BASIS FOR DESIGN

1. BUILDING CODE: INTERNATIONAL BUILDING CODE (IBC) 2018 W/ SOUTHERN NEVADA AMENDMENTS
2. FOUNDATION DESIGN AND SOIL PARAMETERS PER MINIMUM RECOMMENDATIONS OF APPLICABLE BUILDING CODE

GENERAL REQUIREMENTS

1. THESE DOCUMENTS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND SKILL ORDINARILY EXERCISED UNDER SIMILAR CONDITIONS BY PROFESSIONAL CONSULTANTS PRACTICING IN THE SAME FIELD AT THE SAME TIME IN THE SAME OR SIMILAR LOCALITY. THEY 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 INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
2. ENGINEER SHALL NOT AT ANY TIME SUPERVISE, DIRECT OR HAVE CONTROL OVER CONTRACTOR'S WORK, NOR SHALL ENGINEER HAVE AUTHORITY OVER OR RESPONSIBILITY FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES OF CONSTRUCTION SELECTED OR USED BY CONTRACTOR, FOR SECURITY OR SAFETY AT THE SITE NOR FOR SAFETY PRECAUTIONS AND PROGRAMS INCIDENT TO CONTRACTOR'S WORK IN PROGRESS.
3. ALL INSPECTIONS REQUIRED BY THE LOCAL BUILDING DEPARTMENTS, BUILDING CODES OR BY THESE PLANS SHALL BE PROVIDED BY THE BUILDING DEPARTMENT OR BY AN APPROVED INDEPENDENT INSPECTION COMPANY.
4. ALTHOUGH NOT NECESSARILY INDICATED AT A SPECIFIC LOCATION ON THE DRAWINGS, TYP DETAILS AND NOTES SHALL APPLY. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT. DETAILS MAY SHOW ONLY ONE SIDE OF CONNECTION OR MAY OMIT INFORMATION FOR CLARITY. WHERE DISCREPANCIES OCCUR W/IN THESE DRAWINGS, THE NOTES AND DETAILS ON THESE DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
5. WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH REFERENCE SHALL BE THE LATEST EDITION OR ADDENDA.
6. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS WITH THE ARCHITECTURAL DRAWINGS AND GRADING PLANS, AND RESOLVE ANY DISCREPANCIES, OMISSIONS, OR VARIATIONS W/ THE ARCHITECT OR CIVIL ENGINEER PRIOR TO CONSTRUCTION.
7. THE CONTRACTOR SHALL ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, DRAINAGE, ETC. IN COORDINATION W/ APPROPRIATE TRADES, DRAWINGS AND SUBCONTRACTORS PRIOR TO CONSTRUCTION.
8. RETAINING/FENCE WALLS DETAILED IN THIS ENGINEERING PACKET SHALL NOT BE SURCHARGED, USED IN A STACKED CONFIGURATION, OR SURCHARGE ANY EXISTING RETAINING WALLS BELOW UNO ON PLANS/DETAILS. GLOBAL STABILITY OF ALL STACKED RETAINING WALL CONFIGURATIONS SHALL BE ANALYZED BY A GEOTECHNICAL ENGINEER. SURCHARGE LOADS INCLUDE, BUT ARE NOT LIMITED TO, FENCE WALLS, RETAINING WALLS, BUILDINGS, ROADS, PARKING LOTS, ETC.
9. WITH RESPECT TO EXISTING RETAINING WALL(S) BELOW, A NON-SURCHARGED CONFIGURATION EXISTS WHEN PROPOSED RETAINING WALL(S) ARE LOCATED A MIN DISTANCE OF (1.5)*(EXISTING RETAINED HEIGHT) AWAY, MEASURED FROM FRONT, OR "TOE" SIDE, OF FOOTING OF PROPOSED RETAINING WALL TO BACK FACE OF EXISTING RETAINING STRUCTURE, UNO.
10. WITH RESPECT TO SURCHARGE LOADS ABOVE, A NON-SURCHARGED CONFIGURATION EXISTS WHEN PROPOSED RETAINING WALL(S) ARE LOCATED A MIN DISTANCE OF (1.5)*(PROPOSED RETAINED HEIGHT) FOR LEVEL BACKFILL OR (2.0)*(PROPOSED RETAINED HEIGHT) FOR SLOPING BACKFILL AWAY FROM SURCHARGE LOADS, MEASURED FROM BACK FACE OF WALL, UNO.

CONCRETE

1. MINIMUM 28 DAY COMPRESSIVE STRENGTH:
   ALL STRUCTURES & FOOTINGS ..4,000 PSI
   MAXIMUM WATER-CEMENT RATIO.......0.53
   CONCRETE SLUMP..................4 INCHES
2. CONCRETE MIXES SHALL BE DESIGNED BY A CERTIFIED LABORATORY AND APPROVED BY THE OWNER.
3. ALL CONCRETE SHALL BE REGULAR WEIGHT OF 145 POUNDS PER CUBIC FOOT (PCF) USING HARDROCK AGGREGATES CONFORMING TO ASTM C33. WATER SHALL BE CLEAN AND POTABLE.
4. PORTLAND CEMENT SHALL CONFORM TO ACI 318, CHAPTER 3.2 TYPE V W/ ADDITIONS AND/OR EXCEPTIONS OF SECTION 501 OF "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA."
5. NO MORE THAN 90 MINUTES SHALL ELAPSE BETWEEN CONCRETE BATCHING AND CONCRETE PLACEMENT, UNLESS APPROVED BY THE ENGINEER OR AUTHORIZED TESTING AGENCY.
6. CONCRETE MIXING, PLACEMENT AND QUALITY SHALL BE PER ACI 318, CHAPTER 5 W/ ADDITIONS AND/OR EXCEPTIONS OF SECTIONS 501 & 502 OF "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA." MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED. REMOVE ALL DEBRIS FROM FORMS BEFORE PLACING CONCRETE. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL (AS IN WALLS AND COLUMNS) SO AS TO CAUSE SEGREGATION OF AGGREGATES. UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED 5 FEET. CARE SHALL BE TAKEN IN PLACING SLABS ON GRADE SO AS TO NOT DISTURB FILL MATERIAL.
7. ALL ITEMS TO BE CAST IN CONCRETE SUCH AS REINFORCING, DOWELS, BOLTS, ANCHORS, PIPES, SLEEVES, ETC., SHALL BE SECURELY POSITIONED IN THE FORMS BEFORE PLACING CONCRETE.
8. PROTECT CONCRETE FROM DAMAGE OR REDUCED STRENGTH DUE TO HOT OR COLD WEATHER IN ACCORDANCE WITH ACI 305 AND 306, RESPECTFULLY W/ ADDITIONS AND/OR EXCEPTIONS OF SECTION 501.03.10 OF "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA."
9. DAMPPROOF ALL CONCRETE WALLS IN CONTACT W/ SOIL PER SECTION 646 OF "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA."
10. JOINT REQUIREMENTS: A ¾" TRANSVERSE EXPANSION JOINT WILL BE REQUIRED IN CHANNEL WALLS AND INVERT SLABS AT A MAXIMUM SPACING OF 90'-0" MEASURED ALONG THE CHANNEL CENTER LINE. A TRANSVERSE CUTOFF WALL ACROSS THE ENTIRE WIDTH OF THE CHANNEL IS REQUIRED AT ALL EXPANSION JOINTS. VERTICAL WALL CONTRACTION JOINTS AND TRANSVERSE CONSTRUCTION JOINTS OR SLAB CONTRACTION JOINTS IN THE BOTTOM SLAB ARE REQUIRED AT INTERVALS NO GREATER THAN 30'-0" O.C. (SEE TYP DETAILS).
11. ALL TRANSVERSE JOINTS IN WALLS AND SLABS SHALL BE IN THE SAME PLANE. TRANSVERSE JOINTS SHALL BE NORMAL OR RADIAL TO THE CENTERLINE OF CONSTRUCTION.
12. AT ALL EXPANSION AND WEAKENED PLANE JOINTS WITH WIDTHS 1" OR LESS, JOINT SEALER AND FILLER SHALL COMPLY WITH SECTION 707.03.03 OF "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA."
13. AT ALL EXPANSION AND WEAKENED PLANE JOINTS WITH WIDTHS GREATER THAN 1", JOINT SEALER AND FILLER SHALL COMPLY WITH SECTION 707.03.05 OF "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA."
14. AT THE BEGINNING AND ENDING OF ALL POURS, A COMPLETE CURTAIN OF REINFORCEMENT RUNNING PARALLEL TO THE JOINT SHALL BE PLACED 3" FROM ALL TRANSVERSE CONSTRUCTION, CONTRACTION AND EXPANSION JOINTS.
15. TRANSVERSE CONSTRUCTION AND EXPANSION JOINTS OR WALL CONTRACTION JOINTS SHALL NOT BE PLACED WITHIN 10'-0" OF JUNCTION STRUCTURE OPENINGS OR WITHIN 3'-0" OF A MANHOLE OPENING, UNO.
16. IN CURVED SECTIONS OF CHANNELS AND BOX CULVERTS, THE MAXIMUM SPACING OF BARS SHALL NOT EXCEED THAT SHOWN FOR TYPICAL SECTIONS. REINFORCING SHALL BE PLACED RADIALLY FROM THE MAXIMUM SPACING AND NORMAL TO THE CHANNEL CENTERLINE.
17. PROVIDE 1" FILLET AT EXPOSED CHANNEL CORNERS

REINFORCING

1. REINFORCING STEEL SHALL CONFORM TO ASTM A615. WELDABLE REINFORCING STEEL SHALL CONFORM TO ASTM A706. REINFORCING SHALL BE GRADE 60.
2. LATEST ACI DETAILING MANUAL, ACI 318 AND CRSI MANUAL OF STANDARD PRACTICE APPLY TO REINFORCEMENT SPLICING, DETAILING, BENDING, AND PLACEMENT.
3. REFER TO TYPICAL WALL INTERSECTION DETAIL FOR REINFORCING REQUIREMENTS AT WALL AND FOOTING INTERSECTIONS.
4. REFER TO LAP SCHEDULE FOR MINIMUM O.C. SPACING, LAP SPLICE LENGTHS IN CONCRETE AND MASONRY, AND HOOK LENGTHS. NO WELDING (TACK, SPOT ETC.) OF REINFORCING ALLOWED. STAGGER SPLICES A MINIMUM OF (1) LAP LENGTH. MECHANICAL SPLICE COUPLERS SHALL DEVELOP AT LEAST 125 PERCENT OF THE SPECIFIED YIELD STRENGTH OF THE BAR AND SHALL HAVE CURRENT ICC APPROVAL.
5. ALL REINFORCEMENT SHALL BE BENT COLD. NO FIELD BENDING OF BARS IS ALLOWED UNLESS APPROVED BY THE ENGINEER.
6. SUPPORT REINFORCEMENT ADEQUATELY TO SECURE REINFORCEMENT AGAINST DISPLACEMENT DURING CONCRETE PLACEMENT IN THE FOOTING AND GROUT PLACEMENT IN THE CMU.
7. PROVIDE VERTICAL REINFORCING BARS, W/ HOOKS INTO FOOTING PER APPLICABLE DETAIL SECTION, IN GROUTED CELLS AT ALL WALL INTERSECTIONS, CORNERS, WALL ENDS, AND EACH SIDE OF CONTROL JOINTS. EXTEND ALL VERTICAL REINFORCING TO FOUNDATION EITHER CONTINUOUS OR WITH SUFFICIENT LAP REQUIREMENTS, AS INDICATED PER APPLICABLE DETAIL SECTIONS.
8. REINFORCING BAR SPACING SHOWN ON PLANS ARE MAXIMUM ON CENTER DIMENSIONS. MINIMUM CLEAR SPACING BETWEEN PARALLEL REINFORCEMENT SHALL BE LARGER OF 1-1/2 TIME NOMINAL BAR DIAMETER, 1-1/3 TIMES MAX AGGREGATE SIZE OR 1-1/2".
9. 9-GAUGE LADDER TYPE WALL REINFORCING SHALL BE HOT-DIPPED GALVANIZED OR APPROVED EQUIVALENT.

FOUNDATION

1. SITE PREPARATION AND GRADING REQUIREMENTS FROM THE GEOTECHNICAL REPORT AND ANY ADDENDA ALONG W/ ANY TESTS, INSPECTIONS, FIELD OBSERVATIONS, OR APPROVAL FROM THE GEOTECHNICAL ENGINEER RECOMMENDED BY THE GEOTECHNICAL REPORT SHALL BE COMPLETED PRIOR TO CONSTRUCTION OF FOUNDATIONS. IF NO GEOTECHNICAL REPORT IS SUBMITTED, SITE PREPARATION AND GRADING SHALL BE PER IBC SECTION 1804.
2. EXCAVATIONS UNDER OR ADJACENT TO FOUNDATIONS OR FOOTINGS SHALL BE PROPERLY COMPACTED PER THE SOILS REPORT. PROTECT THE FOUNDATION OR FOOTING AGAINST SETTLEMENT OR LATERAL TRANSLATION.
3. W/IN THE TIME OF CONSTRUCTION AND W/IN THE LIFETIME OF THE WALL, THE OWNER MUST ENSURE THAT ALL SURFICIAL DRAINAGE IS DIRECTED AWAY FROM THE WALL SYSTEM.

BACKFILL

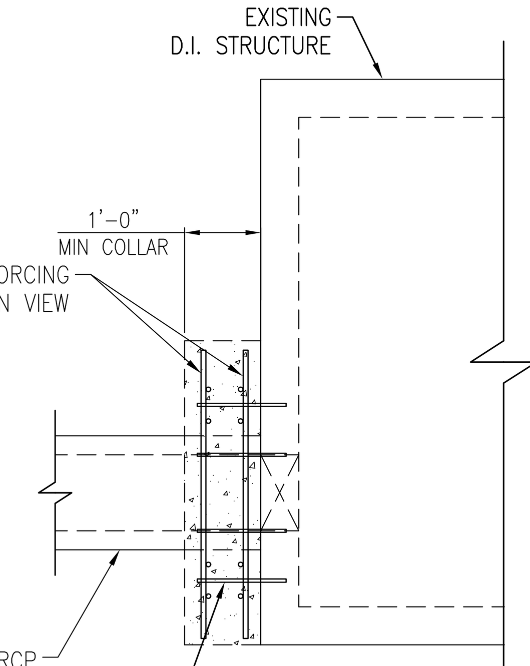
1. BACKFILL MATERIAL AND PLACEMENT SHALL BE IN ACCORDANCE W/ RECOMMENDATIONS BY THE GEOTECHNICAL ENGINEER OR IBC SECTION 1804 IF GEOTECHNICAL REPORT NOT SUBMITTED.
2. BACKFILL SHALL NOT BE PLACED AGAINST WALLS BELOW GRADE OR ATOP FOUNDATIONS UNTIL GROUT AND CONCRETE HAVE REACHED DESIGN STRENGTH.
3. RETAINING WALL SYSTEM IS NOT DESIGNED TO WITHSTAND HYDROSTATIC PRESSURE. DRAINAGE SYSTEM PER APPROVED GEOTECHNICAL REPORT (OR APPROVED ALTERNATE BY OTHERS) SHALL BE PROVIDED TO PREVENT BUILD UP OF HYDROSTATIC PRESSURE. IN ADDITION, DRAINAGE SYSTEM SHALL NOT ADVERSELY AFFECT THE INTEGRITY OF THE RETAINING SYSTEM.

SPECIAL INSPECTION (WHERE NOTED ON DETAILS)

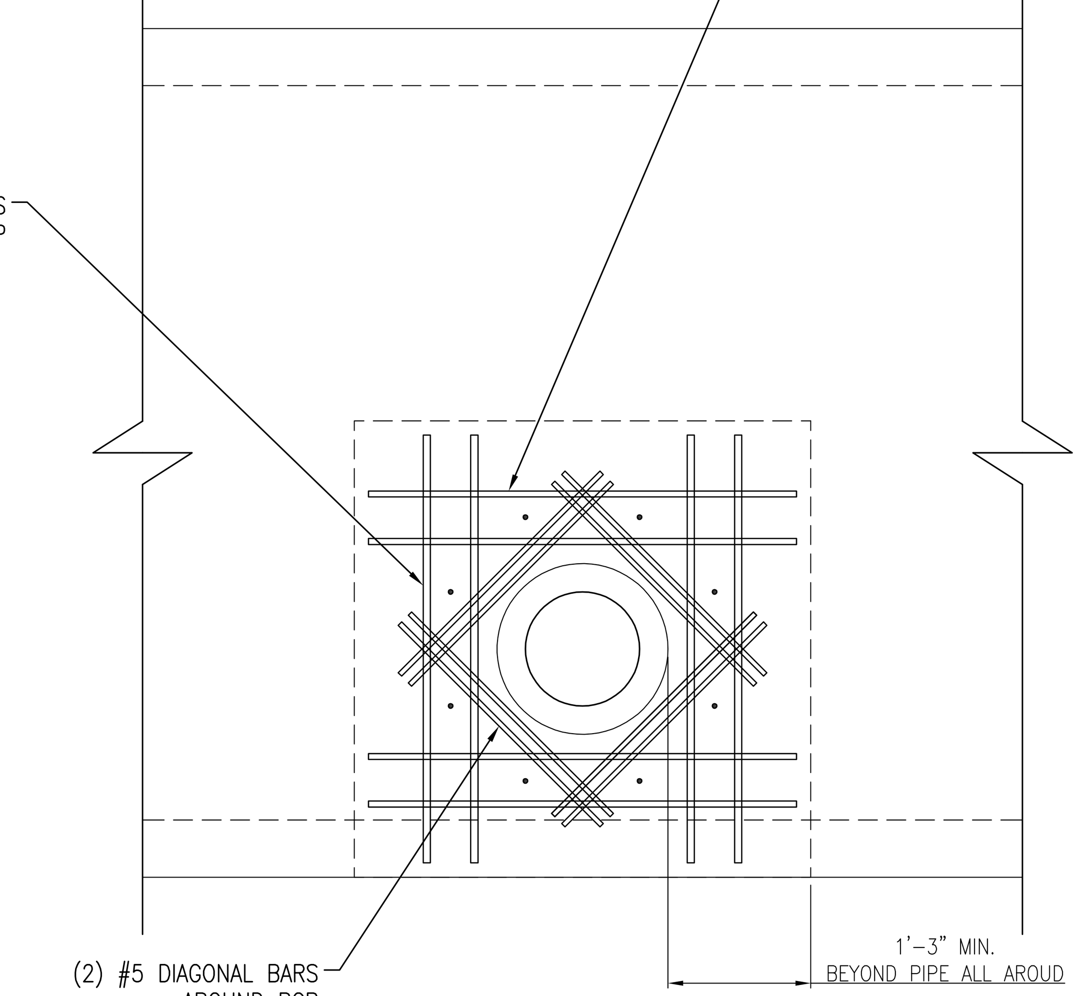
1. IN ADDITION TO THE INSPECTIONS SPECIFIED IN IBC SECTION 110 THE OWNER SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS TO PROVIDE INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THIS SECTION (ONLY WHEN SPECIFICALLY NOTED ON THE DETAILS).
2. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON, APPROVED BY CLARK COUNTY, WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL & ICC CERTIFIED, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION AND SHALL MEET THE REQUIREMENTS OF 1704.2.1.
3. THE SPECIAL INSPECTOR SHALL SATISFY THE REPORT REQUIREMENTS OF IBC SECTION 1704.2.4. AND THE CONTRACTOR SATISFY THE REQUIREMENTS OF IBC SECTION 1704.4.
4. IN ACCORDANCE W/ IBC SECTION 1705.6.1, SOILS FOR ANY RETAINING WALL WHERE THE RETAINED HEIGHT EXCEEDS 6 FEET OR FOR RETAINING WALLS THAT RECEIVE SURCHARGE LOADS FROM ADJACENT WALLS OR OTHER STRUCTURES REGARDLESS OF RETAINED SOIL HEIGHT SHALL BE INSPECTED AND EVALUATED IN ACCORDANCE W/ THE REQUIREMENTS OF THE SPECIAL INSPECTION TABLE, UNO PER PLAN OR DETAILS.
6. THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS, NOT THE SHOP DRAWINGS. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR FOR CORRECTION. CONTINUOUS OR PERIODIC SPECIAL INSPECTION IS REQUIRED FOR THE FOLLOWING WORK:

SPECIAL INSPECTION		
CONCRETE	CONT	PERIODIC
1. INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS, AND PLACEMENT		■
2. VERIFYING USE OF REQUIRED DESIGN MIX		■
3. SAMPLING FRESH CONCRETE AND PERFORMING SLUMP, AIR CONTENT AND DETERMINING THE TEMPERATURE OF FRESH CONCRETE AT THE TIME OF MAKING SPECIMENS FOR STRENGTH TESTS	■	
4 INSPECTION OF CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	■	
5. INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES		■
6. VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS		■
7. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.		■
EPOXY-ANCHORING OPERATIONS		
1. FOR BOLTS, REBAR, THREADED ROD, ETC., INCLUDING VERIFICATION OF BOLT OR BAR MATERIALS, HOLE DEPTH AND DIAMETER, CLEAN OUT, MIXING AND PLACEMENT OF EPOXY, AND EMBEDMENT DEPTH IN ACCORDANCE W/ THE CONTRACT DOCUMENTS AND MFR'S RECOMMENDATIONS.	■	

STANDARD ABBREVIATIONS	
ACI	AMERICAN CONCRETE INSTITUTE
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ARCH	ARCHITECT/ARCHITECTURAL PLANS
ALT	ALTERNATE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIAL
CL	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CONT	CONTINUOUS
DIA OR ϕ	DIAMETER
EQ	EQUAL
EW	EACH WAY
FT	FOOT
FTG	FOOTING
GSN	GENERAL STRUCTURAL NOTES
HORIZ	HORIZONTAL
IBC	INTERNATIONAL BUILDING CODE
ICC	INTERNATIONAL CODE COUNCIL
IN	INCH
INFO	INFORMATION
K	KIP (1000 LBS)
KSI	KIPS PER SQUARE INCH
LBS	POUNDS
MFR	MANUFACTURER
MAX	MAXIMUM
MIN	MINIMUM
MISC	MISCELLANEOUS
NTS	NOT TO SCALE
O.C.	ON-CENTER
PLF	POUNDS PER LINEAR FOOT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
REINF	REINFORCING
REQ'D	REQUIRED
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
STD	STANDARD
T&B	TOP AND BOTTOM
THK	THICK/THICKNESS
TRANS	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W/	WITH
W/O	WITHOUT



COLLAR DETAIL
SIDE VIEW
SCALE: 1/2" = 1'-0"



COLLAR DETAIL
ELEVATION VIEW
SCALE: 3/4" = 1'-0"

1 / S0.1 RCP INTO EXISTING D.I. STRUCTURE COLLAR DETAIL

SEAL: ENGINEER · STATE OF NEVADA · TROY R. BANKS · CIVIL · Exp. 12/31/2022 · No. 017898 · PROFESSIONAL
8/12/2022
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TITLE: RCP INTO EXISTING D.I. STRUCTURE COLLAR DETAIL

REV #	DESCRIPTION	DATE

CHECKED: TRB
DRAWN: DLC DESIGN LLC
DATE: 8/11/2022
PROJ No.: 22-525
SHEET: S0.1