

GENERAL CONSTRUCTION NOTES:

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE BUILDING CODE... THE PUBLICATIONS LISTED BELOW ARE THE GOVERNING CODES AND STANDARDS AND ARE REFERENCED BY THEIR BASIC DESIGNATION... BUILDING CODE SHALL GOVERN.
2. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS, MEMBER SIZES AND FIELD CONDITIONS PRIOR TO ANY DEMOLITION, FABRICATION, CONSTRUCTION OR INSTALLATION AND NOTIFY ENGINEER IF CONDITIONS, MATERIALS, SIZES AND DIMENSIONS ARE DIFFERENT FROM THOSE SHOWN.
3. THE CONTRACTOR'S STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE... UNLESS OTHERWISE INDICATED, THEY DO NOT INDICATE THE MEANS OR METHOD OF CONSTRUCTION... THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROTECTION OF THE STRUCTURE DURING ALL PHASES OF DEMOLITION, CONSTRUCTION, AND INSTALLATION... MEASURES NECESSARY TO PROTECT THE STRUCTURE, WORKMEN OR OTHER PERSONS BY MEANS OF SHORING, BRACING, ETC. AS A PART OF THIS RESPONSIBILITY, RETAIN THE SERVICES OF A LICENSED STRUCTURAL ENGINEER TO DESIGN AND SUPERVISE ANY SCAFFOLDING FOR WORKMEN AND ALL SHORING AND ELEMENTS OF CONSTRUCTION.
4. DETAILS AND CONDITIONS NOT SPECIFICALLY SHOWN SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS SHOWN FOR SIMILAR CONDITIONS AND MATERIAL.
5. SHOP DRAWINGS PREPARED BY SUPPLIERS, SUB-CONTRACTORS, ETC. SHALL BE REVIEWED, COORDINATED AND SIGNED/STAMPED BY GENERAL CONTRACTOR PRIOR TO SUBMITTING TO THE ENGINEER.

APPLICABLE CODES AND STANDARDS:

BUILDING CODE INTERNATIONAL BUILDING CODE (IBC), 2006 EDITION, INCLUDING THE STATE OF MINNESOTA BUILDING CODE AMENDMENTS.
ACI 318 AMERICAN CONCRETE INSTITUTE, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" 2005 EDITION

DESIGN CRITERIA, LOADS AND STRESSES:

A. CONCRETE:

- 1. MIXING, BATCHING, TRANSPORTING, PLACING, AND CURING OF ALL CONCRETE, AND SELECTION OF CONCRETE MATERIALS, SHALL CONFORM TO ACI 301, "SPECIFICATION FOR STRUCTURAL CONCRETE FOR BUILDINGS," EXCEPT AS NOTED BELOW... PROPORTIONS OF AGGREGATE TO CEMENTITIOUS PASTE SHALL BE SUCH AS TO PRODUCE A DENSE, WORKABLE MIX THAT CAN BE PLACED WITHOUT SEGREGATION OR EXCESS SURFACE WATER.
2. ALL CONCRETE USED IN HORIZONTAL SURFACES EXPOSED TO THE WEATHER SHALL CONTAIN AN ACCEPTABLE ADMIXTURE TO PRODUCE AIR-ENTRAINED CONCRETE WITH TOTAL AIR CONTENT, AS NOTED IN THE CONCRETE MIX SPECIFICATION TABLE... TOLERANCE FOR AIR CONTENT SHALL BE +/- 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.
3. MIX DESIGNS LISTED BELOW SHALL BE SUBMITTED TO THE ENGINEER AND APPROVED PRIOR TO USE... SUBMITTALS SHALL INCLUDE TEST DATA THAT CONFIRMS THE STRENGTH OF EACH MIX PER ACI 318 CHAPTERS 5... 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. MAXIMUM SIZE OF AGGREGATE SHALL BE AS LISTED BELOW... MAXIMUM FLY ASH AS A PERCENTAGE OF TOTAL WEIGHT OF CEMENTITIOUS MATERIAL SHALL BE 30 PERCENT... FLY ASH SHALL BE CLASS C OR F, MEETING ASTM C618 REQUIREMENTS... WATER/CEMENT RATIO SHALL BE BASED ON TOTAL CEMENTITIOUS MATERIAL, INCLUDING FLY ASH AND OTHER POZZOLANIC MATERIALS.
5. THE CONTRACTOR SHALL DETERMINE SLUMP... EACH CONCRETE MIX SUBMITTED SHALL HAVE THE SLUMP SPECIFIED... SLUMP SHALL BE MEASURED AT THE DISCHARGE OF THE TRUCK... IF CONCRETE IS PUMPED, SLUMP SHALL BE MEASURED AT THE DISCHARGE END OF THE PUMP LINE... SLUMPS SHALL BE WITHIN +1 INCH AND -2 INCHES OF THE SPECIFIED SLUMP.
6. THE USE OF SUPER PLASTICIZERS AND WATER REDUCERS IS ALLOWED, BUT NOT REQUIRED... ALL ADMIXTURES SHALL BE CHLORIDE FREE, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

CONCRETE MIX DESIGN TABLE

Table with 6 columns: LOCATION, f'c (PSI), TEST AGE (DAYS), MAX W/C RATIO, AIR CONTENT (%), MAX. AGGREGATE SIZE. Rows include MISCELLANEOUS CONCRETE, CURBS, SIDEWALKS, EXTERIOR SLABS ON GRADE, and FULL DEPTH CONCRETE REPAIR.

B. REINFORCING STEEL:

- 1. 60,000 PSI ASTM A615 GRADE 60 DEFORMED REINFORCING (EPOXY COATED U.N.)
2. SEE WORK ITEM #2 (NOTE 10) FOR COATING OF REINFORCING.
3. SEE WORK ITEM #12 FOR ADDITIONAL INFORMATION.
4. WELDING OR TACK WELDING OF REINFORCING BARS TO OTHER BARS OR TO PLATES, ANGLES, ETC. IS PROHIBITED, EXCEPT WHERE SPECIFICALLY APPROVED BY THE ENGINEER... WHERE WELDING IS APPROVED, IT SHALL BE DONE BY AWS CERTIFIED WELDERS USING E6018 OR APPROVED EQUIVALENT... WELDING PROCEDURES SHALL CONFORM TO THE REQUIREMENTS OF AWS D1.4.

C. TEMPORARY BRACING / SHORING:

- 1. PROVIDE TEMPORARY LATERAL SUPPORT FOR ALL WALLS WHERE GRADE VARIES ON THE TWO SIDES UNTIL SLAB HAS REACHED ITS DESIGN STRENGTH.
2. PROVIDE TEMPORARY SHORING FOR ALL EXISTING WALLS, FLOORS AND ROOF MEMBERS UNTIL NEW CONSTRUCTION IS IN PLACE AND PROPERLY ANCHORED AND CURED IN FINAL FORM.

CONCRETE SURFACE PREPARATION: WORK ITEM #1

- 1. ALL DECK PREPARATION BY SHOT OR WATER BLASTING.
2. ALL CURB PREPARATION BY AIR AND WATER BLAST.
3. PRESSURE WASH ALL INDICATED SURFACES USING 3000-4000 PSI WATER BLAST... AS REQUIRED TO REMOVE ALL EXISTING TRAFFIC COATING, DUST AND DIRT... ABRASIVE SHALL BE USED IN COMBINATION WITH WATER WHEN CLEANING REPAIR CAVITIES, AS REQUIRED TO ELIMINATE MICRO-CRACKED SURFACE MATERIALS RESULTING FROM DEMOLITION... NO WATER WITH CONCRETE DUST SHALL BE ALLOWED TO REMAIN ON ANY SURFACE FOLLOWING WASHING... AND MUST BE IMMEDIATELY REMOVED, PRIOR TO DRYING AND REHARDENING.
4. THE RESULT OF THIS PREPARATION SHALL RENDER A SURFACE CLEAN, MEANING HAVING COMPLETE EXPOSURE OF SOUND ORIGINAL MATERIAL WITHOUT ANY DEPOSITS OF CONTAMINANTS, FOREIGN MATTER OR LOOSE MATERIAL, WHICH COULD AFFECT THE BOND OR LONG-TERM DURABILITY OF THE SURFACE AND THE PATCHING COMPOUND.

CONCRETE SPALL REPAIR PREPARATION: WORK ITEM #2

- 1. LOCATE AND MARK THE DELAMINATED AREAS OF THE CONCRETE SURFACE.
2. REMOVE ALL UNSOUND AND DELAMINATED CONCRETE BY CHIPPING. THE CHIPPING TOOL SHALL HAVE A MAXIMUM WEIGHT OF 30 POUNDS. EXERCISE CARE TO PREVENT DAMAGING SOUND CONCRETE. DO NOT CHIP NEAR NEW CONCRETE PATCHES LESS THAN 28 DAYS OLD.
3. TAKE EXTREME PRECAUTION NOT TO DAMAGE THE REINFORCING STEEL.
4. TAKE PRECAUTION WHEN WORKING IN THE PROXIMITY OF THE EMBEDDED ELECTRIC BOXES AND CONDUITS THE WORK MUST BE COORDINATED WITH THE BUILDING OR STRUCTURE'S ELECTRICIAN.
5. REMOVE THE CONCRETE AS NECESSARY TO COMPLETELY EXPOSE THE REINFORCING STEEL AND PROVIDE A SPACE 3/4" BEHIND THE REINFORCING STEEL OR AS NECESSARY TO PROVIDE A MINIMUM DEPTH FOR THE PATCH OF 1-1/2", WHICHEVER IS GREATER. PROVIDE A SOUND FRACTURED-AGGREGATE SURFACE WITH A MINIMUM SURFACE PROFILE VARIATION OF +/- 1/16". DO NOT OPERATE CHIPPING HAMMER AT MORE THAN A 45 DEGREE ANGLE.
6. SAW CUT (OR CHIP) THE EDGES OF THE PATCH AREA TO A MINIMUM DEPTH OF 1/2" OR TO THE TOP OF THE REINFORCING STEEL IF THE REINFORCING STEEL IS WITHIN 1/2" OF THE SURFACE. EXERCISE CARE TO PREVENT CUTTING THE REINFORCING STEEL. INSURE THAT SAW CUT LINES ARE PLACED SOME DISTANCE OUTSIDE THE LIMIT OF THE SPALLING TO MAKE SURE ALL DEFECTIVE CONCRETE IS REMOVED AND THE REPAIR IS BONDING TO SOUND MATERIAL... ALL EDGES (SAW CUT OR CHIPPED) MUST BE PERPENDICULAR TO THE SURFACE... CONCRETE WITHIN THE AREA OF THE SAW CUT SHALL BE CHIPPED AWAY TO EXPOSE SOUND CONCRETE OR TO A MINIMUM DEPTH OF 1-1/2", WHICHEVER IS GREATER OVER THE ENTIRE AREA.
7. AFTER CHIPPING HAS BEEN COMPLETED, THE ENTIRE AREA SHALL BE SANDBLASTED TO REMOVE ANY FOREIGN PARTICLES FROM THE CONCRETE AND TO REMOVE ALL RUST AND SCALE FROM THE REINFORCEMENT... AFTER THE REINFORCING HAS BEEN FULLY EXPOSED AND CLEANED, A CHECK OF STEEL DETEORINATION SHOULD BE MADE... IF THE CROSS-SECTIONAL AREA OF THE STEEL HAS BEEN REDUCED BY AS MUCH AS 15%, ADDITIONAL REINFORCEMENT IS REQUIRED.
8. IF SIGNIFICANT CORROSION OF THE EXISTING REINFORCING STEEL HAS OCCURRED, REFER TO NOTES PER THE REINFORCING STEEL WORK ITEM AND PER TYPICAL LAP DEVELOPMENT SPLICE DETAILS.
9. CLEAN THE PATCH AREA TO REMOVE ALL LOOSE PARTICLES AND DUST BY VACUUMING OR BLOWING OUT WITH COMPRESSED AIR... IF COMPRESSED AIR IS USED, THE COMPRESSOR SHALL HAVE A FUNCTIONING OIL SEPARATOR... THE ENGINEER SHALL OBSERVE AND APPROVE THE PREPARATION OF THE PATCH AREAS BEFORE PATCHING MATERIAL IS PLACED IN THAT AREA... THE ENGINEER SHALL VERIFY THE SQUARE FOOTAGE AND/OR LINEAR FEET OF REPAIR WORK AND THE AMOUNT OF ADDED REINFORCING STEEL FOR PAYMENT PURPOSES.
10. COAT THE EXISTING REINFORCING STEEL WITH AN APPROVED PRODUCT LISTED BELOW:
a) "ARMATEC 110 BONDING AGENT/ ANTI-CORROSION COATING" BY SIKA CORPORATION.
b) "EMACO P22 - FLEXIBLE CEMENTITIOUS REBAR COATING" BY MASTER BUILDERS TECHNOLOGY.
c) OR APPROVED EQUAL.
d) FOLLOW SUPPLIER'S INSTRUCTIONS FOR SURFACE PREPARATION, MIXING, APPLICATION, TEMPERATURE LIMITATIONS, CURING, ETC.

EXISTING CONCRETE SHALL BE CLEAN AND FREE OF LOOSE PARTICLES, DUST, GREASE AND OTHER FOREIGN MATERIALS THAT WOULD PREVENT BONDING OF THE NEW CONCRETE.

- 12. THE TEMPERATURE OF THE EXISTING SLAB SHALL BE WITHIN 10 DEGREES FAHRENHEIT OF THE TEMPERATURE OF THE CONCRETE MIX AT THE TIME THE NEW CONCRETE IS BEING PLACED.
13. THOROUGHLY WET THE SURFACE OF THE REPAIR AREAS AND ALLOW THE SURFACE TO DRY BEFORE PROCEEDING... BROOM A THIN COAT OF BONDING GROUT ON TO THE SURFACE OF THE REPAIR AREA... PREVENT PUDDLING OF THE GROUT... THIN THE GROUT AND PAINT ON VERTICAL SURFACES.
14. THE CONTRACTOR SHALL PREPARE AT LEAST ONE SET OF FOUR TEST CYLINDERS FOR EACH DAY'S POUR IN EXCESS OF ONE CUBIC YARD FOR EACH TYPE OF CONCRETE... IF A DAY'S POUR EXCEEDS 25 CUBIC YARDS, AN ADDITIONAL SET OF CYLINDERS SHALL BE PREPARED FOR EACH ADDITIONAL 50 CUBIC YARDS OR FRACTION THEREOF... TEST CYLINDERS SHALL BE STD. 6" DIAMETER USED FOR CONCRETE COMPRESSION TEST AND PREPARE IN ACCURACIES WITH ASTM C31 AND ASTM C172.
15. FINISH ON THE PATCH SHALL BE COMPATIBLE WITH SURROUNDING CONCRETE... PATCH AREA SHALL BE PROTECTED FROM PREMATURE DRYING AND EXCESSIVELY HOT OR COLD TEMPERATURES AS REQUIRED BY ACI 308R AND ACI 308R BY THE AMERICAN CONCRETE INSTITUTE, CURRENT EDITION.
16. CURE CONCRETE BY COVERING WITH WET BURLAP AND THEN COVERING THE BURLAP WITH 6 MIL. POLYETHYLENE FILM... PLACE BURLAP AS SOON AS THE CONCRETE CAN SUPPORT THE BURLAP WITHOUT DEFORMATION... TAPE JOINTS IN POLYETHYLENE... KEEP THE BURLAP CONTINUOUSLY WET FOR AT LEAST 3 DAYS.
17. ALL UNSOUND PATCHES AND DEFECTIVE WORK NOT COMPLYING WITH THE STANDARDS HEREIN SET SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.

FULL DEPTH DECK REPAIR: WORK ITEM #3

- 1. REFER TO WORK ITEMS #1 AND #2 FOR TYPICAL CONCRETE PREPARATION AND REPAIR NOTES.
2. SEE DETAIL 5/S3.0 FOR ADDITIONAL INFORMATION.
3. MINIMUM SLAB REINFORCING IS WWF 6x6-W2x9xW2.9, UNLESS NOTED OTHERWISE.
4. REFER TO DESIGN CRITERIA NOTES (A: CONCRETE) FOR ADDITIONAL INFORMATION.
5. THE CONTRACTOR SHALL PREPARE AT LEAST ONE SET OF FOUR TEST CYLINDERS FOR EACH DAY'S POUR IN EXCESS OF ONE CUBIC YARD FOR EACH TYPE OF CONCRETE... IF A DAY'S POUR EXCEEDS 25 CUBIC YARDS, AN ADDITIONAL SET OF CYLINDERS SHALL BE PREPARED FOR EACH ADDITIONAL 50 CUBIC YARDS OR FRACTION THEREOF... TEST CYLINDERS SHALL BE STD. 6" DIAMETER USED FOR CONCRETE COMPRESSION TEST AND PREPARE IN ACCURACIES WITH ASTM C31 AND ASTM C172.
6. FINISH ON THE PATCH SHALL BE COMPATIBLE WITH SURROUNDING CONCRETE... PATCH AREA SHALL BE PROTECTED FROM PREMATURE DRYING AND EXCESSIVELY HOT OR COLD TEMPERATURES AS REQUIRED BY ACI 308R AND ACI 308R BY THE AMERICAN CONCRETE INSTITUTE, CURRENT EDITION.
7. CURE CONCRETE BY COVERING WITH WET BURLAP AND THEN COVERING THE BURLAP WITH 6 MIL. POLYETHYLENE FILM... PLACE BURLAP AS SOON AS THE CONCRETE CAN SUPPORT THE BURLAP WITHOUT DEFORMATION... TAP JOINTS IN POLYETHYLENE... KEEP THE BURLAP CONTINUOUSLY WET FOR AT LEAST 3 DAYS.
8. ALL UNSOUND PATCHES AND DEFECTIVE WORK NOT COMPLYING WITH THE STANDARDS HEREIN SET SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.

HORIZONTAL SHALLOW DEPTH SPALL REPAIR: WORK ITEM #4

- (INCLUDES ALL SHALLOW DEPTH DECK AND BEAM REPAIRS WHERE THE FORMING OF REPAIR AREA IS NOT REQUIRED)
1. REFER TO WORK ITEMS #1 AND #2 FOR TYPICAL CONCRETE PREPARATION AND REPAIR NOTES.
2. PATCH THE REPAIR AREA WITH THE FOLLOWING MATERIALS:
a) "SIKATOP 122 - GENERAL PURPOSE REPAIR MORTAR" BY SIKA CORPORATION.
b) "EMACO R310 - POLYMER MODIFIED PATCHING MORTAR" BY MASTER BUILDERS TECHNOLOGIES.
c) APPROVED EQUAL.
3. PATCH MATERIAL SHALL BE PLACED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS REGARDING SURFACE PREPARATION, MIXING, PLACEMENT AND FINISH, CURING, TEMPERATURE LIMITATIONS, ETC... ALL FORMING SHALL CONFORM TO THE PROFILE OF THE EXISTING STRUCTURE.
4. FINISH ON THE PATCH SHALL BE COMPATIBLE WITH SURROUNDING CONCRETE... PATCH AREA SHALL BE PROTECTED FROM PREMATURE DRYING AND EXCESSIVELY HOT OR COLD TEMPERATURES AS REQUIRED BY ACI 308R AND ACI 308R BY THE AMERICAN CONCRETE INSTITUTE, CURRENT EDITION.
5. ALL UNSOUND PATCHES AND DEFECTIVE WORK NOT COMPLYING WITH THE STANDARDS HEREIN SET SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.

VERTICAL AND OVERHEAD SPALL REPAIR: WORK ITEM #5

- (TROWEL APPLIED OR FORMED AND POURED)
(INCLUDES DECK, BEAM, COLUMN AND CURB SPALL REPAIRS)
1. REFER TO WORK ITEMS #1 AND #2 FOR TYPICAL CONCRETE PREPARATION AND REPAIR NOTES.
2. PATCH THE REPAIR AREA WITH THE FOLLOWING MATERIALS:
a) "SIKATOP 123 - OVERHEAD/AND VERTICAL REPAIR MORTAR" BY SIKA CORPORATION.
b) "EMACO R350 - POLYMER MODIFIED, LIGHTWEIGHT VERTICAL AND OVERHEAD MORTAR" BY MASTER BUILDERS TECHNOLOGIES.
c) APPROVED EQUAL.
3. PATCH MATERIAL SHALL BE PLACED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS REGARDING SURFACE PREPARATION, MIXING, PLACEMENT AND FINISH, CURING, TEMPERATURE LIMITATIONS, ETC... CONCRETE, USE MIX AS PER NOTE FOR OVERHEAD REPAIR PATCHES DEEPER THAN 1-1/2". APPLY PATCH MATERIAL IN MORE THAN ONE LIFT AS RECOMMENDED BY THE MANUFACTURER... ALL FORMING SHALL CONFORM TO THE PROFILE OF THE EXISTING STRUCTURE.
4. FINISH ON THE PATCH SHALL BE COMPATIBLE WITH SURROUNDING CONCRETE... PATCH AREA SHALL BE PROTECTED FROM PREMATURE DRYING AND EXCESSIVELY HOT OR COLD TEMPERATURES AS REQUIRED BY ACI 308R AND ACI 308R BY THE AMERICAN CONCRETE INSTITUTE, CURRENT EDITION.
5. ALL UNSOUND PATCHES AND DEFECTIVE WORK NOT COMPLYING WITH THE STANDARDS HEREIN SET SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.

RANDOM CRACK REPAIR: WORK ITEM #6

- (INCIDENTAL - SEE NOTE 5)
1. LOCATE AND MARK CRACKS WHICH ARE WIDER THAN 1/32", HAVE FAILED JOINT SEALANT, SHOW EVIDENCE OF WATERSALT STAINS ALONG THE UNDERSIDE OF THE CONCRETE OR AS DIRECTED BY THE ENGINEER... ROUT CRACKS TO THE CROSS-SECTION SHOWN PER DETAIL 9/S3.0... REMOVE DAMAGED EXISTING SEALANT WHERE PRESENT.
2. AIR BLAST AND COMPLETELY CLEAN THE GROOVE BEFORE SEALING COMMENCES... USE AN AIR COMPRESSOR WITH A FUNCTIONING OIL TRAP... APPLY JOINT CLEANER, JOINT PRIMER, BOND BREAKING TAPE, SEALANT BACKER ROD, ETC. AS RECOMMENDED BY THE SEALANT MANUFACTURER.
3. THE SEALANT SHALL BE THE APPROVED PRODUCT LISTED BELOW:
a) "VULKEM 245-2 PART POURABLE POLYURETHANE SEALANT" BY MAMECO INTERNATIONAL.
b) "SL 2 - SELF LEVELING AND SLOPE GRADE POLYURETHANE SEALANT" BY SONNEBORN.
c) "SIKAFLEX-2CNS" BY SIKA CORPORATION.
d) "SONOLASTIC NP-2" BY SONNEBORN.
e) APPROVED EQUAL.
4. INSTALL SEALANT EVENLY AND RECESS 1/8" BELOW THE CONCRETE SURFACE... DO NOT OVERFILL THE GROOVE... FOLLOW THE MANUFACTURER'S RECOMMENDATION FOR PLACING, CURING, TEMPERATURE, ETC.
5. THESE REPAIR COSTS ARE INCIDENTAL TO AND SHALL BE INCLUDED IN WORK ITEM #9 TRAFFIC COATING (HEAVY DUTY).

DOUBLE-TEE JOINT REPAIR: WORK ITEM #7

- (INCIDENTAL - SEE NOTE 5)
1. LOCATE AND REMOVE THE ENTIRE LENGTH OF ALL DOUBLE-TEE JOINT SEALANT AND BACKER ROD AS INDICATED ON THE DRAWINGS.
2. LOCATE AND MARK THE AREAS OF DELAMINATED AND SPALLED CONCRETE ADJACENT TO THE JOINTS... RESTORE THE CONCRETE DELAMINATIONS AS PER WORK ITEM... PROVIDE OR TOOL A GROOVE FOR JOINT SEALANT RODS.
3. APPLY JOINT PRIMER AS RECOMMENDED BY THE SEALANT MANUFACTURER... COMPLY WITH MANUFACTURER'S RECOMMENDATION FOR BACKING RODS, MIXING, PLACING, CURING, TEMPERATURE, ETC.
4. THE SEALANT SHALL BE THE APPROVED PRODUCT LISTED BELOW:
a) A QUALITY URETHANE MATERIAL COMPATIBLE WITH THE SELECTED TRAFFIC COATINGS.
5. THESE REPAIR COSTS ARE INCIDENTAL TO AND SHALL BE INCLUDED IN WORK ITEM #9 TRAFFIC COATING (HEAVY DUTY).

EXPANSION JOINT REPLACEMENT: WORK ITEM #8

- 1. REMOVE THE ENTIRE LENGTH OF EXISTING EXPANSION JOINT AND MEASURE GAP FOR NEW JOINT... CONTRACTOR TO SIZE REPLACEMENT JOINT ALLOWING FOR TEMPERATURE MOVEMENT.
2. MARK AND REPAIR DELAMINATED OR SPALLED CONCRETE.
3. ENGINEER TO REVIEW JOINT SELECTION AND TEMPERATURE / MOVEMENT CALCULATIONS PRIOR TO INSTALLATION.
4. EXPANSION JOINT SHALL BE THE APPROVED PRODUCT LISTED BELOW:
a) WABOCRETE MEMBRANE ME 300 BY WATSON BOWMAN
b) OR APPROVED EQUAL.

TRAFFIC COATING APPLICATION (HEAVY DUTY): WORK ITEM #9

- 1. REMOVE ALL LOOSE TRAFFIC MEMBRANE FROM THE TOPSIDE OF THE PARKING DECK & WALLS (IF ANY)... THE TRAFFIC MEMBRANE REMOVAL PROCEDURE SHALL BE IN COMPLIANCE WITH THE SEALER MANUFACTURER'S INSTRUCTIONS.
2. BY SHOT OR WATER BLASTING, REMOVE ALL SURFACE DIRT, GREASE AND OTHER CONTAMINANTS ACCORDING TO THE SEALER MANUFACTURER'S RECOMMENDATIONS... (CURBS SHALL BE SHOT, WATER, OR AIR BLASTED)
3. ALL DAMAGED JOINT SEALANTS RESULTING FROM THE SURFACE PREPARATION SHALL BE REPAIRED AND RESTORED TO ENGINEER'S SATISFACTION AT THE CONTRACTOR'S COST.
4. LOCATE ALL CRACKS WHICH ARE WIDER THAN 1/32", SEE W.I. #9 RANDOM DECK CRACK REPAIR... THESE REPAIR COSTS ARE INCIDENTAL TO AND SHALL BE INCLUDED IN THIS SECTION.
5. APPLY TRAFFIC COATING IN STRICT CONFORMANCE WITH THE MANUFACTURER'S INSTRUCTIONS REGARDING SURFACE PREPARATION, MIXING, APPLICATION, TEMPERATURE LIMITATIONS, CURING, ETC... ALL VERTICAL SURFACES (I.E. COLUMNS, WALLS, CURBS, STEEL PIPE RAILS, ETC.) SHALL BE COATED UP 4 INCHES MINIMUM, OR TO THE CURRENT LEVEL OF PROTECTION.
6. ACCEPTABLE TRAFFIC COATING PRODUCTS ARE:
a) AUTOGARD II, NEOGARD.
b) ISO-FLEX, LYMTAL INTERNATIONAL, INC.
c) SONOGARD VEHICULAR DECK SYSTEM BY SONNEBORN BUILDING PRODUCTS.
d) APPROVED EQUAL.
7. CONTRACTOR SHALL SUBMIT MANUFACTURE'S SPECIFICATIONS FOR TRAFFIC COATING PRIOR TO APPLICATION.
8. HEAVY DUTY TRAFFIC COATING SHALL CONSIST OF:
a) 25 WET MILIMETER BASE COAT
b) 20 WET MILIMETER INTERMEDIATE COAT
c) 20 WET MILIMETER TOP COAT
d) TOTAL COATING THICKNESS OF 65 MILIMETERS

DOUBLE-TEE WELD CLIP REPAIR: WORK ITEM #10

- 1. LOCATE ALL BROKEN WELD CLIPS BETWEEN DOUBLE-TEE PLANKS.
2. SANDBLAST ALL EXISTING STEEL AS REQUIRED REMOVING RUST.
3. PROVIDE NEW STEEL STOCK AND WELD PER TYPICAL DETAIL 2/S3.0
4. COAT NEW AND EXISTING STEEL PER WORK ITEM #2 (NOTE 10)
5. -SEE WORK ITEMS #4 AND #5 FOR RELATED WORK

DOUBLE-TEE LOAD TRANSFER PLATE REPAIR: WORK ITEM #11

- 1. LOCATE AND REPAIR LOAD TRANSFER PLATES AT EXISTING DOUBLE-TEE EXPANSION JOINTS AS REQUIRED.
2. WHERE APPLICABLE, AT FULL DEPTH REPAIR AREAS, THE NEW TRANSFER PLATES SHALL BE RE-BUILT AND INSTALLED WITH SLIP CONNECTION TO MATCH THE ORIGINAL STEEL PLATE AND REINFORCING BAR SIZE, LENGTH AND LOCATION.
3. SANDBLAST ALL STEEL AS REQUIRED REMOVING RUST.
4. WHERE APPLICABLE, AT SHALLOW DEPTH REPAIR LOCATIONS, NEW ALTERNATING STEEL LOAD TRANSFER CONNECTIONS SHALL BE FIELD INSTALLED AS PER TYPICAL DETAIL 10/S3.0
5. COAT NEW AND EXISTING STEEL PER WORK ITEM #2 (NOTE 10)
6. -SEE WORK ITEMS #4 AND #5 FOR RELATED WORK

REINFORCING STEEL MECHANICAL CONNECTORS: WORK ITEM #13

- 1. WHERE USE HAS BEEN DETERMINED BY ENGINEER, FIELD INSTALLED MECHANICAL SPLICE CONNECTIONS SHALL BE USED.
2. UNIT COST FOR THIS ITEM SHALL BE CALCULATED USING A COUPLERS SIZED FOR #5 BARS
3. MECHANICAL COUPLERS SHALL BE THE APPROVED PRODUCT LISTED BELOW:
a) LENTON LOCK S-SERIES
b) DAYTON SUPERIOR BAR-LOCK SERIES COUPLER SYSTEM
c) OR APPROVED EQUAL

VERTICAL CRACK REPAIR (EPOXY INJECTION): WORK ITEM #14

- (CONCRETE COLUMNS AND BEAMS)
1. WHERE DETERMINED TO BE OF PRACTICAL USE, LOCATE AND MARK ALL VERTICAL CRACKS IN CONCRETE COLUMNS AND BEAMS... NOTED ON PLANS, THAT ARE 5 MILS WIDE OR GREATER... THE ENGINEER SHALL VERIFY THE LINEAL FEET QUANTITY OF REPAIR WORK PRIOR TO APPLICATION.
2. THE SUPERVISOR AND APPLICATOR MUST HAVE COMPLETED THE MANUFACTURER'S INSTRUCTION PROGRAM IN USE AND METHODS IN RESTORING CONCRETE STRUCTURES UTILIZING THE EPOXY INJECTION PROCESS.
3. CONTRACTOR SHALL FURNISHING ALL LABOR, MATERIALS AND EQUIPMENT TO PERFORM ALL OPERATIONS IN CONNECTION WITH THE COMPLETE INSTALLATION OF THE PRESSURE INJECTED EPOXY
4. TEST AND PREPARE CRACKS DETERMINED FOR EPOXY INJECTION AS REQUIRED BY THE MANUFACTURER'S SPECIFICATIONS
5. CONTRACTOR SHALL ASSUME 3" MINIMUM CRACK DEPTH FOR EPOXY INJECTION AS BASIS FOR LINEAL FOOT QUANTITY COST.
6. MIX EPOXY IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.

PHYSICAL PROPERTIES:

- a) ELONGATION (ASTM D-639) 1.6%
b) TENSILE STRENGTH (ASTM D-639) 6,970 P.S.I (MIN.)
c) MODULUS OF ELASTICITY (ASTM D-638) 444,800
d) COMPRESSIVE STRENGTH (ASTM C109-75) 12,220
e) BOND STRENGTH, 7 DAYS @ 77°F (AASHTO T237-73) 7,380
7. BEFORE PROCESSING, SWEEP OR CLEAN AREA IN VICINITY OF CRACK LOCATION TO RECEIVE EPOXY AND LEAVE IN GENERALLY CLEAN CONDITION... JOINTS TO RECEIVE EPOXY... CLEAN IN MANNER SUCH THAT JOINTS ARE FREE FROM DIRT, LANTANCE, AND OTHER LOOSE MATTER... ACIDS AND CORROSIVES SHALL NOT BE PERMITTED FOR CLEANING.
8. SUBMIT MANUFACTURER'S DATA COMPLETELY DESCRIBING EPOXY INJECTION SYSTEM MATERIALS, A QUALITY CONTROL SUBMITTALS: B. CERTIFICATES OF COMPLIANCE, C. MANUFACTURER'S INSTRUCTIONS.
9. MANUFACTURERS - ONE OF THE FOLLOWING OR EQUAL:
a) BASF BUILDING SYSTEMS, INC. CONCRESSIVE STANDARD LVI.
b) SIKA CHEMICAL CORP.'S, SIKADUR 35, HI-MOD LV.
c) SIKA CHEMICAL CORP.'S, SIKADUR 52.
d) OR APPROVED EQUAL.
10. PROVIDE EPOXY MATERIALS THAT ARE NEW AND USE THEM WITHIN SHELF LIFE LIMITATIONS SET FORTH BY MANUFACTURER... WATER-INSENSITIVE TWO PART TYPE LOW VISCOSITY EPOXY ADHESIVE MATERIAL CONTAINING 100 PERCENT SOLIDS AND MEETING OR EXCEEDING FOLLOWING CHARACTERISTICS WHEN TESTED IN ACCORDANCE WITH STANDARDS SPECIFIED.
11. INSTALL AND CURE EPOXY MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS... PERFORM AND CONDUCT WORK OF THIS SECTION IN NEAT ORDERLY MANNER.

UNIT QUANTITIES, CALCULATIONS AND INSPECTION:

- 1. THE ESTIMATED QUANTITIES LISTED IN THE BID CALCULATION TABLE BELOW ARE BASED ON FIELD OBSERVATIONS AND SOUNDINGS AS DETERMINED BY THE NORTHLAND CONSULTING ENGINEERS WITHOUT THE USE OF DESTRUCTIVE ANALYSIS.
2. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE FINAL WORK ITEM QUANTITIES.
3. AFTER WORK ITEMS HAVE BEEN DEFINED, QUANTITIES MUST BE CALCULATED JOINTLY BY REPRESENTATIVE OF THE CONTRACTOR AND THE OWNER PRIOR TO ANY INSTALLATION OF NEW REPAIR MATERIALS... THESE QUANTITIES WILL BE THE SOLE BASIS FOR PAYMENT TO THE CONTRACTOR.
4. EXPOSED REPAIR WORK MUST BE INSPECTED AND APPROVED BY THE ENGINEER PRIOR TO ANY INSTALLATION OF NEW REPAIR MATERIALS.

MATERIAL TESTING:

AT THE OWNER'S EXPENSE AN INDEPENDENT TESTING LABORATORY SHALL BE EMPLOYED TO PERFORM COMPRESSION STRENGTH TESTING (AT 3, 7 AND 28 DAYS) ON THE CONCRETE AND PATCH MATERIAL CYLINDERS IN ACCORDANCE WITH ASTM C31 AND ASTM C39.

BIDDING:

- 1. INCLUDED IN PART OF THE CITY OF DULUTH "REQUEST FOR BIDS" SPECIFICATIONS AND DOCUMENTS AND USING THE ESTIMATED QUANTITIES IN THE TABLE LISTED BELOW, THE CONTRACTOR SHALL SUBMIT A LUMP SUM BID USING THE "BID COMPUTATION SCHEDULE."

TOTAL ESTIMATED QUANTITIES

Table with 5 columns: WORK ITEM, DESCRIPTION, UNIT, QUANTITY, UNIT COST, EXTENDED COST. Rows include CONCRETE SURFACE PREPARATION, CONCRETE SPALL REPAIR PREPARATION, FULL DEPTH DECK REPAIR, HORIZONTAL SHALLOW DEPTH SPALL REPAIR, VERTICAL AND OVERHEAD SPALL REPAIR, RANDOM CRACK REPAIR, DOUBLE-TEE JOINT REPAIR, EXPANSION JOINT REPLACEMENT, TRAFFIC COATING APPLICATION (HEAVY DUTY), DOUBLE-TEE WELD CLIP REPAIR, DOUBLE-TEE LOAD TRANSFER PLATE REPAIR, REINFORCING STEEL REPLACEMENT, REINFORCING STEEL MECHANICAL CONNECTORS, VERTICAL CRACK REPAIR (EPOXY INJECTION), CONCRETE SLAB ON GRADE, EXISTING CONCRETE CURB REMOVAL.

NOTES:

- 1. NOTATIONS:
db : NOMINAL BAR DIAMETER (INCHES)
Ld : TENSION DEVELOPMENT LENGTH (INCHES) FOR REINFORCEMENT SATISFYING THE FOLLOWING REQUIREMENTS:
SLABS AND WALLS: CLEAR SPACING > 2 db, AND CONC. CLEAR COVER > db
BEAMS AND COLUMNS: CLEAR SPACING > db, AND CONC. CLEAR COVER > db
L1 : DEVELOPMENT LENGTH OF TOP BARS IN TENSION = 1.3 x Ld (INCHES)
L2 : DEVELOPMENT LENGTH OF BARS OR DOWELS IN COMPRESSION = 19 x db (INCHES)
L3 : TIED COLUMN LAP SPLICE IN COMPRESSION = 30 x db (INCHES)
Lc : SPIRAL COLUMN LAP SPLICE IN COMPRESSION = 22.5 x db (INCHES)
Ldb : TENSION LAP SPLICE LENGTH FOR OTHER THAN TOP BARS = 1.3 x Ld (INCHES)
Ldb1 : TENSION LAP SPLICE LENGTH OF TOP BARS = 1.7 x Ld (INCHES)
2. MULTIPLY VALUES IN THE TABLE BY 1.5 IF CLEAR SPACING OR CONCRETE COVER DO NOT MEET THE REQUIREMENTS FOR LD IN NOTE 1.
3. TOP BARS: HORIZONTAL BEAM REINFORCING WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW.
4. THE DEVELOPMENT AND SPLICE LENGTHS ARE BASED ON REINFORCEMENT STRENGTH Fy = 60 KSI
#14 AND #18 BARS SHALL NOT BE LAP SPLICED, SEE GENERAL NOTES.
6. MULTIPLY VALUES IN THE TABLE BY 1.33 FOR USE WITH LIGHTWEIGHT AGGREGATE CONCRETE.

CONCRETE SLAB ON GRADE: WORK ITEM #15

- 1. SAW CUT AND REMOVE EXISTING CONCRETE SLAB ON GRADE TO THE EXTENT SHOWN ON PLANS.
2. INSTALL NEW CONCRETE SLAB ON GRADE AND PREPARE SUBGRADE SURFACE PER DETAIL 8/S3.0
3. CONTRACTOR SHALL PROVIDE CONTROL JOINT PER DETAIL 8A/S3.0
4. NEW CONCRETE SLAB ON GRADE SHALL MATCH ADJACENT EXISTING SLAB / CURB ELEVATIONS.
5. UNIT COST FOR THIS ITEM SHALL BE CALCULATED PER CUBIC YARD OF PLACED CONCRETE (INCLUDING REINFORCING)

EXISTING CONCRETE CURB REMOVAL: WORK ITEM #16

- 1. EXISTING CONCRETE ISLAND CURBS TO BE REMOVED.
2. EXISTING CONCRETE DECKS AS REQUIRED MATCHING ADJACENT SURFACES. SEE PLANS FOR EXTENT.
2. SEE DETAILS 6/S3.0 AND 7/S3.0 FOR ADDITIONAL INFORMATION.
3. THE OWNER SHALL REMOVE EXISTING PARKING METERS.
4. CONTRACTOR SHALL SALVAGE EXISTING STEEL EXPANSION JOINT COVERS FOR RE-USE. SEE PLAN FOR LOCATIONS.

Table with 2 columns: SHEET INDEX, SHEET NUMBER. Rows include S1.0 STRUCTURAL NOTES / WORK ITEM NOTES / QUANTITIES, S2.0 RAMP FRAMING PLAN (BELOW), S2.1 RAMP DECK REPAIR PLAN, S3.0 SECTIONS AND DETAILS.

Northland Consulting Engineers L.L.P. logo and contact information: 1507752005, 1507752778.

CITY OF DULUTH logo and address: 2011 LIBRARY RAMP RENOVATION, 600 BLOCK WEST MICHIGAN STREET, DULUTH, MINN.

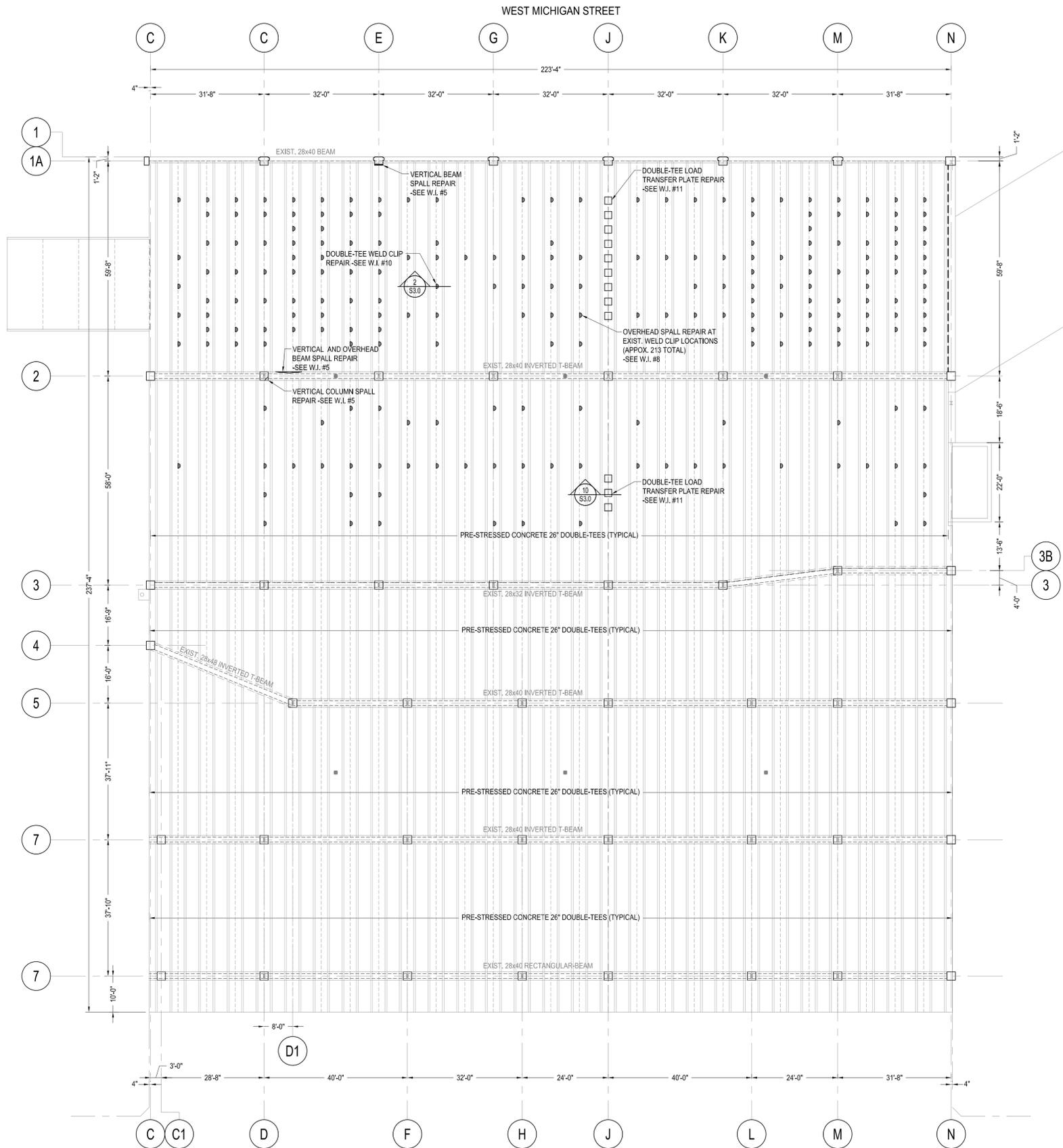
Professional Engineer signature: John R. Woodworth, Reg. #: 19543.

NCE Project # 11-255
Date: September 28, 2011
Drawn By: GDB
Checked By: JRW

Revisions:

NOTES EST. QUANTITIES SHEET INDEX sheet title sheet number S1.0

1 S1.0 TYPICAL REINFORCING BAR DEVELOPMENT AND SPLICE LENGTH TABLES NOT TO SCALE



1 RAMP FRAMING PLAN
S2.0 1/16"=1'-0"



I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

 Engineer - John R. Woodworth Reg. #: 15943

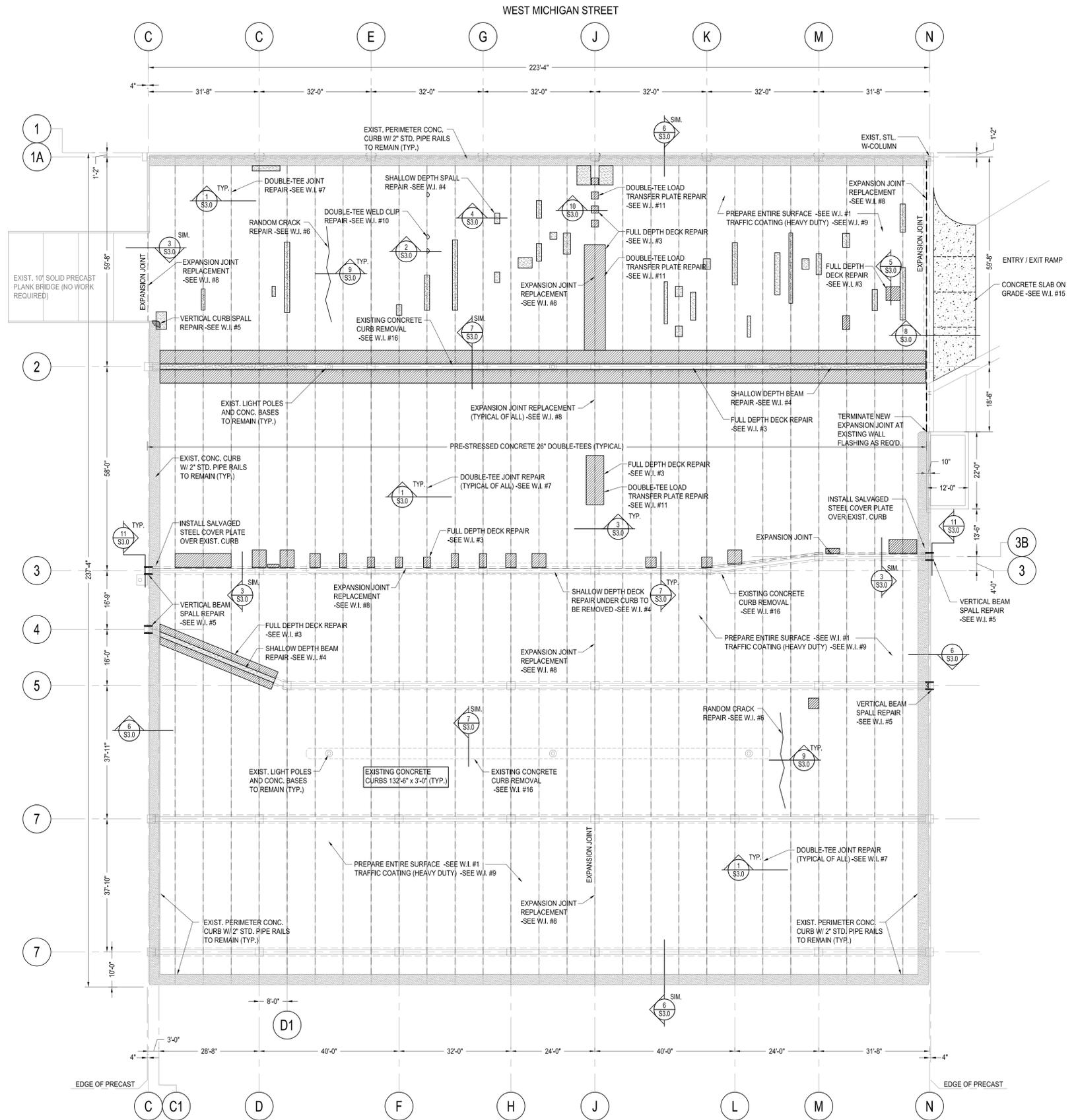
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FRAMING PLAN

sheet
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 sheet
 number

S2.0



1 RAMP DECK PLAN
S2.1 1/16"=1'-0"

- FULL DEPTH CONCRETE DECK REPAIR
- SHALLOW DEPTH SPALL REPAIR
- VERTICAL / OVERHEAD SPALL REPAIR



Project Name:

I hereby certify that this plan, specification, or record was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

John R. Woodworth
Engineer - John R. Woodworth
Reg. #: 19643

NCE Project # 11-255

Date: September 28, 2011

Drawn By: GDB

Checked By: JRW

Revisions:

RAMP DECK PLAN

sheet
title
sheet
number

S2.1

