

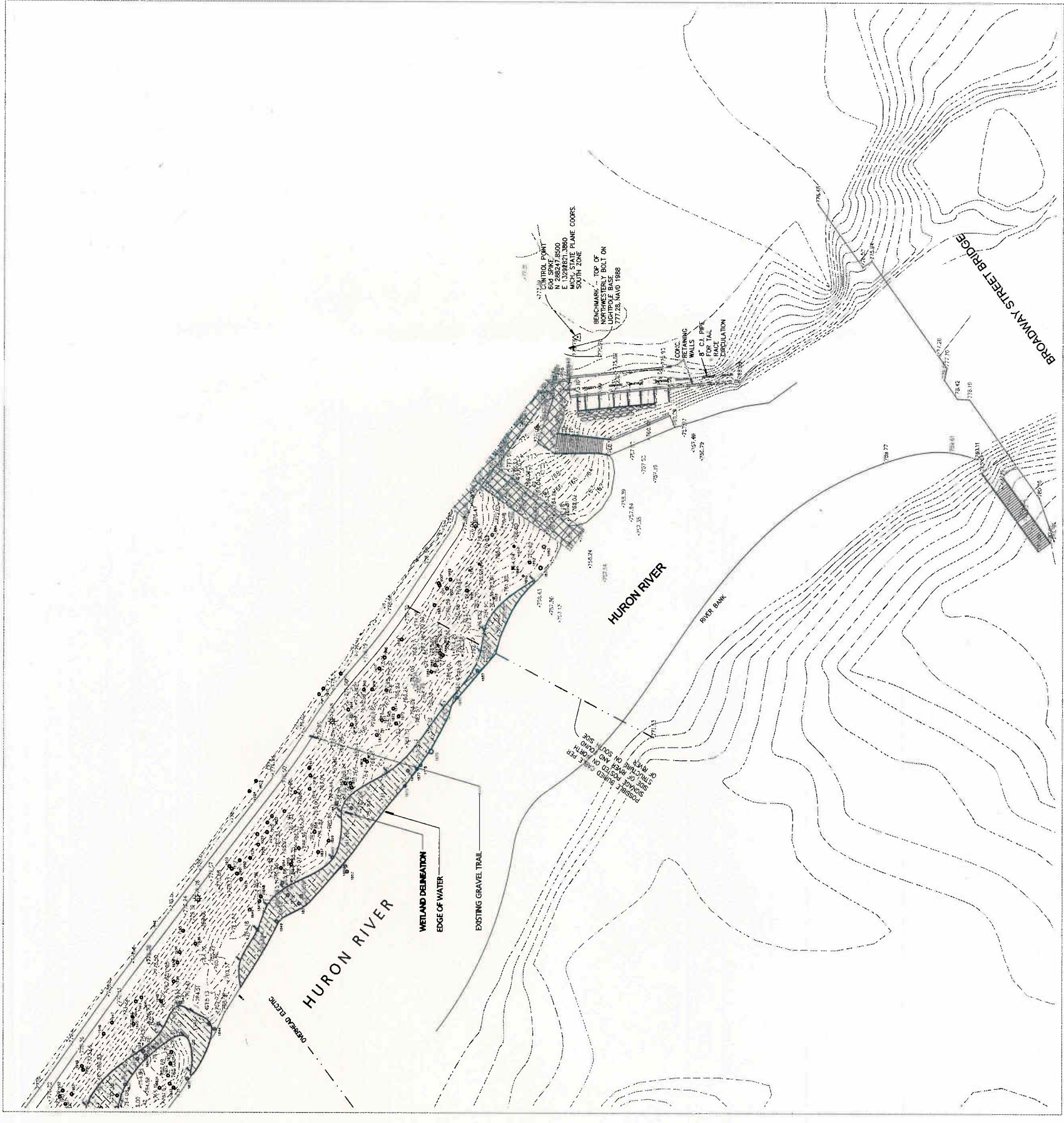
Date	Issued for
March 7, 2011	MDNR-E PERMIT APPLICATION
April 8, 2011	Design Progress Meeting 3
April 28, 2011	MDNR-E APPLICATION CORRECTION RE

Existing Conditions Legend

- | | |
|--------------------|-----------------------|
| SECTION CORNER | WATER MANHOLE |
| FOUND IRON PIPE | FIRE HYDRANT |
| FOUND IRON ROD | GATE VALVE |
| SET IRON PIPE | BEEHIVE CATCH BASIN |
| SET MAG NAIL | CURB CATCH BASIN |
| FOUND MAG NAIL | STORM MANHOLE |
| CONTROL POINT | CULVERT / END SECTION |
| MEASURED DIMENSION | SANITARY MANHOLE |
| RECORDED DIMENSION | LIGHT POLE |
| SURFACE FLOW | UTILITY RISER |
| | GAS MAIN RISER |

Existing Conditions Notes

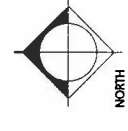
THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY DATA. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN ARE IN SERVICE OR ABANDONED. THE SURVEYOR DOES NOT WARRANT THAT THE INFORMATION SHOWN ARE IN THE EXACT LOCATION INDICATED. ALTHOUGH HE DOES CERTIFY THAT THEY ARE FROM AN ACCURATE SOURCE, THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES OTHER THAN THE STRUCTURE INDICATED ON THESE PLANS.



Surveyor
Arbor Land Consultants, Inc.
 Professional Land Surveyors
 2936 Macgregor Ct.
 Ann Arbor, MI 48103
 Tel 1-734-669-2960
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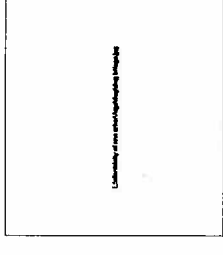
Know what's below.
 Call before you dig.



NORTH



Consultants



**RECREATION ENGINEERING
 AND PLANNING**
485 ARAPAHOE AVE.
BOULDER | CO | 80302
WWW.BOATERRPARKS.COM

Project Title

City of Ann Arbor
 Argo Dam Headrace
 Improvements
 Huron River Improvements
 Ann Arbor, Michigan

Sheet Title

Layout Plan

Dates listed for:

March 7, 2011	MDNR PERMIT APPLICATION
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Know what's below.
 Call before you dig.

Scale

1" = 30'

Quality Control

Drawn:
 Checked:
 Approved:

Project Number

Sheet Number

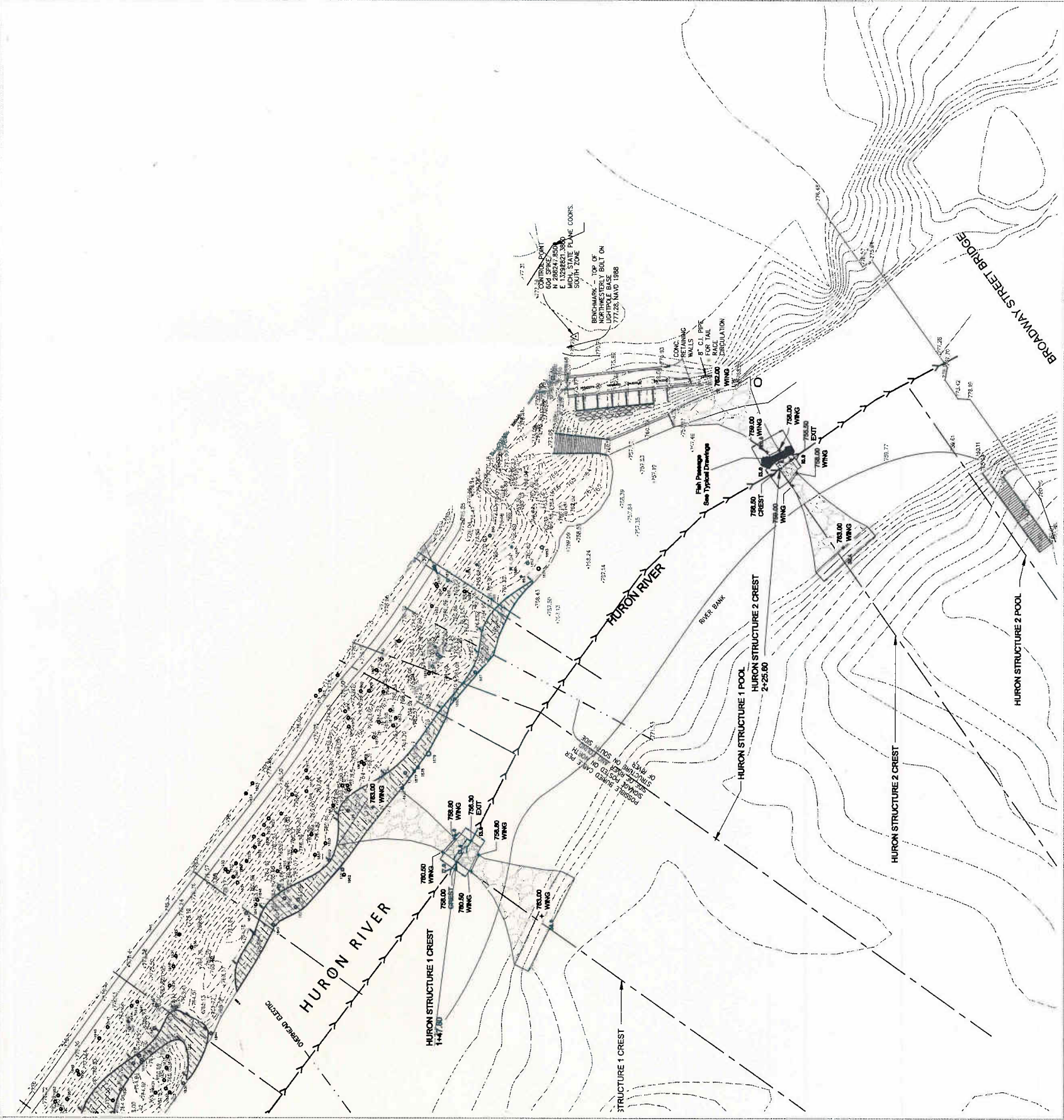
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LEGEND

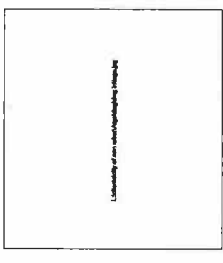
- CONSTRUCTION LIMITS
- 100 YEAR FLOODPLAIN
- EXISTING WATER LEVEL
- PROPOSED WATER LEVEL
- FILTER FABRIC FENCE
- THALWEG AND DIRECTION OF FLOW
- WETLAND DELINEATION
- EXISTING CONTOUR LINES
- PROPOSED CONTOUR LINES
- STRUCTURE LOW FLOW
- STRUCTURE WING
- 10' WIDE BITUMINOUS WALKING PATH

NOTES

1. All elevations given in feet above sea level (NAD 1983).
2. Rock fill/match and vegetative images shown for illustrative purposes. Not to scale.
3. All rock voids to be filled with grout held back from exposed rock.
4. Minor changes may be made by an IEP representative.
5. All structures shown are preliminary construction of key portions of structures.
6. All elevations to be confirmed by an IEP representative prior to final grading.



0 15 30 60 90 120



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SPECIFICATIONS

GENERAL NOTES

ENGINEER OVERSIGHT
 1. ALL ELEVATIONS, DIMENSIONS, ALIGNMENTS AND ORIENTATION OF ALL ELEMENTS SHOWN IN THE PLANS MUST BE PROVIDED BY THE ENGINEER'S REPRESENTATIVE (REP ENGINEER OR REP REPRESENTATIVE)
 2. WORK SHALL NOT COMMENCE UNTIL AFTER THE DATE OF THE ON-SITE PRE-CONSTRUCTION MEETING WHICH WILL BE ATTENDED BY REPRESENTATIVES OF THE PROJECT OWNER, ENGINEER, CONTRACTOR AND ANY SUB-CONTRACTORS. IN THE EVENT THAT WORK DOES NOT BEGIN WITHIN THE PERIOD OF TIME SPECIFIED IN THE PERMIT, THE CONTRACTOR SHALL PROVIDE REPRESENTATIVES OF THE PROJECT OWNER, REP ENGINEER, ANY SUB-CONTRACTORS, AND RELEVANT AGENCIES NOTED IN THE PERMIT, TWO WEEKS NOTICE BEFORE CONSTRUCTION COMMENCES.

PERMITS
 1. THE CONTRACTOR SHALL HAVE COPIES OF ANY REQUIRED PERMITS ON SITE AT ALL TIMES.
 2. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL CONDITIONS AND STIPULATIONS OF ALL REQUIRED PERMITS.

UTILITIES
 1. THE CONTRACTOR SHALL LOCATE ALL UTILITIES WITHIN THE PROJECT AREA PRIOR TO CONSTRUCTION.
 2. NO EXCAVATION SHALL OCCUR IN THE AREA SURROUNDING A UTILITY CROSSING. NO IMPROVEMENTS THAT MAY CAUSE SCOUR, BEING PLACED IN THE VICINITY OF AN AT-GRADE, ABOVE OR BELOW THE UTILITY.
 3. IF UTILITIES ARE IDENTIFIED WITHIN THE PROJECT AREA, A MINIMUM BUFFER OF NO DISTURBANCE IS TO BE MAINTAINED ON ALL UTILITY CROSSINGS.

ROCK QUALITY
 1. INDIVIDUAL STONE BOULDERS SHALL BE DENSE, SOUND AND FREE FROM CRACKS, SEAMS AND OTHER DEFECTS CONDUCTIVE TO ACCELERATED WEATHERING.
 2. THE BOULDERS SHALL BE DELIVERED AS MINED FROM QUARRY. AT A MINIMUM EXPOSED ROCK SHOULD HAVE ONE FLAT SURFACE AND THIS SHOULD BE THE ONLY EXPOSED SURFACE.
 3. THE ROCK SHALL HAVE THE FOLLOWING PROPERTIES:
 A) NOT LESS THAN 2.5.
 B) ABSORPTION NOT MORE THAN 2% BY WEIGHT.
 C) THE BULK SPECIFIC GRAVITY AND ABSORPTION SHALL BE DETERMINED BY ASTM METHOD C-127.
 4. ROCK THAT FAILS TO MEET THESE REQUIREMENTS MAY BE ACCEPTED ONLY IF SIMILAR ROCK FROM THE SAME SOURCE HAS BEEN TESTED AND FOUND TO MEET THESE REQUIREMENTS. THE SERVICE UNDER CONDITIONS OF WEATHER, WETTING, AND DRYING, AND EROSION FORCES SIMILAR TO THOSE ANTICIPATED. ALTERNATIVELY NATIVE OR IMPORTED STONE, ALREADY AT THE SITE AND MEETING THE STANDARDS OUTLINED ABOVE, MAY BE USED.

5. REP RETAINS RIGHT OF REFUGAL FOR ANY ROCK BROUGHT TO THE SITE WHICH IS NOT SUITABLE AND DOES NOT MEET THE ABOVE CRITERIA FOR USE. ROCKS BROUGHT TO THE SITE WHICH DO NOT MEET THE ABOVE CRITERIA, IN DETERMINING WHETHER ROCKS MEET THE SIZE SPECIFICATIONS, A ROCK SHOULD EQUAL THE SPECIFIED DIMENSION ON ONE SIDE AND MAY VARY +/- 50% ON ANY OF REMAINING TWO DIMENSIONS BUT THE AVERAGE OF THE THREE DIMENSIONS MUST BE AT LEAST 75% OF THE SPECIFIED SIZE. FOR EXAMPLE, IN THE CASE OF AN 8 FOOT DIAMETER BOULDER, A ROCK 6 FEET BY 6 FEET BY 4 FEET WOULD MEET THE SPECIFICATION (6*6*4 = 96; 96/3 = 32; 32 IS 75% OF 8).

SITE PREPARATION- ROCKS PLACED IN BANK "STONE TERRACING"
 1. ALL ROCK PLACED AS BANK TERRACING OR STABILIZATION SHALL BE KEVED INTO THE BANKS A MINIMUM OF 12" IN THE HORIZONTAL AND VERTICAL DIRECTION.
 2. ALL STONE BOULDERS SHALL BE SET SUCH THAT IT IS SUPPORTED BY PLACEMENT ORSING EXISTING FOUNDATIONAL MATERIAL, AS APPROVED BY REP ENGINEER.
 3. ALL STONE TERRACING SHALL BE BACKFILLED WITH CLEAN FILL.

SITE PREPARATION- ROCKS PLACED IN CHANNEL
 1. ALL ROCK STRUCTURES SHALL BE PLACED AS DIRECTED BY REP ENGINEER.
 2. NO ROCK PLACEMENT SHALL OCCUR IN CHANNEL UNTIL APPROPRIATE WATER CONTROL MEASURES ARE IN PLACE.
 3. EXCAVATION FOR KEYSTONE BOULDERS SHALL BE BELOW SCOUR DEPTH.

PLACEMENT
 1. STONE BOULDERS SHALL BE PLACED AS SHOWN ON THE DRAWINGS IN AS CLOSE PROXIMITY AS POSSIBLE.
 2. EACH STONE SHALL BE PLACED TO THE FINAL POSITION BE SUITABLE EQUIPMENT FOR HANDLING MATERIAL AND, IF NECESSARY, THE STONE SHALL BE PICKED UP AND REPOSITIONED.
 3. DRAGLINE BUCKETS AND SKIPS SHALL NOT BE USED FOR PLACEMENT OF STONE BOULDERS. AFTER INITIAL PLACEMENT WILL BE REQUIRED TO INDIVIDUAL STONES, THE FINAL ELEVATIONS AND POSITION.
 4. THE ENGINEER SHALL OBSERVE ALL ROCK PLACEMENT AND APPROVE OF THE PLACEMENT BEFORE BOULDERS ARE DRINKED OR BACKFILLED, UNLESS EXPLICIT EXCEPTION IS MADE BY THE ENGINEER BEFORE PLACEMENT.

GROUT AND CONCRETE MATERIALS
 1. CONCRETE SHALL CONSIST OF PORTLAND CEMENT, SAND, AND GRAVEL, THOROUGHLY MIXED WITH WATER TO PRODUCE A THICK, CREAMY CONSISTENCY. THE MINIMUM AMOUNT OF WATER SHOULD BE USED TO OBTAIN THE ABOVE CONSISTENCY.
 2. THE AGGREGATE FOR CONCRETE SHALL CONSIST OF 70 PERCENT SAND AND 30 PERCENT 3/8-INCH ROCK. MAXIMUM AGGREGATE SHALL BE 3/8 INCH.
 3. ALL CONCRETE SHALL BE PRODUCED FROM TYPE II PORTLAND CEMENT WITH LESS THAN 5% TR CALCIUM ALUMINATE. CONCRETE SHALL HAVE MINIMUM CEMENT CONTENT OF 7 GALLONS PER GALLON.

4. STRENGTH OF THE CONCRETE SHALL BE 3,000 PSI IN 28 DAYS. THE WATER CEMENT RATIO SHALL NOT EXCEED 0.48. A STIFFER MIX MAY BE USED FOR SPECIAL APPLICATIONS. AIR ENTRAINMENT SHALL BE 6% TO 9%, AND SLUMP SHALL BE 5-INCHES TO 9-INCHES, EXCEPT AS APPROVED OR DIRECTED. AIR ENTRAINING AGENTS SHALL CONFORM TO ASTM C200 AND WATER REDUCING AGENTS SHALL CONFORM TO ASTM C494.

PLACEMENT
 1. CONCRETE SHALL BE PUMPED INTO VOIDS, LOW FLOW CHANNELS AND CUT OFF WALLS, AS DIRECTED BY REP REPRESENTATIVE.
 2. THE LOW FLOW SHOULD BE FINISHED TO A SMOOTH SURFACE.
 3. ALL EXPOSED, VISIBLE GROUT IN THE WINGS SHALL BE SMOOTHED WITH THROWER OR BRUSHED FINISH, EVEN IN VOID SPACES AND HELD BACK 4-6 INCHES FROM THE TOP SURFACE OF THE ROCKS.
 4. AT COMPLETION OF GROUT PLACEMENT, SMALL BRUSHES HAVE BEEN CLEANED OF GROUT AND GROUT RESIDUE. SMALL BRUSHES HAVE BEEN PROVEN TO BE THE MOST EFFECTIVE TECHNIQUE FOR REMOVING CONCRETE GROUT RESIDUE.
 5. GROUT SHALL NOT BE PLACED UNLESS APPROPRIATE WATER CONTROL MEASURES ARE IN PLACE.
 6. GROUT SHALL BE PLACED WITHIN 24 HOURS OF CONCRETE PLACEMENT. ANY CONCRETE SUNK AFTER THIS 24 HOUR PERIOD, WHICH IN THE OPINION OF THE OWNER'S REPRESENTATIVE HAS EXCESSIVE SHRINKAGE CRACKS, SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

COLD WEATHER PLACEMENT
 1. CONCRETE MUST FOLLOW RECOMMENDATIONS SET IN THE AMERICAN CONCRETE INSTITUTE COMMITTEE 306 (ACI 306R-88). WHEN PLACING CONCRETE AFTER THE FIRST FROST OR WHEN THE MEAN DAILY TEMPERATURES ARE BELOW 40° F.
 A. HEAT AGGREGATES AND WATER IN ORDER TO PLACE FLOW FILL AT TEMPERATURES BETWEEN 50° F AND 60° F.
 B. PLACE CONCRETE THAT BEGINS IN FREEZING, BUT SHALL BE REHEATED AT 3:00 PM OF SAME DAY IF FREEZING WEATHER THREATENS.
 C. AFTER CONCRETE IS PLACED, PROVIDE SUFFICIENT PROTECTION SUCH AS COVER, CANVAS, FRAMEWORK, HEATING APPARATUS, ETC., TO ENCLOSE AND PROTECT FLOW FILL AND MAINTAIN TEMPERATURE OF 70° F FOR 3 DAYS OR 50° F FOR 5 DAYS AFTER PLACING.

OTHER
 1. ALL WASTE MATERIAL SHALL BE RELOCATED ON THE JOB SITE. DEBRIS NOT SUITABLE FOR FILL TO BE REMOVED AND TAKEN TO AN ACCEPTABLE LOCATION IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.
 2. THE CONTRACTOR AT ALL TIMES DURING CONSTRUCTION SHALL PROVIDE SIGNAGE, BARRICADES AND OTHER SAFETY DEVICES (INCLUDING TEMPORARY FENCING AROUND THE JOB SITE) TO PROTECT PUBLIC SAFETY AND HEALTH.