

THE SWAIN COUNTY TOURISM  
DEVELOPMENT AUTHORITY  
SWAIN COUNTY, NORTH CAROLINA

# NANTAHALA RIVER COMPETITIVE WHITEWATER TRAINING CENTER

OCTOBER 2011

PROJ. NO. FY 2011-293



FOR CONSTRUCTION

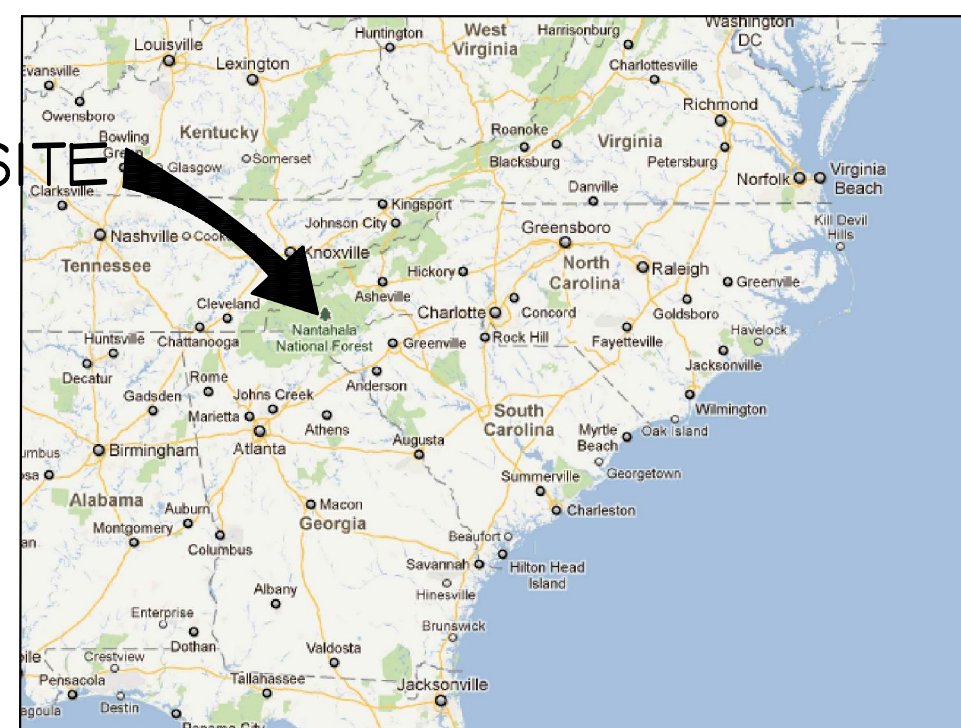
October 13, 2011

CALL UTILITY NOTIFICATION CENTER  
OF NORTH CAROLINA



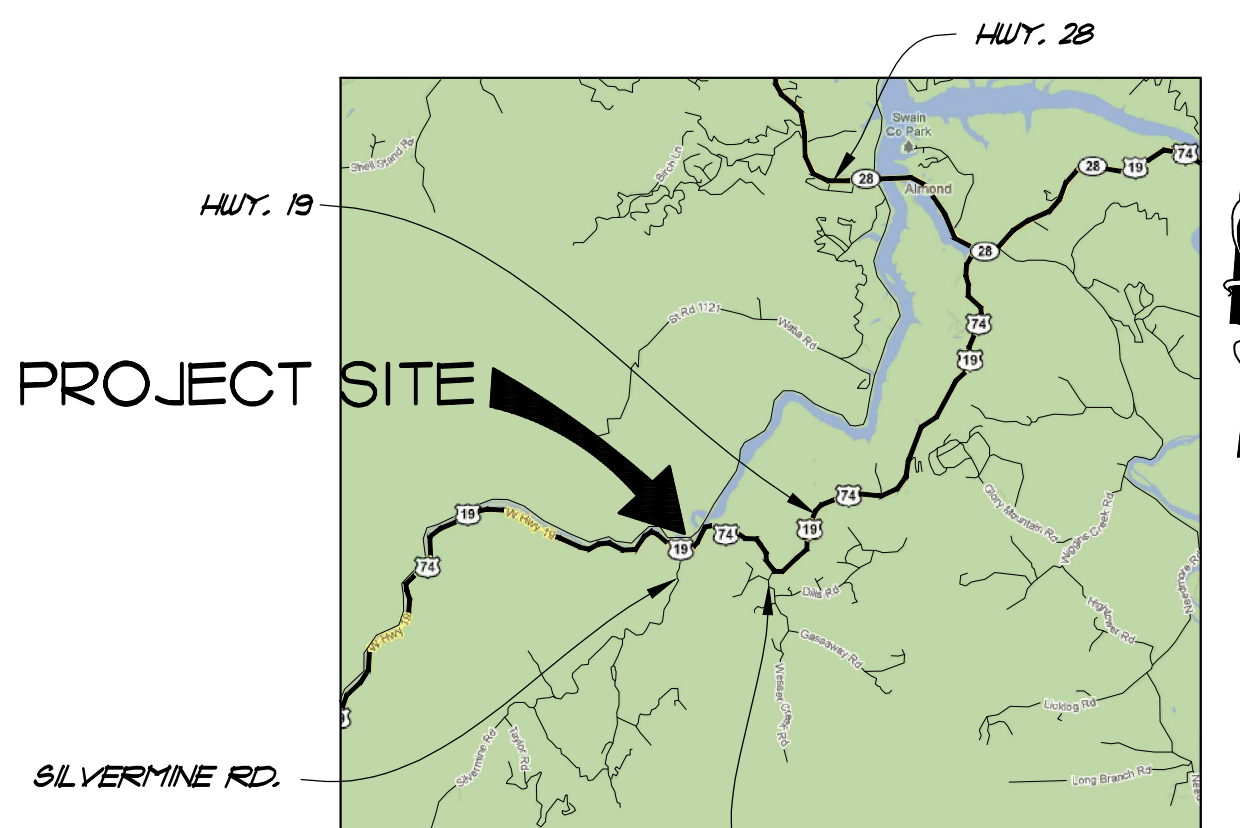
Know what's below.  
Call before you dig.

PROJECT SITE



LOCATION MAP  
N.T.S.

PROJECT SITE



VICINITY MAP  
N.T.S.

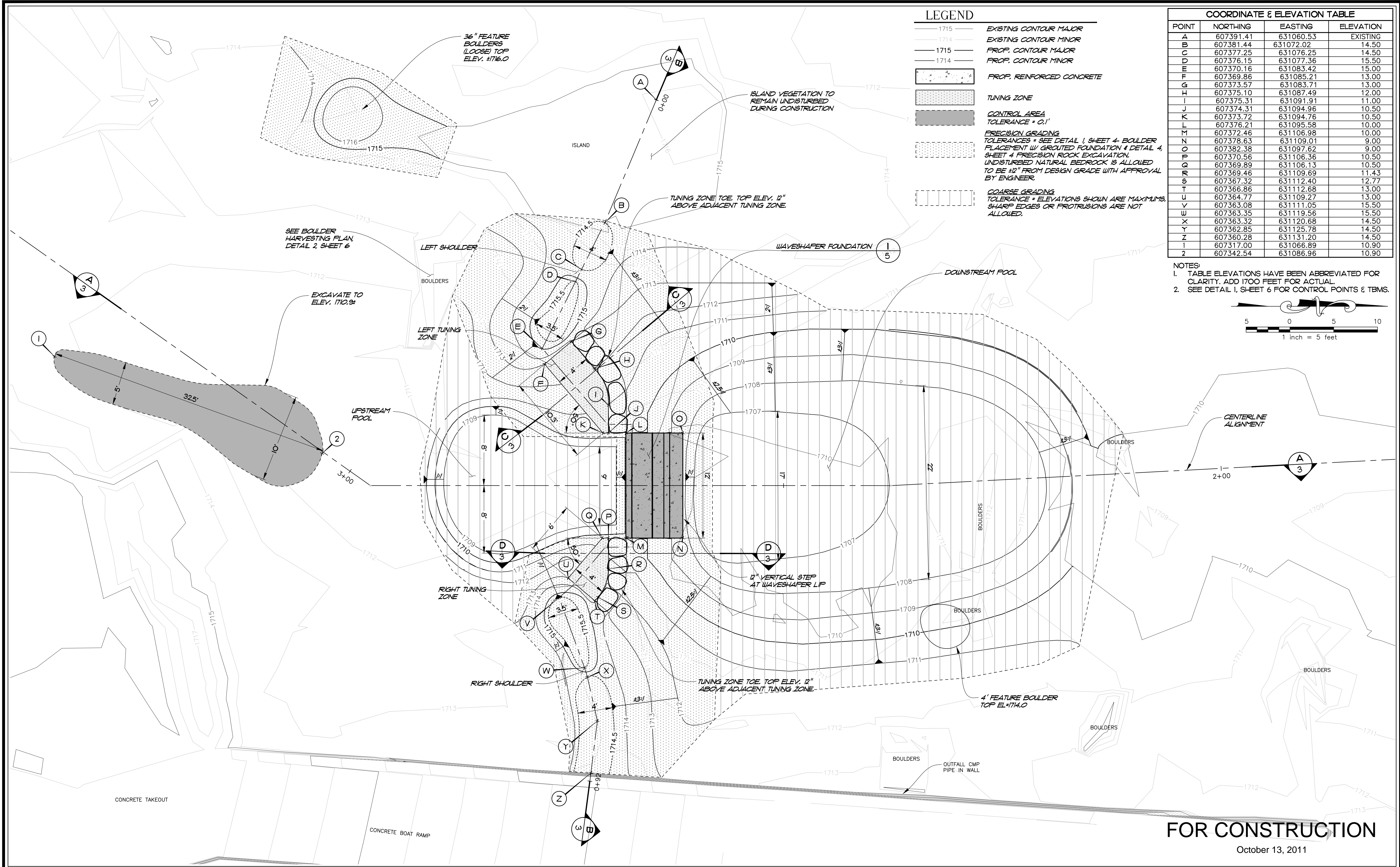
## INDEX OF DRAWINGS

No.	DESCRIPTION
1	COVER SHEET
2	WHITEWATER IMPROVEMENTS PLAN
3	WHITEWATER IMPROVEMENTS SECTIONS
4	WHITEWATER IMPROVEMENTS DETAILS
5	WAVESHAPER DETAILS
6	MISCELLANEOUS DETAILS

PREPARED BY:



MWE PROJ. NO. 07-03.02



**LEGEND**

- 1715 ——— EXISTING CONTOUR MAJOR
- 1714 ——— EXISTING CONTOUR MINOR
- 1715 ——— PROF. CONTOUR MAJOR
- 1714 ——— PROF. CONTOUR MINOR
- PROP. REINFORCED CONCRETE
- TUNING ZONE
- CONTROL AREA  
TOLERANCE = 0.1'
- PRECISION GRADING  
TOLERANCES - SEE DETAIL 1, SHEET 4 - BOULDER PLACEMENT w/ GROUTED FOUNDATION & DETAIL 4, SHEET 4 - PRECISION ROCK EXCAVATION.  
UNDISTURBED NATURAL BEDROCK IS ALLOWED TO BE 12" FROM DESIGN GRADE WITH APPROVAL BY ENGINEER.
- COARSE GRADING  
TOLERANCE = ELEVATIONS SHOWN ARE MAXIMUMS. SHARP EDGES OR PROTRUSIONS ARE NOT ALLOWED.

COORDINATE & ELEVATION TABLE			
POINT	NORTHING	EASTING	ELEVATION
A	607391.41	631060.53	EXISTING
B	607381.44	631072.02	14.50
C	607377.25	631076.25	14.50
D	607376.15	631077.36	15.50
E	607370.16	631083.42	15.00
F	607369.86	631085.21	13.00
G	607373.57	631083.71	13.00
H	607375.10	631087.49	12.00
I	607375.31	631091.91	11.00
J	607374.31	631094.96	10.50
K	607373.72	631094.76	10.50
L	607376.21	631095.58	10.00
M	607372.46	631106.98	10.00
N	607378.63	631109.01	9.00
O	607382.38	631097.62	9.00
P	607370.56	631106.36	10.50
Q	607369.89	631106.13	10.50
R	607369.46	631109.69	11.43
S	607367.32	631112.40	12.77
T	607366.86	631112.68	13.00
U	607364.77	631109.27	13.00
V	607363.08	631111.05	15.50
W	607363.35	631119.56	15.50
X	607363.32	631120.68	14.50
Y	607362.85	631125.78	14.50
Z	607360.28	631131.20	14.50
1	607317.00	631066.89	10.90
2	607342.54	631086.96	10.90

**NOTES:**  
 1. TABLE ELEVATIONS HAVE BEEN ABBREVIATED FOR CLARITY. ADD 1700 FEET FOR ACTUAL.  
 2. SEE DETAIL 1, SHEET 6 FOR CONTROL POINTS & TBMS.

1 inch = 5 feet

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THE SWAIN COUNTY TOURISM DEVELOPMENT AUTHORITY

NANTAHALA RIVER COMPETITIVE WHITewater TRAINING CENTER

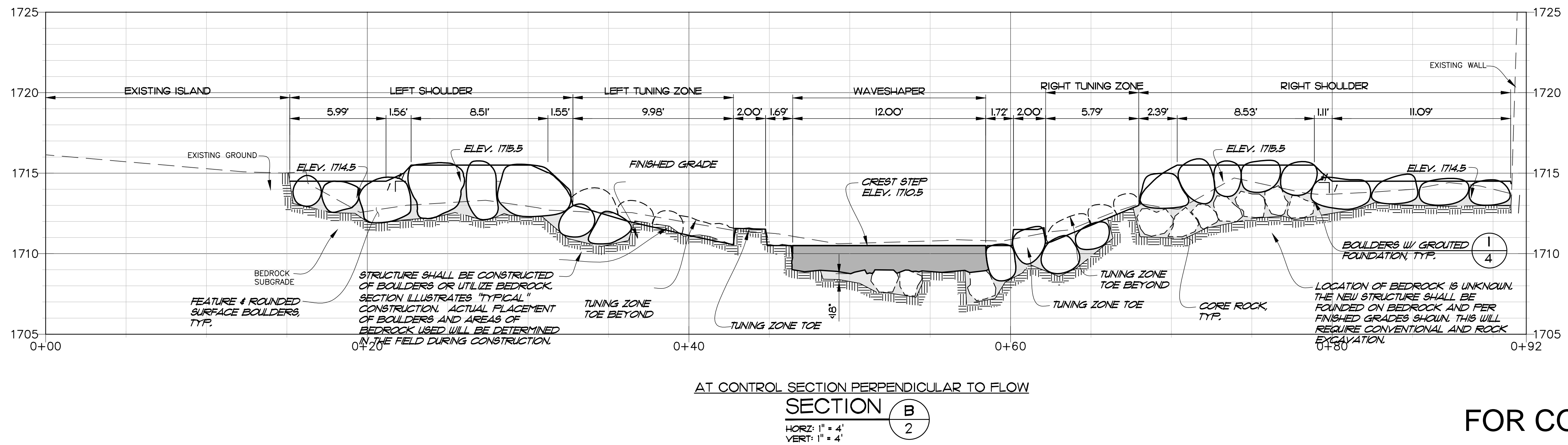
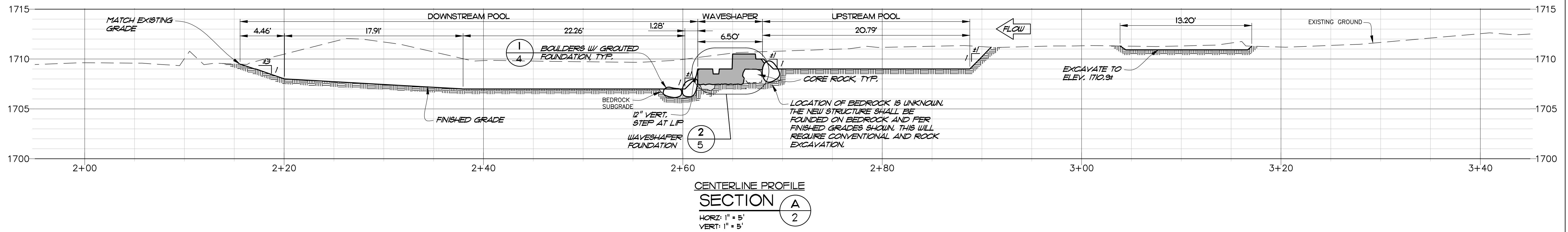
WHITewater IMPROVEMENTS PLAN



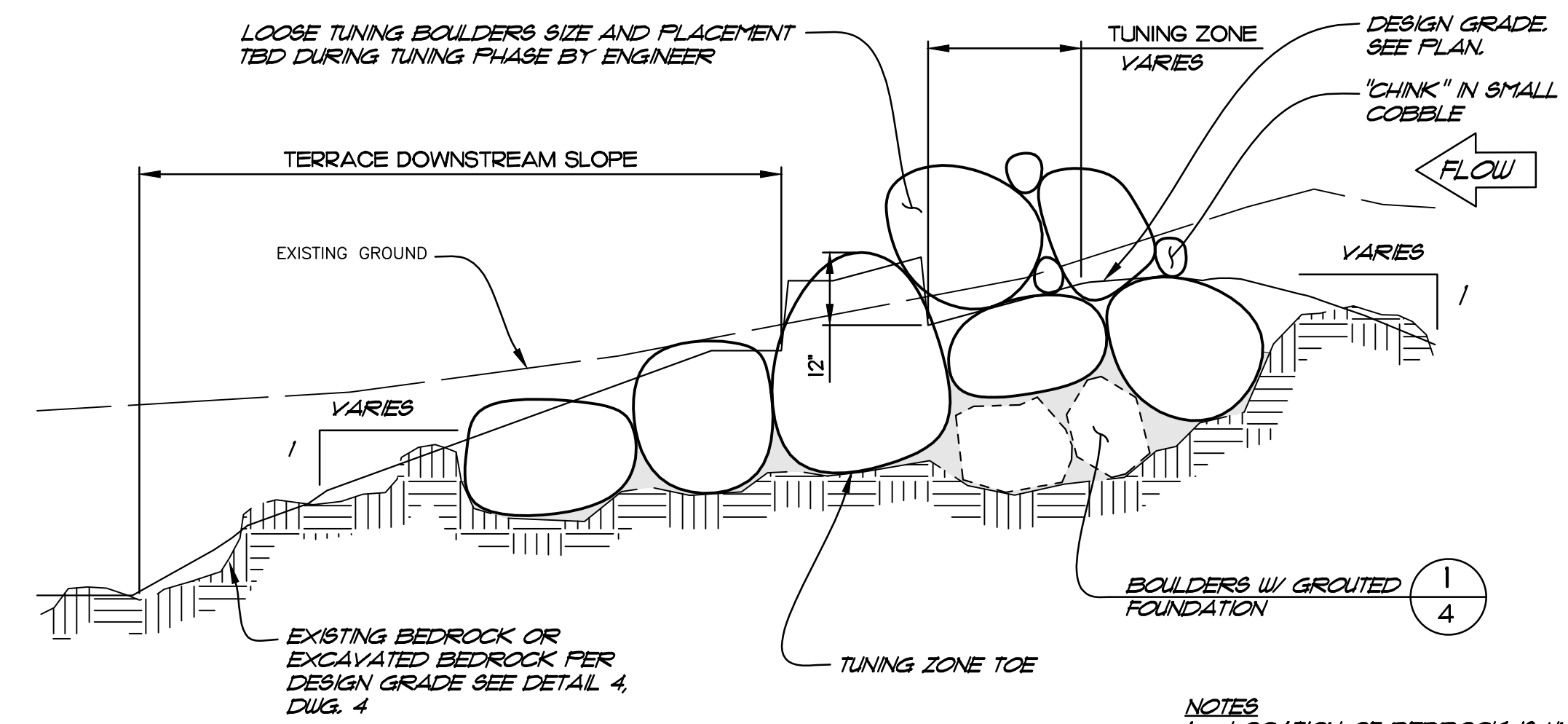
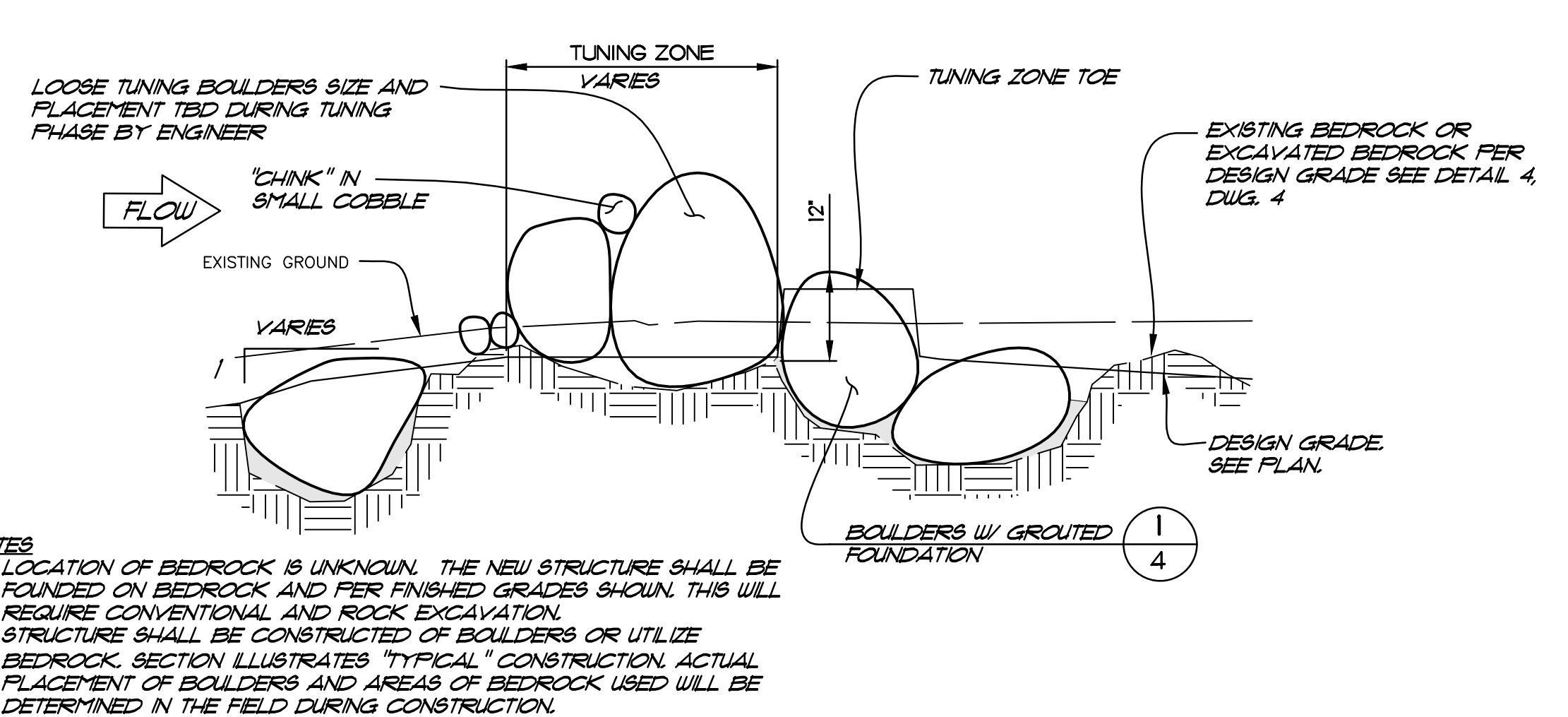
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 DATE: SEPTEMBER 2011

PROJECT NUMBER: 07-03.02  
 Drawing Number: **2**

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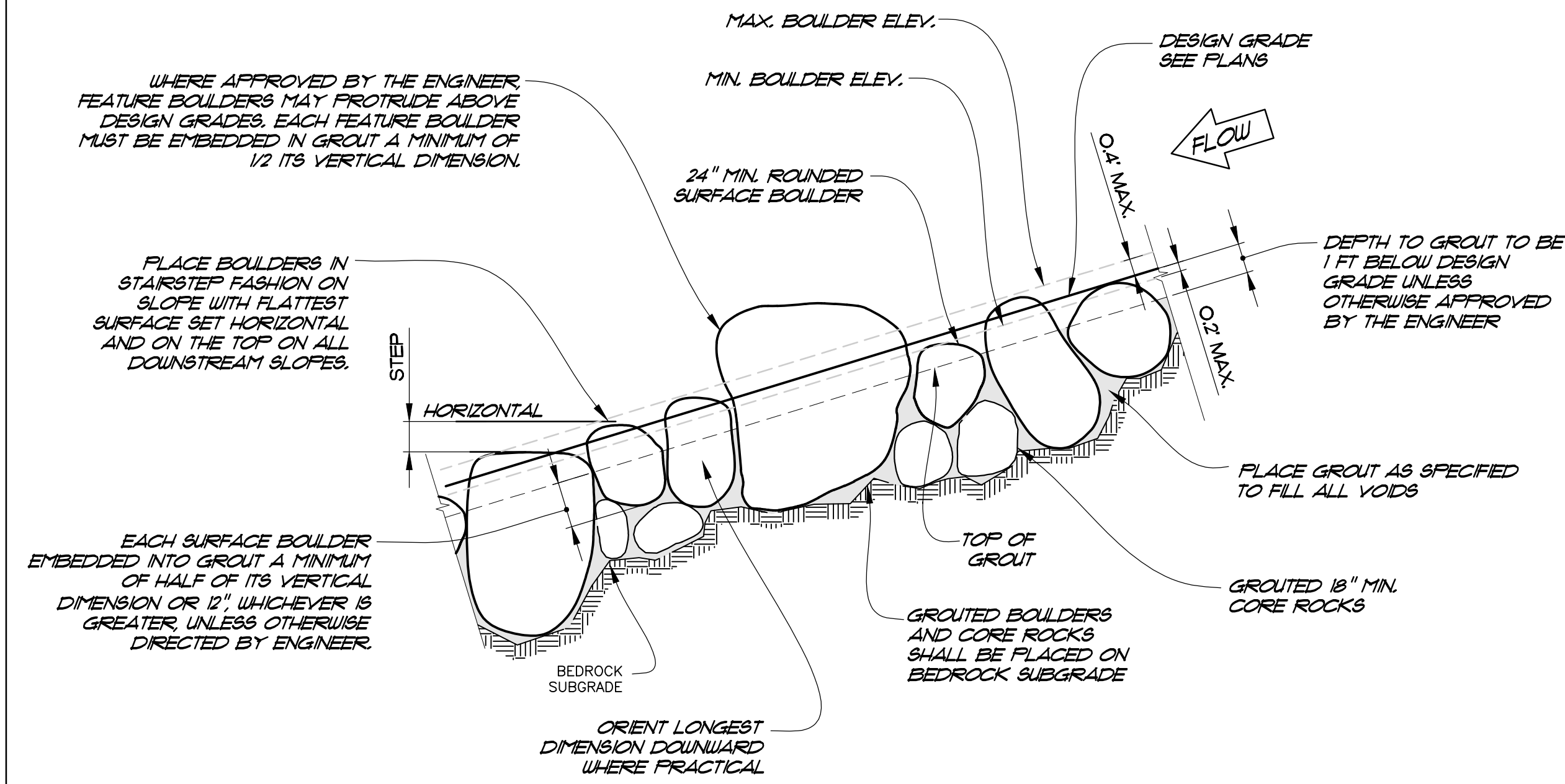


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- NOTES**
1. LOCATION OF BEDROCK IS UNKNOWN. THE NEW STRUCTURE SHALL BE FOUNDED ON BEDROCK AND PER FINISHED GRADES SHOWN. THIS WILL REQUIRE CONVENTIONAL AND ROCK EXCAVATION.
  2. STRUCTURE SHALL BE CONSTRUCTED OF BOULDERS OR UTILIZE BEDROCK. SECTION ILLUSTRATES "TYPICAL" CONSTRUCTION. ACTUAL PLACEMENT OF BOULDERS AND AREAS OF BEDROCK USED WILL BE DETERMINED IN THE FIELD DURING CONSTRUCTION.

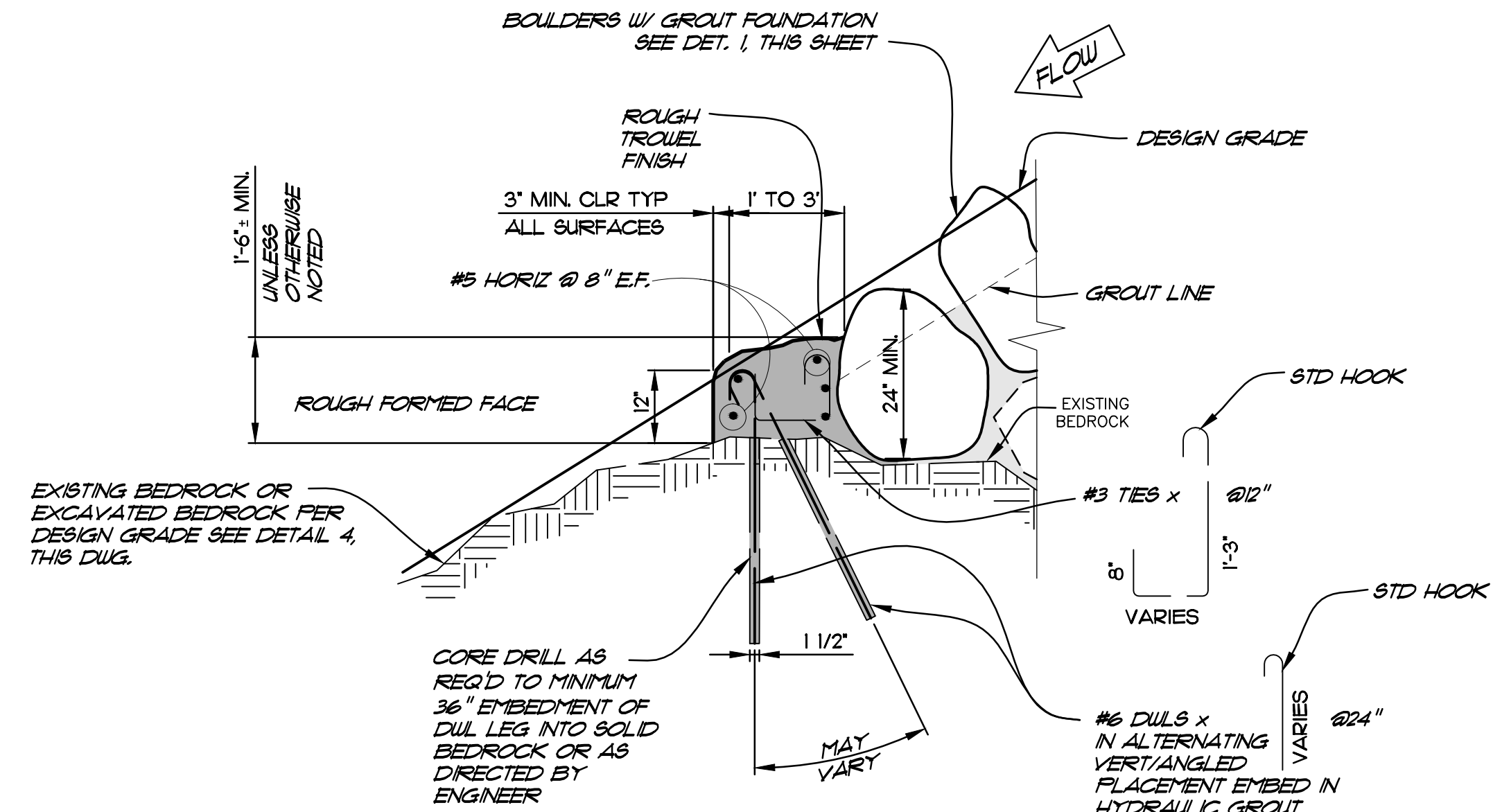
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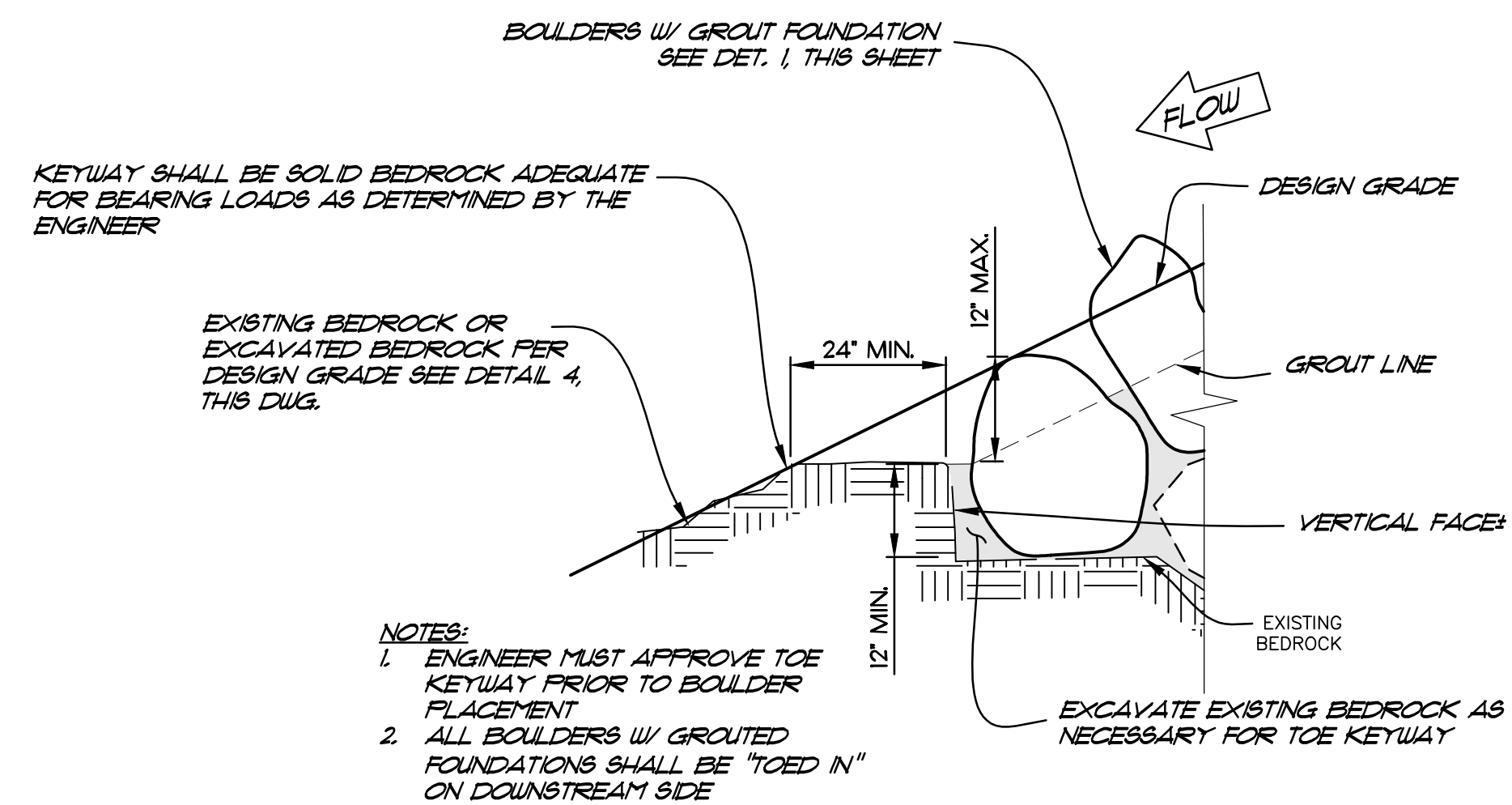
**BOULDER PLACEMENT W/ GROUTED FOUNDATION**  
**DETAIL 1**  
 1" = 4'

**GROUTED BOULDER NOTES:**

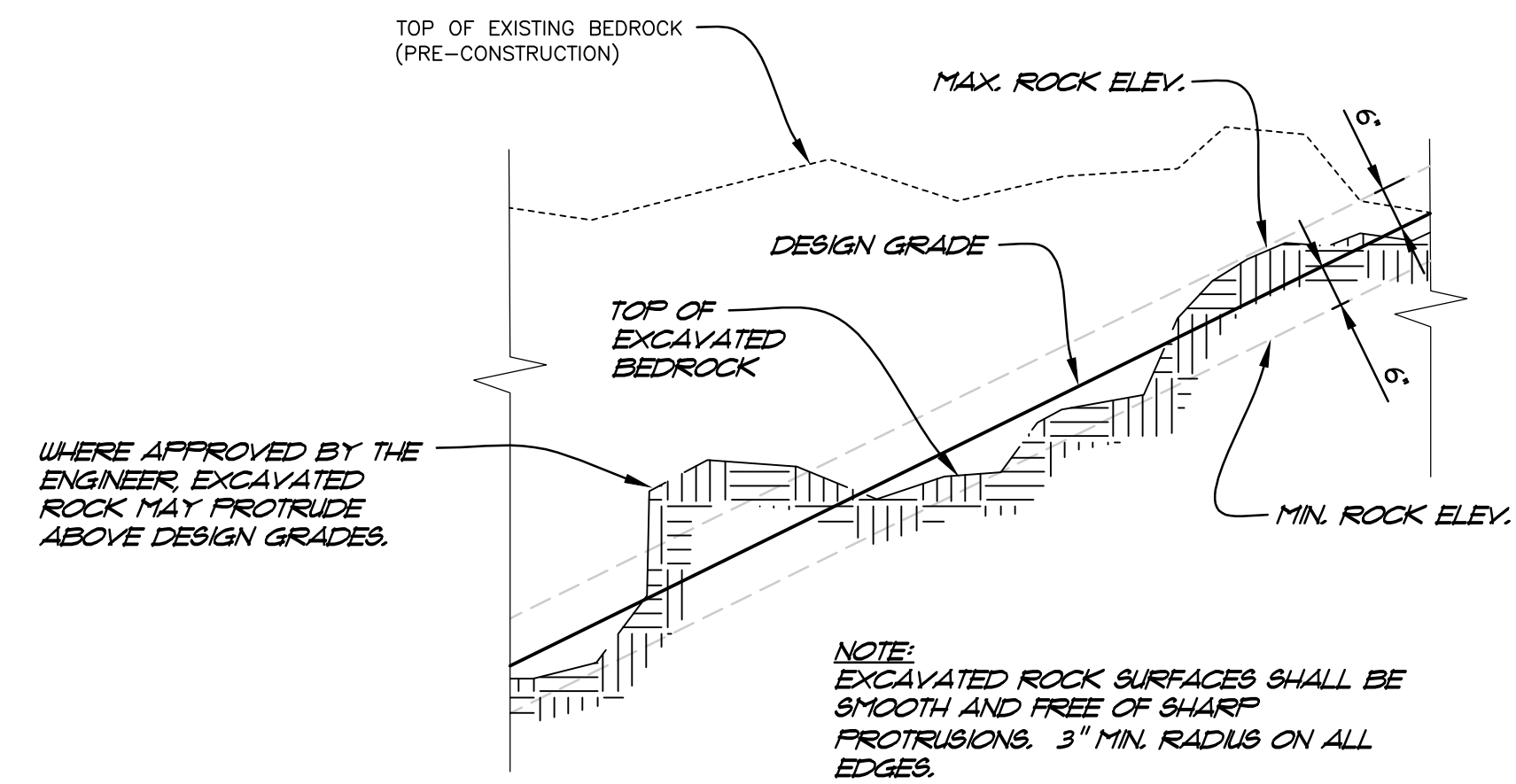
1. UNLESS OTHERWISE INDICATED, ALL SURFACE BOULDERS TO BE INDIVIDUALLY PLACED AS DIRECTED BY THE ENGINEER.
2. ALL SURFACE BOULDERS ON THE PROJECT SHALL BE "ROUNDED SURFACE BOULDERS" PER SPECIFICATIONS.
3. BEFORE GROUTING, CLEAN ALL DIRT AND MATERIALS FROM ROCK THAT COULD PREVENT THE GROUT FROM BONDING.
4. PLACE GROUT BY INJECTION METHODS AND VIBRATE TO FILL VOIDS TO THE SPECIFIED GROUT DEPTH, CLEAN EXCESS GROUT FROM ALL EXPOSED SURFACES.
5. BOULDER PLACEMENT SHALL BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO GROUT PLACEMENT.
6. EXPOSED GROUT SHALL BE TROWELED AND FINISHED TO MINIMIZE VISIBILITY, WASH AND CLEAN ALL NON-GROUTED SURFACES.
7. THE CONTRACTOR SHALL CONTROL GROUT MIX AND PLACEMENT PROCEDURES TO ACHIEVE THE SPECIFIED THICKNESS AND GRADE OF THE GROUT LAYER.
8. MAXIMUM BOULDER HEIGHT CAN BE EXCEEDED ON A CASE BY CASE BASIS UPON APPROVAL BY ENGINEER.
9. CONTRACTOR WILL BE REQUIRED TO USE MULTIPLE BOULDER LAYER GROUT WHEN GROUTING MORE THAN TWO BOULDER LAYERS IN ONE PLACEMENT.
10. SURFACE BOULDERS AND CORE ROCK SHALL BE TIGHTLY PLACED SO THAT THE VOID RATIO AND VOLUME OF GROUT IS LESS THAN 35% OF THE TOTAL VOLUME (BELOW THE GROUT LINE) OF THE ENTIRE GROUTED BOULDER MASS.
11. ROCK AND SUBGRADE MUST BE BLANKETED AND HEATED IF COLD WEATHER CONCRETE PLACEMENT CONDITIONS EXIST. REFER TO SECTION 03300 OF SPECIFICATIONS.
12. REFER TO SECTION 02262 OF SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.



**BEDROCK-ANCHORED TOE CONNECTION**  
**DETAIL 2**  
 1" = 2'



**ALTERNATE TOE CONNECTION**  
**DETAIL 3**  
 1" = 2'



**PRECISION ROCK EXCAVATION**  
**DETAIL 4**  
 1" = 2'

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WHITEWATER TRAINING CENTER

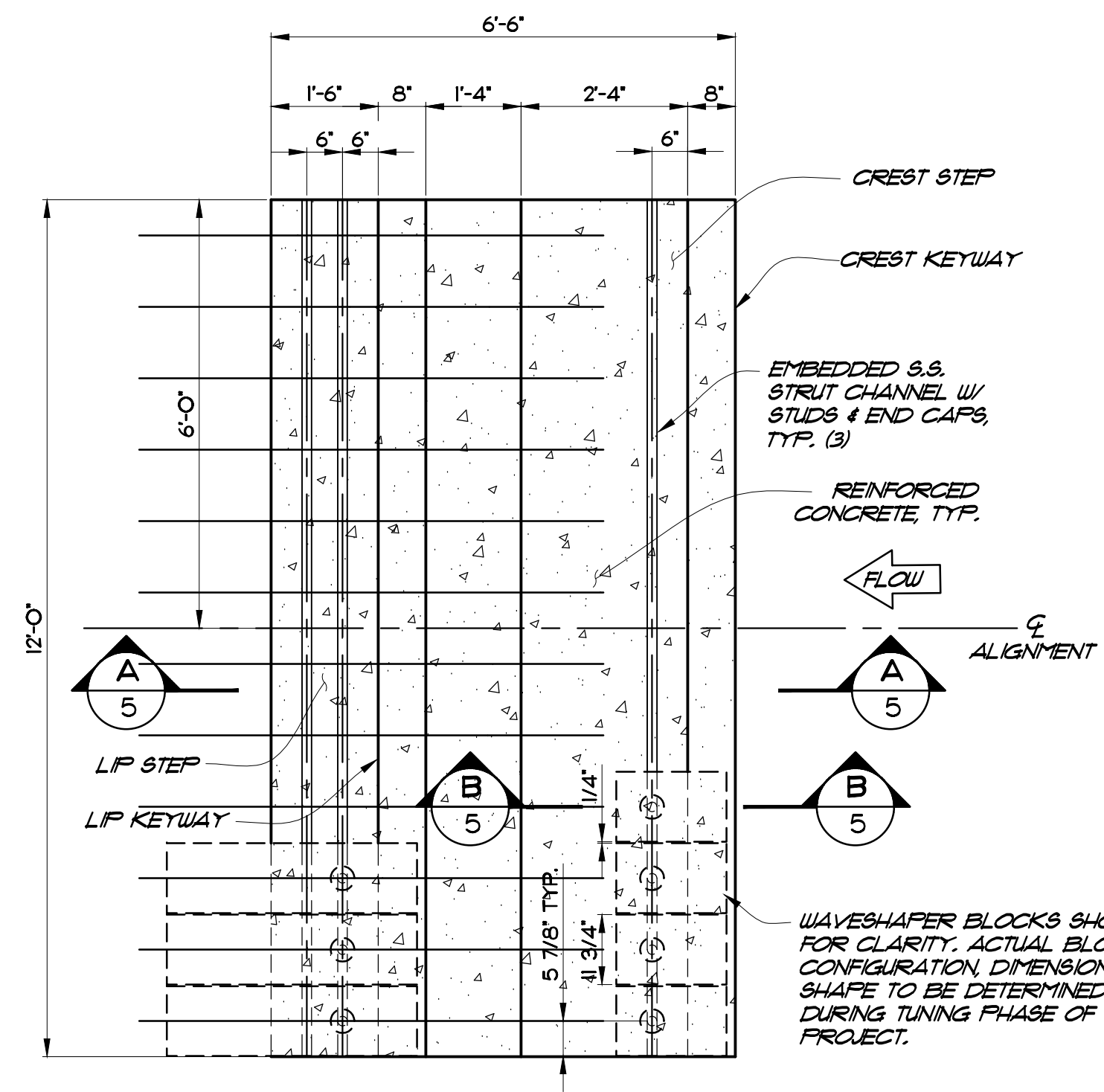
WHITEWATER IMPROVEMENTS  
DETAILS



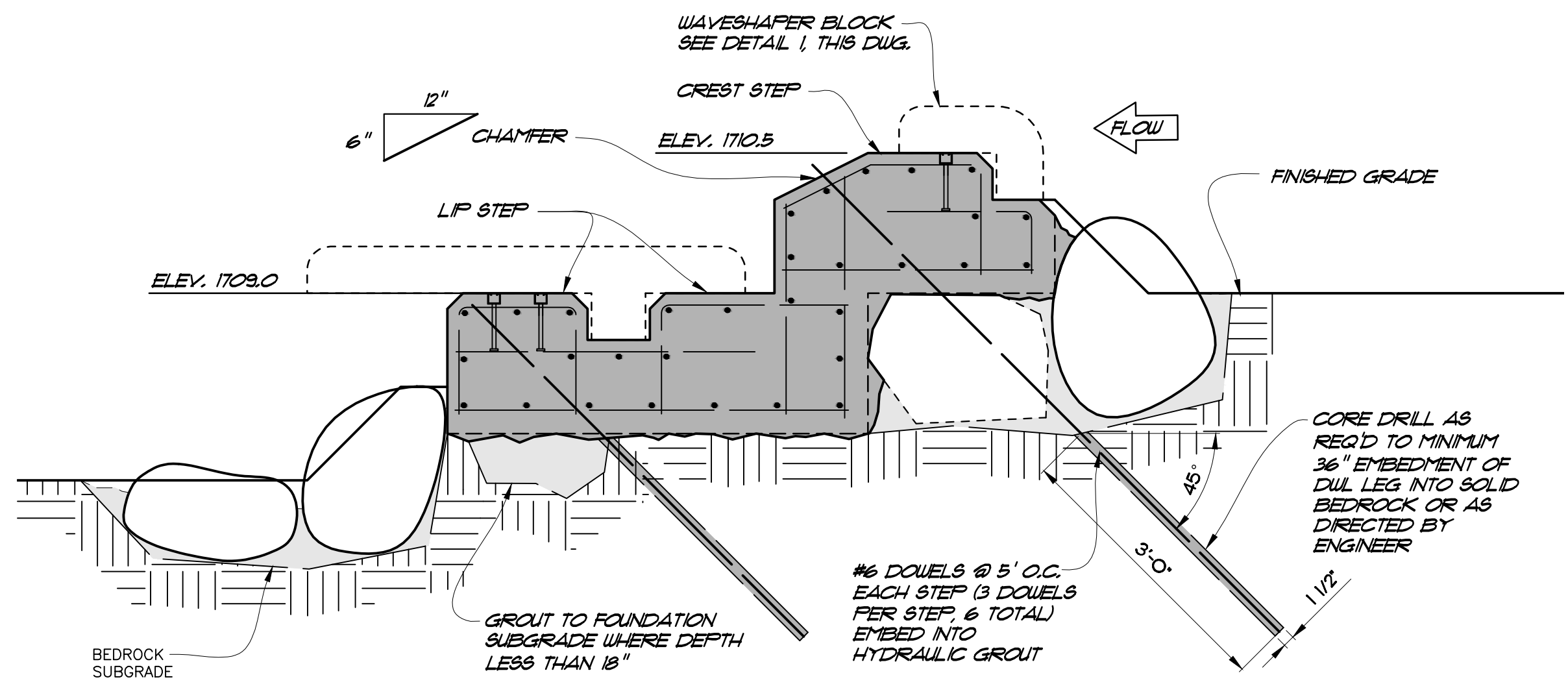
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07-03.02

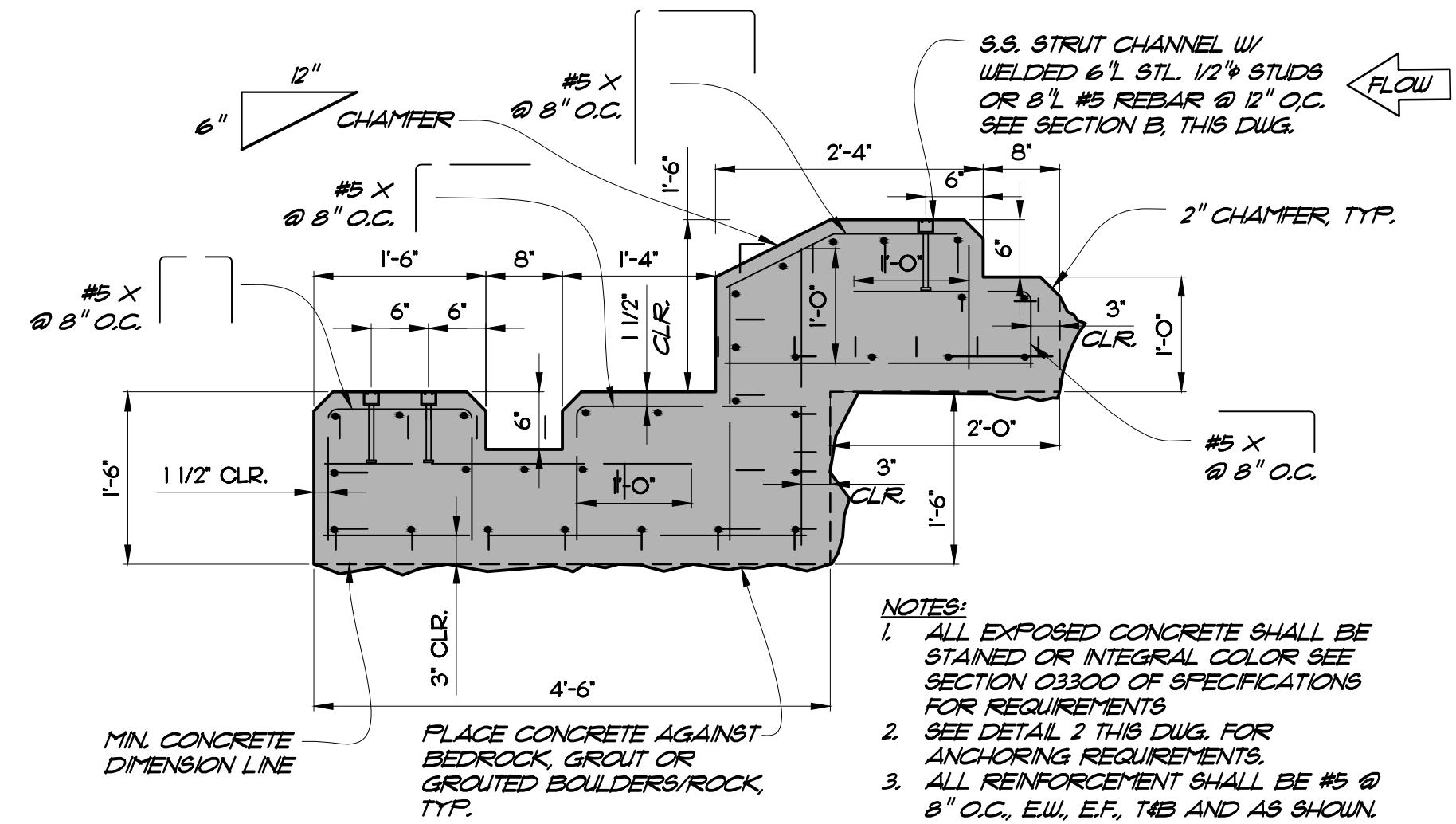
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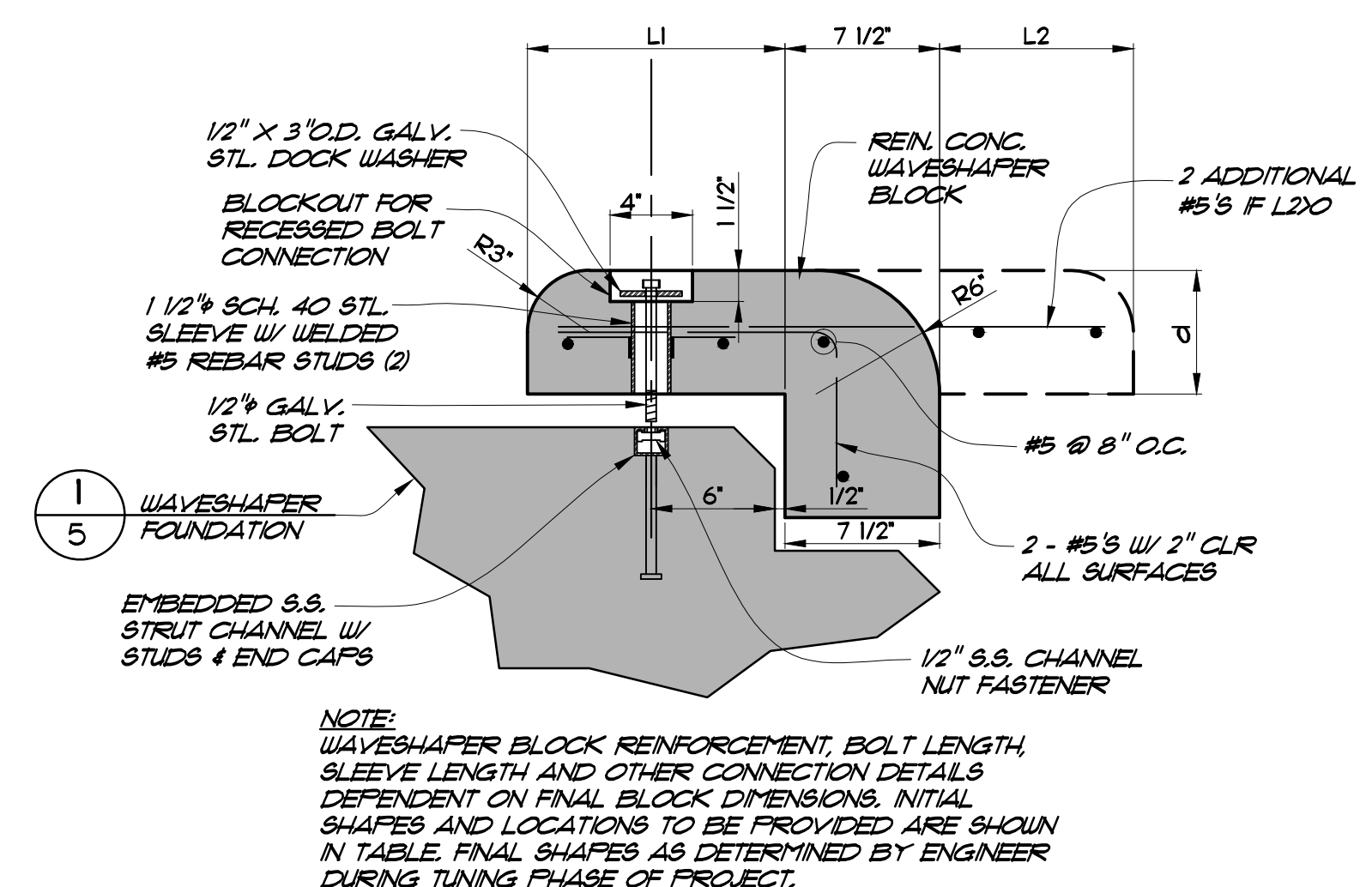
WAVESHAPER FOUNDATION PLAN  
**DETAIL 1**  
 1/2" = 1'-0" (2, 3)



WAVESHAPER FOUNDATION CONNECTION TYPICAL SECTION  
**DETAIL 2**  
 3/4" = 1'-0" (3, 5)



WAVESHAPER FOUNDATION TYPICAL SECTION  
**SECTION A**  
 3/4" = 1'-0" (5)



WAVESHAPER BLOCK & CONNECTION - CREST STEP  
**SECTION B**  
 1 1/2" = 1'-0" (5)

INITIAL WAVESHAPER BLOCKS TO BE PROVIDED FOR TUNING			
NUMBER PROVIDED	d	L1	L2
6	6"	12"	0"
6	12"	12"	0"
12	8"	30"	15"
6	8"	24"	0"
6	6"	24"	0"

- NOTES:
- ALL EXPOSED CONCRETE SHALL BE STAINED OR INTEGRAL COLOR SEE SECTION 03300 OF SPECIFICATIONS FOR REQUIREMENTS
  - SEE DETAIL 2 THIS DUG. FOR ANCHORING REQUIREMENTS.
  - ALL REINFORCEMENT SHALL BE #5 @ 8" O.C. E.W., E.F., T&B AND AS SHOWN.

NOTE:  
 WAVESHAPER BLOCK REINFORCEMENT, BOLT LENGTH, SLEEVE LENGTH AND OTHER CONNECTION DETAILS DEPENDENT ON FINAL BLOCK DIMENSIONS. INITIAL SHAPES AND LOCATIONS TO BE PROVIDED ARE SHOWN IN TABLE. FINAL SHAPES AS DETERMINED BY ENGINEER DURING TUNING PHASE OF PROJECT.

**FOR CONSTRUCTION**  
 October 14, 2011

WAVESHAPER IS COVERED BY  
 PATENT NO. US 7,717,645 B2

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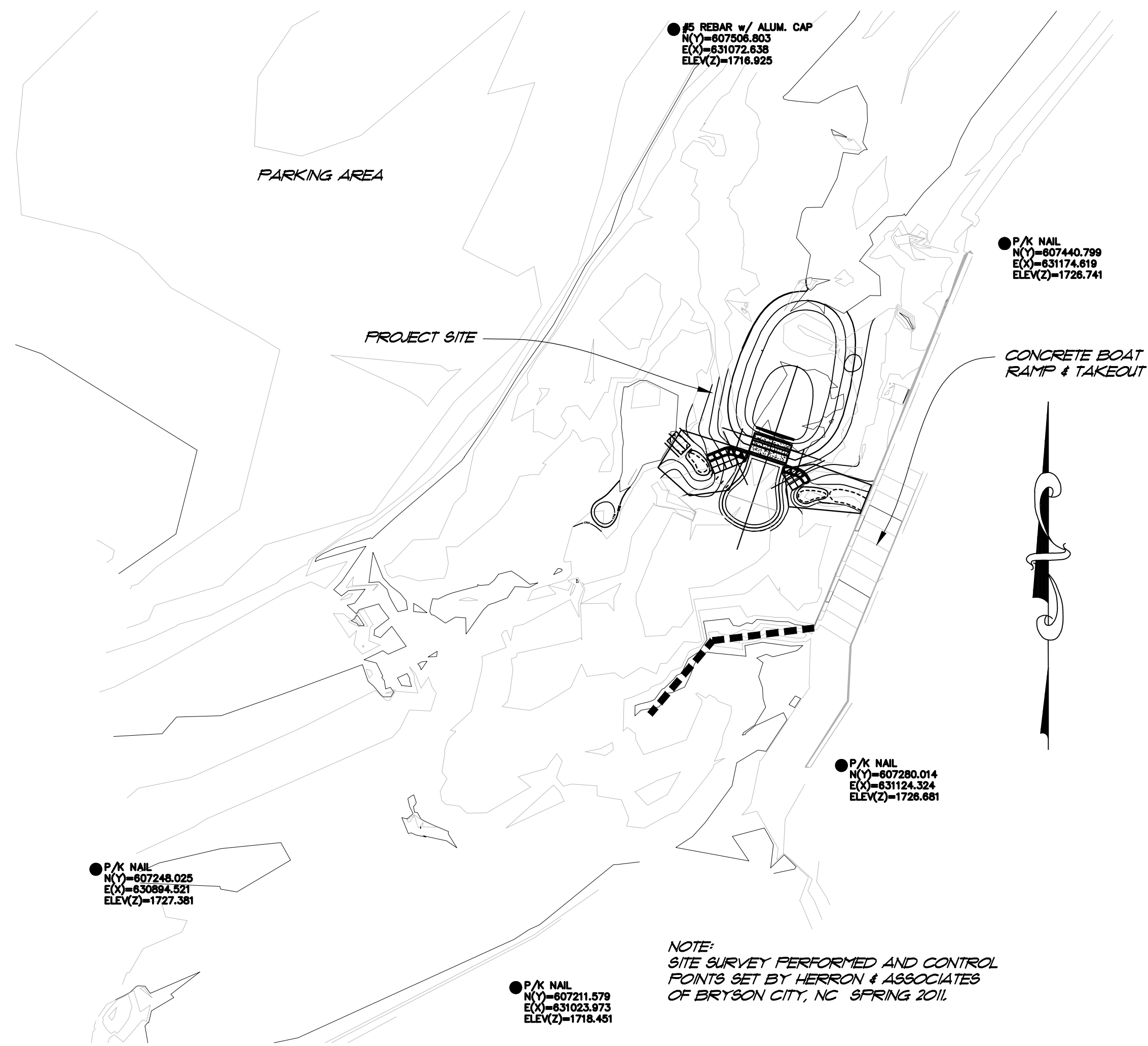
WAVESHAPER  
 DETAILS



DESIGN: REM, BAN  
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SURVEY CONTROL PLAN  
 DETAIL 1  
 1" = 30'



- NOTES:
1. BOULDERS INDICATED TO BE REUSED IN NEW CONSTRUCTION AS DIRECTED BY THE ENGINEER.
  2. ADDITIONAL BOULDERS NOT INDICATED ON THIS PLAN MAY BE HARVESTED IF APPROVED BY THE ENGINEER.
  3. ALL HARVESTED BOULDERS SHALL MEET THE REQUIREMENTS OF SPECIFICATION SECTION 02262 ROCK.

BOULDER HARVESTING PLAN - LOOKING SOUTH  
 DETAIL 2  
 N.T.S.

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										202 South Street Denver, Colorado 80211 P: 303.944.3333 F: 303.944.3333		DETAIL: BAN CHECK: BAN DATE: SEPTEMBER 2011	07-03.02	6