

FILE: N:\ME\2652\19th_avenue_combined.ctb; project: 2 Design\working_drawing\ENR\current_aws\Structural_drawing\2652\19thAve-SU-GEN-NT-dwg
SAVE: Monday, December 17, 2018 9:25:44 AM

PLOT: EXTENTS
SCALE: 1:1
BORDER:
22,34
COLOR: No.
RED 0.70MM
YELLOW 0.20MM
GREEN 0.25MM
CYAN 0.40MM
BLUE 0.50MM
MAGENTA 0.20MM
WHITE 0.35MM
GRAY 0.15MM
9 0.15MM
10 1.00MM
100 0.50MM
210 0.50MM

FOUNDATIONS

1. THE FOUNDATION DESIGN IS BASED UPON CHAPTER 18 OF THE 2016 CALIFORNIA BUILDING CODE.

2. DESIGN SOIL PARAMETERS:

ALLOWABLE BEARING PRESSURE:
2,500 PSF FOR DEAD LOADS + LIVE LOADS

SKIN FRICTION: 150 PSF

COEFFICIENT OF FRICTION: 0.3 BETWEEN CONCRETE AND SOIL

PASSIVE EARTH PRESSURE: 200 PCF EQUIVALENT FLUID PRESSURE (IGNORE UPPER 12 INCHES UNLESS COVERED BY SLAB-ON-GRADE)

ACTIVE EARTH PRESSURE:
UNRESTRAINED WALLS: 35 PCF EQUIVALENT FLUID PRESSURE (ACTIVE)
RESTRAINED WALLS: 45 PCF EQUIVALENT FLUID PRESSURE (AT-REST)
SURCHARGE: 100 PSF UNIFORM APPLIED AT TOP 10 FEET OF WALL
- 3.. REFER TO THE 2016 CALIFORNIA BUILDING CODE FOR ADDITIONAL INFORMATION AND RECOMMENDATIONS NOT NOTED HERE.

4. 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.

5. EXCAVATIONS FOR FOOTINGS 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.

6. FOOTINGS SHALL BEAR ON FIRM, UNDISTURBED NATIVE SOIL OR ENGINEERED FILL. ALL ABANDONED FOOTINGS, UTILITIES, ETC., SHALL BE REMOVED. ALL FOOTINGS SHALL BE FOUNDED 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.

7. 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.

8. 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.

9. 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. 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.

11. ALL EXCAVATIONS SHALL BE PROPERLY BACKFILLED. DO NOT PLACE BACKFILL BEHIND RETAINING WALLS BEFORE THE CONCRETE OR GROUT HAS ATTAINED FULL DESIGN STRENGTH UNLESS SPECIFICALLY APPROVED BY THE CITY REPRESENTATIVE IN WRITING. THE CONTRACTOR SHALL BRACE OR PROTECT ALL BUILDING AND PIT WALLS BELOW GRADE FROM LATERAL LOADS UNTIL ATTACHING FLOORS ARE COMPLETELY IN PLACE AND HAVE ATTAINED FULL STRENGTH. THE CONTRACTOR SHALL PROVIDE FOR THE DESIGN, PERMITS, AND INSTALLATION OF SUCH BRACING.

12. OVER-EXCAVATED FOOTINGS SHALL BE BACKFILLED WITH CONTROLLED LOW STRENGTH MATERIAL (CLSM) (fc'min = 100 PSI, fc'max = 1,200 PSI).

13. 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.

14. THE CONTRACTOR SHALL NOT UNDERMINE EXISTING FOUNDATIONS AND STRUCTURES DURING EXCAVATION. IF UNDERMINING OCCURS, THE CONTRACTOR SHALL PROVIDE CORRECTIVE MEASURES FOR CITY REPRESENTATIVE TO REVIEW AND APPROVE AT CONTRACTOR'S EXPENSE.

CONCRETE

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.

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 0.037% AFTER 28 DAYS OF DRYING.

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.

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 20 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.

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.

6. CONCRETE SHALL HAVE THE FOLLOWING CHARACTERISTICS:

LOCATION	STRENGTH, fc' MIN	TEST AGE	MAXIMUM	MAXIMUM	SLUMP
			AGGREGATE SIZE	WATER/CEMENT RATIO	
FOOTINGS	4,000 PSI	28 DAYS	¾"	0.45	4"
SLABS	4,000 PSI	28 DAYS	¾"	0.45	4"
WALLS	4,000 PSI	28 DAYS	¾"	0.45	4"

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 ⅓ TIMES THE MEMBER THICKNESS, OR 1¼", 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, PROVIDE 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, SUCH AS ELECTRICAL PANEL ROOMS.

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.

10. ALUMINUM PIPES, CONDUITS, AND SLEEVES SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE.

11. THE CONTRACTOR SHALL INFORM THE CITY REPRESENTATIVE AT LEAST 3 DAYS PRIOR TO POURING ANY STRUCTURAL CONCRETE SO THAT THE CITY REPRESENTATIVE MAY HAVE THE OPPORTUNITY OF REVIEWING THE WORK PRIOR TO CONCRETE PLACEMENT.

12. ALL CONCRETE EXCEPT SLABS-ON-GRADE 6"THICK OR LESS SHALL BE MECHANICALLY VIBRATED AS TO COMPLETELY FILL THE FORM WITHOUT CAUSING UNDOE SEGREGATION.

13. FOR EACH CLASS OF CONCRETE, FOUR TEST CYLINDERS FROM EACH 150 CUBIC YARDS OR 5,000 SQUARE FEET OF SURFACE AREA FOR SLABS OR WALLS, PLACED IN ANY ONE DAY, SHALL BE SECURED AND TESTED BY THE BUREAU OF CONSTRUCTION MANAGEMENT - ONE TO BE TESTED AT 7 DAYS, TWO AT 28 DAYS, AND THE FOURTH HELD IN RESERVE. FOR POST-TENSIONED CONCRETE, SECURE FIVE CYLINDERS PER 150 CUBIC YARDS OR 5,000 SQUARE FEET OF SURFACE AREA FOR SLABS OR WALLS, PLACE IN ANY ONE DAY, TWO SETS MINIMUM - ONE TO BE TESTED AT 4 DAYS, TWO AT 28 DAYS, AND TWO HELD IN RESERVE.

14. THE CONTRACTOR SHALL REMOVE AND REPLACE ANY CONCRETE WHICH FAILS TO ATTAIN SPECIFIED STRENGTH IN 28 DAYS IF SO DIRECTED BY THE ENGINEER. ANY DEFECTS IN THE HARDENED CONCRETE SHALL BE SATISFACTORILY REPAIRED OR THE HARDENED CONCRETE SHALL BE REPLACED.

15. PROJECTING CORNERS SHALL BE FORMED WITH A ¾"CHAMFER UNLESS OTHERWISE NOTED ON DRAWINGS.

16. ALL CONSTRUCTION JOINTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ACI 318 AND THE TYPICAL CONSTRUCTION JOINT DETAILS SHOWN ON THE STRUCTURAL DRAWINGS. ALL SURFACES OF CONSTRUCTION JOINTS SHALL BE CLEANED TO REMOVE DUST, CHIPS, OR OTHER FOREIGN MATTER PRIOR TO PLACING THE ADJACENT CONCRETE. THE CONTRACTOR SHALL SUBMIT THE PROPOSED LOCATIONS OF CONSTRUCTION JOINTS TO THE CITY REPRESENTATIVE FOR REVIEW PRIOR TO START OF CONSTRUCTION.

17. WHERE NEW CONCRETE IS TO BE CAST AGAINST EXISTING CONCRETE, THE EXISTING CONCRETE SURFACE SHALL BE ROUGHENED TO A MINIMUM OF ¼" AMPLITUDE BY SANDBLASTING OR BUSH HAMMERING. THE EXISTING SURFACE SHALL BE CLEANED AND LAITANCE REMOVED. APPLY "SIKADUR 32, HI-MOD" EPOXY BONDING ADHESIVE, AS MANUFACTURED BY SIKA CORPORATION, LYNHURST, NEW JERSEY, OR APPROVED EQUAL, TO EXISTING CONCRETE SURFACE PRIOR TO PLACEMENT OF NEW CONCRETE.

REINFORCING STEEL

1. REINFORCING STEEL DETAILING, FABRICATION, AND PLACEMENT SHALL CONFORM TO THE ACI 318, CHAPTER 7.

2. REINFORCING STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS:

DEFORMED BARS ASTM A615 OR ASTM A706, GRADE 60

WELDED REINFORCEMENT, WHEN SPECIFIED BY THE CITY REPRESENTATIVE ASTM A706, GRADE 60

WELDED WIRE FABRIC (WWF) (SMOOTH WIRE) ASTM A185

WELDED WIRE REINFORCEMENT (DEFORMED WIRE) ASTM A496, ASTM A497

SPIRAL REINFORCEMENT ASTM A615

3. ALL STEEL REINFORCING BAR BENDS SHALL BE MADE COLD.

4. REINFORCEMENT AND EMBEDMENTS SHALL BE ACCURATELY POSITIONED AND SECURED AGAINST DISPLACEMENT BEFORE AND DURING CONCRETE PLACEMENT. PROVIDE SUFFICIENT SUPPORTS TO PREVENT DAMAGE OR DISPLACEMENT DUE TO CONSTRUCTION TRAFFIC ON REINFORCEMENT.

5. PROVIDE CONTINUOUS REINFORCEMENT WHEREVER POSSIBLE. SPLICE ONLY AS SHOWN OR APPROVED.

6. WHERE NOTED ON PLANS, PROVIDE THREADED COUPLERS CAPABLE OF DEVELOPING 125% OF THE SPECIFIED YIELD STRENGTH OF THE REINFORCING STEEL. THREADED COUPLERS SHALL BE "LENTON COUPLERS", AS MANUFACTURED BY ERICO COMPANY, SOLON, OHIO, OR APPROVED EQUAL WITH CURRENT ICC-ES EVALUATION REPORT.

7. WELDING (INCLUDING TACK WELD) OR REINFORCING BARS IS PROHIBITED EXCEPT WHERE DETAILED OR APPROVED IN WRITING BY CITY REPRESENTATIVE.

8. REINFORCEMENT CROSSING CONSTRUCTION JOINTS SHALL BE CONTINUOUS OR LAP SPLICED PER TENSION LAP TABLE OR APPROVED COUPLERS.

9. MINIMUM CLEAR COVER DISTANCES FROM FINISHED FACE OF CONCRETE TO STEEL REINFORCEMENT SHALL BE AS FOLLOWS:

CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"

CONCRETE EXPOSED TO EARTH OR WEATHER:
#6 THROUGH #18 BARS 2"
#5 BAR, W31 OR D31 WIRE, AND SMALLER 1 ½"

CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
SLABS, WALLS, JOISTS
#14 AND #18 BARS 1 ½"
#11 BAR AND SMALLER ¾"
BEAMS, COLUMNS 1 ½"

10. SHOP DRAWINGS SHALL BE SUBMITTED TO THE CITY REPRESENTATIVE FOR REVIEW PRIOR TO FABRICATION. SUBMIT MILL CERTIFICATES FOR REINFORCING STEEL PRIOR TO REBAR PLACEMENT.

FOR THE SOLE USE OF THE DOCUMENT
RECIPIENT - DO NOT CITE, COPY, OR
CIRCULATE WITHOUT THE EXPRESS
PERMISSION OF THE SFPUC.

REFERENCES

GATE BOOK PAGES, PLANS,
SURVEY NOTES, ETC. USED

GATE BOOK PAGES
NO.



CITY AND COUNTY OF SAN FRANCISCO SAN FRANCISCO PUBLIC WORKS BUREAU OF DESIGN AND ENGINEERING			
SECTION MANAGER <i>[Signature]</i> 12/18/18	DRAWN BH <i>[Signature]</i> 01/2019	DESIGNED WY <i>[Signature]</i> 01/2019	CHECKED WL <i>[Signature]</i> 01/2019
DEPUTY BUREAU MANAGER 42000000325			
BUREAU MANAGER <i>[Signature]</i> 12/18/18			
NO.	DATE	DESCRIPTION	BY
REVISIONS			

CITY AND COUNTY OF SAN FRANCISCO PUBLIC UTILITIES COMMISSION WATER ENTERPRISE CITY DISTRIBUTION DIVISION			
19TH AVENUE (STATE ROUTE 1) COMBINED CITY PROJECT			
AUXILIARY WATER SUPPLY SYSTEM WORK			
STRUCTURAL GENERAL NOTES II			
APPROVED <i>[Signature]</i> ENGINEERING MANAGER	APPROVED <i>[Signature]</i> MANAGER, CITY DISTRIBUTION DIVISION	SCALE NONE	DATE 01/2019
291 OF 356	MA-S1.2	111,589	REVISION NO. 0