

GENERAL STRUCTURAL NOTES

GENERAL REQUIREMENTS

- 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 OF 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.
- THESE 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.
- 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.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS, CONDITIONS AND ELEVATIONS WITH CIVIL 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 SUCH DISCREPANCY, OMISSION, OR VARIATION NOT REPORTED BEFORE 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.
- WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDA.
- OPTIONS ARE FOR CONTRACTOR'S CONVENIENCE. IF ANY OPTION IS USED, THE CONTRACTOR SHALL USE THE LATEST EDITION AND/OR ADDENDA.
- ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR CIVIL AND ELECTRICAL REQUIREMENTS WITH APPROPRIATE TRADES, DRAWINGS AND SUBCONTRACTORS PRIOR TO CONSTRUCTION.
- OWNER SHALL BE RESPONSIBLE FOR THE COSTS OF ALL INSPECTIONS WHETHER PERFORMED BY AN AGENCY, INDEPENDENT CONSULTANT OR STRUCTURAL ENGINEER ALL INSPECTIONS REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS OR THESE PLANS SHALL BE PROVIDED BY AN INDEPENDENT INSPECTION COMPANY OR THE BUILDING DEPARTMENT. SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN INSPECTION, UNLESS SPECIFICALLY CONTRACTED FOR.
- 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 NOT BE CONSIDERED APPROVED AFTER 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 REGISTERED ENGINEER. SEDCO SHALL NOT BE RESPONSIBLE FOR THE ADEQUACY OF ENGINEERING DESIGNS PERFORMED BY THE OTHERS. ALLOW 5 WORKING DAYS FOR THE ENGINEER OF RECORD'S REVIEW. ONE COPY OF EACH SUBMITTAL WILL BE RETAINED BY THE ENGINEER OF RECORD.

DESIGN BASIS

- GILMORE CHANNEL AND RCB
- CODE: IBC 2003, AASHTO 1998

FOUNDATION

- THE FOUNDATIONS FOR THE ABOVE REFERENCED PROJECT ARE DESIGNED WITH RECOMMENDATIONS FROM GEOTECH INC., REPORT #4312-LV6 DATED DEC 6, 2002, AND ADDENDUM LETTER DATED FEBRUARY 18, 2004. ALL RECOMMENDATIONS LISTED WITH IN THIS REPORT REGARDING SITE PREPARATION, GRADING, BEDDING, WATER PROTECTION, BACKFILLING, COMPACTION TESTS, INSPECTIONS ETC., SHALL BE FOLLOWED WITH STRICT ADHERENCE. ALL ITEMS SHALL ALSO BE IN ACCORDANCE W/ THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY.

CONCRETE

- MIN. 28 DAY COMPRESSIVE STRENGTH, f'_c , SHALL BE 4500 PSI.
- CEMENT SHALL BE TYPE V AND MAX WATER CEMENT RATIO SHALL BE 0.45.
- CONCRETE SHALL BE TESTED IN ACCORDANCE WITH ASTM C 42 SPECIFICATION.
- ALL CONCRETE SHALL BE NORMAL WEIGHT USING HARDROCK AGGREGATES.
- CONCRETE MIXES SHALL BE DESIGNED BY A CERTIFIED LABORATORY AND APPROVED BY SEDCO.
- ALL CONCRETE SHALL BE REGULAR WEIGHT OF 145 POUNDS PER CUBIC FOOT USING HARDROCK AGGREGATES CONFORMING TO ASTM C33. WATER SHALL BE CLEAN AND POTABLE.
- MECHANICALLY VIBRATE ALL POURED CONCRETE WHEN PLACED. SLABS 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.
- ALL ITEMS TO BE CAST IN CONCRETE SUCH AS REINFORCING, DOWELS, BOLTS, ANCHORS, SLEEVES, ETC., SHALL BE SECURELY POSITIONED PRIOR TO CONCRETE PLACEMENT.
- FINISHING
SHALL BE ACCORDING TO THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY. INVERT EXPOSED SURFACE SHALL BE ORDINARY BROOM FINISH.
ADMITTURES
ONLY ADMIXTURES PERMITTED BY THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY SHALL BE ALLOWED.
CURING
CURING ON THE OUTSIDE SURFACE AND INSIDE SURFACE AFTER FORM REMOVAL SHALL BE BY MEANS OF LIQUID MEMBRANE-FORMING COMPOUND MEETING THE REQUIREMENTS OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY.
- SURFACES OF STEEL FORMS SHALL BE COATED W/ AN ICBO APPROVED FORM RELEASE OIL.
- CONTROL JOINTS IN CONCRETE CHANNEL SHALL BE PER DETAIL 4 THIS SHEET. STAGGERING OF JOINTS IS NOT ALLOWED. CONSTRUCTION JOINTS MAY BE LOCATED AT CONTROL JOINT LOCATIONS OR AS NOTED IN DETAILS. IN THE EVENT THE CONTRACTOR WISHES TO PLACE A CONSTRUCTION JOINT AT A DIFFERENT LOCATION THE ENGINEER SHALL GIVE WRITTEN APPROVAL PRIOR TO CONSTRUCTION.
- CONCRETE USED IN BASE INVERTS AND SLABS SHALL BE AN ABRASION RESISTANT MIX USING 1 1/2 MINUS AGGREGATE.

REINFORCING STEEL

- REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615. REINFORCING SHALL BE GRADE 60 ($F_y = 60$ KSI) DEFORMED BARS FOR ALL BARS #4 AND LARGER AND ALL BARS USED FOR CONCRETE WALLS. REINFORCING MAY BE GRADE 40 ($F_y = 40$ KSI) DEFORMED BARS FOR ALL BARS #3 AND SMALLER UNLESS NOTED OTHERWISE ON PLANS OR DETAILS. ALL REINFORCING TO BE WELDED SHALL BE ASTM A706, GRADE 60 ALLOY WELDABLE STEEL.
- ALL DIMENSIONS SHOWING THE LOCATION OF REINFORCING STEEL NOT NOTED AS "CLR" OR "CLR" ARE TO CENTER OF STEEL. MINIMUM COVER FOR NON-PRESTRESSED CONCRETE REINFORCING SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE ON PLANS OR DETAILS:
EXPOSURE CONDITION: COVER: TOLERANCES: (+/-)
FOOTINGS & SLABS ON GRADE: 3" 3/8"
WALLS & SLABS EXPOSED TO EARTH OR WEATHER: 1 1/2" 1/2"
#6 BAR OR LARGER: 2" 1/2"
INTERIOR SLABS: 1 1/2" 1/2"
- LAP SPLICES OF REINFORCING STEEL IN CONCRETE BEAMS, SLABS AND FOOTINGS SHALL BE ACCORDING TO ACI 318-99 CPT 12 OR LAP 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 BARS AT ALL CORNERS AND INTERSECTIONS PER TYPICAL DETAILS. VERTICAL WALL BARS SHALL BE SPLICED AT OR NEAR FLOOR LINES. SPLICE BARS TOP BARS AT CENTER LINE OF SPAN AND BOTTOM BARS AT THE SUPPORT IN SPANDRELS, BEAMS, GRADE BEAMS, ETC., UNLESS NOTED OTHERWISE.

REBAR LAP SCHEDULE		
BAR	LAP	1.7 LAP
#3	18"	31"
#4	18"	31"
#5	23"	39"
#6	28"	48"

- ALL REINFORCING SHALL BE BENT COLD. BARS SHALL NOT BE UNBENT AND RE-BENT EXCEPT AS NOTED ON PLAN. FIELD BENDING OF REBAR SHALL NOT BE ALLOWED EXCEPT AS NOTED ON PLAN. BENDS AND HOOKS SHALL CONFORM TO ACI STANDARD 315-80.
- WELDING OF REINFORCING BARS, METAL INSERTS AND CONNECTIONS SHALL CONFORM WITH ACI 318 CHAPTER 12, 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.
- 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

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

DEFERRED SUBMITTALS

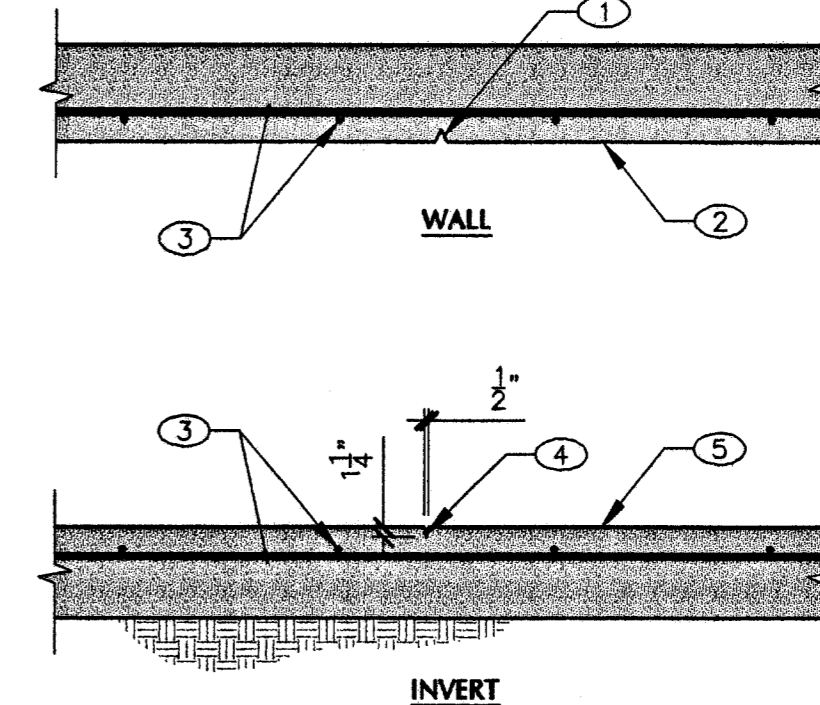
- ALL ITEMS CONSIDERED IN THESE DESIGN DOCUMENTS AS BY OTHERS ARE NOTED AS DEFERRED SUBMITTALS. THE FOLLOWING WILL INCLUDE BUT NOT BE LIMITED TO:
CONCRETE MIX DESIGN
REINFORCING SHOP DRAWING
- PRIOR TO SUBMITTAL OF DEFERRED ITEMS TO PLAN REVIEW, THEY SHALL BE SUBMITTED TO OUR OFFICE FOR REVIEW.

STANDARD ABBREVIATIONS

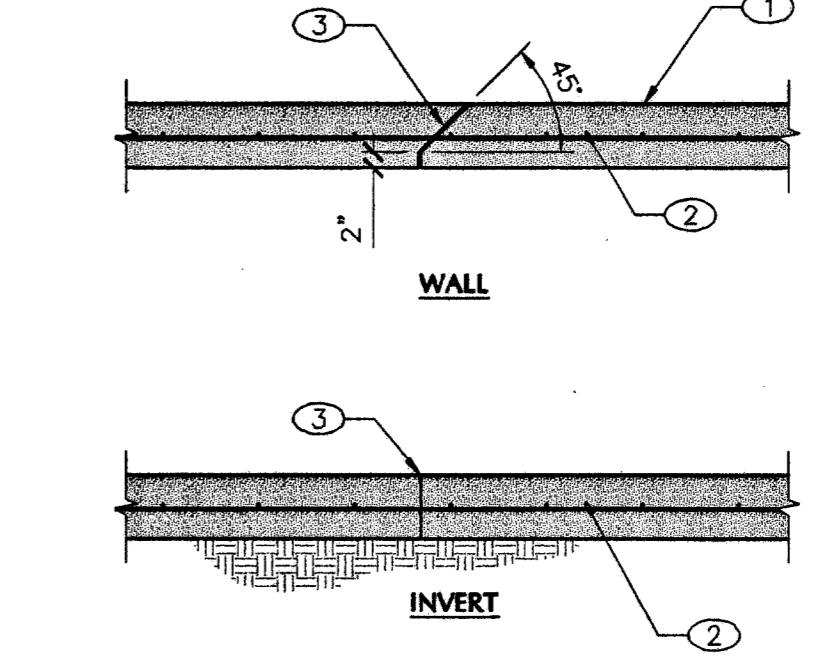
AB	ANCHOR BOLT	EQ	EQUAL	OPP	OPPOSITE
ACI	AMERICAN CONCRETE INSTITUTE	EW	EACH WAY	PSF	POUNDS PER SQUARE FOOT
ASC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	FLR	FLOOR	PSI	POUNDS PER SQUARE INCH
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	FT	FOOT	REQ'D	REQUIRED
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIAL	FTG	FOOTING	SM	SIMILAR
BTM	BOTTOM	GSN	GENERAL STRUCTURAL NOTES	T&B	TOP AND BOTTOM
CL	CENTER LINE	KSI	KIPS PER SQUARE INCH	TYP	TYPICAL
CLR	CLEAR	MFR	MANUFACTURER	UBC	UNIFORM BUILDING CODE
CONC	CONCRETE	MAX	MAXIMUM	UNO	UNLESS OTHERWISE NOTED
CONT	CONTINUOUS	MECH	MECHANICAL	VERT	VERTICAL
CR OR #	CORNER	MIN	MINIMUM	W/	WITH
DWG	DRAWING	MISC	MISCELLANEOUS	W/O	WITHOUT
EF	EACH FACE	NTS	NOT TO SCALE	WT	WEIGHT
ELEV	ELEVATION	OC	ON CENTER		

SHEET INDEX

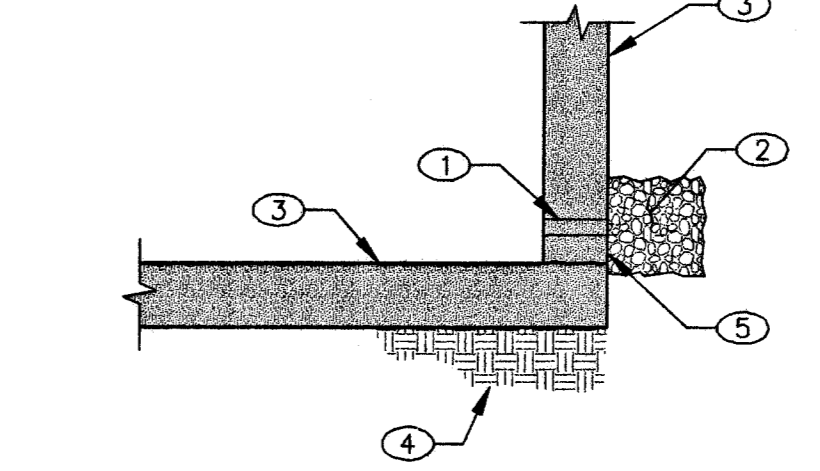
SHEET NO.	SHEET TITLE
S0.1	GSN, STD ABBREVIATIONS, SHEET INDEX
S1.1	PLAN VIEW
S1.2	PLAN VIEW
S2.1	CHANNEL AND BOX CULVERT SECTIONS
S2.2	DETAILS
S2.3	DETAILS
S3.1	DROP INLET/DETAILS



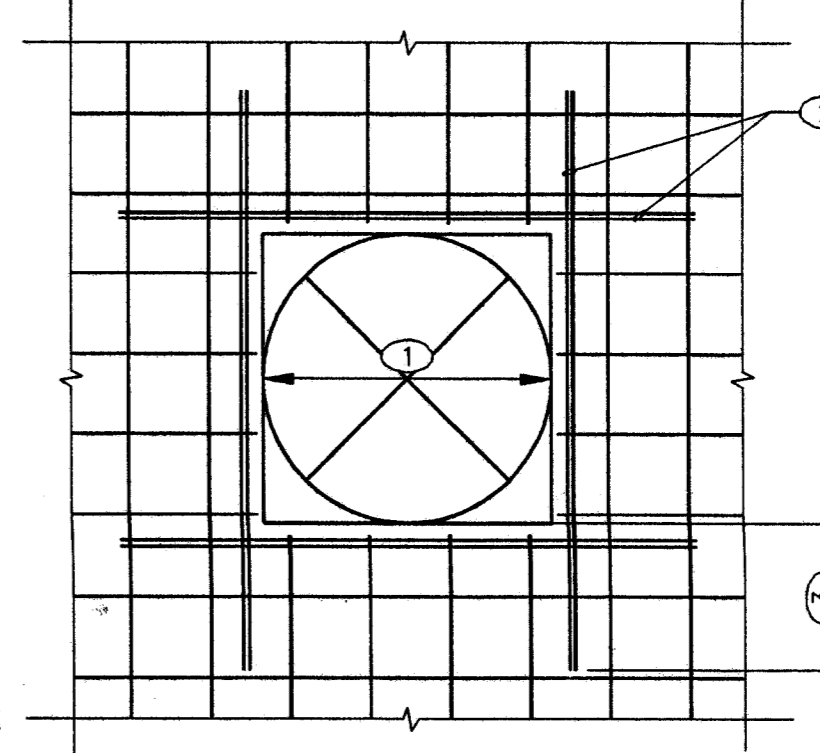
1 CONTROL JOINT
NO SCALE



2 TYPICAL CONSTRUCTION JOINT IN WALL OR INVERT
NO SCALE



3 WEEP HOLE DRAIN REQUIREMENTS
NO SCALE



4 TYPICAL OPENING IN WALL
NO SCALE

KEYNOTES:

- CONTROL JOINT USING 1 1/2" CHAMFER STRIP
- INSIDE FACE OF WALL
- REINFORCEMENT PER SECTIONS AND DETAILS
- A FORMED GROOVE
- TOP FACE OF INVERT

KEYNOTES:

- CONCRETE WALL
- REIN PER DETAILS
- CONSTRUCTION JOINT

KEYNOTES:

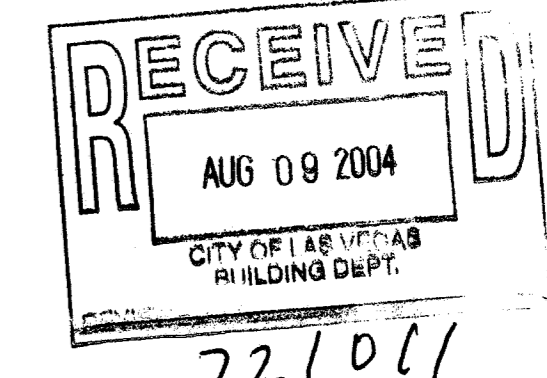
- 2" WEEP HOLE EA SIDE. SEE PLANS AND DETAILS FOR SPACING
- (1) CUBIC FOOT OF FREE DRAIN MATERIAL WRAPPED IN FILTER FABRIC AT EA WEEP HOLE
- CONCRETE WALL OR INVERT
- COMPACT BACKFILL, SEE GEOTECHNICAL REPORT
- REMOVE WATER PROOFING AS OCCURS AT AREAS WHERE DRAIN ROCK TOUCHES WALL

KEYNOTES:

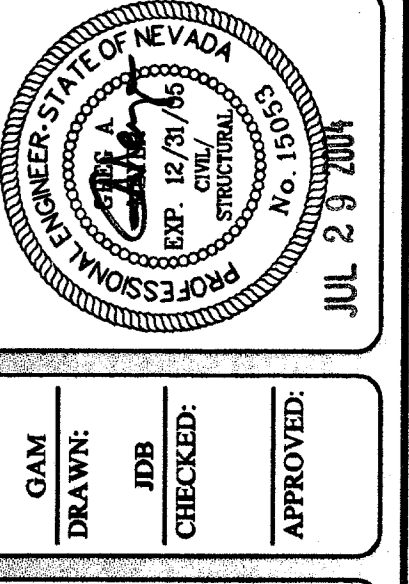
- OPENING DIAMETER 4'-0" MAX
- NUMBER OF ADDED BARS EQUAL TO THE NUMBER OF BARS INTERRUPTED BY OPENING. ROUND UP TO AN EQUAL NUMBER OF BARS EACH SIDE OF OPENING
- EXTEND BARS PAST EDGE OF OPENING EQUAL TO LAP LENGTH OF BAR PER LAP SCHEDULE

NOTE:

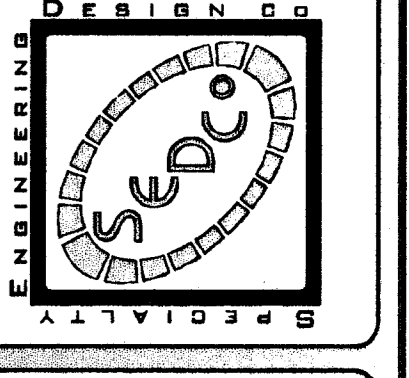
- LOCATION AS SHOWN PER CIVIL DRAWINGS AS OCCURS



JOE



DESIGNED: CAM
DRAWN: IDB
CHECKED:
APPROVED:



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SHEET TITLE: GSN, ABBREVIATIONS, SHEET INDEX

DESIGN REVISION	DATE	DATE	DATE
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PLAN CHECK			
SUBMITTED FOR APPROVAL			
DESCRIPTION			
REV.			

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PROJECT NUMBER: LV04126
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