwater seepage on the site at depths varying from approximately 4½-feet to 21-feet below grade. Based on this study the project area consists of a relatively thin layer of alluvium topsoil underlain by alluvium/glacial moraine deposits. The glacial till with minor interbeds of basalt extend down to approximately 350-feet below the ground surface. (SGSI, 2005)

A Preliminary Hydrogeologic Investigation by Sierra Geotechnical (SGSI, 2006) discusses groundwater, and dewatering requirements for this site.

3 - Objective

In this drainage study we will:

- preliminarily estimate hydrologic runoff quantities
- preliminarily size drainage facilities
- preliminarily size retention / infiltration facilities
- estimate increase in runoff due to site improvements

4 - Assumptions

Offsite runoff quantity results after this site are included in the Town of Mammoth Lakes Storm Drainage Master Plan[1], as shown on Plate 8 and as noted in Table 6-1, attached.

The hydrology calculations for this drainage report are based on the Design Manual[2] and included in Appendix B. Hydraulic Calculations are generally based on Manning's, Darcy-Weisbech, and Bernoulli's equations. LANDesk programs were used for the some of the Hydraulic Calculations, with remaining Hydraulic equations and Hydrologic Calculations written to Excel Spreadsheet programs. Hydraulic Calculations are included in Appendix C.

Retention / Infiltration pipe systems and drywells will be designed to contain 1 hour of a 20 year intensity storm, which is assumed to be 1 inch (0.83 feet) * Area (square feet) * C (infiltration coefficient) as required by the Water Quality Control Plan for the Lahontan Region[3].

References are included in Appendix E.

5 - Offsite Drainage Facilities

The entire tributary area that contains this site has a flow of 180 cfs according to the Town of Mammoth Lakes Master Plan[1] in a storm of 100 year intensity (including areas that are not directly tributary to this site). This study identifies the area that is directly tributary to this site (see Exhibit 3 in Appendix A). The area shown is based on what is directly tributary to the site and does not include the site itself or runoff that bypasses the site. Based on calculations in conformance with the Storm Drainage Design Manual[2] runoff in the offsite tributary area will be 103.8 cfs in a storm of 100 year intensity. The final area will be determined once final inlet locations have been determined.

Presently there is a 36" storm drain from the southwest corner diagonal across the site to the northeast corner of the site. This storm drain will be removed. There are two existing 36" storm drain pipes across Majestic Pines. These will remain. Offsite runoff will be collected in a new inlet installed upstream of this project and conveyed to a new storm drainage facility that will be connected to the existing 2-36" storm drains that cross under Majestic Pines and continue to the Golf Course. The route of this new storm drain has been preliminarily determined to be from the northwest side of the project, to the intersection of Meridian and the west intersection with Majestic Pines, along Meridian Boulevard, north at the east intersection with Majestic Pines, and connected to the existing 2-36" storm drain pipes. These facilities will be sized for a storm of 100 year intensity. It is estimated that this runoff can be contained in one 36" smooth flow storm drain pipe at 2.1% or one 42" smooth flow storm drain pipe at 1%.

6 - Onsite Drainage Facilities

Onsite storm drainage facilities will be designed based on the final site concept. The total quantity of runoff developed by the site in a storm of 100 year intensity is 9.9 cfs. A cmp pipe of 18" diameter can convey this entire amount. Therefore the maximum size of onsite storm drains will not need to exceed 18". The underground parking garage will have elevations that will be lower than all surrounding grades or storm drainage, so will need to have a sump pump system that "lifts" stormwater to the surface. Since this is a parking

garage it is recommended that this water be conveyed through a device that removes oil and silt, prior to reintroduction into the storm water system.

Based on Predeveloped conditions as shown in Exhibit 4 of Appendix A under a storm of 100 year intensity, the site would contribute 8.4 cfs to this tributary area. Based on Proposed conditions as shown on Exhibit 5 of Appendix A under a storm of 100 year intensity, the site will contribute 9.9 cfs to this tributary area. This is an increase of 1.5 cfs. The total runoff tributary to and including this site equals the offsite runoff of 103.8 cfs plus the existing onsite runoff of 8.4 cfs or 112.2 cfs. The percentage increase in runoff rate for this area is therefore 1.5/112.2 or less than 2 percent. This increase will be offset by the required infiltration / retention facilities until these facilities have reached full capacity. The actual quantity of runoff will be reduced by the infiltration / retention facility capacity.

7 - Infiltration / Retention Facilities

The site has a total improved acreage of 8.68 acres. C values were taken from the Hydrologic calculations for storms of 100 year intensity. The table in Appendix D shows the summary of the Infiltration facility calculations.

There are several options that will be determined during the design phase for infiltration and retention. These options are preliminarily explored and shown in Appendix D.

8 - Erosion Protection

Grading shall be limited as much as possible. Graded areas shall be protected against erosion once they are brought to final grade. No graded areas are to be left unstabilized between April 15th and October 15th. A Notice of Intent will be required to connect this project with the NPDES for small construction projects in the State of California, as well as a SWPPP in conformance with the Lahontan Regional Water Quality Control Board[3] requirements.

Though this site is presently disturbed, all final surfaces should be stabilized to eliminate the potential for erosion.

9 - Conclusions

A preliminary analysis of storm water flows and quantities has been made as per Town of Mammoth Lakes Master Plan and Design Manual and Regional Water Quality Control Board Requirements.

The land upstream from the project site is relatively steep, so there is no impact to sites above this based on surface runoff or snowfall to sites. The runoff rate to downstream areas may increase during a storm of 100 year intensity by an amount of 1-2 percent. In storms of lower intensity, runoff rate may be reduced due to the new retention / infiltration facilities. Runoff Quantities to downstream area will be reduced by quantity of runoff held in the retention / infiltration facilities. Runoff will continue to be conveyed in the location identified in the Town of Mammoth Lakes Storm Drainage Master Plan[1].

Drainage facilities shall be selected to adequately collect and convey historic runoff across the site and outflow in as close to historic conditions as practicable. The final location and details of drainage facilities will be determined during the design process in preparation of the improvement plans. The criteria followed during the design process should address issues such as safety, erosion protection and water quality, as well as conforming to the requirements of the Clean Water Act, the State and regional Lahontan Water Quality Control Board.

Retention / Infiltration systems will be designed to collect the first flush as required by the Town of Mammoth Lakes and the Lahontan Regional Water Quality Control Board. Since the existing site did not have infiltration / retention facilities, and since there was a significant amount of existing impervious surfaces, this aspect of the project will be a significant improvement to the existing conditions.

A Notice of Intent must be filed to be part of the State of California NPDES CAS000002 for small construction projects as part of the Federal Clean Water Act. A Storm Water Pollution Prevention Plan must be prepared to conform to this NPDES. Runoff quality will be managed during construction with the SWPPP. After construction runoff quality will be managed with landscaping and sediment traps prior to the infiltration facilities.

A system that ensures the storm drainage facilities for on and offsite flows and infiltration / retention basins should be put in place. Particular items requiring maintenance include but are not limited to cleaning of grates, removal of foreign materials from storm drainage pipes, maintenance as necessary to inlet facilities and retention basins, and repairs as necessary to damaged facilities. Source control has been stated by the Lahontan regional water quality control board as the best way to limit sediment transport in stormwater. Therefore, the landscape is a part of the sediment elimination system and must be maintained.

This site is not located on a wetland or a stream. It is also not on a water of the state as identified by a blue line on the USGS Quad maps. The site is downstream from an identified wetland area. Based on the Preliminary Hydrogeologic Investigation study by Sierra Geotechnical Services, this site will not negatively affect the upstream wetland (SGSI 2006).

[1]Mammoth Lakes Storm Drainage Master Plan, Prepared for Mono County Public Works Department, July 1984, Brown and Caldwell and Triad Engineering.

[2]Design Manual, Mammoth Lakes Storm Drainage and Erosion Control, Prepared for Mono County Public Works Department, July 1984, Brown and Caldwell and Triad Engineering, see Appendix E for excerpts.

[3]Water Quality Control Plan for the Lahontan Region, North and South Basins, prepared by the State of California, Regional Water Quality Control Board, Lahontan Region, see Appendix E for excerpts.

Preliminary Drainage Study

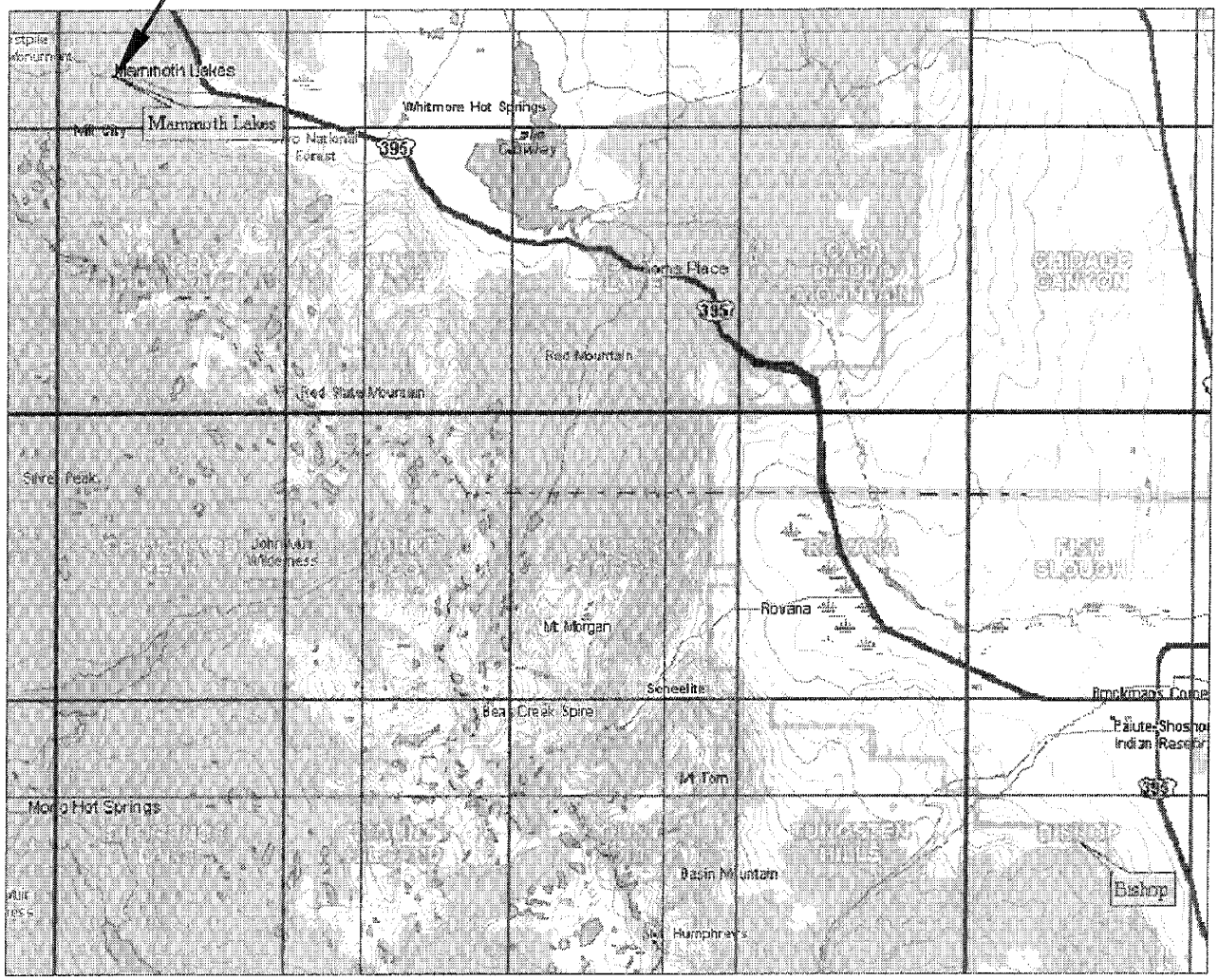
FOR

Eagle Lodge

APPENDIX A

FIGURES

PROJECT SITE



SCALE: NTS

EAGLE LODGE BASE AREA

EXHIBIT 1 – REGIONAL MAP

JOB NO. 1737.2	triad/holmes associates	08-10-06
DWG SMF		

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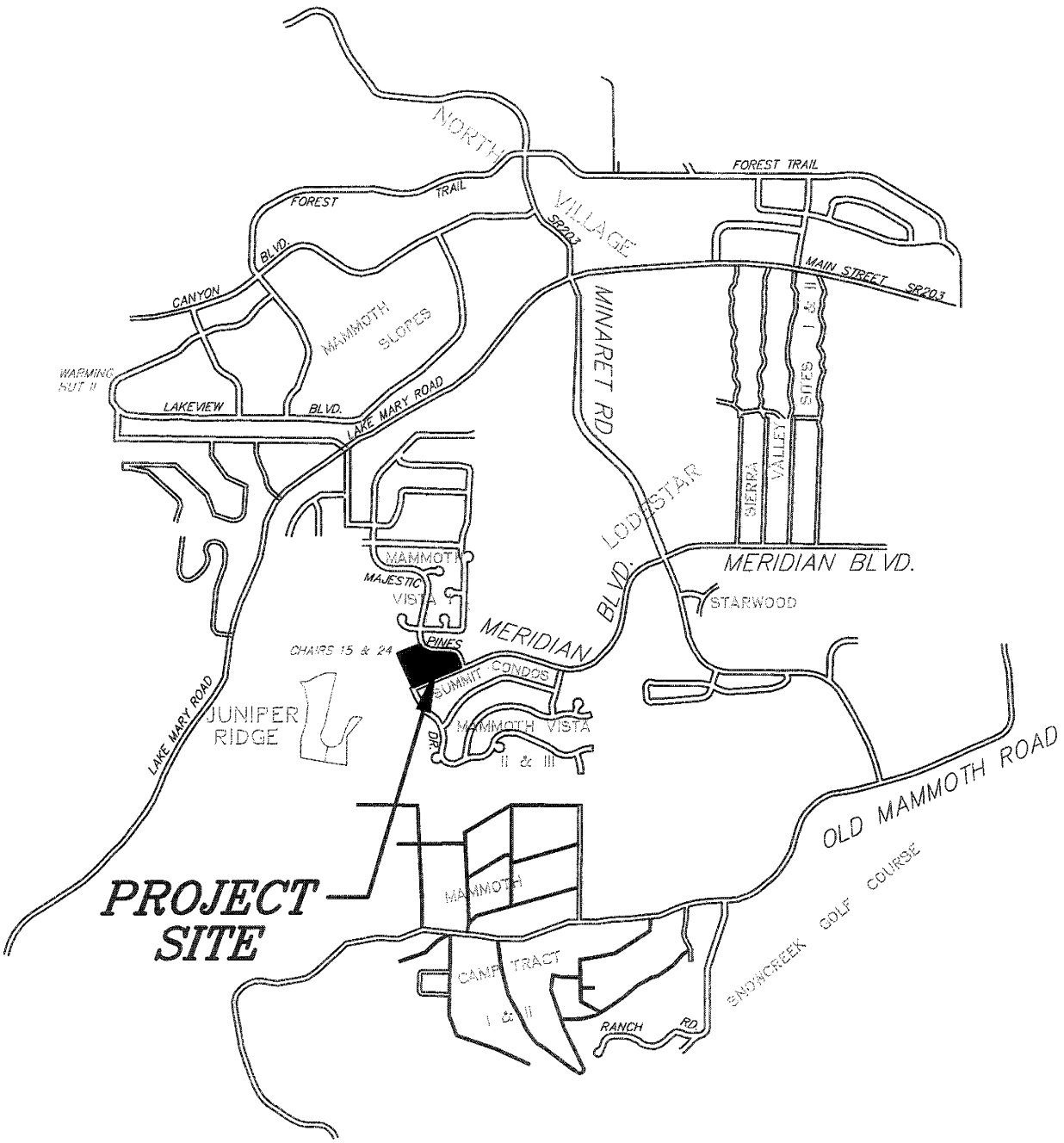

SCALE: NTS

EAGLE LODGE BASE AREA

EXHIBIT 2 – VICINITY MAP

JOB NO. 1737.2	triad/holmes associates	08-10-06
DWG SMF		

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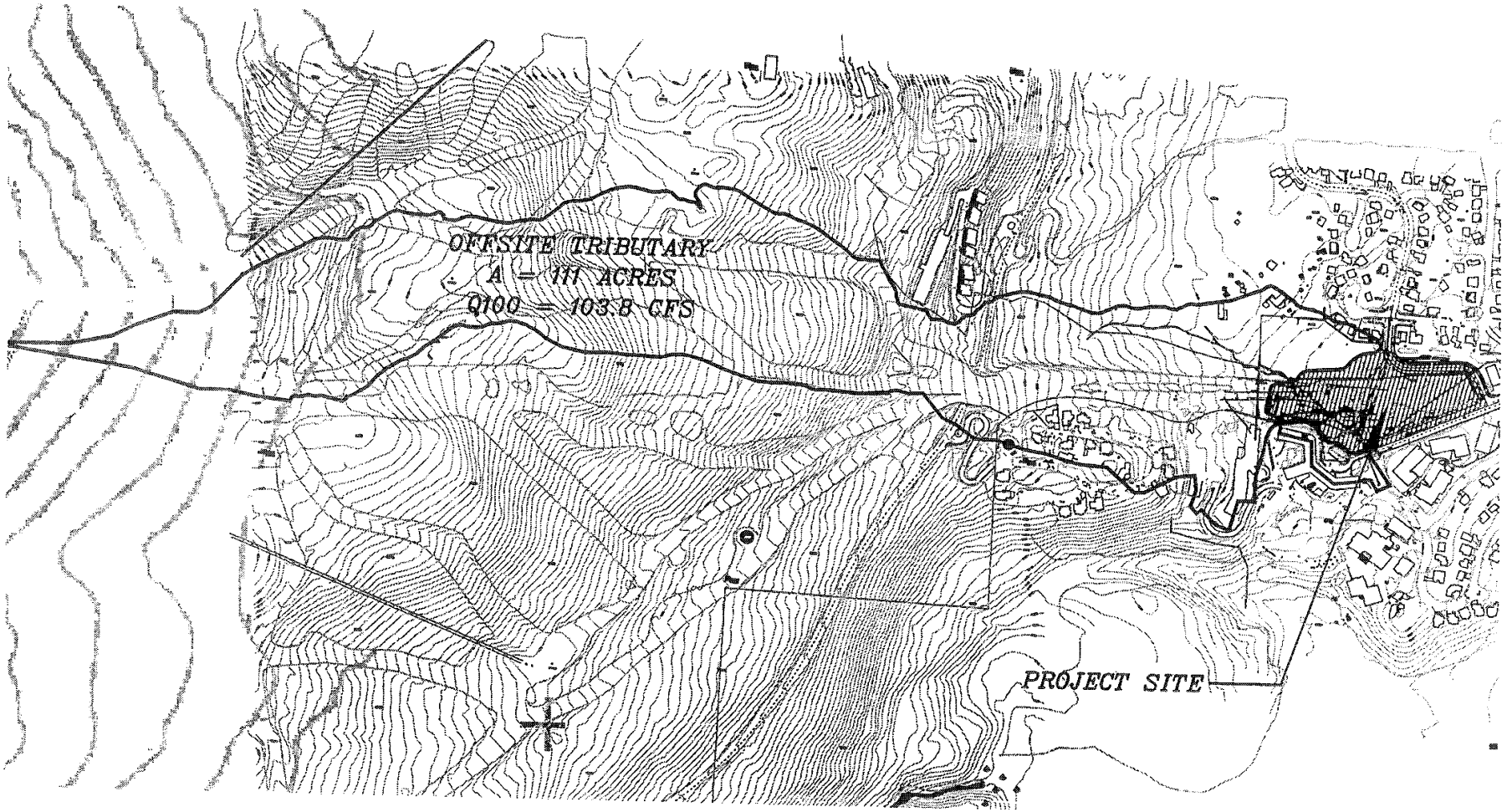

SCALE: 1"=750'

EAGLE LODGE BASE AREA

EXHIBIT 3 – AREA BASIN DRAWING

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1737.2	triad/holmes associates	08-10-06
DWG SMF		

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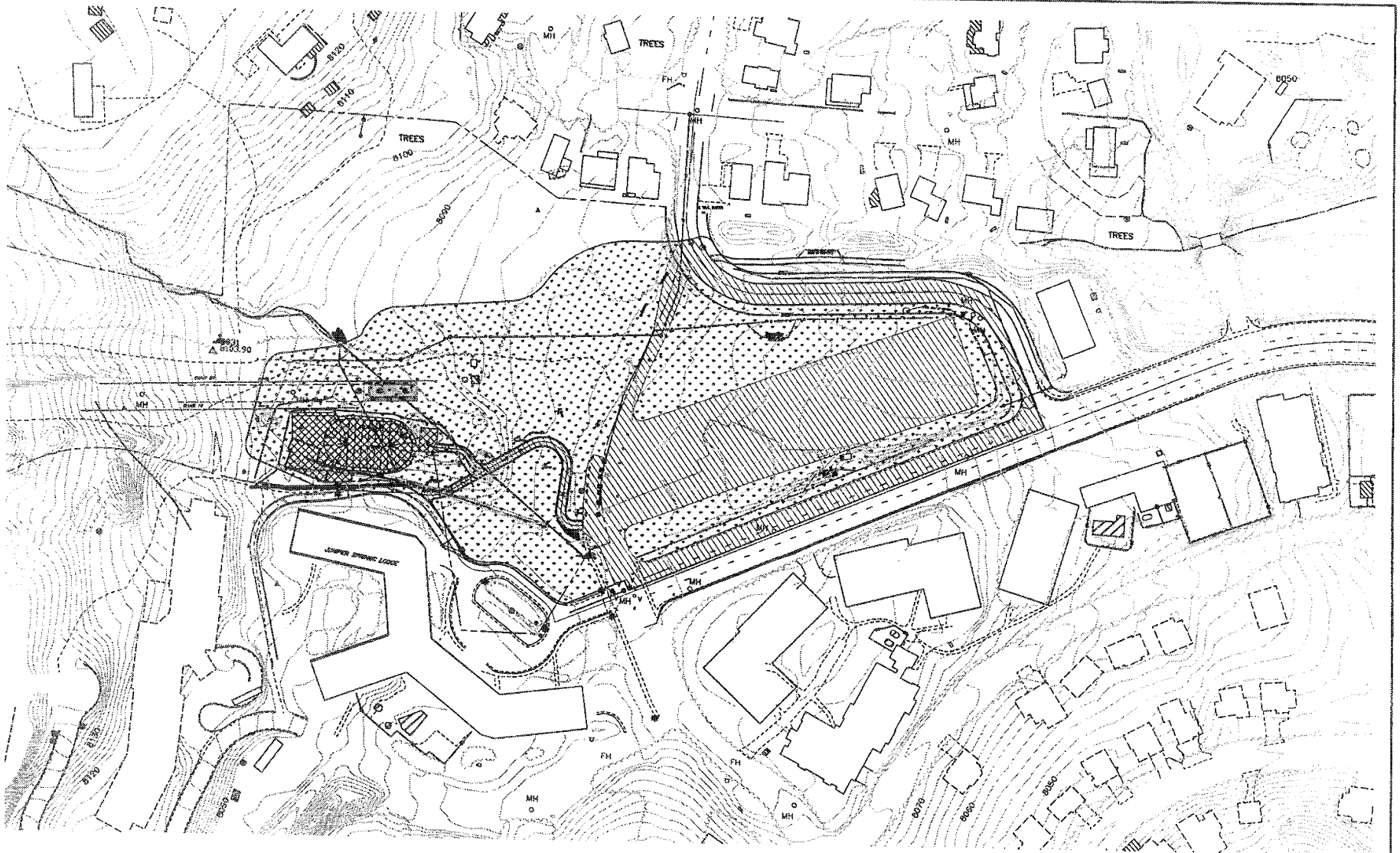

BASIN BOUNDARY (8.68 ACRES)

PAVED AREA (2.96 ACRES)

BUILDING AREA (0.39 ACRES)

LANDSCAPE AREA (5.33 ACRES)

SCALE: 1"=200'

EAGLE LODGE BASE AREA

EXHIBIT 4 – PRE DEVELOPMENT BASIN DRAWING

JOB NO.		
1737.2	triad/holmes associates	08-10-06
DWG. SMF		

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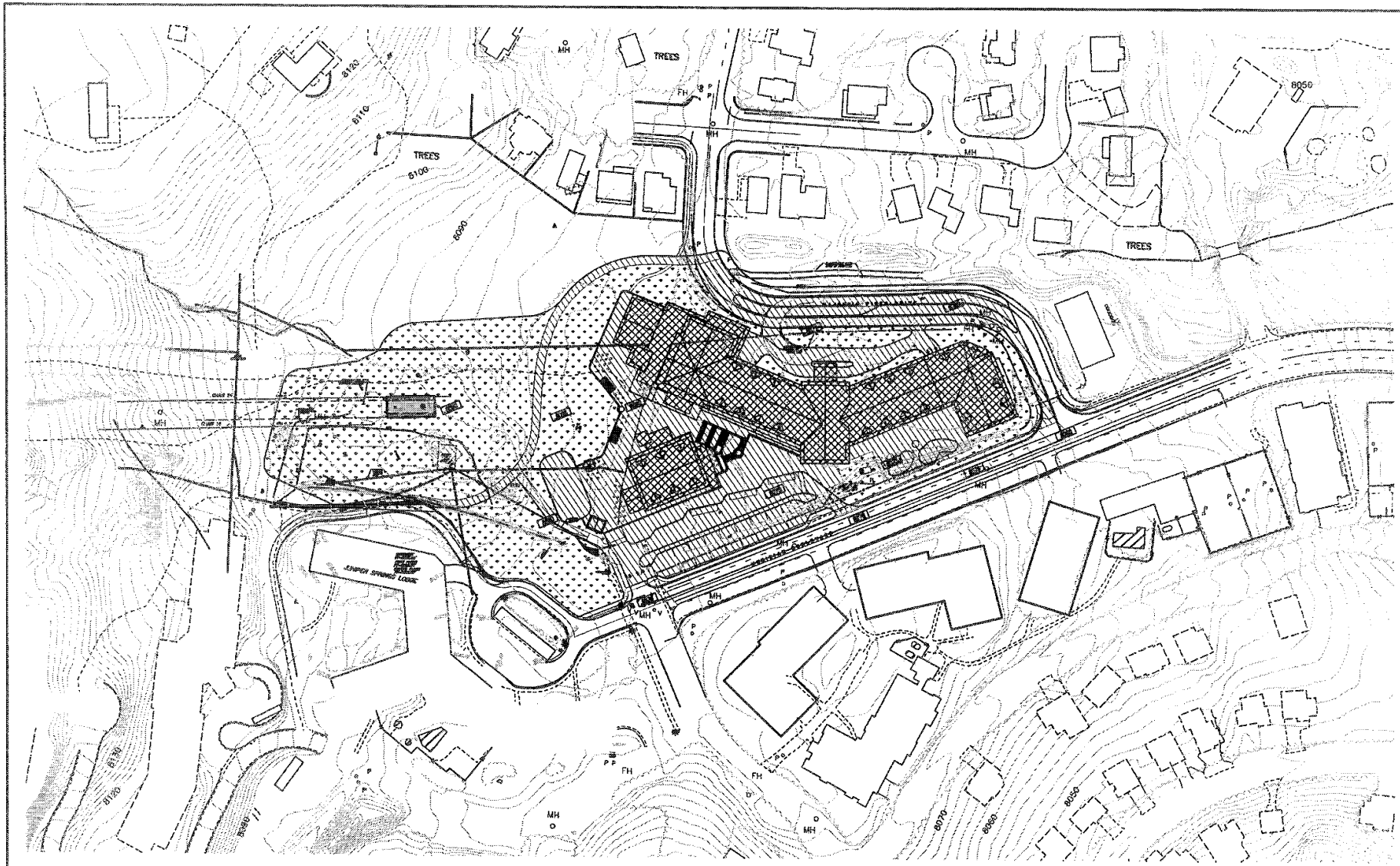


BASIN BOUNDARY (8.68 ACRES)

PAVED AREA (3.15 ACRES)

BUILDING AREA (1.64 ACRES)

LANDSCAPE AREA (3.89 ACRES)

SCALE: 1"=200'

EAGLE LODGE BASE AREA

EXHIBIT 5 – POST DEVELOPMENT BASIN DRAWING

JOB NO.		
1737.2	triad/holmes associates	08-10-06
DWG. SMF		

K:\01 Mammoth\1737-2 Grading Plan\1737-2 Drainage Drawings 1.dwg Aug 11,2006 - 8:49am, sfuller

Preliminary Drainage Study

FOR

Eagle Lodge

APPENDIX B

HYDROLOGY

EAGLE LODGE

Hydrology Calculations - Summary

Area	Code	Design Q	Exceedance Interval for Design	Winter Q at Exceedance Interval	Winter Intensity	Winter Average Cfactor	Summer Q at Exceedance Interval	Summer Intensity	Summer Average Cfactor	Acres	Calc Page	Comments
Offsite Tributary	1	103.8	Q100	103.8	1.3	0.7	82.6	1.7	0.4	111	2	
PreDevelopment	2	8.4	Q100	8.4	1.4	0.7	8.1	1.8	0.5	8.68	4	Existing Basin Drawing
PostDevelopment	3	9.9	Q100	9.1	1.4	0.8	9.9	1.8	0.6	8.68	6	Proposed Basin Drawing

Area Description:	Offsite Tributary	1

Q=1.008CIA	Q2	Q5	Q10	Q20	Q50	Q100
Winter	14.4	28.3	43.1	57.2	81.6	103.8
Summer	14.9	29.2	38.1	51.6	67.3	82.6

C — Weighted C Factor

Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Roofs	0.10	0.10	0.10	0.10	0.10	0.10
Paving	0.09	0.09	0.09	0.09	0.09	0.09
Agg drives & walks	0.00	0.00	0.00	0.00	0.00	0.00
unpaved corp yards	0.00	0.00	0.00	0.00	0.00	0.00
Winter "B" Soils	0.15	0.24	0.31	0.37	0.46	0.50
Winter "C" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Winter "D" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Summer "B" Soils	0.07	0.11	0.14	0.18	0.21	0.24
Summer "C" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Summer "D" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Winter Coefficient	**0.34**	**0.42**	**0.50**	**0.55**	**0.64**	**0.69**
Summer Coefficient	**0.25**	**0.30**	**0.32**	**0.36**	**0.40**	**0.43**

I — Intensity

Winter Precipitation Design Curve (Figure 1-4)				(tc = 1.03)		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.39	0.62	0.80	0.95	1.17	1.39
Intensity	0.38	0.60	0.78	0.92	1.14	1.35
Winter Precipitation Design Curve (Figure 1-4)				**(tc = 1.)**		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.38	0.60	0.78	0.93	1.15	1.36
Intensity	0.38	0.60	0.78	0.93	1.15	1.36
Summer Precipitation Design Curve (Figure 1-5)				**(tc = .404)**		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.21	0.35	0.43	0.52	0.61	0.70
Intensity	0.53	0.88	1.05	1.28	1.50	1.74
Summer Precipitation Design Curve (Figure 1-5)				**(tc = 1.)**		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.36	0.58	0.71	0.86	1.03	1.20
Intensity	0.36	0.58	0.71	0.86	1.03	1.20

A — Areas

type of area	Coefficient Winter, C	% of area	Acreage	Weighted C
Roofs	0.95	10%	11.10	0.10
Paving	0.90	10%	11.10	0.09
Agg drives & walks	0.80	0%	0.00	0.00
unpaved corp yards	0.75	0%	0.00	0.00
"B" Soils (RF*RR*NF)	varies	80%	88.80	varies
"C" Soils (RF*RR*NF)	varies	0%	0.00	
"D" Soils (RF*RR*NF)	varies	0%	0.00	
Total		100%	111.00	

Area Description: Offsite Tributary 1

Time of Concentration

Overland Flow tc Component, tco (Figure 1-2) Winter

Overland Condition	Length, feet	slope	Lo/So	tco, hours
Unpaved and Unplowed in Winter	1500	0.2	7500	1.03
Paved and never Plowed in Winter	0	0.02	0	0.00
unpaved and plowed in winter	0	0.02	0	0.00
paved and plowed winter	0	0.02	0	0.00
			tco winter	1.03
			tcc	0.00
			Total time of concentration winter, tc	1.03

Overland Flow tc Component, tco (Figure 1-2) Summer

Unpaved Summer	1500	0.2	7500	0.40
paved summer	0	0.01	0	0.00
			tco summer	0.40
			tcc	0.00
			Total time of concentration summer, tc	0.40

Channel Flow tc Component, tcc (Figure 1-3)

Channel Description			Length, feet	slope	tcc, hours
Unimproved Channel			0	0.02	0.00
Riprap-Lined Channel			0	0.02	0.00
Pipe or Concrete-Lined Channel			0	0.02	0.00
				Total Time of Concentration, Channel, tcc	0.00

Natural Area Runoff Factor, RF (Figure 1-6)

Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Winter Storm "B" Soils, RF	0.19	0.30	0.39	0.46	0.57	0.63
Cn=RF*RR*NF	0.19	0.30	0.39	0.46	0.57	0.63
Winter Storm "C" Soils, RF	0.34	0.53	0.65	0.73	0.80	0.84
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00
Barren Rocky Soil "D", RF	0.81	0.84	0.85	0.87	0.89	0.90
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00

Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Summer Storm "B" Soils, RF	0.08	0.14	0.17	0.22	0.27	0.30
Cn=RF*RR*NF	0.08	0.14	0.17	0.22	0.27	0.30
Summer Storm "C" Soils, RF	0.18	0.29	0.35	0.43	0.51	0.59
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00
Barren Rocky Soil "D", RF	0.81	0.83	0.85	0.86	0.88	0.89
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00

Reduction Ratio, RR (Figure 1-6)

Soil Type	Overland Slope	Slope Reduction Ration, RR
"B"	20%	1.00
"C"	0%	0.73
"D"	0%	0.73

Natural Area Size Factor, NF (Figure 1-8)

Soil Type	Tributary Area	Natural Area Reduction Factor, NF
"B"	88.8	1.00
"C"	0.0	0
"D"	0.0	0

Area Description:	PreDevelopment	2

Q=1.008CIA	Q2	Q5	Q10	Q20	Q50	Q100
Winter	1.5	2.7	3.9	5.0	6.8	8.4
Summer	1.9	3.4	4.3	5.5	6.8	8.1

C Weighted C Factor

Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Roofs	0.04	0.04	0.04	0.04	0.04	0.04
Paving	0.31	0.31	0.31	0.31	0.31	0.31
Agg drives & walks	0.00	0.00	0.00	0.00	0.00	0.00
unpaved corp yards	0.00	0.00	0.00	0.00	0.00	0.00
Winter "B" Soils	0.11	0.17	0.22	0.26	0.33	0.36
Winter "C" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Winter "D" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Summer "B" Soils	0.05	0.08	0.10	0.13	0.15	0.17
Summer "C" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Summer "D" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Winter Coefficient	**0.46**	**0.52**	**0.57**	**0.61**	**0.67**	**0.71**
Summer Coefficient	**0.40**	**0.43**	**0.45**	**0.48**	**0.50**	**0.52**

I Intensity

Winter Precipitation Design Curve (Figure 1-4)				(tcc = 1.)		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.39	0.60	0.79	0.93	1.15	1.36
Intensity	0.38	0.60	0.78	0.93	1.15	1.36
Winter Precipitation Design Curve (Figure 1-4)				**(tcc = 1.0)**		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.38	0.60	0.78	0.93	1.15	1.36
Intensity	0.38	0.60	0.78	0.93	1.15	1.36
Summer Precipitation Design Curve (Figure 1-5)				**(tcc = .38)**		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.21	0.34	0.41	0.50	0.58	0.67
Intensity	0.54	0.91	1.09	1.32	1.55	1.79
Summer Precipitation Design Curve (Figure 1-5)				**(tcc = 1.0)**		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.36	0.58	0.71	0.86	1.03	1.20
Intensity	0.36	0.58	0.71	0.86	1.03	1.20

A Areas

type of area	Coefficient Winter, C	% of area	Acreage	Weighted C
Roofs	0.95	4%	0.39	0.04
Paving	0.90	34%	2.96	0.31
Agg drives & walks	0.80	0%	0.00	0.00
unpaved corp yards	0.75	0%	0.00	0.00
"B" Soils (RF*RR*NF)	varies	61%	5.33	varies
"C" Soils (RF*RR*NF)	varies	0%	0.00	
"D" Soils (RF*RR*NF)	varies	0%	0.00	
Total		100%	8.68	

Area Description:	PreDevelopment	2

Time of Concentration

Overland Flow tc Component, tco (Figure 1-2) Winter

Overland Condition	Length, feet	slope	Lo/So	tco, hours
Unpaved and Unplowed in Winter	600	0.1	6000	1.00
Paved and never Plowed in Winter	0	0.02	0	0.00
unpaved and plowed in winter	0	0.02	0	0.00
paved and plowed winter	0	0.02	0	0.00
			tco winter	1.00
			tcc	0.00
			Total time of concentration winter, tc	1.00

Overland Flow tc Component, tco (Figure 1-2) Summer

Unpaved Summer	600	0.1	6000	0.38
paved summer	0	0.01	0	0.00
			tco summer	0.38
			tcc	0.00
			Total time of concentration summer, tc	0.38

Channel Flow tc Component, tcc (Figure 1-3)

Channel Description			Length, feet	slope	tcc, hours
Unimproved Channel			0	0.02	0.00
Riprap-Lined Channel			0	0.02	0.00
Pipe or Concrete-Lined Channel			0	0.02	0.00
				Total Time of Concentration, Channel, tcc	0.00

Natural Area Runoff Factor, RF (Figure 1-6)

Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Winter Storm "B" Soils, RF	0.19	0.30	0.39	0.46	0.57	0.63
Cn=RF*RR*NF	0.18	0.28	0.36	0.43	0.53	0.59
Winter Storm "C" Soils, RF	0.34	0.53	0.65	0.73	0.80	0.84
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00
Barren Rocky Soil "D", RF	0.81	0.84	0.85	0.87	0.89	0.90
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00

Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Summer Storm "B" Soils, RF	0.08	0.14	0.17	0.22	0.27	0.30
Cn=RF*RR*NF	0.08	0.13	0.16	0.20	0.25	0.28
Summer Storm "C" Soils, RF	0.18	0.29	0.35	0.43	0.51	0.59
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00
Barren Rocky Soil "D", RF	0.81	0.83	0.85	0.86	0.88	0.89
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00

Reduction Ratio, RR (Figure 1-6)

Soil Type	Overland Slope	Slope Reduction Ration, RR
"B"	10%	0.93
"C"	0%	0.73
"D"	0%	0.73

Natural Area Size Factor, NF (Figure 1-8)

Soil Type	Tributary Area	Natural Area Reduction Factor, NF
"B"	5.3	1.00
"C"	0.0	0
"D"	0.0	0

Area Description:	PostDevelopment	3

Q=1.008CIA	Q2	Q5	Q10	Q20	Q50	Q100
Winter	2.0	3.3	4.6	5.7	7.5	9.1
Summer	2.6	4.5	5.5	6.9	8.4	9.9

C — Weighted C Factor

Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Roofs	0.18	0.18	0.18	0.18	0.18	0.18
Paving	0.33	0.33	0.33	0.33	0.33	0.33
Agg drives & walks	0.00	0.00	0.00	0.00	0.00	0.00
unpaved corp yards	0.00	0.00	0.00	0.00	0.00	0.00
Winter "B" Soils	0.08	0.12	0.16	0.19	0.24	0.26
Winter "C" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Winter "D" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Summer "B" Soils	0.04	0.06	0.07	0.09	0.11	0.13
Summer "C" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Summer "D" Soils	0.00	0.00	0.00	0.00	0.00	0.00
Winter Coefficient	0.59	0.63	0.67	0.70	0.74	0.77
Summer Coefficient	0.54	0.56	0.58	0.60	0.62	0.63

I — Intensity

Winter Precipitation Design Curve (Figure 1-4)				(tcc = 1.)		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.39	0.60	0.79	0.93	1.15	1.36
Intensity	0.38	0.60	0.78	0.93	1.15	1.36
Winter Precipitation Design Curve (Figure 1-4)				**(tcc = 1.0)**		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.38	0.60	0.78	0.93	1.15	1.36
Intensity	0.38	0.60	0.78	0.93	1.15	1.36
Summer Precipitation Design Curve (Figure 1-5)				**(tcc = .38)**		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.21	0.34	0.41	0.50	0.58	0.67
Intensity	0.54	0.91	1.09	1.32	1.55	1.79
Summer Precipitation Design Curve (Figure 1-5)				**(tcc = 1.0)**		
Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Precipitation, in.	0.36	0.58	0.71	0.86	1.03	1.20
Intensity	0.36	0.58	0.71	0.86	1.03	1.20

A — Areas

type of area	Coefficient Winter, C	% of area	Acreage	Weighted C
Roofs	0.95	19%	1.64	0.18
Paving	0.90	36%	3.15	0.33
Agg drives & walks	0.80	0%	0.00	0.00
unpaved corp yards	0.75	0%	0.00	0.00
"B" Soils (RF*RR*NF)	varies	45%	3.89	varies
"C" Soils (RF*RR*NF)	varies	0%	0.00	
"D" Soils (RF*RR*NF)	varies	0%	0.00	
Total		100%	8.68	

Area Description:	PostDevelopment	3

Time of Concentration

Overland Flow tc Component, tco (Figure 1-2) Winter

Overland Condition		Length, feet	slope	Lo/So	tco, hours
Unpaved and Unplowed in Winter		600	0.1	6000	1.00
Paved and never Plowed in Winter		0	0.02	0	0.00
unpaved and plowed in winter		0	0.02	0	0.00
paved and plowed winter		0	0.02	0	0.00
				tco winter	1.00
				tcc	0.00
				Total time of concentration winter, tc	1.00

Overland Flow tc Component, tco (Figure 1-2) Summer

Unpaved Summer	600	0.1	6000	0.38
paved summer	0	0.01	0	0.00
			tco summer	0.38
			tcc	0.00
			Total time of concentration summer, tc	0.38

Channel Flow tc Component, tcc (Figure 1-3)

Channel Description			Length, feet	slope	tcc, hours
Unimproved Channel			0	0.02	0.00
Riprap-Lined Channel			0	0.02	0.00
Pipe or Concrete-Lined Channel			0	0.02	0.00
				Total Time of Concentration, Channel, tcc	0.00

Natural Area Runoff Factor, RF (Figure 1-6)

Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Winter Storm "B" Soils, RF	0.19	0.30	0.39	0.46	0.57	0.63
Cn=RF*RR*NF	0.18	0.28	0.36	0.43	0.53	0.59
Winter Storm "C" Soils, RF	0.34	0.53	0.65	0.73	0.80	0.84
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00
Barren Rocky Soil "D", RF	0.81	0.84	0.85	0.87	0.89	0.90
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00

Storm Frequency	2 Year	5 Year	10 Year	20 Year	50 Year	100 Year
Summer Storm "B" Soils, RF	0.08	0.14	0.17	0.22	0.27	0.30
Cn=RF*RR*NF	0.08	0.13	0.16	0.20	0.25	0.28
Summer Storm "C" Soils, RF	0.18	0.29	0.35	0.43	0.51	0.59
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00
Barren Rocky Soil "D", RF	0.81	0.83	0.85	0.86	0.88	0.89
Cn=RF*RR*NF	0.00	0.00	0.00	0.00	0.00	0.00

Reduction Ratio, RR (Figure 1-6)

Soil Type	Overland Slope	Slope Reduction Ration, RR
"B"	10%	0.93
"C"	0%	0.73
"D"	0%	0.73

Natural Area Size Factor, NF (Figure 1-8)

Soil Type	Tributary Area	Natural Area Reduction Factor, NF
"B"	3.9	1.00
"C"	0.0	0
"D"	0.0	0

Preliminary Drainage Study

FOR

Eagle Lodge

APPENDIX C

HYDRAULICS

18" cmp

	enter	calced
Pipe Diameter (inches)	18	18
Pipe Diameter (feet)		1.50
Slope (s)	0.018	
Friction Factor(n)	0.018	
Depth (inches)		18
Depth (feet)		1.50
Depth (percentage)	100%	100%
Area		1.77
Wetted Perimeter		4.71
Hydraulic radius		0.38
Quantity (cfs)		**10.18**
Quantity (gpm)		4570.1
Velocity (fps)		**5.76**
radius		0.75
cos length		-0.75
angle (radians)		3.14
angle degrees		180.0
sin length		0.00
two triangle areas		0.00
sector area		1.77
total area of pipe		1.77
area at depth		1.77
Wetted Perimeter at depth		4.71
Circumfirence		4.71

36" hancor

	enter	calced
Pipe Diameter (inches)	36	36
Pipe Diameter (feet)		3.00
Slope (s)	0.021	
Friction Factor(n)	0.012	
Depth (inches)		36
Depth (feet)		3.00
Depth (percentage)	100%	100%
Area		7.07
Wetted Perimeter		9.42
Hydraulic radius		0.75
Quantity (cfs)		**104.71**
Quantity (gpm)		47014.7
Velocity (fps)		**14.81**
radius		1.50
cos length		-1.50
angle (radians)		3.14
angle degrees		180.0
sin length		0.00
two triangle areas		0.00
sector area		7.07
total area of pipe		7.07
area at depth		7.07
Wetted Perimeter at depth		9.42
Circumfirence		9.42

42" hancor

	enter	calced
Pipe Diameter (inches)	42	42
Pipe Diameter (feet)		3.50
Slope (s)	0.01	
Friction Factor(n)	0.012	
Depth (inches)		42
Depth (feet)		3.50
Depth (percentage)	100%	100%
Area		9.62
Wetted Perimeter		11.00
Hydraulic radius		0.88
Quantity (cfs)		**108.99**
Quantity (gpm)		48938.3
Velocity (fps)		**11.33**
radius		1.75
cos length		-1.75
angle (radians)		3.14
angle degrees		180.0
sin length		0.00
two triangle areas		0.00
sector area		9.62
total area of pipe		9.62
area at depth		9.62
Wetted Perimeter at depth		11.00
Circumfirence		11.00

Preliminary Drainage Study

FOR

Eagle Lodge

APPENDIX D

RETENTION / INFILTRATION BASIN

Triad/Holmes Associates

Job No. **1737.2**

Date: **8/11/2006**

Bishop Fax: (760) 873-8024
Mammoth Lakes Fax: (760) 934-5619
San Luis Obispo Fax: (805) 544-8932
Napa Fax: (707) 251-9108
Redwood City Fax: (650) 366-0298

Runoff Volume and Drywell Sizing Calulation

based on Lahontan RWQCB Design Parameters

Input

Rainfall (First Inch)	1 in/hr =	0.083 ft/hr	
Percolation Rate	0 in/hr =	0 ft/hr	

(Initial assumptions are for 0 percolation rate. This may be revised based on percolation testing.)

Tributary Area			Runoff Coefficient	
Roof Area	71438.4 S.F.	19%	0.95	Roof Area
Pavement Area	137214 S.F.	36%	0.9	Pavement Area
Gravel/Aggregate Area	0 S.F.	0%	0.8	Gravel/Aggregate Area
Unpaved Industrial Area	0 S.F.	0%	0.75	Unpaved Industrial Area
Landscaping Area	169448.4 S.F.	45%	0.46	Landscaping Area
Total Area	378100.8 S.F.		0.71	Average Runoff Coefficient

Average Runoff Volume = Total Area * Average Runoff Coefficient * Rainfall (First Inch)

Average Runoff Volume = **22442 C.F.** **Storage capacity required**

(This sizing is preliminary, final sizing will be determined during the design process)

Approximate Drywell Sizing Options

		Typical Cubic foot storage per square foot of facility	approximate square footage required	approximate size width	length
Option A	Drywells (10 foot deep)	3	7481	20	374
Option B	Conspan	8	2805	20	140
Option C	Rainstore 3 (6 foot deep)	5	4488	20	224
Option D	Hancor (3 foot diameter pipes)	2.5	8977	20	449

(These options have been considered to allow for initial space requirements.)

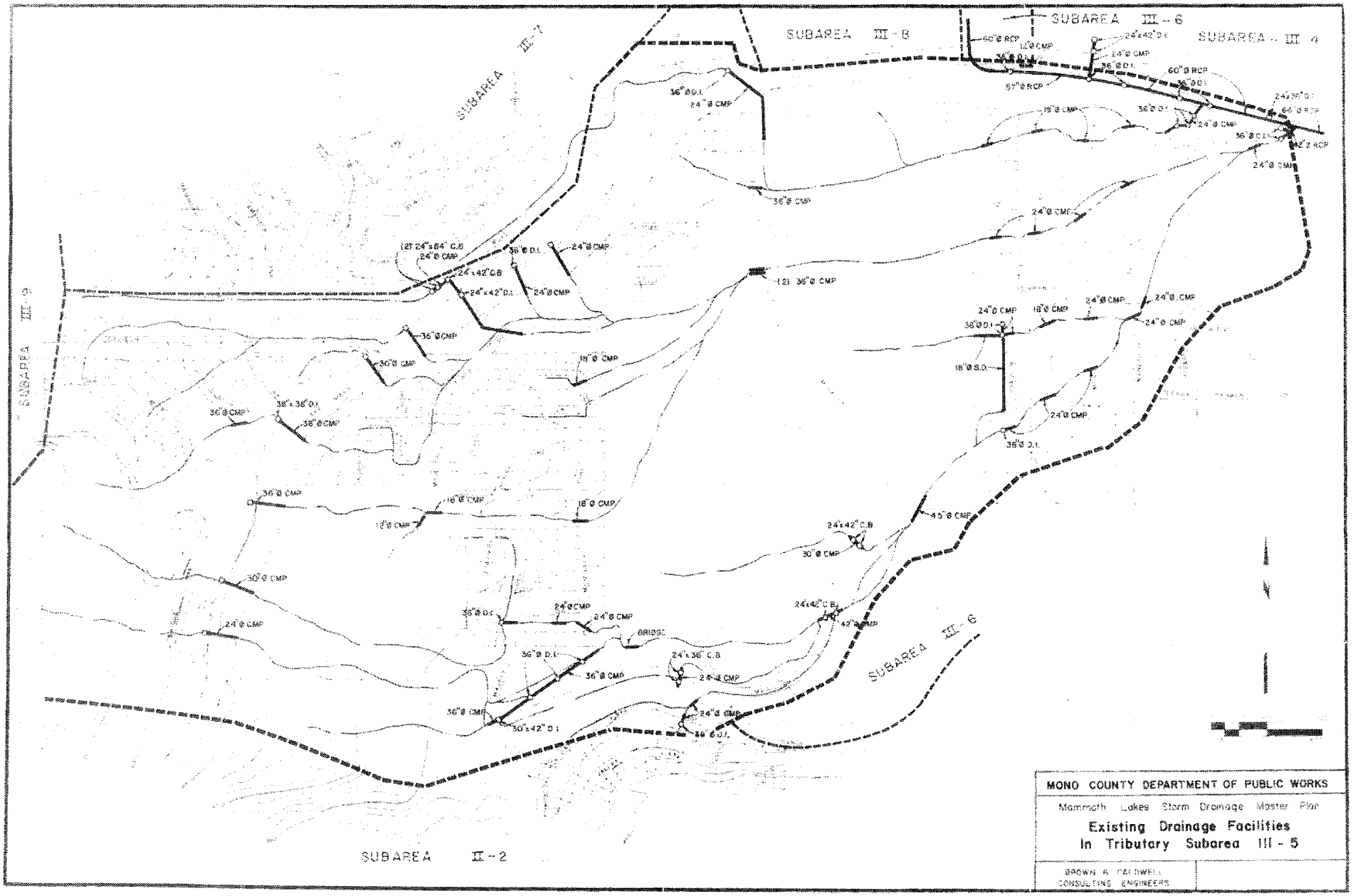
Preliminary Drainage Study

FOR

Eagle Lodge

APPENDIX E

REFERENCE MATERIAL


SUBAREA III - 8
SUBAREA III - 6
SUBAREA III - 7
SUBAREA III - 3
SUBAREA III - 6
SUBAREA II - 2
BRIDGE
MONO COUNTY DEPARTMENT OF PUBLIC WORKS
Mammoth Lakes Storm Drainage Master Plan
Existing Drainage Facilities
In Tributary Subarea III - 5
BROWN & CALDWELL
CONSULTING ENGINEERS

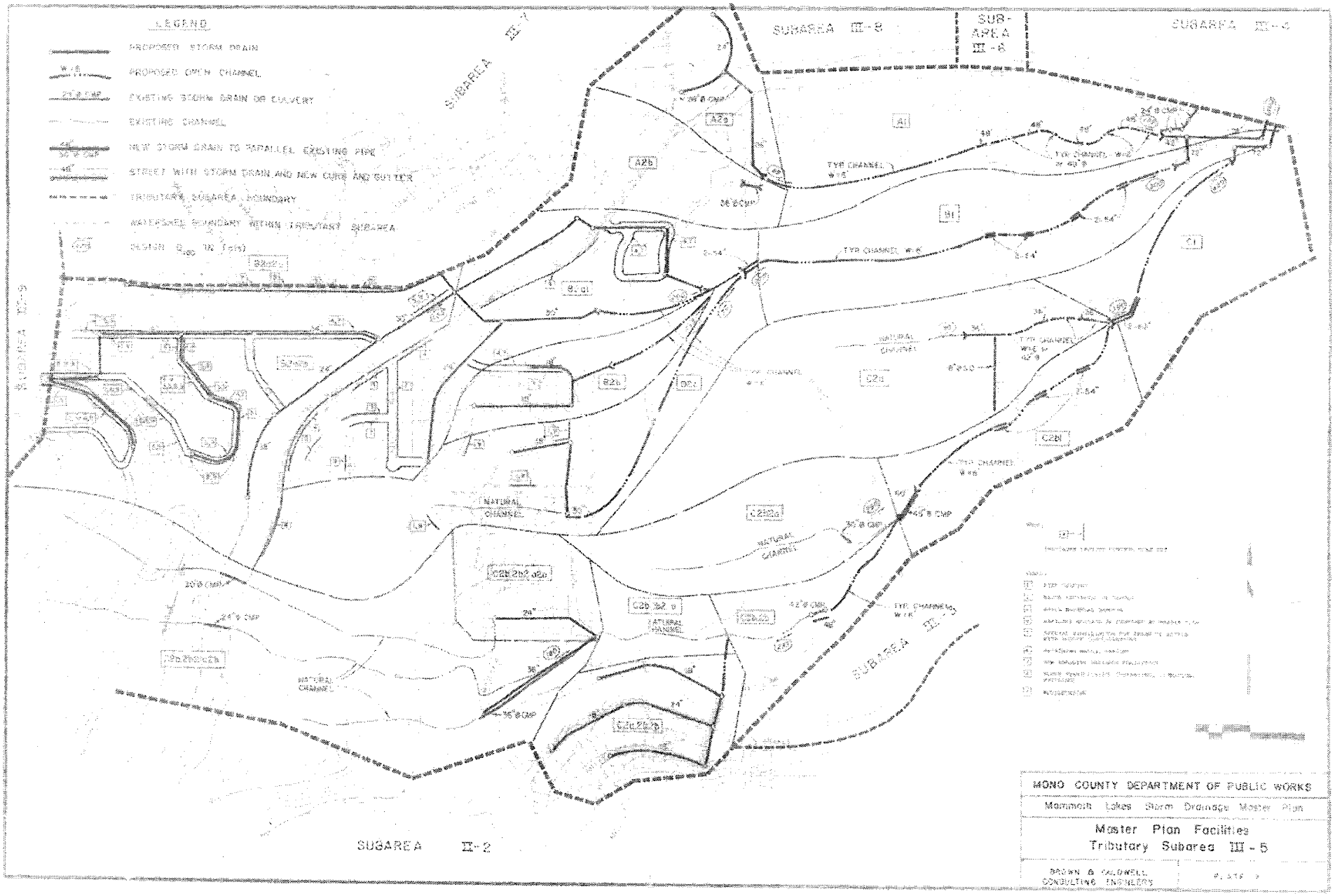

LEGEND
PROPOSED STORM DRAIN
PROPOSED OPEN CHANNEL
EXISTING STORM DRAIN OR CULVERT
EXISTING CHANNEL
NEW STORM DRAIN TO PARALLEL EXISTING PIPE
STREET WITH STORM DRAIN AND NEW CURB AND GUTTER
TRIBUTARY SUBAREA BOUNDARY
WATERSHED BOUNDARY WITHIN TRIBUTARY SUBAREA
SUBAREA III-1
SUBAREA III-2
SUBAREA III-3
SUB-AREA III-4
SUBAREA III-5
SUBAREA III-6
NATURAL CHANNEL
TYP CHANNEL W=6'
TYP CHANNEL W=8'
TYP CHANNEL W=10'
TYP CHANNEL W=12'
TYP CHANNEL W=16'
TYP CHANNEL W=40'
MONO COUNTY DEPARTMENT OF PUBLIC WORKS
Mammoth Lakes Storm Drainage Master Plan
Master Plan Facilities
Tributary Subarea III - 5
BROWN & CALDWELL
CONSULTING ENGINEERS

Table 6-1. Master Plan Design Flows, cfs, continued

Watershed	Q_{20}	Q_{50}	Q_{100}	Design Season[a]
Subarea III-3				
A2b.2a	55	69	86	W
A2b.2b	31	37	46	W
A2b.2	82	104	130	W
A2b.1	20	25	31	W
A2b	97	124	152	W
A2a	39	48	62	S
A2	130	161	200	W
A1	4	5	6	W
A	134	172	212	W
Subarea total	134	172	212	W
Subarea III-4				
B	89	132	177	W
A	52	73	95	W
Subarea total	141	205	272	W
Subarea III-5				
C2b.2b2.a2b	105	145	180	W
C2b.2b2.a2a	12	15	18	S
C2b.2b2.a2	115	158	195	W
C2b.2b2.a	121	166	210	W
C2b.2b2.b	21	25	30	S
C2b.2b	136	188	233	W
C2b.2a	28	34	41	S
C2b.2	171	232	290	W
C2b	187	253	310	W
C2a	59	71	90	S
C2	234	313	390	W
C	257	343	420	W
B2a.2b	70	84	105	S
B2a.2a	26	32	38	S
B2a.2	96	114	140	S
B2a	136	164	200	S
B2b	13	17	22	S
B2c	41	54	70	W
B2	168	218	270	W
B	198	245	300	S
A2a	23	27	36	S
A2b	22	27	36	S
A2	45	54	69	S
A1	48	56	70	S
A	91	108	135	S
Subarea total	510	660	800	W

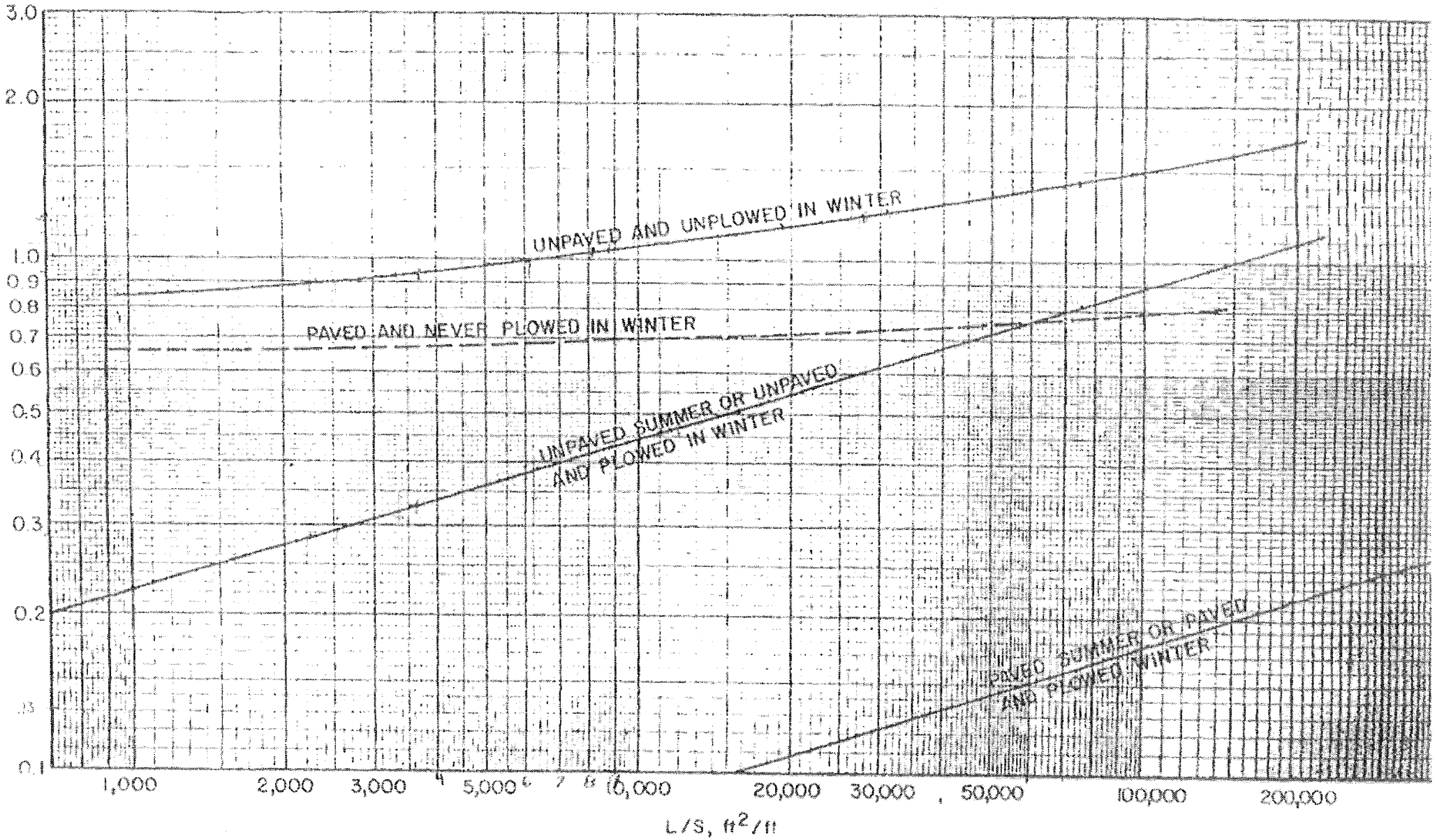


Figure I-2 Overland Flow tc Component, tco

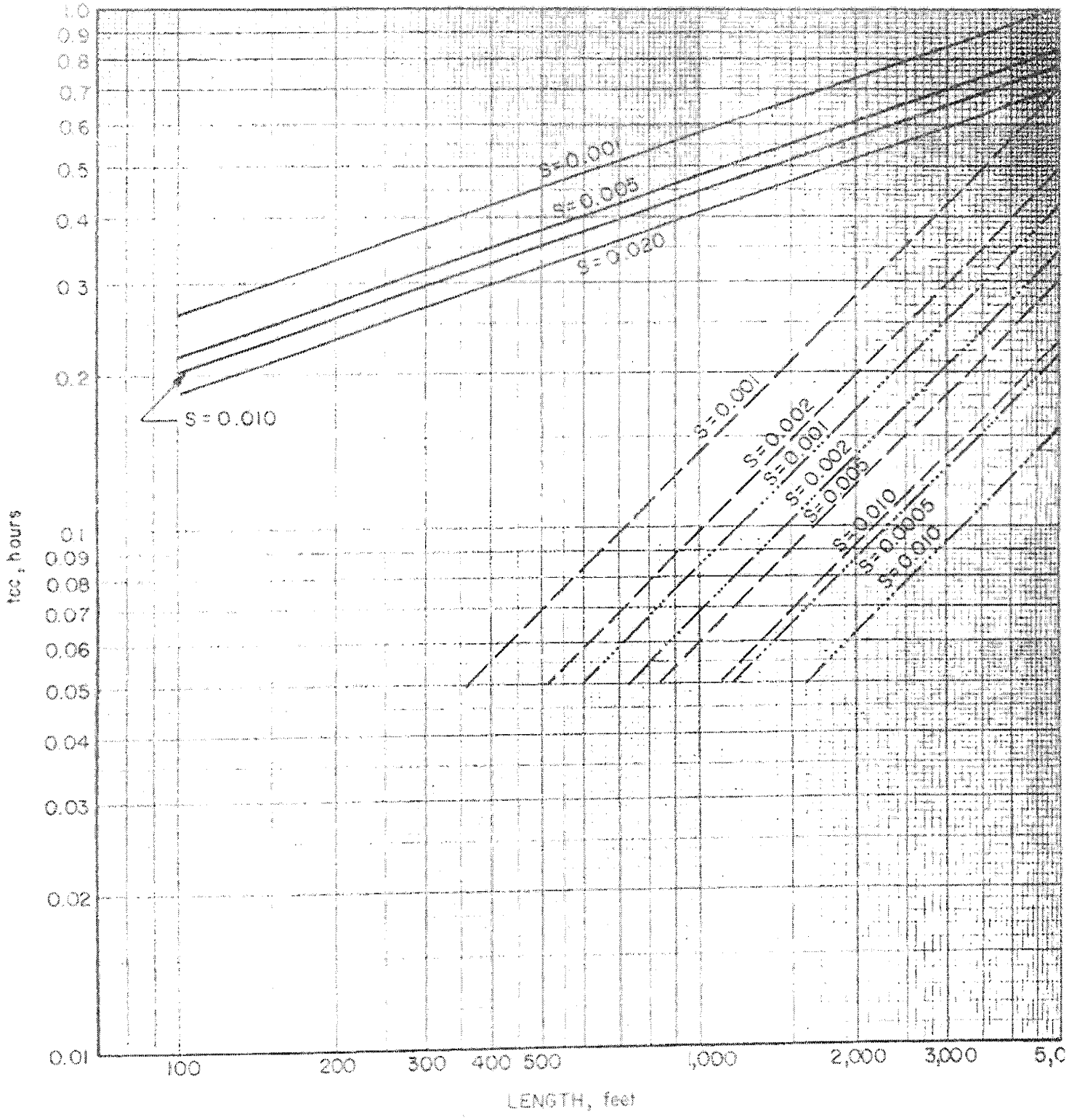


Figure I-3 Channel Flow tc Component, tcc

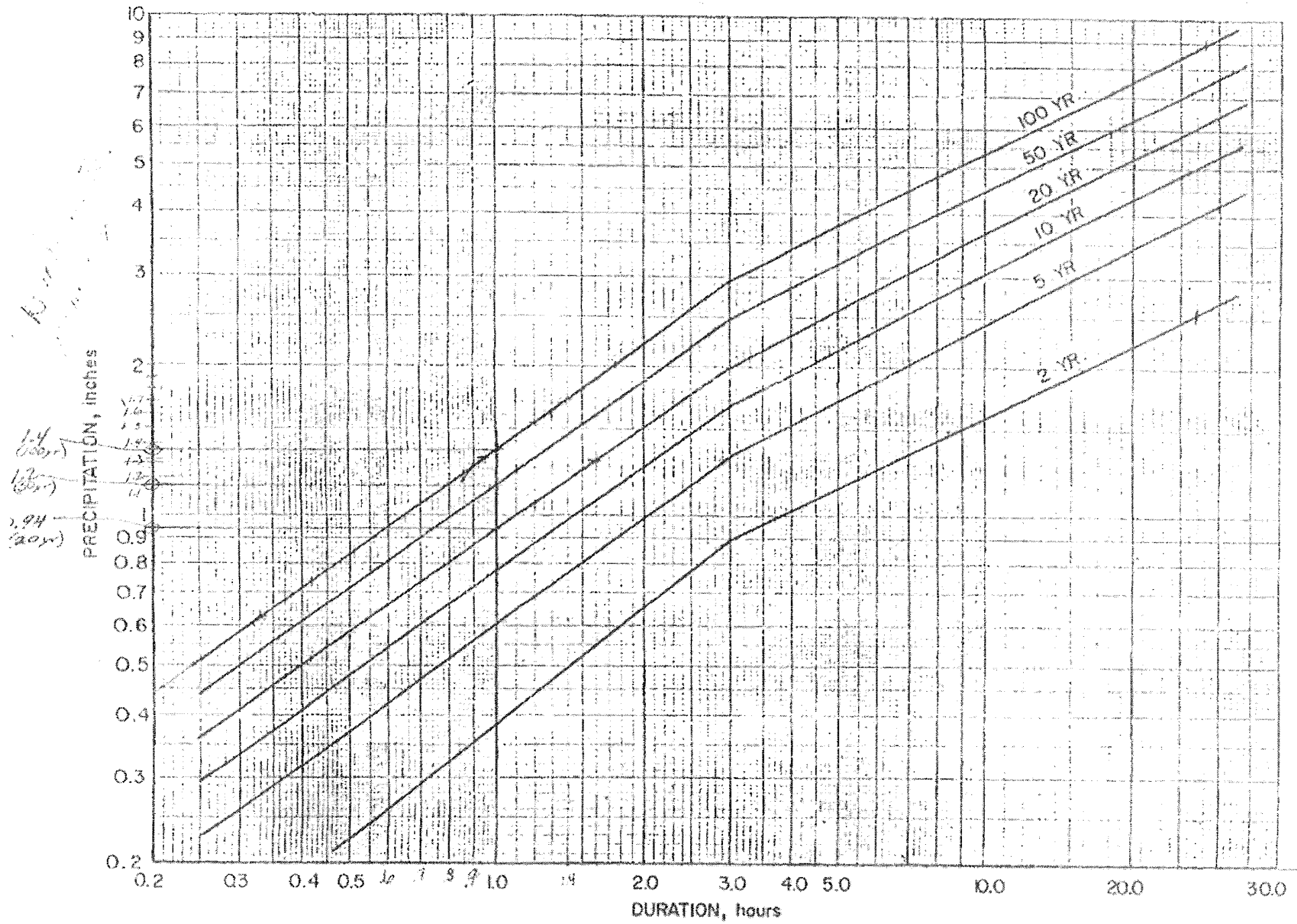


Figure I-4 Winter Precipitation Design Curve

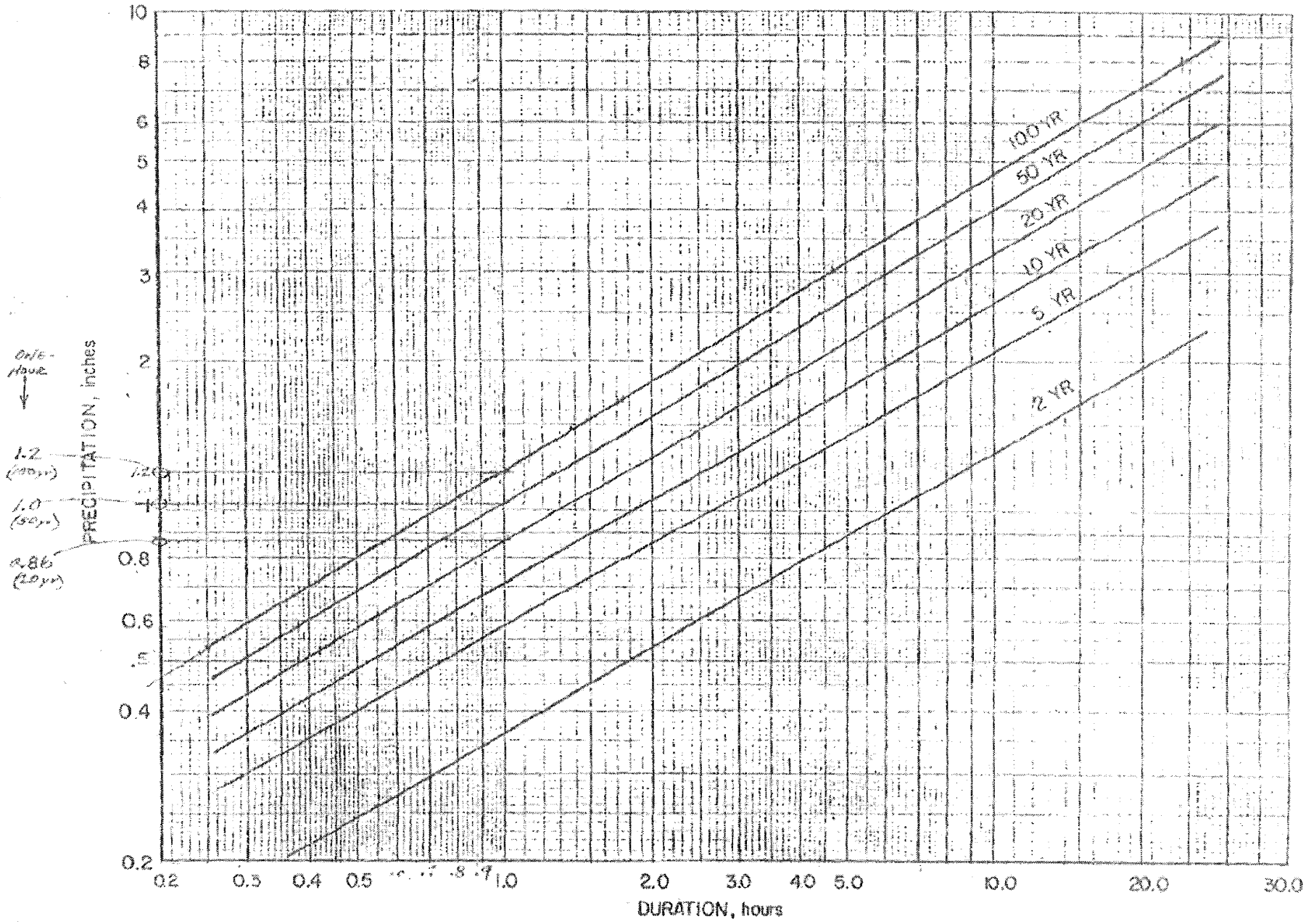


Figure I-5 Summer Precipitation Design Curve

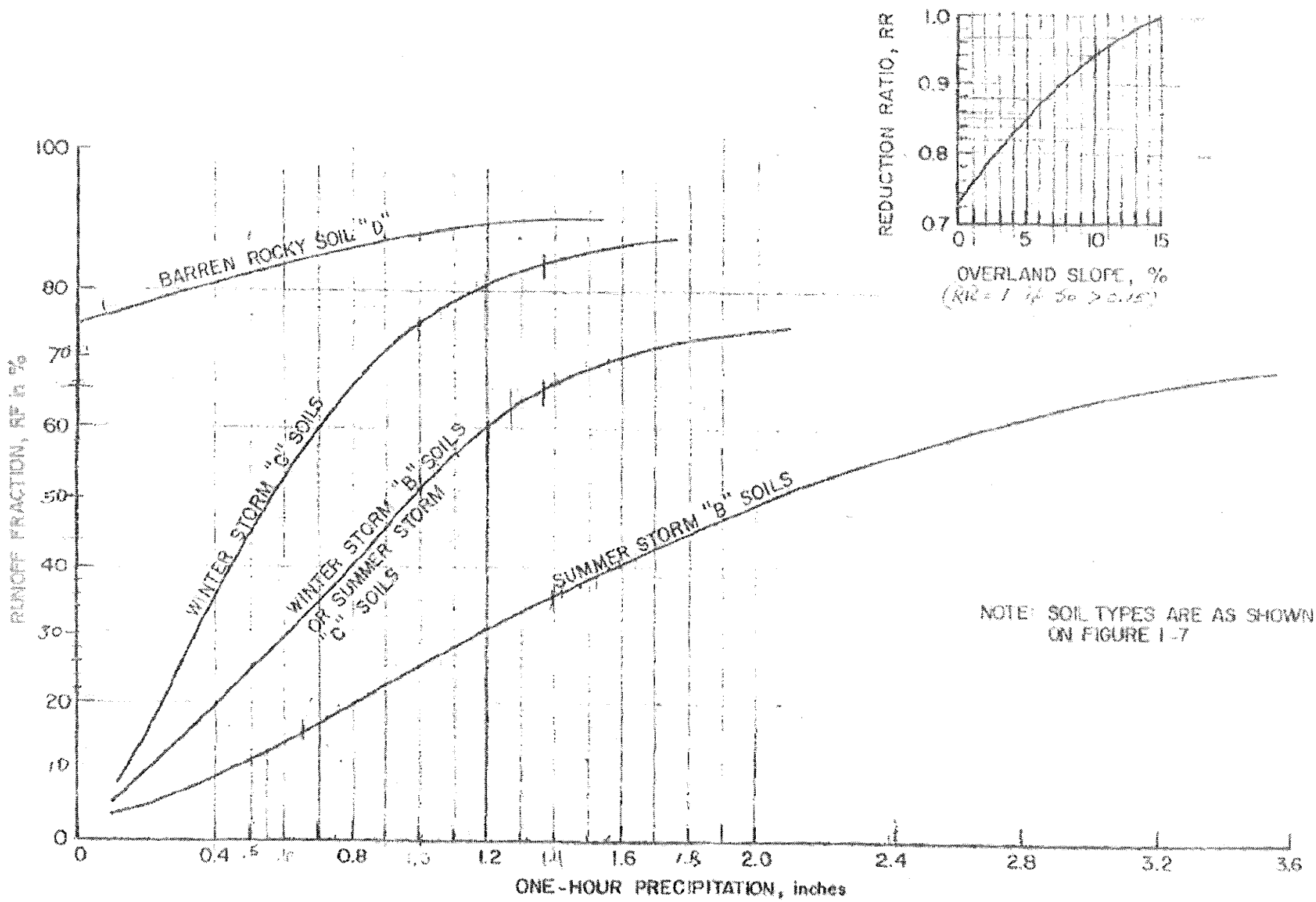


Figure I-6 Natural Area Runoff Factor, RF, and Reduction Ratio, RR

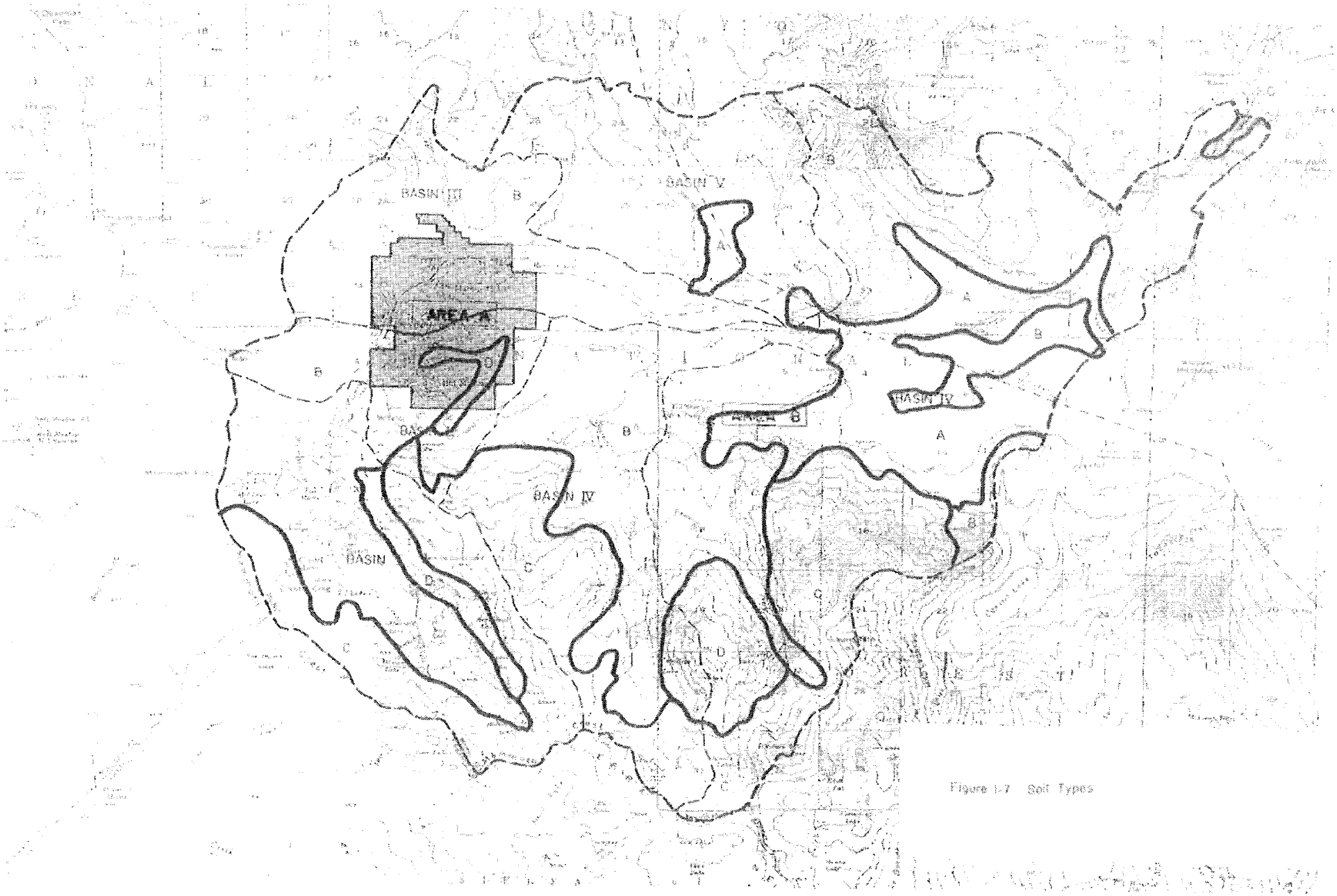


Figure I-7 Soil Types

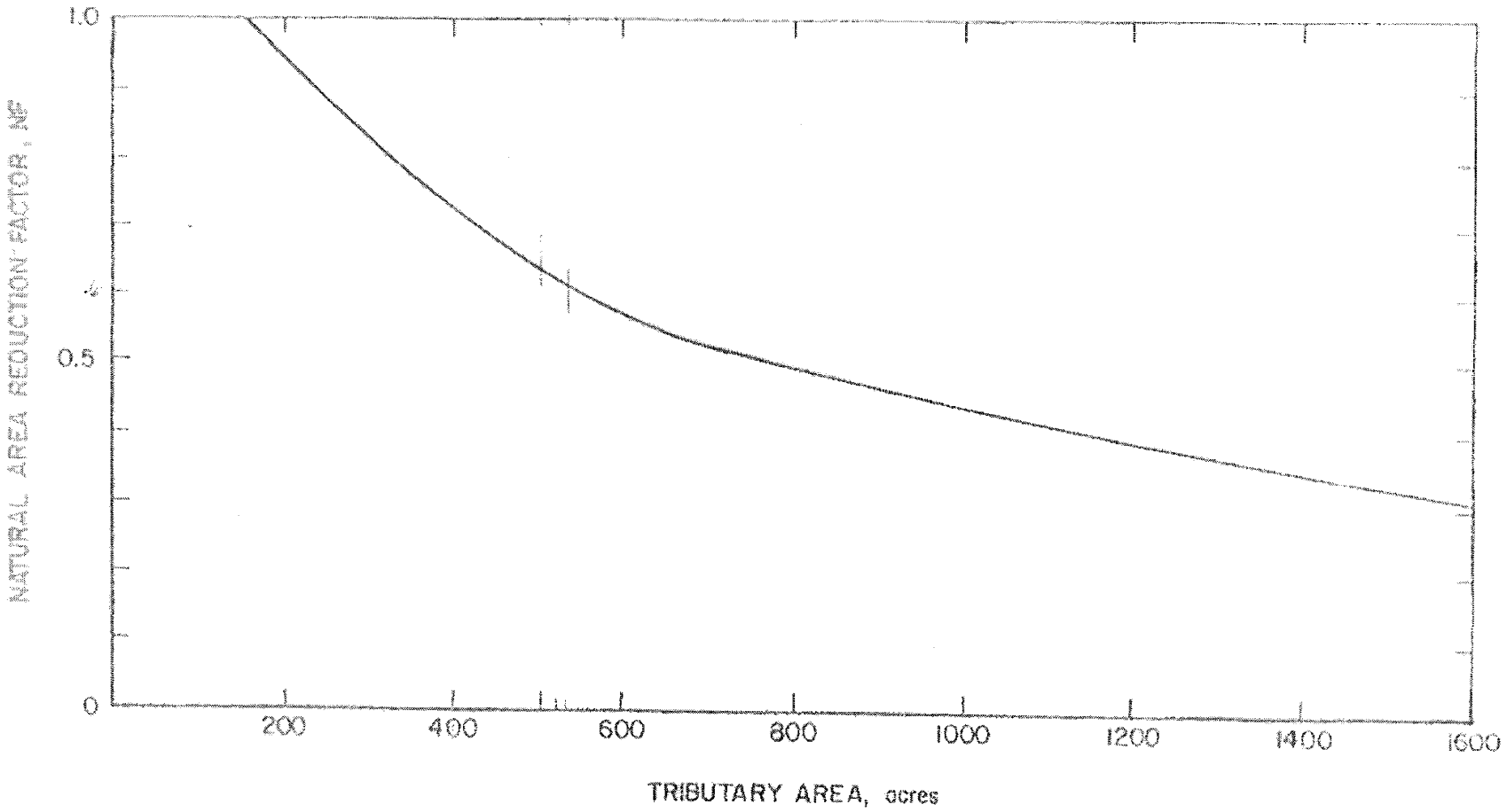


Figure I-8 Natural Area Size Factor, NF

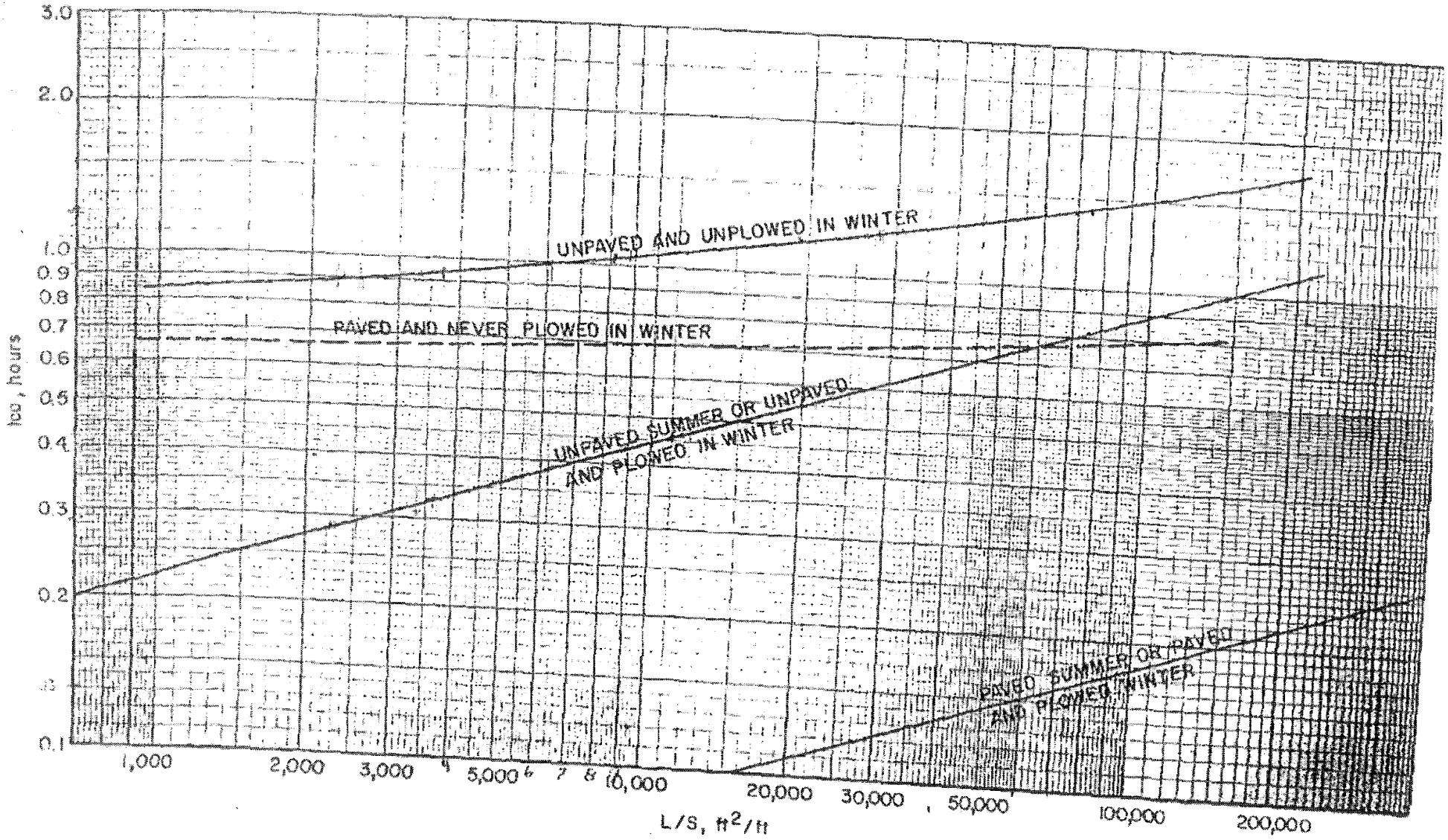


Figure 1-2 Overland Flow tc Component, tco

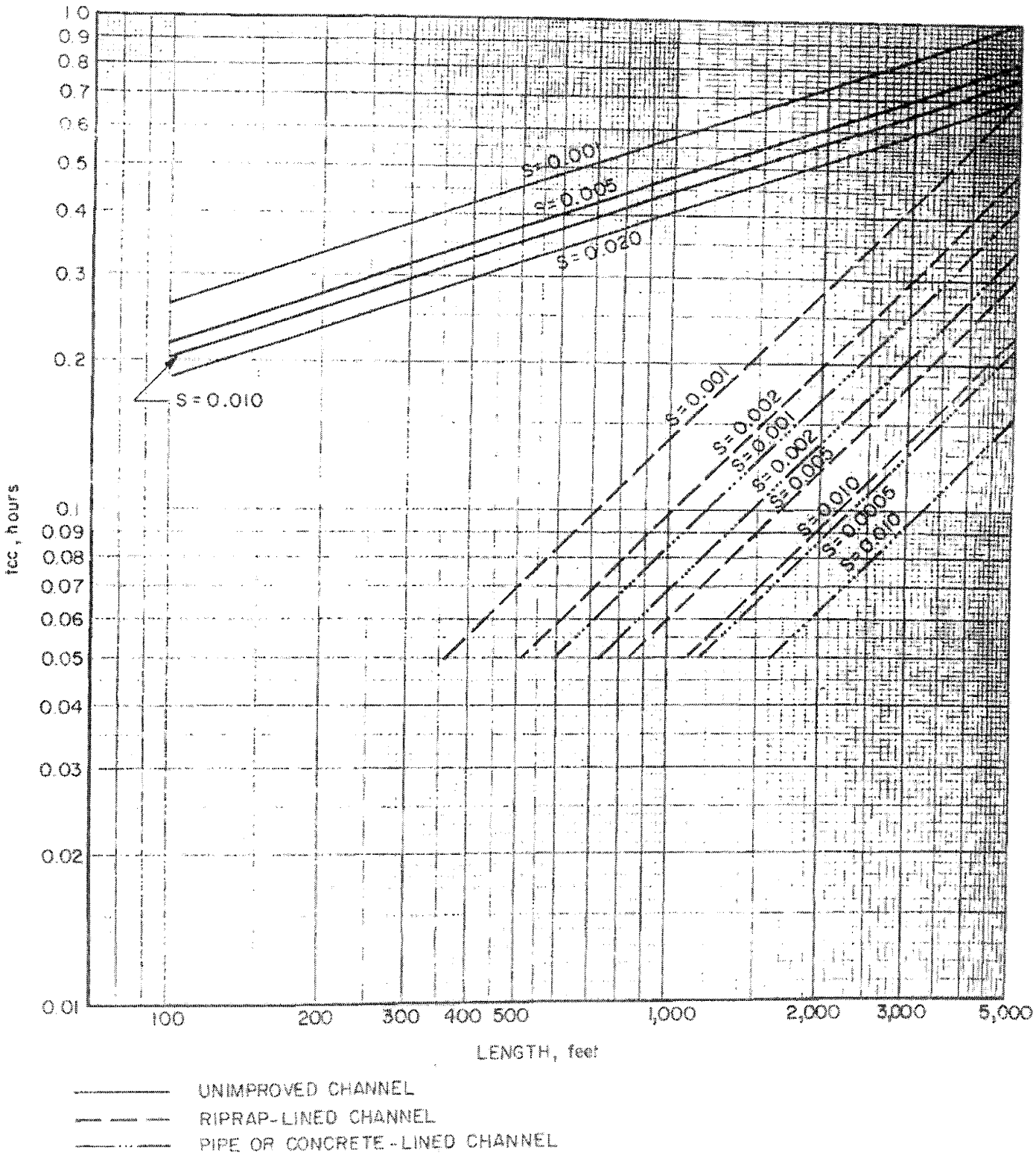


Figure 1-3 Channel Flow tc Component, tcc

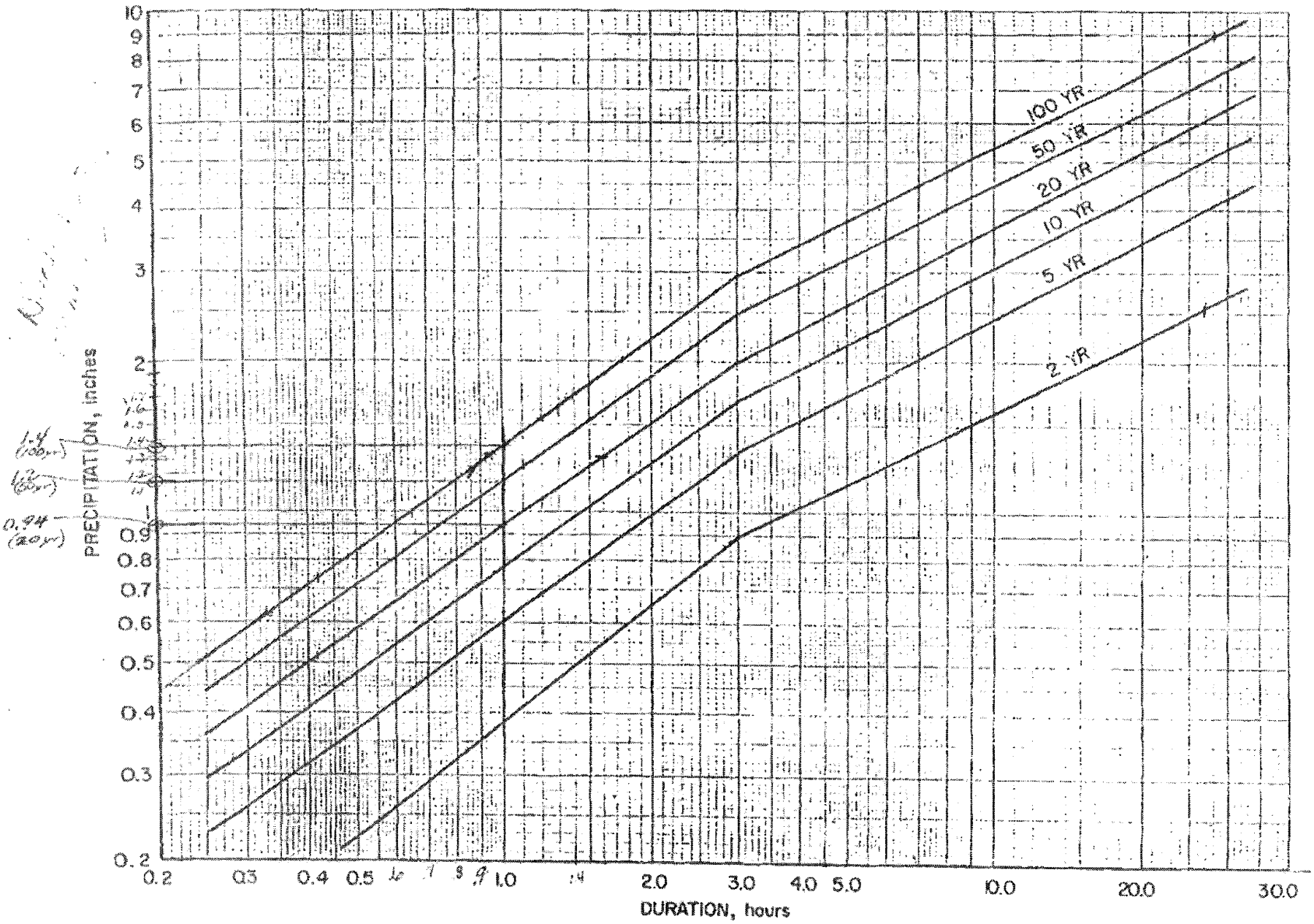


Figure I-4 Winter Precipitation Design Curve

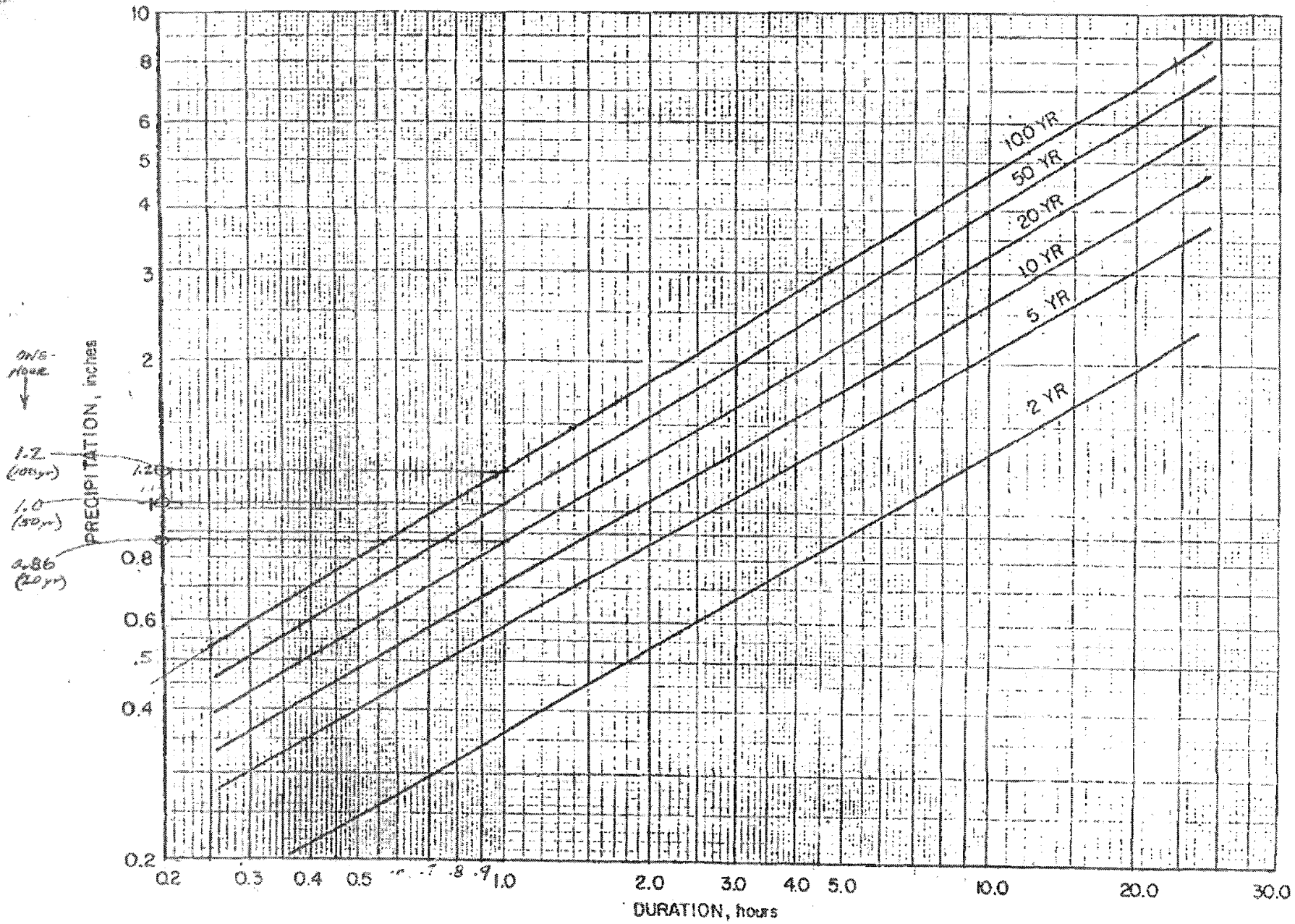


Figure I-5 Summer Precipitation Design Curve

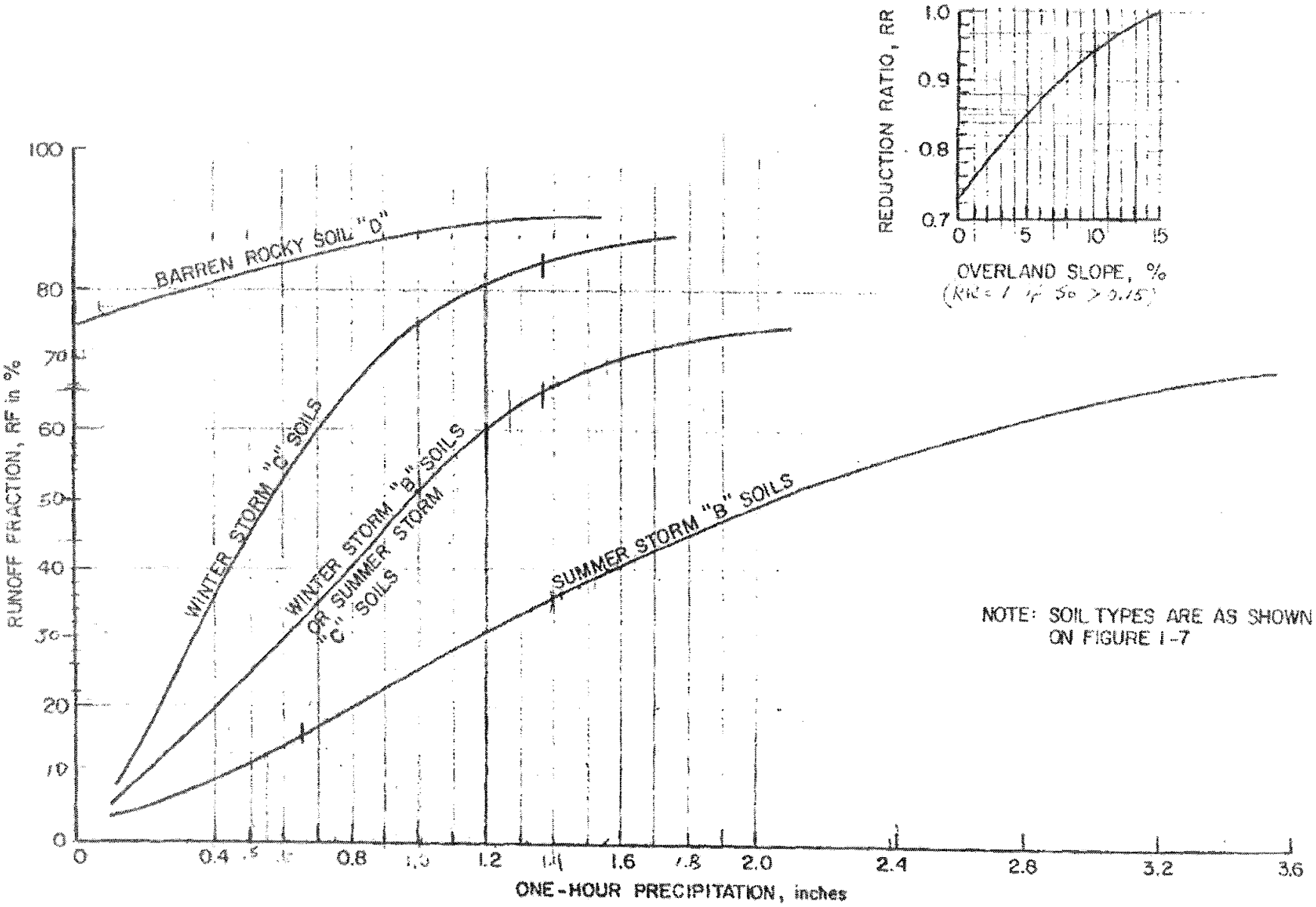


Figure I-6 Natural Area Runoff Factor, RF, and Reduction Ratio, RR

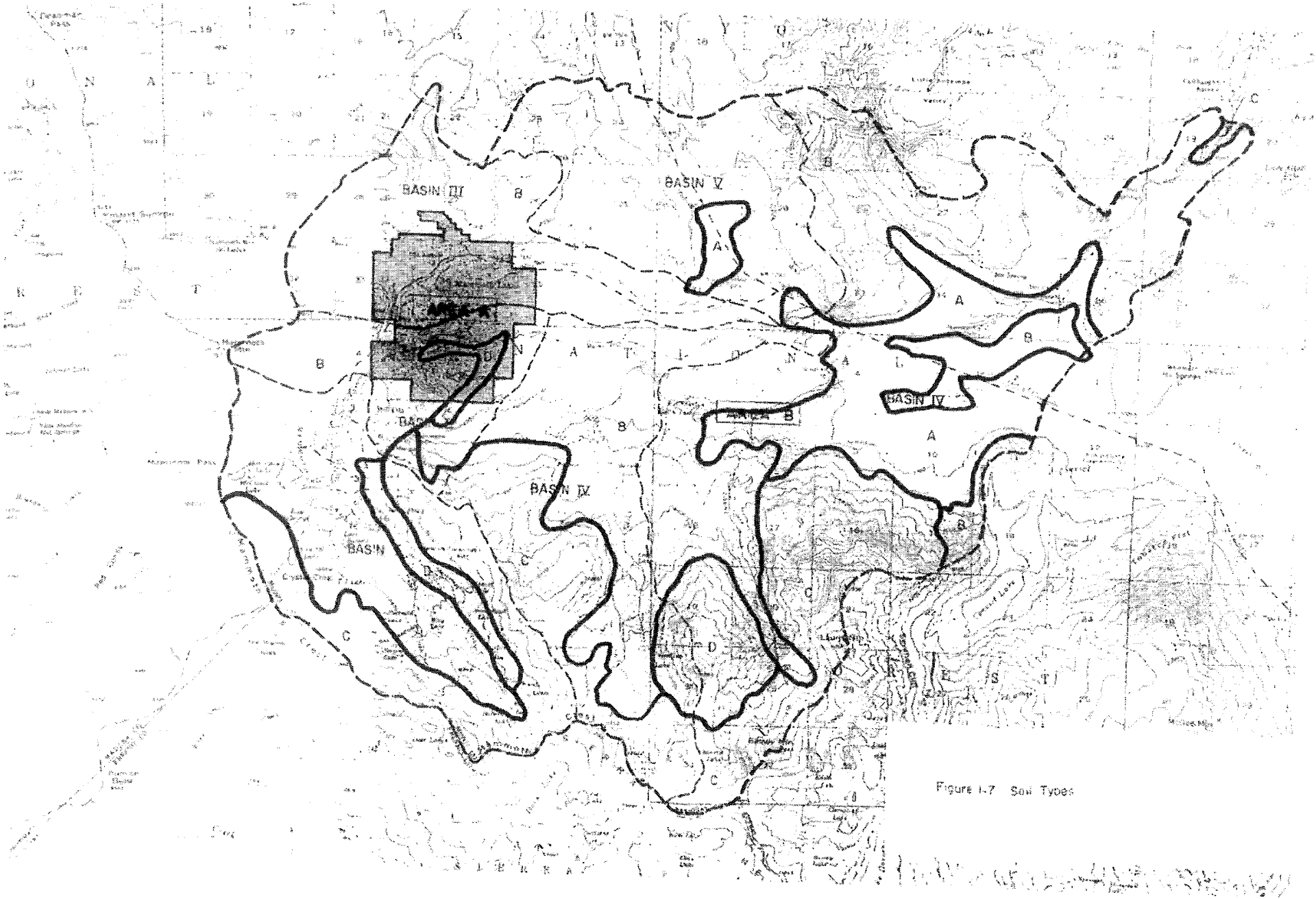


Figure I-7 Soil Types

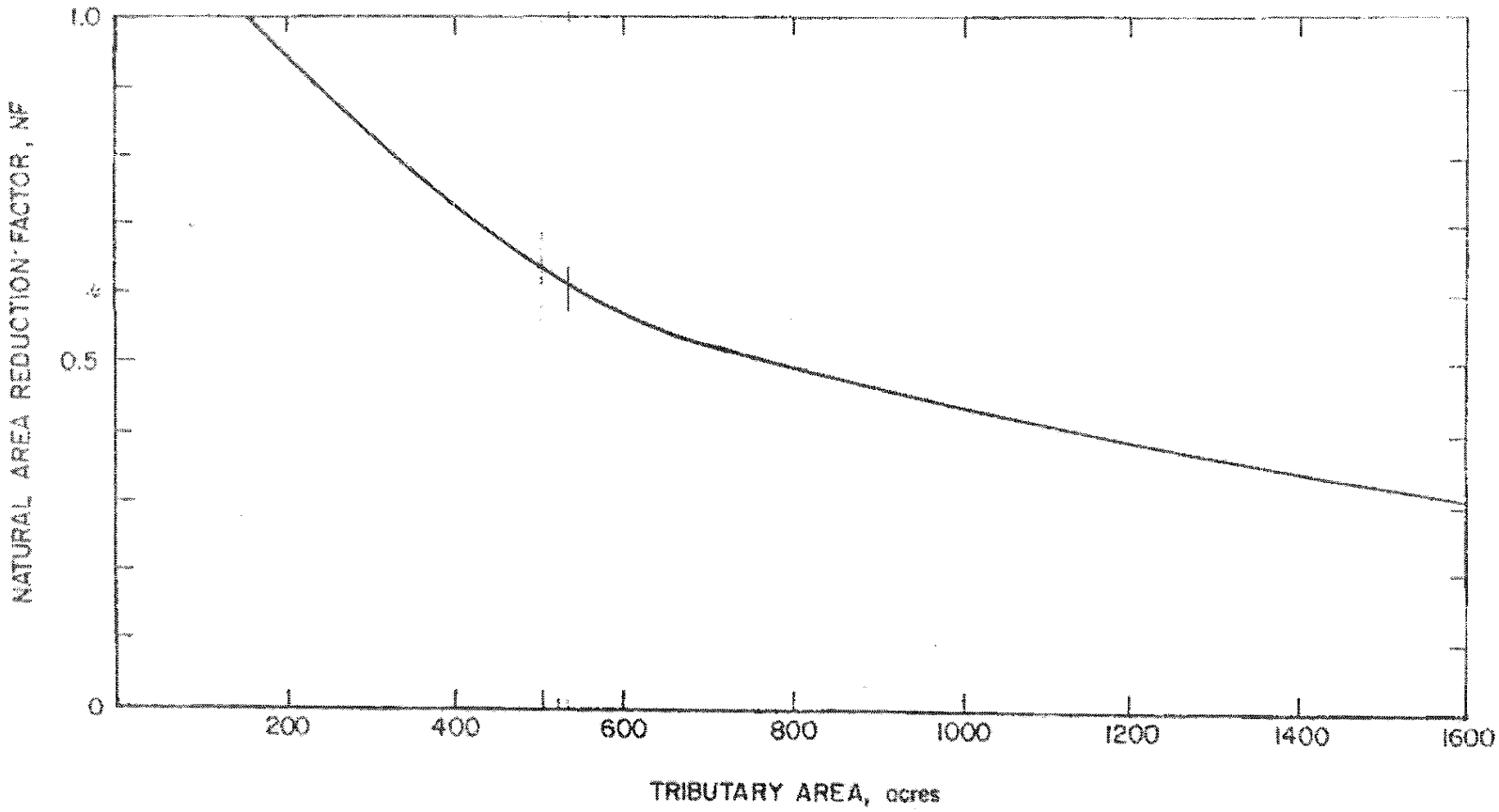


Figure I-8 Natural Area Size Factor, NF

4.8 LAND DEVELOPMENT

The construction and maintenance of urban and commercial developments can impact water quality in many ways. Construction activities inherently disturb soil and vegetation, often resulting in accelerated erosion and sedimentation. Stormwater runoff from developed areas can also contain petroleum products, nutrients, and other contaminants.

This section contains a discussion of the potential water quality impacts expected to result from land development activities, followed by control measures to reduce or offset water quality impacts from such activities.

Construction Activities and Guidelines

Construction activities often produce erosion by disturbing the natural ground surface through scarifying, grading, and filling. Floodplain and wetland disturbances often reduce the ability of the natural environment to retain sediment and assimilate nutrients. Construction materials such as concrete, paints, petroleum products, and other chemicals can contaminate nearby water bodies. Construction impacts such as these are typically associated with subdivisions, commercial developments, and industrial developments.

Control Measures for Construction Activities

The Regional Board regulates the construction of subdivisions, commercial developments, industrial developments, and roadways based upon the level of threat to water quality. The Regional Board will request a Report of Waste Discharge and consider the issuance of an appropriate permit for any proposed project where water quality concerns are identified in the California Environmental Quality Act (CEQA) review process. Any construction activity whose land disturbance activities exceed five acres must also comply with the statewide general NPDES permit for stormwater discharges (see "Stormwater" section of this Chapter).

The following are guidelines for construction projects regulated by the Regional Board, particularly for projects located in portions of the Region where erosion and stormwater threaten sensitive watersheds. The Regional Board recommends that each county within the Region adopt a grading/erosion control ordinance to require implementation of these same guidelines for all soil disturbing activities:

1. Surplus or waste material should not be placed in drainageways or within the 100-year floodplain of any surface water.

2. All loose piles of soil, silt, clay, sand, debris, or other earthen materials should be protected in a reasonable manner to prevent any discharge to waters of the State.

3. Dewatering should be performed in a manner so as to prevent the discharge of earthen material from the site.

4. All disturbed areas should be stabilized by appropriate soil stabilization measures by October 15th of each year.

5. All work performed during the wet season of each year should be conducted in such a manner that the project can be winterized (all soils stabilized to prevent runoff) within 48 hours if necessary. The wet season typically extends from October 15th through May 1st in the higher elevations of the Lahontan Region. The season may be truncated in the desert areas of the Region.

6. Where possible, existing drainage patterns should not be significantly modified.

7. After completion of a construction project, all surplus or waste earthen material should be removed from the site and deposited in an approved disposal location.

8. Drainage swales disturbed by construction activities should be stabilized by appropriate soil stabilization measures to prevent erosion.

9. All non-construction areas should be protected by fencing or other means to prevent unnecessary disturbance.

10. During construction, temporary protected gravel dikes, protected earthen dikes, or sand bag dikes should be used as necessary to prevent discharge of earthen materials from the site

during periods of precipitation or runoff.

11. Impervious areas should be constructed with infiltration trenches along the downgradient sides to dispose of all runoff greater than background levels of the undisturbed site. Infiltration trenches are not recommended in areas where infiltration poses a risk of ground water contamination.

12. Infiltration trenches or similar protection facilities should be constructed on the downgradient side of all structural drip lines.

13. Revegetated areas should be continually maintained in order to assure adequate growth and root development. Physical erosion control facilities should be placed on a routine maintenance and inspection program to provide continued erosion control integrity.

14. Waste drainage waters in excess of that which can be adequately retained on the property should be collected before such waters have a chance to degrade. Collected water shall be treated, if necessary, before discharge from the property.

15. Where construction activities involve the crossing and/or alteration of a stream channel, such activities should be timed to occur during the period in which stream flow is expected to be lowest for the year.

16. Use of materials other than potable water for dust control (i.e., reclaimed wastewater, chemicals such as magnesium chloride, etc.) is strongly encouraged but must have prior Regional Board approval before its use.

Specific Policy and Guidelines for Mammoth Lakes Area

To control erosion and drainage in the Mammoth Lakes watershed at an elevation above 7,000 feet (Figure 4.8-1), the following policy and guidelines apply:

Policy:

A Report of Waste Discharge is required not less than 90 days before the intended start of construction activities of a **new development** of either (a) six or more dwelling units, or (b) commercial developments involving soil disturbance on one-quarter acre or more.

The Report of Waste Discharge shall contain a description of, and time schedule for implementation, for both the **interim erosion control measures** to be applied during project construction, and **short- and long-term erosion control measures** to be employed after the construction phase of the project. The descriptions shall include appropriate engineering drawings, criteria, and design calculations.

Guidelines:

1. Drainage collection, retention, and infiltration facilities shall be constructed and maintained to prevent transport of the runoff from a 20-year, 1-hour design storm from the project site. A 20-year, 1-hour design storm for the Mammoth Lakes area is equal to 1.0 inch (2.5 cm) of rainfall.

2. Surplus or waste materials shall not be placed in drainageways or within the 100-year flood plain of surface waters.

3. All loose piles of soil, silt, clay, sand, debris, or earthen materials shall be protected in a reasonable manner to prevent any discharge to waters of the State.

4. Dewatering shall be done in a manner so as to prevent the discharge of earthen materials from the site.

5. All disturbed areas shall be stabilized by appropriate soil stabilization measures by October 15 of each year.

6. All work performed between October 15th and May 1st of each year shall be conducted in such a manner that the project can be winterized within 48 hours.

7. Where possible, existing drainage patterns shall not be significantly modified.

8. After completion of a construction project, all surplus or waste earthen material shall be removed from the site and deposited at a legal

point of disposal.

9. Drainage swales disturbed by construction activities shall be stabilized by the addition of crushed rock or riprap, as necessary, or other appropriate stabilization methods.

10. All nonconstruction areas shall be protected by fencing or other means to prevent unnecessary disturbance.

11. During construction, temporary erosion control facilities (e.g., impermeable dikes, filter fences, hay bales, etc.) shall be used as necessary to prevent discharge of earthen materials from the site during periods of precipitation or runoff.

12. Revegetated areas shall be regularly and continually maintained in order to assure adequate growth and root development. Physical erosion control facilities shall be placed on a routine maintenance and inspection program to provide continued erosion control integrity.

13. Where construction activities involve the crossing and/or alteration of a stream channel, such activities shall be timed to occur during the period in which streamflow is expected to be lowest for the year.

Land Development/Urban Runoff Control Actions for Susan River Watershed

1. To protect riparian vegetation and wetlands from land disturbance activities, the Regional Board shall recommend that Lassen County and the City of Susanville require new development or any land disturbing activities to include buffer strips of undisturbed land, especially along the Susan River and its tributaries.

2. The Regional Board, with assistance from the City of Susanville and the California Department of Transportation (Caltrans), should conduct monitoring of the Susan River and Piute Creek within the City of Susanville to assess impacts from urban runoff. Control measures should be planned and implemented based on the results of the monitoring. The monitoring plan should be developed to identify nonpoint sources needing control. Monitoring proposals will be submitted by the Regional Board, and work will be conducted as resources allow and as the Susan River gains priority.

3. The Regional Board shall encourage and assist other agencies in watershed restoration efforts along the Susan River.

4. The Regional Board shall encourage the City of Susanville and Lassen County to adopt a comprehensive grading ordinance. These ordinances should require, for all proposed land disturbing activities, the use of Best Management Practices to reduce erosion and stormwater runoff, including but not limited to temporary and permanent erosion control measures.

5. The Regional Board shall encourage the City of Susanville, Lassen County and Caltrans to implement Best Management Practices to reduce erosion and stormwater runoff when constructing and maintaining roads, both paved and unpaved, under their jurisdiction.

Road Construction and Maintenance

Road construction activities often involve extensive earth moving, including clearing, scarifying, excavating for bridge abutments, disturbing or modifying floodplains, cutting, and filling. Additionally, the potential for land disturbance exists from construction materials, equipment maintenance, fuel storage facilities, and general equipment use.

Once constructed, impervious road surfaces create another source of water pollution. Oils, greases, and other petroleum products, along with such toxic materials as battery acid, antifreeze, etc., may be deposited along the road surfaces. These contaminants become suspended or dissolved in any stormwater runoff that is generated on the road surfaces. Unless otherwise treated, these contaminants will flow toward local surface or ground waters. (See "Stormwater" section of this Chapter.)

Road maintenance can be potentially threatening to water quality in a number of ways. Below-grade culverts slowly fill with sediment and are cleaned out periodically, sometimes by flushing accumulated sediment into downstream drainageways. Grading of shoulders and drainageways can detach sediments and increase the risk of erosion into nearby surface

waters. Road surfaces may be repainted or resealed with materials that harden quickly, but which can be washed off while still fresh by stormwater runoff.

In the winter, roads are often snowy, icy, or wet. To reduce winter road hazards, maintenance crews may remove the snow or ice, apply sand to provide added traction, and/or apply deicing chemicals to melt the snow and ice. Sand is rapidly dissipated or crushed by the traffic, and must be replaced frequently. Great quantities of sediment enter drainageways and/or surface waters due to this practice. Snow may be removed mechanically via snowplow or snowblower. This practice is not particularly detrimental to water quality in itself, but the snow often carries substances from the roadway when removed. Sediments, chemical deicers, and vehicle fluids may travel much farther than they would otherwise, possibly reaching area surface waters. Ice and small accumulations of snow may be removed with chemical deicers. The deicer in widest use is rock salt (sodium chloride), due to its low cost, high availability, and predictable results.

Winter road maintenance was brought to the forefront in 1989 when significant numbers of roadside trees in the Lake Tahoe Basin suddenly started dying. The public outcry caused many environmental groups and regulatory agencies, including the Regional Board, to look more closely at what had been a more or less unscrutinized, unregulated process in the past. Data began to show that Caltrans was using very high amounts of salt each winter, and the figure seemed to increase from one year to the next. The consensus of the various regulatory agencies was that Caltrans should reduce salt use, explore various alternate deicers, and monitor the impacts of salt applications on soil, water, and vegetation. Salt use decreased significantly from 1989-1992, due to more careful application procedures and to drought conditions.

At least three alternate deicers have been explored: calcium magnesium acetate, potassium acetate, and magnesium chloride with corrosion inhibitors. These products have shown some promise, but further study is required. The cost to switch to an alternate deicer will be significant. The road departments are unwilling to make the switch unless an alternate deicer is demonstrably better environmentally, will not require too much adjustment on the part of the maintenance crews and equipment, and will actually do an effective and predictable job when applied.

However, Caltrans' monitoring of vegetation showed minimal and temporary salt accumulation within the vegetation. During the spring, any salt that had accumulated in the vegetation was flushed out from the plant material. The impacts of chemical deicers on fish and wildlife within the Lahontan Region have not been studied.

Control Measures for Road Construction and Maintenance

(Additional control measures for roads are included in the "Stormwater" section of this Chapter.)

The Regional Board regulates road construction and maintenance projects within the Lahontan Region, concentrating efforts on major construction and construction in sensitive areas. Major construction projects and those projects in sensitive areas are most often regulated under individual WDRs, and are routinely inspected. Less significant projects may be issued conditional waivers of WDRs. The Regional Board has also adopted road maintenance waste discharge requirements for some county governments in the Region. Road construction and maintenance in the Lake Tahoe Basin is also regulated under municipal NPDES Stormwater Permits (see Chapter 5).

For all road projects, the Board requires that construction be conducted in a manner which is protective to water quality, and that, at the end of a given project, the site be restabilized and revegetated. These requirements are detailed in a Management Agency Agreement with Caltrans regarding the implementation of BMPs. Additionally, all road projects are to be in compliance with the Caltrans Statewide 208 Plan (CA Dept. of Transportation 1980), which was approved by the State Board in 1979. This Plan contains a commitment to implement BMPs, but does not include great detail on the BMPs themselves. The State Board should encourage Caltrans to update its 208 plan to provide such detail, with particular attention to:

- stormwater/erosion control along existing highways
- erosion control during highway construction and

maintenance

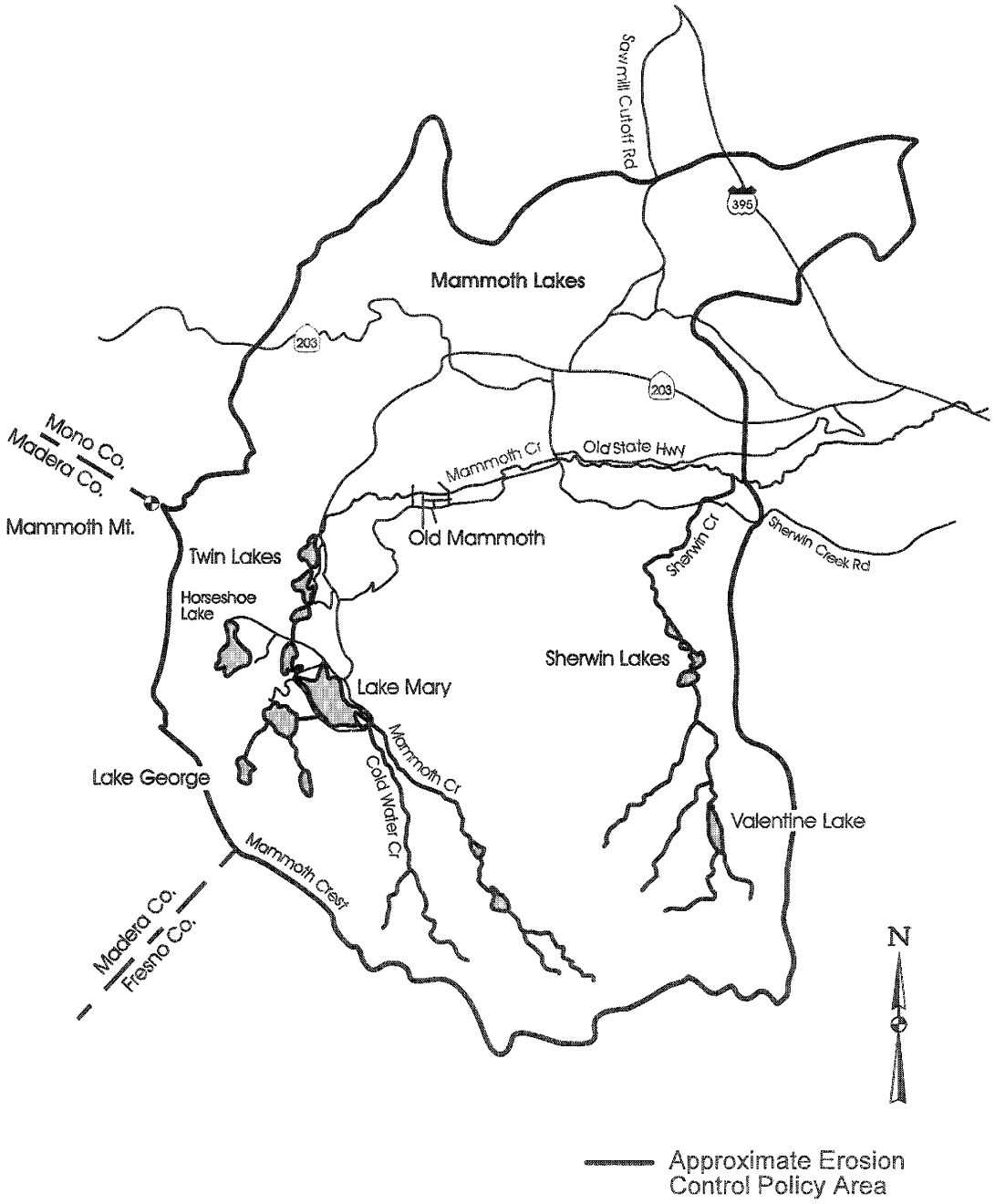
- reduction of direct discharges (e.g., through culverts)
- reduction of runoff velocity
- infiltration, detention and retention practices
- management of deicing compounds, fertilizer, and herbicide use
- spill cleanup measures
- treatment of toxic stormwater pollutants

Since much of the implementation of BMPs on highways is done by Caltrans' contractors, the selection of qualified contractors and ongoing education of construction and maintenance personnel on BMP techniques are particularly important.

In the Lake Tahoe Basin, all governmental agencies assigned to maintain roads are required to bring all roads in the Lake Tahoe Basin into compliance with current "208" standards within a specified time schedule. That is, all existing facilities must be retrofitted to handle the stormwater runoff from the 20-year, 1-hour storm, and to restabilize all eroding slopes. The twenty-year time frame for this compliance process ends in 2008.

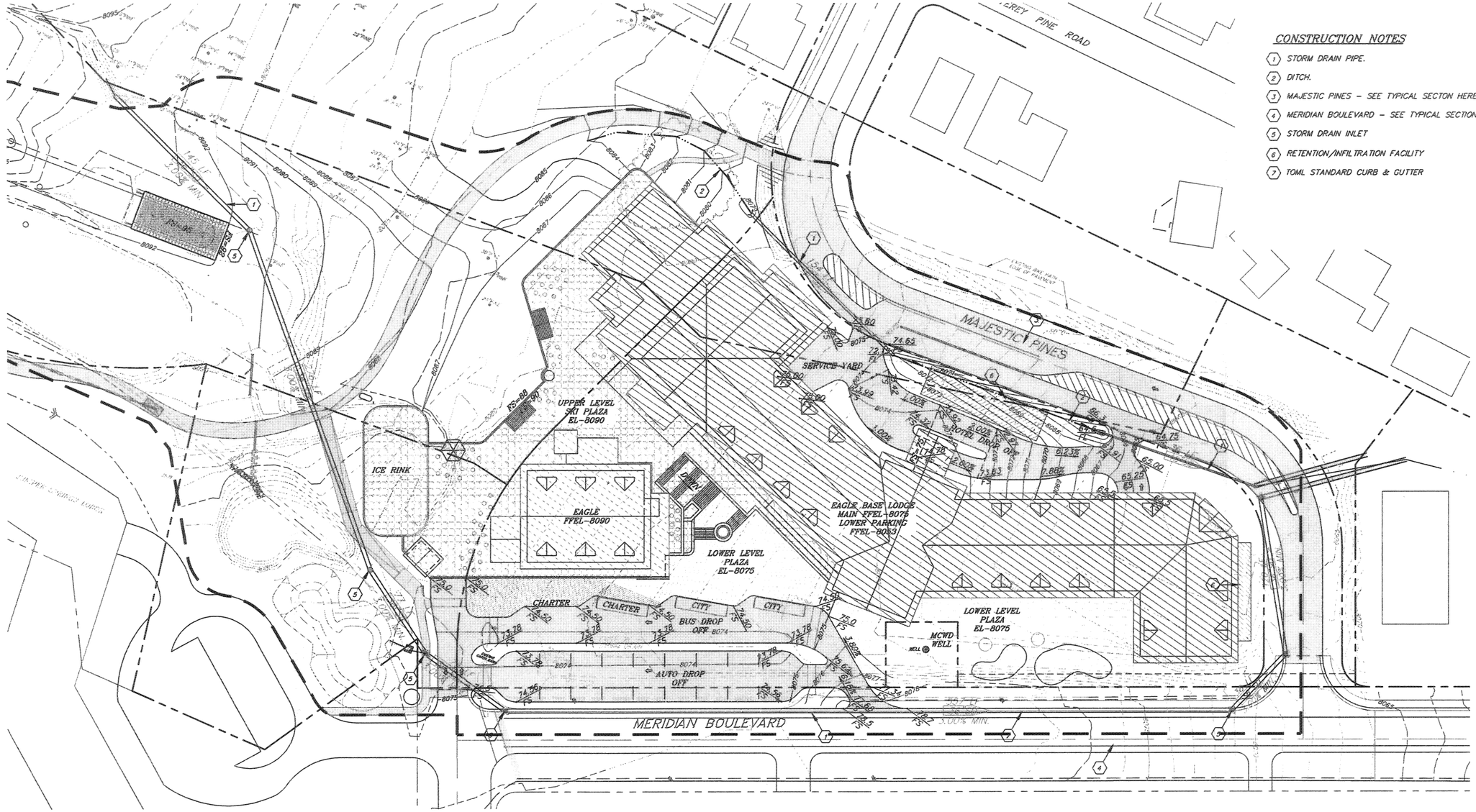
The Regional Board should allow salt use to continue as one component of a comprehensive winter maintenance program. However, the Regional Board should continue to require that it be applied in a careful, well-planned manner, by competent, trained crews. Should even the "proper" application of salt be shown to cause adverse water quality impacts, the Regional Board should then require that it no longer be used in environmentally sensitive areas, such as the Lake Tahoe Basin. Similarly, should an alternate deicer be shown to be effective, environmentally safe, and economically feasible, its use should be encouraged in lieu of salt.

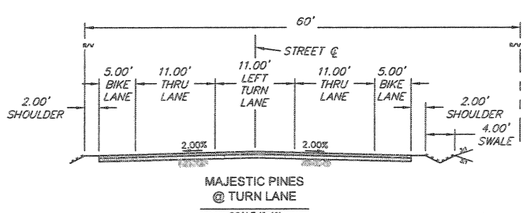
Figure 4.8-1
OWENS HYDROLOGIC UNIT



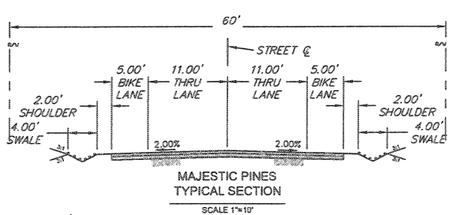
CONSTRUCTION NOTES

1. STORM DRAIN PIPE.
2. DITCH.
3. MAJESTIC PINES - SEE TYPICAL SECTON HEREON
4. MERIDIAN BOULEVARD - SEE TYPICAL SECTION HEREON
5. STORM DRAIN INLET
6. RETENTION/INFILTRATION FACILITY
7. TOML STANDARD CURB & GUTTER

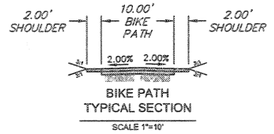




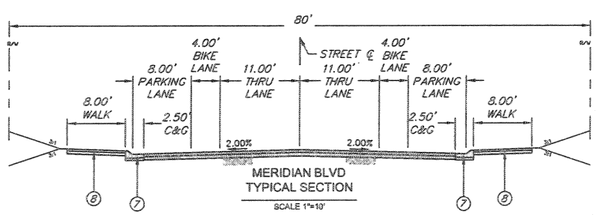
MAJESTIC PINES
@ TURN LANE
SCALE 1"=10'



MAJESTIC PINES
TYPICAL SECTION
SCALE 1"=10'



BIKE PATH
TYPICAL SECTION
SCALE 1"=10'



MERIDIAN BLVD
TYPICAL SECTION
SCALE 1"=10'

⑦ TOWN OF MAMMOTH LAKES TYPE 1 CURB & GUTTER
⑧ TOWN OF MAMMOTH LAKES 8' CONCRETE SIDEWALK

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

SCALE: 1"=40' 22"x34" SHEET
(SEE SCALE BAR ABOVE)
SCALE: 1"=80' 11"x17" SHEET
CONTOUR INTERVAL: 1'

MAMMOTH

triad/holmes assoc.
civil engineering
land surveying

MAMMOTH LAKES
BISHOP
LOMPOC
NAPA
PLEASANTON
REDWOOD CITY
SAN LUIS OBISPO

PREPARED FOR:
MAMMOTH MOUNTAIN SKI AREA
ATTN: TOM HODGES
P.O. BOX 24
MAMMOTH LAKES, CA 93546
760-934-2571 EXT. 3243

GRADING AND DRAINAGE PLAN
EAGLE LODGE BASE AREA

DATE 08/10/2006
SCALE 1"=40'
DRAWN SMF
JOB NO. 1737.2
DWG C2
SHEET 2 OF 4

K:\01 Mammoth\1737-2 Grading Plan\1737-2 Grading Plan R5.dwg Aug 10,2006 - 4:58pm, sfuller

MONTEREY PINE ROAD

CHAIR LIFT TO REMAIN

REMOVE EXISTING WALKS

REMOVE EXISTING BASE FACILITIES

REGRADE EXISTING

MAJESTIC PINES

REMOVE EXISTING ASPHALT

REMOVE STORM DRAIN

REMOVE STORM DRAIN

MERIDIAN BOULEVARD

ITEMS TO BE REMOVED

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

SCALE: 1"=40' 22"x34" SHEET
(SEE SCALE BAR ABOVE)
SCALE: 1"=80' 11"x17" SHEET
CONTOUR INTERVAL: 1'

MAMMOTH

triad/holmes assoc.
civil engineering
land surveying

MAMMOTH LAKES
BISHOP
LOMPOC
NAPA
PLEASANTON
REDWOOD CITY
SAN LUIS OBISPO

PREPARED FOR:
MAMMOTH MOUNTAIN SKI AREA
ATTN: TOM HODGES
P.O. BOX 24
MAMMOTH LAKES, CA 93546
760-934-2571 EXT. 3243

EXISTING CONDITIONS AND SITE DEMOLITION PLAN

EAGLE LODGE BASE AREA

DATE 08/10/2006
SCALE 1"=40'
DRAWN SMF
JOB NO. 1737.2
DWG C1
SHEET 1 OF 4

EROSION CONTROL NOTES

1. General Permit:

a. This Storm Water Pollution Prevention Plan (SWPPP) is authorized under the Federal Clean Water Act (CWA), General Permit, NPDES CAS00002, and the State Water Quality Control Board (SWRCB) Order No. 99 – 08 – DWQ. This General Permit prohibits the discharge of materials other than storm water and authorized non–storm water discharges.

b. The SWPPP shall remain on the construction site while the site is under construction during working hours, commencing with the initial construction activity and ending with termination of coverage under the General Permit.

c. The SWPPP must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. Non–storm water BMP's (Best Management Practices) must be implemented year round.

d. For the purposes of this General Permit, the SWPPP shall be considered to be this plan, all text included in this SWPPP documentation, and all references made by this SWPPP.

e. Conformance to this SWPPP is the minimum requirement. Modifications must be made as necessary to conform with the intent of the SWRCB Order No. 99 – 08 – DWQ and the NPDES General Permit No. CAS000002.

f. This document is not intended and cannot be relied upon to create rights, substantive or procedural, enforceable by any party in litigation with the United States.

g. The Owner is ultimately responsible for the Storm Water Discharge from this site. The Owner shall inform all Contractors, Subcontractor, Future Owners or any other Authorized Representatives of these SWPPP requirements.

h. All requirements of the Improvement Plan shall be incorporated into this plan by reference.

2. General Erosion Control Measures (based on specific plan):

Construction Phase Strategies, Activities, and Revegetation Plans to reduce short–term and long–term erosion and sedimentation, such as:

a. If excavation occurs during the rainy season, storm runoff shall be regulated by temporary onsite detention basins with multiple discharge points to natural drainages and wetlands. Stockpiles of loose material shall be covered and runoff shall be diverted away from exposed soil material. If work is stopped due to rains, a positive grading away from the slopes shall be provided to carry the surface runoff to areas to where flow can be controlled, such as temporary detention basins. Sediment basin/traps shall be designed with efficiency to trap the modal size of soil particles on the site and shall be located and operated to prevent offsite sediment transport. Any trapped sediment shall be reused or removed to an approved disposal site.

b. Temporary erosion control measures including the placement of properly trenched staked straw rolls and straw matting along the base of disturbed slopes and on drainage ways at the downstream site margins shall be provided until perannial revegetation or landscaping is established and can prevent discharge of sediment into drainages.

c. After completion of grading, erosion protection shall be provided on all slopes including cut and fill slopes to reduce erosion problems during the rainy season. Based on the greater chance of precipitation, permanent or temporary revegetation and/or erosion protection shall be installed within two days of grading sloped areas between November 1 and April 1. Revegetation should be facilitated by mulching, hydroseeding or other methods suitable for landscaping. Temporary revegetation shall use a local annual grass adapted to the naturally low rainfall amounts (e.g. Panoche Red Brome), and shall be continued until permanent revegetation is successfully established. Permanent revegetation /landscaping of slopes shall emphasize perennial ground coverings, shrubs, and trees that are drought–tolerant, including native species, to improve the probability of slope and soil stabilization.

3. Non–Storm Discharges:

This General Permit prohibits the discharge of materials other than storm water and authorized non–storm water discharges. It is recognized that certain non–storm water discharges may be necessary for the completion of construction projects. Such discharges include, but are not limited to, irrigation of vegetative erosion control measures, pipe flushing and testing, street cleaning, and dewatering. Such discharges are allowed by this General Permit provided they are not relied upon to clean up failed or inadequate construction or post–construction BMP's designed to keep materials onsite. These authorized non–storm water discharges shall (1) be infeasible to eliminate, (2) comply with BMP's as described in the SWPPP, and (3) not cause or contribute to a violation of water quality standards. Additionally, these discharges may be required to be permitted by the local RWQCB (e.g., some RWQCB's have adopted General Permits for dewatering discharges). This General Permit is performance–based to the extent that it prohibits the discharge of storm water that causes or threatens to cause pollution, contamination, or nuisance; but it also allows the owner/developer to determine the most economical, effective, and possibly innovative BMP's.

4. Inspections:

a. Weekly inspections shall be performed to verify the performance of BMP's.

b. The construction site shall be inspected prior to anticipated storm events and after actual storm events. During extended storm events, inspections must be made during each 24–hour period.

c. The goals of these inspections are (1) to identify areas contributing to a storm water discharge; (2) to evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate and properly installed and functioning in accordance with the terms of the General Permit; and (3) whether additional control practices or corrective maintenance activities are needed. If additional control practices or corrective maintenance activities are determined to be required, they shall be implemented immediately, and the SWPPP updated if necessary.

d. Equipment, materials, and workers must be available for rapid response to failures and emergencies.

e. All corrective maintenance to BMP's shall be performed as soon as possible, depending upon worker safety.

f. These Inspections, along with corrective measures, must be documented, and the documentation must be filed within this SWPPP.

5. Training:

Individuals responsible for installation, inspection, maintenance, and repair of BMP's must be appropriately trained. Documentation of this training shall be filed within this SWPPP. At a minimum:

a. Employees and subcontractors, and those responsible for their installation, maintenance, and inspection shall read and have copies available during use, the appropriate BMP or ACTIVITY sheets from Appendix Q of this SWPPP.

b. Employees and subcontractors shall also be fully trained with this plan and all requirements of this plan and SWRCB Order No. 99 – 08 – DWQ and the NPDES General Permit No. CAS000002.

c. Weekly training meetings shall be held. At these meetings, BMP success and failures shall be discussed, as well as maintenance requirements. Responsible persons shall be assigned with appropriate tasks.

6. Entry:

The discharger shall allow the RWQCB, SWRCB, USEPA, and/or authorized representatives of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to enter construction site, access records, inspect construction site, and sample or monitor at reasonable times.

7. Maintenance of BMP's:

BMP's shall be maintained and operated such that they reduce or eliminate pollutants from exiting the site to the greatest extent possible. If selected BMP's are not working as required, the BMP installation must be improved, or new BMP's shall be selected. If construction operations change, the schedule changes or unexpected site conditions are encountered, the SWPPP must be reviewed to verify compliance with the General Permit requirements. If changes are needed, the SWPPP must be updated, amended, or revised to reflect those changes.

8. Compliance and Non–Compliance Reporting:

Discharger must certify annually that construction activities are in compliance with the requirements of the General Permit and the SWPPP. This Certification shall be based on the site inspections, and must be completed by July 1 of each year.

The discharger will give advance notice to the RWQCB and local storm water management agency of any planned changes in the construction activity which may result in noncompliance with General Permit requirements.

9. Monitoring Program for Sedimentation / Siltation:

This site is not located directly on a water body listed for turbidity, so it is not subject to sampling and analysis requirements for sedimentation or siltation based on RWQCB requirements.

10. Monitoring Program for Pollutants Not Visually Detectable in Storm Water:

The sampling and analysis program (section 600) may be required under certain conditions. Examples of construction sites that may require sampling and analysis include: sites that are known to have contaminants spilled or spread on the ground; sites where construction practices include the application of soil amendments, such as gypsum; or sites having uncovered stockpiles of material exposed to storm water. If there is a site discharge that could contain a pollutant, or if specifically requested by the RWQCB, then the sampling and analysis program must be implemented.

11. Penalties for Violations of Permit Conditions

a. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed $27,500 per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.

b. The Porter–Cologne Water Quality Control Act also provides for civil and criminal penalties which in some cases are greater than those under the CWA.

12. Oil and Hazardous Substance Spill

In the event of a Oil or Hazardous Substance Spill, An Oil Spill Report (included in Attachment T) shall be filled out and submitted as required.

13. Potential Pollutants

In the event of a significant spill, a significant spill report (included in Attachment T) shall be filled out and submitted as required. The Discharge Reporting Log in Attachment T must also be filled out. These as well as any other Potential Pollutant which may come in contact with Storm Water must be entered onto the Potential Pollutant form (included in Attachment T). At this time Contractor and/or Owner must verify with the Lahontan Regional Water Quality Control Board if testing will be required.

14. Construction Scheduling

Construction Scheduling based on Erosion Control BMP ES–1 shall be provided prior to construction activities.

Grading shall be limited as much as possible. Earth disturbing activities shall be between October 15 and April 15. During this time, the site shall be "Winterized". No graded areas shall be left unstabilized between October 15 and April 15.

The storm drain to collect offsite runoff shall be built prior to the earth disturbing activities.

General Interim Erosion Control Measures (Pre–Construction):
(REFER TO APPENDIX Q FOR COMPLETE DESCRIPTION OF BMP'S)

1. Employee / Subcontractor Training: Responsible Managers, Inspectors Contractors, Subcontractors and Employees must be trained appropriately for the Installation, Maintenance and Inspection of BMP's. Proof of training shall be filed in the SWPPP.

2. Preservation of Existing Vegetation (EC–2): Native vegetation shall be retained, protected, and supplemented wherever possible. Exposure of soil areas shall be limited to the immediate area required for construction operations. The native vegetative ground cover shall not be destroyed, removed or disturbed more than 15 days prior to grading.

3. Grading areas shall be clearly marked and no equipment or vehicles shall disturb slopes or drainages outside of the grading area.

4. Contractor shall keep informed to potential weather conditions and Limit excavation and grading activities to the dry weather conditions. This reduces the chance of severe erosion from intense rainfall and surface runoff, as well as the potential for soil saturation in swale areas. Reduce the probability of significant wind erosion during the dry season, which would occur due to the wind regime and fine soils, by implementing a dust abatement program.

General Interim Erosion Control Measures (during construction):
(REFER TO APPENDIX Q FOR COMPLETE DESCRIPTION OF BMP'S)

1. Employee / Subcontractor Training: Responsible Managers, Inspectors Contractors, Subcontractors and Employees must be trained appropriately for the Installation, Maintenance and Inspection of BMP's. Proof of training shall be filed in the SWPPP.

2. Efforts must be taken to reduce the tracking of sediment onto public or private roads at all times. Stabilized Construction Entrances (BMP TC–1, TC–2, and TC–3) must be maintained to reduce potential for tracking. Trucks shall not leave site with large amounts of dirt on truck, trailer or tires. Public and private roads shall be inspected and cleaned as necessary (BMP SC–7). Road cleaning operations must be done in such a way as to avoid the washing of accumulated sediment or silt into the storm drain system. Road cleaning operations must also avoid creating dust. Preferable methods of road cleaning include use of road sweepers with water applied prior to sweeping operation and a vacuum system to pick up dirt.

3. Preservation of Existing Vegetation (BMP EC–2): Native vegetation shall be retained, protected, and supplemented wherever possible. Exposure of soil areas shall be limited to the immediate area required for construction operations. The native vegetative ground cover shall not be destroyed, removed or disturbed more than 15 days prior to grading.

4. Limit excavation and grading activities to the dry weather conditions. (BMP EC–1) This reduces the chance of severe erosion from intense rainfall and surface runoff, as well as the potential for soil saturation in swale areas. Reduce the probability of significant wind erosion during the dry season, which would occur due to the wind regime and fine soils, by implementing a dust abatement program (BMP WE–1).

5. Water Conservation Practices shall used for this project (BMP NS–1).

6. Dewatering (BMP NS–2): Dewatering is not anticipated. If dewatering is performed, the contractor shall use sediment controls and test the groundwater for pollution, to prevent or reduce the discharge of pollutants to storm water.

7. Paving Operations (BMP NS–3): Contractor shall prevent or reduce the discharge of pollutants for paving operations, using measures to prevent runon and runoff pollution, properly disposing of wastes and training employees and subcontractors. Drainage courses shall be protected. An onsite mixing plant is not allowed by this SWPPP. A separate industrial activities permit would be required to allow an onsite mixing plant.

8. Vehicle and Equipment Cleaning (BMP NS–8): It is anticipated that offsite facilities shall be used for Equipment Cleaning. If vehicle and equipment cleaning operations are performed onsite, contractor shall conform to this BMP.

9. Vehicle and Equipment Fueling (BMP NS–9): It is anticipated that Vehicle and Equipment fueling will take place offsite. Contractor shall prevent fuel spills and leaks, and reduce their impacts to storm water by using offsite facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors. If vehicle and equipment fueling operations are performed onsite, contractor shall conform to this BMP.

10. Vehicle and Equipment Maintenance (BMP NS–10): Contractor shall prevent or reduce the discharge of pollutants to storm water from vehicle and equipment maintenance by running a "dry site". This involves using offsite facilities, performing work in designated areas only, providing cover for materials stored outside, checking for leaks and spills, containing and cleaning up spills immediately, and training employees and subcontractors. If vehicle and e quipment maintenance operations are performed onsite, contractor shall conform to this BMP.

11. Dust Control (BMP WE–1): Dust control measures shall be used to stabilize soil from wind erosion, and reduce dust generated by construction activities.

12. Material Delivery and Storage (BMP WM–01): Hazardous Materials storage onsite shall be minimized. Specific areas shall be designated for material storage. Designated areas shall not be near drainage paths or waterways. Materials (except soil, gravel and sand) shall not be stored on the ground (consider pallets). Stored materials shall be covered during rainy season, or when a storm is predicted within 24 hours.

13. Material Use (BMP WM–02): Use of hazardous materials; such as fertilizers, herbicides, and pesticides; shall be minimized. Alternate materials (non–hazardous) shall be used where possible and / or use of hazardous material shall be minimized. Employees and subcontractors shall be trained in the use of these materials. Do not over apply fertilizers, herbicides, and pesticides. Stockpile operations shall employ procedures and practices to reduce or eliminate air and stormwater pollution (BMP WM–03).

14. Spill Prevention and Control (BMP WM–04): Hazardous materials shall be protected from vandalism. Place stockpile of spill cleanup materials where it will be readily accessible. Employees shall be trained in spill prevention and cleanup. Designated responsible individual shall be available at all times Hazardous materials are stored onsite.

15. Solid Waste Management (BMP WM–05): Contractor shall prevent or reduce the discharge of pollutants to storm water from solid or construction waster by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

16. Hazardous Waste Management (BMP WM–06): Hazardous waste materials shall be removed from the site at the earliest convenience. Prevent or reduce the discharge of pollutants to storm water from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

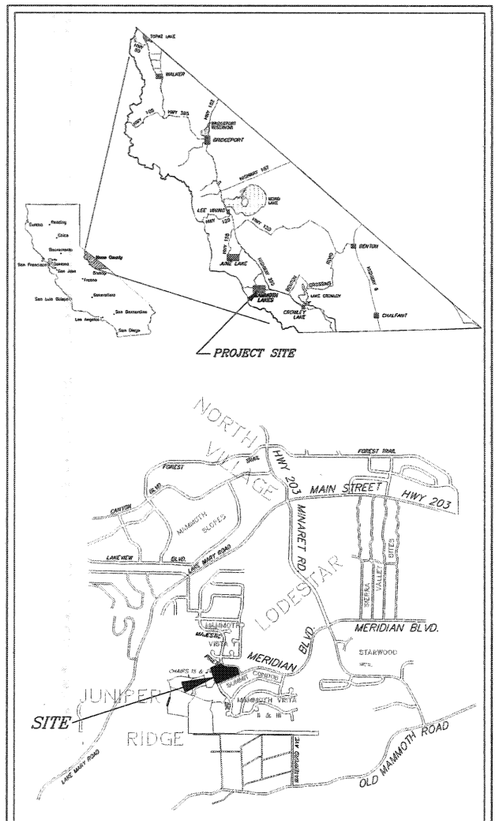
17. Contaminated Soil Management (BMP WM–07): Contaminated soil is not anticipated. Should contaminated soil be encountered, notify the RWQCB and the engineer, and prevent or reduce the discharge of pollutants to storm water from contaminated soil and highly acidic or alkaline soils by conducting pre–construction surveys, inspecting excavations regularly, and remediating contaminated soil promptly.

18. Concrete Waste Management (BMP WM–08): Whenever possible, concrete washout shall occur offsite. When it must occur onsite, an area must be designated, and employees and subcontractors must be trained in its use. If onsite, a concrete washout must be at least 50 feet from storm drains, open ditches or water bodies. No runoff is allowed from this site. Washout must go into a temporary pit where the concrete can set, be broken up and then disposed of properly.

19. Sanitary / Septic Waster Management (BMP WM–09): Sanitary / septic facilities shall be placed in convenient locations, at least 50 feet from any drainage path. They shall be inspected regularly. Contractor shall arrange for regular waste collection. Untreated raw wastewater shall never be discharged or buried. Portable sanitary facilities must be secured to prevent overturning.

20. Structure Construction and Painting: Contractor shall prevent or reduce the discharge of pollutants to storm water by enclosing or covering or barming building materials storage areas, using good housekeeping practices, using safer alternative products where possible, and training employees and subcontractors.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) EAGLE LODGE BASE AREA MAMMOTH LAKES, MONO COUNTY, CALIFORNIA



SWPPP INDEX

ENGINEER OF RECORD
TRIAD/HOLMES ASSOCIATES
P.O. BOX 1570
MAMMOTH LAKES, CA 93546
760–934–7588

PROPERTY LOCATION
WEST END OF MERIDIAN BOULEVARD
MONO COUNTY
MAMMOTH LAKES, CA 93546

SURVEYOR
TRIAD/HOLMES ASSOCIATES
P.O. BOX 1570
MAMMOTH LAKES, CA 93546
760–934–7588

RECORD OWNER
MAMMOTH MOUNTAIN SKI AREA
ATTN: TOM HODGES
P.O. BOX 24
MAMMOTH LAKES, CA 93546
760–934–2571 EXT. 3243

GEOTECHNICAL ENGINEER
SIERRA GEOTECHNICAL SERVICES
P.O. BOX 5024
MAMMOTH LAKES, CA 93546
760–934–3992

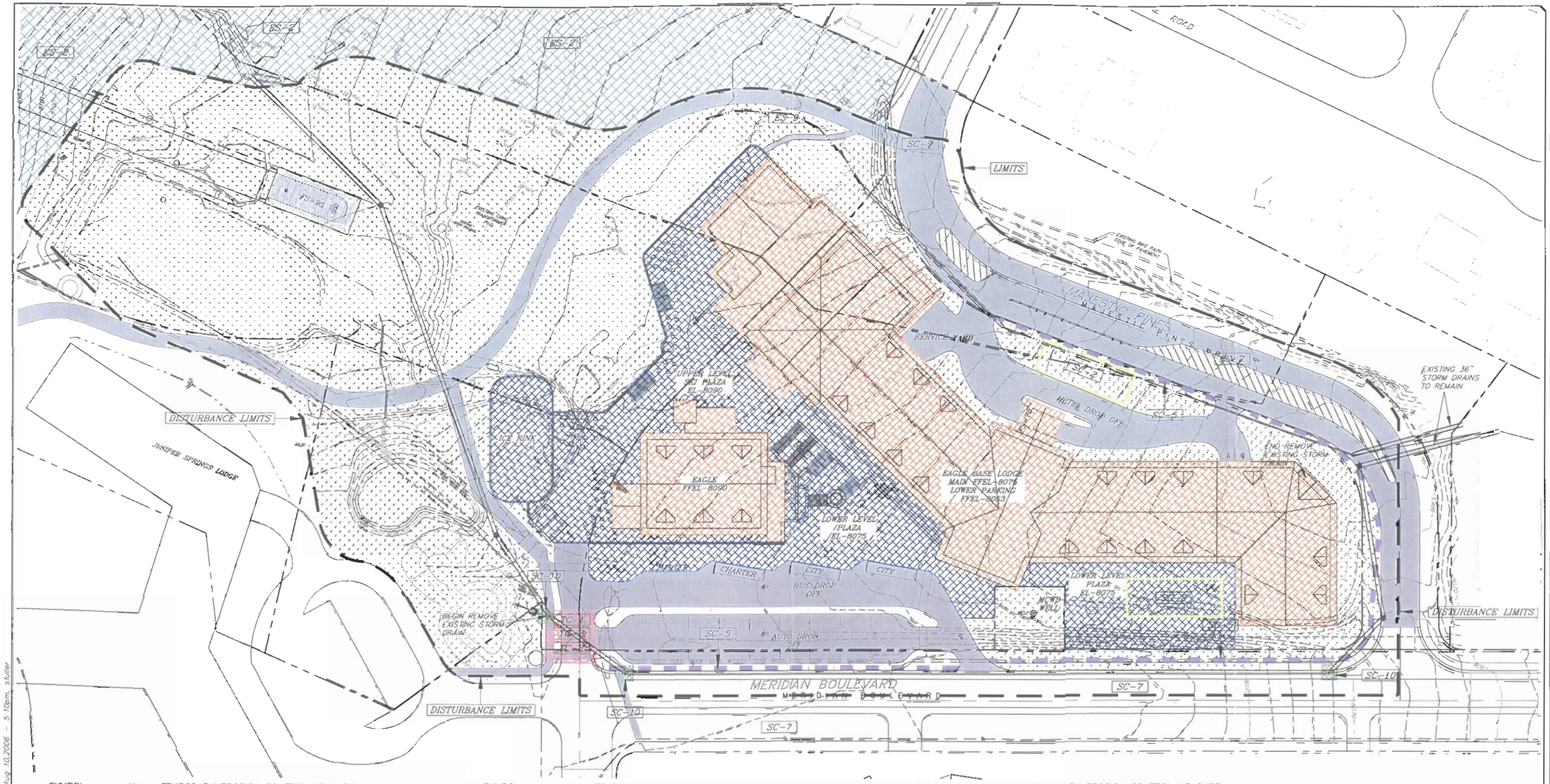
MAMMOTH

triad/holmes assoc.
civil engineering
land surveying
MAMMOTH LAKES
BISHOP
LOMPOC
NAPA
PLEASANTON
REDWOOD CITY
SAN LUIS OBISPO

PREPARED FOR:
MAMMOTH MOUNTAIN SKI AREA
ATTN: TOM HODGES
P.O. BOX 24
MAMMOTH LAKES, CA 93546
760–934–2571 EXT. 3243

EROSION CONTROL NOTES AND GENERAL INTERIM EROSION CONTROL MEASURES
EAGLE LODGE BASE AREA

DATE	08/10/2006
SCALE	1"=40'
DRAWN	SMF
JOB NO.	1737.2
DWG	SWPPP1
SHEET	3 OF 4



SYMBOL	No.	TEMPORARY EROSION CONTROL MEASURE
SEE SWPPP1	ES-1	SCHEDULING (BMP ES-1)
	ES-2	PRESERVATION OF EXISTING VEGETATION (BMP ES-2)
SEE SWPPP1	ES-3	HYDRAULIC MULCH (BMP ES-3)
SEE SWPPP1	ES-4	HYDROSEEDING (BMP ES-4)
SEE SWPPP1	ES-7	GEOTEXTILES & MATS (BMP ES-7)
SEE SWPPP1	ES-9	EARTH DIKES & DRAINAGE SWALES (ES-9)
	SC-2	SEDIMENT BASIN (BMP SC-2)
SEE SWPPP1	SC-3	SEDIMENT TRAP (BMP SC-3)
SEE SWPPP1	SC-4	CHECK DAM (BMP SC-4)
	SC-5	INSTALL FIBER ROLLS OR POTENTIAL ALTERNATIVE AT LIMIT OF CONSTRUCTION PRIOR TO EARTH DISTURBING OPERATIONS (BMP SC-5)
SEE SWPPP1	SC-7	PERFORM STREET SWEEPING AND VACUUMING AS REQUIRED (BMP SC-7)
	SC-10	STORM DRAIN INLET PROTECTION (BMP SC-10)
SEE SWPPP1	WE-1	WIND EROSION CONTROL (BMP WE-1)
	TC-1	STABILIZED CONSTRUCTION ENTRANCE (BMP TC-1)

SYMBOL	No.	TEMPORARY EROSION CONTROL MEASURE
	TC-2	STABILIZED CONSTRUCTION ROADWAY (BMP TC-2)
	TC-3	ENTRANCE/OUTLET TIRE WASH (BMP TC-3)
SEE SWPPP1	NS-1	WATER CONSERVATION PRACTICES (BMP NS-1)
SEE SWPPP1	NS-2	DEWATERING OPERATIONS (BMP NS-2)
SEE SWPPP1	NS-3	PAVING AND GRINDING OPERATIONS (BMP NS-3)
SEE SWPPP1	NS-6	ILLICIT CONNECTION/DISCHARGE (BMP NS-6)
SEE SWPPP1	NS-8	VEHICLE AND EQUIPMENT CLEANING (BMP NS-8)
SEE SWPPP1	NS-9	VEHICLE AND EQUIPMENT FUELING (BMP NS-9)
SEE SWPPP1	NS-10	VEHICLE AND EQUIPMENT MAINTENANCE (BMP NS-10)
SEE SWPPP1	NS-12	CONCRETE CURING (BMP NS-12)
SEE SWPPP1	NS-13	CONCRETE FINISHING (BMP NS-13)
SEE SWPPP1	NS-15	DEMOLITION ADJACENT TO WATER (BMP NS-15)
SEE SWPPP1	WM-1	MATERIAL DELIVERY AND STORAGE (BMP WM-1)
SEE SWPPP1	WM-2	MATERIAL USE (BMP WM-2)
SEE SWPPP1	WM-3	STOCKPILE MANAGEMENT (WM-3)

SYMBOL	No.	TEMPORARY EROSION CONTROL MEASURE
SEE SWPPP1	WM-4	SPILL PREVENTION AND CONTROL (BMP WM-4)
SEE SWPPP1	WM-5	SOLID WASTE MANAGEMENT (BMP WM-5)
SEE SWPPP1	WM-6	HAZARDOUS WASTE MANAGEMENT (BMP WM-6)
SEE SWPPP1	WM-8	CONCRETE WASTE MANAGEMENT (BMP WM-8)
SEE SWPPP1	WM-9	SANITARY/SEPTIC WASTE MANAGEMENT (BMP WM-9)

IMPERVIOUS AREAS

- PLAZA AREAS = 51,485 SQUARE FEET
- BUILDING AREAS = 71,483 SQUARE FEET
- PAVED AREAS = 85,585 SQUARE FEET
- LANDSCAPED AREAS = 196,751 SQUARE FEET

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

SCALE: 1"=40' 22"x34" SHEET
(SEE SCALE BAR ABOVE)
SCALE: 1"=80' 11"x17" SHEET
CONTOUR INTERVAL: 1'

MAMMOTH

triad/holmes assoc
civil engineering
land surveying
MAMMOTH LAKES
BISHOP
LOMPOC
NAPA
PLEASANTON
REDWOOD CITY
SAN LUIS OBISPO

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760-934-2571 EXT. 3243

EROSION CONTROL PLAN & STORMWATER MANAGEMENT PLAN
EAGLE LODGE BASE AREA

DATE: 08/10/2006
SCALE: 1"=40'
DRAWN: SMF
JOB NO.: 1737.2
DWG: SWPPP2
SHEET 4 OF 4

K:\01 Mammoth\1737-2 Grading Plan\1737-2 Grading Plan R5.dwg Aug 10,2006 - 5:10pm, sfuller

Attachment C

BMP Consideration Checklist – Eagle Lodge

CONSTRUCTION SITE BMPs CONSIDERATION CHECKLIST					
The BMPs listed here should be considered for every project. Those BMPs that are not included in the SWPPP must be checked as "Not Used" with a brief statement describing why it is not being used.					
EROSION CONTROL BMPs					
BMP No.	**BMP**	**CONSIDERED FOR PROJECT**	**CHECK IF USED**	**CHECK IF NOT USED**	**IF NOT USED, STATE REASON**
ES-1	Scheduling	☑	☑		
ES-2	Preservation of Existing Vegetation	☑	☑		
ES-3	Hydraulic Mulch	☑	☑		
ES-4	Hydroseeding	☑	☑		
ES-5	Soil Binders	☑		☑	Water will be used in lieu of Soil Binders
ES-6	Straw Mulch	☑		☑	This product is typically avoided in our area due to potential to be carried by wind
ES-7	Geotextiles & Mats	☑	☑		
ES-8	Wood Mulching	☑		☑	This product will not be used due to potential to introduce unwanted species
ES-9	Earth Dikes & Drainage Swales	☑	☑		
ES-10	Velocity Dissipation Devices	☑		☑	This project does not have any storm drain outlets that would produce high velocities
ES-11	Slope Drains	☑		☑	This project does not have steep sloped areas

CONSTRUCTION SITE BMPs CONSIDERATION CHECKLIST

The BMPs listed here should be considered for every project. Those BMPs that are not included in the SWPPP must be checked as "Not Used" with a brief statement describing why it is not being used.

BMP No.	BMP	CONSIDERED FOR PROJECT	CHECK IF USED	CHECK IF NOT USED	IF NOT USED, STATE REASON
SEDIMENT CONTROL BMPs					
SC-1	Silt Fence	☑		☑	This project is located in view shed and we are generally directed to avoid this product in lieu of SC-5
SC-2	Sediment Basin	☑	☑		
SC-3	Sediment Trap	☑	☑		
SC-4	Check Dam	☑	☑		
SC-5	Fiber Rolls	☑	☑		
SC-6	Gravel Bag Berm	☑		☑	Will be avoided in lieu of Fiber Rolls
SC-7	Street Sweeping and Vacuuming	☑	☑		
SC-8	Sand Bag Barrier	☑		☑	Sand Bag Barriers have more potential of harm than good
SC-9	Straw Bale Barrier	☑		☑	Has been noted by RWQCB personnel to us that this is not preferred BMP
SC-10	Storm Drain Inlet Protection	☑	☑		
WIND EROSION CONTROL BMPs					
WE-1	Wind Erosion Control	☑	☑		
TRACKING CONTROL BMPs					
TC-1	Stabilized Construction Entrance/Exit	☑	☑		
TC-2	Stabilized Construction Roadway	☑	☑		
TC-3	Entrance/Outlet Tire Wash	☑	☑		

CONSTRUCTION SITE BMPs CONSIDERATION CHECKLIST

The BMPs listed here should be considered for every project. Those BMPs that are not included in the SWPPP must be checked as "Not Used" with a brief statement describing why it is not being used.

NON-STORM WATER MANAGEMENT BMPs

BMP No.	BMP	CONSIDERED FOR PROJECT	CHECK IF USED	CHECK IF NOT USED	IF NOT USED, STATE REASON
NS-1	Water Conservation Practices	☑	☑		
NS-2	Dewatering Operations	☑	☑		
NS-3	Paving and Grinding Operations	☑	☑		
NS-4	Temporary Stream Crossing	☑		☑	There will be no temporary stream crossings
NS-5	Clear Water Diversion	☑		☑	There will be no clear water diversions
NS-6	Illicit Connection/ Discharge	☑	☑		
NS-7	Potable Water/Irrigation	☑		☑	There will be no Potable water / irrigation discharges for this work
NS-8	Vehicle and Equipment Cleaning	☑	☑		
NS-9	Vehicle and Equipment Fueling	☑	☑		
NS-10	Vehicle and Equipment Maintenance	☑	☑		
NS-11	Pile Driving Operations	☑		☑	There will be no pile driving operations
NS-12	Concrete Curing	☑	☑		
NS-13	Concrete Finishing	☑	☑		
NS-14	Material and Equipment Use Over Water	☑		☑	There will not be material usage or equipment usage over water
NS-15	Demolition Adjacent to Water	☑	☑		
NS-16	Temporary Batch Plants	☑		☑	There will not be a temporary batch plant on site

CONSTRUCTION SITE BMPs CONSIDERATION CHECKLIST

The BMPs listed here should be considered for every project. Those BMPs that are not included in the SWPPP must be checked as "Not Used" with a brief statement describing why it is not being used.

WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs

BMP No.	BMP	CONSIDERED FOR PROJECT	CHECK IF USED	CHECK IF NOT USED	IF NOT USED, STATE REASON
WM-1	Material Delivery and Storage	☑	☑		
WM-2	Material Use	☑	☑		
WM-3	Stockpile Management	☑	☑		
WM-4	Spill Prevention and Control	☑	☑		
WM-5	Solid Waste Management	☑	☑		
WM-6	Hazardous Waste Management	☑	☑		
WM-7	Contaminated Soil Management	☑		☑	There are no known contaminated soils on site
WM-8	Concrete Waste Management	☑	☑		
WM-9	Sanitary/Septic Waste Management	☑	☑		
WM-10	Liquid Waste Management	☑		☑	Project will not produce Liquid Waste of the type identified in WM10

Attachment G

Program for Maintenance, Inspection, and Repair of Construction Site BMPs

The contractor shall use the following guidelines for maintenance, inspection, and repair of BMPs identified in the SWPPP		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM (also see attachment Q)**
TEMPORARY EROSION CONTROL BMPs		
ES-1 - Scheduling	• Continuous	■ Coordinate work
ES-2 - Preservation of Existing Vegetation	• Bi- weekly during dry season and weekly during wet	■ Inspect existing vegetation and any barrier fence replace as needed
ES-3 – Hydraulic Mulch ES-4 – Hydroseeding ES-7 – Geotextiles & Mats	• Bi- weekly during dry season and weekly during wet • Prior to forecast rain event • Every 24 hr during rain event • After rain event	■ Areas where erosion is evident shall be repaired and BMPs re-applied as soon as possible. Care shall be taken to minimize damage to protected areas. Where seed fails to germinate, area must be re-seeded.
ES-9 – Earth Dikes & Drainage Swales	• Bi- weekly during dry season and weekly during wet • Prior to forecast rain event • Every 24 hr during rain event • After rain event	■ Inspect ditches swales and berms for washouts. Replace lost or damaged linings as needed ■ Inspect channel linings, beds of ditches and swales. Remove debris and sediment and repair linings as needed. ■ Temporary conveyances should be completely removed as soon as the surrounding drainage area has been stabilized or at the completion of construction.

The contractor shall use the following guidelines for maintenance, inspection, and repair of BMPs identified in the SWPPP		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM (also see attachment Q)**
TEMPORARY SEDIMENT CONTROL BMPs		
SC-2 – Sediment Basin SC-3 – Sediment Trap	• Bi- weekly during dry season and weekly during wet • Prior to forecast rain event • Every 24 hr during rain event • After rain event	■ Inspect banks for seepage and structural soundness, repair as needed ■ Inspect inlet and outlet structure and spillway for any erosion, damage or obstructions. Repair damage and remove obstructions as needed. ■ Inspect for standing water, corrective measures should be taken if BMP does not dewater completely in 72 hours. ■ Remove sediment load and vegetation and repair damaged BMP per Attachment Q for each BMP. ■ Remove BMP when no longer needed ■ BMPs that require dewatering shall be continuously attended while dewatering takes place. Dewatering BMPs shall be implemented at all times during dewatering activities.
SC-4 - Check Dam SC-5 - Fiber Rolls SC-10 - Storm Drain Inlet Protection	• Bi- weekly during dry season and weekly during wet • Prior to forecast rain event • Every 24 hr during rain event • After rain event	■ Remove sediment load and repair damaged BMP per Attachment Q for each BMP. ■ Remove BMP when no longer needed
SC-7 - Street Sweeping	• Daily during construction activities	■ Inspect site access points, sweep as needed
WIND EROSION CONTROL BMPs		
WE-1 - Wind Erosion Control	• Daily during construction activities • Bi-weekly when project not under construction	■ Apply adequate water to contol dust without causing soil erosion per Attachment Q for WE-1 ■ During non construction periods, if dust becomes a problem, soil palliatives should be considered for disturbed areas.
TRACKING CONTROL BMPs		
TC-1 – Stabilized Construction Entrance / Exit	• Weekly or sooner depending on weather and usage during construction activities • Bi-weekly when project not under construction	■ Clean or replace rock as needed to eliminate excessive soil accumulation, see Attachment Q for TC-1
TC-2 – Stabilized Construction Roadway	• Weekly or sooner depending on weather and usage during construction activities • Bi-weekly when project not under construction	■ This will be installed, if it is determined necessary during construction ■ Maintain as needed per Attachment Q for TC-2

The contractor shall use the following guidelines for maintenance, inspection, and repair of BMPs identified in the SWPPP		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM (also see attachment Q)**
TC-3 – Entrance/Outlet Tire Wash	• Weekly or sooner depending on weather and usage during construction activities (if installed) • Bi-weekly when project not under construction (if installed)	■ This will be installed, if it is determined necessary during construction ■ Clean as needed to eliminate excessive soil accumulation see Attachment Q for TC-3
NON-STORM WATER MANAGEMENT BMPs		
NS-1 – Water Conservation NS-2 – Dewatering Operations NS-3 – Paving and Grinding Operations NS-6 – Illicit Connection / Discharge NS-8 – Vehicle and Equipment Cleaning NS-9 – Vehicle and Equipment Fueling NS-10 – Vehicle and Equipment Maintenance NS-12 – Concrete Curing NS-13 – Concrete Finishing NS-15 – Demolition Adjacent to Water	• Inspect and verify that activity based BMPs are in place prior to the commencement of associated activities • Weekly or sooner depending on weather and usage during construction activities • Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.	■ Check Attachment Q for the requirements for each NS BMP ■ No construction materials or equipment shall be left on site during periods of no construction activity with the exception of materials for use in implementing BMPs
WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs		
WM-1 – Material Delivery & Storage WM-2 – Material Use WM-3 – Stockpile Management WM-4 – Spill Prevention and Control WM-5 – Solid Waste Management WM-6 – Hazardous Waste Management WM-8 – Concrete Waste Management WM-9 – Sanitary / Septic Waste Management	• Weekly or sooner depending on weather and usage during construction activities	■ Implement and maintain these BMPs in accordance with the information provided by Attachment Q for each WM BMP ■ No construction materials or equipment shall be left on site during periods of no construction activity with the exception of materials for use in implementing BMPs