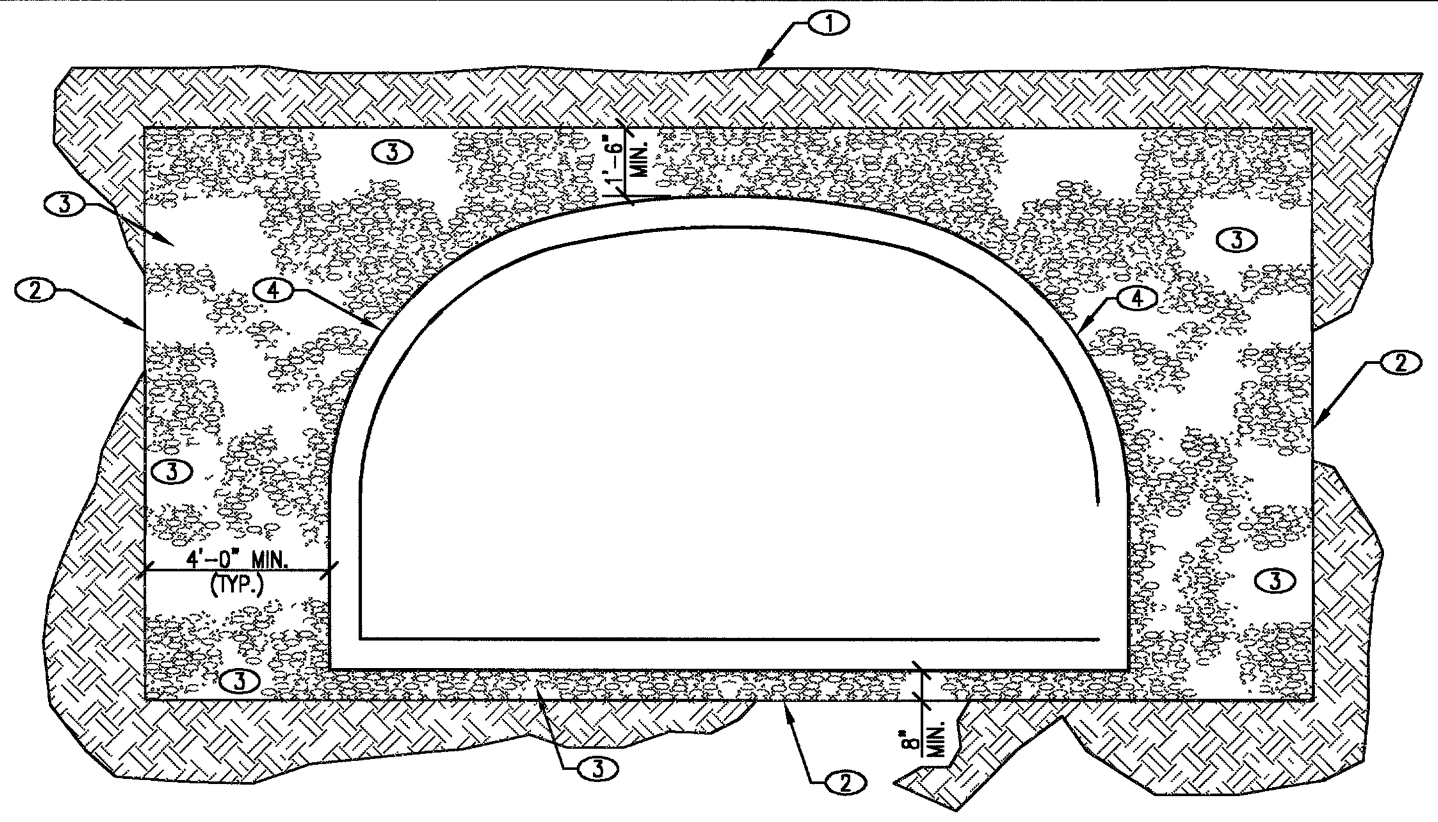
KEY NOTES

1. FINISH GRADE
2. LIMITS OF BACKFILL ZONE
3. COMPACTED MATERIAL PER THIS DETAIL
4. APPLY WATERPROOF MEMBRANE PER ASTM C836



NOTES:

8" TYPE II COMPACTED TO 90%.

FOR FILL HEIGHT LESS THEN 2'-0", THE FINISH GRADE SHALL BE THE BOUNDARY LINE FOR THE BACK FILL ZONE.

BACKFILLING OPERATIONS WITHIN THE BACKFILL ZONE SHALL BE PERFORMED IN LIFTS OF 8" OR LESS (LOOSE DEPTH).

MAXIMUM DRY DENSITY SHALL BE DETERMINED BY AASHTO T-99 OR OTHER APPROVED METHODS.

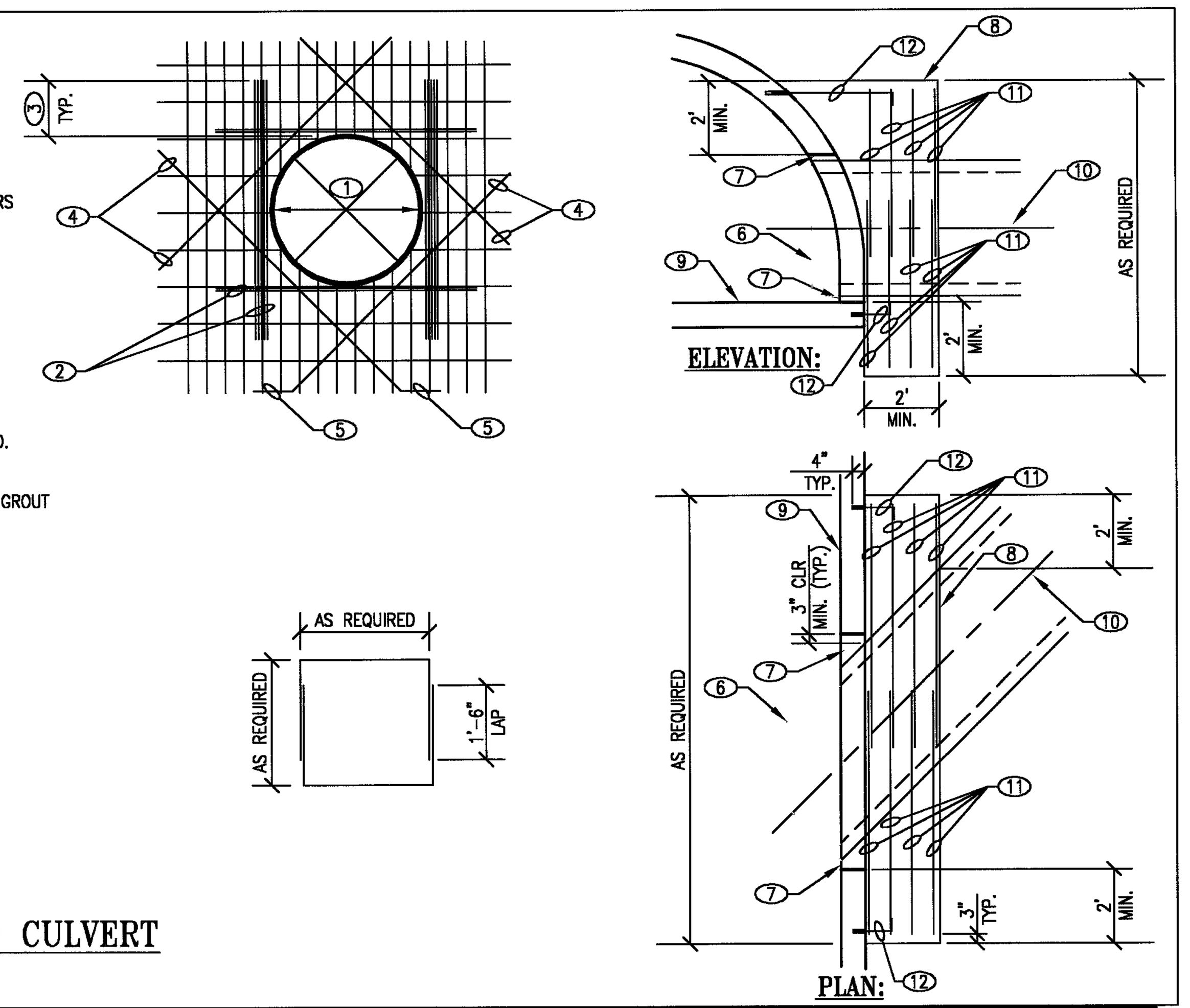
BACKFILL SHALL BE COMPACTED IN LAYERS UNTIL THE DRY DENSITY IS NOT LESS THAN 95% OR THE MAXIMUM DRY DENSITY.

1 TYPICAL BACKFILL REQUIRMENTS (ELEVATION)

NTS

KEY NOTES

1. OPENING DIAMETER 4'-0" MAXIMUM
2. NUMBER OF ADDED BARS EQUAL TO THE NUMBER OF BARS INTERRUPTED BY OPENING. ROUND UP TO AN EQUAL NUMBER OF BARS EACH SIDE OF OPENING.
3. EXTEND BARS PAST EDGE OF OPENING EQUAL TO LAP LENGTH OF BAR PER LAP SCHEDULE.
4. (1) #6 E.F. LENGTH = D+5'-0"
5. RUN BAR AS FAR AS POSSIBLE AND BEND IF NECESSARY.
6. CUT RCP FLUSH WITH ARCH WALL OR SLIGHTLY RECESSED.
7. APPLY BONDING AGENT TO ALL CONCRETE SURFACES PER MANUFACTURERS INSTRUCTIONS. FILL WITH NON-SHRINK GROUT AND TROWEL ARCH SURFACE SMOOTH.
8. PIPE COLLAR
9. REINFORCED ARCH TYPE STORM DRAIN
10. 36" RCP STORM DRAIN
11. 4 SETS OF #5 BARS EQUALLY SPACED
12. #5 DOWEL @ 10" O.C., 4 SIDES TYPICAL



NOTES:

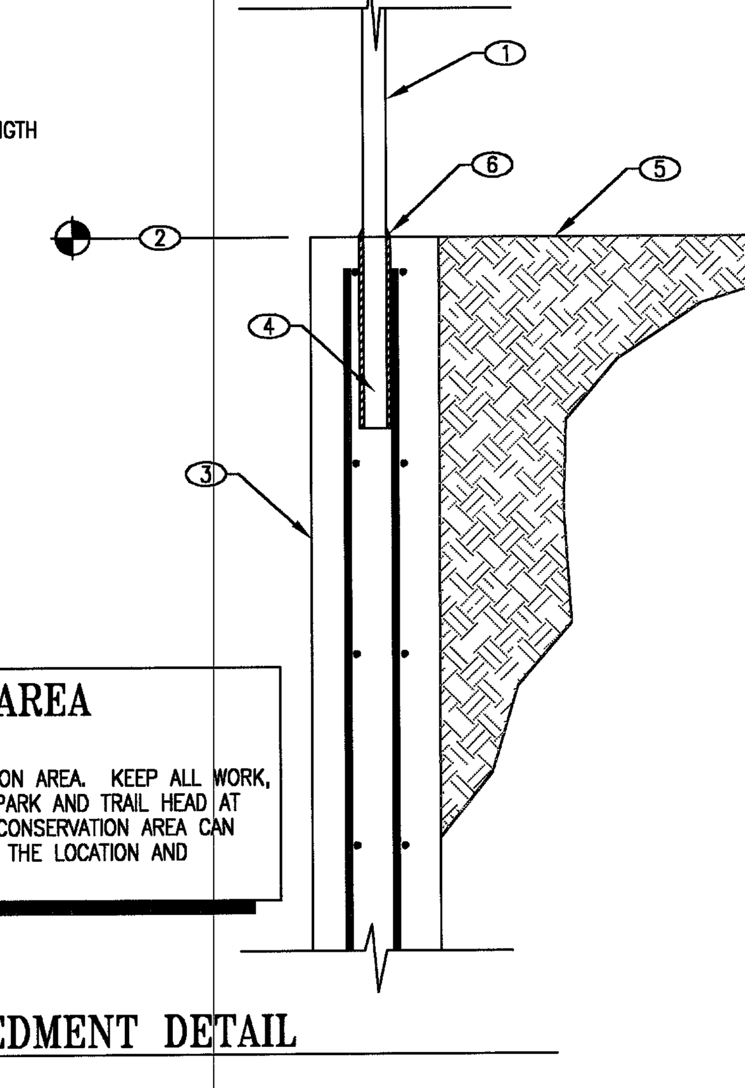
LOCATION AS SHOWN PER SHEET C6.00 AND C6.01 AS OCCURS

2 TYPICAL OPENING IN ARCHED CULVERT

NTS

KEY NOTES

1. PROVIDE 6' TALL CHAIN LINK FENCE ENTIRE TOP OF WALL LENGTH
2. REFER TO SHEET C6.00 AND C6.01 FOR WALL ELEVATIONS
3. REFER TO SHEET C7.01 FOR ADDITIONAL INFORMATION.
4. 3" FORMED OPENING (HOLE MAY BE CORE DRILLED AT CONTRACTORS OPTION).
5. FINISH GRADE, REFER TO SHEET C6.00 AND C6.01.
6. FILL VOID WITH NO-SHRINK, NON-METALLIC GROUT.



BLM RED ROCK CONSERVATION AREA

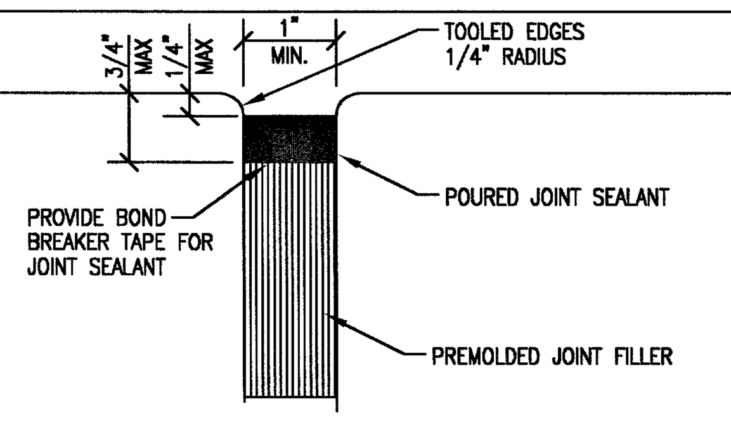
NO WORK IS TO ENCROACH UPON THE BLM RED ROCK CONSERVATION AREA. KEEP ALL WORK, EQUIPMENT AND PERSONNEL WITHIN THE GILMORE CLIFF SHADOWS PARK AND TRAIL HEAD AT ALL TIMES. DISTURBANCES OR ANY KIND TO THE BLM RED ROCK CONSERVATION AREA CAN RESULT IN SUBSTANTIAL FINES. CONTRACTOR IS REPSONSIBLE FOR THE LOCATION AND MAINTENANCE OF BOUNDARY LINE LOCATION.

3 FENCE POST EMBEDMENT DETAIL

NTS

KEY NOTES

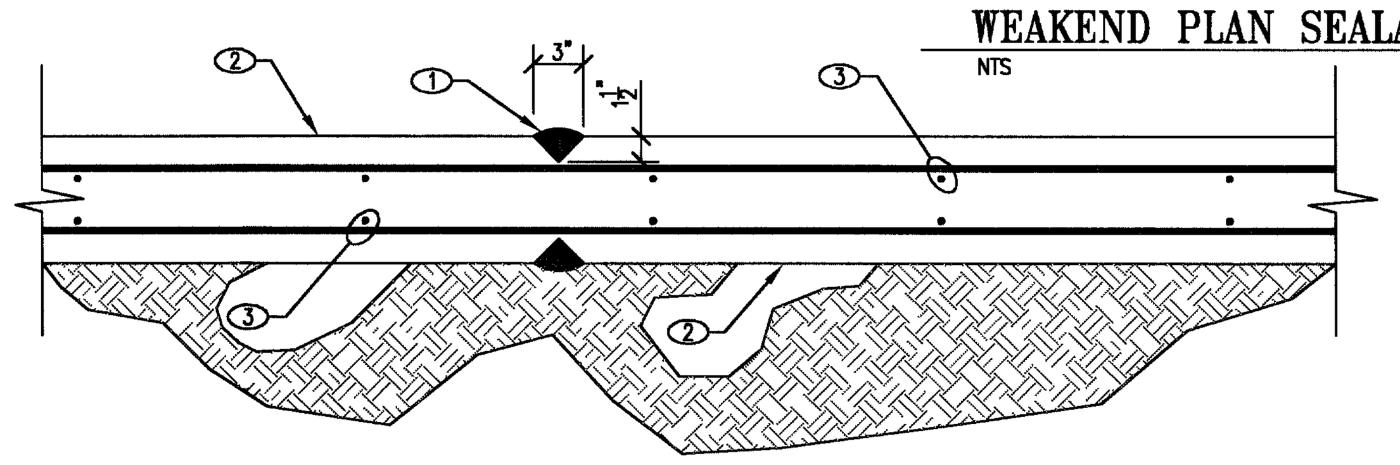
1. SEALANT 2-COMPONENT POLYURETHANE "SIKAFLEX-2C" OR APPROVED EQUAL PLACED IN A FORMED GROOVE, TYP. SEE SHEET C6.00 AND C6.01.
2. INSIDE FACE OF WALL OR OUTSIDE FACE OF WALL.
3. STEEL REINFORCEMENT, REFER TO SHEET C7.01.



NOTE: INSTALL COMPONENTS PER MANUFACTURER'S INSTRUCTIONS

WEAKEND PLAN SEALANT

NTS

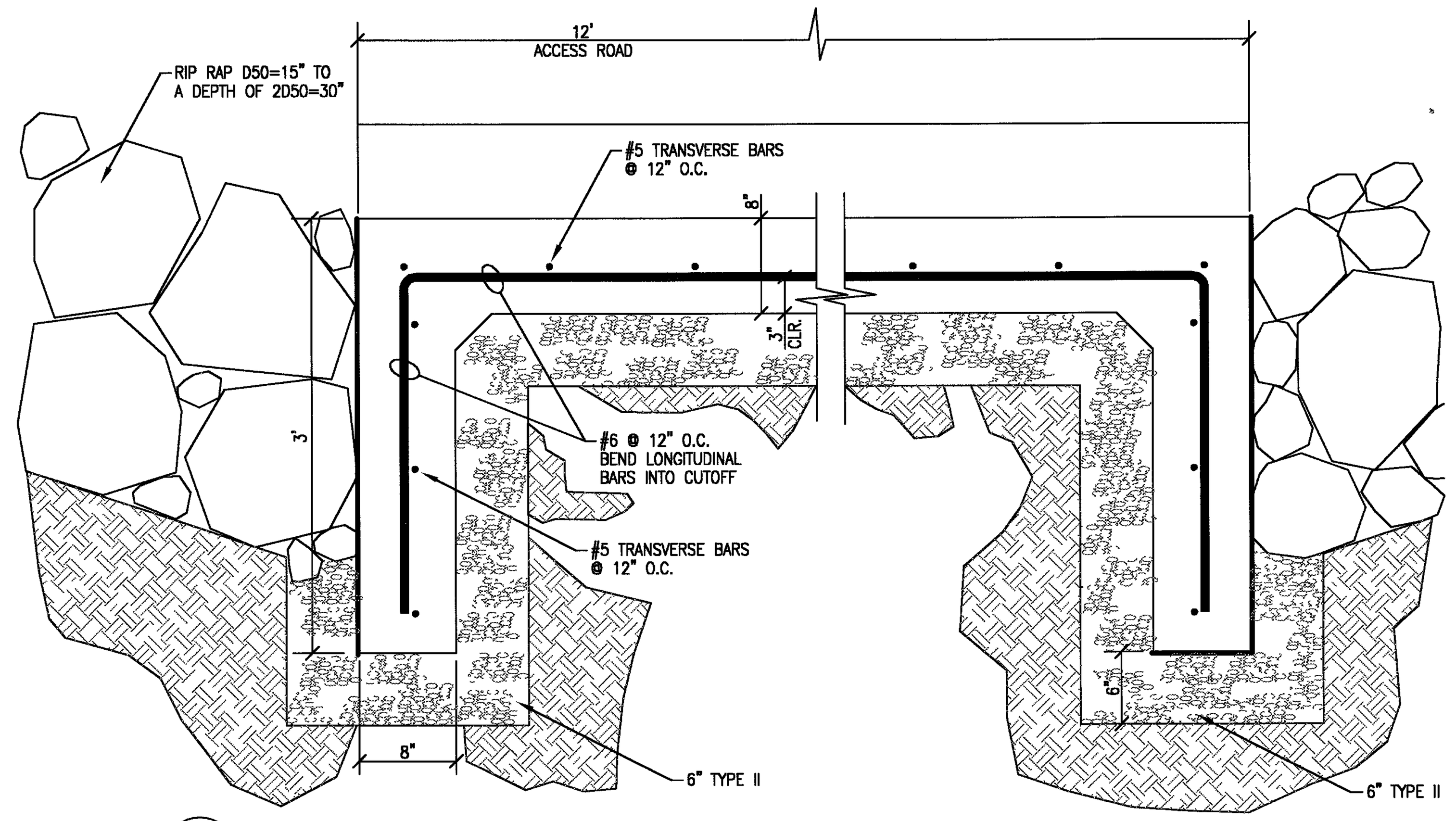


NOTES:

CONTRACTION JOINT MUST BE INSTALLED AT A MAX OF 30'-0" O.C.

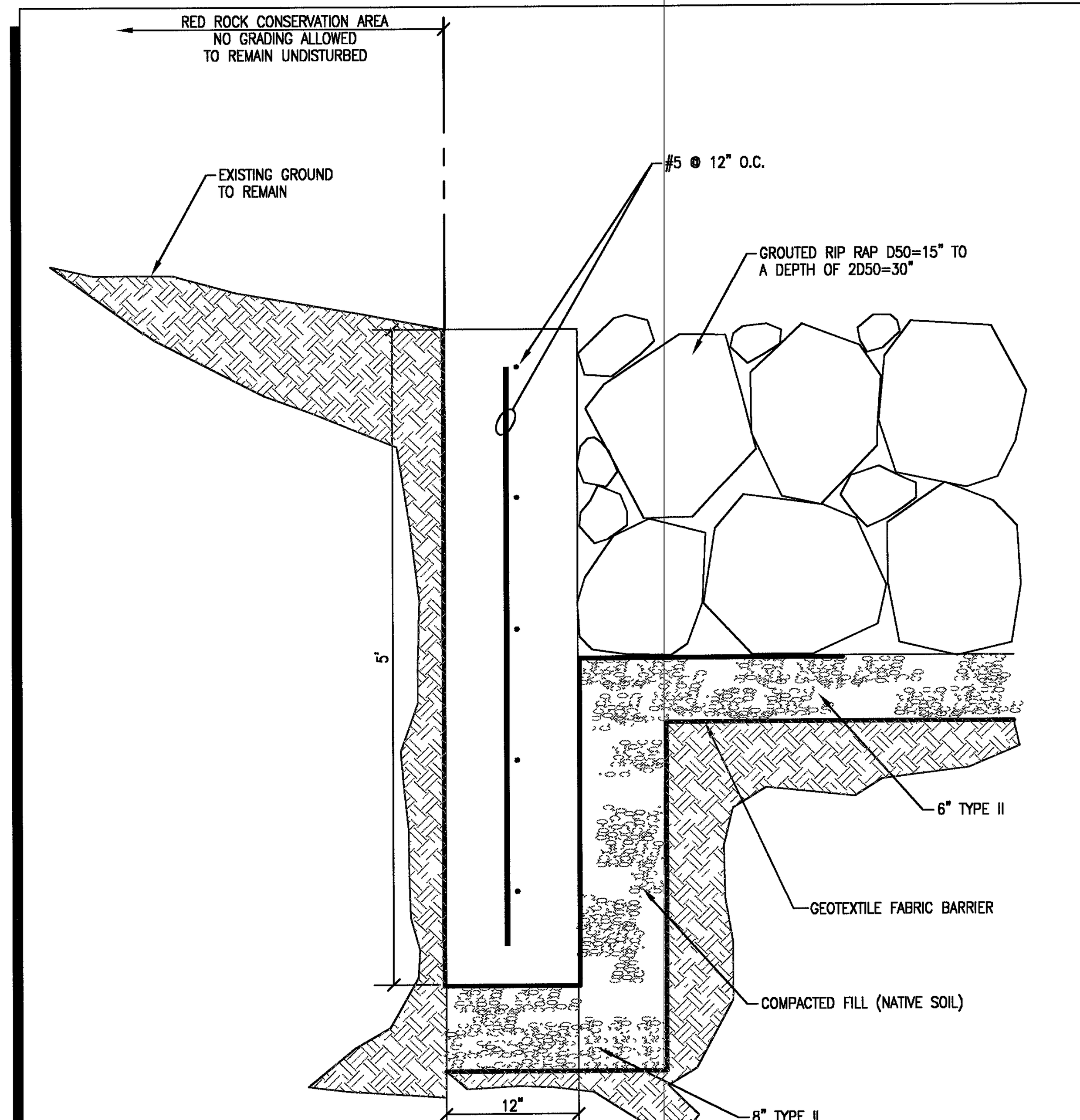
4 TYPICAL CONTRACTION JOINT (PLAN VIEW)

NTS



5 ACCESS ROAD

NTS



6 CUT OFF WALL DETAIL

NTS

GENERAL STRUCTURAL NOTES:

GENERAL REQUIREMENTS

1. THE PURPOSE OF THESE DRAWINGS HEREIN IS PRIMARILY TO SAFEGUARD AGAINST MAJOR STRUCTURAL FAILURES AND LOSS OF LIFE, TO LIMIT DAMAGE AND MAINTAIN FUNCTION.
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE STRUCTURAL ENGINEERS IN THIS OR SIMILAR LOCALITIES. THEY NECESSARILY ASSUME THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKMEN WHO HAVE A WORKING KNOWLEDGE OR THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, IT IS UNDERSTOOD THAT THE CONTRACTOR WILL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR ALL MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES,. AND PROCEDURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DESIGN AND PROVIDE ADEQUATE SHORING, BRACING, FORM-WORK, ETC., AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. CONSTRUCTION MATERIALS SHALL BE UNIFORMLY SPREAD OUT SUCH THAT DESIGN LIVE LOAD PER SQUARE FOOT AS STATED HEREIN IS NOT EXCEEDED. VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATION PROCEDURES INCLUDING SHORING AND PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS AND UTILITIES IN ACCORDANCE WITH THE LOCAL BUILDING DEPARTMENT. ALL WORK OR CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE BUILDING CODES, REGULATIONS AND SAFETY REQUIREMENTS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS, CONDITIONS AND ELEVATIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEER AND/OR STRUCTURAL ENGINEER IN WRITING OF ANY DISCREPANCIES OR OMISSIONS NOTED ON THE DRAWINGS. ANY DISCREPANCY, OMISSIONS, OR VARIATION NOT REPORTED BEFORE THE START OF CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. WHERE DISCREPANCIES OCCUR IN THESE DRAWINGS, NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS.
6. WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDA.
7. OPTIONS ARE FOR THE CONTRACTOR'S CONVENIENCE. IF ANY OPTION IS USED, THE CONTRACTOR SHALL USE THE LATEST EDITION AND/OR ADDENDA.
8. ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL WITH APPROPRIATE TRADES, DRAWINGS AND SUBCONTRACTORS PRIOR TO CONSTRUCTION.
9. ALL INSPECTIONS REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS OR BY THESE PLANS SHALL BE PROVIDED BY AN INDEPENDENT INSPECTION COMPANY OR THE BUILDING DEPARTMENT. SITE VISITS BY THE ENGINEER DOES NOT CONSTITUTE AN INSPECTION, UNLESS SPECIFICALLY CONTRACTED FOR.
10. SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL ITEMS. SHOP DRAWINGS ARE REVIEWED ONLY FOR GENERAL COMPLIANCE WITH THE STRUCTURAL DRAWINGS. REVIEW DOES NOT INDICATE THAT THE SHOP DRAWINGS ARE CORRECT OR COMPLETE. RESPONSIBILITY FOR CORRECTNESS SHALL REST WITH THE CONTRACTOR. ANY CHANGES, SUBSTITUTIONS OR DEVIATIONS FROM CONTRACT DRAWINGS SHALL BE CLOUDED. ANY OF THE AFOREMENTIONED SHALL BE CONSIDERED APPROVED AFTER THE ENGINEERS REVIEW UNLESS SPECIFICALLY NOTED ACCORDINGLY. THE SHOP DRAWINGS DO NOT SUPERSEDE OR REPLACE THE ORIGINAL CONTRACT DRAWINGS. ANY ENGINEERING PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW SHALL BEAR THE SEAL OF AN APPROPRIATELY LICENSED ENGINEER. t&grf CIVIL ENGINEERING SHALL NOT BE RESPONSIBLE FOR THE ADEQUACY OF ENGINEERING DESIGNS PERFORMED BY OTHERS. ALLOW 5 WORKING DAYS FOR THE ENGINEER'S REVIEW. ONE COPY OF EACH SUBMITTAL WILL BE RETAINED.

102518

DESIGN BASIS

1. GILMORE CULVERT: (1) 16'-0"x9'-0" CULVERT W/ASSOCIATED HEADWALL AND WING WALLS
2. CODE: IBC 2003
3. DEAD LOAD: STRUCTURE SELF WEIGHT CONCRETE = 150 pcf
   VARYING COVER WITH A SOIL BACKFILL DENSITY = 120 pcf
4. LIVE LOAD: HS20-44 LOADING

FOUNDATION

1. EXISTING SUB-BASE SHALL BE FREE OF COBBLES LARGER THAN A 12" SPHERE, AND SILT OR CLAY DEPOSITS. EXISTING SUB-BASE SHALL BE SCARIFIED FOR 1'-0" DEPTH AND COMPACTED TO 95% OF DRY DENSITY AND 8" OF WELL GRADED 3" MINUS GRANULAR OR TYPE II MATERIAL BE PLACED ON EXISTING COMPACTED SUB-BASE AND PROPERLY COMPACTED.

BACKFILL

1. BACKFILL SHALL CONSIST OF WELL GRADED 3" MINUS GRANULAR MATERIAL WITH A MINIMUM OF 1'-6" COVER OVER THE ARCH AND 4'-0" ON EACH SIDE OF THE ARCH OR STEM WALLS.
2. PLACEMENT OF THE FILL AT THE STEM WALLS AND OVER THE ARCH MAY BEGIN WHEN THE CONCRETE STRENGTH HAS REACHED 2800 psi COMPRESSIVE STRENGTH.
3. FILL SHALL BE PLACED IN 8" MAXIMUM VERTICAL LIFTS AND COMPACTED TO 95% OF DRY DENSISTY. LIFTS SHALL BE PLACED SYMMETRICALLY EACH SIDE ALONG THE FULL LENGTH OF THE CULVERT WITH A MAXIMUM BACKFILL LIFT HEIGHT DIFFERENTIAL OF 1'-0".
4. NO EQUIPMENT WEIGHING MORE THAN 3 YARD RUBBER TIRE LOADER (928 CATEPILLAR OR EQUIVALENT) SHALL BE ALLOWED TO PASS OVER THE STRUCTURE UNTIL THE SPECIFIED FILL IS IN PLACE. HEAVY EQUIPMENT SUCH AS SCRAPERS AND CRANES SHALL NOT BE ALLOWED TO PASS OVER THE STRUCTURE UNLESS WRITTEN PERMISSION IS OBTAINED BY THE STRUCTURAL ENGINEER..

CONCRETE

1. MIX AND DELIVERY IN ACCORDANCE WITH ASTM C94, ALTERNATIVE No. 3.
   MINIMUM 28 DAY COMPRESSIVE STRENGTH, f'c, SHALL BE 4500 psi (EXCEPT WHERE NOTED ON PLANS).
   WATER/CEMENT RATIO (MAXIMUM) 45 BY WEIGHT (MASS), AGGREGATE SIZE (MAX) 1-1/12 IINCH, AGGREGATE SIZE (MIN) 3/8 INCH, SLUMP (PLUS OR MINUS 1 INCH) 4 INCHES
2. CEMENT SHALL BE ASTM C150, TYPE V SULFATE RESISTANT, PORTLAND TYPE.
3. ALL CONCRETE SHALL BE NORMAL WEIGHT USING HARD ROCK AGGREGATES.
4. MECHANICALLY VIBRATE ALL POURED CONCRETE WHEN PLACED. SLAB ON GRADE NEED NOT BE VIBRATED. REMOVE ALL DEBRIS FROM FORMS BEFORE PLACING CONCRETE. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL SO AS TO CAUSE SEGREGATION OF AGGREGATES. UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED 5 FEET.
5. ALL ITEMS SHALL BE CAST IN CONCRETE SUCH AS REINFORCING, DOWELS, BOLTS, ANCHORS, SLEEVES, ETC., SHALL BE SECURELY POSITIONED PRIOR TO CONCRETE PLACEMENT.
6. SHOTCRETE PROPORTIONS SHALL BE SELECTED THAT ALLOW SUITABLE PLACEMENT PROCEDURES USING THE DELIVERY EQUIPMENT SELECTED AND SHALL RESULT IN FINISHED IN-PLACE HARDENED SHOTCRETE MEETING THE STRENGTH REQUIREMENTS STATED HERE-IN. COARSE AGGREGATE, IF USED, SHALL NOT EXCEED 3/4 INCH (19). ANY REBOUND OR ACCUMULATED LOOSE AGGREGATE SHALL BE REMOVED FROM THE SURFACES TO BE COVERED PRIOR TO PLACING THE INITIAL OR ANY SUCCEEDING LAYERS OF SHOTCRETE. REBOUND SHALL NOT BE REUSED AS AGGREGATE.

REINFORCING STEEL

1. REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615.

   ALL REINFORCING TO BE
   WELDED SHALL BE ASTM A706, GRADE 60 ALLOY WELDABLE STEEL.
2. ALL DIMENSIONS SHOWING THE LOCATION OF REINFORCING STEEL NOT NOTED AS "CLEAR" OR "CLR" ARE TO BE CENTER OF STEEL. MINIMUM COVER FOR NON-PRESTRESSED CONCRETE REINFORCING SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED ON PLANS OR DETAILS:

EXPOSURE CONDITION:	COVER:	TOLERENCES(+/-):
WALLS:	1-1/2"	1/2"
FOOTINGS AND SLABS ON GRADE:	3-1/2"	3/8"
STABS EXPOSED TO EARTH OR WEATHER:	2"	1/2"
INTERIOR SLABS:	3-1/2"	1/2"

3. LAP SLICES OF REINFORCING STEEL IN CONCRETE BEAMS, SLABS AND FOOTINGS SHALL BE ACCORDING TO UBC SECTION 19-2 OR LAB SCHEDULE WHERE PRESENT, UNLESS NOTED OTHERWISE, STAGGER SPLICES A MINIMUM OF ONE LAP LENGTH. NO TACK WELDING OF REINFORCING BARS ALLOWED. LATEST ACI CODE AND DETAILING MANUAL APPLY. PROVIDE BENT CORNER BARS TO MATCH AND LAP WITH HORIZONTAL WALL BARS SHALL BE SPLICED AT OR NEAR FLOOR LINES. SPLICE BARS AT CENTER LINE OF SPAN AND BOTTOM BARS AT THE SUPPORT IN SPANDRELS, BEAMS, GRADE BEAMS, ETC., UNLESS OTHERWISE NOTED.

	REBAR LAP SCHEDULE	
BAR	LAP	1.7 LAP
#3	18"	31"
#4	18"	31"
#5	23"	39"
#6	28"	48"
#7	36"	62"
#8	47"	80"
#9	59"	101"
#10	75"	128"
#11	92"	157"

4. ALL REINFORCING SHALL BE BENT COLD. BARS SHALL NOT BE UNBENT AND RE-BENT EXCEPT AS NOTED ON PLAN. FIELD BENDING OR REBAR SHALL NOT BE ALLOWED EXCEPT AS NOTED ON PLAN. BENDS AND HOOKS SHALL CONFORM TO ACI STANDARD 315-80.
5. WELDING OF REINFORCING BARS, METAL INSERTS, AND CONNECTIONS SHALL CONFORM WITH UBC STANDARD 19-2, AND SHALL BE MADE ONLY AT LOCATIONS SHOWN ON PLANS OR DETAILS. ALL REINFORCING SHALL BE BENT COLD. BARS SHALL NOT BE UN-BENT AND RE-BENT.
6. REINFORCING BAR SPACING SHOWN ON PLANS ARE MAXIMUM ON CENTERS. ALL BARS SHALL BE DETAILED AND PLACED PER CRSI SPECIFICATIONS AND HANDBOOK. DOWEL ALL VERTICAL REINFORCING TO FOUNDATION. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE

SPECIAL INSPECTIONS

1. THE OWNER SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS WHO SHALL PROVIDE INSPECTIONS WHO SHALL PROVIDE INSPECTIONS DURING PLACEMENT OF THE REINFORCEMENT, CONCRETE, SHOTCRETEING, EPOXY DOWELING, AND BACKFILL. THE INSPECTOR SHALL SUBMIT A STATEMENT INDICATING COMPLIANCE WITH THE PLANS AND SPECIFICATIONS.

CONTRACTOR NOTE:

PRIOR TO ANY COINSTRUCTION, THE CONTRACTOR SHALL SCRAPE AND STOCKPILE THE TOP 3"-6" OF EXISTING UNDISTURBED SOIL WITHIN THE LIMITS OF THE PROPOSED WORK AREA. CONTRACTOR TO LOCATE AND STOCKPILE THIS SCRAPED EXISTING UNDISTURBED SOIL ON-SITE IN AN AREA AGREED UPON BY CONTRACTOR AND OWNER PROVIDING EASE OF ACCESS TO AND LEAST AMOUNT OF DISTURBANCE TO THE SITE.

CONTRACTOR TO USE SCRAPED STOCKPILED SOIL AS FINAL TOP DRESSING IN AREAS NOT COVERED WITH RIP-RAP, CONCRETE, ASHPALT, OR COMPACTED GRAVEL PATHWAYS. STOCKPILED SOIL CONTAINS DORMANT SEEDS FOR RE-VEGETATION OF NATIVE PLANTS.

SITE NOTES:

1) CONTRACTOR RESPONSIBLE FOR THE LOCATION AND MAINTENANCE OF BOUNDARY LINE LOCATION. NO WORK TO ENCROACH UPON THE BLM RED ROCK CONSERVATION AREA. KEEP ALL WORK EQUIPMENT AND PERSONNEL WITHIN THE GILMORE CLIFF SHADOWS TRAIL HEAD BOUNDARY/PROPERTY AT ALL TIMES. ENCROACHMENT AND/OR DISTURBANCE TO THE BLM AREA CAN RESULT IN SUBSTANTIAL FINES.
2) CONTRACTOR TO PROVIDE DUST CONTROL DURING AND UPON COMPLETION OF WORK.
3) PROTECT EXISTING PLANTS DURING CONSTRUCTION. REFER TO LANDSCAPE ARCHITECTS PLANS
4) CONTRACTOR TO SCRAPE AND STOCKPILE THE TOP 3"-6" OF EXISTING NATIVE UNDISTURBED SOIL WITH ASSOCIATED PLANT MATERIAL (OTHER THAN SALVAGED PLANT MATERIAL) WITHIN THE LIMIT OF WORK, OVER ALL SURFACES TO BE DISTURBED BY CONSTRUCTION. STOCKPILE COLLECTED TOPSOIL MATERIAL WITHIN LIMIT OF WORK. STOCKPILED SOIL WITH PLANT DEBRIS TO BE REINSTALLED. STOCKPILED SOIL IS TO BE EVENLY DISTRIBUTED OVER ALL DISTURBED AREAS. BEFORE STOCKPILED SOIL IS REINSTALLED, FINE GRADE EARTH TO BE REMOVE UNUSUAL IRREGULARITIES. REINSTALL STOCKPILED TOPSOIL OVER ALL DISTURBED AREAS AND LIGHTLY RAKE SURFACE TO RESTORE NATURAL CONDITION. APPLY ECO-TEX SOIL BINDER PER MANUFACTURE'S RECOMMENDATION AND SPECIFICATIONS (702) 873-2033. DO NOT APPLY A PRE-EMERGENT OR ROCK MULCH AREAS THAT ARE TO RECEIVE THE STOCKPILED SOIL.

Avoid cutting underground utility lines. It's costly
Call before you Dig
1-800-227-2600
UNDERGROUND SERVICE ALERT (U.S.A.)

Avoid overhead power line contact
Call before you CRANE
1-702-593-6111
NEVADA POWER ENVIRONMENT & SAFETY SERVICES DEPARTMENT

NOTICE !

EXISTING UTILITIES ARE LOCATED ON THE PLANS FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. THE ENGINEER BEARS NO RESPONSIBILITY FOR THE LOCATION OF UTILITIES SHOWN OR NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES BEFORE STARTING CONSTRUCTION AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES WITH THE UTILITY COMPANIES.

AVOID CUTTING UNDERGROUND UTILITIES. IT'S COSTLY.
CALL BEFORE YOU DIg
1-800-227-2600
UNDERGROUND SERVICE (USA)

REVISIONS

CONSULTANT

t&grf
CIVIL ENGINEERING
1231 DARMAK DRIVE
LAS VEGAS, NV 89102
PHONE: 702-870-2660
FAX: 702-870-6033

GOWAN LONE MOUNTAIN SYSTEM
CLIFF SHADOWS PARK

DRAINAGE STRUCTURE NOTES, SECTIONS AND DETAILS

STAMP

03-26-07

OWNER: CITY OF LAS VEGAS
DEPARTMENT OF PUBLIC WORKS
ARCHITECTURAL SERVICES

400 EAST STEWART AVENUE
LAS VEGAS, NEVADA 89101
PHONE: (702) 229-6535
FAX: (702) 384-4846
TDD: (702) 386-9108

DRAWN	gfr
FILE	C100.004arch
DATE	APRIL 2006
SCALE	NA
BID NO	
CLV DWG NO	650.83
SHT NO	C7.00