

PROJECT DESCRIPTION		BASIS OF DESIGN		FOUNDATIONS		CONCRETE	
1.	THE STRUCTURAL WORK SHOWN ON THESE DRAWINGS COMPRISES CONSTRUCTION OF CUSTOM TRAFFIC SIGNAL POLES AND CIDH FOUNDATIONS FOR THE STREET LIGHT AND TRAFFIC SIGNAL POLES.	1.	ALL NEW CONSTRUCTION SHALL CONFORM TO THE 2019 SAN FRANCISCO BUILDING CODE (SFBC) WHICH COMPRISES THE 2019 CALIFORNIA BUILDING CODE (CBC) AND 2019 SAN FRANCISCO AMENDMENTS.	1.	THE FOUNDATION DESIGN IS BASED UPON THE PROJECT GEOTECHNICAL ENGINEER'S ANALYSIS OF POLE FOUNDATIONS FOR THE SOIL CONDITIONS ON THE PROJECT.	1.	MIXING, BATCHING, TRANSPORTING, PLACING, AND CURING OF ALL CONCRETE AND SPECIFICATION OF CONCRETE MATERIALS, SHALL CONFORM TO ACI 301 "SPECIFICATION FOR STRUCTURAL CONCRETE", EXCEPT AS NOTED BELOW.
GENERAL		2.	ALL NEW POLE FOUNDATION CONSTRUCTION SHALL CONFORM TO THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) "LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS", FIRST EDITION 2015, WITH 2018 INTERIM REVISIONS.	2.	THE GEOTECHNICAL ENGINEER SHALL VERIFY THE CONDITIONS AND/OR ADEQUACY OF ALL SUBGRADES, ENGINEERED FILLS, AND BACKFILLS BEFORE PLACEMENT OF FILLS, FOOTINGS, SLABS, OR OTHER CONSTRUCTION DEPENDENT UPON THEM.	2.	CONCRETE SHALL BE READY-MIXED CONFORMING TO ASTM C94. CEMENT SHALL BE PORTLAND CEMENT TYPE II, CONFORMING TO ASTM C150. ALL CONCRETE USED IN SUSPENDED SLABS AND SLABS-ON-GRADE SHALL BE DESIGNED WITH A SHRINKAGE LIMITATION OF 0.04% AFTER 28 DAYS OF DRYING.
1.	THESE GENERAL NOTES APPLY THROUGHOUT ALL STRUCTURAL DRAWINGS EXCEPT WHERE SPECIFICALLY SHOWN BY NOTES ON DRAWINGS AND/OR DETAILS.	3.	THE PUBLICATIONS LISTED BELOW ARE THE SPECIFICATIONS AND STANDARDS REFERENCED BY THE CODE AND ARE REFERENCED HEREIN BY THEIR BASIC DESIGNATION. IN THE CASE OF CONFLICTING REQUIREMENTS, THE CODE SHALL GOVERN.	3.	SIDES OF FOUNDATIONS SHOWN STRAIGHT ARE FORMED. IF SITE CONDITIONS ALLOW AND GEOTECHNICAL ENGINEER CONCURS, SIDES OF FOUNDATION MAY BE FORMED OR NOT FORMED AT CONTRACTOR'S OPTION.	3.	CONCRETE MIX DESIGNS SHALL BE SUBMITTED TO THE ENGINEER AND APPROVED PRIOR TO USE. SELECTION OF CONCRETE MIX PROPORTIONS SHALL BE IN ACCORDANCE WITH ACI 301. MIX PROPORTIONS SHALL MEET OR EXCEED THE REQUIREMENTS LISTED BELOW FOR THE LOCATIONS NOTED. THE MORE STRINGENT OF THE REQUIREMENTS LISTED SHALL GOVERN.
2.	THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO THE START OF CONSTRUCTION OR FABRICATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REVIEW AND COORDINATION OF ALL DRAWINGS AND SPECIFICATIONS PRIOR TO THE START OF CONSTRUCTION OR FABRICATION. ANY DISCREPANCIES, INCONSISTENCIES, OR UNSOUND CONDITIONS SHALL BE REPORTED TO THE ENGINEER FOR RESOLUTION PRIOR TO THE START OF ANY CONSTRUCTION OR FABRICATION SO THAT A CLARIFICATION CAN BE ISSUED.	AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, "LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS", FIRST EDITION 2015, WITH 2018 INTERIM REVISIONS.	4.	WHERE FOUNDATIONS ARE CAST AGAINST EARTH, SLOPE SIDES OF EXCAVATIONS AS APPROVED BY GEOTECHNICAL ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN-UP OF SLOUGHED MATERIALS BEFORE AND DURING CONCRETE PLACEMENT. CONCRETE COVER FOR REINFORCEMENT MAY BE AFFECTED.	4.	SUPPLEMENTARY CEMENTITIOUS MATERIALS (SCM), SUCH AS SLAG, FLY ASH, SILICA FUME, AND CALCINED CLAY, AS A PERCENTAGE OF TOTAL WEIGHT OF CEMENTITIOUS MATERIAL SHALL BE A MINIMUM OF 25 PERCENT AND A MAXIMUM OF 50 PERCENT. COAL FLY ASH, AS A PERCENTAGE OF TOTAL WEIGHT OF CEMENTITIOUS MATERIAL, SHALL BE A MAXIMUM OF 25 PERCENT. COAL FLY ASH SHALL BE CLASS F, MEETING ASTM C618 REQUIREMENTS. FINELY GROUND GRANULATED BLAST-FURNACE SLAG SHALL CONFORM TO ASTM C989. WATER/CEMENT RATIO SHALL BE BASED ON TOTAL CEMENTITIOUS MATERIAL, INCLUDING SUPPLEMENTARY CEMENTITIOUS MATERIALS.
3.	DIMENSIONS ARE TO CENTERLINE OF POLES, EQUIPMENT, OUTSIDE FACE OF THE CURB, UNLESS OTHERWISE NOTED.	ACI 301-16	AMERICAN CONCRETE INSTITUTE, "SPECIFICATIONS FOR STRUCTURAL CONCRETE"	5.	CONTRACTOR SHALL PROVIDE FOR DE-WATERING IF WATER IS PRESENT IN THE EXCAVATION. DE-WATERING PLANS SHALL BE SUBMITTED FOR REVIEW. DE-WATERING PLANS MAY INCLUDE A MONITORING PROGRAM TO EVALUATE SETTLEMENT IN THE ADJACENT IMPROVEMENTS. SEE GEOTECHNICAL MEMORANDUM.	5.	PROPORTIONS OF AGGREGATE TO CEMENTITIOUS PASTE SHALL BE SUCH AS TO PRODUCE A DENSE, WORKABLE MIX THAT CAN BE PLACED WITHOUT SEGREGATION OR EXCESS FREE SURFACE WATER. SUPERPLASTICIZERS MAY BE USED TO IMPROVE WORKABILITY IN THIN OR CONGESTED SECTIONS.
4.	DIMENSIONS ARE TO CENTERLINE OF STEEL FRAMING, FACE OF CONCRETE SURFACES, FACE OF STUDS, FACE OF CONCRETE MASONRY UNITS (CMU), TOP OF SHEATHING, OR TOP OF STRUCTURAL SLAB, UNLESS OTHERWISE NOTED.	ACI 318-14	AMERICAN CONCRETE INSTITUTE, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"	6.	ALL EXCAVATIONS SHALL BE PROPERLY BACKFILLED. DO NOT PLACE BACKFILL BEHIND RETAINING WALLS OR OVER SEWER BEFORE THE CONCRETE OR GROUT HAS ATTAINED FULL DESIGN STRENGTH UNLESS SPECIFICALLY APPROVED BY THE ENGINEER IN WRITING.	6.	ALL CONCRETE USED IN HORIZONTAL SURFACES EXPOSED TO THE WEATHER SHALL CONTAIN AN ACCEPTABLE ADMIXTURE TO PRODUCE AIR-ENTRAINED CONCRETE WITH TOTAL AIR CONTENT OF 4.5 PERCENT +/- 1 PERCENT. AIR CONTENT SHALL BE MEASURED AT THE DISCHARGE OF THE TRUCK. IF CONCRETE IS PUMPED, AIR CONTENT SHALL BE MEASURED AT THE DISCHARGE END OF THE PUMP LINE. TESTS FOR AIR CONTENT SHALL MEET ASTM C172 REQUIREMENTS.
5.	DIMENSIONS IN THE STRUCTURAL DRAWINGS ARE AS NOTED. DO NOT USE DIMENSIONS SCALED FROM THE STRUCTURAL DRAWINGS.	AISC 303-10	AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"	7.	OVER-EXCAVATED FOOTINGS SHALL BE BACKFILLED WITH CONTROLLED LOW STRENGTH MATERIAL (CLSM) (fc'min = 100 PSI, fc'max = 1,200 PSI).	7.	CONCRETE SHALL HAVE THE FOLLOWING CHARACTERISTICS:
6.	ALL DRAWINGS ARE CONSIDERED TO BE A PART OF THE CONTRACT DOCUMENTS. ANY WORK PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS OR ANY CODE REQUIREMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT THEIR OWN EXPENSE AND AT NO EXPENSE TO THE CITY AND COUNTY OF SAN FRANCISCO.	AISC 360-16	AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS"	8.	THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF APPROPRIATE, ADEQUATE SHORING AND BRACING OF FOUNDATION EXCAVATION, AND UNDERPINNING OF EXISTING STRUCTURES TO ENSURE PROTECTION OF LIFE AND ADJACENT PROPERTY, STRUCTURES, STREETS, AND UTILITIES IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL ORDINANCES. UNDERPINNING, SHORING, LAGGING, ETC., SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA AND SHALL BE CONSTRUCTED UNDER SEPARATE PERMIT. SHORING PLAN TO BE SUBMITTED TO THE GEOTECHNICAL ENGINEER AND THE STRUCTURAL ENGINEER FOR REVIEW TO ENSURE CONFORMANCE WITH DESIGN DOCUMENTS.		
7.	ALL TYPICAL DETAILS AND NOTES SHOWN ON DRAWINGS SHALL APPLY UNLESS OTHERWISE NOTED. TYPICAL DETAILS MAY NOT NECESSARILY BE INDICATED ON THE PLANS, BUT SHALL STILL APPLY AS SHOWN OR DESCRIBED IN THE DETAILS. WHERE TYPICAL DETAILS ARE NOTED ON THE DRAWINGS, THE SPECIFIED TYPICAL DETAIL SHALL BE USED. WHERE NO DETAILS ARE NOTED, CONSTRUCTION SHALL BE AS SHOWN FOR SIMILAR WORK. THE CONTRACTOR SHALL SUBMIT ALL PROPOSED ALTERNATE TYPICAL DETAILS TO THOSE PROVIDED WITH RELATED CALCULATIONS TO THE ENGINEER FOR APPROVAL PRIOR TO SHOP DRAWING PRODUCTION AND FIELD USE.	ASCE 7-16	AMERICAN SOCIETY OF CIVIL ENGINEERS, "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES"	9.	THE CONTRACTOR SHALL NOT UNDERMINE EXISTING FOUNDATIONS AND STRUCTURES DURING EXCAVATION. IF UNDERMINING OCCURS, THE CONTRACTOR SHALL PROVIDE CORRECTIVE MEASURES FOR ENGINEER TO REVIEW AND APPROVE AT CONTRACTOR'S EXPENSE.		
8.	REFER TO OTHER DISCIPLINES' DRAWINGS AND COORDINATE INFORMATION RELATED TO THOSE OTHER DISCIPLINES' SYSTEMS FOR ITEMS SUCH AS:	AWS D1.1	AMERICAN WELDING SOCIETY, "STRUCTURAL WELDING CODE - STEEL", LATEST EDITION	10.	INSTALLATION OF CAST-IN-DRILLED-HOLE (CIDH) PILES SHALL BE PERFORMED WHILE UNDER THE OBSERVATION OF THE GEOTECHNICAL ENGINEER OF RECORD.		
	a. TOP OF SIDEWALK ELEVATIONS, PROFILE GRADE ELEVATIONS, CHANGES IN ELEVATION, SLOPES, DRAINS, CURBS GUTTERS, ETC.	RCSC	RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS, "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS", DECEMBER 31, 2009	11.	THE CONTRACTOR SHALL PROVIDE TEMPORARY CASINGS OR LINERS WHEN DRILLING FOR FOUNDATIONS IN THIS PROJECT UNLESS OTHERWISE NOTED BY THE GEOTECHNICAL ENGINEER OF RECORD. TEMPORARY CASING OR LINERS SHALL BE PROVIDED WHEN DRILLING IN SAND AND SILTY SAND, AND AS REQUIRED, TO STABILIZE THE DRILLED SHAFT EXCAVATION, AND TO FORM THE UPPER 2 FEET OF THE LIGHT POLE FOUNDATION. THE TEMPORARY CASING OR LINER SHALL BE REMOVED AFTER CONCRETE PLACEMENT EXCEPT THAT CORRUGATED STEEL METAL CASING IS ALLOWED TO REMAIN IN PLACE.		
	b. PIPE RUNS, SLEEVES, HANGERS, TRENCHES, WALL AND FLOOR OPENINGS, ETC., EXCEPT AS SHOWN OR NOTED.	STRUCTURAL DESIGN CRITERIA		12.	EXCAVATIONS FOR FOOTINGS AND DRILL PIERS SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACING REINFORCING AND CONCRETE. THE CONTRACTOR SHALL NOTIFY THE GEOTECHNICAL ENGINEER WHEN THE EXCAVATIONS ARE READY FOR OBSERVATION BY THE GEOTECHNICAL ENGINEER.	8.	PIPES OTHER THAN ELECTRICAL CONDUITS SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE EXCEPT WHERE SPECIFICALLY APPROVED BY THE ENGINEER. OUTSIDE DIAMETER OF CONDUIT EMBEDDED IN CONCRETE SHALL NOT EXCEED 1/6 TIMES THE MEMBER THICKNESS, OR 1 ¼", WHICHEVER IS LESS, WITHOUT APPROVAL OF THE ENGINEER. MINIMUM CLEAR DISTANCE BETWEEN CONDUITS OR REBAR SHALL BE 3 TIMES CONDUIT-DIAMETER (LARGER CONDUIT) OR 1 INCH, WHICHEVER IS GREATER. CONDUIT EMBEDDED IN SLABS SHALL BE EMBEDDED IN ONE LAYER AT MID-DEPTH OF SLABS. CONDUITS SHALL BE FIRMLY CHAIRED AND TIED TO PREVENT DISPLACEMENT DURING CONCRETE PLACEMENT. CONDUIT CAN BE TIED TO REBAR WHEN ORIENTED PERPENDICULAR TO THEM, PROVIDED THE LOCATION OF THE REBAR IS NOT AFFECTED BY THE CONDUIT. PLACE #3 AT 12 INCHES ADDED REINFORCEMENT PERPENDICULAR TO CONDUITS WHERE REQUIRED TO SUPPORT CONDUIT. CONDUITS WITHOUT CLEARANCE NOTED ABOVE SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION. ADDED TRIM REINFORCEMENT WILL BE REQUIRED WHERE CLEARANCES CANNOT BE MET.
	c. ELECTRICAL CONDUIT RUNS, BOXES, OUTLETS, ETC.	1.	WIND DESIGN CRITERIA:	13.	FOOTINGS SHALL BEAR ON FIRM, UNDISTURBED NATIVE SOIL OR ENGINEERED FILL. ALL ABANDONED FOOTINGS, UTILITIES, ETC., SHALL BE REMOVED. ALL FOOTINGS SHALL BE FOUNDATED AT A DEPTH AT LEAST 30" BELOW THE LOWEST ADJACENT GRADE. FOOTING DEPTHS SHOWN ON THE STRUCTURAL DRAWINGS ARE MINIMUM DEPTHS AND SHALL BE VERIFIED IN THE FIELD BY THE GEOTECHNICAL ENGINEER.	9.	SLEEVES, WHEN EMBEDDED IN CONCRETE, SHALL BE SPACED WITH ONE SLEEVE-DIAMETER (LARGER SLEEVE) CLEAR BETWEEN ADJACENT SLEEVES OR REBAR, OR 1 INCH, WHICHEVER IS GREATER. SLEEVES WITHOUT CLEARANCE NOTED ABOVE SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION. ADDED TRIM REINFORCEMENT WILL BE REQUIRED WHERE CLEARANCES CANNOT BE MET, SUCH AS ELECTRICAL PANEL ROOMS.
	d. SIZE, LOCATION, ANCHORAGE AND BRACING FOR MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT.	AASHTO	ANALYTICAL PROCEDURE:	14.	ENGINEERED FILL BELOW BUILDING FOOTINGS SHALL BE COMPACTED TO 95% RELATIVE COMPACTION AS DETERMINED BY THE ASTM D1557 COMPACTION TEST METHOD AND UNDER THE OBSERVATION OF THE GEOTECHNICAL ENGINEER. ENGINEERED FILL SHALL EXTEND AT LEAST 5 FEET BEYOND THE BUILDING PERIMETER.	10.	ALUMINUM PIPES, CONDUITS, AND SLEEVES SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE.
9.	FOR OPENINGS LARGER THAN 6" THAT ARE REQUIRED BUT NOT SHOWN ON THE STRUCTURAL DRAWINGS, THE CONTRACTOR SHALL SUBMIT DRAWINGS INDICATING OPENING LOCATIONS TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.	HEIGHT FACTOR, K <sub>z</sub> :	LRFD			11.	THE CONTRACTOR SHALL INFORM THE ENGINEER AT LEAST 3 CALENDAR DAYS PRIOR TO POURING ANY STRUCTURAL CONCRETE SO THAT THE ENGINEER MAY HAVE THE OPPORTUNITY OF REVIEWING THE WORK PRIOR TO CONCRETE PLACEMENT.
10.	THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS AND/OR METHODS OF CONSTRUCTION. ALTHOUGH THE NEED FOR SHORING MAY SOMETIMES BE INDICATED IN THE STRUCTURAL DRAWINGS, IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DESIGN, PROVIDE, AND MAINTAIN TEMPORARY BRACING, SHORING, GUYING, OR OTHER TEMPORARY SUPPORT AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION.	DIRECTIONAL FACTOR, K <sub>d</sub> :	1.00				
11.	THE CONTRACTOR SHALL PROVIDE ALL NECESSARY PROTECTION OF ADJACENT STRUCTURES DURING CONSTRUCTION. THE CONTRACTOR SHALL BEAR ALL EXPENSE FOR REPAIR OR REPLACEMENT.	GUST FACTOR, G:	0.95				
12.	THE USE OF NEW CONSTRUCTION FOR TEMPORARY SUPPORT OR STORAGE OF CONSTRUCTION EQUIPMENT OR MATERIALS IS RESTRICTED TO THE DESIGN CAPACITY OF THE NEW CONSTRUCTION AT THE TIME IT IS TO BE USED. EQUIPMENT OR MATERIALS SHALL BE PLACED SO AS NOT TO EXCEED THE CAPACITY OF INDIVIDUAL ELEMENTS. PROVIDE ADEQUATE, ENGINEERED SHORING AND/OR BRACING WHERE DESIGN CAPACITY IS NOT SUFFICIENT.	BASIC WIND SPEED:	1.14				
13.	CONSTRUCTION LOADS SHALL NOT BE PLACED ON NEW CONCRETE CONSTRUCTION, INCLUDING CONCRETE FILL ON METAL DECK, FOR AT LEAST 7 DAYS AFTER CONCRETE PLACEMENT.	YEARLY MEAN WIND VELOCITY:	115 MPH				
14.	IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING PIPES, DUCTS, AND UTILITIES, WHETHER SHOWN HEREIN OR NOT, AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR SHALL BEAR ALL EXPENSE FOR REPAIR OR REPLACEMENT.	DESIGN TRUCK SPEED:	16 MPH				
15.	ALL STRUCTURAL MEMBERS AND ELEMENTS SHOWN ON THE STRUCTURAL DRAWINGS ARE NEW UNLESS NOTED (E) FOR EXISTING CONDITIONS.		35 MPH				