Sites Imported Aggregate Briefing

September 9, 2022

Agenda

- Project Description
- Dam Filter, Drain and Transition Zones
- Road Base
- Concrete Aggregate
- Summary of Quantities
- Questions

Project Description

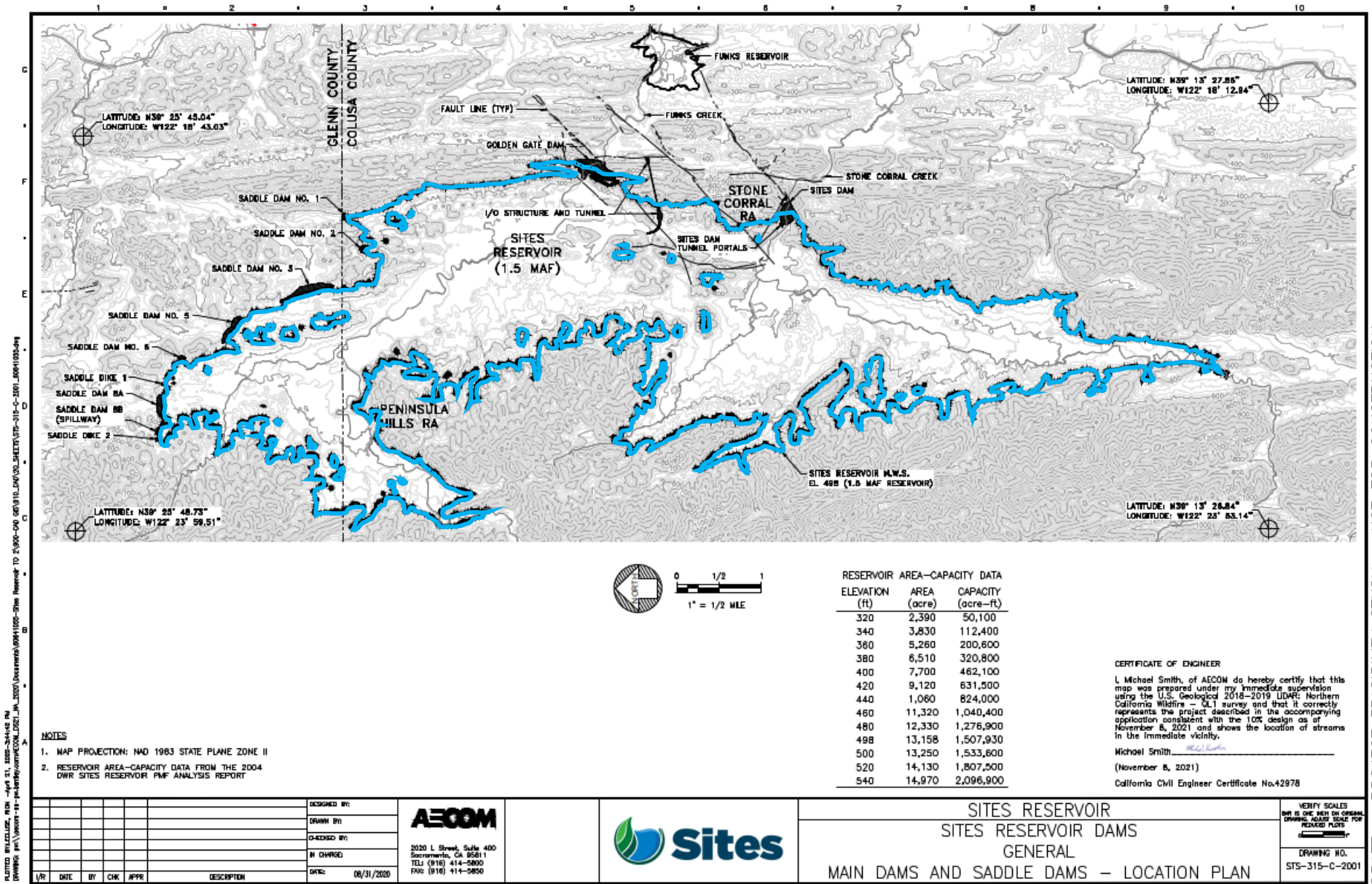
Project Location

80 miles north of Sacramento

10 miles west of Maxwell

45 miles south of Orland

Sites Reservoir Features



RESERVOIR AREA–CAPACITY DATA

ELEVATION (ft)	AREA (acre)	CAPACITY (acre–ft)
320	2,390	50,100
340	3,830	112,400
360	5,260	200,600
380	6,510	320,800
400	7,700	462,100
420	9,120	631,500
440	1,060	824,000
460	11,320	1,040,400
480	12,330	1,276,900
498	13,158	1,507,930
500	13,250	1,533,600
520	14,130	1,807,500
540	14,970	2,096,900

NOTES

1. MAP PROJECTION: NAD 1983 STATE PLANE ZONE II
2. RESERVOIR AREA–CAPACITY DATA FROM THE 2004 DWR SITES RESERVOIR PMF ANALYSIS REPORT

CERTIFICATE OF ENGINEER

I, Michael Smith, of AECOM do hereby certify that this map was prepared under my immediate supervision using the U.S. Geological 2018–2019 LIDAR: Northern California Wildfire – QL1 survey and that it correctly represents the project described in the accompanying application consistent with the 10% design as of November 8, 2021 and shows the location of streams in the immediate vicinity.

Michael Smith

(November 8, 2021)

California Civil Engineer Certificate No.42978

I/R	DATE	BY	CHK	APPR	DESCRIPTION

DESIGNED BY:
DRAWN BY:
CHECKED BY:
IN CHARGE:
DATE: 08/31/2020

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Sites

SITES RESERVOIR
SITES RESERVOIR DAMS
GENERAL
MAIN DAMS AND SADDLE DAMS – LOCATION PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALE FOR REDUCED PLOTS

DRAWING NO.
STS-315-C-2001

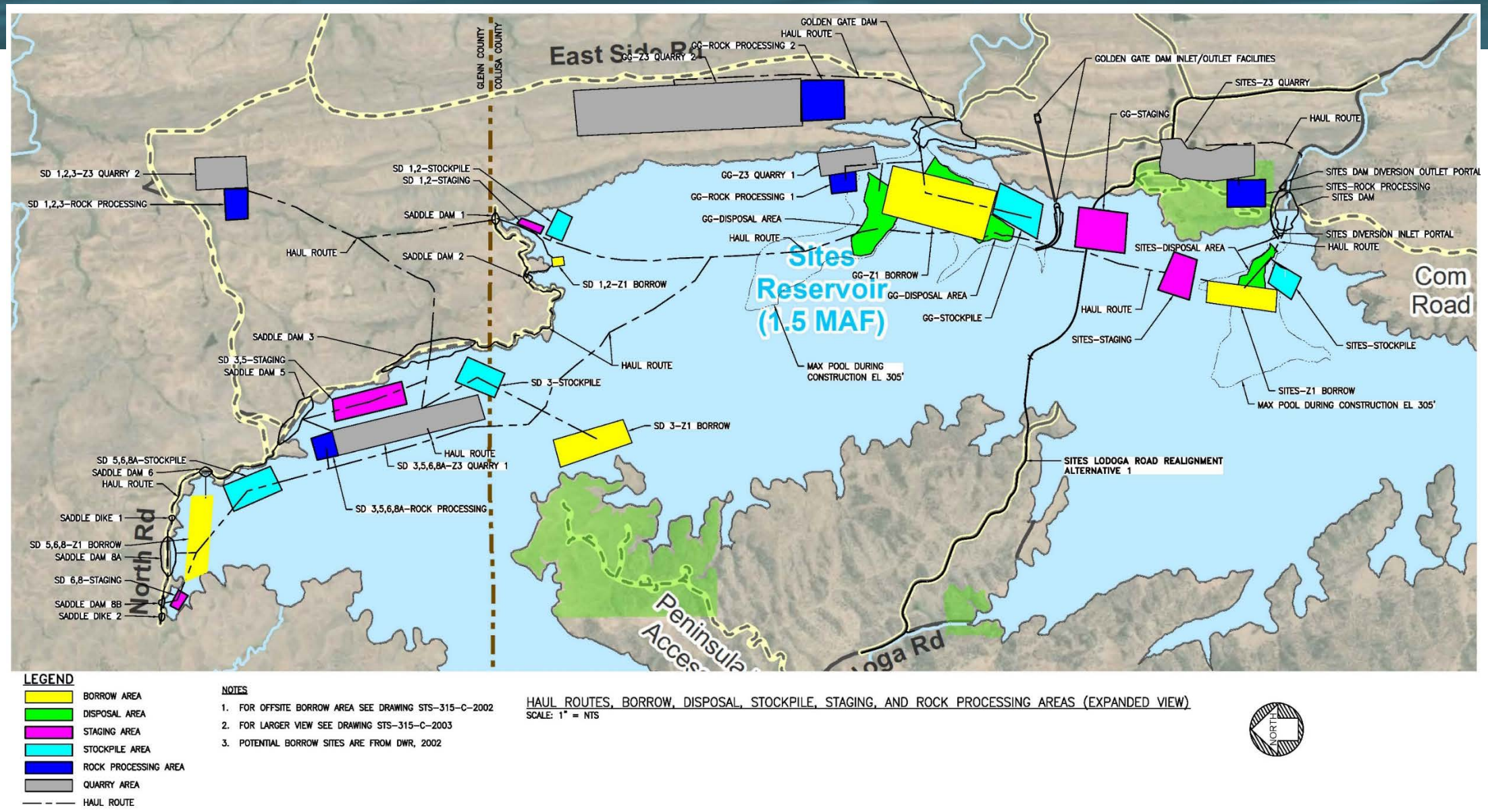
DRAFT – PROJECT FEASIBILITY STUDY – NOT FOR CONSTRUCTION

Sites Reservoir Features

Total Storage Capacity	1.5 MAF
Active Storage Capacity	1.4 MAF
Approximate Inundation Area	13,200 acres
Approximate Watershed Area	54,150 acres (84.6 mi^2)
Dam/Saddle Dam/Dike Crest Elevation (Without Camber)	517 feet
Dam Heights (approx. - max. ht. above streambed):	
Golden Gate Dam	287 feet
Sites Dam	267 feet
7 Saddle Dams*/2 Saddle Dikes (for freeboard)	12 – 107 feet
Maximum Operating Water Elevation	498 feet
Minimum Operating Water Elevation	340 feet
Top of Dead Pool	300 feet
Inlet/Outlet Facilities:	
I/O Tunnel (single), with sloping intake (south of GG Dam)	32 feet ID
Sites Diversion Tunnel (north abutment of Sites Dam)	12 feet ID

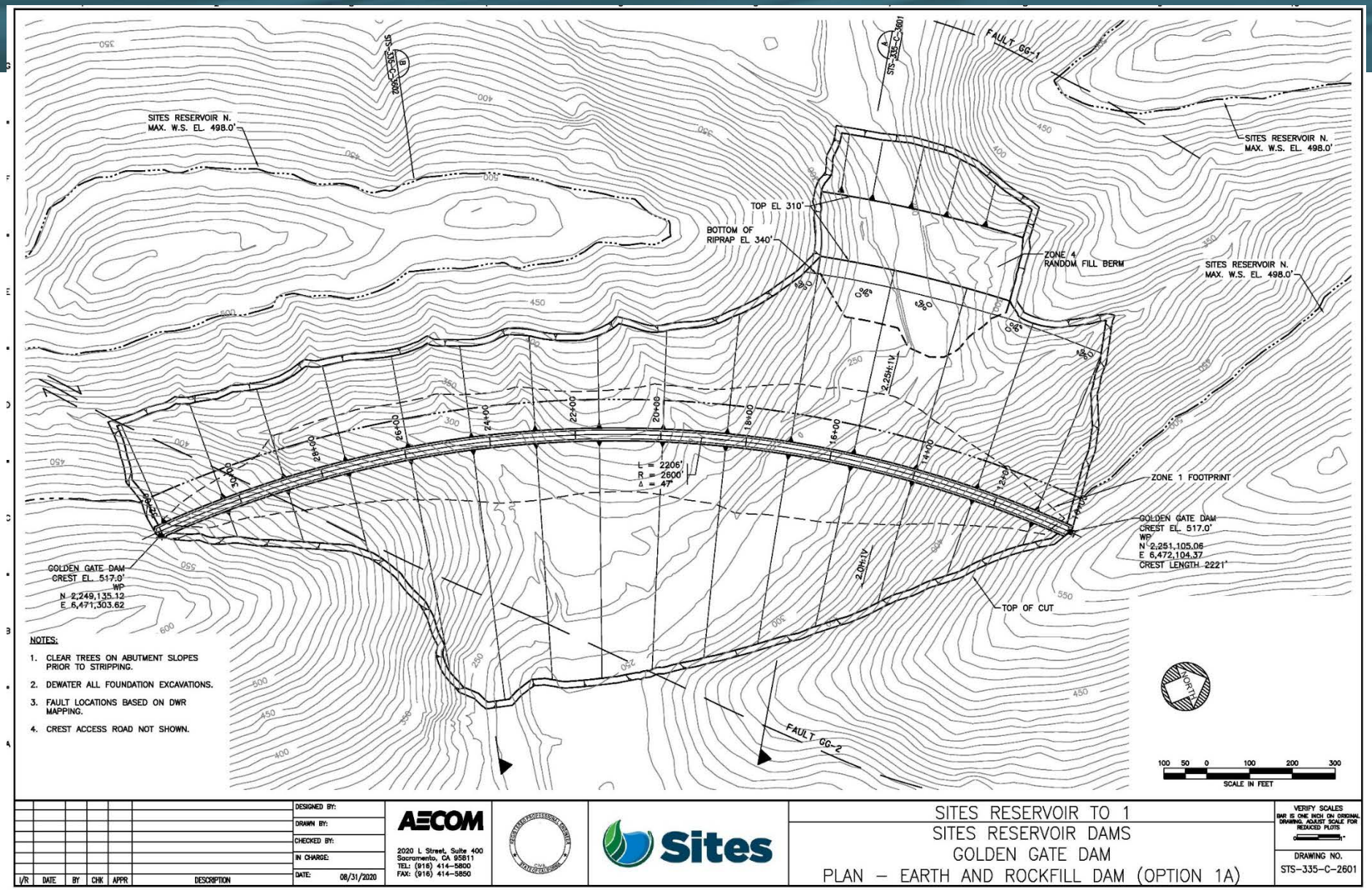
* Saddle Dam 8B is the spillway location.

Sites Reservoir Features – Construction

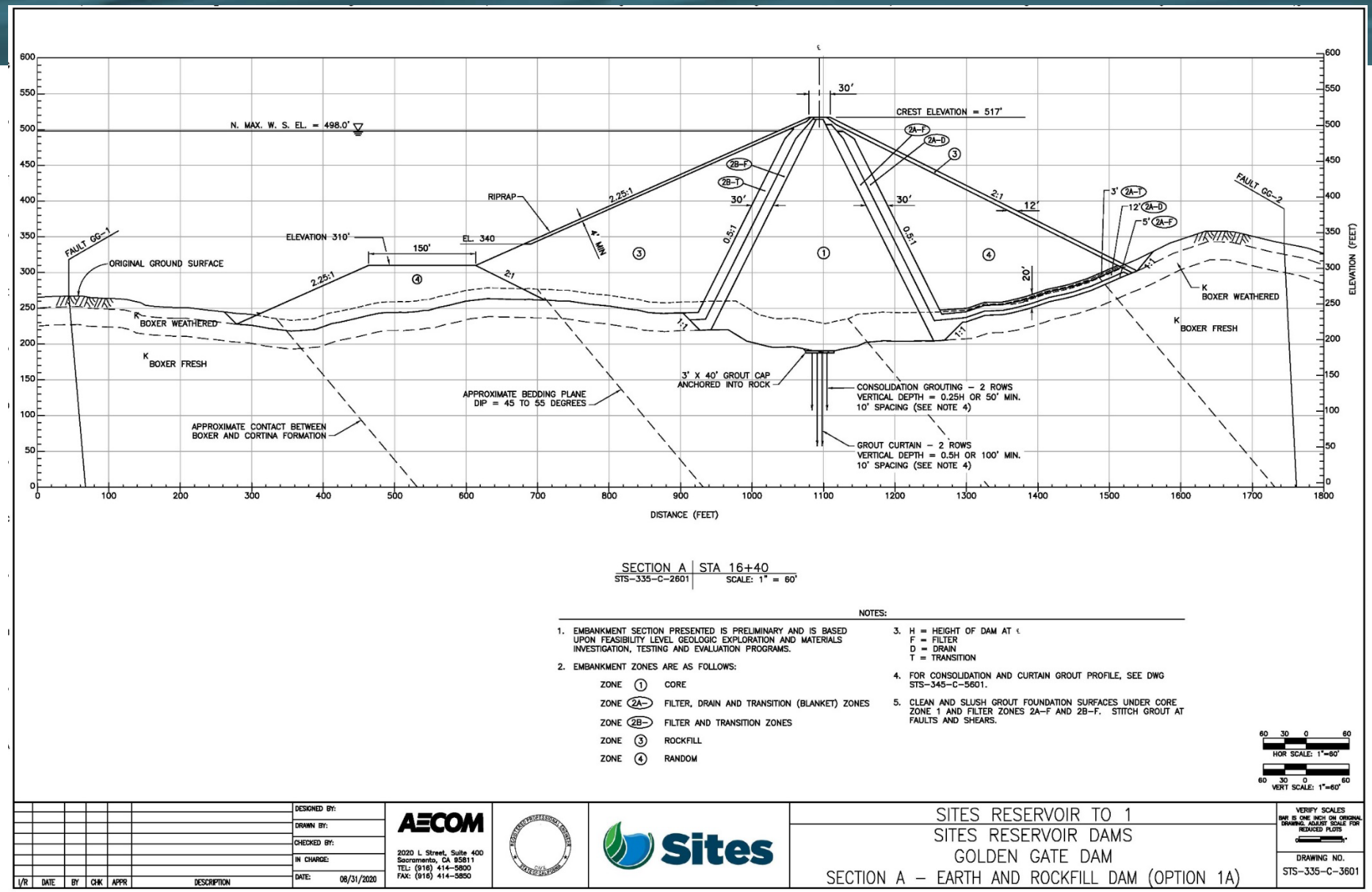


Dam Filter, Drain and Transition Zones

Golden Gate Dam



Typical Golden Gate and Sites Dam Section



SECTION A | STA 16+40
STS-335-C-2601 | SCALE: 1" = 60'

NOTES:

1. EMBANKMENT SECTION PRESENTED IS PRELIMINARY AND IS BASED UPON FEASIBILITY LEVEL GEOLOGIC EXPLORATION AND MATERIALS INVESTIGATION, TESTING AND EVALUATION PROGRAMS.
2. EMBANKMENT ZONES ARE AS FOLLOWS:
   - ZONE (1) CORE
   - ZONE (2A–) FILTER, DRAIN AND TRANSITION (BLANKET) ZONES
   - ZONE (2B–) FILTER AND TRANSITION ZONES
   - ZONE (3) ROCKFILL
   - ZONE (4) RANDOM
3. H = HEIGHT OF DAM AT ℄
   F = FILTER
   D = DRAIN
   T = TRANSITION
4. FOR CONSOLIDATION AND CURTAIN GROUT PROFILE, SEE DWG STS-345-C-5601.
5. CLEAN AND SLUSH GROUT FOUNDATION SURFACES UNDER CORE ZONE 1 AND FILTER ZONES 2A–F AND 2B–F. STITCH GROUT AT FAULTS AND SHEARS.

60 30 0 60
HOR SCALE: 1"=60'
60 30 0 60
VERT SCALE: 1"=60'

I/R	DATE	BY	CHK	APPR	DESCRIPTION

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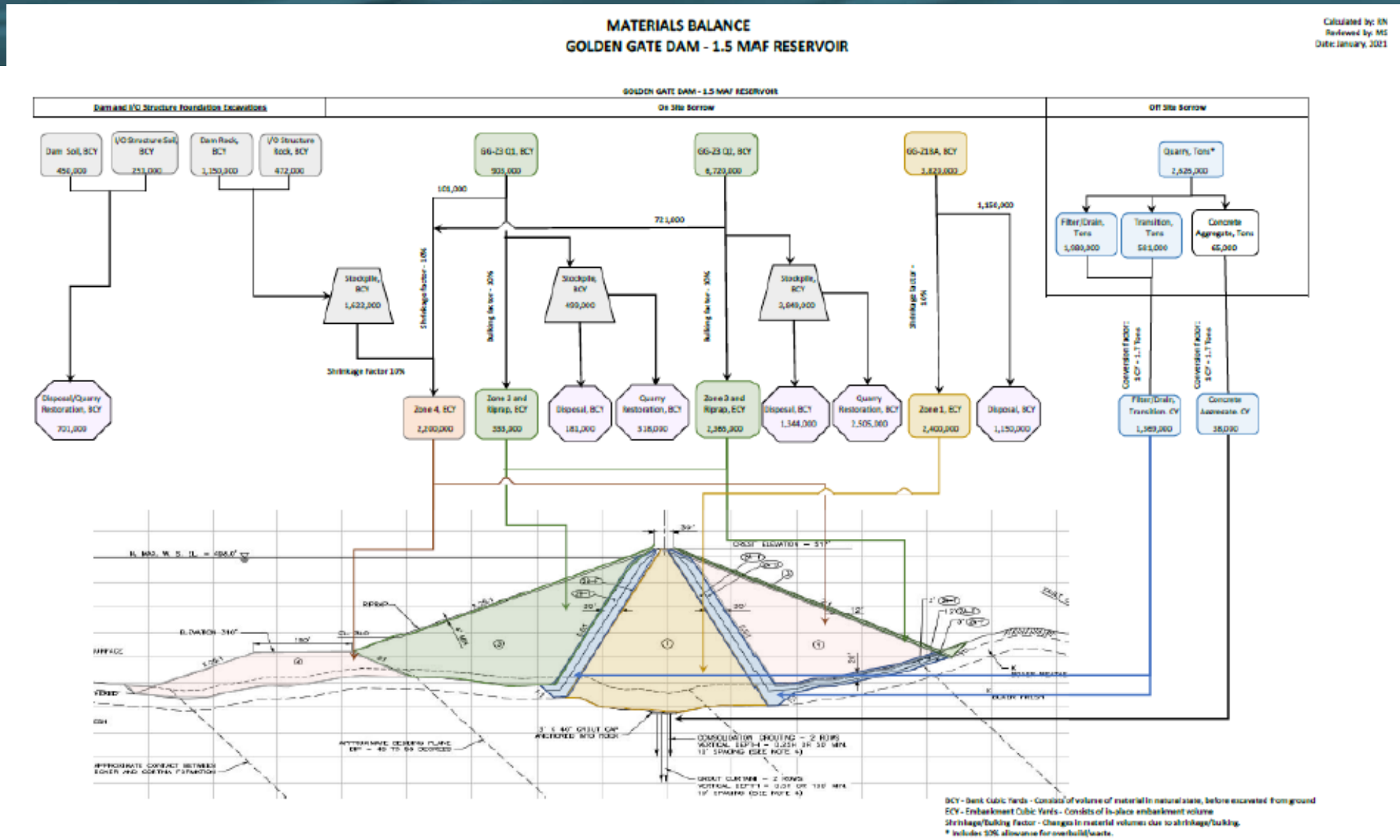
Sites

SITES RESERVOIR TO 1
SITES RESERVOIR DAMS
GOLDEN GATE DAM
SECTION A – EARTH AND ROCKFILL DAM (OPTION 1A)

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALE FOR REDUCED PLOTS

DRAWING NO.
STS-335-C-3601

Material Balance Golden Gate Dam



Examples of Dam Construction

Examples of Dam Construction

Examples of Dam Construction

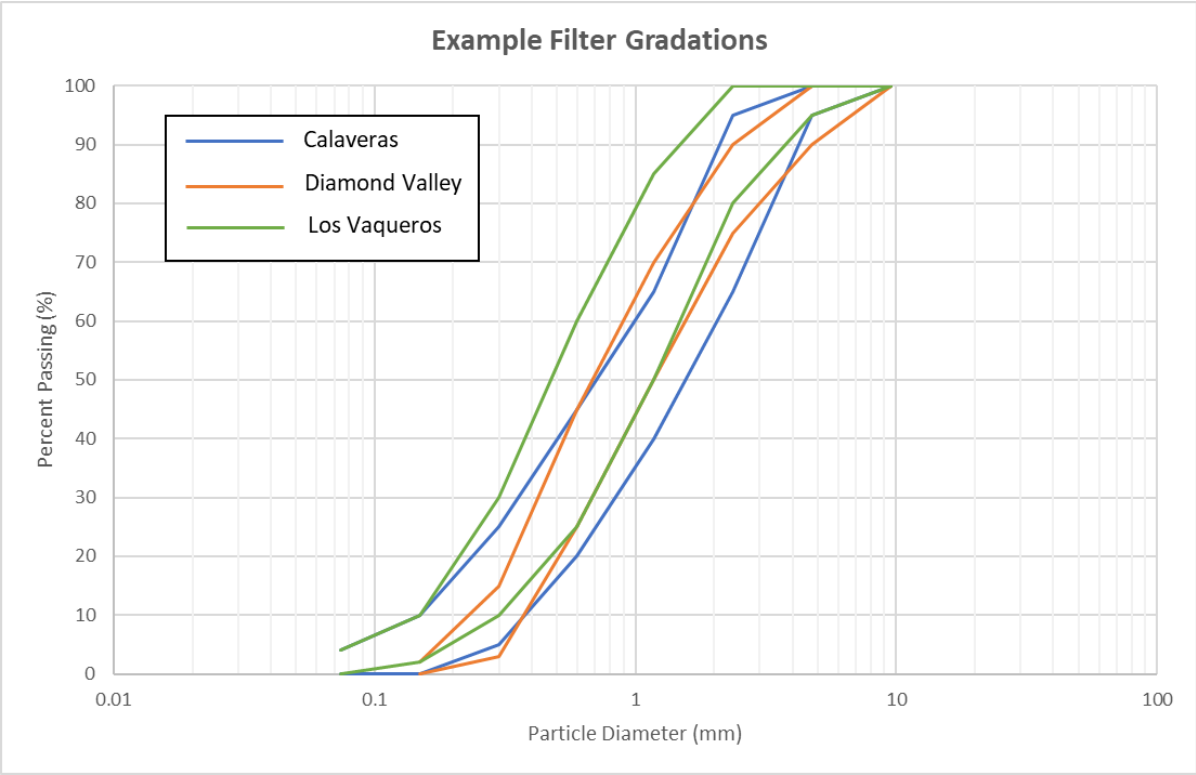
Examples of Dam Construction

Examples of Filter Gradations and Requirements

Generally meet the soundness requirements of ASTM C33 for fine aggregate plus requirements below

Test Type	Acceptability Standard	Criteria
Specific Gravity	ASTM C127	Greater than 2.6
Abrasion Resistance	ASTM C131	10 percent maximum loss by weight at 100 revolutions, and 40 percent loss of weight at 500 revolutions
	ASTM C535	40 percent maximum loss of weight at 1000 revolutions
Sodium Sulfate Soundness	ASTM C88	10 percent maximum weighted average loss by weight, after five cycles
Shape		Particles shall be generally equidimensional
Elongated Particles	CRD-C-119 and CRD-C-120	Not greater than 15 percent by weight
Other		Material shall be free of clay balls, organics, soft particles, and other impurities

Examples of Filter Gradations and Requirements



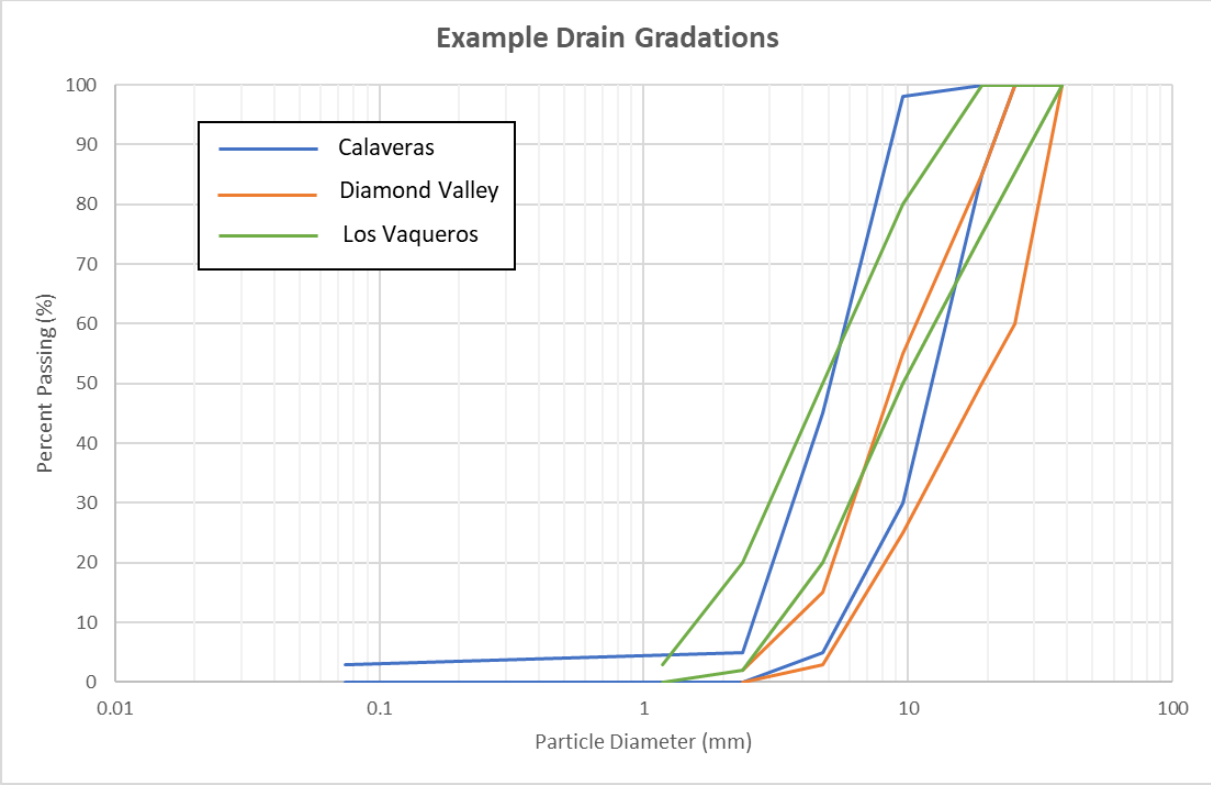
Sieve Size	Calaveras	Diamond Valley	Los Vaqueros
3/8-inch	100	100	100
No. 4	95 – 100	90 – 100	95 – 100
No. 8	65 – 95	75 – 90	80 – 100
No. 16	40 – 65	50 – 70	50 – 85
No. 30	20 – 45	25 – 45	25 – 60
No. 50	5 – 25	3 – 15	10 – 30
No. 100	0 – 10	0 – 2	2 – 10
No. 200	0 – 4	-	0 – 4

Note: No gap or skip grading between any two consecutive sieves

Examples of Drain Gradations and Requirements

Test Type	Acceptability Standard	Criteria
Adsorption	ASTM C127	Greater than 2.6
Specific Gravity	ASTM C127 and C128	Greater than 2.6
Abrasion Resistance	ASTM C131	10 percent maximum loss by weight at 100 revolutions, and 40 percent loss of weight at 500 revolutions
Sodium Sulfate Soundness	ASTM C88	10 percent maximum weighted average loss by weight, after five cycles
Shape		Particles shall be generally equidimensional
Elongated Particles	CRD-C-119 and CRD-C-120	Not greater than 15 percent by weight
Other		Material shall be free of clay balls, organics, soft particles, and other impurities

Examples of Drain Gradations and Requirements

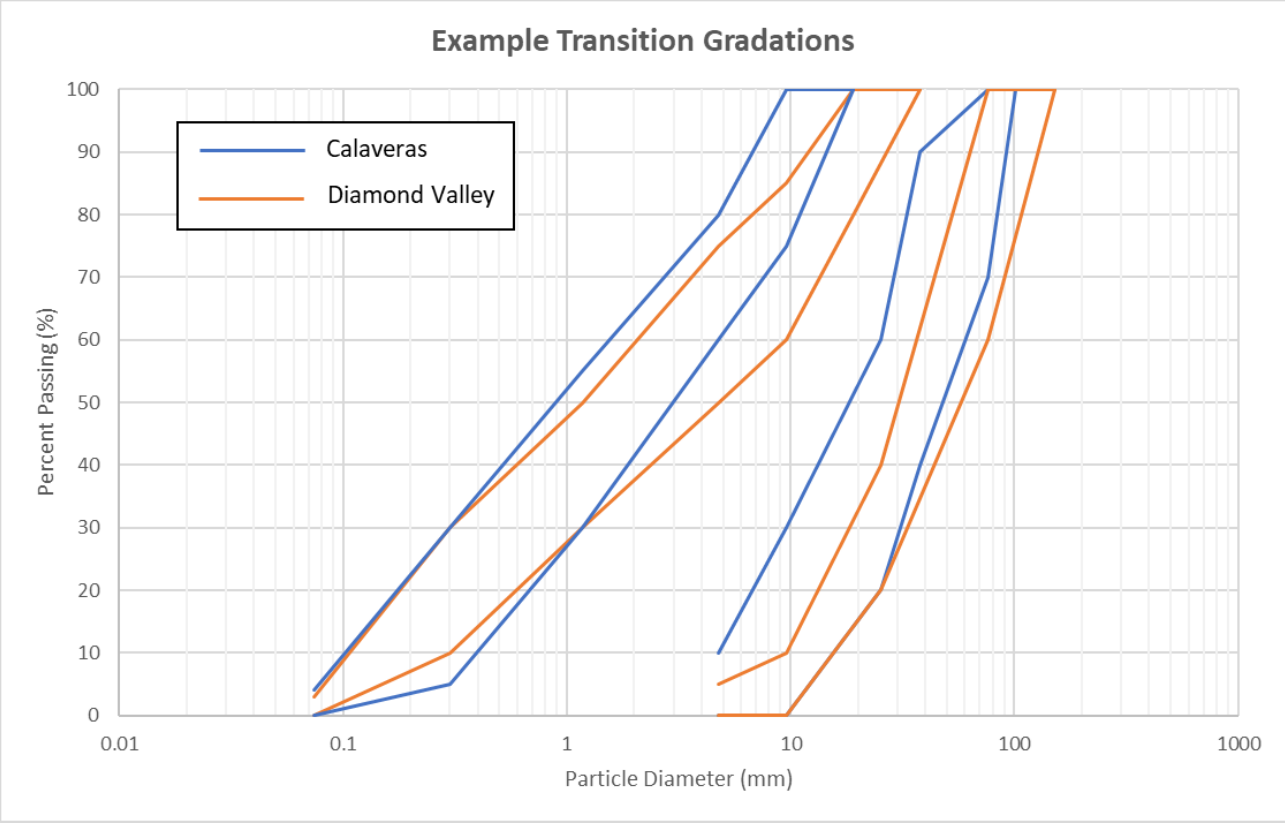


Sieve Size	Calaveras	Diamond Valley	Los Vaqueros
1.5-inch	-	100	100
1-inch	100	60 – 100	-
3/4-inch	85 – 100	50 – 85	75 – 100
3/8-inch	30 – 98	25 – 55	50 – 80
No. 4	5 – 45	3 – 15	20 – 50
No. 8	0 – 5	0 – 2	2 – 20
No. 16	-	-	0 – 3
No. 200	0 – 3	-	-

Note: No gap or skip grading between any two consecutive sieves

Examples of Transition Gradations and Requirements

- Similar soundness requirements to filter and drain



Sieve Size	Calaveras (Upstream)	Calaveras (Downstream)	Diamond Valley (Upstream)	Diamond Valley (Downstream)
6-inch	-	-	-	100
4-inch	-	100	-	-
3-inch	-	70 – 100	-	60 – 100
1.5-inch	-	40 – 90	100	-
1-inch	-	20 – 60	-	20 – 40
¾-inch	100	-	80 – 100	-
3/8-inch	75 – 100	0 – 30	60 – 85	0 – 10
No. 4	60 – 80	0 – 10	50 – 75	0 – 5
No. 16	30 – 55	-	30 – 50	-
No. 50	5 – 30	-	10 – 30	-
No. 200	0 – 4	-	0 – 3	-

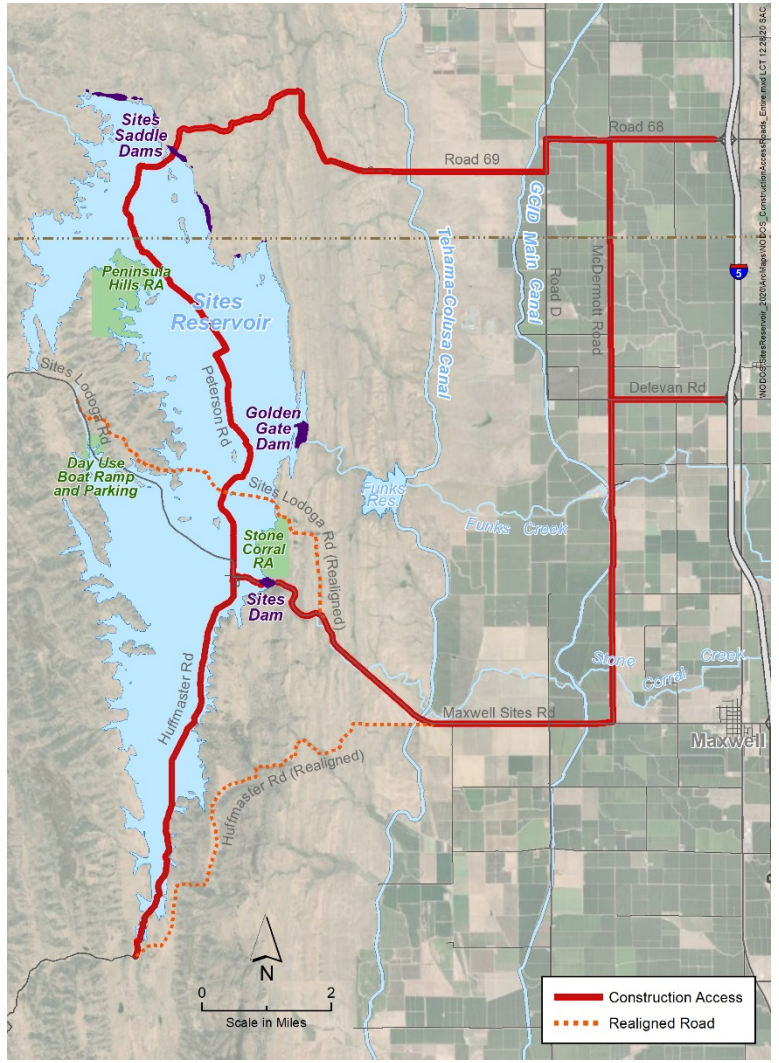
Road Base

Road Base

- Caltrans Class 2 Aggregate Base (standard specifications 26-1.02)
  - Consists of clean broken stone, crushed gravel, natural rough-surfaces gravel, sand, and/or processed reclaimed AC, PCC, LCB, or CTB

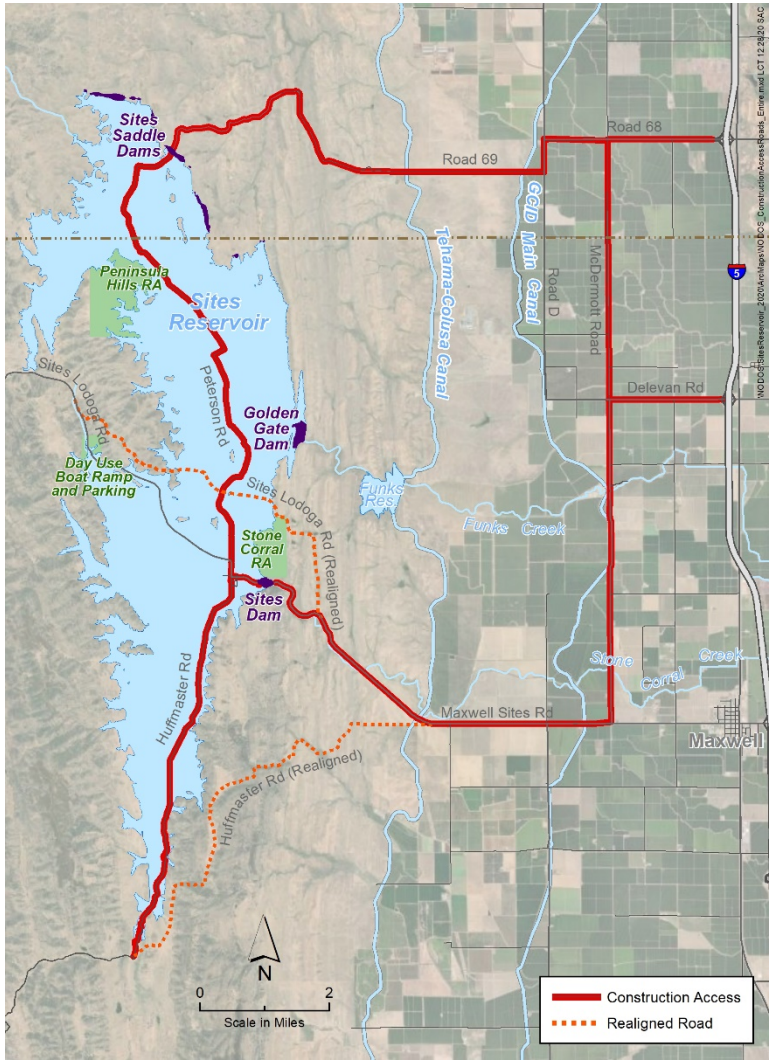
Sieve size	Percentage passing			
	1-1/2 inch maximum		3/4 inch maximum	
	Operating range	Contract compliance	Operating range	Contract compliance
2"	100	100	--	--
1-1/2"	90–100	87–100	--	--
1"	--	--	100	100
3/4"	50–85	45–90	90–100	87–100
No. 4	25–45	20–50	35–60	30–65
No. 30	10–25	6–29	10–30	5–35
No. 200	2–9	0–12	2–9	0–12

Quality characteristic	Requirement	
	Operating range	Contract compliance
Resistance (R-value, min)	--	78
Sand equivalent (min)	25	22
Durability index (min)	--	35



Road Base

- Caltrans Class 4 Aggregate Subbase (standard specifications 25-1.02)
  - Consists of clean broken stone, crushed gravel, natural rough-surfaces gravel, sand, and/or processed reclaimed AC, PCC, LCB, or CTB
  - Gradation and quality requirements to be decided based on project needs, but likely to have a minimum sand equivalent of about 20 and R-value of about 40



Concrete Aggregate

Concrete Aggregate

- Need to meet quality requirements of ASTM C33, Concrete Aggregates

Location	Approximate Quantities (tons)
Spillway (Saddle Dam 8B)	19,500
Inlet/Outlet Structure	115,900
Sites Diversion Tunnel	10,400
Golden Gate Dam Bypass	35,000
Sites Lodoga Bridge	45,585

Summary of Quantities

Summary of Quantities

Location	Approximate Quantities (Million Tons)
Zone 2A – Downstream Filter	1.5
Zone 2A – Downstream Drain	1.6
Zone 2A – Downstream Transition	0.3
Zone 2B – Upstream Filter	0.6
Zone 2B – Upstream Transition	0.6
Class 4 Aggregate Subbase	0.3
Class 2 Aggregate Base	0.5
Concrete Aggregate	0.6
Total	**6.0 million tons**

Crude Average Delivery Schedule

- Overall Project Schedule = 800 to 1200 days
- Overall Quantity of Material = 6 million tons
- Average Delivery = 6,000 to 7,500 tons per day

Questions

Sites

Questions

- Do you have the quality of materials needed and their location(s)?
- Do you have the plants to create the materials in spec and their location(s)?
- Do you have the capacity to deliver the quality and quantities of materials in the time needed?

Questions – cont'd.

- Do you have technical specifications/lab certifications such as durability, gradation, petrographic analysis, LA rattler, R-value, available?
- What is the location of quarry and type of material; alluvium, hard rock, soft rock?
- What are the available material remaining/duration of permitted operations?

Questions – cont'd.

- What are the productivity rates for different materials?
- What is the maximum amount of material you can deliver per day?
- What are the approximate at plant costs for different materials?
- Will you be using prevailing labor rates for trucking?