

STRUCTURAL NOTES

GENERAL

- 1 THE CONTRACT DRAWINGS HAVE BEEN PREPARED FOR THE PURPOSE OF INDICATING TO BIDDERS THE GENERAL TYPE OF CONSTRUCTION OR ALTERATION
 - 2 ALL DIMENSIONS AND CONDITIONS OF EXISTING STRUCTURES CONTROLLING NEW CONSTRUCTION SHALL BE VERIFIED IN THE FIELD PREPARE SHOP DRAWINGS BASED ON THE ACTUAL FIELD CONDITIONS
 - 3 ANY PORTION OF EXISTING WORK WHICH IS REMOVED, DISTURBED OR DAMAGED IN THE COURSE OF INSTALLATION OF NEW WORK SHALL BE RESTORED TO A CONDITION AS GOOD AS THAT EXISTED BEFORE THE COMMENCEMENT OF THE WORK
 - 4 ELEVATIONS INDICATED REFER TO NEW YORK CITY TRANSIT AUTHORITY DATUM. THE NEW YORK CITY TRANSIT AUTHORITY DATUM IS ELEVATION 100 WHICH IS 265.3 FEET ABOVE MEAN SEA LEVEL AT SANDY HOOK UNITED STATES COAST AND GEODETIC SURVEY DATUM
- CONCRETE**
- 1 CONCRETE SHALL BE AS SPECIFIED IN THE SPECIFICATIONS. THE COMPRESSIVE STRENGTH SHALL NOT BE LESS THAN 4000 PSI WHEN TESTED AT TWENTYEIGHT (28) DAYS UNLESS OTHERWISE NOTED. CONCRETE SHALL BE AIR ENTRAINED
 - 2 STEEL REINFORCEMENT BARS SHALL CONFORM TO ASTM A635 GRADE 60 WELDED WIRE FABRIC. WIRE REINFORCEMENT SHALL CONFORM TO ASTM A635 STEEL STUDS SHALL CONFORM TO ASTM A498. ALL REINFORCING BARS AND WIRE SHALL BE EPOXY COATED
 - 3 ALL CORNERS OF CONCRETE COLUMNS AND BEAMS AND CONCRETE ENCASMENT OF STEEL COLUMNS AND BEAMS ARE TO HAVE A CHAMFER UNLESS OTHERWISE NOTED
 - 4 PRIOR TO PLACEMENT OF NEW CONCRETE AGAINST EXISTING CONCRETE STRUCTURE THE EXISTING STRUCTURE SHALL BE CLEANED TO SOUND CONCRETE AND ALL FOREIGN OBJECTS REMOVED. APPLY BONDING AGENT TO EXISTING CONCRETE BEFORE PLACING NEW CONCRETE
 - 5 SUBMIT SHOP DRAWINGS SHOWING LOCATIONS OF ALL CONSTRUCTION JOINTS AND DETAILS OF SEAR KEYS FOR REVIEW AND APPROVAL OF THE ENGINEER
 - 6 SHOP DRAWINGS FOR REINFORCING BARS SHALL INCLUDE SPACE LENGTHS AND LOCATION EMBEDMENT LENGTH AT SUPPORTS AND CONCRETE COVER THICKNESS
 - 7 REMOVAL OF ALL EXISTING CONCRETE SHALL BE INITIATED BY SAW CUT
 - 8 ANCHOR BOLTS IN CONCRETE SHALL BE ASTM A36 UNLESS OTHERWISE NOTED
- STEEL**
- 1 WELDES STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM SERIAL DESIGNATION A992 GRADE 50 FOR OTHER SHAPES SUCH AS ANGLES CHANNELS PLATES ETC. STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A572 GRADE 50 UNLESS OTHERWISE NOTED
 - 2 ALL CONNECTIONS UNLESS OTHERWISE NOTED SHALL BE MADE WITH ASTM A325 OR A490 HIGH STRENGTH BOLTS. BOLT DIAMETER SHALL BE UNLESS OTHER SIZES ARE SHOWN OR ARE NECESSARY AND APPROVED. WEB REINFORCEMENT PLATES SHALL BE USED ON BEAMS. GIRDERS AND COLUMNS AS REQUIRED BY AUTHORITY'S STRUCTURAL DESIGN GUIDELINES AND/OR STANDARD DETAILING PRACTICE
 - 3 WHERE BEAM REACTIONS OR CONNECTION DETAILS ARE NOT SHOWN, BEAM CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE LESSER OF 50 PERCENT OF THE TOTAL UNIFORM LOAD CAPACITY OF THE BEAM IN FLEXURE, LATERALLY SUPPORTED OR THE SHEAR CAPACITY OF THE WEB. ALL CONNECTIONS SHALL HAVE A MINIMUM OF TWO BOLTS
 - 4 BOLTED CONNECTION SHALL BE SLP CRITICAL CLASS A SURFACE FULLY PRESTENSIONED THREADS SHALL BE EXCLUDED FROM SEAR PLANE DENSITY AREAS OF SHOP AND FIELD BOLTING
 - 5 DESIGN WELDED CONNECTIONS IN ACCORDANCE WITH THE LATEST EDITION OF AWS D11. BOTH SHOP AND FIELD WELDS SHALL BE SHOWN ON SHOP DRAWINGS BY STANDARD WELDING SYMBOLS IN ACCORDANCE WITH AWS D1.1. SHOP AND ERECTION DRAWINGS SHALL SHOW LOCATION, TYPE, SIZE AND EXTENT OF THE WELD
 - 6 SHOP DRAWINGS SHALL INCLUDE ALL SHOP AND ERECTION DETAILS INCLUDING CUTS, CORES, CONNECTIONS, HOLES, BOLTS AND WELDS IN THE STRUCTURAL STEEL
 - 7 CORES, BLOCKS, REINFRANT CUTS SHALL HAVE 1 MINIMUM RADIUS FILETS
 - 8 THE ENDS OF BEAMS AND COLUMNS IN BEARING SHALL BE MILLED
 - 9 ALL STEEL MEMBERS ENCASED IN CONCRETE SHALL HAVE CLIPS OR WIRE MESH WRAPPING IN CONFORMANCE WITH THE SPECIFICATIONS
 - 10 IT WILL BE SATISFACTORY TO USE STEEL MEMBERS OTHER THAN THOSE INDICATED PROVIDED THE MEMBERS ARE SUITABLE AS DETERMINED BY THE ENGINEER AND THE COST OF CONSTRUCTION IS NOT INCREASED THEREBY
 - 11 WHERE INDICATED PROVIDE NELSON STUDS AS MANUFACTURED BY NELSON STUD WELDING COMPANY OR APPROVED EQUAL STUDS SHALL CONFORM TO ASTM A498. STUDS MAY BE FILET WELDED AS PER AWS D11 SECTION 7
 - 12 EXISTING CORRODED STRUCTURAL STEEL AFFECTED BY THE NEW CONSTRUCTION OR AS INDICATED IN THE CONTRACT DRAWINGS SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER AND PAINTED AS PER SPECIFICATIONS. SUBMIT SHOP DRAWINGS INDICATING THE METHOD AND DETAILS OF REPAIRING OR REPLACING CORRODED STEEL FOR THE ENGINEERS APPROVAL
 - 13 EXISTING RIVETS THAT INTERFERE WITH THE NEW CONSTRUCTION SHALL BE REMOVED AND REPLACED WITH THE SAME SIZE HIGH STRENGTH BOLTS

- 14 WHERE EXISTING HOLES ARE TO BE USED IN THE INSTALLATION OF NEW WORK, THEIR LOCATIONS AND SPACING SHALL BE FIELD VERIFIED BEFORE FABRICATION OF NEW STEEL WORK. THE EXISTING HOLES SHALL BE REAMED IF NECESSARY TO WITHIN AISC GUIDELINES. IF UNUSED HOLES ARE VISIBLE THEY SHALL BE FILLED WITH HS BOLTS WHERE THESE BOLTS IN UNUSED HOLES COULD CAUSE INTERFERENCE PROBLEMS. SUCH HOLES SHALL BE PLUG WELDED AND GROUND SMOOTH

PAINING

- 1 PAINT ALL NEW STEEL EXCEPT AS PROVIDED HEREIN
- 2 PAINT EXISTING STEEL ON ALL SURFACES TO A DISTANCE OF 6" ALL AROUND IN THE VICINITY OF NEW WORK. ALL STEEL EXPOSED DURING REMOVALS THAT WILL REMAIN EXPOSED SHALL BE PAINTED
- 3 THE FOLLOWING STEEL SURFACES SHALL NOT BE PAINTED
 - a STEEL MEMBERS ENCASED IN CONCRETE OR STEEL SURFACES TO BE IN CONTACT WITH CONCRETE
 - b CONTACT SURFACES OF MILLED ENDS OF COMPRESSION MEMBERS
 - c CONTACT SURFACES FOR SLP CRITICAL TYPE CONNECTIONS
 - d CONTACT SURFACES FOR FIELD WELDING
- 4 ALL EXPOSED STEEL WHICH IS TO BE ENCLOSED AND WILL REMAIN UNACCESSIBLE AFTER THE COMPLETION OF THE WORK SHALL BE PAINTED WITH BRUNNEN'S PAINT
- 5 SPOT PAINT DAMAGED SURFACES AND UNPAINTED PORTIONS OF WELDED AND BOLTED CONNECTIONS IN THE FIELD AFTER ERECTION USING THE SAME PAINT SYSTEM AND ACCORDING TO THE MANUFACTURERS INSTRUCTIONS

SPECIAL CONSTRUCTION CONSIDERATIONS

- 1 ALL STRUCTURES HAVE BEEN DESIGNED TO RESIST THE DESIGN LOADS ONLY AS COMPLETED STRUCTURES. FULLY BRACE OR OTHERWISE PROTECT WORK IN PROGRESS UNTIL THE STRUCTURES ARE COMPLETED. ENSURE THAT CONSTRUCTION OPERATIONS AND PROCEDURES IMPOSE NO LOADINGS GREATER THAN THE DESIGN LOADS ON ANY MEMBER
- 2 PROTECT AND MAINTAIN THE AUTHORITY'S OPERATIONS WHICH WILL REMAIN ACTIVE DURING THE CONSTRUCTION OF THIS CONTRACT. SUBMIT DRAWINGS AND PROCEDURES SHOWING THE DETAILS AND METHODS TO PROTECT MAINTAIN AND IF NECESSARY SUPPORT THE EXISTING WORK
- 3 PROVIDE WATERIGHT SHIELDING IN THE WORK AREAS TO PROTECT THE RONG PUBLIC AUTHORITY'S PERSONNEL AND EQUIPMENT. DESIGN THE SHIELDING IN ACCORDANCE WITH THE AUTHORITY'S FIELD DESIGN STANDARDS. SUBMIT DESIGN CALCULATIONS AND DRAWINGS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF NEW YORK
- 4 MAINTAIN PROTECT AND IF NECESSARY RELOCATE EXISTING UTILITIES AND EQUIPMENT. NOTIFY THE ENGINEER 48 HOURS IN ADVANCE OF ANY WORK ON OR IN THE VICINITY OF ANY DUCT LINES. USE HAND EXCAVATION TO DETERMINE THE EXACT LOCATION OF ALL UTILITIES. INSULATE ALL CONSTRUCTION EQUIPMENT TO AVOID ACCIDENTAL GROUNDING
- 5 PROVIDE AND INSTALL TEMPORARY SUPPORT OR BARRICADE SYSTEM AS REQUIRED. INSTALL THIS WORK WITHOUT INTERFERENCE WITH OR ENCROACHMENT ON CLEARANCES REQUIRED FOR RAILROAD OPERATIONS. SUBMIT PROCEDURE DESIGN CALCULATIONS AND DRAWINGS FOR THE PROPOSED TEMPORARY SYSTEMS FOR THE APPROVAL OF THE ENGINEER
- 6 WHEN EXISTING ELEMENTS SUCH AS RAILINGS, WIND SCREENS AND CATWALKS ETC. ARE REMOVED IN ORDER TO PERFORM THE WORK, PROVIDE TEMPORARY PROTECTIVE ELEMENTS. RESTORE ALL SUCH ELEMENTS AFTER COMPLETION OF THE WORK
- 7 EXISTING STRUCTURAL BRACING MEMBERS INTERFERING WITH THE NEW CONSTRUCTION SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE ENGINEER. SUBMIT SHOP DRAWINGS SHOWING THE PROPOSED DETAILS AND METHOD OF REPLACING THE BRACING MEMBERS
- 8 PRIOR TO DISTURBING THE EXISTING TRACK OBTAIN FROM NEW YORK CITY TRANSIT THE GEOMETRY CAR PRINTOUT OF THE EXISTING TRACK GEOMETRY

NOTES TO DESIGNER

- 1 IF THE CONTRACT DOES NOT AFFECT THE TRACKS IN ANY WAY DELETE NOTE 8 UNDER SPECIAL CONSTRUCTION CONSIDERATIONS
- 2 WHEN REPLACING RIVET OR REINFORCING EXISTING MEMBERS CALL FOR A36 STEEL
- 3 EDIT NOTE 3 UNDER STEEL WHEN USING COMPOSITE DESIGN FOR COMPOSITE DESIGN THE ACTUAL BEAM REACTIONS MUST BE GIVEN IN THE CONTRACT DRAWINGS
- 4 DELETE NOTES TO DESIGNER BOX

REVISION	DESCRIPTION	DATE	APPROVED

 <p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>STRUCTURAL ENGINEERING</p>	<p>New York City Transit Authority</p> <p>REFERENCE DRAWING</p> <p>STRUCTURAL NOTES</p> <p>SHEET-1</p>	DRAWN BY: _____	DATE: _____
		DESIGNED BY: _____	DRAWING NO.: RC-1001
		CHECKED BY: _____	REVISION: _____
		APPROVED BY: _____	_____

LEVATED LINE CONTRACTS

SPECIAL CONSTRUCTION CONSIDERATIONS

1. IN ORDER TO PROTECT AND MAINTAIN THE TRAFFIC, THE CONTRACTOR SHALL PROVIDE WATERIGHT SHIELDING OVER THE MEZZANINE DURING THE THRU SPAN WORK. THE CONTRACTOR SHALL DESIGN THE SAID SHIELDING AND SUBMIT THE DESIGN CALCULATIONS AND DRAWINGS FOR THE ENGINEER'S APPROVAL BEFORE THE START OF WORK. ALL SUBMITTALS SHALL BE SEALED BY PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN NEW YORK STATE.
- DIFFERING CONDITIONS OF WORK MAY BE ENCOUNTERED IN THE THRU SPAN GIRDER AREAS. THEY INCLUDE:
 - a) DIFFERENCE IN STIFFENER ORIENTATION FROM THAT SHOWN IN THE DRAWINGS.
 - b) PENETRATIONS AND CONDUITS PASSING THROUGH THE WEB.
 - c) ATTACHED PLATES AND ANGLES.
 - d) CONCRETE ON THE FAR SIDE OF THE GIRDERS.
 THE CONTRACTOR SHALL PREPARE DETAILS TAKING INTO CONSIDERATIONS OF THESE CONDITIONS.
2. ALL ACTIVE TRACKS ADJACENT TO EXCAVATION SHALL BE MAINTAINED AND PROTECTED. THE CONTRACTOR SHALL SUBMIT DRAWINGS SHOWING METHOD OF SUPPORTING THE TRACKS.
3. REMOVE EXISTING HANDRAILS, CUT TIES AND PLANKING AS REQUIRED AND REPLACE WITH NEW, IF NECESSARY, AFTER COMPLETION OF CONSTRUCTION.

SIGNAL ENCLOSURES

1. THE FLOORS OF ALL CENTRAL INSTRUMENT ROOMS AND OTHER SIGNAL ENCLOSURES SHALL BE LEVEL. IT MAY BE NECESSARY TO PROVIDE SHIMS UNDER BEAMS TO ACHIEVE A LEVEL FLOOR. USE FILLER PLATES WHEN THE GAP BETWEEN FLOOR BEAMS AND THEIR SUPPORTING MEMBERS IS LESS THAN 4 INCH AND USE PIECES OF WIDE FLANGE BEAMS AS FILLER FOR GAP MORE THAN 4 INCH. PROVIDE MINIMUM OF FOUR BOLTS AT EACH FILLER LOCATION.
2. CLEAR TREES AND UNDERGROWTH, OF AND ADJACENT TO THE AREAS OF CONSTRUCTION AS REQUIRED AND AS SHOWN IN THE SPECIFICATIONS. LIMIT REMOVAL TO THREE FEET BEYOND EXCAVATION LINE. RESTORE GRADES DISTURBED DUE TO NEW WORK TO SAME AS EXISTED PRIOR TO CONSTRUCTION FOR PROPER DRAINAGE.

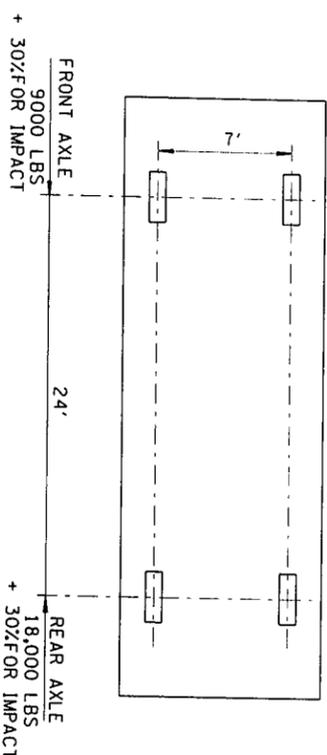
BUS DEPOTS

1. DESIGN AND CONSTRUCTION SHALL CONFORM TO THE "BUILDING CODE OF THE CITY OF NEW YORK" WITH ITS REFERENCE STANDARDS AND "AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) SPECIFICATIONS FOR DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2. CONSTRUCTION OF THIS DEPOT SHALL BE TYPE 2 CONSTRUCTION, AS SPECIFIED IN SECTION 1-2 OF THE MANUAL OF STEEL CONSTRUCTION (NINTH EDITION) BY AISC.
3. THE CONTRACTOR SHALL MAINTAIN AND PROTECT ALL EXISTING FOUNDATION AND STEEL STRUCTURE DURING CONSTRUCTION.

*** DEPOT LOAD SCHEDULE**

AREA	LIVE LOAD	SLAB	HANGING LOAD
EDR	250 PSF + 5K CONCENTRATED LOAD	125 PSF	20 PSF
FIRST FLOOR	150 PSF OR BUS WHEEL LOAD OR HS 20-44 TRUCK WHEEL LOAD	125 PSF	20 PSF
MEZZANINE FLOOR	150 PSF EXCEPT STORAGE AREAS & EDR'S	90 PSF	20 PSF
SECOND FLOOR	150 PSF OR BUS WHEEL LOAD	125 PSF	20 PSF
THIRD FLOOR BUS PARKING	150 PSF OR BUS WHEEL LOAD	125 PSF	20 PSF
TRANS. AREA	150 PSF	125 PSF	20 PSF
MAIN ROOF	150 PSF OR BUS WHEEL LOAD	125 PSF	20 PSF
ROOF OF TRANS. AREA	40 PSF	125 PSF	20 PSF
STAIRWELL ROOF	40 PSF	125 PSF	—
SERVICE PLATFORMS BETWEEN FLOORS	150 PSF	100 PSF	—
STORAGE ROOM	300 PSF	125 PSF	20 PSF

• TO BE MADE JOB SPECIFIC.



BUS LOADING DIAGRAM

ES/EST/STREF/RC1002

SPONSOR: I. MOTIWALA

WATER REMEDY WORK-GENERAL NOTES

- THE QUANTITIES OF ACTIVE LEAKS AND OTHER DEFECTS AS SHOWN BELOW ARE BASED ON THE BEST INFORMATION AVAILABLE. PRIOR TO START OF WORK, THE CONTRACTOR SHALL MAKE A JOINT INSPECTION WITH THE ENGINEER AND SUBMIT WRITTEN REPORTS OR DRAWINGS TO:
 - VERIFY THE LOCATION OF LEAKS AND OTHER DEFECTS.
 - DETERMINE THE MEASUREMENTS OF EACH INDIVIDUAL ITEM.
 - LOCATE NEW LEAKS AND DEFECTS REQUIRING REPAIRS AND PROVIDE MEASUREMENTS OF EACH ITEM.
- THE APPROXIMATE ESTIMATE OF THE QUANTITY OF DEFECTS IS AS FOLLOWS:

ITEM	QUANTITIES
SEALING ACTIVE LEAKS	LINEAR FEET
POLYURETHANE GROUT	GALLONS
SPALLED CONCRETE REPAIR	SQUARE FEET
SCRAPE AND PAINT STEEL	SQUARE FEET
DRIP PAN (3" DIA.)	SQUARE FEET
DRAIN PIPE	LINEAR FEET

THE APPROXIMATE ESTIMATE OF QUANTITIES IS BASED ON VISUAL EXAMINATION AT THE TIME OF DESIGN. THE QUANTITIES HAVE BEEN FACTORED TO TAKE INTO ACCOUNT THE FOLLOWING:

- LEAKS THAT HAVE TO BE CHASED.
- ERRORS/OMISSIONS IN INSPECTION.
- ADDITIONAL DEFECTS DEVELOPED SINCE INSPECTION.

A. ACTIVE LEAKS

- ACTIVE LEAKS SHALL BE SEALED WITH POLYURETHANE GROUT.
- ALL METAL AND PLASTIC DRIP PANS SHALL BE REMOVED TO INSPECT AND SEAL WATER LEAKS. WHERE LEAKS CANNOT BE SEALED THE DRIP PAN SHALL BE REPLACED.
- MIXING AND HANDLING OF THE CHEMICAL GROUT AND THE ACCELERATOR, WHICH ARE TOXIC AND HAZARDOUS UNDER NORMAL CONDITIONS, SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER AND ALL APPLICABLE SAFETY CODES TO SAFEGUARD WORKERS, TRANSIT AUTHORITY PERSONNEL AND THE GENERAL PUBLIC.
- THE WORK AREA SHALL BE ADEQUATELY VENTILATED BY PROVIDING A LOCAL EXHAUST SYSTEM, SUCH AS EXHAUST FANS.
- THE CONTRACTOR SHALL INFORM ALL HIS EMPLOYEES AND TRANSIT AUTHORITY PERSONNEL OF THE HEALTH HAZARD WHICH MAY BE CAUSED BY TOXIC CHEMICALS USED DURING THE CHEMICAL GROUTING WORK.
- WHEN NECESSARY, RESPIRATORY PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR TO WORKMEN AND TRANSIT AUTHORITY PERSONNEL.
- REMOVE ALL STALACTITES AND SEAL ACTIVE LEAKS BY CHEMICAL GROUTING.
- AN EXPERIENCED INSTALLER SHALL BE IN CHARGE OF ACTUAL GROUTING OPERATIONS, WHICH INCLUDES LOCATING THE PROPER POINTS OF DRILLING FOR PLACEMENT OF PACKERS. THE INTENT IS TO HAVE AN EXPERIENCED INSTALLER TO EFFECTIVELY STOP WATER LEAKS AS APPROVED BY THE ENGINEER.

B. SPALLED CONCRETE

- REPAIR SPALLED CONCRETE AS PER DETAILS SHOWN ON THE CONTRACT DRAWINGS.

C. CORRODED STEEL

- REMOVE LAMINATIONS ON STEEL MEMBERS. SCRAPE THE STEEL TO BRIGHT METAL AND PAINT.

SURFACE RESTORATION

IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION:

- REPLACE EXISTING SIDEWALK AREAS DISTURBED AS PER D.O.T. STANDARD (OUTSIDE OF DRIVEWAYS) INCLUDING PEDESTRIAN QUADRANTS.
- ALL PAVEMENT MARKINGS INCLUDING THERMOPLASTIC AND PAINTED LINES SHALL BE REPLACED IN KIND.
- RESTORE EXISTING ROADWAYS REMOVED OR DISTURBED.
- THE CONTRACTOR SHALL VERIFY ALL DETAILS FOR CONFORMITY WITH THE LATEST REQUIREMENTS OF THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION.
- CURBS DISTURBED SHALL BE REPLACED IN KIND. SIDEWALK AND ROADWAY DISTURBED SHALL BE REPLACED TO THE NEAREST SCORELINE.
- THE EXPANSION JOINTS OF THE CURB AND STEEL CURB FACING SHALL LINE UP WITH THE EXPANSION JOINTS OF THE CONCRETE SIDEWALKS.
- NO PIECE OF STEEL CURB FACING HAVING LESS THAN 2 WELDED DOWELS MAX. BE

FLOOR AND ROOF DECKING

- FLOOR AND ROOF DECK SHALL CONFORM TO THE LATEST AMERICAN IRON AND STEEL INSTITUTE PUBLICATION "SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL MEMBERS."
- THE DECK AND ACCESSORY SHEET METAL ITEMS SHALL BE COLD FORMED FROM STEEL SHEETS CONFORMING TO ASTM A448. BEFORE FORMING, THE STEEL SHEET SHALL BE COATED (GALVANIZED) WITH ZINC COATING BY THE HOT-DIP PROCESS CONFORMING TO ASTM A525.
- SHEET METAL WASHERS WITH $\frac{3}{4}$ " DIAMETER HOLES SHALL BE FURNISHED FOR HOLES IN PUDDLE WELDING STEEL DECK TO THE SUPPORTING STEEL.
- TWO INCH WIDE TAPE OF SUFFICIENT LENGTH TO TAPE AND SEAL ALL BUTT AND LAPPED JOINTS ON THE ROOF DECK SHALL BE FURNISHED.
- FOR THE PURPOSE OF SEALING THE SIDE LAPS BETWEEN ADJACENT SECTIONS OF DECKING, FACTORY APPLIED CAULKING COMPOUND (NON-SHRINKING) SHALL BE PROVIDED $1\frac{1}{2}$ " DEEP IN THE SIDE LAPS.
- THE STEEL DECKING UNITS SHALL BE FASTENED TO STEEL FRAMEWORK AT ENDS OF UNITS AND AT INTERMEDIATE SUPPORTS BY PLUG WELDS NOT LESS THAN $\frac{3}{4}$ " DIAMETER @ 12" C/C (MAX.) THROUGH WELDING WASHERS. WHEN TWO UNITS ABUT, EACH UNIT SHALL BE SO FASTENED TO THE STEEL FRAMING. PUDDLE AND SEAM WELDS SHALL BE PRODUCED BY BURNING HOLES AND LAYING ON THE WELD MATERIAL IN ONE CONTINUOUS OPERATION.
- WELDS SHALL BE FREE OF SHARP POINTS OR EDGES. DAMAGED PANELS SHALL BE REPLACED BY NEW PANELS ONLY.
- THE OPEN ENDS OF DECKING SHALL BE CLOSED OFF WITH RUBBER CLOSURE STRIPS.
- THE SIDE LAPS OF ADJACENT UNITS SHALL BE FASTENED BETWEEN SUPPORTS BY MEANS OF SEAM CLINCHING, METAL SCREWS OR STITCH WELDING.

ROOFING

- ROOFING SHALL BE API "ROOF-LOK" 0.048 IN. GALVANIZED STEEL PANELS OR I.A. APPROVED EQUAL. PANELS SHALL BE 12 IN. WIDE WITH A 2 $\frac{5}{8}$ " IN. HIGH VERTICAL LEG. WITH TWO 0.037 IN. STIFFENING RIBS EQUALLY SPACED.
- PANELS SHALL RECEIVE A FACTORY APPLIED FLUOROCARBON BAKED ENAMEL FINISH ON THE TOP SURFACE. COLOR TO BE SPARTAN BRONZE. UNDERSIDE OR BOTTOM SURFACE TO RECEIVE AN OFF-WHITE BAKED ACRYLIC FINISH ALL TRIM AND FLASHING TO BE MANUFACTURED FROM THE SAME MATERIAL AND FINISH AS CANOPY ROOF PANELS.
- STRUCTURAL STEEL THAT WILL BE INACCESSIBLE FOR PAINTING AFTER INSTALLATION OF NEW ROOFING SHALL BE PAINTED WITH BITUMINOUS PAINT.
- BUTTON PUNCH ROOF-LOK ROOFING AT HIGH POINT OF PURLIN TO PREVENT LONGITUDINAL SHIFTING. CLAWS SHALL BE OF 750 LBS CAPACITY TO BE SPACED AT 12 IN. O.C.
- SLOPE SHALL BE PROVIDED FOR CANOPIES AS EXISTING.
- FILLER PLATES SHALL BE PROVIDED AS REQUIRED.
- LEADERS AND GUTTERS SHALL BE PROVIDED AS SHOWN ON DRAINAGE DRAWINGS.
- IN THE INSTALLATION OF NEW ROOF, THE CONTRACTOR SHALL FOLLOW THE MANUFACTURER'S RECOMMENDATION, AS APPROVED BY THE ENGINEER.
- THE DIMENSIONS OF PLATFORMS, PASSAGEWAYS AND STAIRS CANOPY ROOFING ARE APPROXIMATE. THE CONTRACTOR SHALL SURVEY THE AREA AND SUBMIT SHOP DRAWINGS BEFORE THE START OF WORK.
- THE EXPANSION JOINTS IN THE ROOF SHALL BE PROVIDED AT THE SAME LOCATION AS EXISTING. THE CONTRACTOR SHALL SUBMIT DETAILS FOR APPROVAL.
- ALL NEW PURLIN ANGLES SHALL BE CONNECTED TO THE SUPPORT BY MEANS OF 3x3x $\frac{3}{8}$ " CLEAT ANGLES WITH MINIMUM OF 2 BOLTS.
- FLASHING SHALL BE SECURED BY 14"x $\frac{3}{4}$ " LONG S.S. "A" SCREW WITH NEOPRENE WASHER @ 12" O.C.
- CAULKING TAPE SHALL BE $\frac{1}{8}$ " x 1". CONTINUOUS METAL CLAD NEOPRENE CLOSURE BED SHALL BE PROVIDED WITH CAULK TO MAKE WATERTIGHT.

SECURITY FENCE

- IN AREA WHERE THE EXISTING SECURITY FENCE AT THE SITES ARE TO BE TEMPORARILY REMOVED, THE FENCE POSTS, WIRE MESHES, RAZOR RIBBON, ETC. SHALL CAREFULLY BE DISASSEMBLED, STORED AND RE-INSTALLED, THE DAMAGED OR CORRODED PARTS OF THE FENCE, IN THE JUDGEMENT OF THE ENGINEER, UNSUITABLE FOR RE-USE, SHALL BE SUBSTITUTED WITH NEW ONES.
- THE INSIDE FENCE SHOULD HAVE A MINIMUM OF 10'-0" CLEARANCE TO CENTER LINE OF ADJACENT RAILROAD TRACK OR ACCESS ROAD.
- MINIMUM DISTANCE BETWEEN INSIDE AND OUTSIDE FENCE IS 4'-6". PREFERABLY USE THE SAME DISTANCE AS THE EXISTING.
- ALL STEEL IN FENCE EXCEPT CHAIN LINK FABRIC SHALL BE GALVANIZED. CHAIN LINK FABRIC IS ALUMINIZED STEEL PER ASTM A-4911.
- MANUFACTURER SHALL SUBMIT HIS DESIGN CALCULATIONS OF THE CANTILEVER SLIDE GATE FOR THE ENGINEER'S REVIEW AND APPROVAL.

FLOOR PLATES (CHECKERED)

- FLOOR PLATES SHALL BE SKID RESISTANT RAISED PATTERN TYPE STANDARD TO THE M FROM WHICH OBTAINED. NO SPECIAL STEEL SPECIFICATION IS REQUIRED, EXCEPT THAT IT SHALL HAVE STRENGTH CHARACTERISTICS AT LEAST EQUIVALENT TO ASTM A36.
- CHECKERED PLATE NOSING AS REQUIRED ON STAIR TREADS SHALL BE FURNISHED FROM THE REGULAR STEEL MILL STOCK OF RAISED PATTERN STEEL PLATE.

ANCHOR STUDS

MATERIAL FOR ANCHOR STUDS SHALL BE NELSON STUDS AS MANUFACTURED BY NELSON STEEL WELDING COMPANY OR APPROVED EQUAL & SHALL CONFORM TO ASTM A108. STUDS MAY BE FILET WELDED AS PER AWS D 1.1, SECTION 4, PART F.

STEEL GRATING

- ALL BEARING BARS, CROSS BARS & BENT CONNECTING BARS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A569.
- GRATING SHALL BE PRESSURE LOCKED, RECTANGULAR DESIGN, STEEL TYPE F AS MANUFACTURED BY IKG INDUSTRIES OR APPROVED EQUAL. MAIN BARS SHALL BE 1 $\frac{1}{4}$ "x $\frac{3}{16}$ ", SPACED 1 $\frac{3}{16}$ " CENTER TO CENTER. CROSS BARS SHALL BE OF RECTANGULAR CROSS SECTION, FLUSH TOP AND SPACED 2" CENTER TO CENTER OR APPROVED EQUAL.
- GRATING SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
- GALVANIZED AREAS THAT REQUIRE TOUCH-UP DUE TO DAMAGE IN TRANSIT SHALL BE REPAIRED.
- GRATING SHALL BE ANCHORED TO STRUCTURAL MEMBERS BY MEANS OF SADDLE CLIPS, STUD BOLTS " IN. DIAMETER (WITH MATCHING NUTS AND WASHERS) WELDED TO THE SUPPORTING MEMBERS SHALL BE USED TO ANCHOR SADDLE CLIPS. SADDLE CLIP ANCHORS SHALL BE DESIGNED TO FIT OVER TWO BEARING BARS. PROVIDE NO LESS THAN TWO SADDLE CLIPS AT EACH SUPPORT FOR EACH PANEL. CLIP SHALL HAVE HOLES FOR WELDED STUD BOLTS.
- ALL CUTOUTS REQUIRED FOR ANY TYPE OF PENETRATION SHALL BE PROVIDED IN THE FLOOR GRATING. CUTOUTS FOR PENETRATIONS SHALL BE BONDED WITH " THICK PLATE PROJECTING 4" ABOVE THE FINISHED FLOOR & SET FLUSH WITH THE BOTTOM OF THE GRATING PANEL. CURB PLATES SHALL BE WELDED TO THE GRATING AT ALL LOCATIONS WHERE THE GRATING EXTENDS BEYOND THE EDGE OF THE SUPPORTING STEEL AND NO RAILING IS PROVIDED.
- CUTS FOR FOUR OR MORE BEARING BARS, NOT BEARING DIRECTLY OR SUPPORTING STEEL, SHALL BE PROVIDED WITH A STRESS BAND OF THE SAME SIZE AT THE BEARING BAR. NOTCHING OF BEARING BARS AT THE SUPPORTS TO MAINTAIN ELEVATIONS WILL NOT BE PERMITTED UNLESS NOTED ON THE DRAWING.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING ALL DETAILS OF FABRICATION AND ERECTION TO THE ENGINEER FOR APPROVAL.

STRUCTURAL NOTES

A. GENERAL

1. THESE CONTRACT DRAWINGS HAVE BEEN PREPARED FOR THE PURPOSE OF INDICATING TO BIDDERS THE GENERAL TYPE OF CONSTRUCTION OR ALTERATION.
2. ALL DIMENSIONS AND CONDITIONS OF EXISTING STRUCTURES CONTROLLING NEW CONSTRUCTION ARE TO BE SURVEYED AND VERIFIED BY THE CONTRACTOR IN THE FIELD. THE CONTRACTOR SHALL PREPARE SHOP DRAWINGS BASED ON THE ACTUAL FIELD CONDITIONS.
3. ANY PORTION OF EXISTING WORK WHICH IS REMOVED, DISTURBED, OR DAMAGED IN THE COURSE OF INSTALLATION OF NEW WORK SHALL BE RESTORED TO A CONDITION AS GOOD AS EXISTED BEFORE THE COMMENCEMENT OF THE WORK.
4. ELEVATIONS INDICATED REFER TO NEW YORK CITY TRANSIT AUTHORITY DATUM. THE NEW YORK CITY TRANSIT AUTHORITY DATUM IS ELEVATION 100.00, WHICH IS 2.653 FEET ABOVE MEAN SEA LEVEL AT SANDY HOOK, UNITED STATES COAST AND GEODETIC SURVEY DATUM.

B. CONCRETE

1. CONCRETE SHALL BE AS DESCRIBED IN THE SPECIFICATIONS. THE COMPRESSIVE STRENGTH SHALL NOT BE LESS THAN 4000 PSI WHEN TESTED AT TWENTY-EIGHT (28) DAYS, UNLESS OTHERWISE NOTED.
2. STEEL REINFORCEMENT RODS AND BARS SHALL CONFORM TO ASTM DESIGNATION A615, GRADE 60. STEEL STUDS SHALL CONFORM TO ASTM A108. WELDED WIRE FABRIC REINFORCEMENT SHALL CONFORM TO ASTM A185.
3. ALL CONCRETE SHALL BE AIR ENTRAINED.
4. APPLY CONCRETE BONDING AGENT TO EXISTING CONCRETE BEFORE POURING NEW CONCRETE. AND DETAILS OF SHEAR KEYS FOR REVIEW.
5. THE CONTRACTOR SHALL SUBMIT DRAWINGS SHOWING LOCATIONS OF CONSTRUCTION JOINTS AND CONSTRUCTION JOINTS MUST HAVE WATERSTOPS.
6. CONCRETE TO BE CUT SHALL BE SAW CUT ONLY.
7. ALL CORNERS OF CONCRETE COLUMNS & BEAMS AND CONCRETE ENCASUREMENT OF STEEL COLUMNS AND BEAMS ARE TO HAVE $\frac{3}{4}$ " CHAMFER, U.O.N.
8. ALL CONCRETE SHALL BE FLOAT FINISHED U.O.N.
9. ALL CONCRETE WALLS AND CEILING SHALL BE RUBBED FINISH.
10. ALL STEEL BEAMS & COLUMNS EXCEPT TROLLEY BEAMS) SHALL BE ENCASED IN CONCRETE WITH MIN. COVER OF 2".
11. EPOXY COATED BARS SHALL NOT BE USED.

C. STEEL

1. STRUCTURAL STEEL SHAPES ARE TO CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A992 AND ALL STRUCTURAL PLATES ARE TO CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A572 GR.50, UNLESS OTHERWISE NOTED.
2. STANDARD CONNECTIONS SHALL BE USED IN ACCORDANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION, ASD DESIGN, NINTH EDITION, UNLESS OTHERWISE NOTED. THE CONNECTION MUST BE SELECTED TO SUPPORT 75% OF THE TOTAL UNIFORM LOAD CAPACITY SHOWN IN THE ALLOWABLE UNIFORM LOAD TABLES, PART 2 OF THE MANUAL. FOR THE GIVEN BEAM, SPAN AND GRADE OF STEEL SPECIFIED, ALL CONNECTIONS SHALL HAVE TWO BOLTS MINIMUM, UNLESS OTHERWISE NOTED.
3. BOLTED JOINTS SHALL BE SLIP CRITICAL - CLASS A SURFACE. BOLTS ARE TO BE ASTM A490 SC AND FULLY PRETENSIONED. TENSION CONTROL BOLTS SHALL NOT BE USED.
4. ALL CONNECTIONS SHALL BE WITH $\frac{3}{4}$ " DIAMETER BOLTS UNLESS OTHERWISE NOTED.
5. COPES, BLOCKS & RE-ENTRANT CUTS SHALL HAVE 1" MINIMUM RADIUS FILLETS.
6. ENDS OF BEAMS AND COLUMNS IN BEARING ARE TO BE MILLED.
7. THE CHECKERED PLATE STAIR LANDING ARE TO BE SECURED TO THE SUPPORTING STEEL BY $\frac{3}{8}$ " COUNTERSUNK BOLTS @ 12" O.C. AROUND THE PERIMETER OF THE LANDING.
8. HAND RAILS AND POSTS SHALL BE 1 1/2" NOM. GALVANIZED STEEL PIPE AND ARE TO HAVE COMPLETE PENETRATION WELD. POSTS SHALL BE SPACED MAX. 4'-0" C/C TO HAVE COMPLETE PENETRATION WELD. POSTS SHALL BE SPACED MAX. 4'-0" C/C ARE TO BE BOLTED TO STRINGERS BY 2- $\frac{3}{4}$ " DIA. BOLTS.
9. HEIGHT OF RAILINGS SHALL BE 3'-6" FOR HORZ. RAILINGS, 2'-8" ABOVE THE NOSING LINE AT STAIRS, AND 11" FROM THE TOP OF THE SHIP LADDER STRINGER. LATTER IS MEASURED PERPENDICULAR TO THE STRINGER.
10. THERE SHALL BE TWO INTERMEDIATE RAILS FOR HORZ. RAILINGS, AND ONE FOR STAIR RAILINGS.

D. PAINTING

1. REFER TO SPECIFICATIONS FOR PAINTING REQUIREMENTS. EXISTING STEEL SHALL BE PAINTED AS PER SPECIFICATIONS ON ALL SURFACES TO A DISTANCE OF 6" ALL AROUND IN THE VICINITY OF NEW WORK. ALL STEEL EXPOSED DURING REMOVALS WHICH REMAINS EXPOSED SHALL BE PAINTED.
2. THE FOLLOWING STEEL SURFACES SHALL NOT BE PAINTED.
 - a. STEEL MEMBERS ENCASED IN CONCRETE OR STEEL SURFACES TO BE IN CONTACT WITH CONCRETE.
 - b. CONTACT SURFACES OF MILLED ENDS OF COMPRESSION MEMBERS.
 - c. CONTACT SURFACES FOR SLIP CRITICAL TYPE CONNECTIONS.
 - d. CONTACT SURFACES FOR FIELD WELDING.

3. ALL EXPOSED STEEL WHICH ARE TO BE ENCLOSED AND REMAIN INACCESSIBLE AFTER THE COMPLETION OF THE WORK SHALL BE PAINTED WITH BITUMINOUS PAINT.

E. SPECIAL CONSTRUCTION CONSIDERATIONS

1. MAINTAIN, PROTECT AND RELOCATE (IF REQUIRED) LIGHTING AND POWER CONDUITS, AIR PIPES, WATER LINES, WIRES (EXPOSED AND CONCEALED), AND SIGNAL/COMMUNICATION CABLES/EQUIPMENT DURING CONSTRUCTION. INSULATE ALL CONSTRUCTION EQUIPMENT TO AVOID ACCIDENTAL GROUNDING.
2. THE EXISTING DUCTS SHALL BE PROTECTED AND MAINTAINED DURING CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF ANY WORK ON OR IN THE VICINITY OF THE DUCT LINE. FOR ANY WORK DONE IN THE VICINITY OF THE DUCT LINES/UTILITIES, HAND EXCAVATION SHALL BE USED TO DETERMINE THEIR EXACT LOCATION.
3. PROVIDE TEMPORARY SUPPORT SYSTEM AS PER T. A. FIELD DESIGN STANDARDS AND BARRICADES, AS PER SPECIFICATION, WHERE NECESSARY. IT SHALL BE INSTALLED WITHOUT ANY INTERFERENCE WITH OR ENCRAGEMENT ON CLEARANCES REQUIRED FOR RAILROAD OPERATIONS AND IN CONFORMANCE WITH PERSONNEL CLEARANCE REQUIREMENTS OF NYCTA. CONTRACTOR SHALL SUBMIT PROCEDURE, DESIGN CALCULATIONS AND DETAILED DRAWINGS FOR THE COMPLETE PROPOSED TEMPORARY SUPPORT SYSTEM. ALL SUBMITTALS ARE TO BE SEALED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN NEW YORK STATE.
4. CONTRACTOR SHALL PROVIDE DUST PROOF, FIRE RETARDANT SHIELDS TO SEPARATE THE WORK AREA FROM THE OPERATION AREAS.
5. HOLES AND FERRULES SHALL BE PROVIDED IN WALLS, FLOOR AND ROOF WHERE NECESSARY FOR VARIOUS SERVICES AS INDICATED ON CONTRACT DRAWINGS.
6. FOR OTHER DETAILS OF WORKMANSHIP AND HOURS OF WORK, SEE SPECIFICATION.
7. WHEN EXISTING WORK SUCH AS RAILINGS, CATWALKS ETC. IS REQUIRED TO BE REMOVED, SUITABLE SUPPORTS SHALL BE PROVIDED FOR THE REMAINING WORK. THE NEW SUPPORTS SHALL BE SIMILAR TO THE EXISTING. THE CONTRACTOR IS REQUIRED TO SUBMIT SHOP DRAWINGS SHOWING THE DETAILS OF NEW SUPPORTS SHALL BE SEALED BY A PROFESSIONAL ENGINEER. ANY WORK REMOVED FOR ACCESS SHALL BE REPLACED IN KIND.
8. PRIOR TO ANY WORK WHICH WOULD DISTURB THE EXISTING TRACK STRUCTURE NOT SCHEDULED FOR RENEWAL UNDER THIS CONTRACT, THE CONTRACTOR IS REQUIRED TO OBTAIN FROM THE T.A. THE GEOMETRY CAR PRINTOUT OF THE EXISTING TRACK GEOMETRY. THE CONTRACTOR IS REQUIRED TO RESTORE THE TRACK GEOMETRY TO A CONDITION AT LEAST AS GOOD AS IT WAS BEFORE THE START OF WORK. THIS MAY REQUIRE SHIMMING EXISTING TRACK OR REMOVAL OF SHIMS FROM EXISTING TRACK.
9. ALL STRUCTURES HAVE BEEN DESIGNED TO RESIST THE DESIGN LOADS ONLY AS COMPLETED STRUCTURES. THE CONTRACTOR SHALL FULLY BRACE AND OTHERWISE PROTECT WORK IN PROGRESS UNTIL THE STRUCTURES ARE COMPLETED. THE CONTRACTOR SHALL ALSO INSURE THAT ITS OPERATIONS AND PROCEDURES PROVIDE NO LOADINGS GREATER THAN THE DESIGN LOADS ON ANY MEMBER.

F. WORKING AND SHOP DRAWINGS

GENERAL

1. REFER TO SPECIFICATIONS FOR WORKING AND SHOP DRAWING REQUIREMENTS.
2. SHOP DRAWINGS SHALL INCLUDE ALL SHOP AND ERECTION DETAILS INCLUDING CUTS, COPES, CONNECTIONS, HOLES, BOLTS AND WELDS IN THE STRUCTURAL STEEL.
3. SHOP DRAWINGS FOR REINFORCED CONCRETE SHALL INCLUDE SPLICE LENGTHS AND LOCATION, EMBEDMENT AT SUPPORTS AND CONCRETE COVER.

BOLTS

1. ALL UNFINISHED BOLTS, NUTS & THREADED FASTENERS FOR ANCHOR BOLTS & HANGER RODS SHALL CONFORM TO ASTM A307 GRADE A, SPECIFICATION FOR LOW CARBON STEEL EXTERNALLY & INTERNALLY THREADED STANDARD FASTENERS
2. ALL BOLTS EXPOSED TO WEATHER SHALL BE PAINTED OR GALVANIZED.

WELDING

ALL WELDS SHALL BE DESIGNED IN ACCORDANCE WITH LATEST EDITION OF AWS. BOTH SHOP AND FIELD WELDS SHALL BE SHOWN IN SHOP DRAWINGS BY STANDARD WELDING SYMBOLS, IN ACCORDANCE WITH AWS 2.0. SHOP AND ERECTION DRAWINGS SHALL SHOW LOCATION, TYPE, SIZE AND EXTENT OF THE WELD.

GALVANIZING

1. GALVANIZING SHALL MEET THE REQUIREMENTS OF ASTM A123 STANDARD SPECIFICATION FOR ZINC HOT GALVANIZED COATINGS.
2. TOUCH UP GALVANIZING - GALVANIZED AREAS REQUIRING TOUCH UP AT FIELD WELDS MADE DURING THE INSTALLATION OPERATIONS OR ON GALVANIZED STEEL MEMBERS THAT HAVE BEEN DAMAGED IN TRANSIT OR IN HANDLING SHALL BE REPAIRED IN ACCORDANCE WITH ASTM A780, ANNEX 2.

STEEL PIPE & STRUCTURAL TUBING

STEEL PIPE & STRUCTURAL TUBING SHALL CONFORM TO ASTM 501.

PIPE & TUBING SHALL BE PAINTED OR GALVANIZED IF EXPOSED TO WEATHER.

PIPE SLEEVES

PIPE SLEEVES IN WALLS & FLOORS SHALL CONFORM TO ASTM A120.

G. ANCHOR STUDS

1. MATERIAL FOR ANCHOR STUDS SHALL BE NELSON STUDS AS MANUFACTURED BY NELSON STUD WELDING COMPANY OR APPROVED EQUAL & SHALL CONFORM TO ASTM A108. ALL STUDS SHALL BE INSTALLED IN FIELD USING STUD-WELDING GUN PER AWS PROCEDURE. HOWEVER, ONLY IN CERTAIN SPECIAL SITUATIONS FILLET WELDING OF STUDS IN FIELD MAY BE PERMITTED. AFTER REVIEW OF SHOP DRAWINGS.

2. ALL FLOOR AND ROOF BEAMS SHALL HAVE SHOP-WELDED STUDS IN WEBS, AS TYPICALLY SHOWN IN DETAILS. STUDS ON BEAM FLANGES MAY BE FIELD WELDED. ALL STUDS SHALL BE SHOWN ON SHOP DRAWINGS FOR REVIEW.

ABBREVIATIONS

ARCH. - ARCHITECT	D.P.R. - DEPARTMENT	MAX. - MAXIMUM	T.O.S. - TOP OF STEEL
BM. - BEAM	OF PARKS & RECREATION	MH - MANHOLE	TYP. - TYPICAL
BOT. - BOTTOM		MIN. - MINIMUM	U.O.N. - UNLESS OTHERWISE NOTED
C.C. - CENTER LINE	DWG. - DRAWING	N.B. - NORTH BOUND	
C/C-CENTER TO CENTER	E.A. - EACH	N.T.S. - NOT TO SCALE	
COL. - COLUMN	E.F. - EACH FACE	NPC - NOT PER CONTRACT	
CONC. - CONCRETE	EL. - ELEVATION	O.C. - ON CENTER	
CONT. - CONTINUOUS	E.W. - EACH WAY	PROT. - PROTECTION	
DIA. - DIAMETER	EXIST. - EXISTING	PSF - POUNDS PER SQ. FT.	
DO - DITTO	EXP. - EXPANSION	R.L. - RIDGE LINE	
	FG - FIBERGLASS	S.B. - SOUTH BOUND	
	GALV. - GALVANIZED	S.S. - STAINLESS STEEL	
	GR. - GRADE	W.P. - WATERPROOFING	
	HYD. - HYDRAULIC		

UNIT STRESSES FOR NEW CONCRETE

DESIGN SHALL CONFORM TO THE "ACI STANDARD BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE." ACI 318-02 STRESSES AND STRAINS SHALL BE AS PER STRENGTH DESIGN METHOD.

UNIT STRESSES FOR STRUCTURAL STEEL

DESIGN SHALL CONFORM TO THE "AISC MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN, 9TH EDITION".

UNIT STRESSES FOR EXIST. STEEL AND CONCRETE

SEE SUPPLEMENTARY DRAWING.

REVISION	DESCRIPTION	DATE	APPROVED

 New York City Transit Authority		REFERENCE DRAWING STRUCTURAL NOTES AND ALLOWABLE STRESS SHEET 1 OF 2
DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT		
STRUCTURAL ENGINEERING		
DRAWN BY	DATE :	DRAWING NO.
DESIGNED BY		RC-1006
CHECKED BY		REVISION
APPROVED BY		

H. HATCHES (PERSONNEL OR EQUIPMENT)

- HATCH SHALL BE OF BILCO TYPE OR APPROVED EQUAL, SINGLE OR DOUBLE LEAF WITH LOCATION OF HINGES AS NOTED ON DRAWING.
 - HATCH DOOR LEAF COVER, FRAME AND EMBEDMENTS SHALL BE DESIGNED TO LIVE LOAD OF HS-25 LOADING AND AN UPLIFT FORCE OF 30 PSF. DOOR TO HAVE TWO LOCK.
 - UNLESS OTHERWISE NOTED, DOOR LEAF COVER AND FRAME SHALL BE HOT DIPPED GALVANIZED.
 - FRAME SHALL BE SECURED TO THE SUPPORT SYSTEM STEEL OR CONCRETE BY MEANS OF BOLTS, WELDS AND/OR STUDS (TO BE PROVIDED BY THE MANUFACTURER)
 - THE WHOLE UNIT SHALL BE SET WITH SLIGHT PITCH TOWARDS DRAIN.
 - IF NECESSARY, BLOCK UP AND SHIM THE FRAME TO ENSURE THAT THE DOOR RESTS EVENLY ON FRAME ALL AROUND AND LEVEL WITH SURROUNDING SURFACES.
 - SOUND PROOF:
- EQUIPMENT HATCHES TO HAVE MINERAL WOOL INSULATION ON THE UNDERSIDE OF THE COVERS OF 6-12" DENSITY, PROTECTED BY A COVER LINER OF 22 GA. STEEL OR .040" ALUMINUM SECURED TO THE REINFORCING MEMBERS. IN ADDITION, THERE SHALL BE GASKETS AROUND THE PERIMETER OF THE DOOR FRAME TO MINIMIZE THE PASSAGE OF SOUND THROUGH THE HATCHES.

I. ANCHORING SYSTEM FOR EXISTING CONCRETE AND CONCRETE BLOCK:

- EXISTING CONCRETE:
 - ANCHOR SHALL BE ADHESIVE TYPE UNLESS OTHERWISE NOTED.
 - ANCHOR ROD SHALL BE OF ASTM A36 STEEL WITH MATCHING NUT AND WASHER. ROD SHALL BE HILTI HVA SYSTEM, HAS TYPE OR APPROVED EQUAL UNLESS OTHERWISE NOTED. ROD SHALL BE OF 3/8" INCH DIA. WITH 7 INCH MIN. EMBEDMENT.
 - ANCHOR INSERT WHERE CALLED IN CONTRACT DRAWING SHALL BE OF HILTI HVA SYSTEM, HFA TYPE. MATERIAL SHALL BE AS SPECIFIED BY MANUFACTURER.
 - DOWELLING SHALL OF HILTI HVA SYSTEM, REBAR ANCHOR OF ASTM A615 GRADE 60 INSTALLED WITH HILTI HEA CAPSULE OR APPROVED EQUAL UNLESS OTHERWISE NOTED. DOWELS SHALL BE OF #4 REBAR WITH 8 1/2 INCH EMBEDMENT.
- CONCRETE BLOCK:
 - FOR SOLIDLY GROUTED BOND BEAM AND FILLED IN CONCRETE, ANCHORING SYSTEM SHALL BE AS INDICATED IN NOTE 1.
 - FOR MASONRY CONSTRUCTION WITH VOIDS AND HOLLOW BLOCK, ANCHOR ROD AND INSERT SHALL BE HILTI HIT.
- INSTALLATION:

INSTALLATION SHALL BE STRICTLY AS PER MANUFACTURER'S RECOMMENDATION.

J. FIXED STEEL GRATING:

UNLESS OTHERWISE NOTED, GRATING TO BE PRESSURE LOCKED RECTANGULAR DESIGN, TYPE B, AS MANUFACTURED BY IKG INDUSTRIES. MATERIAL TO BE GALVANIZED STEEL. MAIN BARS TO BE 1 1/2"x3/8" SPACED 1 3/8" C/C. CROSS BARS TO BE OF RECTANGULAR CROSS SECTION, FLUSH TOP AND SPACED 4" C/C U.O.N. GRATING SHALL BE ANCHORED TO SUPPORT STEEL BY MEANS OF SADDLE CLIPS. STUD BOLTS 1/4" IN DIA. (WITH MATCHING NUTS AND WASHERS) WELDED TO THE SUPPORTING MEMBERS SHALL BE USED TO ANCHOR SADDLE CLIPS. SADDLE CLIP ANCHORS SHALL BE DESIGNED TO FIT OVER TWO BEARING BARS. SADDLE CLIPS SHALL BE PROVIDED AT EVERY 5/2" O.C. AT EACH SUPPORT. CLIPS SHALL HAVE HOLES FOR WELDED STUD BOLTS. GRATINGS, FRAMES ETC. SHALL BE GALVANIZED.

K. REMOVABLE FIBERGLASS GRATING:

- FIBERGLASS GRATING SHALL BE OF STANDARD T-5000-2" SERIES OR APPROVED EQUAL. RESINS SHALL BE FIRE RETARDANT POLYESTER YELLOW IN COLOR.
- GROSS TIE RODS SHALL BE SPACED NOT MORE THAN 6" ON CENTERS, WHEN CUT AND FABRICATED, CUT ENDS SHALL BE COATED WITH A RESIN SEALER.
- PANEL CONNECTORS AT SUPPORT SHALL BE WITH 316L STAINLESS STEEL SADDLE CLIPS OR INSERT CLIPS, ALL BOLTS SHALL BE 1/4" DIA.-20x1 1/4" SOCKET HEAD CAP SCREWS 316L STAINLESS STEEL.
- PANEL HOLD DOWNS AT SUPPORT SHALL BE WITH WELDABLE 316L STAINLESS STEEL CLIPS. ALL BOLTS SHALL BE 1/4" DIA.-20x1 1/4" SOCKET HEAD CAP SCREWS 316L STAINLESS STEEL SPACED AT 12" ON CENTERS.

L. CONSTRUCTION JOINTS:

- FOR CONSTRUCTION JOINTS AND WATER STOP DETAILS SEE DWG. C-504

M. COMPACTION:

- SOIL OVER ROOF SHALL BE COMPACTED IN ONE FOOT LIFT TO ACHIEVE RELATIVE COMPACTION OF 95% STANDARD PROCTOR. THE COMPACTION SHALL BE PERFORMED BY NON VIBRATORY ROLLER. PROPS IN THE ROOF STRUCTURE AS NOTED BELOW SHALL BE IN PLACE BEFORE ANY COMPACTION.
- PROPS:

ROOF SLABS SHALL BE PROVIDED WITH CONTINUOUS PROPS FROM THE MAT SLAB AT MAX. SPAN OF 10'. THE CONTINUOUS PROPS OR SUPPORT BEAMS SHALL BE SUPPORTED AT EVERY 10' APART.

N. WATERPROOFING:

- ALL EXTERIOR CONCRETE SHALL HAVE PREPRUFE WATER PROOFING OR APPROVED EQUAL WATERPROOFING & PROTECTION BOARD.
- ALL WATERPROOFING SHALL BE APPLIED TO THE OUTER SURFACE OF THE STRUCTURAL CONCRETE IN EXTERIOR WALLS AND ROOF SLAB. TEMPORARY STRUCTURES AROUND SHALL BE INSTALLED ACCORDINGLY.
- CONTRACTOR SHALL HIRE WATERPROOFING MATERIAL MANUFACTURER'S REPRESENTATIVE TO WITNESS ENTIRE WATER PROOFING INSTALLATION WORK IN THE FIELD AND PROVIDE A CERTIFICATE OF COMPLIANCE FROM THE MANUFACTURER PRIOR TO POURING OF CONCRETE. THIS WILL NOT RELIEVE CONTRACTOR OF ITS OBLIGATION TO DELIVER FACILITY FREE OF WATER SEEPAGE.

O. DEMOLITION:

- PRIOR TO START OF DEMOLITION, THE CONTRACTOR TO SURVEY THE SITE AND EXAMINE DRAWINGS AND SPEC TO DETERMINE THE EXTENT OF WORK. THE CONTRACTOR TO TAKE NECESSARY PRECAUTION TO AVOID DAMAGE TO EXISTING ITEMS TO REMAIN IN PLACE. THE CONTRACTOR TO COORDINATE THE WORK DEFINED HERE WITH ALL OTHER WORK AND SHALL CONSTRUCT AND MAINTAIN SHORING, BRACING AND SUPPORTS AS REQUIRED. THE CONTRACTOR SHALL ENSURE THAT STRUCTURAL ELEMENTS ARE NOT OVERLOADED AND SHALL BE RESPONSIBLE FOR ADDING NEW SUPPORTS AS MAY BE REQUIRED AS A RESULT OF ANY CUTTING, REMOVAL OR DEMOLITION WORK PERFORMED UNDER THIS CONTRACT.
- CONCRETE REMOVAL SHALL BE ACCOMPLISHED BY LINE DRILLING AND CHEMICAL ROCK SPLITTING METHODS. BLASTING OR BOOM MOUNTED PNEUMATIC IMPACT BREAKERS SHALL NOT BE PERMITTED. HAND OPERATED IMPACT BREAKERS (JACK HAMMERS) MAY BE USED TO TRIM THE SIDES OF EXCAVATIONS.

P. EXCAVATION

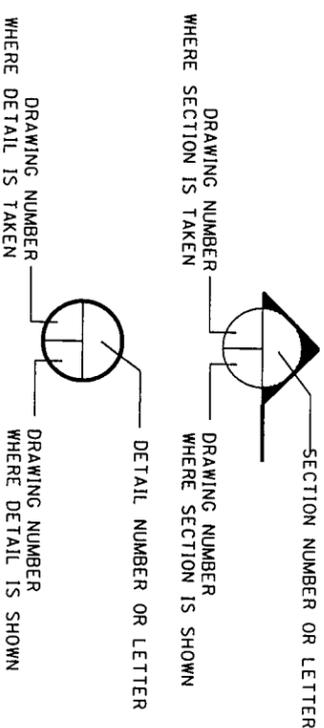
- THE PRESENCE OF LARGE PIECES OF ROCKS OR BOULDERS SHOULD BE CONSIDERED THROUGHOUT ALL EXCAVATION WITHIN 15FT BELOW THE STREET SURFACE.
- CONTRACTOR SHALL UTILIZE TEST PITS AND BORINGS DATA TO DESIGN SUPPORT OF EXCAVATION (SOE).

NOTES:

- ALL OPEN CUT STRUCTURE SHALL BE TEMPORARILY SUPPORTED (LATERALLY & VERTICALLY) SO AS TO MINIMIZE STRESSES IN THE EXIST. SUBWAY CONSTRUCTION. THIS TEMPORARY SUPPORT SYSTEM SHALL BE REMOVED AFTER INSTALLATION OF THE PERMANENT STRUCTURE.
- IT IS ANTICIPATED THAT SOLDIER BEAMS AND LAGGINGS USED FOR SUBWAY CONSTRUCTION REMAINED BURIED. THE CONTRACTOR IS REQUIRED TO REMOVE THEM WITHOUT JEOPARDIZING THE INTEGRITY OF THE WATERPROOFING SYSTEM. ALL DAMAGED AREA ARE TO BE REPAIRED PRIOR TO THE START OF NEW WORK.
- CONSTRUCTION OF FACILITY SHALL BE DONE WITH THE ROADWAY DECK IN PLACE.
- CONTRACTOR TO SUBMIT CALCULATION AND DRAWINGS SIGNED AND SEALED BY AN APPROVED LICENSED ENGINEER IN THE STATE OF NEW YORK FOR SHORING, BRACING AND SUPPORTS AS REQUIRED FOR STRUCTURAL STABILITY PRIOR TO START OF WORK.

LEGEND

- CENTER LINE: _____
- EXIST. CONCRETE & STEEL (TO BE REMOVED): _____
- EXIST. CONCRETE & STEEL (TO REMAIN): _____
- NEW CONCRETE & STEEL: _____
- EXIST. FENCE
X-----X-----X-----
- NEW FENCE
X-----X-----X-----



<p>New York City Transit Authority</p>		<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>STRUCTURAL ENGINEERING</p>	
<p>REFERENCE DRAWING</p> <p>STRUCTURAL NOTES AND LEGEND SHEET 2 OF 2</p>		<p>REVISION</p> <p>DATE</p> <p>APPROVED</p>	<p>DATE</p> <p>DRAWING NO.</p> <p>RC-1007</p> <p>REVISION</p>
<p>DRAWN BY</p> <p>DESIGNED BY</p> <p>CHECKED BY</p> <p>APPROVED BY</p>	<p>DATE</p>	<p>DATE</p>	<p>DATE</p>

4.0 FOUNDATIONS

- 4.1 ALL FOUNDATIONS SHALL BEAR ON PROPERLY PREPARED SUBGRADE. ALL UNSUITABLE MATERIAL SHALL BE REMOVED AND REPLACED WITH LEAN CONCRETE AS DIRECTED BY THE ENGINEER PRIOR TO PLACEMENT OF FOUNDATION.
- 4.2 CONCRETE SHALL NOT BE PLACED IN WATER OR ON FROZEN GROUND.
- 4.3 BACKFILL AGAINST TUNNEL WALLS SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS.
- 4.4 ROOF SLAB SHALL BE IN PLACE OR WALLS SHALL BE BRACED PRIOR TO BACKFILLING.

5.0 MATERIAL

- 5.1 CEMENT SHALL BE PORTLAND CEMENT IN ACCORDANCE WITH ASTM C-150.
- 5.2 ALL CONCRETE SHALL BE READY MIXED IN ACCORDANCE WITH ASTM C-94 OR ASTM C-685 AND WITH COMPRESSIVE STRENGTH NOT LESS THAN 4000 PSI WHEN TESTED AT TWENTY-EIGHT (28) DAYS UNLESS OTHERWISE NOTED.
- 5.3 STEEL REINFORCEMENT RODS SHALL CONFORM TO ASTM A-615 GRADE 60 WELDED STEEL WIRE FABRIC (W.W.F.) REINFORCEMENT SHALL CONFORM TO ASTM A-185. STEEL STUDS SHALL CONFORM TO ASTM A-108.
- 5.4 ALL REINFORCING BARS AND W.W.F. SHALL BE EPOXY COATED AS PER ASTM A-775.
- 5.5 FOR PATCHING MORTAR USE POLYMER MODIFIED PORTLAND CEMENT.
- 5.6 AGGREGATE FOR PATCHING MORTAR SHALL BE 3/8" MAX. CLEAN PEA GRAVEL.
- 5.7 ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A-36.
- 5.8 ALL STRUCTURAL CONNECTION BOLTS SHALL BE A325 HIGH STRENGTH BOLTS.
- 5.9 ALL CONCRETE SHALL BE AIR ENTRAINED.
- 5.10 SHOP WELDING SHALL BE MADE WITH E70XX ELECTRODES.
- 5.11 ALL GROUT FOR STEEL BEARING PLATE SHALL BE "FIVE STAR" NON-SHRINK GROUT OR APPROVED EQUAL.
- 5.12 ALL GRATING SHALL BE HEAVY-DUTY STEEL GRATING "TYPE DF" BY "J&G BORDEN" OR APPROVED EQUAL. ALL STEEL GRATINGS & FRAMES SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.

6.0 PAINTING

- 6.1 REFER TO SPECIFICATIONS FOR PAINTING REQUIREMENTS.
- 6.2 THE FOLLOWING STEEL SURFACES SHALL NOT BE PAINTED.
 - a. STEEL MEMBERS ENCASED IN CONCRETE OR STEEL SURFACES TO BE IN CONTACT WITH CONCRETE.
 - b. CONTACT SURFACES OF MILLED ENDS OF COMPRESSION MEMBERS.
 - c. CONTACT SURFACES FOR FRICTION TYPE CONNECTIONS.
 - d. CONTACT SURFACES FOR FIELD WELDING.
- 6.3 ALL EXPOSED STEEL WHICH IS TO BE ENCLOSED AND REMAIN INACCESSIBLE AFTER THE COMPLETION OF THE WORK SHALL BE PAINTED WITH BITUMINOUS PAINT.

7.0 UNIT STRESSES FOR NEW STEEL

(FOR: ELEVATED STRUCTURE)

FOR A36 STEEL

TENSION _____ KSI

NET SECTION _____ 20

COMPRESSION _____ 18.5-0.09L/r Q 15

COLUMNS _____ L/r SHALL NOT EXCEED 100 FOR MAIN MEMBERS,
L/r SHALL NOT EXCEED 150 FOR SECONDARY MEMBERS.

_____ L-UNBRACED LENGTH OF MEMBER IN INCHES.
r-GOVERNING RADIUS OF GYRATION OF MEMBER IN INCHES.

WEB OF ROLLED SECTION AT TOE OF FILLET _____ 24

BENDING EXTREME FIBRE _____ 20

COMPRESSION OR TENSION, GROSS AREA _____ 20

WHERE COMPRESSION FLANGE IS SUFFICIENTLY EMBEDDED IN CONCRETE 25

COPEL OR BLOCKED SECTION _____ 15

SHEAR _____ 13

WEB CROSS SECTION _____ 10

COPEL OR BLOCKED SECTION _____ 10

BEARING _____ 20

CONTACT AREA OF ROLLED SURFACES _____ 20

CONTACT AREA OF MILLED SURFACES _____ 20

CONTACT AREA OF ROLLED AND MILLED SURFACES _____ 20

HIGH STRENGTH BOLTS _____ A325 A490

TENSION _____ 40 KSI 54 KSI

SHEAR _____ 15 KSI 19 KSI

BEARING _____ 48.6 KSI

WELDING (E 70XX ELECTRODE)

8.0 UNIT STRESSES FOR CONCRETE

- PSI
- COMPRESSIVE STRENGTH AT 28 DAYS _____ 4000
- BEARING ON FULL CONCRETE AREA _____ 1000
- SHEAR AS A MEASURE OF DIAGONAL TENSION _____ 63
- (NON-REINFORCED MEMBERS)
- BOND BETWEEN CONCRETE AND ROLLED SHAPES _____ 30
- ALLOWABLE TENSILE STRENGTH OF DEFORMED REINFORCED BARS
- ASTM A615 GRADE 60 - 24 KSI
- THE ABOVE STRESSES ARE FOR NEW WORK ONLY.
- DESIGN SHALL CONFORM TO LATEST EDITION OF "ACI STANDARD BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", ACI 318.

9.0 APPLICABLE PUBLICATIONS

- ALL STRUCTURAL DESIGN SHALL BE IN ACCORDANCE WITH THE FOLLOWING PUBLICATIONS:
- 9.1 NYCTA STRUCTURAL DESIGN GUIDELINES.
 - 9.2 NEW YORK STATE UNIFORM FIRE PROTECTION & BUILDING CODE.
 - 9.3 NYCTA FIELD DESIGN STANDARDS.
 - 9.4 NEW YORK CITY BUILDING CODE.
 - 9.5 AMERICAN INSTITUTE OF STEEL CONSTRUCTION INC. (AISC) MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN.
 - 9.6 AMERICAN CONCRETE INSTITUTE (ACI) BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318)
 - 9.7 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) STANDARD SPECIFICATIONS FOR HIGHWAY BUILDINGS.
 - 9.8 AMERICAN RAILWAY ENGINEERING ASSOCIATION (AREA) MANUAL FOR RAILWAY ENGINEERING.

10.0 WORKING AND SHOP DRAWINGS

- 10.1 SUBMITTAL REQUIREMENTS
 - a. REFER TO SPECIFICATIONS FOR WORKING AND SHOP DRAWING REQUIREMENTS.
 - b. SHOP DRAWINGS SHALL INCLUDE ALL SHOP AND ERECTION DETAILS INCLUDING CUTS, COPIES, CONNECTIONS, HOLES, BOLTS AND WELDS IN THE STRUCTURAL STEEL.
 - c. SHOP DRAWINGS FOR REINFORCED CONCRETE SHALL INCLUDE SPICE LENGTHS AND LOCATION, EMBEDMENT LENGTH AT SUPPORTS AND CONCRETE COVER THICKNESS.
 - d. SHOP DRAWINGS SHALL BE THOROUGHLY CHECKED, SIGNED AND DATED; AND MADE OF PROPER SIZE WITH TITLE BOX AND LIST OF REFERENCE OF THE CONTRACT DRAWINGS PRIOR TO SUBMISSION TO T.A. FOR REVIEW AND APPROVAL.
 - e. THE CONTRACTOR SHALL SUBMIT DRAWINGS SHOWING LOCATIONS OF ALL CONSTRUCTION JOINTS AND DETAILS OF SHEAR KEYS FOR REVIEW AND APPROVAL OF THE ENGINEER.
- 10.2 TEMPORARY SUPPORTS

CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS AND PROCEDURES FOR THE ROADWAY DECKING AND TEMPORARY SUPPORTING SYSTEM, STAMPED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW YORK, FOR APPROVAL PRIOR TO THE START OF WORK.
- 10.3 WELDING
 - a. ALL WELDS, BOTH SHOP AND FIELD, SHALL BE SHOWN IN SHOP DRAWINGS BY STANDARD WELDING SYMBOLS IN ACCORDANCE WITH AWS. 2.0. SHOP AND ERECTION DRAWINGS SHALL SHOW LOCATION, TYPE, SIZE AND EXTENT OF THE WELD.
 - b. ALL SHOP WELDING SHALL BE MADE WITH E70XX ELECTRODES.
 - c. FOR FIELD WELDING, SEE NOTE * 2.13 ON DWG. C-1.
 - d. AREAS OF SHOP AND FIELD BOLTING MUST BE CLEARLY IDENTIFIED.
 - e. ALL BOLTS EXPOSED TO WEATHER SHALL BE PAINTED OR GALVANIZED.
 - f. ANCHOR BOLTS IN CONCRETE TO BE ASTM DESIGNATION A325.
- 10.4 BOLTING
 - a. ALL GALVANIZING SHALL MEET THE REQUIREMENTS OF ASTM A123 STANDARD SPECIFICATION FOR ZINC HOT GALVANIZED COATINGS.
 - b. TOUCH UP GALVANIZING- GALVANIZED AREAS REQUIRING TOUCH UP ON FIELD WELDS MADE DURING THE INSTALLATION OPERATIONS OR ON GALVANIZED STEEL MEMBERS THAT HAVE BEEN DAMAGED IN TRANSIT OR IN HANDLING SHALL BE REPAIRED IN ACCORDANCE WITH ASTM A780, ANNEX 2.
- 10.5 GALVANIZING
 - a. ALL GALVANIZING SHALL MEET THE REQUIREMENTS OF ASTM A123 STANDARD SPECIFICATION FOR ZINC HOT GALVANIZED COATINGS.
 - b. TOUCH UP GALVANIZING- GALVANIZED AREAS REQUIRING TOUCH UP ON FIELD WELDS MADE DURING THE INSTALLATION OPERATIONS OR ON GALVANIZED STEEL MEMBERS THAT HAVE BEEN DAMAGED IN TRANSIT OR IN HANDLING SHALL BE REPAIRED IN ACCORDANCE WITH ASTM A780, ANNEX 2.

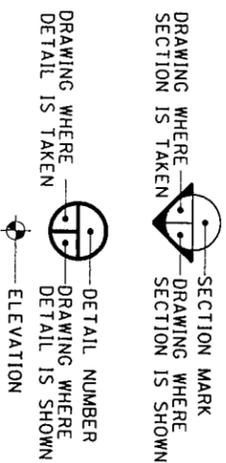
CROSS REFERENCES:

ABBREVIATION

B.O.R. - BASE OF RAIL	MAX. - MAXIMUM
BOT. - BOTTOM	MIN. - MINIMUM
BRG. - BEARING	N.T.S. - NOT TO SCALE
B.U. - BUILT-UP MEMBER	O.C. - ON CENTER
C.B.H. - CIRCUIT BREAKER HOUSE	PSF - POUNDS PER SQUARE FOOT
CL - CENTER LINE	PSI - POUNDS PER SQUARE INCH
COL. - COLUMN	PL. - PLATE
CONC. - CONCRETE	SECT. - SECTION
DIA. - DIAMETER	SPA. - SPACING
D.O.T. - DEPARTMENT OF TRANSPORTATION	STIFF. - STIFFENER
DWG. - DRAWING	TH - THICK
E.P.R. - ELECTRICAL PANEL ROOM	T.O.S. - TOP OF STEEL
EA. - EACH	TYP. - TYPICAL
EL. - ELEVATION	U.O.N. - UNLESS OTHERWISE NOTED
EQ. - EQUAL	V.L.F. - TO BE VERIFIED IN FIELD
EXIST. - EXISTING	BY THE CONTRACTOR
EXP. - EXPANSION	W/- WITH
FIX - FIXED	W.P. - WATER PROOFING
H.S. - HIGH STRENGTH	W.P.T. - WORKING POINT
INCL. - INCLUDE	
KSI - KIPS PER SQUARE INCH	

LEGEND

- CENTER LINE: _____
- EXIST. CONCRETE & STEEL (TO BE REMOVED) _____
- EXIST. CONCRETE & STEEL (TO REMAIN) _____
- BASE OF RAIL: _____
- NEW CONCRETE & STEEL: _____
- NEW WATERPROOFING: _____
- MATCH LINE _____



GENERAL NOTES FOR
ELEVATED STRUCTURES

(ELEVATED STRUCTURE)

1.0 GENERAL NOTES

- 1.1 THE CONTRACT DRAWINGS HAVE BEEN PREPARED FOR THE PURPOSE OF INDICATING TO BIDDERS AND CONTRACTORS THE GENERAL TYPE OF CONSTRUCTION OR ALTERATION.
- 1.2 ALL DIMENSIONS AND CONDITIONS OF EXISTING STRUCTURES CONTROLLING NEW CONSTRUCTION ARE TO BE VERIFIED BY THE CONTRACTOR IN THE FIELD. THE CONTRACTOR SHALL PREPARE SHOP DWGS. BASED ON THE ACTUAL FIELD CONDITIONS.
- 1.3 ORIGINAL CONSTRUCTION DRAWINGS ARE AVAILABLE FOR INSPECTION, EXAMINATION AND REFERENCE BY PROSPECTIVE BIDDERS AND CONTRACTORS. THE SAID DRAWINGS ARE LOCATED IN T.A. MICROFILM REPRO ROOM, 2 BROADWAY, NEW YORK, N.Y. IT SHOULD BE UNDERSTOOD THAT THE SAID ORIGINAL CONSTRUCTION DRAWINGS MAY NOT REFLECT ACTUAL FIELD CONDITION.
- 1.4 IT IS THE RESPONSIBILITY OF THE PROSPECTIVE BIDDERS AND CONTRACTORS TO INVESTIGATE AND VERIFY ACTUAL FIELD CONDITION, EXPOSED OR CONCEALED, AND TO TAKE INTO ACCOUNT ANY POSSIBLE CONSTRUCTION INTERFERENCES AND RELOCATIONS OF, BUT NOT LIMITED TO, STRUCTURES, EQUIPMENT, UTILITIES, CABLES, DUCTLINES, PIPING, DRAINLINE, ETC.
- 1.5 THE LOCATION & EXTENT OF STRUCTURAL DEFECTS AS SHOWN ON THE CONTRACT DRAWINGS ARE BASED ON VISUAL INSPECTION, PRIOR TO COMMENCEMENT OF REPAIR WORK. THE CONTRACTOR AND T.A. FIELD ENGINEER SHALL JOINTLY SURVEY THE STRUCTURE WITHIN THE LIMIT OF THE CONTRACT. CONTRACTOR IS TO:
 - (a) PREPARE AND SUBMIT LOCATIONS AND TYPES OF DEFECTS FOR T.A. FIELD ENGINEER'S APPROVAL BEFORE PROCEEDING WITH THE REPAIR WORK.
 - (b) THE REPAIRS ARE TO BE MADE USING DETAILS SHOWN ON THE CONTRACT DRAWINGS AND SPECIFICATIONS.
- 1.6 ANY PORTION OF EXISTING WORK WHICH MAY BE DISTURBED OR DAMAGED DURING CONSTRUCTION SHALL BE RESTORED TO A CONDITION AS GOOD AS BEFORE THE COMMENCEMENT OF THE WORK.
- 1.7 EXISTING STRUCTURE SHALL BE PROTECTED, MAINTAINED AND SUPPORTED DURING THE CONSTRUCTION WORK.
- 1.8 MAINTAIN, PROTECT, REROUTE OR RELOCATE (IF REQUIRED) LIGHTING FIXTURES AND POWER AND LIGHTING CONDUITS, AIR PIPES, WIRES (EXPOSED AND CONCEALED), AND SIGNAL/COMMUNICATION CABLES/EQUIPMENT DURING CONSTRUCTION. INSULATE ALL CONSTRUCTION EQUIPMENT FROM THE GROUND TO AVOID ACCIDENTAL GROUNDING.
- 1.9 THE EXISTING DUCTS SHALL BE PROTECTED & MAINTAINED DURING CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF ANY WORK ON OR IN THE VICINITY OF THE DUCT LINE. FOR ANY WORK DONE IN THE VICINITY OF THE DUCT LINES/UTILITIES, HAND EXCAVATION SHALL BE USED TO DETERMINE THEIR EXACT LOCATION.
- 1.10 PROVIDE TEMPORARY SUPPORTS, DECKING & SHIELDS AS PER T.A. FIELD DESIGN STANDARDS, WHERE NECESSARY. IT SHALL BE INSTALLED WITHOUT ANY INTERFERENCE WITH OR ENCROACHMENT ON CLEARANCES REQUIRED FOR RAILROAD OPERATIONS. CONTRACTOR SHALL SUBMIT PROCEDURE, DESIGN CALCULATIONS AND DETAILED DRAWINGS FOR THE COMPLETE PROPOSED TEMPORARY SUPPORT SYSTEM FOR APPROVAL OF THE ENGINEER.
- 1.11 FOR OTHER DETAILS OF WORKMANSHIP AND HOURS OF WORK SEE SPECIFICATION.
- 1.12 HOLES AND FERRULES SHALL BE PROVIDED IN WALLS, FLOOR AND ROOF WHERE NECESSARY FOR VARIOUS SERVICES AS INDICATED ON DRAWINGS AND AS DIRECTED BY THE ENGINEER.
- 1.13 ALL STATIONINGS SHOWN ON THE DRAWINGS ARE REFERRED TO "NOMINAL" TRACK STATIONING OR AS MARKED IN THE FIELD.
- 1.14 TEMPORARY LIGHTED BARRICADE SHALL BE PROVIDED WHERE REQUIRED.
- 1.15 RESTORATION OF ROADWAY PAVEMENT, SUBBASE, STREET AND TRAFFIC ACCESSORIES SHALL BE IN ACCORDANCE WITH N.Y.C. D.O.T. STANDARDS.
- 1.16 ALL STRUCTURES HAVE BEEN DESIGNED TO RESIST THE DESIGN LOADS ONLY AS COMPLETED STRUCTURES. THE CONTRACTOR SHALL FULLY BRACE AND OTHERWISE PROTECT WORK IN PROGRESS UNTILL THE STRUCTURES ARE COMPLETED. THE CONTRACTOR SHALL ALSO INSURE THAT ITS OPERATIONS AND PROCEDURES PROVIDE NO LOADINGS GREATER THAN THE DESIGN LOADS ON ANY MEMBER.
- 1.17 ELEVATIONS INDICATED REFER TO NEW YORK CITY TRANSIT AUTHORITY DATUM. THE NEW YORK CITY TRANSIT AUTHORITY DATUM IS ELEVATION 100.00, WHICH IS 2.653 FEET ABOVE MEAN SEA LEVEL AT SANDY HOOK, UNITED STATES COAST AND GEODETIC SURVEY DATUM.
- 1.18 ALL MECHANICAL, ELECTRICAL AND ARCHITECTURAL DETAILS SHOWN ON THE STRUCTURAL PLANS ARE FOR CLARITY ONLY. SEE THE APPROPRIATE DISCIPLINE DRAWINGS FOR DESIGN DETAILS. ALL EMBEDDED ITEMS AND OPENINGS REQUIRED FOR ARCHITECTURAL, STRUCTURAL, ELECTRICAL, MECHANICAL, CIVIL AND OTHER SERVICES SHALL BE INCORPORATED IN TO THE STRUCTURE WHETHER OR NOT THEY ARE DETAILED OR INDICATED ON THE STRUCTURAL DRAWINGS. REFER TO THE ARCHITECTURAL, ELECTRICAL, MECHANICAL AND CIVIL DRAWINGS FOR DETAILS OF THESE EMBEDDED ITEMS.

- 1.19 THE CONTRACT DRAWINGS SHOW A TYPICAL INSTALLATION BASED ON A CERTAIN EQUIPMENT MANUFACTURER AND ARE NOT TO BE CONSTRUED AS REPRESENTING THE LAYOUT FOR ANY OTHER EQUIPMENT MANUFACTURER ANY ADDITIONAL ALTERATIONS WHICH ARE NECESSARY TO BE MADE TO ADEQUATELY AND SATISFACTORILY ACCOMMODATE ALTERNATE EQUIPMENT SHALL BE MADE BY THE CONTRACTOR AT NO ADDITIONAL COST.
- 1.20 DESIGN LOADS: ALL DESIGN LOADS ARE IN ACCORDANCE WITH THE NEW YORK CITY TRANSIT AUTHORITY STRUCTURAL DESIGN STANDARDS AND GUIDELINES.
- 1.21 IN ORDER TO HAVE A MAINTENANCE FREE STRUCTURE, USE OF METAL DECK IS NOT PERMITTED EITHER AS SLAB FORMWORK OR AS PART OF STRUCTURAL SLAB.

2.0 PROCEDURE FOR STRUCTURAL STEEL WORK

- 2.1 ALL STRUCTURAL STEEL (EXISTING AND NEW) SHALL BE CLEANED OF RUST & PAINTED AS PER NYCTA STANDARD SPECIFICATIONS.
- 2.2 CORRODED STEEL BEAMS AND CONNECTIONS SHALL BE CLEANED OF RUST AND REPAIRED AS PER CRITERIA DESCRIBED IN NOTE (2.5).
- 2.3 ALL CONNECTIONS UNLESS OTHERWISE NOTED, ARE TO BE MADE WITH A325 HIGH STRENGTH BOLTS. HIGH STRENGTH BOLTS SHALL BE 7/8" DIAMETER UNLESS OTHER SIZE ARE SHOWN OR ARE NECESSARY AND APPROVED. WEB REINFORCEMENT PLATES SHALL BE USED ON BEAMS. GIRDS AND COLUMNS AS REQUIRED BY T.A. STRUCTURAL DESIGN GUIDELINES AND STANDARD DETAILING PRACTICE.
- 2.4 ALL BOLT HOLES SHALL BE DRILLED AND REAMED IF REQUIRED AND NOT BURNED.
- 2.5 THE CRITERION FOR REPAIRING STRUCTURAL STEEL IS WHEN THE AVERAGE LOSS OF MATERIAL IS EITHER:
 - a) 1/8" OR
 - b) 25 % OF THE ORIGINAL THICKNESS, WHICHEVER IS LESS.
- 2.6 CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST EDITION OF THE A.I.S.C. "MANUAL OF STEEL CONSTRUCTION," UNLESS OTHERWISE SHOWN. ALL CONNECTIONS SHALL HAVE MINIMUM OF TWO BOLTS, WHERE BEAM REACTIONS OR CONNECTION DETAILS ARE NOT SHOWN.
- 2.7 BOLTED CONNECTION SHALL BE SLIP CRITICAL - CLASS A SURFACE. BOLTS ARE TO BE ASTM A325 AND A490 AND FULLY PRETENSIONED. THREADS TO BE EXCLUDED FROM SHEAR PLANE.
- 2.8 COPES BLOCKS AND RE-ENTRANT CUT SHALL HAVE 1" MINIMUM RADIUS FILETS.
- 2.9 ENDS OF BEAMS AND COLUMNS IN BEARING ARE TO BE MILLED.
- 2.10 STEEL MEMBERS ENCASED IN CONCRETE SHALL HAVE CLIPS OR WIRE MESH WRAPPING IN CONFORMANCE WITH THE SPECIFICATIONS.
- 2.11 IT WILL BE SATISFACTORY TO USE STEEL MEMBERS OTHER THAN THOSE INDICATED PROVIDED THE MEMBERS ARE SUITABLE AS DETERMINED BY THE ENGINEER AND THE COST OF CONSTRUCTION IS NOT INCREASED THEREBY.
- 2.12 ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY WELDING CODE, D1.1 LATEST ADDITION
- 2.13 FOR FIELD WELDING TO EXISTING STEEL, STEEL COUPONS SHALL BE TAKEN AND SENT TO A CERTIFIED LAB. FOR TESTING TO DETERMINE THE TYPE OF ELECTRODES TO BE USED.
- 2.14 CORRODED BEAM CONNECTIONS SHALL BE REPLACED IN KIND. RIVETS AT CONNECTION SHALL BE REPLACED WITH A325 H.S. BOLTS OF THE SAME SIZE ON A ONE FOR ONE BASIS. TEMPORARY SUPPORT SHALL BE PROVIDED WHEN REPLACING STEEL CONNECTION ON A MEMBER.
- 2.15 WHEN THE REINFORCEMENT IS REQUIRED TO REPAIR A STEEL MEMBER WHICH IS NOT SHOWN IN THE CONTRACT DWG., THE CONTRACTOR SHALL CLEAN THE AREA, INSPECT THE ACTUAL FIELD CONDITION, DEVELOP DETAILS AND SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR REVIEW AND APPROVAL.
- 2.16 EXISTING CORRODED STRUCTURAL STEEL AFFECTED BY THE NEW CONSTRUCTION OR AS CALLED FOR IN THE CONTRACT DRAWINGS SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER AND PAINTED AS PER SPECIFICATIONS. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING THE METHOD AND DETAILS OF REPAIRING OR REPLACING CORRODED STEEL FOR ENGINEER'S APPROVAL.
- 2.17 EXISTING RIVETS INTERFERING WITH THE NEW CONSTRUCTION SHALL BE REMOVED AND REPLACED WITH THE SAME SIZE HIGH STRENGTH BOLTS.
- 2.18 WHERE EXISTING HOLES ARE TO BE USED IN THE INSTALLATION OF NEW WORK THEIR LOCATION AND SPACING SHALL BE FIELD VERIFIED BEFORE FABRICATION OF NEW WORK. THE EXISTING HOLES SHALL BE REAMED IF NECESSARY TO MEET A.I.S.C. REQUIREMENT. UNUSED RIVET HOLES SHALL BE FILLED WITH H.S. BOLTS, WHERE BOLTS CAUSE INTERFERENCE PROBLEM. PLUG WELD THE UNUSED HOLES.
- 2.19 NO FIELD CUTTING OF STRUCTURAL STEEL SHALL BE PERFORMED WITHOUT APPROVAL OF THE ENGINEER.
- 2.20 FOR ADDITIONAL REQUIREMENTS OF STEEL REHABILITATION, SEE CONTRACT SPECIFICATION SECTION-5A.
- 2.21 LEAD ABATEMENT SHOULD BE PERFORMED AT CONNECTIONS OF ALL EXISTING STRUCTURAL STEEL TO BE REMOVED OR REPAIRED.

3.0 PROCEDURE FOR CONCRETE WORK

- 3.1 ALL LOOSE AND UNSOUND CONCRETE IS TO BE REMOVED BY CHIPPING TO SOUND CONCRETE BASE.
- 3.2 ALL RUSTED REBARS SHALL BE CLEANED AND COATED AS SPECIFIED.
- 3.3 INSTALL ANCHOR PINS, WELDED WIRE FABRIC (W.W.F.) AND REBARS AS SPECIFIED.
- 3.4 CLEAN THE SURFACE BY HIGH PRESSURE WATER BLASTING TO REMOVE RESIDUAL LOOSE MATERIAL. THE SURFACE SHALL BE SATURATED SURFACE DRY (S.S.D.) WITH NO STANDING WATER.
- 3.5 PRIOR TO PLACEMENT OF NEW CONCRETE AGAINST EXISTING CONCRETE STRUCTURE, THE EXISTING STRUCTURE IS TO BE CLEANED TO SOUND CONCRETE AND ALL FOREIGN OBJECTS REMOVED.
- 3.6 APPLY BONDING COMPOUND WHERE NEW CONCRETE MEETS EXISTING CONCRETE.
- 3.7 APPLY PATCHING MORTAR OR PATCHING CONCRETE AS SPECIFIED.
- 3.8 ALL EXPOSED CONCRETE SURFACES TO HAVE FINISHED SURFACES UNLESS OTHERWISE NOTED.
- 3.9 THE POLYMER MORTAR & CONC. SHALL BE PREPARED AND APPLIED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. A QUALIFIED MANUFACTURER'S FIELD REPRESENTATIVE SHALL BE PRESENT ON SITE DURING THE INITIAL APPLICATION TO ASSURE THE PROPER PREPARATION AND APPLICATION OF THE MATERIAL.
- 3.10 CONCRETE TO BE CUT SHALL BE SAW CUT.
- 3.11 ALL CORNERS OF CONCRETE COLUMNS, BEAMS AND CONCRETE ENCASUREMENT OF STEEL COLUMNS AND BEAMS ARE TO HAVE 3/4" CHAMFER, U.O.M.
- 3.12 OVERLAP OF NEW WATERPROOFING TO EXISTING WATERPROOFING SHALL BE 12 INCHES MINIMUM, UNLESS OTHERWISE NOTED.
- 3.13 IF THE REINFORCEMENT HAS LOST MORE THAN 20 % OF ITS SECTION SPLICE IT WITH NEW EPOXY COATED REBARS.

CONCRETE REHAB GENERAL NOTES

NAME

NAME

SPALL REPAIR

- THE CHARACTERISTICS DESIRABLE IN REPAIR MATERIALS ARE:
 - GOOD BONDING TO BASE CONCRETE. GOOD SURFACE PREPARATION IS REQUIRED FOR THIS.
 - LOW SHRINKAGE TO ENHANCE BONDING. THE BASE CONCRETE HAS ALREADY SHRUNK AND SHRINKAGE OF THE REPAIR MATERIAL MAY CAUSE SEPARATION.
 - SIMILAR THERMAL EXPANSION AS THE BASE CONCRETE; DIS-SIMILAR EXPANSION CAN CAUSE SEPARATION IN OUTDOOR REPAIRS.
 - BREATHABLE TO ALLOW TRAPPED VAPOR TO ESCAPE (IF APPLICABLE). SLABS ON GRADE SHOULD BE BREATHABLE.
 - RELATIVELY IMPERVIOUS TO WATER WHEN APPLIED TO THE SURFACE IN CONTACT WITH WATER. AN IMPERVIOUS REPAIR ON THE SURFACE NOT IN CONTACT WITH WATER CAN CAUSE THE INFILTRATED WATER TO BE TRAPPED BETWEEN THE REPAIR AND CONCRETE THUS ACCELERATING DETERIORATION.
 - SIMILAR MODULUS OF ELASTICITY FOR SHARING LOADING.
 - REASONABLE COST AND EASY TO WORK WITH.

2. APPROXIMATE COMPARISON OF REPAIR MATERIALS

DESCRIPTION	BINDER	ADDITIONAL MIXTURES (A) (1)	MINIMUM THICKNESS (B)	CURING	DRYING SHRINKAGE	REL. PERMEABILITY (C)	RELATIVE BONDING (K)	FREEZE THAW	COST (F)	REMARKS
PORT. CEMENT MORTAR W/ BONDING AGENT	PORT. CEM.	WATER REDUCE AIR ENT.	1 1/2	WET 7 DAYS	MODERATE	9	1 1/2 X	GOOD	\$0.49	
PORT. CEMENT MORTAR NO BONDING AGENT	PORT. CEM.	WATER REDUCE AIR ENT.	1 3/4	WET 7 DAYS	MODERATE	9	1 X	GOOD	\$0.41	
MICRO SILICA MORTAR W/ BONDING AGENT	PORT. CEM.	AIR ENT.	1/2	WET 7 DAYS	LOW	6	1 1/2 X	GOOD	\$0.54	
LATEX MOD. MORTAR W/ SCRUB COAT	PORT. CEM.	LATEX	1/2	WET 3 DAYS	LOW	5	2X	GOOD	\$2.43	
POLYMER MOD. MORTAR W/ SCRUB COAT	PORT. CEM.	NONSAG FILLERS ACRYLIC LATEX	1/4	WET 3 DAYS	MODERATE	5	2X	EXCEL.	\$8.73	(G)
SHOTCRETE	PORT. CEM.	—	1/2	WET 7 DAYS	MODERATE	5	2X	GOOD	\$0.39	
EPOXY MORTAR	EPOXY	—	1/8"	4 HRS./ 2 DAYS	LOW	1	2X	EXCEL.	\$8.11	

NOTES (A) SAND IS INCLUDED IN ALL THESE MATERIALS, EXCEPT IN EPOXY FOR LESS THAN 3/16" THICK.

(B) AT THICKNESS ABOVE 1 1/2" WHERE PRACTICAL, THE ADDITION OF PEA GRAVEL IS RECOMMENDED TO MINIMIZE SHRINKAGE AND COST.

(C) 10 IS USED FOR ORDINARY CONCRETE. THE LOWER THE NUMBER, THE LESS PERMEABLE THE REPAIR MORTAR.

(D) IF WATER VAPOR IS EXPECTED TO COME FROM THE BASE CONCRETE AND THRU REPAIR MORTAR, A BREATHABLE BONDING AGENT SHOULD BE USED. OTHERWISE EPOXY CAN BE USED, WHICH IS STRONGER BUT 3 TIMES AS COSTLY.

(E) THE BONDING VALUES ARE HIGHLY DEPENDENT ON SURFACE PREPARATION AND OTHER FIELD SITUATIONS.

(F) THE COSTS ARE FOR MATERIALS FOR ONE SQ. FT., 1 1/2" THICK FOR HORIZ. AND VERTICAL APPLICATIONS ONLY. LABOR, EQUIPMENT, DELIVERY, SURFACE PREPARATION, REINFORCING, FORMWORK AND CONTRACTORS MARK-UP ARE NOT INCLUDED. LATEX TYPE BONDING AGENTS ARE USED.

(G) THE PRICE OF THIS MATERIAL REFLECTS THE USE OF PRE-PACKAGED PRODUCTS FOR ALL INGREDIENTS. SEE NOTE #4.

(H) THE THERMAL EXPANSION CO-EFFICIENT OF EPOXY IS DIFFERENT FROM CONCRETE, AND IT COST MORE, AND IS ALSO A VAPOR BARRIER. ON THE OTHER HAND, IT POSSESSES EXCELLENT CHEMICAL AND ABRASION RESISTANCE. IT SHOULD BE USED IN SITUATIONS COMPATIBLE WITH ITS LIMITATIONS.

(I) ADDITION OF FIBERS INCREASE TENSILE STRENGTH, TOUGHNESS AND RESISTANCE TO CRACKING.

(J) METHYLMETHACRYLATE CONC. WITH SAND & GRAVEL IS SIMILAR TO EPOXY, BUT SETS FASTER AND CAN BE PLACED AT MORE EXTREME TEMPERATURES.

(K) RELATIVE TO ORDINARY MORTAR.

3. IF REINFORCING SPLICES ARE REQUIRED, A MECHANICAL SPLICE FOR NEW BARS MAY TAKE UP LESS ROOM THAN A CONVENTIONAL SPLICE.

4. BETTER QUALITY CONTROL CAN BE ACHIEVED WITH PRE-PACKAGED MATERIALS THAN WITH THE SITE MIXED MATERIAL.

5. SHOTCRETE HAS SET UP COSTS AND IS ALSO MORE DIFFICULT TO APPLY IN CONFINED AREAS. SMALL SCATTERED AREAS MAY NOT BE ECONOMIC. THE TYPE OF FINISH SHOULD BE SPECIFIED, GUN OR TROWEL.

6. THE REPAIR MATERIALS MAY BE TROWELED ON, PUMPED, OR PUMPED INTO FORMS. MANUFACTURERS MAKE DIFFERENT PRODUCTS FOR DIFFERENT SITUATIONS. FOR VERTICAL OR OVERHEAD APPLICATIONS, TROWELING CAN ONLY PLACE ABOUT 1/2" INCH AT A TIME. SHOTCRETE ALSO HAS TO BE PLACED IN LAYERS. TROWELING IS NOT RECOMMENDED FOR PLACING MATERIAL BEHIND REBARS. HIGH SLUMP MATERIAL IS NEEDED IF PUMPED OR EASY FLOWING IS REQUIRED. CHECK WITH MANUFACTURER AS TO WHICH PRODUCT TO CALL FOR IN THE SPECIFICATIONS.

7. MANY REPAIR MATERIALS SET FASTER THAN MORTAR. THIS MAY BE AN ADVANTAGE IF REOPENING TO TRAFFIC OR LAYERING IS REQUIRED.

8. HIGH CHLORIDE CONTENT IN BASE CONCRETE MAY MIGRATE FROM THE REPAIR MATERIAL AND ALSO CONTINUE TO CAUSE STEEL CORROSION AFTER THE REPAIR IS MADE. CATHODIC PROTECTION MAY BE THE ONLY EFFECTIVE METHOD TO PREVENT STEEL CORROSION. A SPECIALIST IN THIS FIELD IS REQUIRED TO SPECIFY THE REPAIR, BUT MAY BE TOO EXPENSIVE FOR REPAIR PROJECTS.

9. FOR DAMAGED MARINE CONCRETE PILES IN THE TIDAL ZONE, THE STANDARD REPAIR IS TO PLACE GROUTED FIBERGLASS JACKETS AROUND THE PILE. FAILURES CAN OCCUR IF THE GROUT IS DISCONTINUOUS. THE RECOMMENDED PRACTICE IS TO CLEAN THE EXISTING SURFACE WELL AND TO PUMP THE GROUT FROM THE BOTTOM OF THE JACKET.

10. TO MINIMIZE SHRINKAGE, USE MORE AGGREGATE, LESS WATER, LESS CEMENT, MICRO SILICA ADDITIVE AND/OR WET CURING.

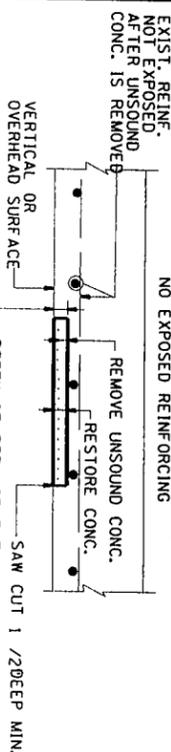
11. LATEX MODIFIED CEMENT SHOULD NOT BE USED IN DRY MIX SHOTCRETE OR WHERE HIGH CREEP MAY BE A PROBLEM.

GENERAL

- WORK THIS DRAWING WITH DWG. RC-1010 THE CAD FILE 3. CHANGE SECTION MARKS AS REQUIRED FOR DRAWING NUMBERS NUMBER OF WHICH IS /ES/EST/STREFF/RC1010.DGN FOR A SPECIFIC CONTRACT.
- CADD FILE NUMBER FOR THIS DWG. IS: **ES/EST/STREFF/RC1009.DGN**

- DELETE "NOTES TO DESIGNER AND BOXED NOTES SHOWN AT REPAIR DETAILS" FROM CONTRACT DWGS.
- DELETE THE TITLE TO MATCH WITH CORRESPONDING CONTRACT.

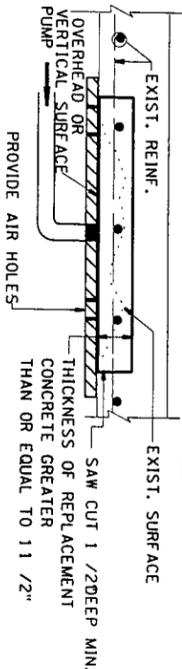
TYPE 1: HAND LAYUP



GENERAL PROCEDURE:

- STOP LEAKAGE FROM OPPOSITE SIDE **IF APPLICABLE.** AND/OR PROVIDE DRAINAGE. **DESIGNER TO CHOOSE**
- REMOVE UNSOUND CONCRETE.
- IF LOSS OF CONCRETE AFTER REMOVAL IS LESS THAN 1" AND IN A NON-PUBLIC AREA, REPAIR IS UNNECESSARY.
- PREPARE SURFACE AS PER SPECIFICATIONS. **DESIGNER TO CHOOSE**
- APPLY SCRUB COAT OR BONDING COMPOUND **DESIGNER TO CHOOSE** EXIST. SOUND CONC.
- DEPOSIT LAYERS OF THE FOLLOWING REPAIR MATERIAL USING STEEL TROWELS OR OTHER HAND TOOLS:
 - POLYMER MODIFIED MORTAR **DESIGNER TO CHOOSE**
 - LATEX MODIFIED MORTAR
- CURE AS PER SPECIFICATIONS.
- PLACE COATING OR SEALER ON VERT. SURFACES IF EXPOSED TO WEATHER.

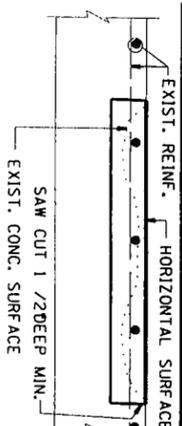
TYPE 3: FORM AND PUMP



GENERAL PROCEDURE:

- STOP LEAKAGE FROM OPPOSITE SIDE AND/OR PROVIDE DRAINAGE. **DESIGNER TO DELETE IF NOT APPLICABLE.**
- REMOVE UNSOUND CONCRETE. IF STEEL OR REINFORCING IS EXPOSED, CLEAN IT TO BRIGHT METAL AND CUT CONCRETE 3/4" BEHIND THE REINFORCING. IF REINFORCEMENT HAS LOST MORE THAN 25% OF ITS AREA, PROVIDE SPLICE WITH NEW REINFORCING.
- PREPARE SURFACE AS PER SPECIFICATIONS.
- COAT THE EXISTING REBARS AS PER SPECIFICATIONS.
- APPLY SCRUB COAT OR BONDING COMPOUND TO EXISTING SOUND CONCRETE. **DESIGNER TO CHOOSE**
- IF REINFORCEMENT IS NOT PRESENT, PROVIDE MECHANICAL ANCHORAGE AS PER DETAIL "A".
- PROVIDE FORMWORK.
- CONNECT HOSES TO THE FORMWORK VIA INLET PORTS. PUMP CONCRETE UNDER PRESSURE UNTIL THE FORMWORK IS FULLY PRESSURIZED OR THE CONCRETE IS COMING OUT OF AN ADJACENT INLET PORT. STOP PUMPING AND CLOSE INLET PORT.
- THE MATERIAL TO BE PUMPED SHALL **DESIGNER TO CHOOSE**
 - POLYMER MODIFIED MORTAR
 - LATEX MODIFIED MORTAR
 - ORDINARY MODIFIED MORTAR
 - ORDINARY MORTAR WITH WATER REDUCING ADMIXTURES
 - FIBER REINFORCED MORTAR
- IF DEPTH OF REPAIR EXCEEDS 3", USE PEA GRAVEL AND CONC. PUMP.
- REMOVE FORMWORK AFTER THE CURING PERIOD.
- APPLY SEALER AND COATING **DESIGNER TO CHOOSE** IF VERTICAL SURFACE IS SUBJECT TO WEATHER.

TYPE 2: HORIZONTAL PATCH



GENERAL PROCEDURE:

- REMOVE UNSOUND CONCRETE. IF STEEL OR REINFORCING IS EXPOSED, CLEAN IT TO BRIGHT METAL AND CUT CONCRETE 3/4" BEHIND THE REINFORCING.
- PREPARE SURFACE AS PER SPECIFICATIONS.
- COAT THE EXISTING REBARS PER SPECIFICATION.
- APPLY SCRUB COAT OR BONDING COMPOUND **DESIGNER TO CHOOSE**
- IF THICKNESS OF CONCRETE IS GREATER THAN 2" ADD COARSE AGGREGATE TO REPAIR MATERIAL.
- RESTORE THE CONCRETE SURFACE, USING:
 - LATEX MODIFIED MORTAR OR CONCRETE **DESIGNER TO CHOOSE**
 - ORDINARY MORTAR OR CONCRETE
 - ORDINARY MORTAR OR CONCRETE MODIFIED WITH FLY ASH, MICROSILICA, AND/OR SUPERPLASTICIZERS
 - FIBER REINFORCED MORTAR OR CONCRETE.
- CURE AS PER SPECIFICATIONS. **DESIGNER TO CHOOSE, DEPENDING ON CONDITIONS.**
- PLACE COATING OR SEALER.

SPALL REPAIR SELECTION TABLE

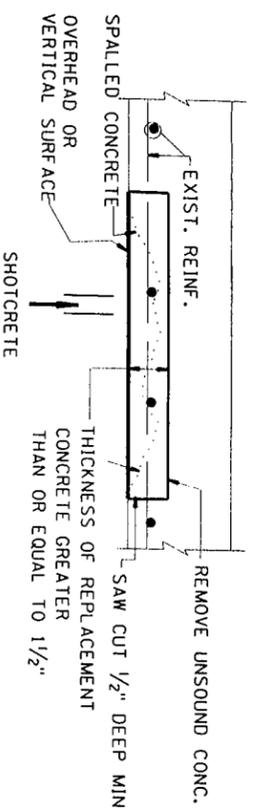
LOCATION OF SPALL	EXPOSED REBARS	DEPTH OF SPALL	SUGGESTED REPAIR TYPE
HORIZ.	YES OR NO	THRU SLAB	6
VERT. OR OVERHEAD	NO	1 1/2" OR LESS	1
VERT. OR OVERHEAD	NO	> 1 1/2"	3 OR 4
VERT. OR OVERHEAD	YES	ANY	3 OR 4
DELAM	—	ANY	8
HAUNCH	YES OR NO	ANY	5
SUSPENDED EXP. JT.	YES OR NO	ANY	11
ON GRADE PLATED EXP. JT.	YES OR NO	ANY	13
	YES OR NO	ANY	12

CONCRETE REHABILITATION
SPALLED CONCRETE REPAIR
SHEET 1

SPONSOR: I. MOTIWALA

RC-1302

TYPE 4: SHOTCRETE (PNEUMATIC WET OR DRY MIX)

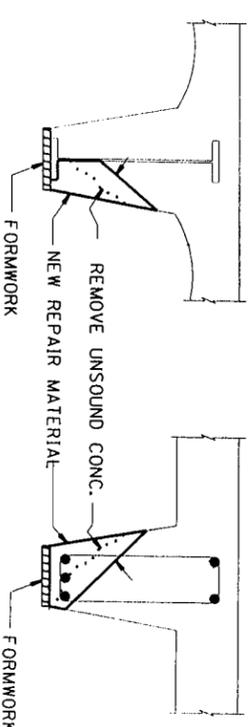


GENERAL PROCEDURE:

1. STOP LEAKAGE FROM OPPOSITE SIDE AND/OR PROVIDE DIVERSION DRAINAGE.
2. REMOVE UNSOUND CONCRETE. IF STEEL OR REINFORCING IS EXPOSED, CLEAN IT TO BRIGHT METAL AND CUT CONCRETE $\frac{3}{4}$ " BEHIND THE REINFORCING. IF REINFORCEMENT HAS LOST MORE THAN 25% OF ITS SECTION, SPLICE IT WITH NEW EPOXY COATED BARS.
3. PREPARE SURFACE AS PER SPECIFICATIONS.
4. COAT THE EXISTING REBARS AS PER SPECIFICATIONS.
5. IF REINFORCEMENT IS NOT PRESENT, PROVIDE MECHANICAL ANCHORAGE AS PER DETAIL "A".
6. PLACE SHOTCRETE IN LAYERS AS SPECIFIED.
7. APPLY WOOD FINISH IN STATIONS AND PUBLIC AREAS AND GUN FINISH ELSEWHERE.
8. CURE AS PER SPECIFICATION.

DELETE NOTE, IF NOT APPLICABLE.

TYPE 5: DRY PACKING WITH FORMWORK

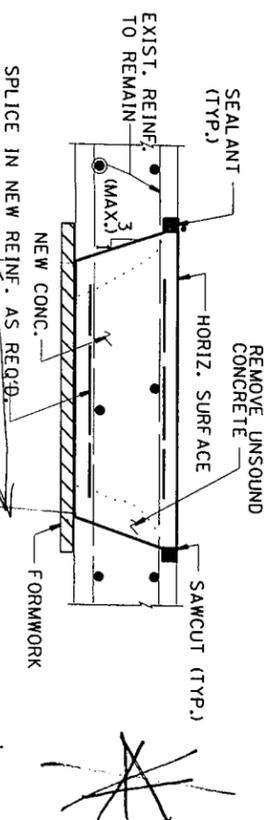


GENERAL PROCEDURE:

1. STOP LEAKAGE FROM OPPOSITE SIDE AND/OR PROVIDE DRAINAGE.
2. REMOVE UNSOUND CONCRETE. IF STEEL OR REINFORCING IS PRESENT, CLEAN TO BRIGHT METAL AND CUT CONCRETE $\frac{3}{4}$ " BEHIND THE REINFORCING. IF REINFORCEMENT HAS LOST MORE THAN 25% OF ITS SECTION, SPLICE IT WITH NEW EPOXY COATED BARS.
3. PREPARE SURFACE AS PER SPECIFICATIONS.
4. COAT THE EXISTING STEEL OR REBARS AS PER SPECIFICATION
5. APPLY SCRUB COAT OR BONDING COMPOUND. [DESIGNER TO CHOOSE]
6. RESTORE CONCRETE USING:
 - a) DRYPACK MORTAR WITH PEA GRAVEL IN ITS DAMP, UNCURED STATE. PLACE IT INTO THE DEFINED AREA WITH SUITABLE RODDING TOOLS AND COMPACT IT UNTIL THE VOID IS ENTIRELY FILLED.
 - b) ALTERNATELY, THE SIDES OF THE HAUNCHES MAY BE FORMED [DESIGNER TO CHOOSE] AND REPAIR MORTAR PUMPED IN, SIMILAR TO THE TYPE 3 REPAIR.
7. CURE REPAIR FOR 4 DAYS MINIMUM.

DELETE NOTE, IF NOT APPLICABLE.

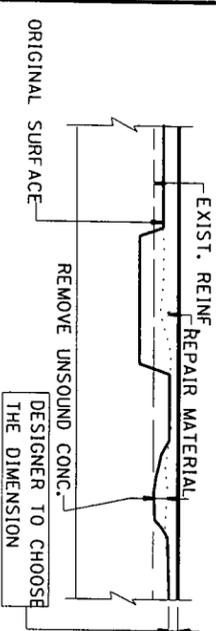
TYPE 6: REMOVE FULL DEPTH AND REPLACE



GENERAL PROCEDURE:

1. PROVIDE SHIELDS AND/OR BARRICADES AS REQUIRED [DESIGNER TO CHOOSE] AND/OR PROVIDE DRAINAGE.
2. REMOVE UNSOUND CONCRETE. CLEAN REBARS TO BRIGHT METAL. COAT THE EXISTING REBARS AS PER SPECIFICATIONS. IF REINFORCEMENT HAS LOST MORE THAN 25% OF ITS SECTION, SPLICE IT WITH NEW EPOXY COATED REINFORCEMENT.
3. CUT BACK EDGES OF REPAIR AS SHOWN.
4. APPLY BONDING COMPOUND TO CONCRETE SURFACES.
5. PLACE AND CONSOLIDATE CONCRETE SPECIFIED IN SECTION 3A.
6. PLACE SEALANT AT EDGES AND APPLY SEALER OR COATING, IF REQUIRED. [DESIGNER TO CHOOSE]

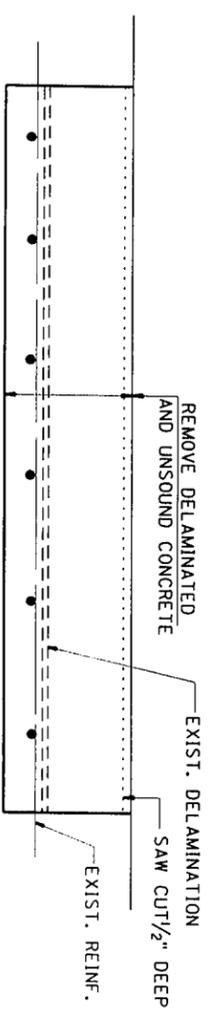
TYPE 7: OVERLAY



GENERAL PROCEDURE:

1. REMOVE UNSOUND CONCRETE. IF STEEL OR REINFORCING IS EXPOSED, CLEAN IT TO BRIGHT METAL AND CUT CONCRETE $1\frac{3}{4}$ " BEHIND THE REINFORCING. COAT THE REINF. AS PER SPECIFICATIONS. IF REINFORCEMENT HAS LOST MORE THAN 25% OF ITS SECTION, SPLICE IT WITH NEW EPOXY COATED BARS.
2. PREPARE SURFACE AS PER SPECIFICATIONS.
3. APPLY SCRUB COAT OR BONDING COMPOUND. [DESIGNER TO CHOOSE.]
4. IF THICKNESS OF OVERLAY IS GREATER THAN 2 INCHES, ADD COARSE AGGREGATE TO REPAIR MATERIAL.
5. RESTORE THE CONCRETE SURFACE, USING:
 - a) LATEX MODIFIED MORTAR OR CONCRETE [DESIGNER TO CHOOSE.]
 - b) ORDINARY MORTAR OR CONCRETE
 - c) ORDINARY MORTAR OR CONCRETE MODIFIED WITH FLY ASH, MICROSILICA, AND/OR SUPERPLASTICIZERS
 - d) FIBER REINFORCED MORTAR OR CONCRETE.
6. CURE AS PER SPECIFICATIONS.
7. PLACE COATING OR SEALER. [DESIGNER TO CHOOSE, DEPENDING ON CONDITIONS.]

TYPE 8-DE-LAMINATED CONCRETE REPAIR

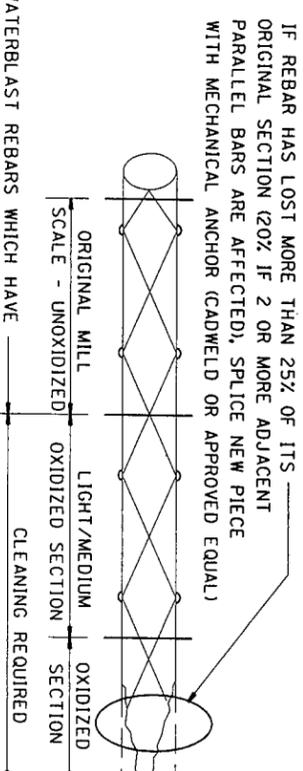


GENERAL PROCEDURE:

1. STOP LEAKAGE FROM OPPOSITE SIDE AND/OR PROVIDE DRAINAGE. [DELETE NOTE, IF NOT APPLICABLE.]
2. REMOVE DELAMINATED AND UNSOUND CONCRETE.
3. CONSIDERING THE EXPOSED AREA AS A SPALL, PROCEED WITH THE APPROPRIATE SPALLED CONCRETE REPAIR.

DELETE NOTE, IF NOT APPLICABLE.

CLEANING OF REBARS

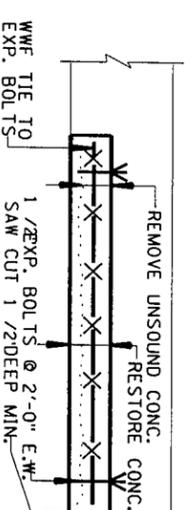


SANDBLAST / WATERBLAST REBARS WHICH HAVE OXIDATION. CLEANING SHALL BE IN ACCORDANCE WITH COMMERCIAL BLAST CLEANING STANDARDS.

NOTES:

BEFORE STARTING ANY REMOVALS FOR REPAIRS, THE CONTRACTOR SHALL REVIEW THE EFFECTS OF REMOVALS ON STRUCTURAL INTEGRITY. PARTICULAR CARE SHALL BE EXERCISED AT SLAB/BEAM CONNECTIONS TO COLUMNS.

DETAIL "A"



CONCRETE REHABILITATION
SPALLED CONCRETE REPAIR
SHEET 2

es/est/stref/rc1010

SPONSOR: I. MOTIWALA

RC-1303

CRACK REPAIR

- STRUCTURAL REPAIR OF CRACKS BY INJECTING EPOXY IS OF LIMITED VALUE FOR TRANSFERRING LOADS:
 - ADHESION TO THE SIDES OF AN OLD CRACK IS QUESTIONABLE SINCE THE BROKEN SURFACES PROBABLY AREN'T IN THE PROPER CONDITION FOR ADHESION AND THEY ARE INACCESSIBLE FOR SURFACE PREPARATION.
 - MOST CRACKS MOVE, INCLUDING OPENING UP IN THE WINTER, WHICH MAY CAUSE THE EPOXY TO BREAK AWAY FROM ONE SIDE OF THE CRACK OR ANOTHER PARALLEL CRACK TO DEVELOP.
- IF THE CRACKS ARE CAUSED BY STEEL CORROSION, THE CORROSION SHOULD BE STOPPED AND CONCRETE COVER RESTORED.
- IF WATER IS COMING THRU CRACKS FROM AN INACCESSIBLE SOURCE, CHEMICAL GROUTING OF THE CRACK IS MORE APPROPRIATE; THE JOINT MATERIAL CAN EXPAND OR CONTRACT WITH THE CRACK MOVEMENT.
- IF THE CRACK IN CONTACT WITH WATER IS ACCESSIBLE, A FLEXIBLE SEALANT IS MORE LIKELY TO STOP WATER. SURFACE SEALERS AND COATINGS MAY BE ABLE TO BRIDGE SMALL CRACKS. ELASTOMERIC COATING MAY BE ABLE TO BRIDGE SOMEWHAT LARGER CRACKS.
- FOR WIDE CRACKS IN UNREINFORCED CONCRETE, THE CRACKED PART OF THE STRUCTURE SHOULD BE REBUILT AND DOWELLED INTO THE PART TO REMAIN.

SURFACE SEALING

- IT IS IMPORTANT TO INVESTIGATE AND ELIMINATE THE CAUSE OF THE CONCRETE & REBAR DETERIORATION PRIOR TO THE REPAIR. OTHERWISE THE REPAIRED WORK ITSELF WILL START DETERIORATING. THE FOLLOWING ARE RECOMMENDED:
 - FOR WATER ENTERING THE CONCRETE FROM THE OPPOSITE SIDE, IF INACCESSIBLE, THE STANDARD METHOD IS TO PUMP CHEMICAL GROUT INTO LEAKING CRACKS. THE LEAK IS CHASED TILL THE EXPOSED FACE IS DRY AFTER A RAIN, BUT WATER MAY STILL LEAK IN THE FUTURE.
 - FOR WATER ENTERING FROM THE OPPOSITE SIDE WHICH IS ACCESSIBLE, THE PREFERRED METHOD WOULD BE TO PLACE NEW ELASTOMERIC WATER PROOFING ON THE OPPOSITE SIDE COVERED BY PROTECTION CONCRETE. IF THIS IS NOT POSSIBLE OR TOO COSTLY, THE CONCRETE CAN BE SEALED BY THE ALTERNATE METHODS INDICATED.
 - SEALERS SOAK INTO PORES AND CRACKS AND CAN BRIDGE SOME CRACKS. THE STATE OF THE ART MATERIALS ARE SILANES, SILOXANES AND METHACRYLATES. SOME REACT WITH THE CONCRETE.
 - CEMENTITIOUS COATINGS BUILD UP THE SURFACE AND ARE BREATHABLE. THEY CAN BRIDGE SOME CRACKS. SOME PRODUCTS REQUIRE SAND BLASTING THE BASE SURFACE.
 - SINCE MANY CONCRETE PROBLEMS ARE WATER RELATED, DEFECTIVE DRAINAGE SHOULD BE CORRECTED, OR WATER COULD BE DIVERTED FROM THE REPAIRED CONCRETE.
 - VAPOR BARRIER COATING MUST GO ON THE NEAR SIDE OF THE WATER INFILTRATION AND MAY BLISTER IF THERE IS TRAPPED MOISTURE IN THE CONCRETE (USE ON SLABS ON GRADE IS NOT RECOMMENDED). THE ELASTOMERIC COATINGS HAVE BETTER CRACK BRIDGING PROPERTIES, BUT ARE MORE SUSCEPTIBLE TO ABRASION OR FIRE DAMAGE. EPOXY COATINGS HAVE HIGHER ABRASION AND CHEMICAL RESISTANCE THAN CONCRETE. THESE COATINGS MAY REQUIRE A BROADCAST SYSTEM TO INCREASE TRACTION.
 - POLYURETHANE SEALANTS CAN BE USED IN ROUTED OUT CRACKS AND CAN TAKE 25% TO 100% ELONGATION DEPENDING ON THE MATERIAL SPECIFIED. TO ACHIEVE MAXIMUM ELONGATION, USE OF A BOND BREAKER AT THE BOTTOM OF THE CRACK IS RECOMMENDED. ON THIS BASIS, A 1/2" WIDE JOINT CAN ACCOMMODATE THE THERMAL CONTRACTION OF 20 LIN. FT. CONCRETE FOR 80°F TEMPERATURE DROP.

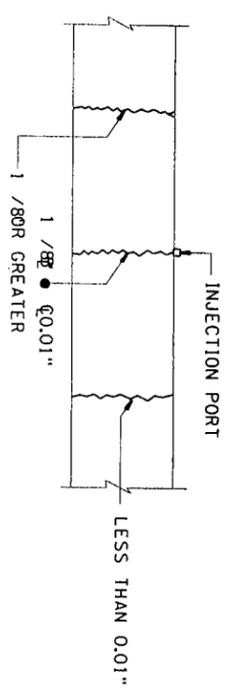
CRACK REPAIR OR SEALING SELECTION TABLE

TYPE OF REPAIR	SUGGESTED REPAIR TYPE
STRUCTURAL REPAIR	9
SEALING CRACKS	10 OR 11

GENERAL

- CADD FILE NUMBER FOR THIS DWG. IS: **ES/EST/STREF/RC1011.DGN**
- CHANGE SECTION MARKS AS REQUIRED FOR DRAWING NUMBERS FOR A SPECIFIC CONTRACT.
- MODIFY THE TITLE TO MATCH WITH CORRESPONDING CONTRACT.
- DELETE ALL "NOTES TO DESIGNER" AND BOXED NOTES SHOWN AT REPAIR DETAILS.

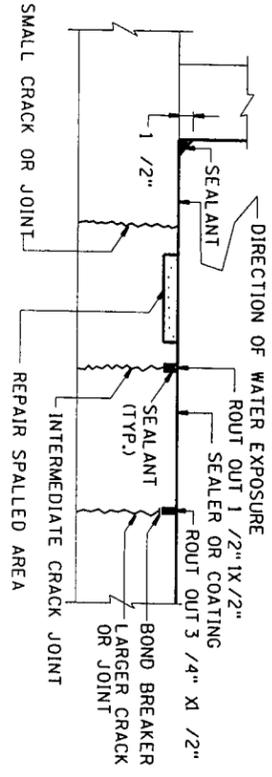
TYPE 9: STRUCTURAL GROUTING OF CRACKS



GENERAL PROCEDURE:

- CLEAN SURFACE OF CRACKS AS PER MANUFACTURER'S RECOMMENDATION.
- FOR CRACKS 1/8" OR GREATER, FORM "V" GROOVE AND POUR IN THE EPOXY.
 - FOR CRACKS LESS THAN 1/8 IN. BUT GREATER THAN 0.01 IN., PLACE INJECTION PORTS AT A SPACING ADEQUATE TO COMPLETELY FILL THE CRACKS. SEAL THE CRACKS TEMPORARILY AT THE SURFACE AND PRESSURE INJECT THE EPOXY. CHECK AT THE NEXT INJECTION PORT TO SEE IF THE GROUT HAS REACHED THAT SPOT.
 - FOR CRACKS 0.01 IN. OR LESS, NO REPAIR IS REQUIRED.
- CLEAN SURFACE.

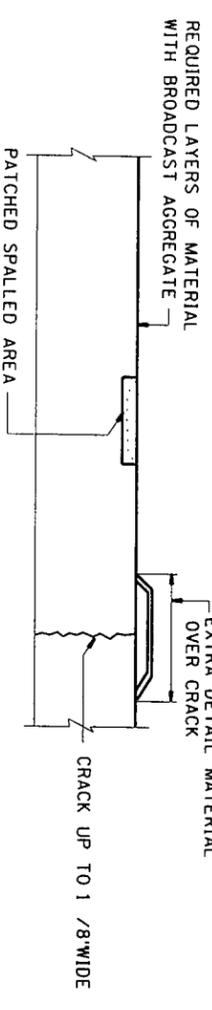
TYPE 10: SEALING OF CONCRETE SURFACES



GENERAL PROCEDURE:

- CLEAN AND PREPARE SURFACES AS REQUIRED PER MANUFACTURER'S RECOMMENDATIONS.
- PATCH SPALLED AREAS.
- ROUT OUT AND SEAL CRACKS AND JOINTS THAT THE SEALER OR COATING CAN'T BRIDGE OVER.
- APPLY THE SEALER OR COATING.

TYPE 11: ELASTOMERIC SEALING OF CONCRETE SURFACE



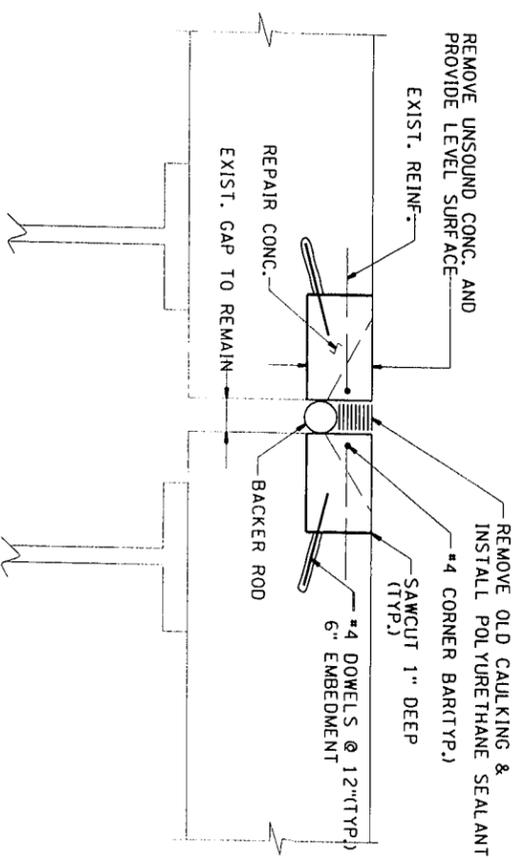
GENERAL PROCEDURE:

- CLEAN AND PREPARE SURFACES AS REQUIRED PER MANUFACTURER'S RECOMMENDATIONS.
- PATCH SPALLED AREAS.
- PRIME SURFACE
- APPLY EXTRA MATERIALS OVER CRACKS.
- APPLY LAYERS OF MATERIAL AND BROADCAST AS PER MANUFACTURER'S RECOMMENDATIONS.

CONCRETE REHABILITATION
CONCRETE CRACK REPAIR
SHEET 3

SPONSOR: I. MOTIWALA

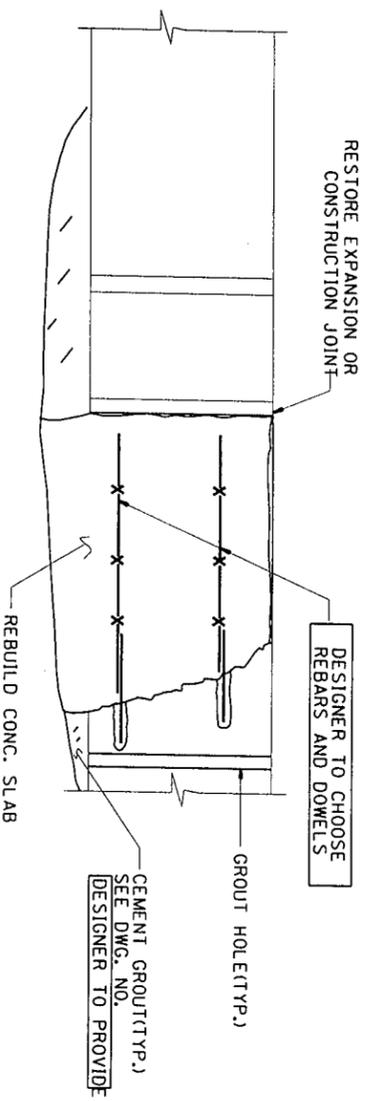
RC-1304



TYPE 12 : FILLED EXPANSION JOINT

GENERAL PROCEDURE:

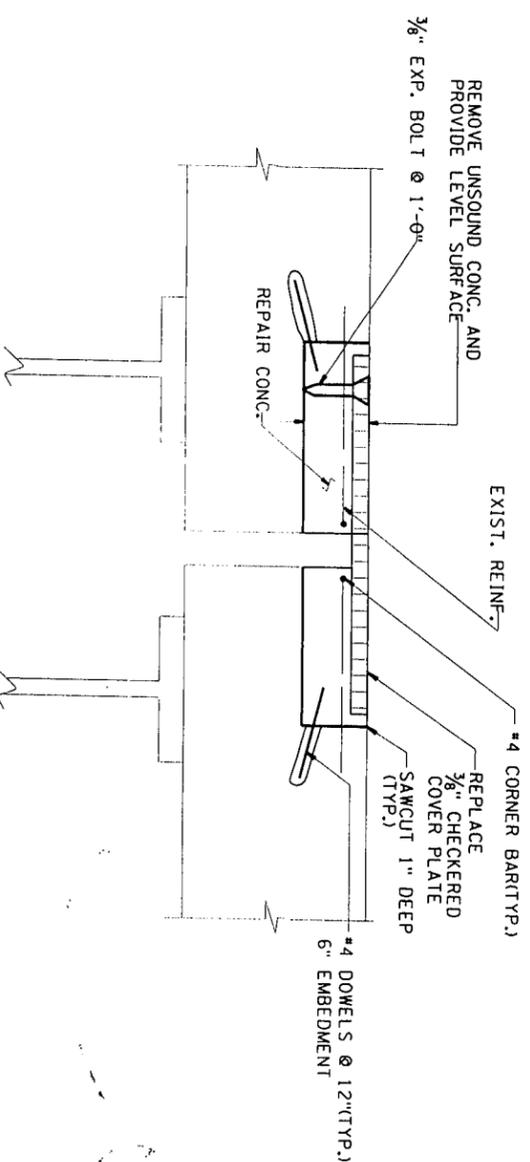
1. REMOVE OLD JOINT MATERIAL
2. REMOVE UNSOUND CONCRETE
3. IF REINF. IS PRESENT, CLEAN IT TO BRIGHT METAL AND COAT IT AS PER SPECIFICATIONS.
4. PREPARE AND CUT CONCRETE SURFACES AS PER SPECIFICATIONS.
5. INSTALL DOWELS IF DEPTH OF REPAIR EXCEEDS 1 1/2 INCHES AND REBARS ARE ABSENT OR MORE THAN 33% CORRODED.
6. APPLY SCRUB COAT OR BONDING AGENT(IF APPLICABLE) DESIGNER TO CHOOSE
7. RESTORE THE CONCRETE USING:
 - a.) LATEX MODIFIED MORTAR. DESIGNER TO CHOOSE
 - b.) ORDINARY MORTAR OR CONCRETE(AIR ENTRAINED)
 - c.) ORDINARY MORTAR OR CONCRETE(AIR ENTRAINED) MODIFIED WITH MICROSILICA AND/OR SUPERPLASTICIZERS.
8. CURE REPAIR AS PER SPECIFICATIONS.
9. PLACE BACKER ROD AND POLYURETHANE SEALANT.



TYPE 14: EXPANSION JOINT ON GRADE

GENERAL PROCEDURE:

1. REMOVE BROKEN OFF PIECES OF SLAB, UNSOUND CONC., AND JOINT MATERIAL.
2. CLEAN AND COMPACT SUBGRADE.
3. IF REINF. IS PRESENT, CLEAN IT TO BRIGHT METAL AND COAT IT AS PER SPECIFICATIONS. IF NO REINF. PRESENT, PLACE NEW REINF. AND DOWELS. DESIGNER TO CHOOSE
4. INSTALL NEW JOINT MATERIAL SIMILAR TO THAT REMOVED.
5. PLACE NEW CONCRETE AS PER SPECIFICATION 3A.
6. CURE NEW CONCRETE AS PER SPECIFICATION 3A.



TYPE 13: PLATED EXPANSION JOINT

GENERAL PROCEDURE:

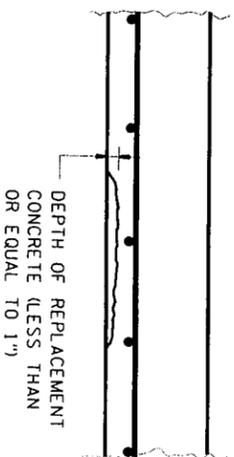
1. REMOVE EXIST. COVER PLATE AND BOLTS.
2. REMOVE UNSOUND CONCRETE.
3. IF REINF. IS PRESENT, CLEAN IT TO BRIGHT METAL AND COAT IT AS PER SPECIFICATIONS.
4. PREPARE AND CUT CONCRETE SURFACES AS PER SPECIFICATIONS.
5. INSTALL DOWELS IF DEPTH OF REPAIR EXCEEDS 1 1/2 INCHES AND REBARS ARE ABSENT OR MORE THAN 33% CORRODED.
6. APPLY SCRUB COAT OR BONDING AGENT(IF APPLICABLE) DESIGNER TO CHOOSE
7. RESTORE THE CONCRETE USING:
 - a.) LATEX MODIFIED MORTAR. DESIGNER TO CHOOSE
 - b.) ORDINARY MORTAR OR CONCRETE(AIR ENTRAINED)
 - c.) ORDINARY MORTAR OR CONCRETE(AIR ENTRAINED) MODIFIED WITH MICROSILICA AND/OR SUPERPLASTICIZERS.
8. CURE REPAIR AS PER SPECIFICATIONS.
9. INSTALL NEW COVER PLATE AND BOLTS.

ES/EST/STREF/RC1012

SPONSOR: I. MOTIWALA

SPALLED CONCRETE REPAIR

HAND LAYUP



GENERAL

PROCEDURE:

1. PREPARE SURFACE AS PER SPECIFICATIONS.
2. DEPOSIT LAYERS OF MORTAR USING STEEL TROWELS OR OTHER HAND TOOLS.

MORTAR/

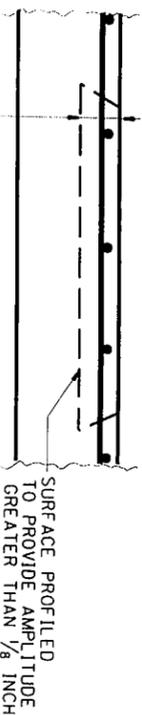
ADMIXTURE:

1. POLYMER MODIFIED CEMENT
2. EPOXY MORTAR

COMMENTS:

USE OF MORTAR ADMIXTURE SHALL BE AS APPROVED BY THE ENGINEER.

PATCH OR OVERLAY



GENERAL

PROCEDURE:

1. PREPARE SURFACE AS PER SPECIFICATIONS. EXPOSE STEEL AND REINFORCEMENT TO BARE METAL. PROVIDE SPLICE TO REINFORCEMENT AS REQUIRED. (SEE PREPARATION OF REBAR SURFACES.)
2. EPOXY COAT EXPOSED REBARS AND STEEL.
3. APPLY BONDING AGENT TO THE EXISTING CONCRETE SURFACE.
4. IF THE THICKNESS OF THE REPLACEMENT CONCRETE IS GREATER THAN OR EQUAL TO 2", INSTALL 1/4" DIAM. STAINLESS STEEL ANCHOR PINS 5" LONG IN CONCRETE @ 12" O.C. EACH WAY AND THE GALVANIZED WIRE FABRIC 2X2 - W0.9 X W0.9 TO THE SAME.
5. RESTORE CONCRETE SURFACE USING ANY OF THE FOLLOWING ADMIXTURES.

MORTAR/

ADMIXTURE:

1. POLYMER MODIFIED CONCRETE.

COMMENTS:

USE OF MORTAR ADMIXTURE SHALL BE AS APPROVED BY THE ENGINEER.

CRACK REPAIR

GENERAL PROCEDURE:

1. REPAIR FOR CRACKS SHALL BE DONE PRIOR TO THE REPAIR FOR SPALLED CONCRETE AND/OR OVERLAY.
- a. CRACKS FROM 0" UP TO 1/4": SHALL BE FILLED UP BY GRAVITY FEED OR PRESSURE INJECTION METHOD. MATERIAL TO BE USED : SIKADUR 35, HI-MOD LV OR SIKADUR 52 OR APPROVED EQUAL
 - b. CRACKS OVER 1/4": SHALL BE FILLED UP BY GRAVITY FEED OR PRESSURE INJECTION METHOD. MATERIAL TO BE USED : SIKAGROUT 212, SIKATOP 111 @ 1/2" ONLY) OR APPROVED EQUAL
 - c. CRACKS SHOWING SIGNS OF THE PRESENCE OF MOISTURE OR BEING WET, SHALL BE PRIOR TO SEALING, PROVIDED WITH QUICKSETTING WATERSTOP LIKE SIKA SET PLUG OR APPROVED EQUAL.

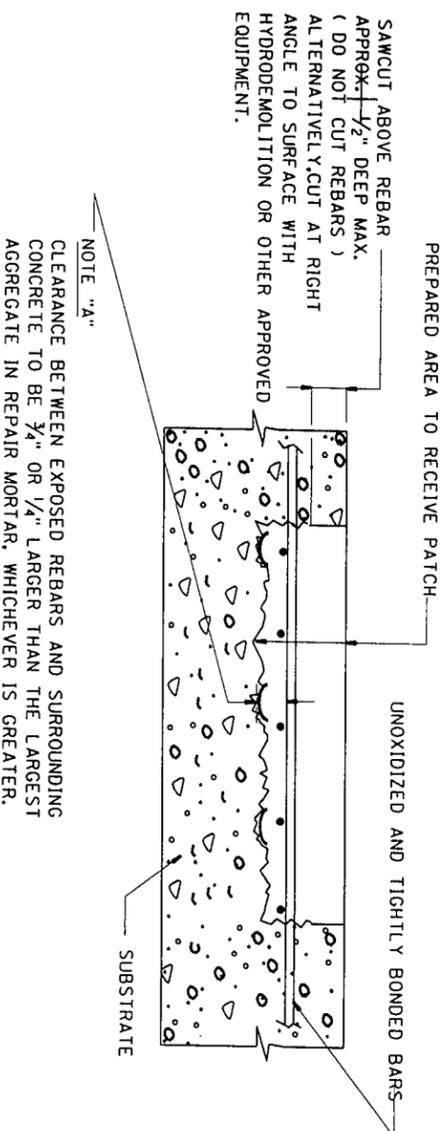
ESTIMATE OF DEFECTS

NO.	ITEM	QUANTITY
1	SPALLED CONCRETE	1000 SQ. FT.
	HAND LAYUP	1000 SQ. FT.
2	CRACK REPAIR	2000 L.F.
	PATCH OR OVERLAY	1000 SQ. FT.
	CRACKS	2000 L.F.

EMERGENCY EXITS, EXIST. WALLS, VENT GRATINGS, SHAFT AND SHAFT PASSAGEWAY

CONCRETE REHABILITATION
SPALLED & CRACK REPAIR
SHEET 5

PREPARATION OF REBAR SURFACES



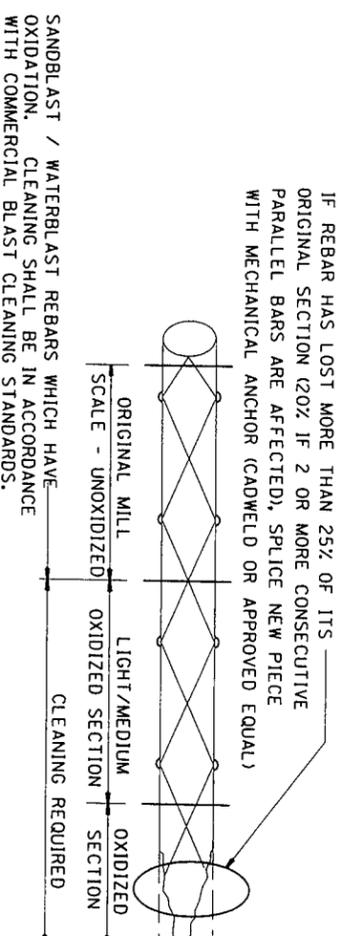
d. UNDERCUTTING AT REBAR EDGE AND SURFACE CONDITIONING

UNDERCUT REBAR IF CORROSION IS PRESENT OR IF AFTER CHIPPING UNOXIDIZED BAR IS EXPOSED GREATER THAN 50% OF ITS CIRCUMFERENCE

N.T.S.

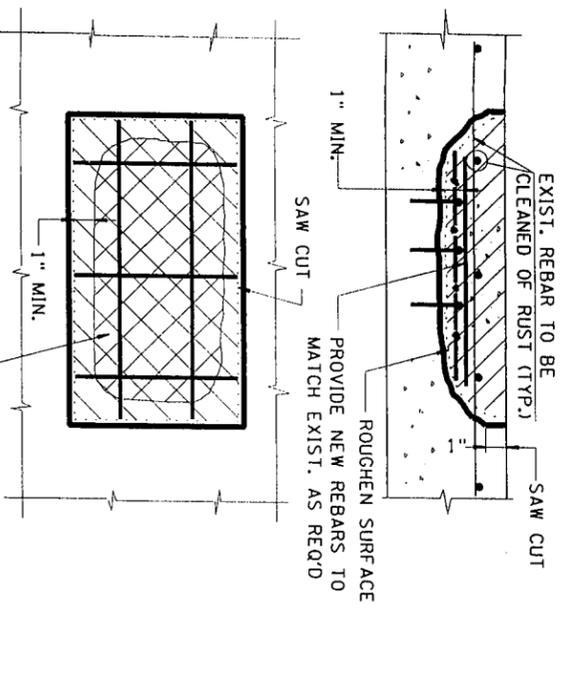
b. CLEANING OF REBARS

N.T.S.



NOTES:

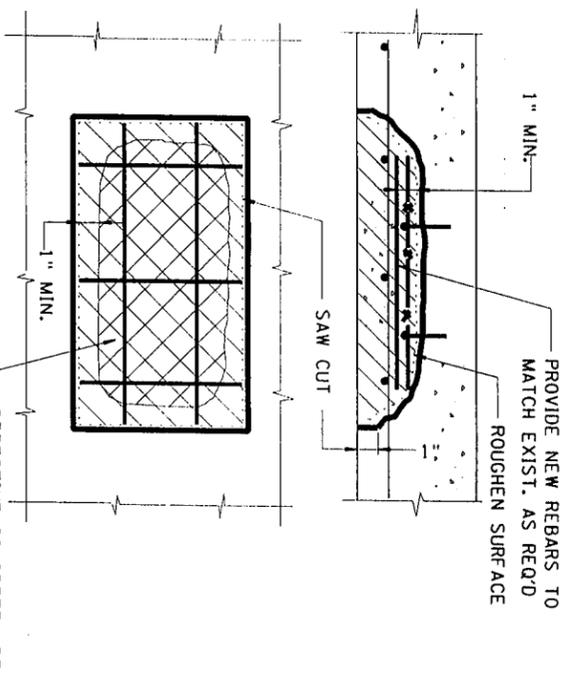
1. FOR NOTES, SEE DWG. C-1 AND C-2
2. ALL CRACKS OVER 1/4" IN EXIST. WALL & CEILING ARE TO FIXED. ALL SPALLED CONCRETE IN EXIST. WALLS, CEILING AND FLOORS ARE TO REPAIRED.
3. BEFORE STARTING ANY REMOVALS FOR REPAIRS, ALL OVERLAYS SHALL BE PRECEDED BY REPAIRING CRACKS AND SPALLS. THE CONTRACTOR IS REQUIRED TO REVIEW THE EFFECTS OF REMOVALS ON STRUCTURAL INTEGRITY. PROVIDE SHORING OF MEMBERS AS NECESSARY. PARTICULAR CARE SHALL BE EXERCISED AT SLAB/BREAM CONNECTIONS TO COLUMNS. WHEN TEMPORARY SUPPORTS ARE PROVIDED, THE CONTRACTOR IS REQUIRED TO SUBMIT SHOP DRAWINGS FOR ENGINEER'S APPROVAL.



TYPE A
N.T.S.

HORIZONTAL SURFACE SPALL

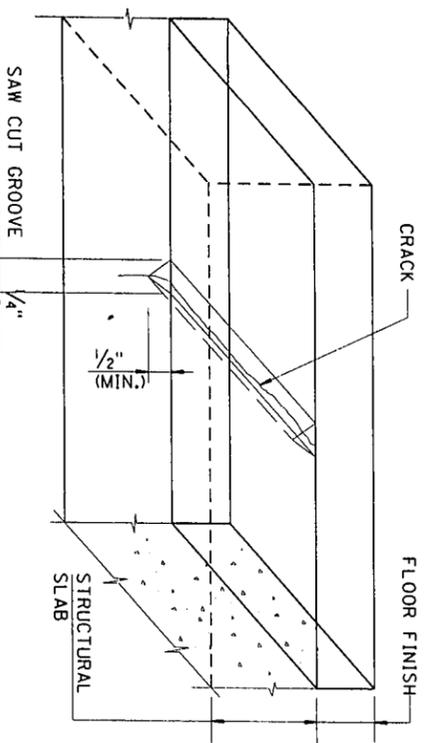
1. REMOVE DEFECTIVE CONCRETE AS REQUIRED.
2. SAW CUT 1" DEEP AROUND PERIMETER OF VOID.
3. REMOVE REMAINING CONCRETE WITHIN CUT LINES.
4. BLAST CLEAN THE SURFACE AND COAT ALL EXPOSED REBARS WITH SIKA ARMATEC-110 OR APPROVED EQUAL.
5. IF THE THICKNESS OF THE REPLACEMENT CONCRETE IS EQUAL TO OR GREATER THAN 3", INSTALL 1/4" DIA. STAINLESS STEEL ANCHOR PINS IN CONCRETE @12" O.C. EACH WAY AND TIE GALVANIZED WIRE FABRIC 2X2-WO.9XWO.9 TO THE SAME.
6. APPLY REPAIRING MORTAR SIKATOP 122-PLUS (OR APPROVED EQUAL) IN MAXIMUM 1 1/2" LIFTS. MORTAR MUST BE SCRUBBED INTO SUBSTRATE.
7. FINISH TO MATCH ADJOINING SURFACES.



TYPE B
N.T.S.

OVERHEAD & VERTICAL SURFACE SPALL

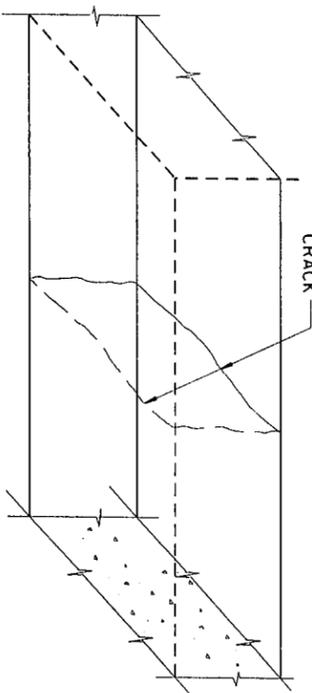
1. REMOVE DEFECTIVE CONCRETE AS REQUIRED.
2. SAW CUT 1" DEEP AROUND PERIMETER OF VOID.
3. REMOVE REMAINING CONCRETE WITHIN CUT LINES.
4. BLAST CLEAN THE SURFACE AND COAT ALL EXPOSED REBARS WITH SIKA ARMATEC-110 OR APPROVED EQUAL.
5. IF THE THICKNESS OF THE REPLACEMENT CONCRETE IS EQUAL TO OR GREATER THAN 3", INSTALL 1/4" DIA. STAINLESS STEEL ANCHOR PINS IN CONCRETE @12" O.C. EACH WAY AND TIE GALVANIZED WIRE FABRIC 2X2-WO.9XWO.9 TO THE SAME.
6. APPLY REPAIRING MORTAR SIKATOP 123-PLUS (OR APPROVED EQUAL) IN MAXIMUM 1 1/2" LIFTS. MORTAR MUST BE SCRUBBED INTO SUBSTRATE.
7. FINISH TO MATCH ADJOINING SURFACES.



TYPE F
N.T.S.

STRUCTURAL FLOOR CRACK REPAIR

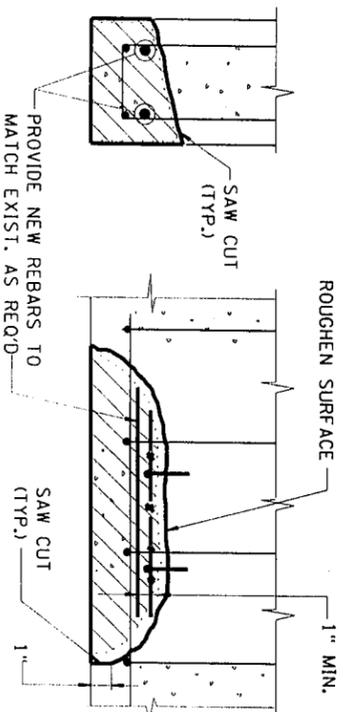
1. SAW CUT THE SURFACE OF CRACK TO CREATE A 1/2" DEEP AND 1/4" WIDE GROOVE.
2. PROPERLY CLEAN THE CRACK WITH BLOWER.
3. APPLY SIKADUR 52 (OR APPROVED EQUAL) BY GRAVITY-



TYPE G
N.T.S.

VERTICAL/OVERHEAD SURFACE CRACK REPAIR

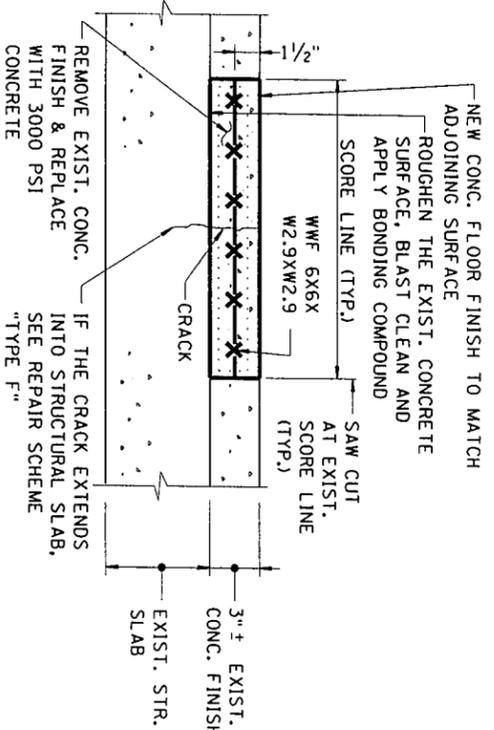
1. PROPERLY CLEAN THE CRACK.
2. PROPERLY INSTALL ONE-WAY POLYETHYLENE VALVES OR GROMMETS OVER THE CRACK AND SEAL ENTRY AREA AROUND PORT WITH SIKADUR 31 (OR APPROVED EQUAL)
3. INJECT SIKADUR 35 (OR APPROVED EQUAL) EPOXY ADHESIVE INTO THE CRACK WITH STEADY PRESSURE TO COMPLETELY FILL THE CRACK.



TYPE C
N.T.S.

BEAM SPALL

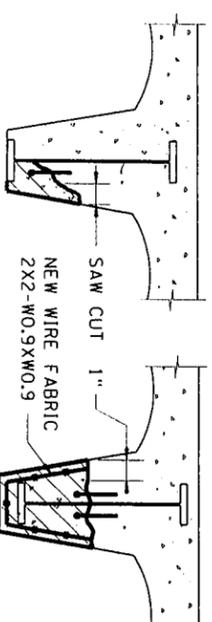
1. REMOVE DEFECTIVE CONCRETE AS REQUIRED.
2. SAW CUT 1" DEEP AROUND PERIMETER OF VOID.
3. REMOVE REMAINING CONCRETE WITHIN CUT LINES.
4. BLAST CLEAN THE SURFACE AND COAT ALL EXPOSED REBARS WITH SIKA ARMATEC-110 OR APPROVED EQUAL.
5. IF THE THICKNESS OF THE REPLACEMENT CONCRETE IS EQUAL TO OR GREATER THAN 3", INSTALL 1/4" DIA. STAINLESS STEEL ANCHOR PINS IN CONCRETE @12" O.C. EACH WAY AND TIE GALVANIZED WIRE FABRIC 2X2-WO.9XWO.9 TO THE SAME.
6. APPLY REPAIRING MORTAR SIKATOP 123-PLUS (OR APPROVED EQUAL) IN MAXIMUM 1 1/2" LIFTS. MORTAR MUST BE SCRUBBED INTO SUBSTRATE.
7. FINISH TO MATCH ADJOINING SURFACES.



TYPE H
N.T.S.

TYPICAL CONCRETE FLOOR FINISH REPAIR

- CROSS REFERENCES:**
- FOR GENERAL NOTES & REPAIR PROCEDURES.....SEE DWG. NO. C-1 FOR STATION KEY PLAN SEE DWG. NO. C-2

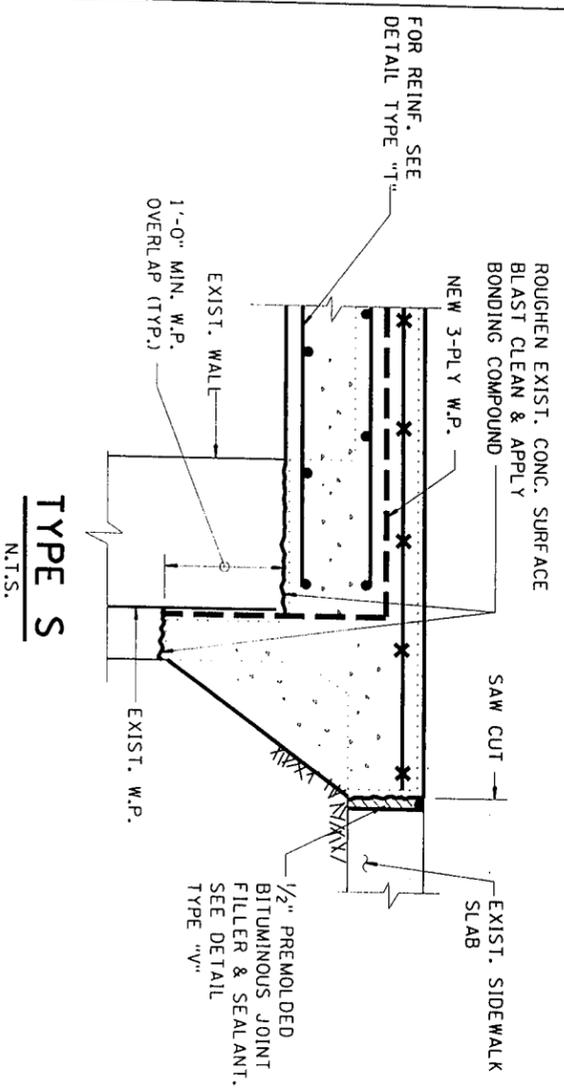


TYPE D
N.T.S.

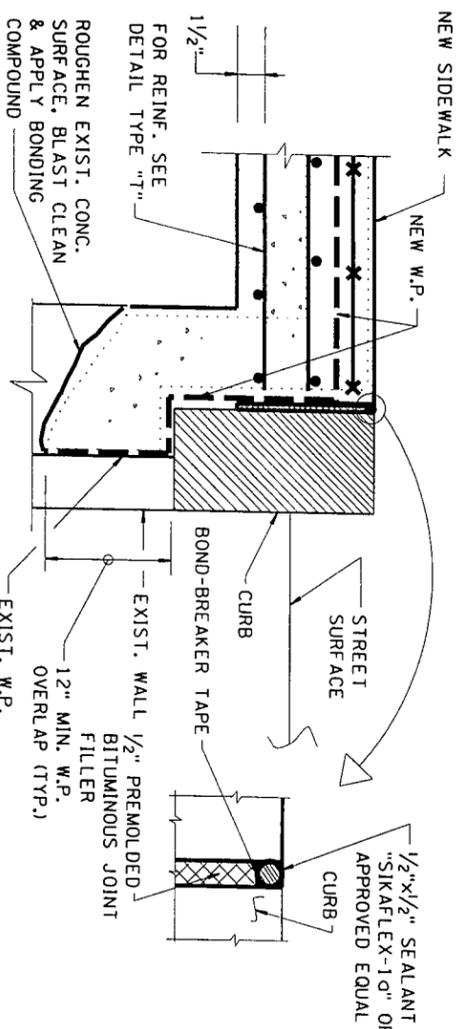
TYPE E
N.T.S.

CEILING BEAM CONCRETE SPALL

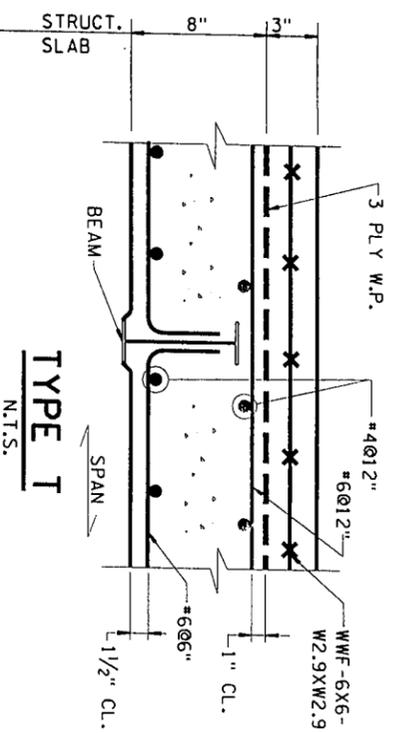
1. REMOVE DEFECTIVE CONCRETE AS REQUIRED.
2. SAW CUT 1" DEEP AROUND PERIMETER OF VOID.
3. REMOVE REMAINING CONCRETE WITHIN CUT LINES.
4. IF THE THICKNESS OF THE REPLACEMENT CONCRETE IS EQUAL TO OR GREATER THAN 3", INSTALL 1/4" DIA. STAINLESS STEEL ANCHOR PINS IN CONCRETE @12" O.C. EACH WAY AND TIE GALVANIZED WIRE FABRIC 2X2-WO.9XWO.9 TO THE SAME.
5. APPLY REPAIRING MORTAR SIKATOP 123-PLUS (OR APPROVED EQUAL) IN MAXIMUM 1 1/2" LIFTS. MORTAR MUST BE SCRUBBED INTO SUBSTRATE.
6. FINISH TO MATCH ADJOINING SURFACES.



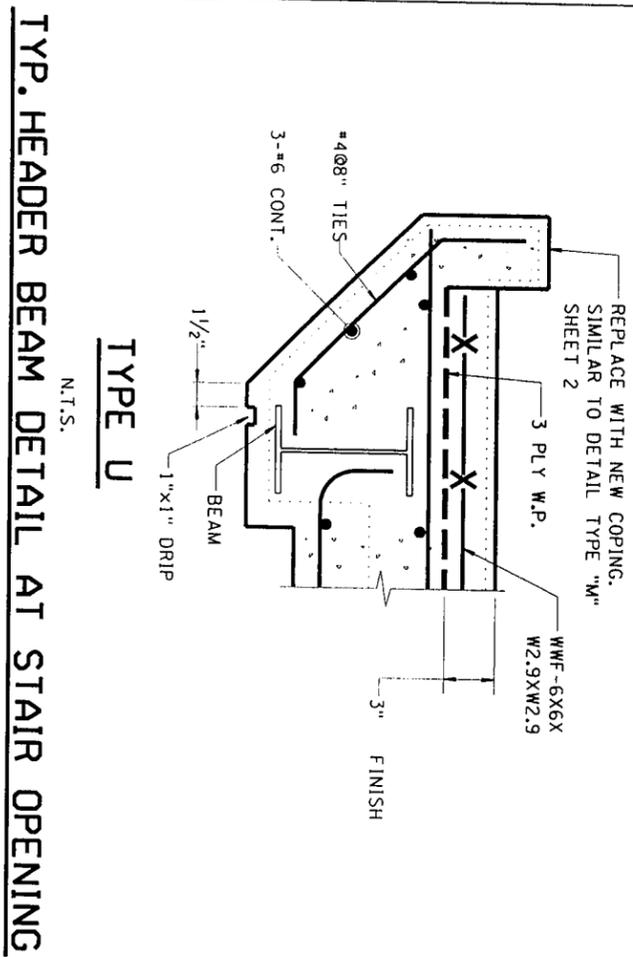
TYP. EDGE DETAIL BETWEEN SIDEWALK SLABS
N.T.S.



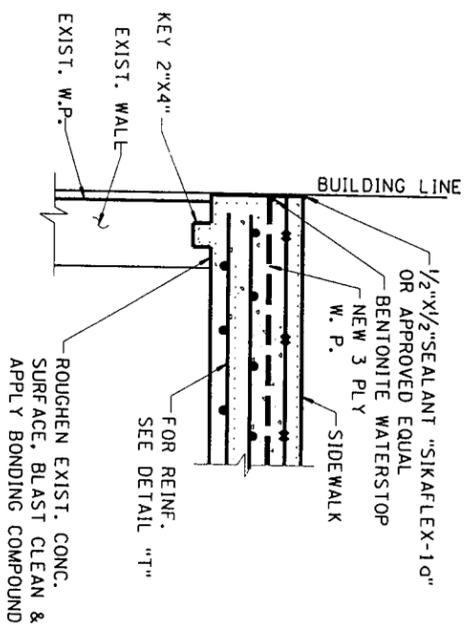
TYP. V
N.T.S.
TYP. EDGE DETAIL AT SIDEWALK CURB



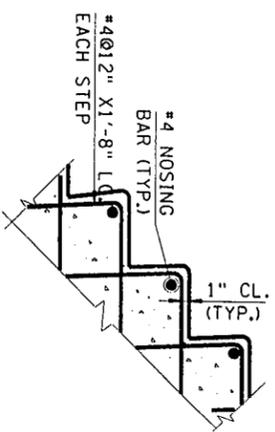
TYP. SIDEWALK ROOF SLAB REINFORCEMENT
N.T.S.



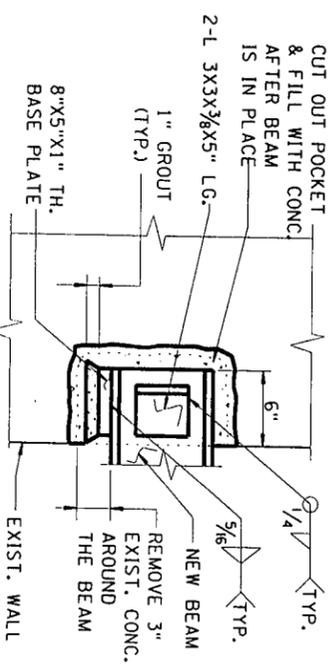
TYP. HEADER BEAM DETAIL AT STAIR OPENING
N.T.S.



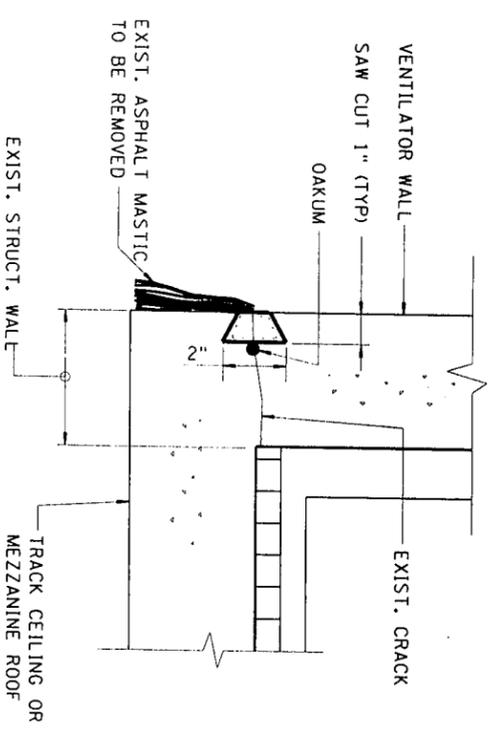
TYP. W
N.T.S.
TYP. SIDEWALK EDGE DETAIL AT BLDG. LINE



TYP. Z
N.T.S.
TYP. STAIR DETAIL



TYP. X
N.T.S.
TYP. CONC. WALL POCKET FOR BEAM SUPPORT



TYP. Y
N.T.S.
TYP. REPAIR OF ASPHALT MASTIC LEAK AT VENTILATOR WALL

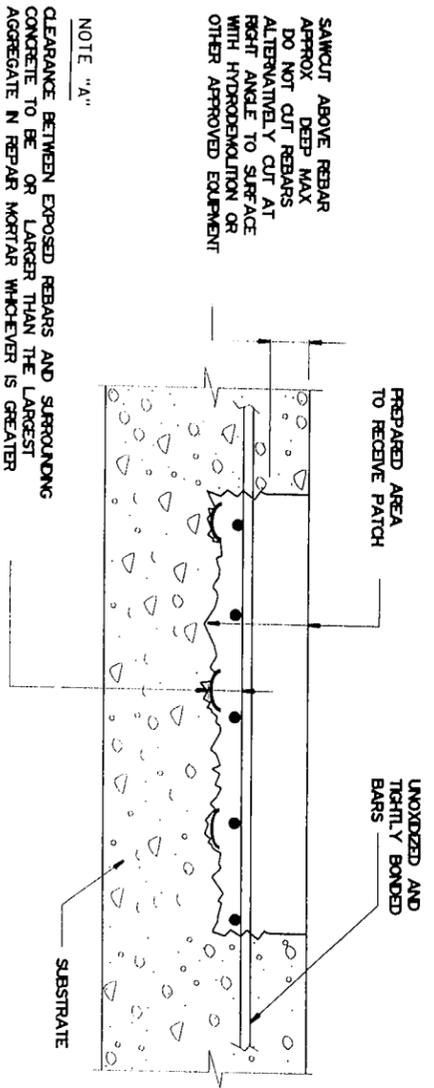
1. REMOVE AND CLEAN ASPHALT MASTIC ON THE WALL.
2. SAW CUT A TRAPEZOIDAL SLOT 1" DEEP BY 2" WIDE.
3. REMOVE CONCRETE TO FORM THE SLOT.
4. CAULK CRACK WITH OAKUM USING PROPER CAULKING TOOL TO FORCE THE OAKUM INTO THE CRACK AT LEAST 1/2" DEEP.
5. FILL TRAPEZOIDAL SLOT WITH "SLKA TOP-123" MORTAR MIX.

CROSS REFERENCES:

FOR GENERAL NOTES & REPAIR PROCEDURES.....SEE DWG. NO. C-1 FOR STATION KEY PLAN.....SEE DWG. NO. C-2 FOR SIDEWALK REPAIRS, PLAN & SECTION..SEE DWG. NO. C-XX THRU C-XX

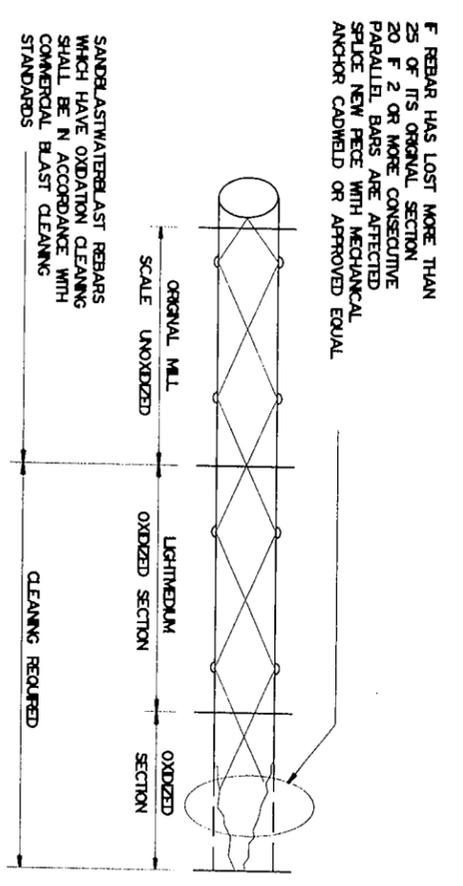
NOTE FOR SIDEWALK REPAIR

AFTER REMOVAL OF EXIST. SIDEWALK SLAB, ACTUAL FIELD CONDITION MAY DIFFER FROM THE DETAILS SHOWN ON THE DWG. CONTRACTOR SHALL MODIFY THE DETAILS TO SUIT THE FIELD CONDITION AND SUBMIT TO THE ENGINEER FOR APPROVAL.



a. UNDERCUTTING AT REBAR EDGE AND SURFACE CONDITIONING

NTS



b. CLEANING OF REBARS

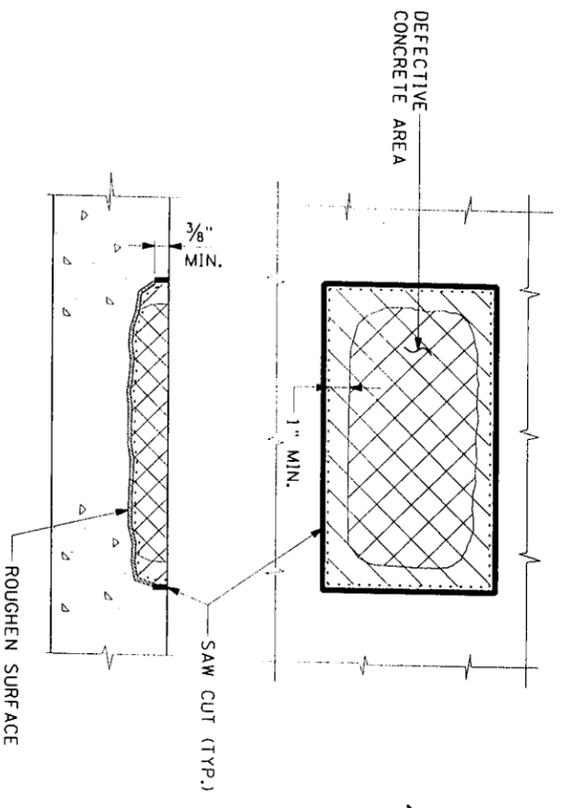
NTS

PREPARATION OF REBAR SURFACES

NOTES:

- 1 FOR NOTES SEE DWG C007 AND C009
- 2 ALL CRACKS OVER IN EXIST WALL, CEILING ARE TO BE REPAIRED
- 3 BEFORE STARTING ANY REMOVALS FOR REPAIRS ALL OVERLAYS SHALL BE PRECEDED BY REPAIRING CRACKS AND SPALLS THE CONTRACTOR IS REQUIRED TO REVIEW THE EFFECTS OF REMOVALS ON STRUCTURAL INTEGRITY PROVIDE SHORING OF MEMBERS AS NECESSARY PARTICULAR CARE SHALL BE EXERCISED AT SLAB-BEAM CONNECTIONS TO COLLARS WHEN TEMPORARY SUPPORTS ARE PROVIDED THE CONTRACTOR IS REQUIRED TO SUBMIT SHOP DRAWINGS FOR ENGINEERS APPROVAL
- 4 FOR SPALLED CONC REPAIR QUANTITY SEE TABLE ON THE DRAWINGS

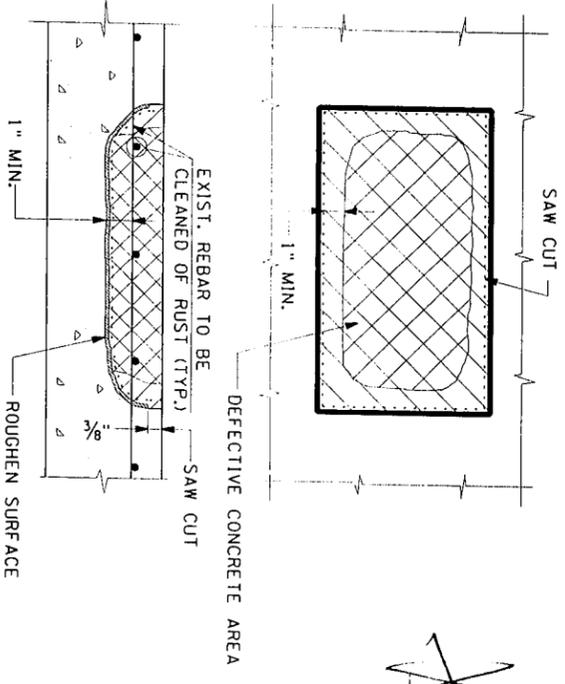
REVISION	0	CONFORMED DRAWING	12/12/08	APPROVED
DESCRIPTION	COMMON DETAILS			
DESCRIPTION	CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS			
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>STRUCTURAL ENGINEERING</p>		<p>PREPARATION OF REBAR SURFACES</p>		
DRAWN BY	G. ESTROPIA	SIGNED	DATE: APRIL 25, 2008	
DESIGNED BY	G. ESTROPIA	SIGNED	DRAWING NO. RC-1309	
CHECKED BY	P. ZHU	P.E.	SIGNED	REVISION
APPROVED BY	H. LAHIANI	P.E.	SIGNED	0



DETAIL C4
NTS

TOP SPALL WITH NO EXPOSED REINFORCEMENT

- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT DEEP AND REMOVE REMAINING CONCRETE WITHIN SAW CUT LINES ROUGHEN THE EDGE OF THE SAW CUT TO OPEN THE PORES OF THE CONCRETE
- 3 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 4 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 5 APPLY A SKATOP E22 PLUS SCRUB COAT OR APPROVED EQUAL TO SUBSTRATE FILLING ALL PORES AND VODS
- 6 WHILE SCRUB COAT IS STILL WET APPLY SKATOP E22 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LFTS FOR APPLICATION DEEPER THAN 1 ADD 42 POUNDS OF CLEAN COARSE AGGREGATE PER BAG OF SKA TOP E22 PLUS
- 7 FINISH TO MATCH ADJOINING SURFACES

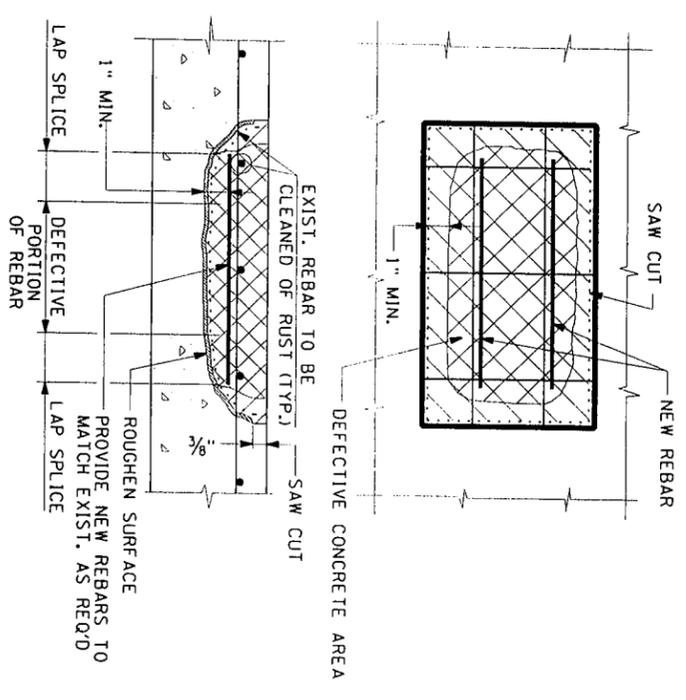


DETAIL C5
NTS

TOP SPALL WITH ONE/TWO LAYERS OF EXPOSED REINFORCEMENT

- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT DEEP AND REMOVE REMAINING CONCRETE WITHIN SAW CUT LINES ROUGHEN THE EDGE OF THE SAW CUT TO OPEN THE PORES OF THE CONCRETE
- 3 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 4 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 5 APPLY BY BRISTLE BRUSH OR SPRAY SKA ARMATEC NO OR APPROVED EQUAL TO EXISTING CONCRETE AND APPLY TWO COATS TO ALL EXPOSED STEEL
- 6 WHILE SCRUB COAT IS STILL WET APPLY SKATOP E22 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LFTS FOR APPLICATION DEEPER THAN 1 ADD 42 POUNDS OF CLEAN COARSE AGGREGATE PER BAG OF SKA TOP E22 PLUS
- 7 FINISH TO MATCH ADJOINING SURFACES

NOTE CONCRETE SHALL BE REMOVED A MINIMUM OF 1 UNDER CORRODED BAR IF UNCORRODED BAR IS EXPOSED DURING THE REMOVAL PROCESS THEN THE BAR SHALL BE FULLY EXPOSED WITH A MINIMUM OF 1 CLEARANCE AROUND IT



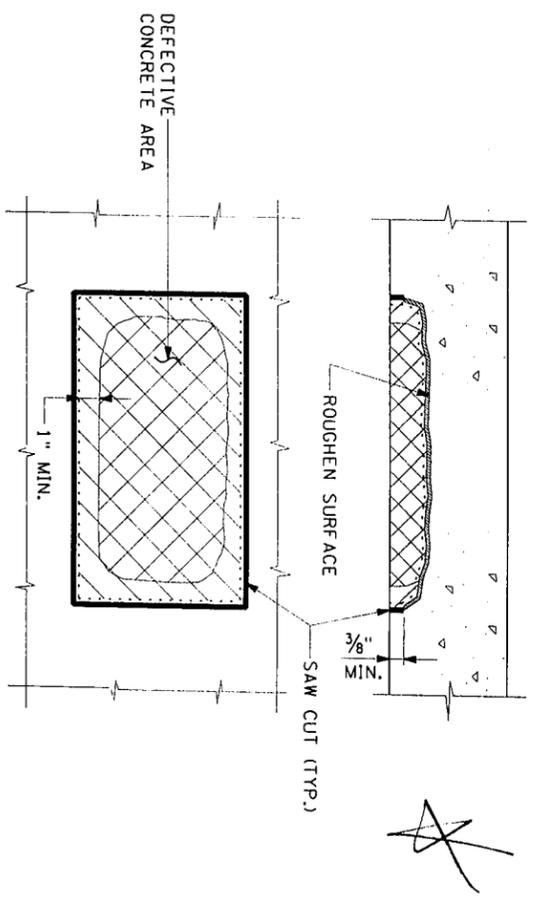
DETAIL C6
NTS

TOP SPALL WITH ADDITIONAL REINFORCEMENT

- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT DEEP AND REMOVE REMAINING CONCRETE WITHIN SAW CUT LINES ROUGHEN THE EDGE OF THE SAW CUT TO OPEN THE PORES OF THE CONCRETE
- 3 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 4 PROPERLY LAP SPLICE ALL DEFECTIVE PORTIONS OF REINFORCEMENT WITH NEW REINFORCEMENT FOR SPLICE DEVELOPMENT LENGTH SEE DRAWING C6-41
- 5 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 6 APPLY BY BRISTLE BRUSH OR SPRAY SKA ARMATEC NO OR APPROVED EQUAL TO EXISTING CONCRETE AND APPLY TWO COATS TO ALL EXPOSED STEEL
- 7 WHILE SCRUB COAT IS STILL WET APPLY SKATOP E22 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LFTS FOR APPLICATION DEEPER THAN 1 ADD 42 POUNDS OF CLEAN COARSE AGGREGATE PER BAG OF SKA TOP E22 PLUS
- 8 FINISH TO MATCH ADJOINING SURFACES

NOTE IF REINFORCING STEEL HAS LOST MORE THAN 20 OF ITS CROSS SECTION THEN STEEL REPAIR IS REQUIRED

REVISION	0	CONFORMED DRAWING	DATE	12/12/08	APPROVED
COMMON DETAILS					
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT STRUCTURAL ENGINEERING</p>			<p>CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p>		
<p>DESIGNED BY: G. ESTROPIA CHECKED BY: P. ZHU APPROVED BY: H. LAHIANI</p>			<p>DATE: APRIL 25, 2008 DRAWING NO.: RC-1310 REVISION: 0</p>		
CONCRETE SPALL REPAIRS SHEET 1 OF 5					



DETAIL C7
NTS

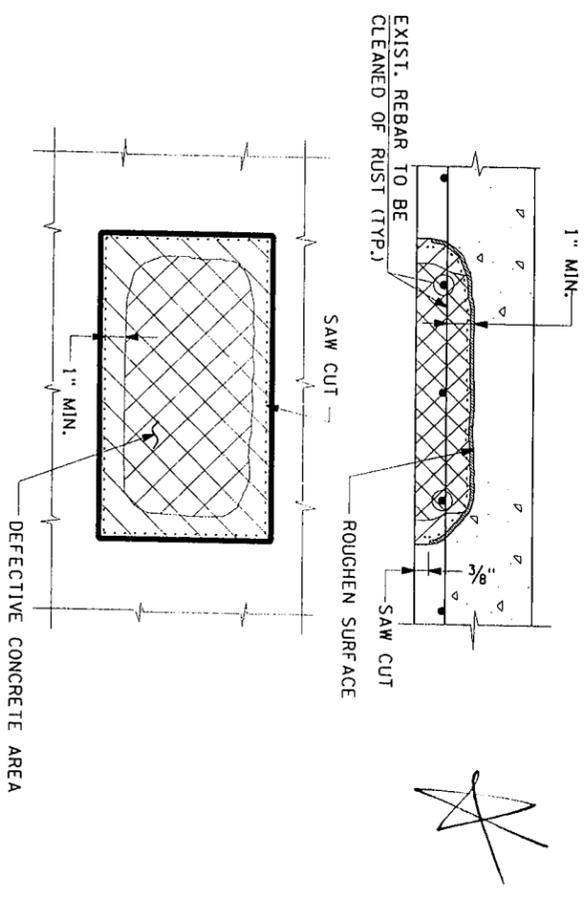
BOTTOM SPALL WITH NO EXPOSED REINFORCEMENT

HAND-APPLIED:

- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT DEEP AND REMOVE REMAINING CONCRETE WITHIN SAW CUT LINES ROUGHEN THE EDGE OF THE SAW CUT TO OPEN THE PORES OF THE CONCRETE
- 3 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 4 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 5 APPLY A SKATOP 123 PLUS SCRUB COAT OR APPROVED EQUAL TO SUBSTRATE FILLING ALL PORES AND VIDS
- 6 WHILE SCRUB COAT IS STILL WET APPLY SKATOP 123 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LITS SCORE AND ROUGHEN THE TOP SURFACE OF EACH LFT BEFORE IT HARDENS TO PROVIDE A ROUGH PROFILE FOR THE NEXT LFT
- 7 FINISH TO MATCH ADJOINING SURFACES

MACHINE APPLIED: SHOTCRETE

- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT DEEP AND REMOVE REMAINING CONCRETE WITHIN SAW CUT LINES ROUGHEN THE EDGE OF THE SAW CUT TO OPEN THE PORES OF THE CONCRETE
- 3 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 4 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 5 APPLY SKAREPAR 224 OR APPROVED EQUAL IN ACCORDANCE WITH AQ 506R99S GUIDE TO SHOTCRETE
- 6 REMOVE ANY EXCESS MATERIAL WITH A CUTTING SCREED AND MEET ADJOINING SURFACES NO SPECIAL FINISH IS REQUIRED OVER THE NATURAL GUN FINISH



DETAIL C8
NTS

BOTTOM SPALL WITH ONE/TWO LAYERS OF EXPOSED REINFORCEMENT

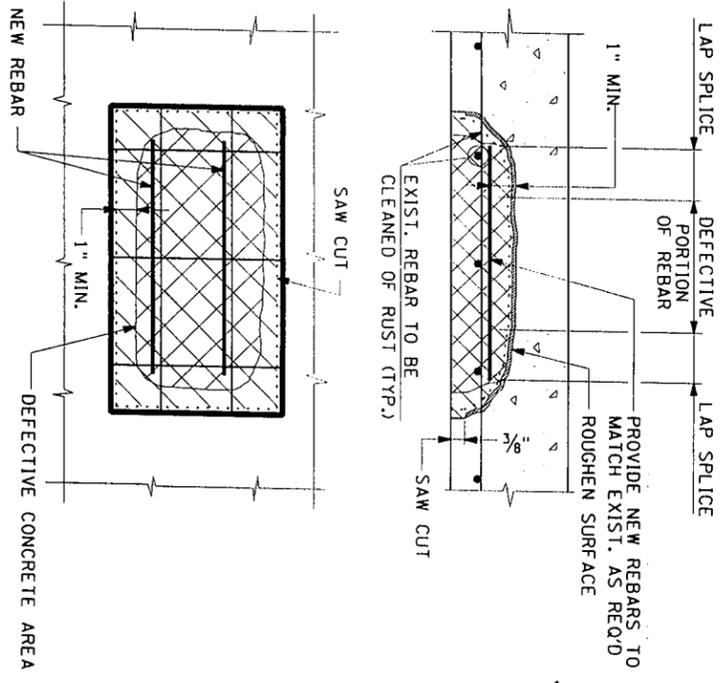
HAND-APPLIED:

- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT DEEP AND REMOVE REMAINING CONCRETE WITHIN SAW CUT LINES ROUGHEN THE EDGE OF THE SAW CUT TO OPEN THE PORES OF THE CONCRETE
- 3 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 4 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 5 APPLY BY BRISTLE BRUSH OR SPRAY SKA ARMATEC 10 OR APPROVED EQUAL AS A SCRUB COAT TO EXISTING CONCRETE AND APPLY TWO COATS TO ALL EXPOSED STEEL
- 6 WHILE SCRUB COAT IS STILL WET APPLY SKATOP 123 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LITS SCORE AND ROUGHEN THE TOP SURFACE OF EACH LFT BEFORE IT HARDENS TO PROVIDE A ROUGH PROFILE FOR THE NEXT LFT
- 7 FINISH TO MATCH ADJOINING SURFACES

MACHINE APPLIED: SHOTCRETE

- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT DEEP AND REMOVE REMAINING CONCRETE WITHIN SAW CUT LINES ROUGHEN THE EDGE OF THE SAW CUT TO OPEN THE PORES OF THE CONCRETE
- 3 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 4 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 5 APPLY BY BRISTLE BRUSH OR SPRAY SKA ARMATEC 10 OR APPROVED EQUAL AS A SCRUB COAT TO EXISTING CONCRETE AND APPLY TWO COATS TO ALL EXPOSED STEEL
- 6 APPLY SKAREPAR 224 OR APPROVED EQUAL IN ACCORDANCE WITH AQ 506R99S GUIDE TO SHOTCRETE
- 7 REMOVE ANY EXCESS MATERIAL WITH A CUTTING SCREED AND MEET ADJOINING SURFACES NO SPECIAL FINISH IS REQUIRED OVER THE NATURAL GUN FINISH

 <p>New York City Transit Authority</p>		<p>COMMON DETAILS</p> <p>CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p>	
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>STRUCTURAL ENGINEERING</p>		<p>CONCRETE SPALL REPAIRS</p> <p>SHEET 2 OF 5</p>	
<p>DESIGNED BY: G. ESTROPIA</p> <p>CHECKED BY: P. ZHU</p> <p>APPROVED BY: H. LAKHANI</p>	<p>SIGNED</p> <p>SIGNED</p> <p>SIGNED</p>	<p>DATE: APRIL 25, 2008</p> <p>DRAWING NO. RC-131</p> <p>REVISION: 0</p>	<p>CONFIRMED DRAWING</p> <p>DATE: 12/12/08</p> <p>APPROVED</p>



Revised Lighting

DETAIL C9

BOTTOM SPALL WITH ADDITIONAL REINFORCEMENT

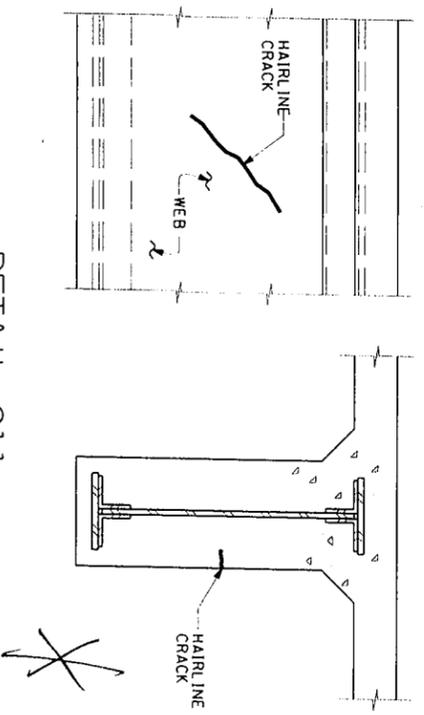
HAND-APPLIED:

- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT DEEP AND REMOVE REMAINING CONCRETE WITHIN SAW CUT LINES ROUGHEN THE EDGE OF THE SAW CUT TO OPEN THE PORES OF THE CONCRETE
- 3 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 4 PROPERLY LAP SPICE ALL DEFECTIVE PORTIONS OF REINFORCEMENT WITH NEW REINFORCEMENT FOR SPICE DEVELOPMENT LENGTH SEE DRAWING C041
- 5 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 6 APPLY BY BRISTLE BRUSH OR SPRAY SKA ARMATEC 10 OR APPROVED EQUAL AS A SCRUB COAT TO EXISTING CONCRETE AND APPLY TWO COATS TO ALL EXPOSED STEEL
- 7 WHILE SCRUB COAT IS STILL WET APPLY SKATOP 123 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LETS SCORE THE TOP SURFACE OF EACH LFT TO PRODUCE A ROUGHENED SURFACE FOR THE NEXT LFT
- 8 FINISH TO MATCH ADJOINING SURFACES

MACHINE APPLIED: SHOTCRETE

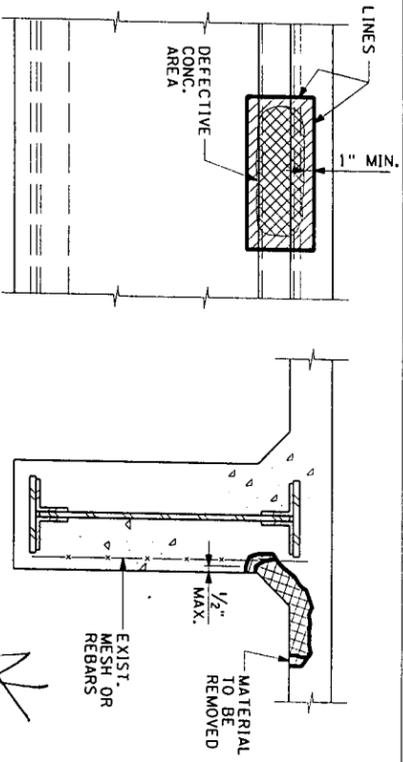
- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT DEEP AND REMOVE REMAINING CONCRETE WITHIN SAW CUT LINES ROUGHEN THE EDGE OF THE SAW CUT TO OPEN THE PORES OF THE CONCRETE
- 3 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 4 PROPERLY LAP SPICE ALL DEFECTIVE PORTIONS OF REINFORCEMENT WITH NEW REINFORCEMENT FOR SPICE DEVELOPMENT LENGTH SEE DRAWING C041
- 5 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 6 APPLY BY BRISTLE BRUSH OR SPRAY SKA ARMATEC 10 OR APPROVED EQUAL AS A SCRUB COAT TO EXISTING CONCRETE AND APPLY TWO COATS TO ALL EXPOSED STEEL
- 7 APPLY SKA REPAIR 224 OR APPROVED EQUAL IN ACCORDANCE WITH A1 506R95 GUIDE TO SHOTCRETE
- 8 REMOVE ANY EXCESS MATERIAL WITH A CUTTING SCREEN AND MEET ADJOINING SURFACES NO SPECIAL FINISH IS REQUIRED OVER THE NATURAL GUN FINISH

<p>New York City Transit Authority</p> <p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT STRUCTURAL ENGINEERING</p>		<p>COMMON DETAILS</p> <p>CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p> <p>CONCRETE SPALL REPAIRS SHEET 3 OF 5</p>	
REVISION	0	CONFORMED DRAWING	DATE: 12/12/08
DESIGNED BY	G. ESTROPIA	CHECKED BY	P. ZHU
DRAWN BY	G. ESTROPIA	APPROVED BY	H. LAHANI
<p>SIGNED</p>		<p>SIGNED</p>	
<p>DRAWING NO. RC-1312</p>		<p>DATE: APRIL 25, 2008</p>	
<p>REVISION</p>		<p>0</p>	



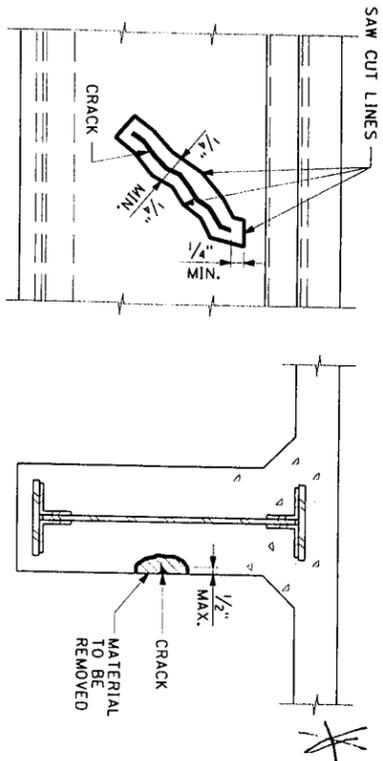
DETAIL C11
NTS

1 REPAIR PROCEDURE IS IDENTICAL TO DETAIL C1 HAIRLINE CRACK CAN OCCUR ANYWHERE ON A BEAM



DETAIL C14
NTS

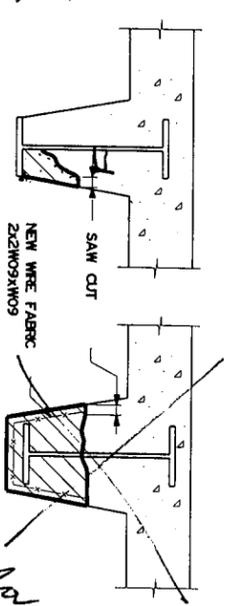
- 1 REMOVE DEFECTIVE CONCRETE AND STEEL MESH AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT THE SURFACE OF THE SPALL AS INDICATED TO A DEPTH OF MAX REMOVE DEFECTIVE CONCRETE WITHIN SAW CUT LINES F SURFACE OF STEEL IS ENCOUNTERED REMOVE ATTACHED PIECES OF CONCRETE
- 3 BLAST CLEAN THE METAL TO REMOVE CORROSION AND BLAST CLEAN CONCRETE SURFACES TO REMOVE ALL LOOSE MATERIAL
- 4 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 5 APPLY BY BRUSH ROLLER OR SPRAY SKA SKADUR 32 H MOD OR APPROVED EQUAL AS A SCRUB COAT TO EXISTING CONCRETE AND STEEL
- 6 APPLY BY BRUSH ROLLER OR SPRAY SKA SKADUR 32 H MOD OR APPROVED EQUAL AS A SCRUB COAT TO EXISTING CONCRETE AND STEEL
- 7 WHILE SCRUB COAT IS STILL WET APPLY SKATOP 123 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LFTS SCORE AND ROUGHEN THE TOP SURFACE TO PROVIDE A ROUGH PROFILE FOR THE NEXT LFT
- 8 FINISH TO MATCH ADJOINING SURFACES



DETAIL C12
NTS

BM. WEB / COL. FACE CRACKS LARGER THAN 20 MILS.

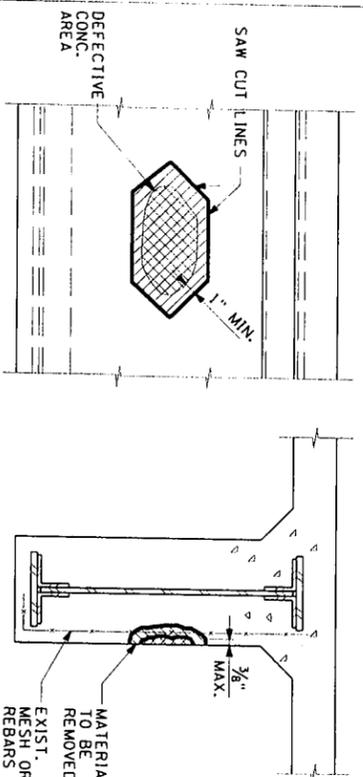
- 1 SAW CUT THE SURFACE OF THE CRACK AS INDICATED TO A DEPTH OF MAX REMOVE DEFECTIVE CONCRETE WITHIN THE SAW CUT LINES ROUTING CAN BE USED INSTEAD OF SAW CUTTING
- 2 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 3 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 4 APPLY A SKATOP 123 PLUS SCRUB COAT OR APPROVED EQUAL TO SUBSTRATE FILLING ALL PORES AND VOIDS
- 5 WHILE SCRUB COAT IS STILL WET APPLY SKATOP 123 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LFTS
- 6 FINISH TO MATCH ADJOINING SURFACES



DETAIL C15
NTS

for underside of platform
note this fully encases the beam.

- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT DEEP AROUND THE PERIMETER OF VOID REMOVE REMAINING CONCRETE WITHIN SAW CUT LINES
- 3 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 4 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 5 APPLY BY BRISTLE BRUSH OR SPRAY SKA ARMAATIC 10 OR APPROVED EQUAL AS A SCRUB COAT TO EXISTING CONCRETE AND COAT ALL EXPOSED REBARS
- 6 APPLY BY BRUSH ROLLER OR SPRAY SKA SKADUR 32 H MOD OR APPROVED EQUAL AS A SCRUB COAT TO EXISTING CONCRETE AND STEEL
- 7 WHILE SCRUB COAT IS STILL WET APPLY SKATOP 123 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LFTS SCORE AND ROUGHEN THE TOP SURFACE TO PROVIDE A ROUGH PROFILE FOR THE NEXT LFT
- 8 FINISH TO MATCH ADJOINING SURFACES



DETAIL C13
NTS

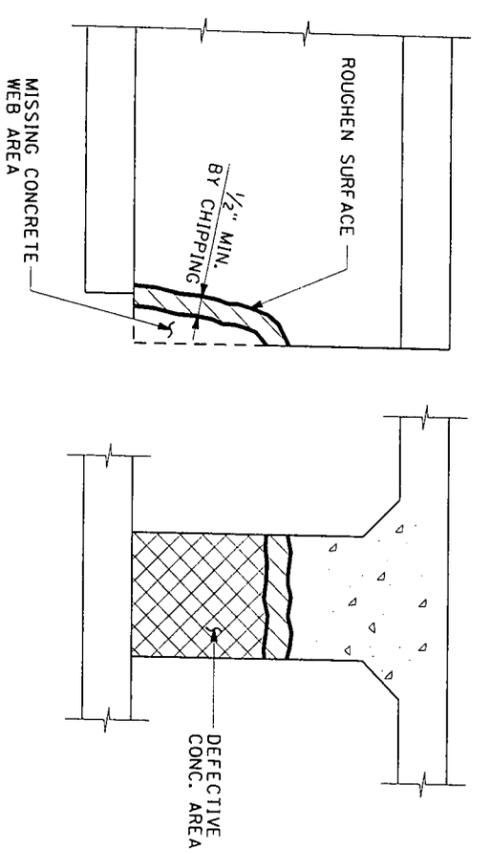
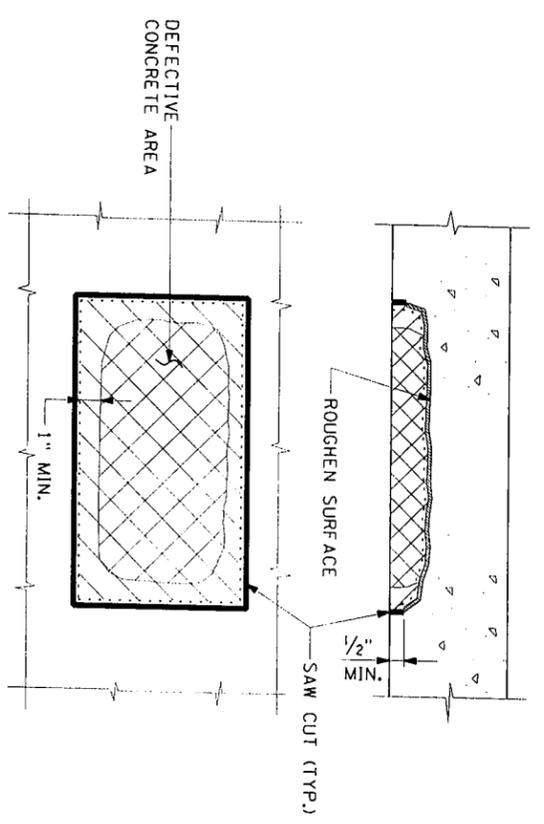
WEB SPALLS ON CONCRETE ENCASED GIRDERS

- 1 SAW CUT THE PERIMETER OF THE REPAIR AREA A MAXIMUM OF DEEP REMOVE DEFECTIVE CONCRETE AND STEEL MESH WITHIN THE SAW CUT LINES F REBARS ARE ENCOUNTERED DO NOT REMOVE BLAST CLEAN REBARS
- 2 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 3 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 4 APPLY A SKATOP 123 PLUS SCRUB COAT OR APPROVED EQUAL TO SUBSTRATE FILLING ALL PORES AND VOIDS F STEEL IS EXPOSED USE SKA ARMAATIC 10 OR APPROVED EQUAL INSTEAD OF SKATOP 123 PLUS AND APPLY TWO COATS TO ALL EXPOSED STEEL
- 5 WHILE SCRUB COAT IS STILL WET APPLY SKATOP 123 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LFTS
- 6 FINISH TO MATCH ADJOINING SURFACES

FOR MACHINED APPLIED PROCEDURE.

- 1 F A MACHINE APPLIED PROCEDURE IS USED SHP NOTE 5 AND CONTINUE WITH THE FOLLOWING NOTE 2 AND PROCEED
- 2 APPLY SKAREBAR 224 OR APPROVED EQUAL IN ACCORDANCE WITH ACI 508R95 GUIDE TO SHOTCRETE
- 3 REMOVE ANY EXCESS MATERIAL WITH A CUTTING SCREED AND MEET ADJOINING SURFACES NO SPECIAL FINISH IS REQUIRED OVER THE NATURAL CAN FINISH

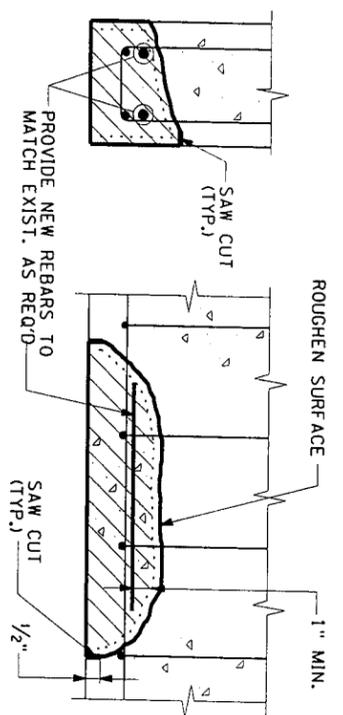
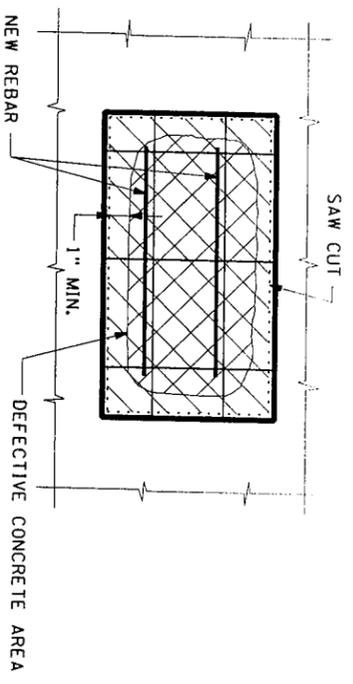
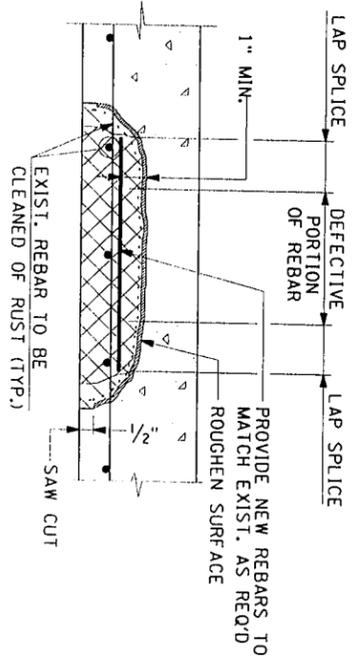
CONF ORMED DRAWING		DATE	APPROVED
REVISION	DESCRIPTION	DATE	APPROVED
0		12/12/08	
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>STRUCTURAL ENGINEERING</p> <p>CONCRETE SPALL REPAIRS SHEET 4 OF 5</p>			
DESIGNED BY	G. ESTROPIA	SIGNED	DATE - APRIL 25, 2008
CHECKED BY	P. ZHU	SIGNED	DRAWING NO.
APPROVED BY	H. LAKHANI	SIGNED	RC-1313
REVISION			0



DETAIL C16
NTS

- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 BLAST CLEAN THE CONCRETE SURFACE TO REMOVE ALL LOOSE MATERIAL
- 3 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 4 APPLY A SKATOP 123 PLUS SCRUB COAT OR APPROVED EQUAL TO SUBSTRATE FILLING ALL PORES AND VOIDS
- 5 WHILE SCRUB COAT IS STILL WET APPLY SKATOP 123 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LFTS FOR AREAS GREATER THAN 1 DEEP SCORE AND ROUGHEN TOP SURFACE TO PROVIDE A ROUGH PROFILE FOR THE NEXT LFT
- 6 FINISH TO MATCH ADJOINING SURFACES

BOTTOM SPALL WITH NO EXPOSED REINFORCEMENT

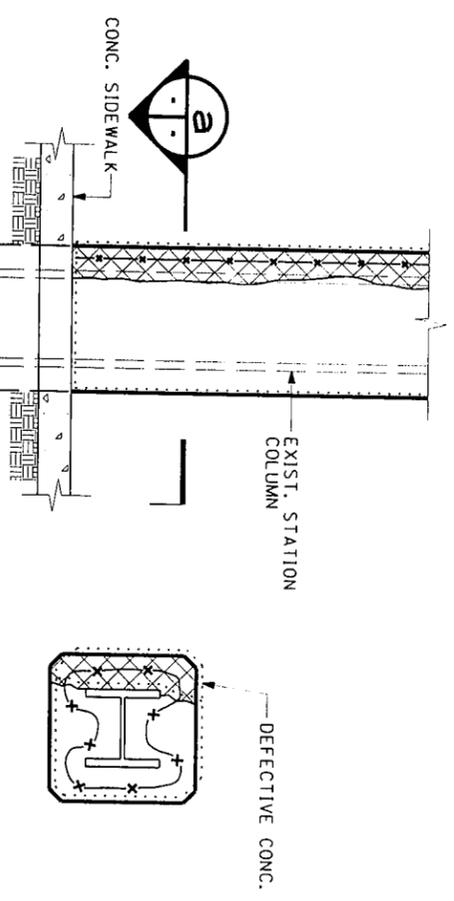


DETAIL C17
NTS

- 1 REMOVE DEFECTIVE CONCRETE AS REQUIRED SEE STRUCTURAL REPAIR NOTE 14
- 2 SAW CUT DEEP AND REMOVE REMAINING CONCRETE WITHIN SAW CUT LINES ROUGHEN THE EDGE OF THE SAW CUT TO OPEN THE PORES OF THE CONCRETE
- 3 BLAST CLEAN TO REMOVE ALL LOOSE MATERIAL
- 4 PROPERLY LAP SPlice ALL DEFECTIVE PORTIONS OF REINFORCEMENT WITH NEW REINFORCEMENT FOR SPlice DEVELOPMENT LENGTH SEE DRAWING C037
- 5 SUBSTRATE SHOULD BE SATURATED SURFACE DRY SSD WITH NO STANDING WATER
- 6 APPLY BY BRISTLE BRUSH OR SPRAY SKA ARMATEC 10 OR APPROVED EQUAL AS A SCRUB COAT TO EXISTING CONCRETE AND APPLY TWO COATS TO ALL EXPOSED STEEL
- 7 WHILE SCRUB COAT IS STILL WET APPLY SKATOP 123 PLUS OR APPROVED EQUAL IN MAXIMUM 1 LFTS SCORE AND ROUGHEN TOP SURFACE TO PROVIDE A ROUGH PROFILE FOR THE NEXT LFT
- 8 FINISH TO MATCH ADJOINING SURFACES

NOTE F THERE IS NO DEFECTIVE REINFORCEMENT SKIP NOTE 4 AND GO TO NOTE 5

BOTTOM SPALL WITH/ WITHOUT ADDITIONAL REINFORCEMENT



SECTION a-a
NTS

DETAIL C18
NTS

- 1 MEASURE ALL DIMENSIONS OF COLUMN ENCASEMENT
- 2 REMOVE ALL CONCRETE ENCASEMENT OF EXISTING COLUMN FROM BOTTOM OF MEZZANINE BEAM TO TOP OF SIDEWALK
- 3 PREPARE COLUMN TO A WHITE METAL FINISH
- 4 REPLACE ENCASEMENT TO SIMILAR SHAPE WITH NEW STRUCTURAL CONCRETE Fc 4000 PSI
- 5 PROVIDE WIRE MESH AS REQUIRED

NEW CONC. COLUMN ENCASEMENT

0	CONFORMED DRAWING	12/12/08	APPROVED
REVISION	DESCRIPTION	DATE	APPROVED
<p>COMMON DETAILS CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p>			
<p>CONCRETE SPALL REPAIRS SHEET 5 OF 5</p>			
DESIGNED BY	C. ESTROPIA	SIGNED	DATE: APRIL 25, 2008
CHECKED BY	P. ZHU	SIGNED	DRAWING NO. RC-131
APPROVED BY	H. LAKHANI	P.E.	REVISION 0

SIZE OF BAR	BARS IN TENSION	
	DEVELOPMENT LENGTH OTHER BARS	SPLICE LENGTH TOP BARS
#3	12	18
#4	14	24
#5	18	23
#6	21	28
#7	25	33
#8	30	39
#9	38	50
#10	48	63
#11	59	77

TABLE 1 :

DEVELOPMENT AND SPLICE LENGTH IN TENSION FOR NON COATED BAR

NOTE : INCREASE DEVELOPMENT AND SPLICE LENGTH BY TWO TIMES WHERE :
 BAR COVER LESS THAN OR EQUAL TO BAR DIAMETER.
 OR
 CLEAR SPACING LESS THAN OR EQUAL TO TWO TIMES BAR DIAMETER.

SIZE OF BAR	BARS IN TENSION	
	DEVELOPMENT LENGTH OTHER BARS	SPLICE LENGTH TOP BARS
#3	17	24
#4	21	22
#5	27	31
#6	32	28
#7	38	33
#8	45	39
#9	57	47
#10	72	59
#11	89	75

TABLE 2A:

DEVELOPMENT AND SPLICE LENGTH (IN) IN TENSION FOR EPOXY COATED BAR

NOTE : USE THIS TABLE WHERE :
 BAR COVER LESS THAN THREE TIMES BAR DIAMETER.
 OR
 CLEAR SPACING LESS THAN SIX TIMES BAR DIAMETER.

SIZE OF BAR	BARS IN TENSION	
	DEVELOPMENT LENGTH OTHER BARS	SPLICE LENGTH TOP BARS
#3	13	22
#4	17	22
#5	22	28
#6	25	28
#7	30	33
#8	36	39
#9	46	47
#10	58	59
#11	71	75

TABLE 2B

DEVELOPMENT AND SPLICE LENGTH (IN) IN TENSION FOR EPOXY COATED BAR

NOTE : USE THIS TABLE WHERE :
 BAR COVER GREATER THAN OR EQUAL TO 3 TIMES BAR DIAMETER.
 OR
 CLEAR SPACING GREATER THAN OR EQUAL TO SIX TIMES BAR DIAMETER.

SIZE OF BAR	BARS IN COMPRESSION	
	DEVELOPMENT LENGTH LDC	SPLICE LENGTH LPC
#3	8	12
#4	9	15
#5	12	19
#6	14	23
#7	17	26
#8	19	30
#9	21	34
#10	24	38
#11	27	42

TABLE 3

DEVELOPMENT AND SPLICE LENGTH (IN) IN COMPRESSION FOR EPOXY COATED AND NON-COATED BAR

SIZE OF BAR	ALL BARS LDH
#3	7
#4	9.5
#5	12
#6	14
#7	17
#8	19
#9	22
#10	24
#11	27

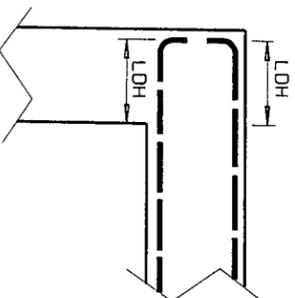


TABLE 4:

DEVELOPMENT LENGTH (IN) IN TENSION FOR A 90 DEGREE STANDARD HOOK.

ITEMS	CLEAR COVER (IN.)
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH :	3/2
EXPOSED TO EARTH OR WEATHER : #6 THRU #11 #5, W31 OR D31 WWF AND SMALLER	2 1/2
NOT EXPOSED TO WEATHER OR NOT IN CONTACT WITH THE EARTH : SLABS, WALLS, AND JOISTS #11 AND SMALLER	2/2
BEAMS, GIRDERS, AND COLUMNS: PRIMARY REINF., TIES, STIRRUPS, SPIRALS	1 1/2

TABLE 5

CONCRETE PROTECTION TO REINFORCEMENT (UNLESS OTHERWISE NOTED)

NOTES

1. DETAILS SHOWN HERE ARE FOR:
 CONCRETE STRENGTH - $f'_c = 4000$ PSI.
 REBAR STRENGTH - $f_y = 60000$ PSI. (ASTM A615)
 WWF STRENGTH, PLAIN AND DEFORMED - $f_y = 60000$ PSI.
 (ASTM A185 & A497 RESPECTIVELY)
 EPOXY COATED REBAR AND WWF SHALL BE AS PER ASTM A775 AND A884 RESPECTIVELY.
2. CLASS B SPLICE IS WHERE MORE THAN ONE-HALF OF THE BARS ARE LAP SPICED WITHIN A REQUIRED LAP LENGTH.
 TOP BAR IS THE HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCHES OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.

- NOTES TO DESIGNER:**
1. WORK THIS DRAWING WITH RC-1006 & RC-10D7.
 2. CADD FILE NUMBER FOR THIS DWG. IS: **ES/EST/STREF/RC1005.DGN**
 3. CHANGE SECTION MARKS AS REQUIRED FOR DRAWING NOS. FOR SPECIFIC CONTRACT.
 4. MODIFY THE TITLE TO MATCH WITH CONTRACT
 5. DELETE "NOTES TO DESIGNER" BOX.

REBAR DETAIL STANDARDS

SPONSOR : S. SENGUPTA

REVISION	DESCRIPTION	DATE	APPROVED

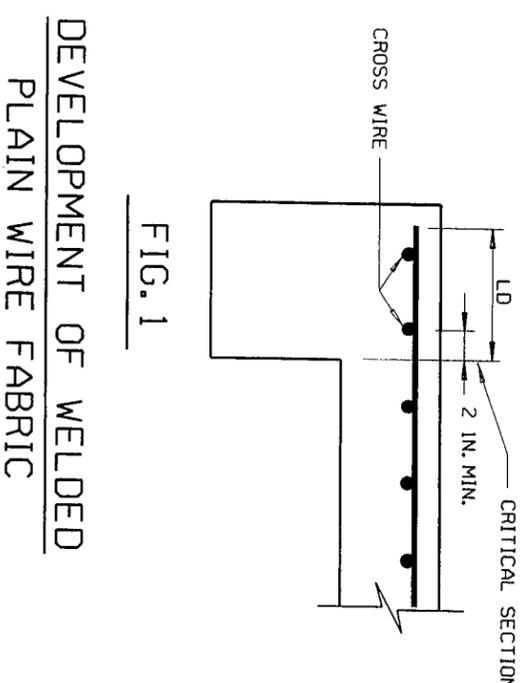

New York City Transit Authority
 DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT
 CIVIL/STRUCTURAL ENGINEERING

REFERENCE DRAWING STANDARDS - SHEET 1

DRAWN BY	DATE :
DESIGNED BY	DRAWING NO. RC-1015
CHECKED BY	RC-2201
APPROVED BY	REVISION

STYLE DESIGNATION	DEVELOPMENT LENGTH (IN.) LD	SPLICE LENGTH* (IN.)
6X6-W1.4xW1.4		
6X6-W2.1xW2.1		
6X6-W2.5xW2.5		
6X6-W2.9xW2.9		
6X6-W4.0xW4.0	8	8
6X6-W5.0xW5.0		
6X6-W6.0xW6.0		
6X6-W7.0xW7.0		
6X6-W8.0xW8.0		
6X6-W9.0xW9.0		
6X6-W10.0xW10.0		
6X6-W12.0xW12.0	8	9
6X6-W14.0xW14.0	8	11

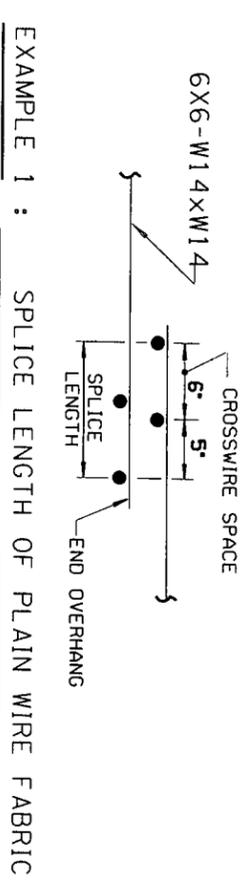
STYLE DESIGNATION	DEVELOPMENT LENGTH (IN.) LD	SPLICE LENGTH* (IN.)
4X4-W1.4xW1.4		
4X4-W2.1xW2.1		
4X4-W2.5xW2.5	6	6
4X4-W2.9xW2.9		
4X4-W4.0xW4.0		
4X4-W5.0xW5.0		
4X4-W6.0xW6.0	6	7
4X4-W7.0xW7.0	6	8
4X4-W8.0xW8.0	6	9
4X4-W9.0xW9.0	7	10
4X4-W10.0xW10.0	8	12
4X4-W12.0xW12.0	9	14
4X4-W14.0xW14.0	11	16



NOTE
1. FOR EPOXY COATED WWF, THE DEVELOPMENT AND SPLICE LENGTHS SHOWN IN TABLES ARE TO BE MULTIPLIED BY 1.5.

TABLE 1: WELDED WIRE FABRIC (WWF), PLAIN (ASTM 185)

*WITHIN A DISTANCE OF SPLICE LENGTH, FABRIC SHEET MUST CONTAIN ONE SPACING OF CROSSWIRE. END OVERHANG SHALL NOT BE INCLUDED IN THE SPLICE LENGTH.



STYLE DESIGNATION	DEVELOPMENT LENGTH (IN.) LD	SPLICE LENGTH* (IN.)
4X4-D4.0xD4.0	8	10
4X4-D5.0xD5.0		
4X4-D6.0xD6.0	8	11
4X4-D7.0xD7.0		
4X4-D8.0xD8.0	8	12
4X4-D9.0xD9.0		
4X4-D10.0xD10.0	8	14
4X4-D12.0xD12.0	9	15
4X4-D14.0xD14.0	10	16
6X6-D4.0xD4.0		
6X6-D5.0xD5.0	8	10
6X6-D6.0xD6.0		
6X6-D7.0xD7.0	8	11
6X6-D8.0xD8.0		
6X6-D9.0xD9.0	8	12
6X6-D10.0xD10.0		
6X6-D12.0xD12.0	8	14
6X6-D14.0xD14.0	9	15
6X6-D14.0xD14.0	10	16

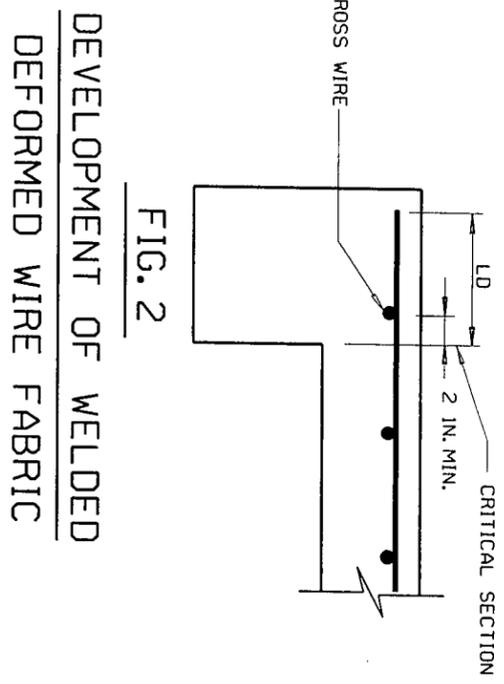
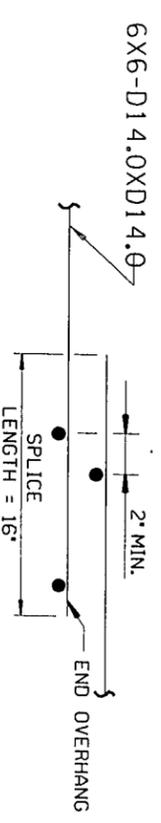


TABLE 2: WELDED WIRE FABRIC (WWF), DEFORMED (ASTM 4977)

*WITHIN A DISTANCE OF SPLICE LENGTH, THE DISTANCE BETWEEN TWO CROSSWIRES OF ADJACENT FABRICS SHALL BE 2" MIN.



NOTES TO DESIGNER:
1. WORK THIS DRAWING WITH RC-1005 .
2. CADD FILE NUMBER FOR THIS DWG. IS: ES/EST/STREF/RC1006.DGN
3. CHANGE SECTION MARKS AS REQUIRED FOR DRAWING NOS. FOR SPECIFIC CONTRACT.
4. MODIFY THE TITLE TO MATCH WITH CONTRACT.
5. DELETE "NOTES TO DESIGNER" BOX.

WELDED WIRE FABRIC DETAIL STANDARDS SPONSOR : S. SENGUPTA

REVISION	DESCRIPTION	DATE	APPROVED


DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT
CIVIL/STRUCTURAL ENGINEERING

REFERENCE DRAWING
REINFORCEMENT DETAIL STANDARDS - SHEET 2

DRAWN BY: _____ DATE: _____
 DESIGNED BY: _____ DRAWING NO. RC-1015
 CHECKED BY: _____ RC-2202
 APPROVED BY: _____ REVISION: _____

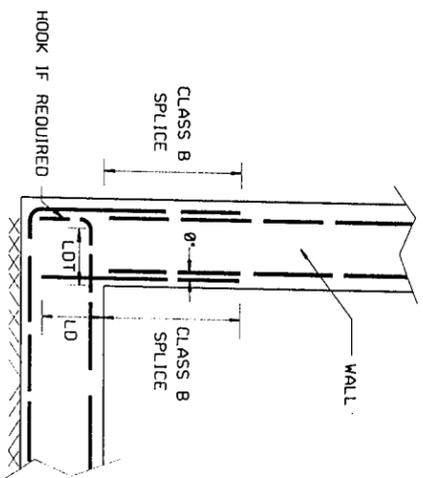


FIGURE 1: EXTERIOR WALL & GRADE SLAB
N.T.S.

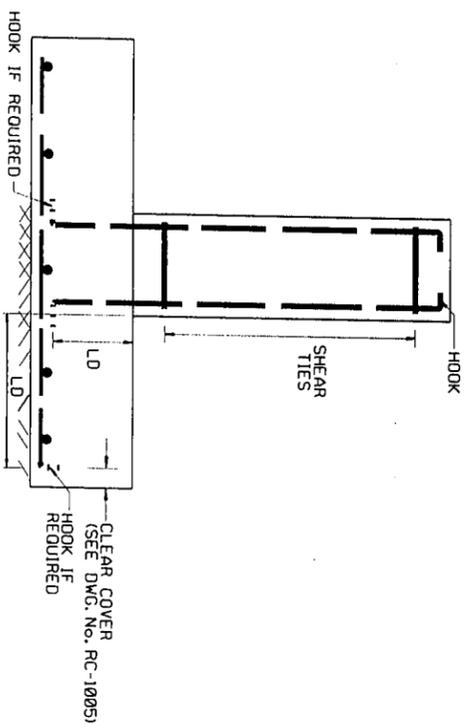


FIGURE 2: PIER & FOOTING
N.T.S.

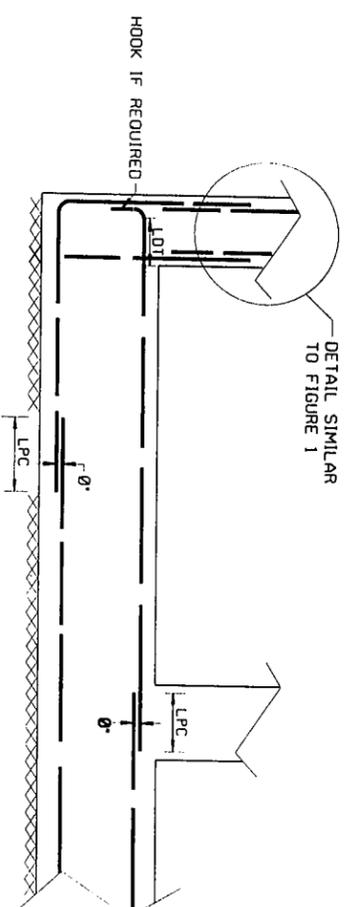


FIGURE 3: GRADE SLAB
N.T.S.

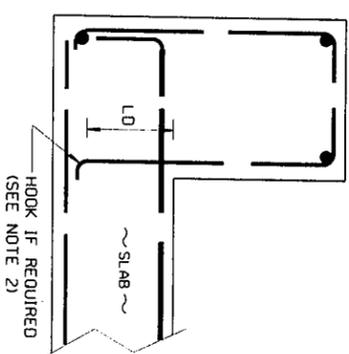


FIGURE 10: CURB DETAIL
N.T.S.

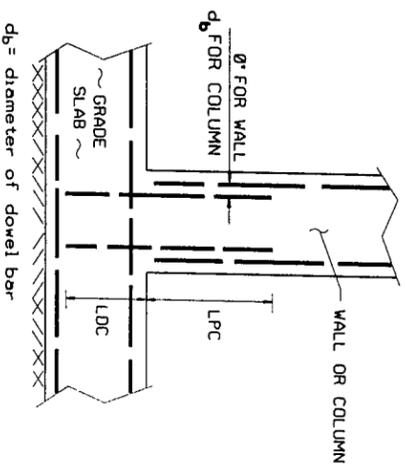


FIGURE 4: INTERIOR WALL OR COLUMN
N.T.S.

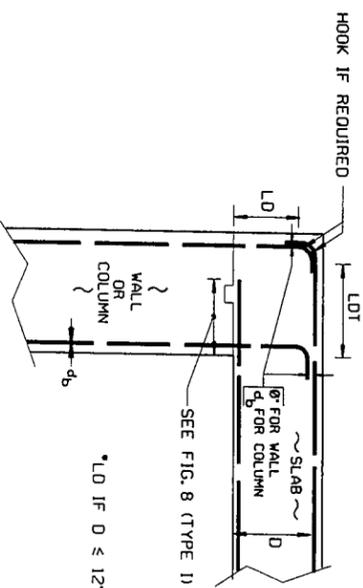


FIGURE 5: SLAB & WALL
(ALSO APPLICABLE TO BEAM & WALL AND BEAM & COLUMN)
N.T.S.

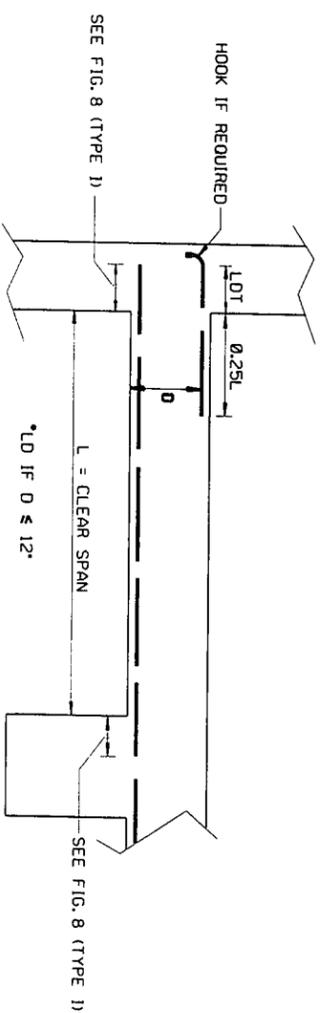


FIGURE 6: SLAB DETAIL
N.T.S.

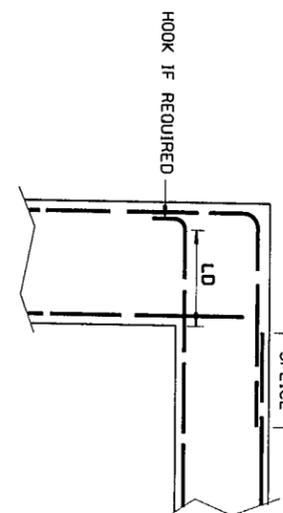


FIGURE 9: CORNER DETAIL (SLAB OR WALL)
N.T.S.

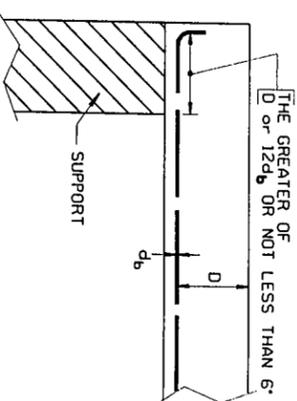
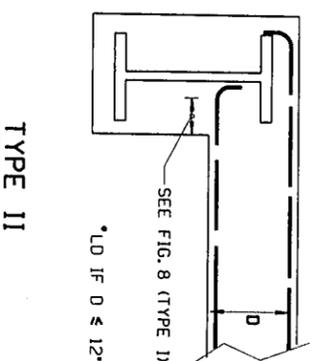


FIGURE 8: SLAB SUPPORTS AT END
N.T.S.



TYPE II

TYPE I

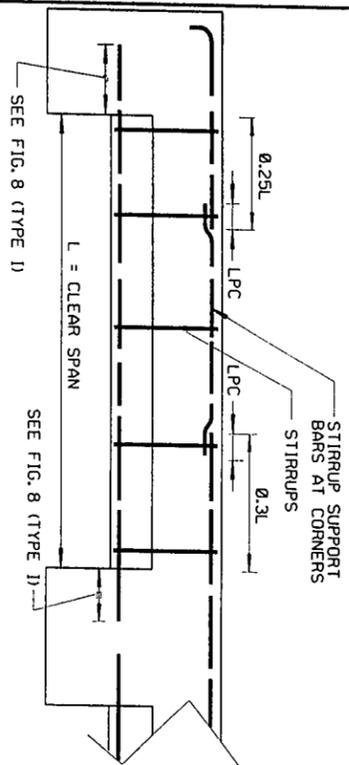


FIGURE 7: BEAM DETAILS
N.T.S.

- NOTES:**
1. WORK THIS DRAWING WITH DRAWING NO. RC-1005
 2. FOR ADDITIONAL DETAILS OF REINFORCEMENT, SEE CHAPTER 7, SECTIONS 7.1 & 7.2, ACI STANDARD 318-89.

- NOTES TO DESIGNER:**
1. WORK THIS DRAWING WITH RC-1005.
 2. CADD FILE NUMBER FOR THIS DWG. IS: **ES/EST/STREF/RC1007.DGN**
 3. CHANGE SECTION MARKS AS REQUIRED FOR DRAWING NUMBERS FOR A SPECIFIC CONTRACT.
 4. MODIFY THE TITLE TO MATCH WITH CORRESPONDING CONTRACT
 5. DELETE "NOTES TO DESIGNER" BOX:

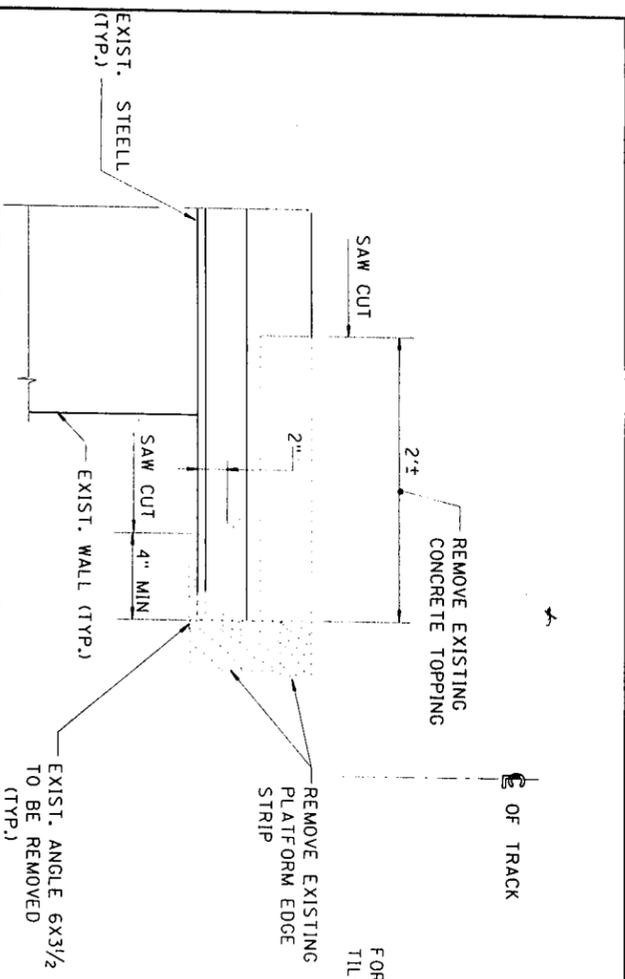
REVISION	DESCRIPTION	DATE	APPROVED

 <p>New York City Transit Authority</p> <p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>CIVIL/STRUCTURAL ENGINEERING</p>	<p>REINFORCEMENT DETAIL STANDARDS - SHEET 3</p>
---	--

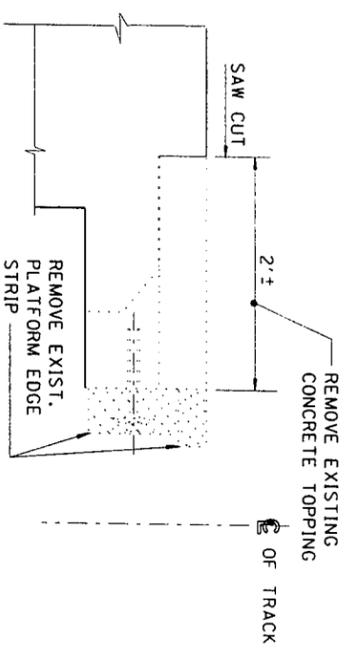
<p>DRAWN BY</p> <p>DESIGNED BY</p> <p>CHECKED BY</p> <p>APPROVED BY</p>	<p>DATE</p> <p>DRAWING NO. RC-1015</p> <p>RC-2203</p> <p>REVISION</p>
---	--

REBAR DETAIL STANDARDS

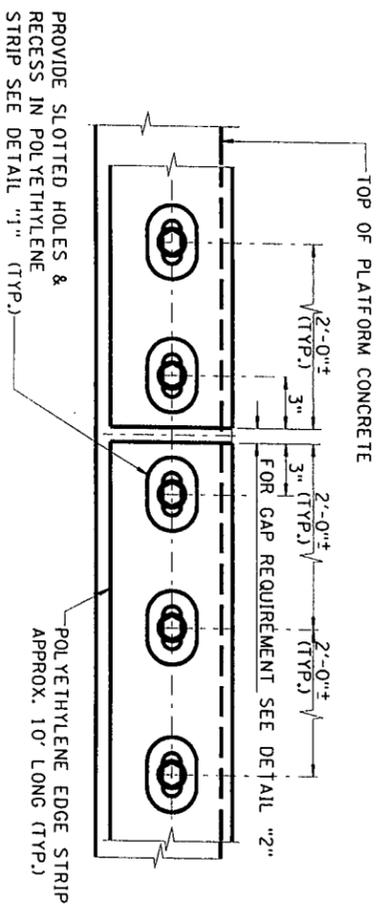
SPONSOR : S.SENGUPTA.



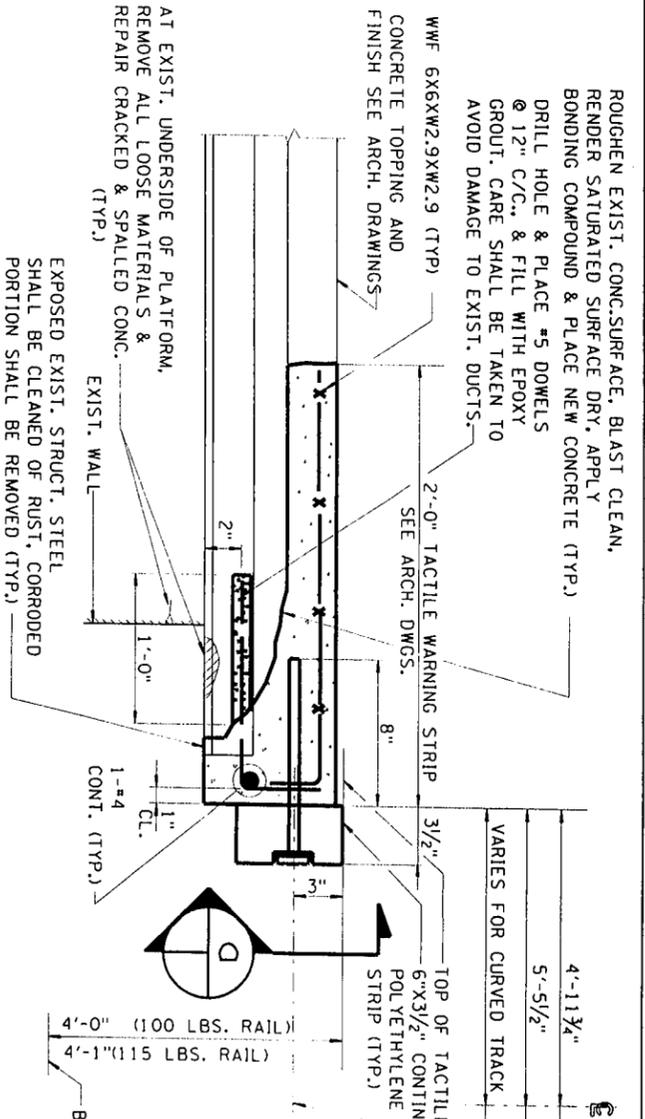
DEMOLITION OF EXISTING PLATFORM EDGE CONDITION "1" (ORIGINAL PLATFORM)
N.T.S.



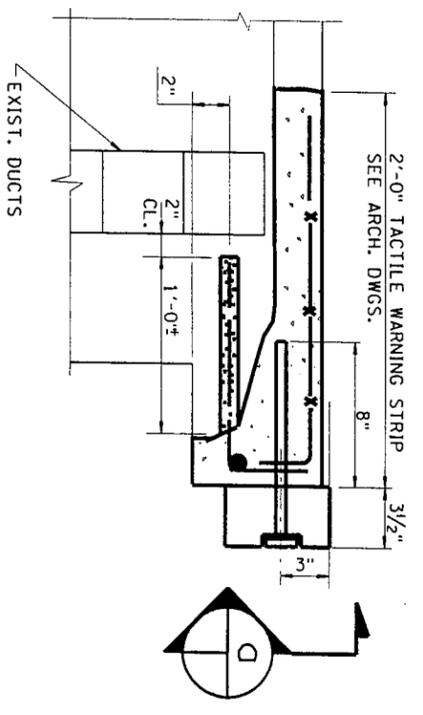
DEMOLITION OF EXISTING PLATFORM EDGE CONDITION "2" (PLATFORM EXTENSION)
N.T.S.



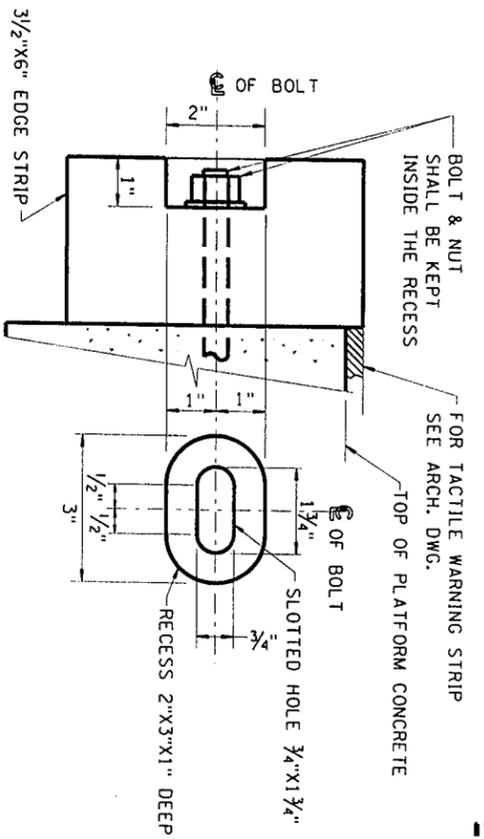
SECTION
N.T.S.



NEW PLATFORM EDGE CONDITION "1"
N.T.S.



NEW PLATFORM EDGE CONDITION "2"
N.T.S.



DETAIL
N.T.S.

- OF TRACK
- "A" DIVISION (IRT) FOR TANGENT TRACK
 - 4'-11 3/4"
 - 5'-5 1/2"
 - "B" DIVISION (BMT & IND) FOR TANGENT TRACK
 - (SEE NOTE NO. 1)
 - TOP OF TACTILE WARNING STRIP
 - 6"x3 1/2" CONTINUOUS YELLOW POLYETHYLENE EDGE STRIP (TYP.)
 - 3/2"
 - SEE ARCH. DWGS.
 - 2'-0" TACTILE WARNING STRIP
 - 8"
 - 1'-0"
 - 1'-4" CL.
 - 1'-4" CONT. (TYP.)
 - 1"
 - 1'-4" CL.
 - 4'-0" (100 LBS. RAIL)
 - 4'-1" (115 LBS. RAIL)
 - BASE OF RAIL
- NOTES:**
1. FOR STATION PLATFORMS EDGE AT LOCATIONS OF CURVED TRACK ALIGNMENT, THE CONTRACTOR SHALL SURVEY EXISTING CLEARANCES FROM CENTERLINE OF TRACK TO PLATFORM EDGE. NEW PLATFORM EDGE SHALL BE INSTALLED TO MATCH EXISTING CLEARANCES.
 2. THE CONTRACTOR SHALL SURVEY THE FOLLOWING DIMENSIONS:
 - a) PRIOR TO DEMOLITION, DOCUMENT THE EXISTING DIMENSION FROM BASE OF RAIL TO TOP OF CONCRETE PLATFORM EDGE AT 10 FEET INTERVALS.
 - b) SUBSEQUENT TO THE EDGE STRIP INSTALLATION, BUT PRIOR TO THE INSTALLATION OF PLATFORM CONCRETE, DOCUMENT THAT THE NEW EDGE INSTALLATION IS IN CONFORMANCE WITH THE CONTRACT REQUIREMENTS. MEASUREMENTS TO BE SUBMITTED FOR APPROVAL OF THE ENGINEER PRIOR TO INSTALLATION OF CONCRETE.
 - c) THE DOCUMENTATION SHALL INCLUDE MEASUREMENTS AT 10 FOOT INTERVALS FOR THE ENTIRE LENGTH OF THE PLATFORM.
 3. THE EDGE STRIP SHALL BE YELLOW POLYETHYLENE EDGE STRIP, "AR" UHMW *819 AS MANUFACTURED BY ULTRA-POLY, INC. OR APPROVED EQUAL. TOP SURFACE OF THE STRIP SHALL BE ROUGHENED BY SCARIFICATION.
 4. CARE SHOULD BE TAKEN TO AVOID DAMAGE TO EXISTING DUCTS WHEN DRILLING FOR DOWEL INSTALLATION.
 5. CONCRETE SHALL BE HIGH-EARLY STRENGTH (TYPE III PORTLAND CEMENT) WITH A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, WHEN TESTED AT 28 DAYS.
 6. FOR A 10 FOOT LENGTH AT EACH END OF PLATFORM, THE STRIP WIDTH SHALL BE TAPERED FROM 3/2" TO 2".
 7. FOR PLATFORM EDGE STRIP INSTALLATION AT THE ADA BOARDING AREA, SEE DRAWING NO. C-.

DETAIL
N.T.S.

- NOTES TO DESIGNER:**
1. DETAILS SHOWN ON THIS DRAWING ARE FOR REFERENCE ONLY. THE EXISTING PLATFORM EDGE CONDITIONS AT EACH STATION SHOULD BE THOROUGHLY INSPECTED AND THE DETAILS MODIFIED AS REQUIRED.
 2. PLATFORM EDGE BLEV TO DETERMINE EXISTING PLATFORM HEIGHT AT 10 FT INTERVALS ALONG THE ENTIRE LENGTH OF THE PLATFORM.

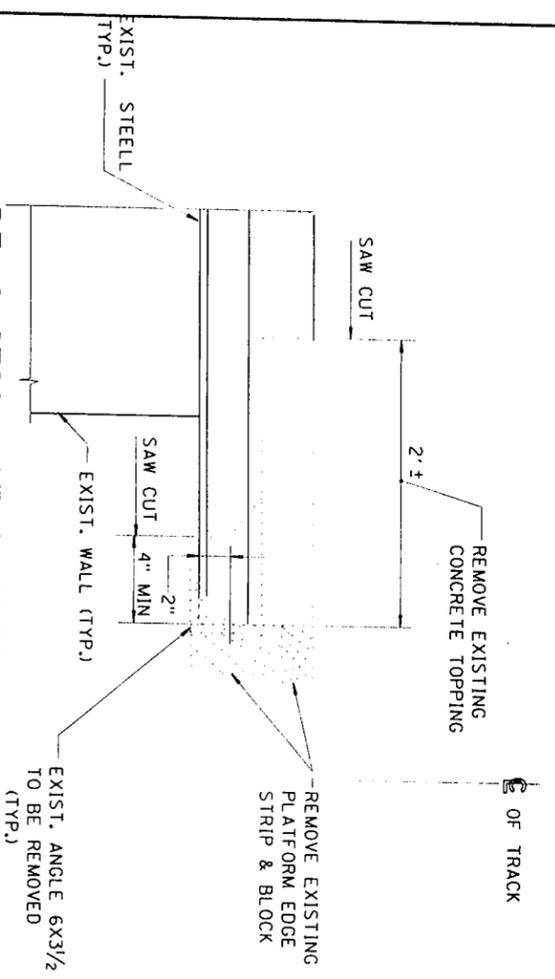
REVISION	DESCRIPTION	DATE	APPROVED

REFERENCE DRAWING

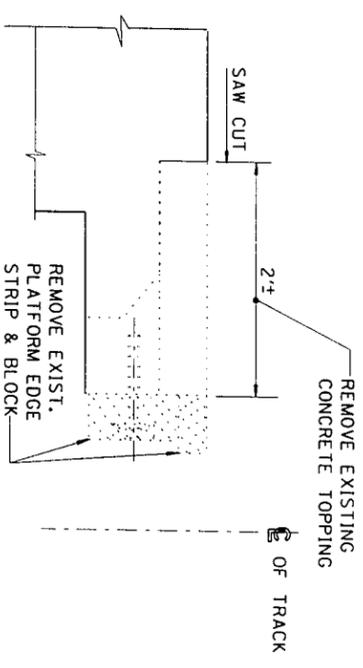
PLATFORM EDGE STRIP DETAILS BEYOND ADA BOARDING AREA - SHEET

<p>New York City Transit Authority</p> <p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>CIVIL/STRUCTURAL ENGINEERING</p>	<p>DATE :</p> <p>DRAWING NO. RC-1015</p> <p>RC-2401</p>
--	--

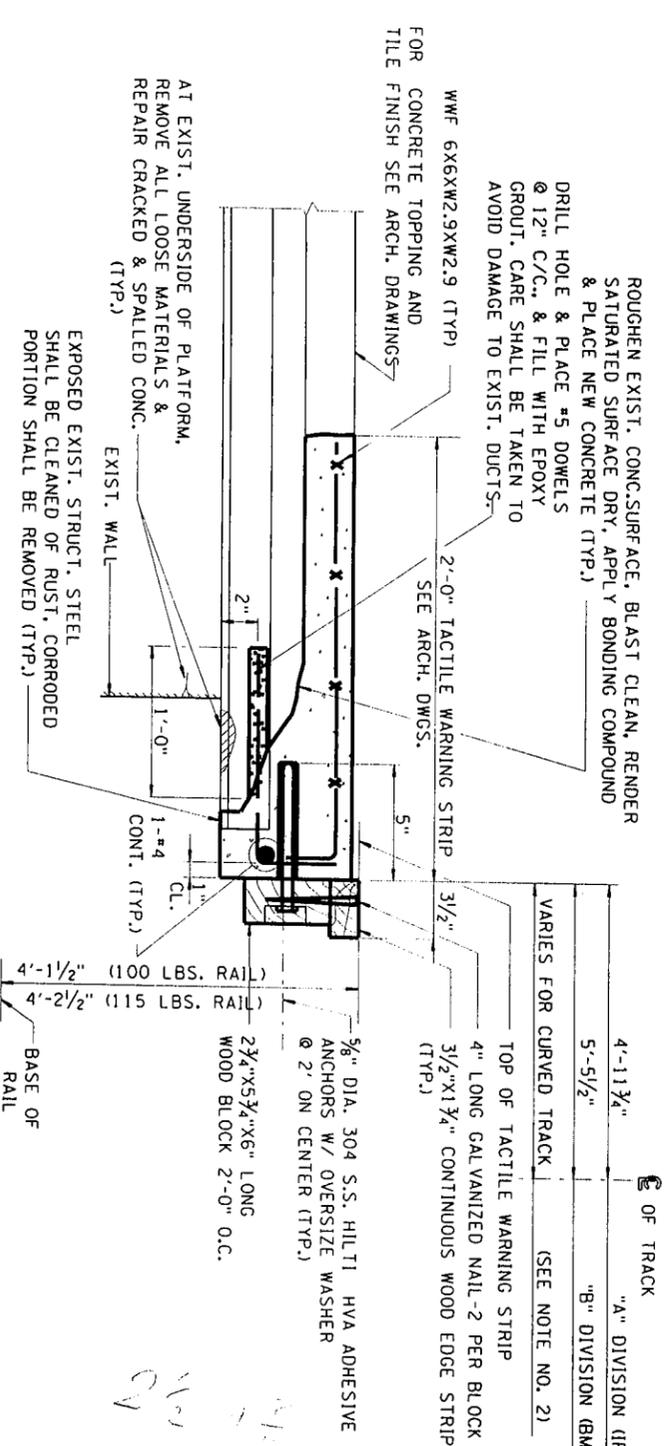
DEMOLITION OF EXISTING PLATFORM EDGE CONDITION "1" (ORIGINAL PLATFORM)
N.T.S.



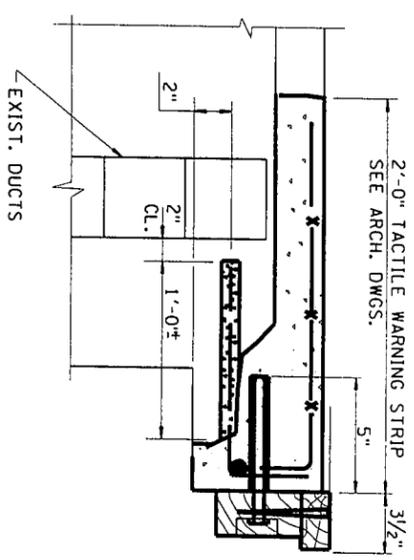
DEMOLITION OF EXISTING PLATFORM EDGE CONDITION "2" (PLATFORM EXTENSION)
N.T.S.



NEW PLATFORM EDGE CONDITION "1"
N.T.S.



NEW PLATFORM EDGE CONDITION "2"
N.T.S.



[FOR INFORMATION NOT SHOWN, SEE EDGE CONDITION "1"]
N.T.S.

NOTES TO DESIGNER:

1. DETAILS SHOWN ON THIS DRAWING ARE FOR REFERENCE ONLY. THE EXISTING PLATFORM EDGE CONDITIONS AT INDIVIDUAL STATIONS SHOULD BE THOROUGHLY INSPECTED AND THE DETAILS ADAPTED AS REQUIRED.
2. PERFORM SURVEY OF EXISTING BASE OF RAIL ELEVATION AND TOP OF PLATFORM EDGE ELEV TO DETERMINE EXISTING PLATFORM HEIGHT AT 10 FT INTERVALS ALONG THE ENTIRE LENGTH OF THE PLATFORM.

NOTES:

1. FOR LOCATION AND EXTENT OF ADA BOARDING AREA, SEE ARCHITECTURAL DRAWINGS.
2. FOR STATION PLATFORMS EDGE AT LOCATIONS OF CURVED TRACK ALIGNMENT, THE CONTRACTOR SHALL SURVEY EXISTING CLEARANCES FROM CENTERLINE OF TRACK TO PLATFORM EDGE. NEW PLATFORM EDGE SHALL BE INSTALLED TO MATCH EXISTING CLEARANCES.
3. THE CONTRACTOR SHALL SURVEY THE FOLLOWING DIMENSIONS:
 - a) PRIOR TO DEMOLITION, DOCUMENT THE EXISTING DIMENSION FROM BASE OF RAIL TO TOP OF CONCRETE PLATFORM EDGE AT 10 FEET INTERVALS.
 - b) SUBSEQUENT TO THE EDGE STRIP INSTALLATION, BUT PRIOR TO THE INSTALLATION OF PLATFORM CONCRETE, DOCUMENT THAT THE NEW EDGE INSTALLATION IS IN CONFORMANCE WITH THE CONTRACT REQUIREMENTS. MEASUREMENTS TO BE SUBMITTED FOR APPROVAL OF THE ENGINEER PRIOR TO INSTALLATION OF CONCRETE.
 - c) THE DOCUMENTATION SHALL INCLUDE MEASUREMENTS AT 10 FOOT INTERVALS FOR THE ENTIRE LENGTH OF THE PLATFORM.
4. FOR WOOD STRIP AND BLOCKS, SEE SPECIFICATION SECTION - 6C
5. CARE SHOULD BE TAKEN TO AVOID DAMAGE TO EXISTING DUCTS WHEN DRILLING FOR DOWEL INSTALLATION.
6. CONCRETE SHALL BE HIGH-EARLY STRENGTH (TYPE III PORTLAND CEMENT) WITH A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. WHEN TESTED AT 28 DAYS.
7. FOR PLATFORM EDGE STRIP INSTALLATION BEYOND THE ADA BOARDING AREA, SEE DRAWING NO. C-.



New York City
Transit Authority

DEPARTMENT OF
CAPITAL PROGRAM
MANAGEMENT

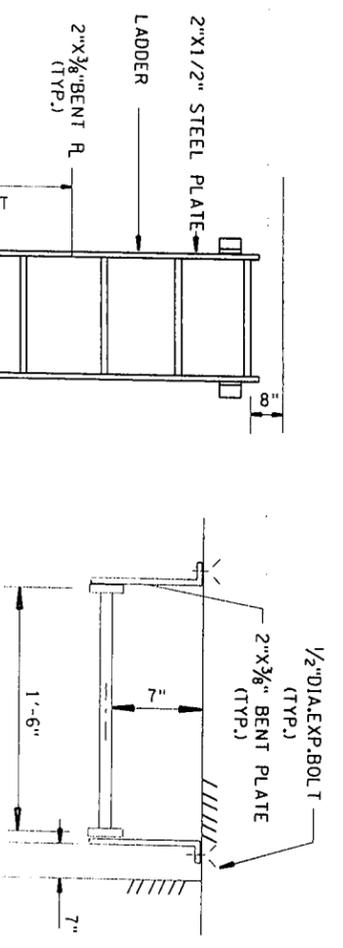
CIVIL/STRUCTURAL ENGINEERING

REFERENCE DRAWING

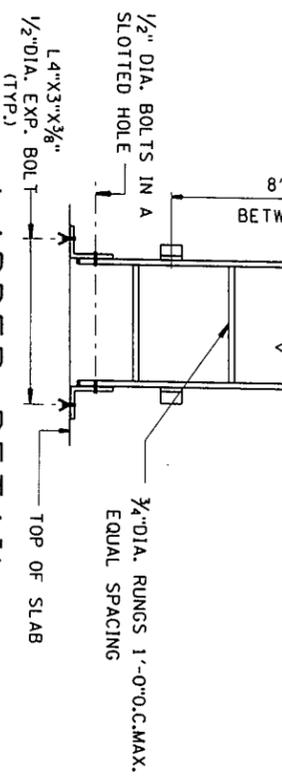
PLATFORM EDGE STRIP DETAILS
AT ADA BOARDING AREA - SHEET 2

REVISION	DESCRIPTION	DATE	APPROVED

DESIGNED BY	DATE	DRAWING NO. RC-1015
CHECKED BY		RC-2402
APPROVED BY		REVISION

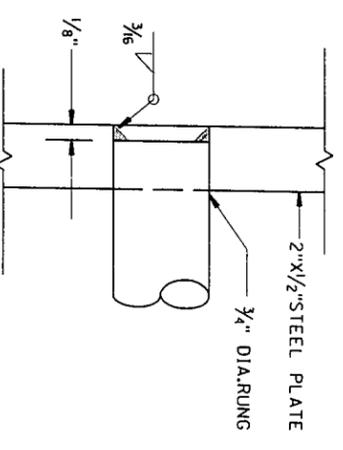


SECTION
N. T. S.

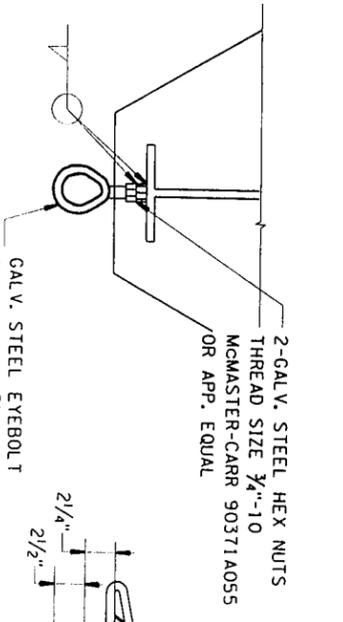


LADDER DETAIL
N. T. S.

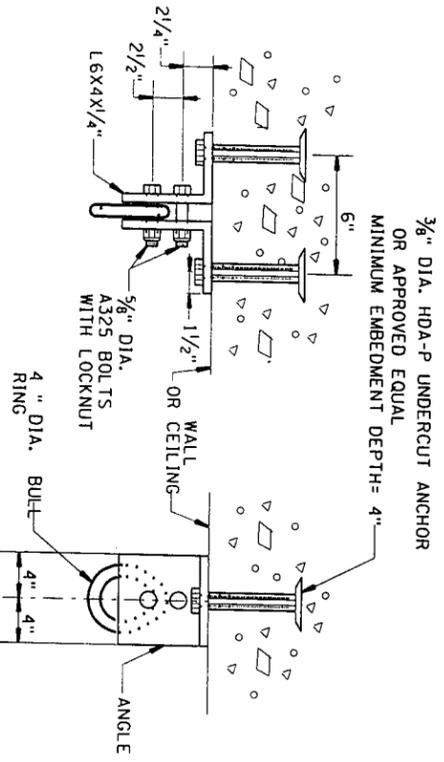
NOTE: PROVIDE BILCO LADDER UP SAFETY POST ON EACH FIXED LADDER.



RUNG CONNECTION
N. T. S.

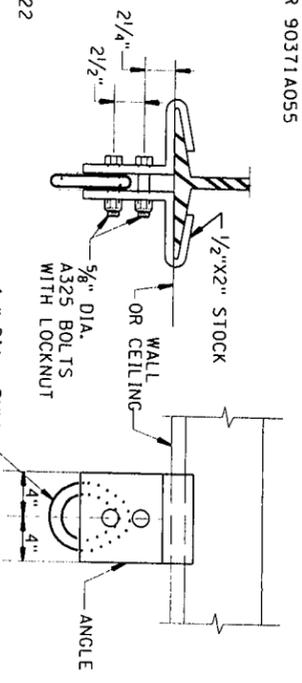


LIFTING HOOK @ PLENUM CEILING
N. T. S.



FRONT VIEW SIDE VIEW
N. T. S.

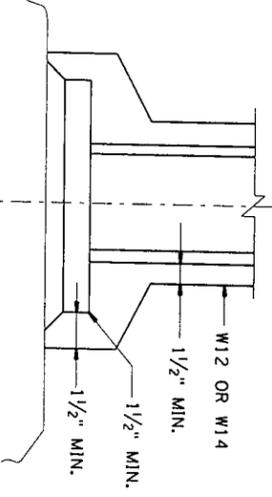
BULL RING TYPICAL DETAIL
N. T. S.



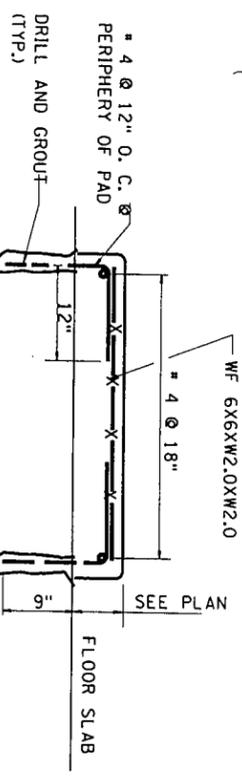
FRONT VIEW SIDE VIEW
N. T. S.

BULL RING TYPICAL
N. T. S.

BEAM DETAIL



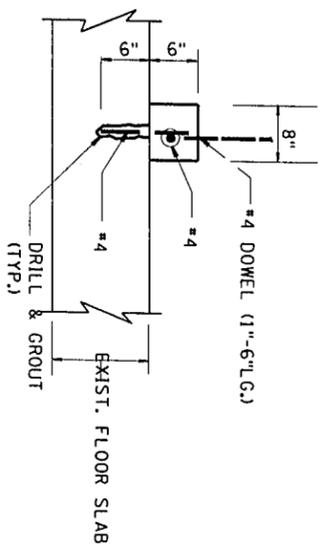
COLUMN BASE CONC. COVER
N. T. S.



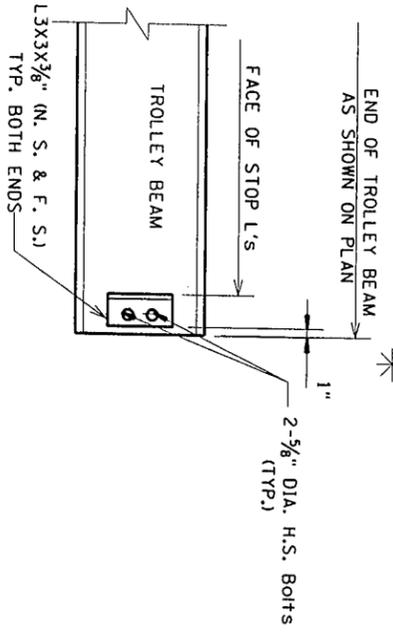
TYPICAL REINFORCEMENT AROUND OPENING

TYPICAL CONCRETE PAD DETAIL
N. T. S.

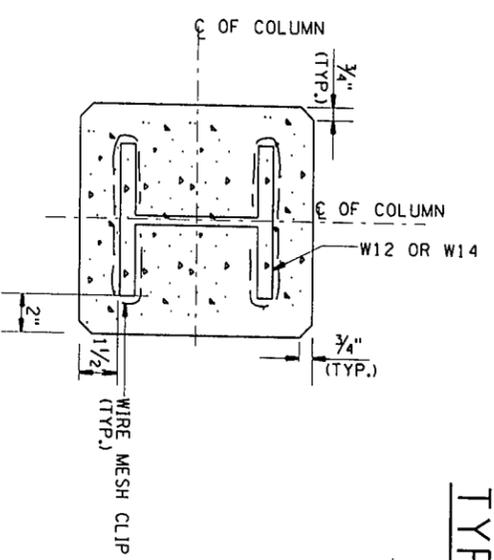
* MATERIAL SHALL BE HOT DIPPED GALVANIZED DETAILS APPLY TO HOOKS IN FAN CHAMBER AREA



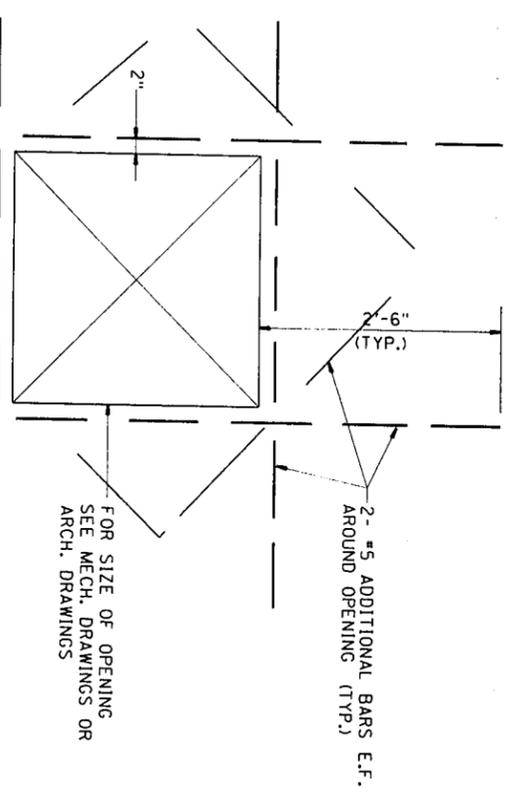
CURB DETAIL



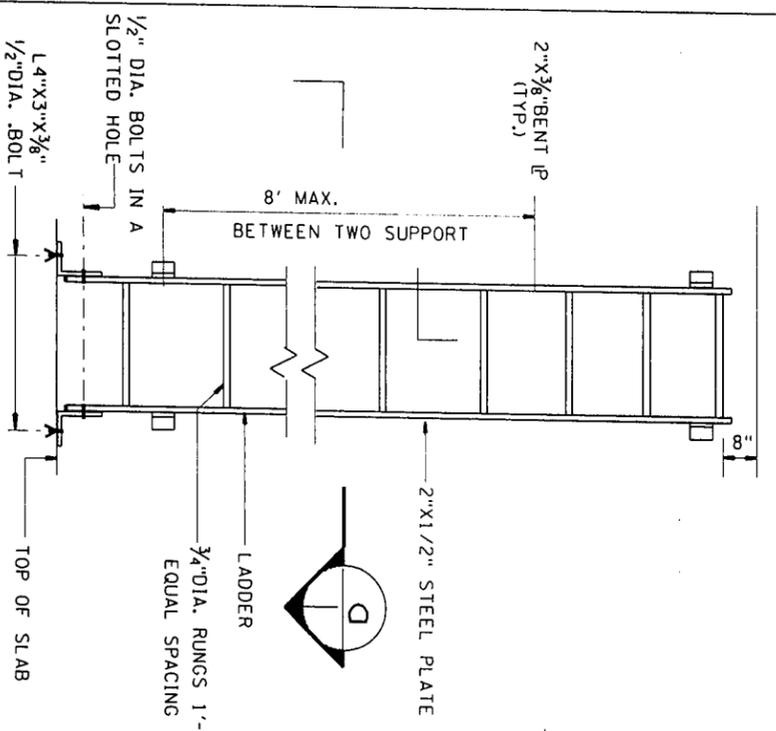
TYPICAL STOP ANGLE DETAIL TYP. COLUMN DETAIL



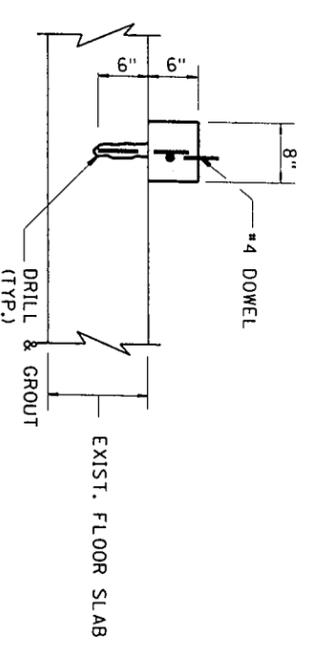
N. T. S.



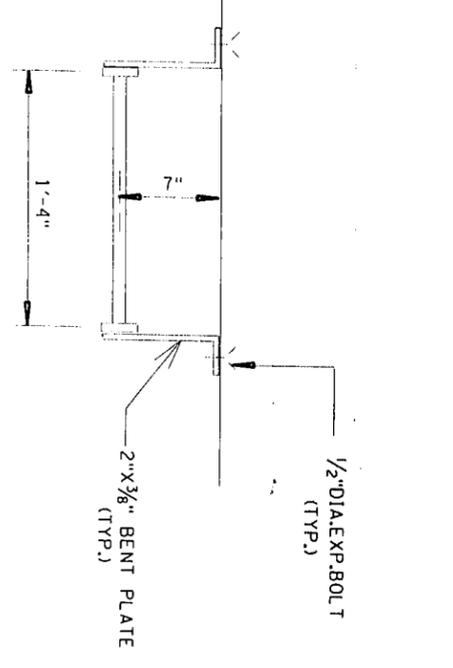
MISCELLANEOUS DETAILS AND SECTIONS SHEET 1 OF 2



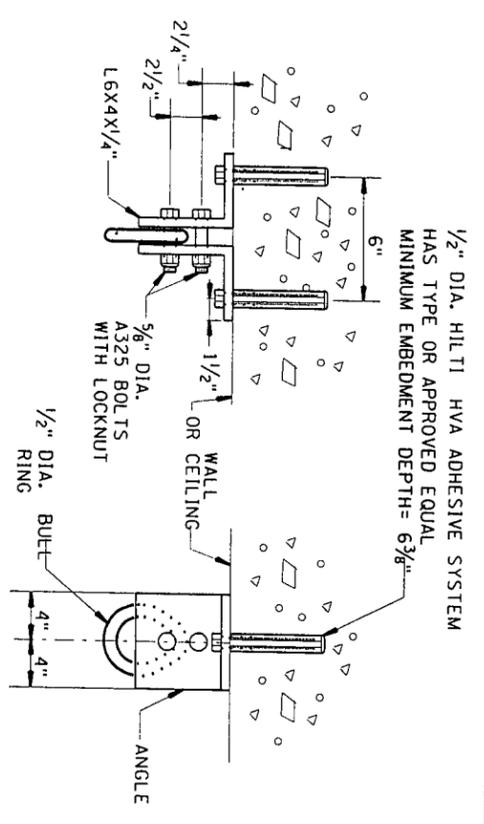
LADDER DETAIL
N. T. S.



CURB DETAIL
N. T. S.

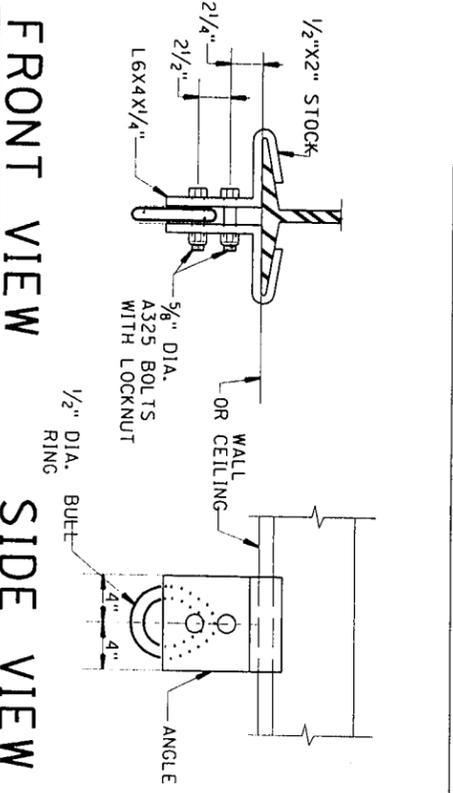


SECTION
N. T. S.



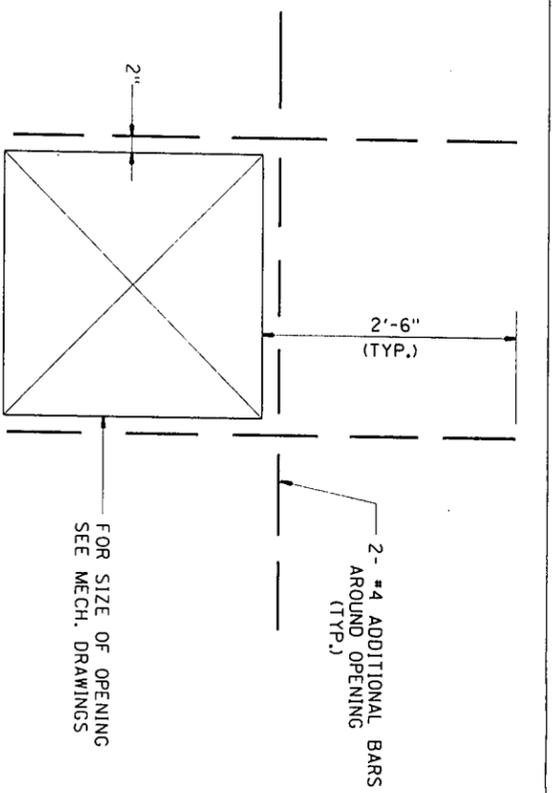
FRONT VIEW SIDE VIEW
N. T. S. N. T. S.

BULL RING TYPICAL DETAIL
ROOF AND WALLS

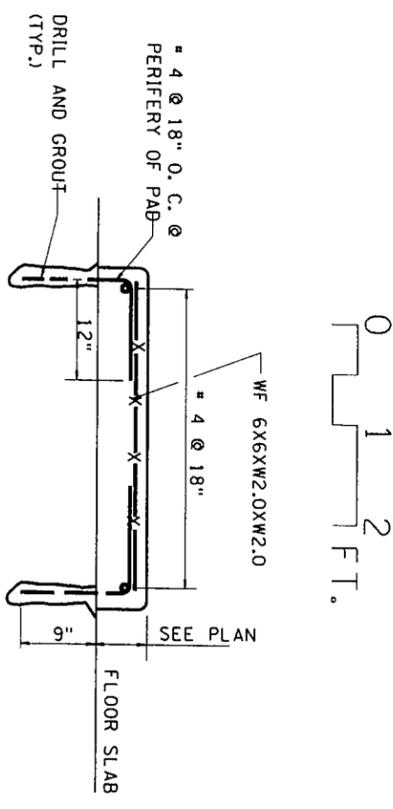


FRONT VIEW SIDE VIEW
N. T. S. N. T. S.

BULL RING TYPICAL DETAIL
BEAM

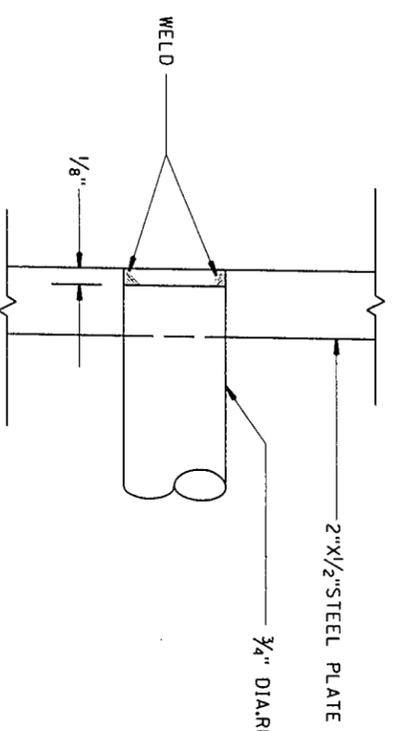


TYPICAL REINFORCEMENT
AROUND OPENING

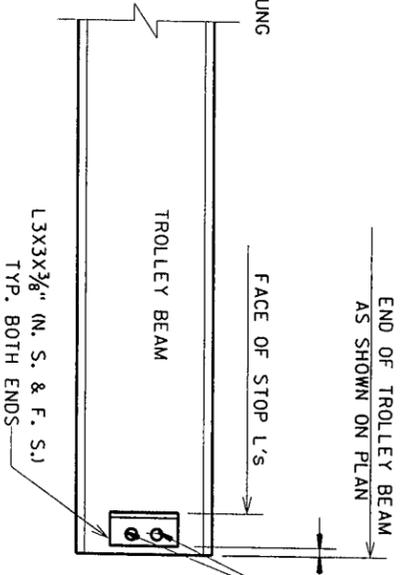


TYPICAL CONCRETE PAD DETAIL
N. T. S.

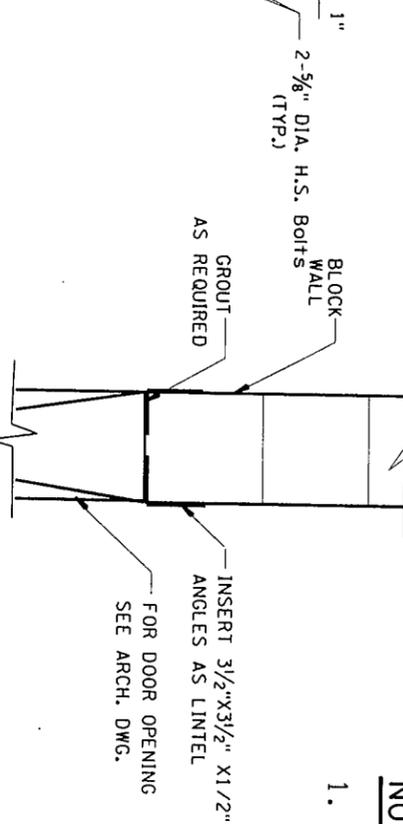
NOTE:
1. ALL MATERIAL SHALL BE HOT DIPPED GALVANIZED.



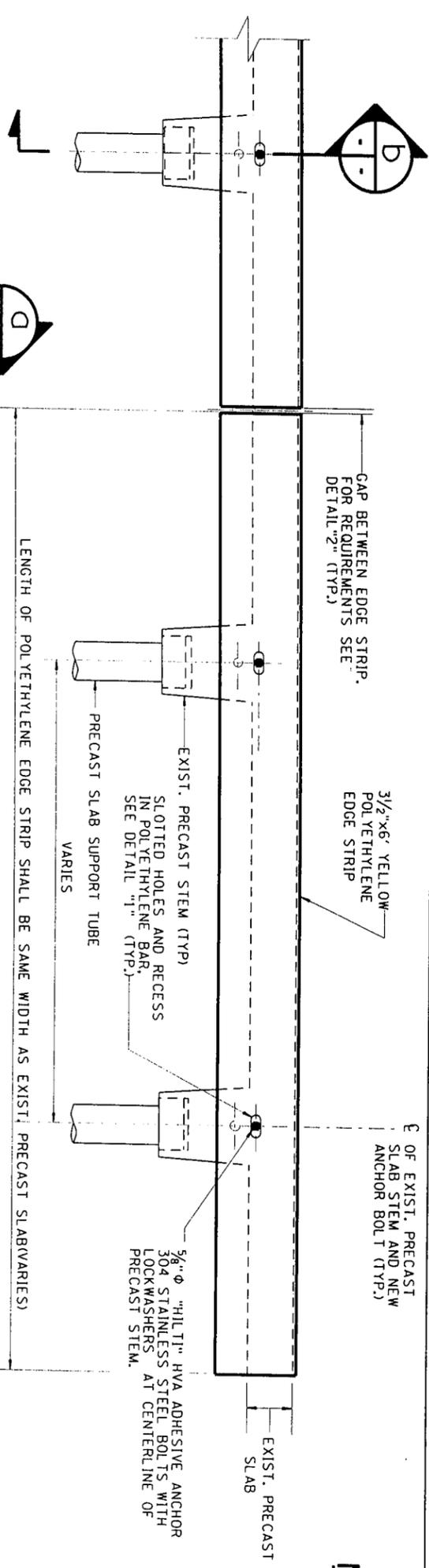
RUNG CONNECTION
N. T. S.



TYPICAL STOP ANGLE DETAIL
N. T. S.

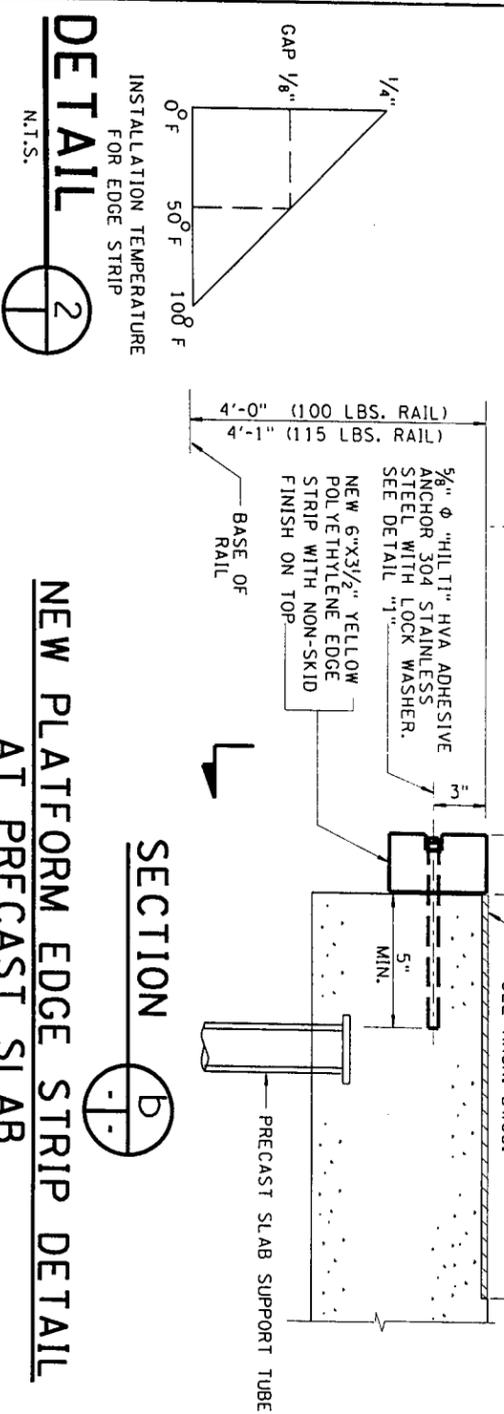


LINTEL DETAIL
N. T. S.

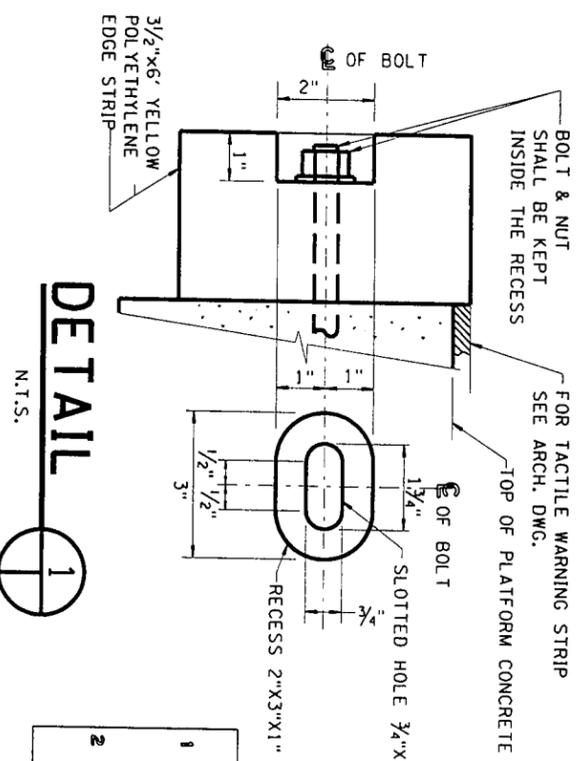


ELEVATION D
N.T.S.

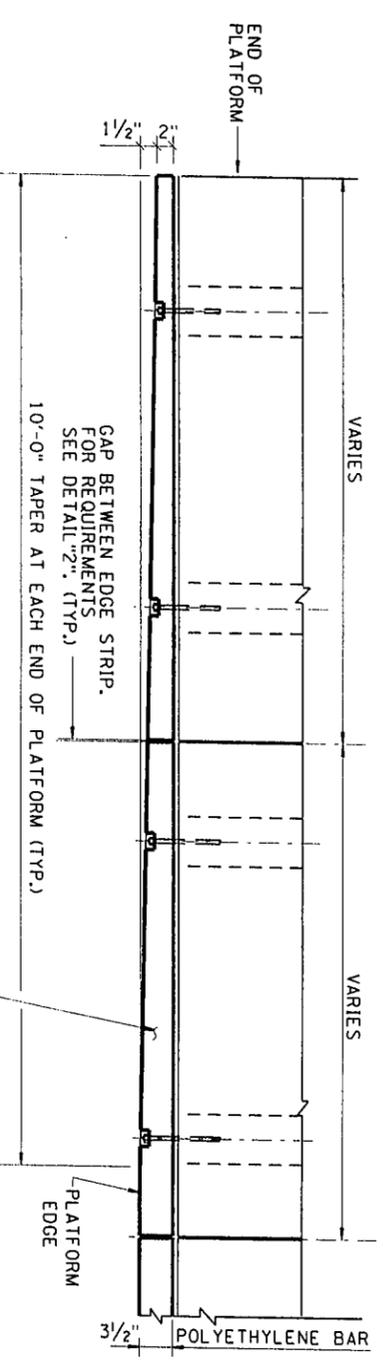
"A" DIVISION (IRT) FOR TANGENT TRACK
4'-11 3/4"
"B" DIVISION (GMT & IND) FOR TANGENT TRACK
5'-5 1/2"
VARIES FOR CURVED TRACK
(SEE NOTE NO. 1)



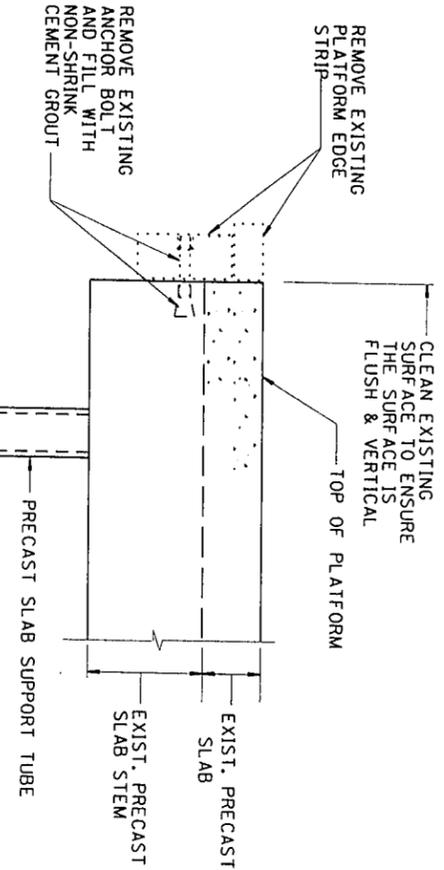
SECTION B
NEW PLATFORM EDGE STRIP DETAIL
AT PRECAST SLAB
N.T.S.



DETAIL 1
N.T.S.



DETAIL OF TAPERED END
(LOCATED AT EACH END OF THE PLATFORM)
N.T.S.



EXIST. PLATFORM EDGE STRIP
AT PRECAST SLAB
N.T.S.

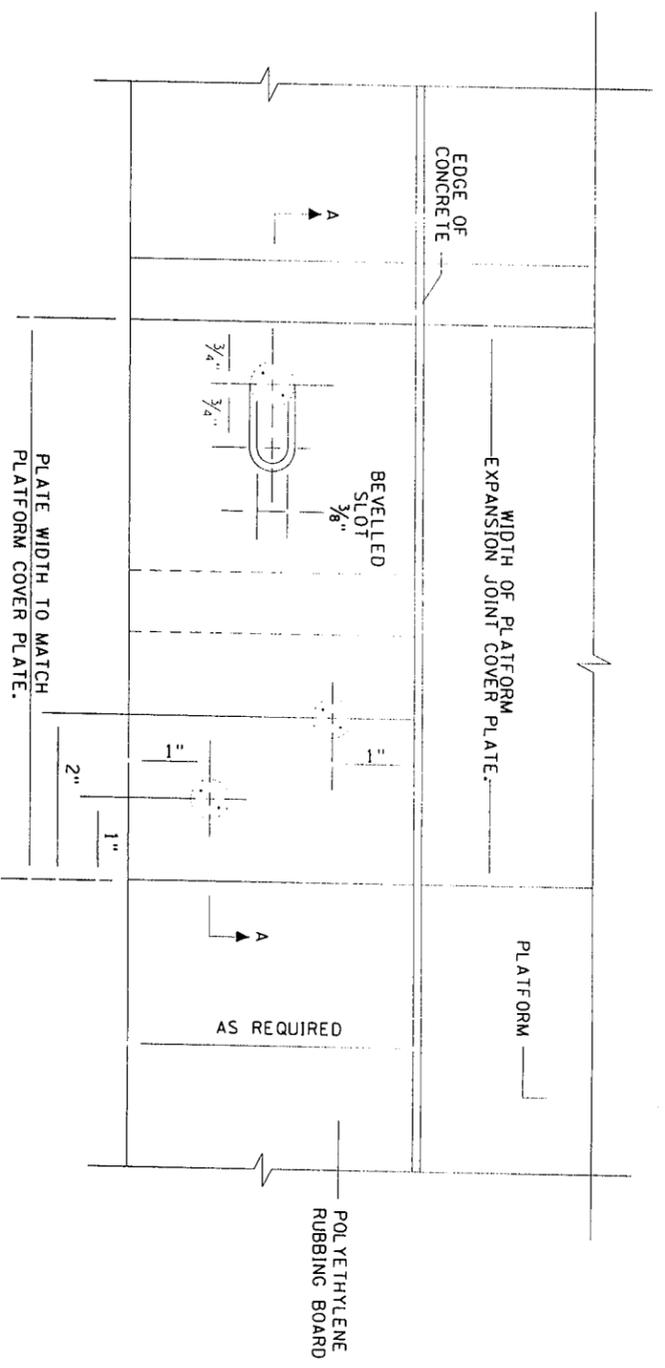
NOTES:

- FOR STATION PLATFORMS EDGE AT LOCATIONS OF CURVED TRACK ALIGNMENT, THE CONTRACTOR SHALL SURVEY EXISTING CLEARANCES FROM CENTERLINE OF TRACK TO PLATFORM EDGE. NEW PLATFORM EDGE SHALL BE INSTALLED TO MATCH EXISTING CLEARANCES.
- THE CONTRACTOR SHALL SURVEY THE FOLLOWING DIMENSIONS:
 - PRIOR TO DEMOLITION, DOCUMENT THE EXISTING DIMENSION FROM BASE OF RAIL TO TOP OF CONCRETE PLATFORM EDGE AT 10 FOOT INTERVALS.
 - SUBSEQUENT TO THE EDGE STRIP INSTALLATION, DOCUMENT THAT THE NEW EDGE INSTALLATION IS IN CONFORMANCE WITH THE CONTRACT REQUIREMENTS. MEASUREMENTS TO BE SUBMITTED FOR APPROVAL OF THE ENGINEER.
 - THE DOCUMENTATION SHALL INCLUDE MEASUREMENTS AT 10 FOOT INTERVALS FOR THE ENTIRE LENGTH OF THE PLATFORM.
- THE EDGE STRIP SHALL BE YELLOW POLYETHYLENE EDGE STRIP, "AR" UHMW #819 AS MANUFACTURED BY ULTRA-POLY, INC. OR APPROVED EQUAL. TOP SURFACE OF THE STRIP SHALL BE ROUGHENED BY SCARIFICATION.
- FOR A 10 FOOT LENGTH AT EACH END OF PLATFORM, THE STRIP WIDTH SHALL BE TAPERED FROM 3 1/2" TO 2".
- FOR PLATFORM EDGE STRIP INSTALLATION AT THE ADA BOARDING AREA, SEE DRAWING NO. C-.

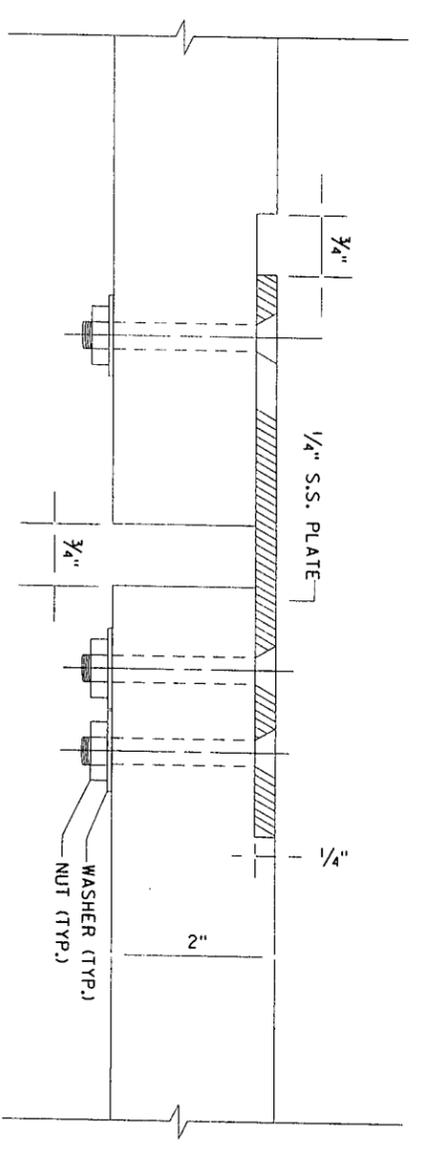
NOTES TO DESIGNER:

- DETAILS SHOWN ON THIS DRAWING ARE FOR REFERENCE ONLY THE EXISTING PLATFORM EDGE CONDITIONS AT INDIVIDUAL STATION SHOULD BE THOROUGHLY INVESTIGATED AND THE DETAILS MODIFIED AS REQUIRED
- PERFORM SURVEY OF EXISTING BASE OF RAIL ELEVATION AND TOP OF PLATFORM EDGE ELEV TO DETERMINE EXISTING PLATFORM HEIGHT AT 10 FT INTERVALS ALONG THE ENTIRE LENGTH OF THE PLATFORM

REVISION	DESCRIPTION	DATE	APPROVED
REFERENCE DRAWING			
PLATFORM EDGE STRIP DETAILS			
AT PRECAST SLAB			
BEYOND ADA BOARDING AREA			
<p>New York City Transit Authority</p>		<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p>	
<p>CIVIL/STRUCTURAL ENGINEERING</p>		<p>DATE :</p>	
<p>DRAWN BY</p>		<p>DRAWING NO. RC-1015</p>	
<p>DESIGNED BY</p>		<p>RC-2403</p>	
<p>CHECKED BY</p>		<p>REVISION</p>	
<p>APPROVED BY</p>			



PLAN

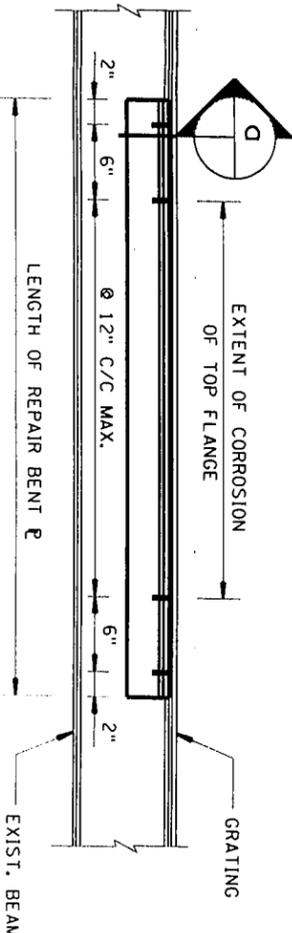


SECTION A - A



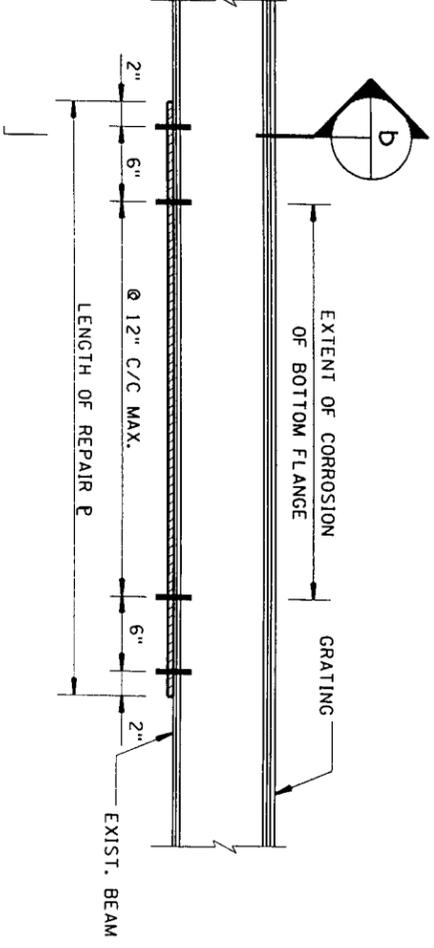
- NOTES:**
1. SCREWS TO BE 3/8" 16 UNC. STAINLESS STEEL, 2 1/2" LONG, VANDAL RESISTANT, FLATHEAD.
 2. NUTS TO BE ELASTIC STOP NUTS, STAINLESS STEEL.
 3. DRAWING SHOWS INSTALLATION AT 0° F. GAP TO BE 0" AT 100 F.
 4. PLATE TO BE 1/4" STAINLESS STEEL.

 <p>New York City Transit Authority</p>		<p>REFERENCE DRAWING</p>
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>CIVIL/STRUCTURAL ENGINEERING</p>		
DRAWN BY		DATE
DESIGNED BY		DRAWING NO. RC-1015
CHECKED BY		
APPROVED BY		



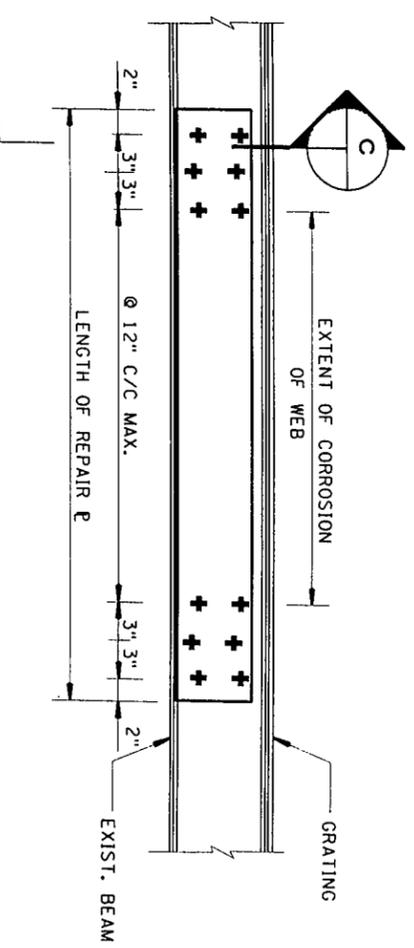
BEAM REPAIR (TOP FLANGE)

0 6 12 IN.



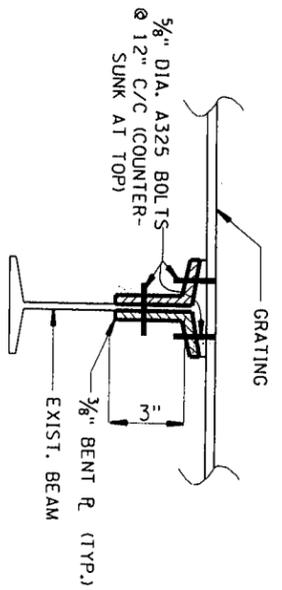
BEAM REPAIR (BOTTOM FLANGE)

0 6 12 IN.

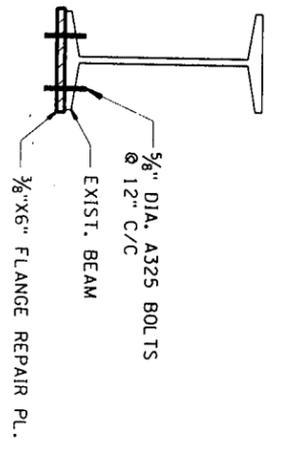


BEAM REPAIR (WEB)

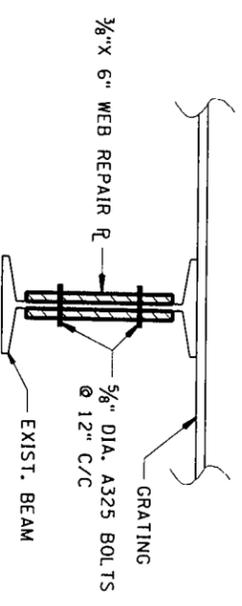
0 6 12 IN.



SECTION D
0 3 6 IN.



SECTION B
0 3 6 IN.



SECTION C
0 3 6 IN.

ESTIMATE OF DEFECTS

NO.	ITEM	QUANTITY
1	STEEL	
	REPAIR/REPLACE CORRODED STEEL	4 TON
	SCRAPE & PAINT	2000 SQ. FT.

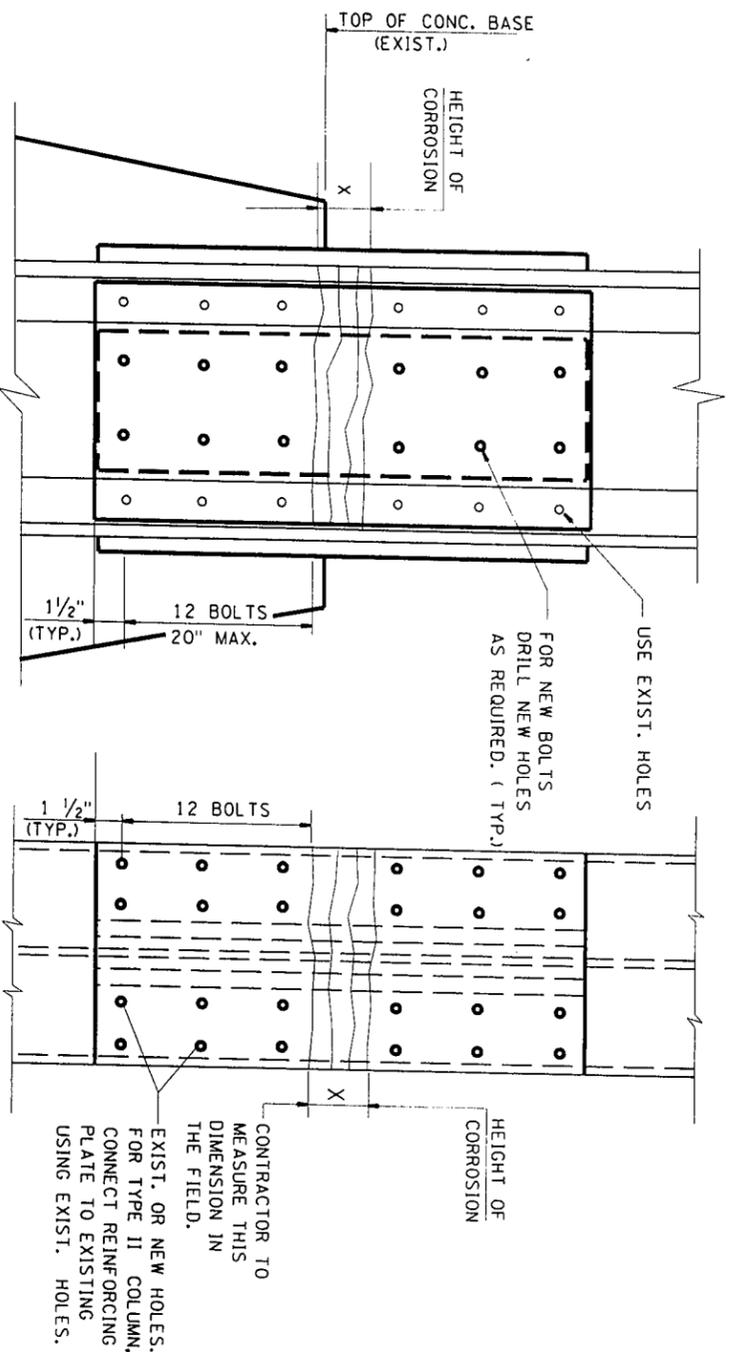
NOTES

- FOR NOTES, SEE DWG. NOS. C-1 AND C-2
- THE CRITERIA OF REPAIR OF CORRODED STEEL SHALL BE WHEN THE MATERIAL LOSS IS:
 - a) 25 PERCENT OF THE THICKNESS OF THE ELEMENT, OR
 - b) GREATER THAN 1/8 INCH, OR
 - c) MATERIAL REMAINING IS LESS THAN 1/4 INCH.
 1. A. ENGINEER MAY REQUIRE REPAIR OF ELEMENTS WHICH DO NOT MEET THE ABOVE CRITERIA IF, IN THE ENGINEER'S OPINION, SUCH REPAIR IS NECESSARY.
3. THE STRUCTURAL STEEL IN THE FOLLOWING AREAS OF THE FAN CHAMBER, VENT AREA & EMERGENCY EXITS SHALL BE SCRAPED AND PAINTED:
 - a) LADDERS,
 - b) BEAMS (I-BEAMS, WF BEAMS CHANNELS)
 - c) ANGLES,
 - d) COLUMNS,
 - e) STAIR TREADS
4. ALL NEW CHECKERED PLATES AND GRATINGS SHALL BE GALVANIZED. GRATINGS SHALL BE 1 1/2" X 3/16", SPACED 1 3/8" WITH CROSS BARS @ 4" O.C. U.O.N.
5. THE REPAIR OF CONCRETE DEFECTS SHALL BE DONE AS SHOWN IN DWG. C-406
6. IF THE STEEL MEMBER CAN'T BE REPAIRED, REPLACE IN KIND.

7. All beams are corroded
ensure

REVISION	DESCRIPTION	DATE	APPROVED

<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT CIVIL/STRUCTURAL ENGINEERING</p>	<p>REFERENCE DRAWING</p> <p>45TH ST.FP-6408D CORRODED STEEL REPAIR</p>	DRAWN BY	DATE :
		DESIGNED BY	DRAWING NO. RC-1015
CHECKED BY	RC-2501	APPROVED BY	REVISION



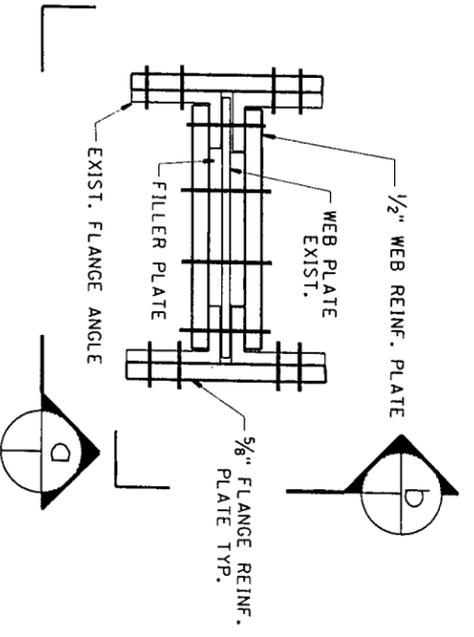
NOTES:

- 1) THE CRITERION FOR REPAIRING COLUMN STEEL IS WHEN THE AVERAGE LOSS OF MATERIAL EXCEEDS EITHER (a) 1/2" OR (b) 25 % OF THE ORIGINAL THICKNESS, WHICHEVER IS LESS.
- 2) THE REPAIR CRITERIA ABOVE ARE FOR GENERAL GUIDANCE ONLY. THE ENGINEER MAY REQUIRE REPAIR OR REPLACEMENT OF STRUCTURAL ELEMENTS WHICH DO NOT MEET THE REPAIR CRITERIA IF IN THE ENGINEER'S OPINION SUCH REPAIR IS NECESSARY.
- 3) THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING THE REPAIR DETAILS FOR EACH COLUMN THAT REQUIRES REPAIRS BASED ON THE FIELD CONDITION AND MEASUREMENTS.
- 4) ALL CONNECTIONS ARE WITH 3/8" DIA. H.S. BOLTS UNLESS OTHERWISE NOTED. ALL BOLT HOLES SHALL BE DRILLED AND REAMED IF REQUIRED. BURNING OF HOLES IS NOT ALLOWED.
- 5) DURING THE TIME THE BOLTS ARE REMOVED TO INSTALL THE NEW STEEL THE TRAINS ARE TO BE FLAGGED AND RUN UNDER SLOW SPEED. THE CONTRACTOR IS TO TIME PHASE THIS WORK SO AS TO MINIMIZE THE EFFECT ON TRAIN OPERATIONS.
- 6) THE HEIGHT OF CORROSION (X-DISTANCE) VARIES FOR EACH COLUMN. IT IS ANTICIPATED THAT THE AVERAGE DISTANCE 'X' IS APPROXIMATELY 2' - 0" PRIOR TO REPAIR WORK, THE EXTENT OF DISTANCE 'X' SHALL BE DETERMINED BY THE CONTRACTOR IN THE PRESENCE OF THE ENGINEER, BY MEASURING THE REMAINING THICKNESS OF STEEL AS DESCRIBED IN SPECIFICATIONS, SECTION 5A.
- 7) IN THE COURSE OF DOING THE WORK IT WILL BE NECESSARY TO REMOVE AND REINSTALL (OR MAINTAIN) COVER PLATES, DRAIN PIPES, CONDUITS, CONC. ENCASING , ETC. CORRODED PIPES, IF ENCOUNTERED, SHALL BE REPLACED WITH NEW PIPES. IT IS ANTICIPATED THAT TOTAL LENGTH OF EXISTING CORRODED PIPE REPLACEMENT SHALL BE APPROXIMATELY 1300 L.F.T. THE AVERAGE DIAMETER OF PIPE IS 4 INCHES. THE CORRODED PIPES SHALL BE REPLACED 'IN KIND'.
- 8) IF THE DISTANCE BETWEEN BOLTS EXCEEDS 6". ADDITIONAL BOLTS ARE TO BE PLACED IN THE CORRODED AREA.
- 9) REPAIR OF ADJACENT COLUMN BASES SHOULD NOT BE UNDERTAKEN SIMULTANEOUSLY .
- 10) DURING THE COLUMN BASE REPAIR , IF THE ADJACENT CURB IS DISTURBED, IN ADDITION TO REPLACING THE CURB, A TWO FEET WIDE STRIP OF THE STREET PAVEMENT SHALL ALSO BE REPLACED, BY REMOVING THE ASPHALT AND PROVIDING NEW ASPHALT. THE LENGTH OF THIS PAVEMENT AREA TO BE REPLACED SHALL BE THE SAME AS THE LENGTH OF THE DISTURBED CURB.
- 11) PRIOR TO WORKING ON COLUMN BASE REPAIR, THE CONTRACTOR SHALL SUBMIT PHOTOGRAPHS OF THE SIDEWALK AROUND EACH COLUMN BASE TO BE REPAIRED TO THE AUTHORITY IN ORDER TO DOCUMENT THE EXISTING CONDITION OF THE SIDEWALK. THE SIDEWALK AREA WHICH ARE DISTURBED DURING CONSTRUCTION SHALL BE REPLACED TO THE SATISFACTION OF THE ENGINEER.
- 12) EXISTING STEEL ABOVE THE NEW COLUMN BASE SHALL BE CLEANED & PAINTED FOR 6" HEIGHT. PAINTING SHALL BE DONE IN ACCORDANCE WITH CONTRACT SPECIFICATIONS, SECTION 9A.
- 13) WHEN THE ROADWAY IS DISTURBED, PROVIDE NEW 6" THICK CONCRETE BASE UNDER THE NEW ASPHALT PAVEMENT. THE SURFACE SHALL BE WATER SEALED AT THE AREA BETWEEN THE NEW AND EXISTING WORK.

CONSTRUCTION PROCEDURES FOR COLUMN BASE REPAIR

1. IDENTIFY THE AREA OF REPAIR AS PER NOTE 1 AND NOTE 2.
2. REMOVE THE EXISTING CONCRETE BASE/CAST IRON FENDER.
3. AFTER EXPOSING THE COLUMN BASE, SCRABE AND CLEAN THE EXISTING CORRODED AREA. THE SURFACES IN CONTACT SHALL NOT BE PAINTED.
4. REPAIR THE STEEL AT COLUMN BASE AS SHOWN.
5. FOR TYPE 2, 4 & 5 COLUMNS, (COLUMN WITH COVER PLATES)
 - a) REMOVE RIVETS AND REPLACE WITH 3/8" DIA. BOLTS ONE AT A TIME FROM DESIGNATED AREAS OF REPAIR.
 - b) IF TOP OR BOTTOM EDGE OF COVER PLATE INTERFERES WITH THE HEAD OF THE NEXT ROW OF RIVETS ON THE EXIST. COLUMN, INCREASE THE LENGTH OF COVER PLATE TO INCLUDE THE NEXT ROW
6. IF WING PLATE INTERFERES WITH NEW REINFORCEMENT PLATE, PROVIDE FILLER PLATE EQUAL TO WING PLATES THICKNESS, REMOVE THE CORRODED WING PLATES AND REINSTALL NEW ONE WITH SAME SIZE PLATES.
7. CORRODED WING PLATE SHALL BE REMOVED AND REPLACED USING THE SAME SIZE AS EXISTING ONE.
8. THE HORIZONTAL CENTER LINES OF REINFORCEMENT PLATES AND CORRODED PORTION SHALL BE ALIGNED.
9. TORQUE BOLTS TO FULL TENSION TO MAKE JOINT FRICTION TYPE.
10. PAINT STEEL AS PER SPECIFICATIONS. THE SURFACES IN CONTACT WITH EACH OTHER SHALL NOT BE PAINTED. PAINT SURFACES TO BE IN CONTACT WITH CONCRETE PER TYPICAL DETAIL ON DWG. NO. C-48.

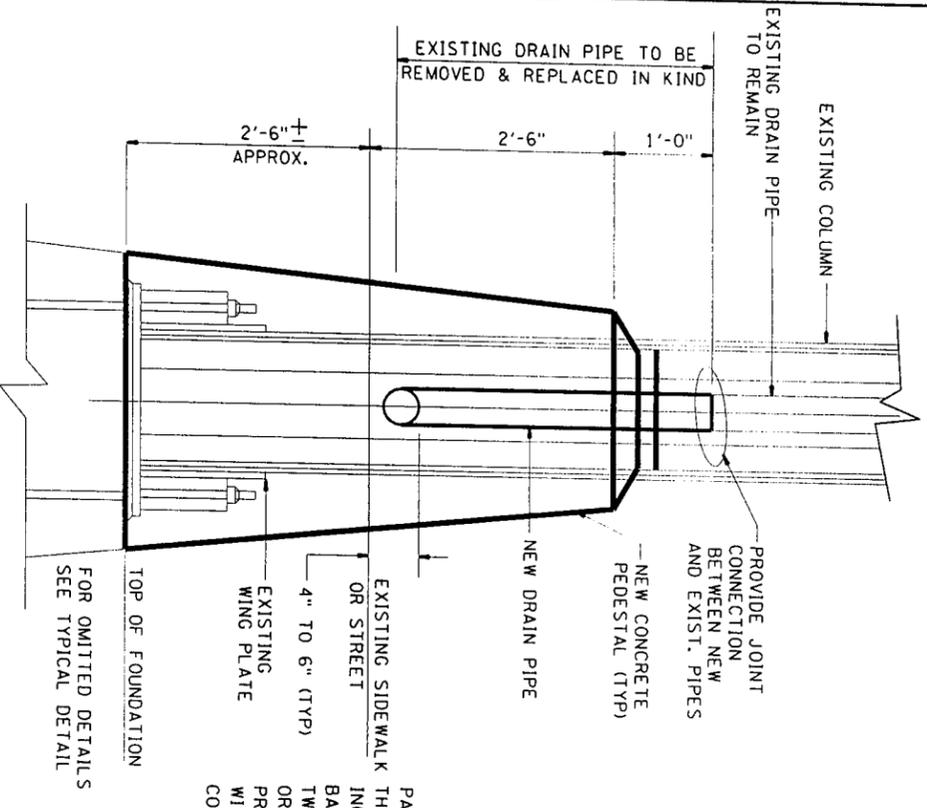
PLAN



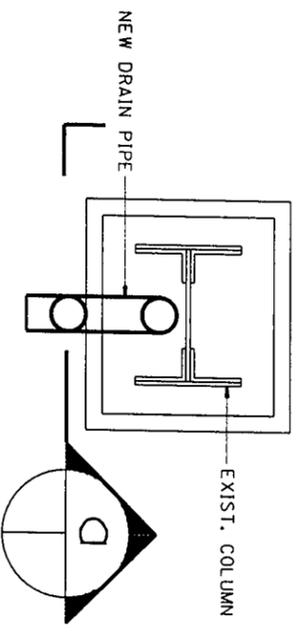
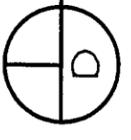
(FOR COLUMN TYPE 1 AND 2)

REVISION	DESCRIPTION	DATE	APPROVED

<p>New York City Transit Authority</p>		<p>METHOD FOR REPAIRING EXISTING DETERIORATED COLUMN BASES - SHEET 1 OF 2</p>
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT CIVIL/STRUCTURAL ENGINEERING</p>		
DRAWN BY		DATE :
DESIGNED BY		DRAWING NO. RC-1015
CHECKED BY		RC-2502
APPROVED BY		REVISION

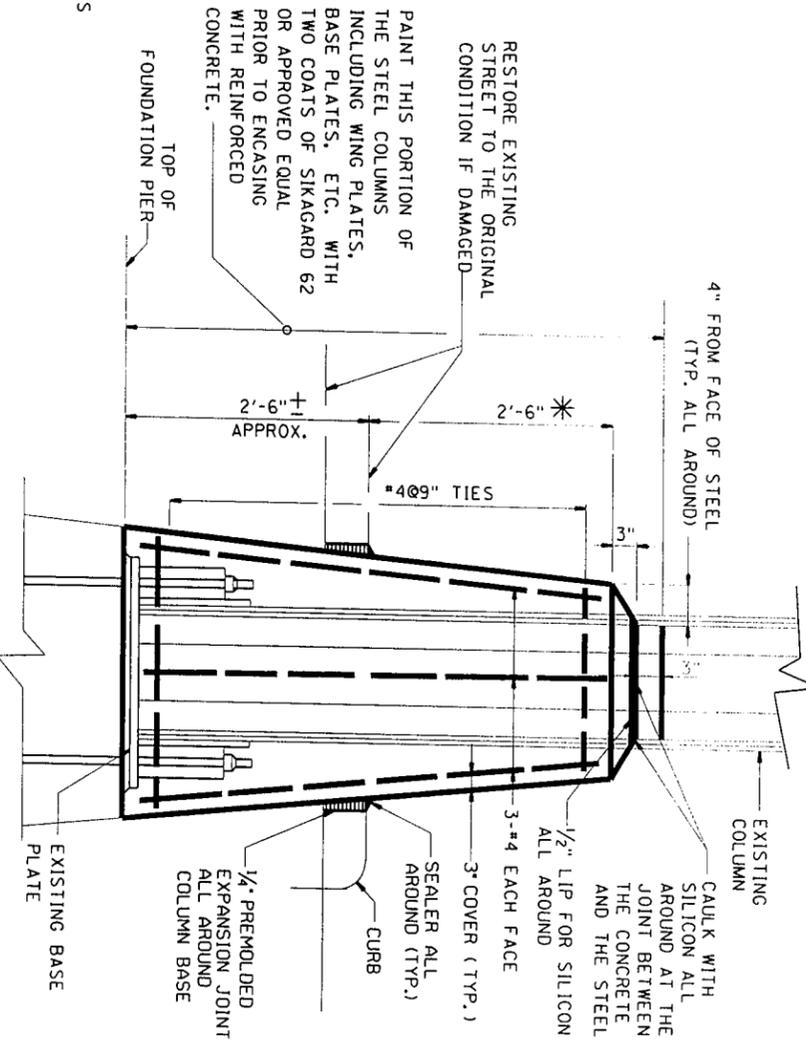


SECTION
N. T. S.



PLAN-COLUMN BASE
N. T. S.

* THIS DIMENSION IS FROM THE TOP OF THE CURB AND FROM THE TOP OF THE ROADWAY WHEN THE COLUMN IS IN THE ROADWAY.



TYPICAL DETAIL
N. T. S.

NOTE "A":
DISCONNECT EXISTING WATER AND WASTE WATER LINES TO THE NEAREST JOINTS FROM THE LIMITS OF REPAIR WORK AND REPLACE THE SECTION OF LINES PRIOR TO POURING CONCRETE FOR NEW COLUMN BASE.

NEW BASE CONSTRUCTION

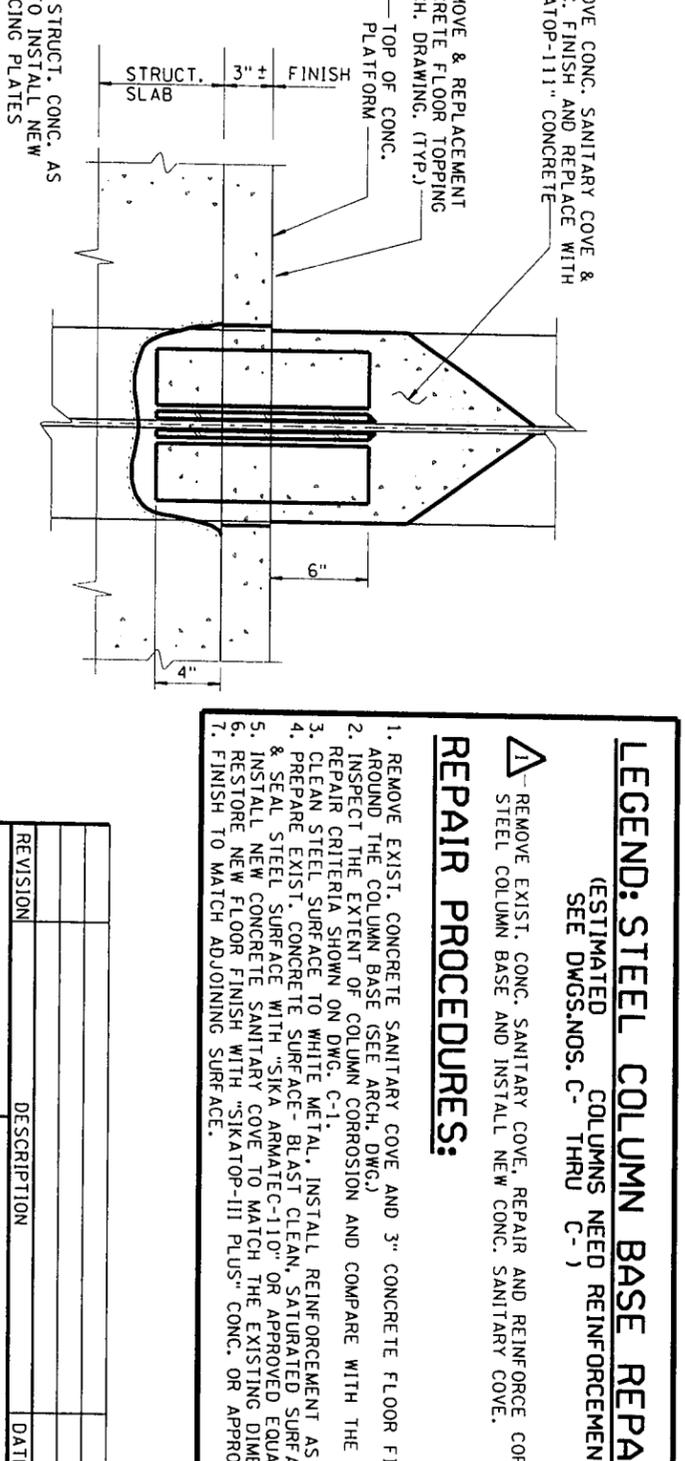
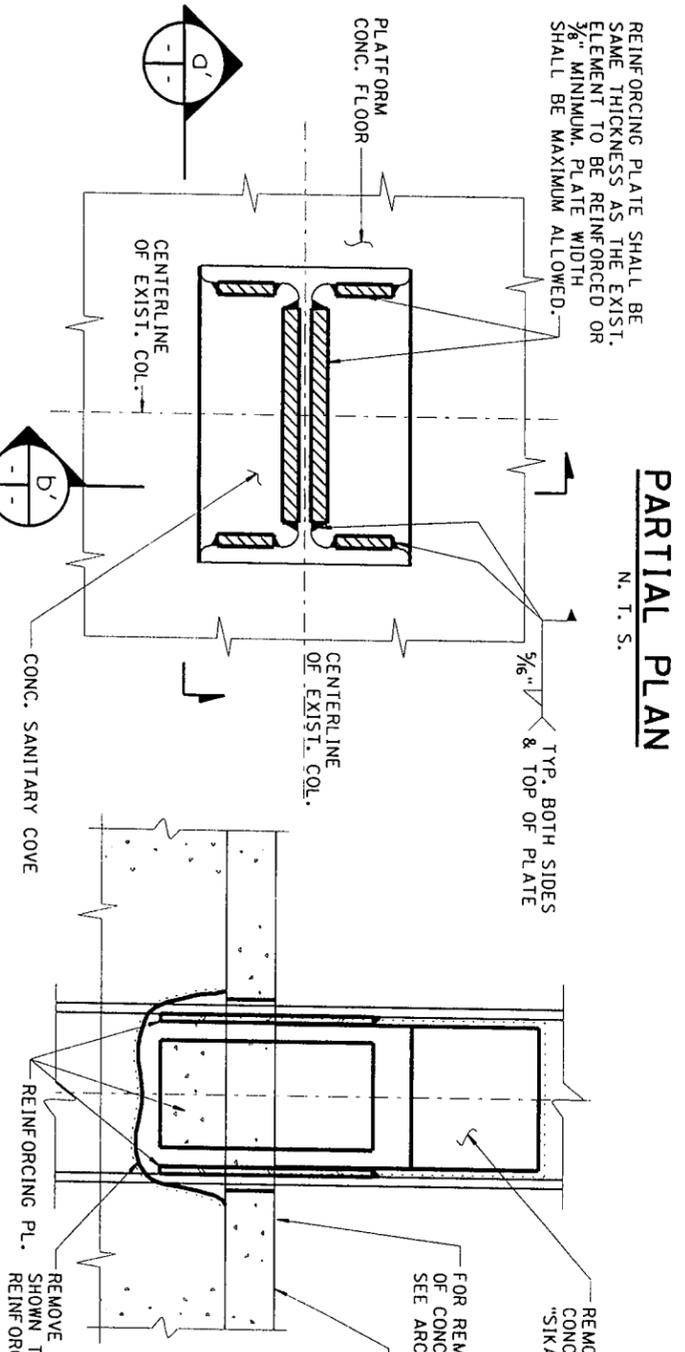
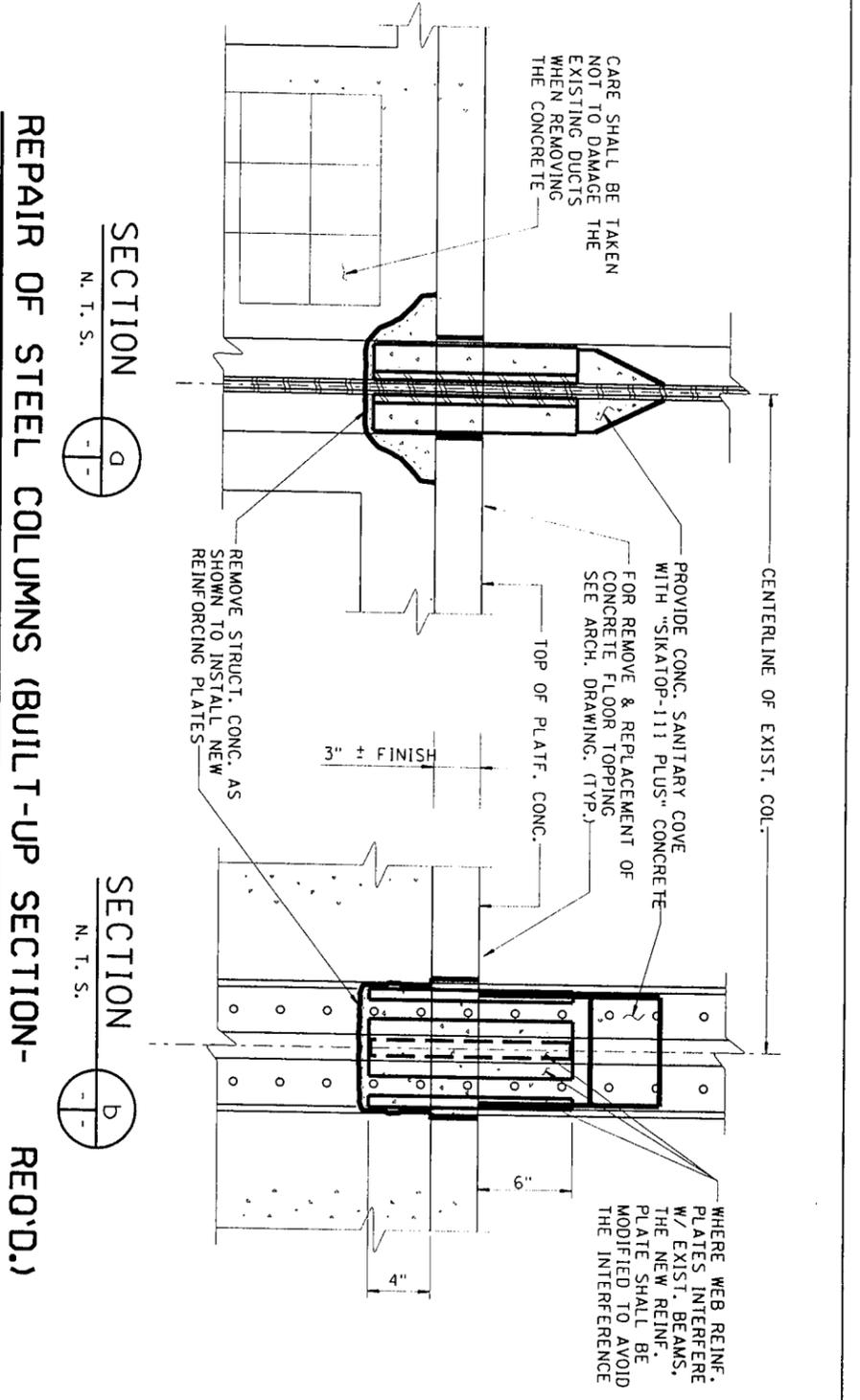
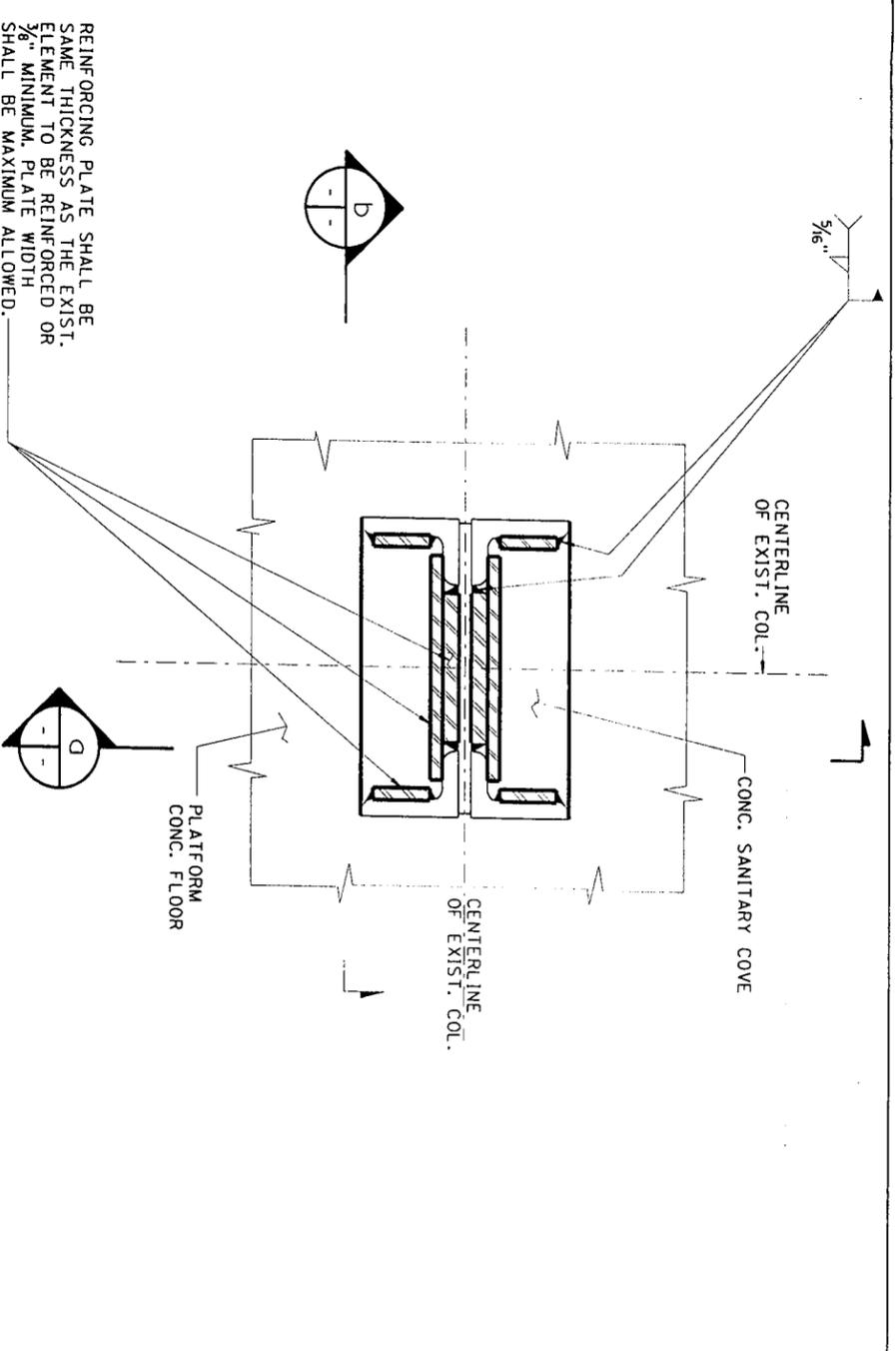
1. TEMPORARILY REMOVE OR RELOCATE PIPES, CONDUITS AND SIGNAL BOXES ATTACHED TO THE COLUMN.
2. DEMOLISH EXISTING CONCRETE ENCASUREMENT WITH OR WITHOUT CAST IRON FENDER WHERE APPLICABLE.
3. REMOVE ALL LOOSE MATERIAL AND PREPARE STEEL SURFACE (CLEAN AND DRY).
4. BEFORE PROCEEDING FURTHER, MAKE STEEL REPAIR AS REQUIRED. FOLLOW APPLICABLE CASE IN DWG. NO. C-47
5. REBUILD CONCRETE BASE. (PAINT STEEL BEFORE REBUILDING BASE.)
6. COLUMN STEEL SECTIONS SHALL NOT BE IN CONTACT WITH REINFORCING BARS. ALL REINFORCING BARS SHALL BE EPOXY COATED.
7. CONCRETE SHALL HAVE NO ADDITIVE WHICH MIGHT REDUCE ITS ELECTRICAL RESISTANCE.
8. BEFORE CONTRACTOR PLACES CONCRETE, THE POWER DEPARTMENT SHALL BE NOTIFIED IN ADVANCE IN ORDER TO MAKE TESTS TO DETERMINE IF THERE ARE GROUND RETURN PATHS FOR STRAY CURRENTS.
9. IN ORDER TO AVOID ACCIDENTAL GROUNDING, ALL CONSTRUCTION EQUIPMENT SUCH AS CRANES, ETC. SHALL BE INSULATED FROM GROUND.
10. ALL EXPOSED CORNERS OF COLUMN BASE SHALL HAVE 3/4" CHAMFER.
11. MAINTAIN AND PROTECT EXIST. UTILITIES, IF ANY, DURING CONSTRUCTION WORK.
12. REATTACH ALL PIPES, CONDUITS AND SIGNAL BOXES TO THE COLUMN.
13. PAINT ALL NEW CONCRETE BASES AS FOLLOWING:
 - a. CONCRETE BASES LOCATED WITHIN STREET CROSSINGS SHALL BE STRIPED ALTERNATELY WITH BLACK AND WHITE PAINT. THE CONTRACTOR SHALL AT ALL TIMES DURING THE PROGRESS OF THE WORK, MAINTAIN THE BLACK AND WHITE STRIPING ON ALL CONCRETE BASES WHICH ARE STRIPED AND AT NO TIME SHALL ANY STRIPED COLUMN OR BASE BE PAINTED SO THAT STRIPING IS OBLITERATED OR CONCEALED. STRIPES SHALL BE PAINTED IN A NEAT MANNER WITH EDGE TRUE TO LINE THE ENTIRE DISTANCE AROUND THE COLUMN. TWO (2) COATS EACH: BLACK STRIPES AND WHITE STRIPES.
 - b. CONCRETE BASES LOCATED BEYOND STREET CROSSINGS SHALL BE PAINTED AS FOLLOWS:

FIRST COAT:
M-20-1-RUST INHIBITIVE UNDERCOAT-RED

SECOND COAT:
M-4-ENAMEL SILICONE ALKYDE, COPOLYMER GLOSS, OR APPROVED EQUAL (BLACK) OR M-12 (AT FRONT END OF BUS STOP) - ALKYDE OR GLOSS ENAMEL (TRAFFIC SAFETY YELLOW).
14. REMOVE EXISTING PAINT FROM THE SURFACE OF ALL EXISTING CONCRETE BASES (WITHIN CONTRACT LIMITS WHICH ARE TO REMAIN (APPROXIMATELY 120 CONC. BASES) AND PAINT THEM AS DESCRIBED IN NOTES 13(a) & 13(b) ABOVE. ALL EXISTING PAINTS CONTAIN LEAD. THE REMOVAL OF PAINTS SHALL BE AS PER CONTRACT SPECIFICATION SECTION 12L.

REVISION	DESCRIPTION	DATE	APPROVED

<p>New York City Transit Authority</p>		<p>REFERENCE DRAWING</p> <p>METHOD FOR REPAIRING EXISTING DETERIORATED COLUMN BASES - SHEET 2 OF 2</p>
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>CIVIL/STRUCTURAL ENGINEERING</p>		
<p>DRAWN BY</p> <p>DESIGNED BY</p> <p>CHECKED BY</p> <p>APPROVED BY</p>	<p>DATE</p> <p>DRAWING NO. RC-1015</p> <p>RC-2503</p> <p>REVISION</p>	



REPAIR OF STEEL COLUMNS (BUILT-UP SECTION - REO'D.)

LEGEND: STEEL COLUMN BASE REPAIR

(ESTIMATED COLUMNS NEED REINFORCEMENT SEE DWGS. NOS. C-1 THRU C-1)

REPAIR PROCEDURES:

1. REMOVE EXIST. CONCRETE SANITARY COVE AND 3" CONCRETE FLOOR FINISH AROUND THE COLUMN BASE (SEE ARCH. DWG.)
2. INSPECT THE EXTENT OF COLUMN CORROSION AND COMPARE WITH THE REPAIR CRITERIA SHOWN ON DWG. C-1.
3. CLEAN STEEL SURFACE TO WHITE METAL. INSTALL REINFORCEMENT AS REQUIRED.
4. PREPARE EXIST. CONCRETE SURFACE - BLAST CLEAN, SATURATED SURFACE DRY & SEAL STEEL SURFACE WITH "SİKA ARMATEC-110" OR APPROVED EQUAL.
5. INSTALL NEW CONCRETE SANITARY COVE TO MATCH THE EXISTING DIMENSIONS.
6. RESTORE NEW FLOOR FINISH WITH "SİKATOP-111 PLUS" CONG. OR APPROVED EQUAL.
7. FINISH TO MATCH ADJOINING SURFACE.

PARTIAL PLAN

SECTION

SECTION

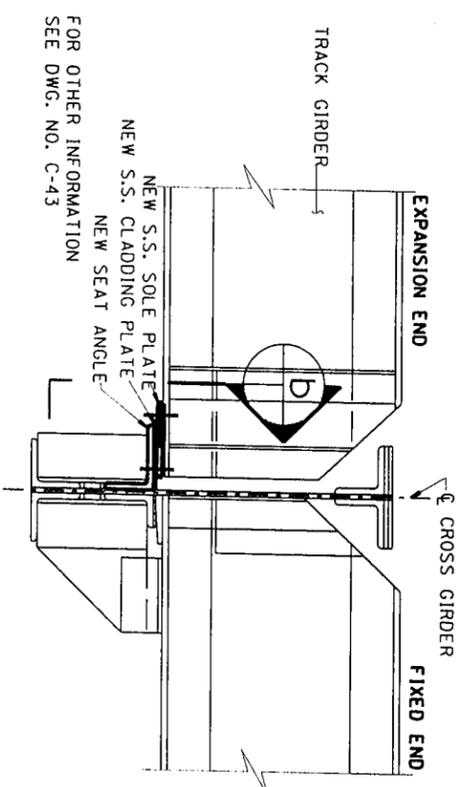
CROSS REFERENCES

FOR GENERAL NOTES AND REPAIR PROCEDURES.....SEE DWG. NOS. C-1
 FOR STATION PLATFORM PLANSEE DWG. NOS. C-1
 FOR TYPICAL CONCRETE REPAIR DETAILSSEE DWG. NOS. C-1

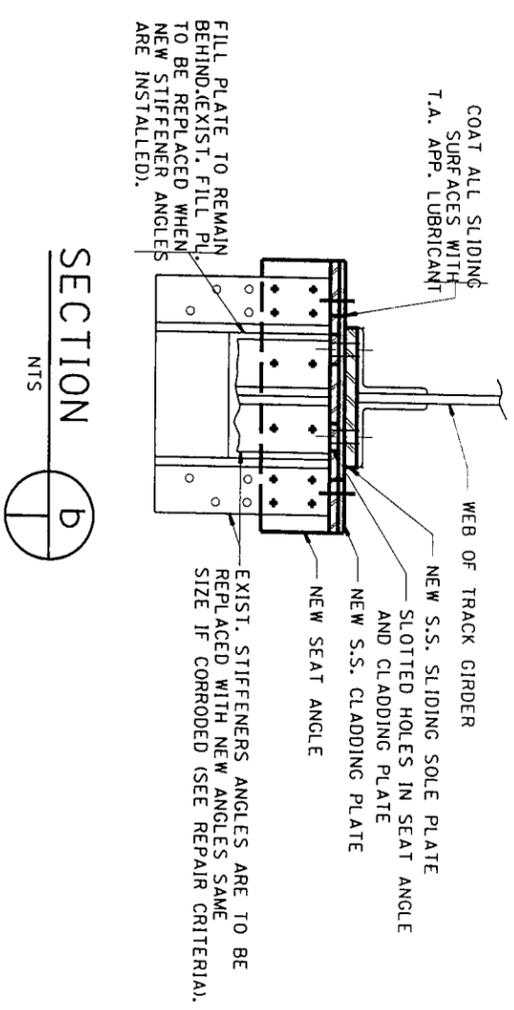
REPAIR OF STEEL COLUMNS (ROLLED SHAPE - REO'D.)

REVISION	DESCRIPTION	DATE	APPROVED

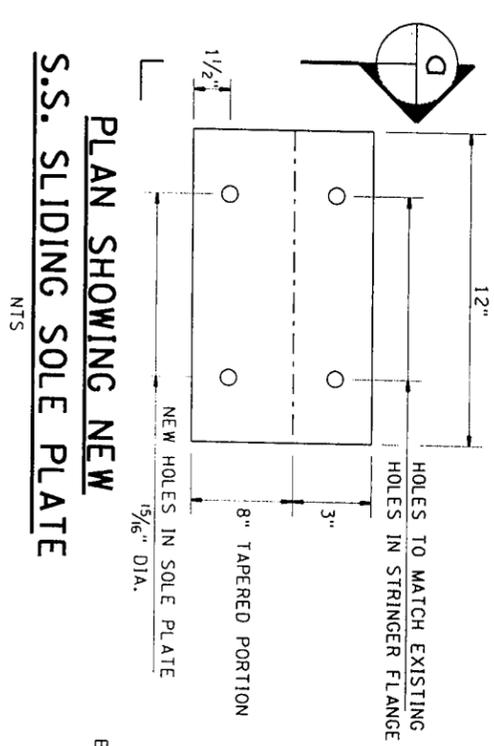
		REFERENCE DRAWING PLATFORM COLUMN REPAIR PLAN AND SECTIONS
DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT CIVIL/STRUCTURAL ENGINEERING		
DRAWN BY DESIGNED BY CHECKED BY APPROVED BY	New York City Transit Authority	DATE : DRAWING NO. RC-1015 RC-2504 REVISION



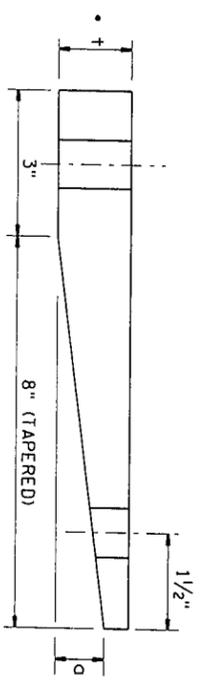
**ELEVATION OF SLIDING SOLE PLATE
EXPANSION JOINT TYPE 1B**
NTS



SECTION b
NTS



**PLAN SHOWING NEW
S.S. SLIDING SOLE PLATE**
NTS

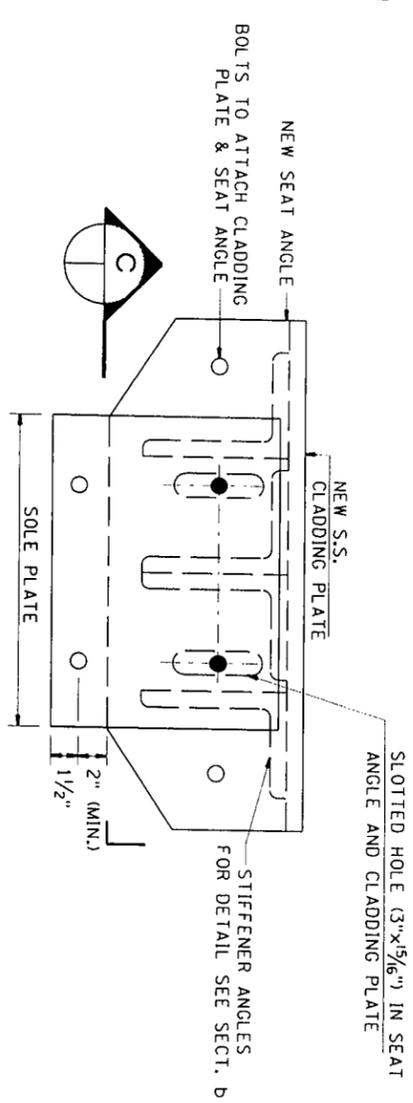


SECTION d
NTS (ENLARGED)
SLIDING SOLE PLATE

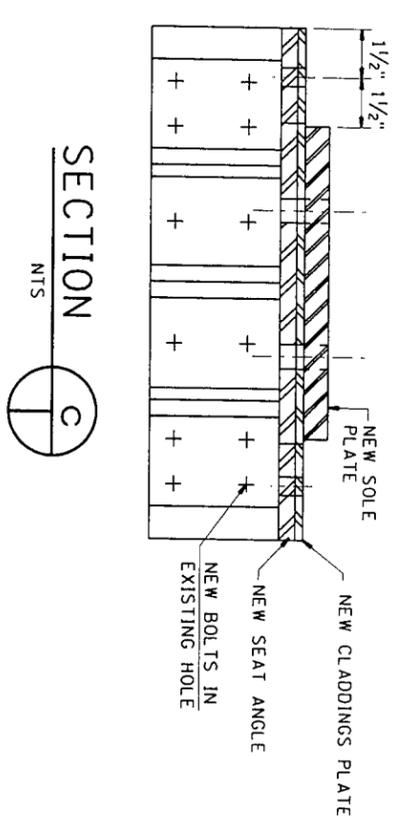
TABLE

DEPTH OF STRINGER	DIMENSION "d"
42"	0.060 in
48"	0.050 in
60" & MORE	0.030 in

*-THICKNESS TO BE USED AS FOR EXIST. SOLE PLATE EACH LOCATION (SEE NOTE 15 ON DWG. NO. C-41).



**PLAN SHOWING NEW SEAT ANGLE
WITH FOUR STIFFENER ANGLES**
NTS



SECTION c
NTS
**NEW SEAT ANGLE WITH CLADDING
PLATE AND SOLE PLATE**

NOTE:
THE DIMENSIONS AND CONFIGURATION SHOWN ON THIS DWG. ARE APPROXIMATE. THE ACTUAL STEEL SHAPES ARE TO BE FABRICATED TO FIT FIELD CONDITIONS.

CROSS REFERENCE:
FOR CROSS REFERENCES.....SEE DWG. NO. C-41.

REVISION	DESCRIPTION	DATE	APPROVED

REFERENCE DRAWING

**New York City
Transit Authority**

DEPARTMENT OF
CAPITAL PROGRAM
MANAGEMENT

CIVIL/STRUCTURAL ENGINEERING

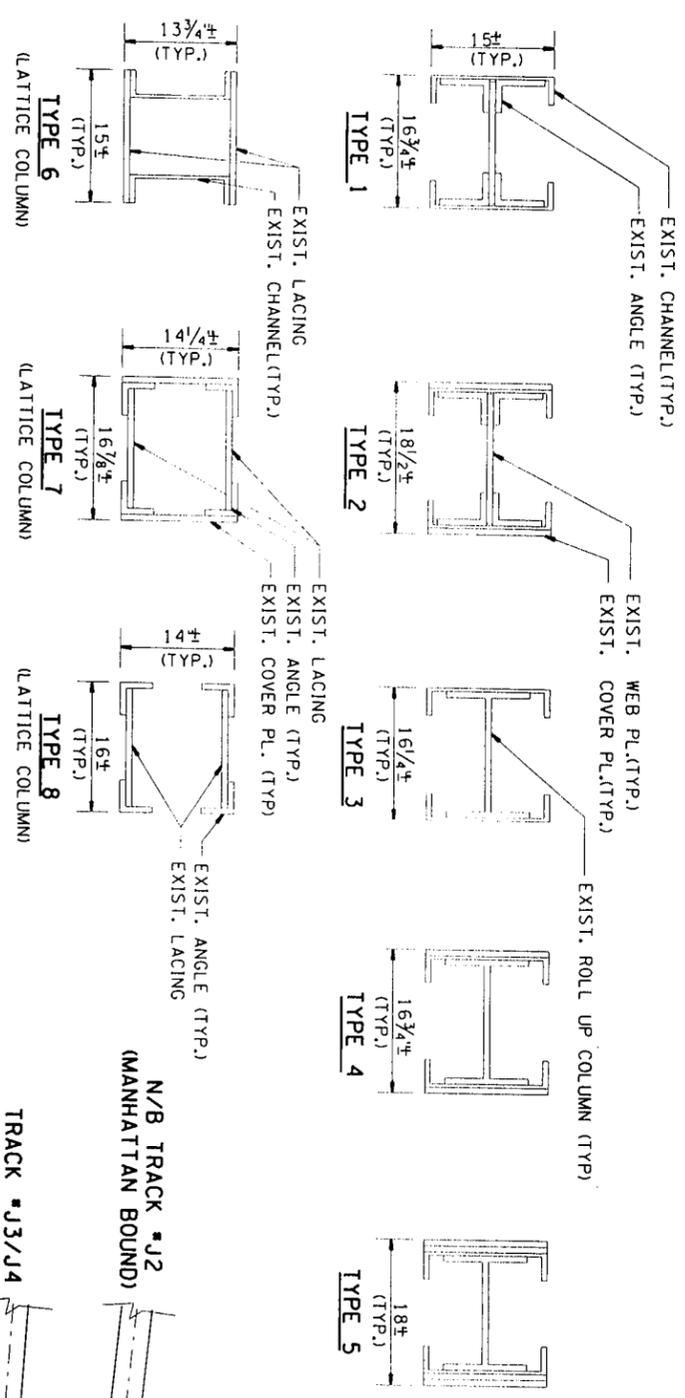
**REHABILITATION OF
SLIDING PLATE EXPANSION
JOINTS TYPE 1B**

DRAWN BY	DATE	DRAWING NO. RC-1015
DESIGNED BY		RC-2505
CHECKED BY		
APPROVED BY		

SCHEDULE OF COLUMN BASE REPAIR

COL. NO.	EXIST. COL. TYPE	REPAIR TYPE	CONDUIT OR PIPE	COL. NO.	EXIST. COL. TYPE	REPAIR TYPE	CONDUIT OR PIPE
JB67-E	4	A		769W	1	A	
752E	2	C		770E	1	A	
753W	5	C		771E	1	A	4' HIGH PIER
JB68W	4	C	DRAIN PIPE	772E	1	A	
754E	2	C		772W	2	A	
JB68E	4	C		773W	1	A	
754W	2	C		774W	1	C	
JB32W	3	C		777W	2	A	
JB33E	3	A		778E	5	C	
755E	1	A		778A E	4	B	
JB36W	3	C		778W	2	C	
756E	1	B		780W	2	A	
757W	2	C		781E	1	A	DRAIN PIPE
758E	2	A		782W	1	A	DRAIN PIPE
758W	2	C		783E	1	A	
759E	2	A		783W	1	A	DRAIN PIPE
759W	2	C		784E	1	C	
760W	2	C		784W	1	A	DRAIN PIPE
761E	1	C		785W	1	A	
761W	1	B		786W	1	A	
762W	1	B		787W	1	C	
763E	1	A		788W	1	A	
763W	1	A		789W	1	A	
764E	1	B		790W	1	A	
765W	1	A		791W	1	A	

* EXISTING UTILITY CONDUITS & PIPES SHALL BE TEMPORARILY RELOCATED OR MAINTAINED AND PROTECTED AS REQUIRED TO COMPLETE THE REPAIR OF COLUMNS.



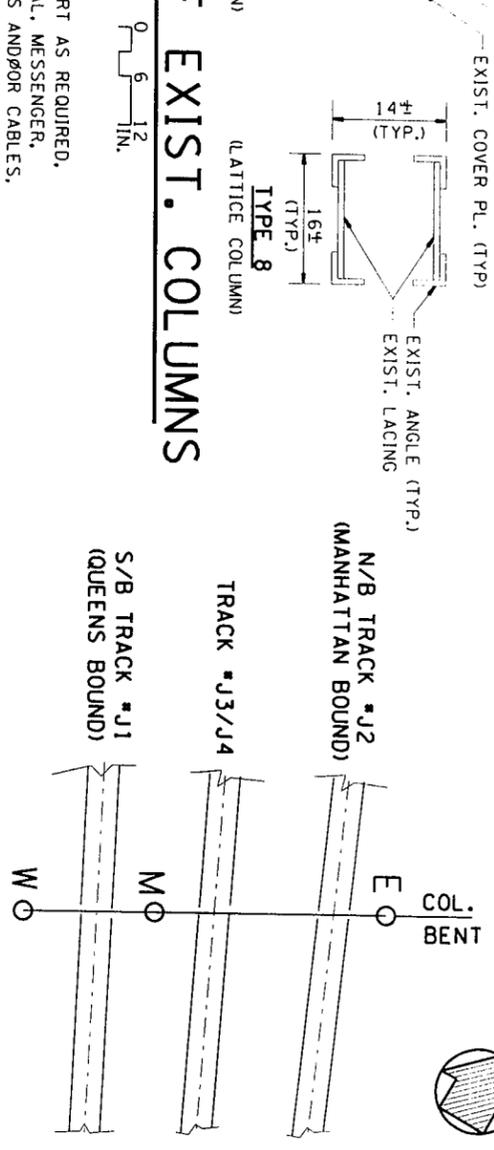
NOTES:

1. THE CONTRACTOR SHALL MAINTAIN, PROTECT, PROVIDE TEMPORARY SUPPORT AS REQUIRED, RESTORE AND IF NECESSARY, RELOCATE ALL EXIST. COMMUNICATION SIGNAL, MESSENGER, ELECTRICAL, POWER SUPERVISORY CONTROL AND TRAFFIC CONDUITS DUCTS AND/OR CABLES, AS REQUIRED TO COMPLETE THE COLUMN REPAIR WORK.
2. THE CONTRACTOR IS REQUIRED TO CLEAR DEBRIS AND TRASH FROM THE BASE OF COLUMN BEFORE THE START OF WORK.
3. THE CONFIGURATION OF COLUMNS AS SHOWN IN REPAIR DETAIL MAY VARY AT LOCATIONS. THE CONTRACTOR IS REQUIRED TO PROVIDE DETAILS SIMILAR TO THOSE SHOWN ON THESE DWGS. FOR APPROVAL BY THE ENGINEER.
4. THE CONTRACTOR MAY BE DIRECTED BY THE ENGINEER TO REPAIR COLUMN BASES IN ADDITION TO THOSE LOCATED ON THE DWGS.
5. THE CONTRACTOR SHALL REMOVE EXIST. CONCRETE BASES AT LOCATIONS AS SHOWN IN TABLES AS SHOWN ON THIS DWG. AND DWG. C-46.
6. AFTER REMOVAL CONCRETE BASES THE CONTRACTOR SHALL CONDUCT JOINT CONDITION SURVEY WITH T.A. ENGINEER OF CORRODED COLUMN BASES TO DETERMINE THE NEED FOR STEEL REPAIR AS PER CRITERIA GIVEN ON DWG. C-47.
7. THE CONDITION SURVEY REPORT SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO THE REPAIR WORK.
8. AT LOCATIONS WHERE STEEL REPAIR IS NOT REQUIRED THE CONTRACTOR SHALL SCRAPE AND CLEAN THE COLUMNS WITH HAND OR POWER TOOLS TO A SSPC SP 2/SP-3 LEVEL AND PAINT PER PAINTING REQUIREMENTS GIVEN ON DWG. C-48.
9. ALL COLUMNS LISTED IN THE TABLE ON THIS DWG. AND DWG. C-46 EXCEPT LATTICE COLUMNS SHALL RECEIVE CONCRETE ENCASMENT AS SHOWN ON DWG. C-49.

TYPE OF COLUMN BASE REPAIR

- A = REMOVE EXIST. CONCRETE COLUMN BASE, REPAIR CORRODED COLUMN BASE STEEL AND CONSTRUCT NEW CONCRETE BASE.
- B = REMOVE EXIST. CAST IRON FENDER, REPAIR CORRODED COLUMN BASE STEEL AND CONSTRUCT NEW CONCRETE BASE.
- C = CONSTRUCT NEW CONCRETE COLUMN BASE. (NO EXIST. CONCRETE COLUMN BASE)
- D = REPLACE EXIST. DETERIORATED CONCRETE PIER SUPPORTING LATTICE COLUMN.
- E = REMOVE EXIST. 15" CORRODED DRAIN PIPE AND INSTALL NEW HEAVY DUTY C.I. PIPE. (DIA. OF NEW DRAIN PIPE TO MATCH EXIST. PIPE)
- F = REMOVE EXIST. 10" ABANDONED CORRODED DRAIN PIPE.
- G = REPLACE BASE PLATE WITH ANCHOR BOLTS AND PROVIDE NEW CONCRETE FOOTING OF SAME SIZE. PROVIDE TEMPORARY SUPPORT. THIS WORK SHALL BE DONE UNDER G.O.

TYPE OF EXIST. COLUMNS



COLUMN LOCATION PLAN

REVISION	DATE	APPROVED	DESCRIPTION

DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT
New York City Transit Authority

CIVIL/STRUCTURAL ENGINEERING

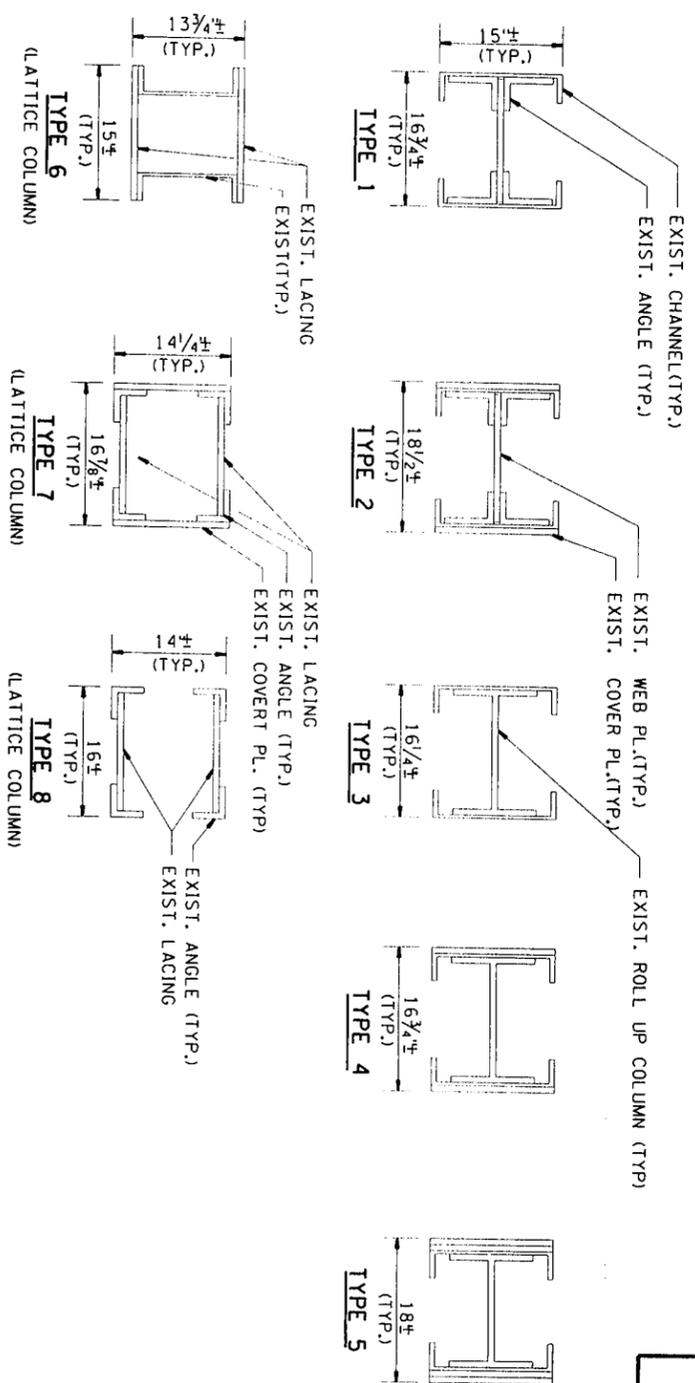
REPAIR OF COLUMN BASES SCHEDULE - SHEET 1 OF 2

DRAMA BY: _____ DATE: _____
DESIGNED BY: _____ DRAWING NO. RC-1015
CHECKED BY: _____ RC-2506
APPROVED BY: _____ REVISION: _____

SCHEDULE OF COLUMN BASE REPAIR

COL. NO.	EXIST. COL. TYPE	REPAIR TYPE	CONDUIT OR PIPE
792E	1	A	
792W	1	A	
793W	1	A	
794E	1	A	
794W	1	C	
795E	1	A	
795W	1	C	
796E	1	A	
796W	1	A	
797W	1	A	
798W	1	A	
799W	1	A	
837E	6	C,D	
842E	6	FLANGE REPAIR	
948W	7	B	ENCASE SAN. PIPE
949E	7	B,F	DRAIN PIPE
949W	7	A,D	DRAIN PIPE
950M	7	B	HIGH PIER 3'Hx2'W
952W	7	HIGH A,E PIER	DRAIN PIPE
954E	7	B	DRAIN PIPE
986W	8	D	
987W	8	B	
988W	8	B	
989E	8	B	
989W	8	A	

COL. NO.	EXIST. COL. TYPE	REPAIR TYPE	CONDUIT OR PIPE
990E	7	B, G	
990W	7	B	DRAIN PIPE
991E	8	B	
991M	7	B	
991W	1	A	
992E	8	B,G	
992M	7	B,E	
994E	1	B	
994W	1	B	
995E	1	B	
995W	1	B	
996W	2	B	
997E	2	B	DRAIN (BIG DIA) PIPE
997W	2	B	DRAIN PIPE
999W	1	B	DRAIN PIPE
1000E	1	B	
1001W	1	B	DRAIN PIPE
1005E	1	B	
1006E	2	B	DRAIN PIPE
1007E	2	B	
1007W	2	B	DRAIN PIPE



TYPE OF EXIST. COLUMNS

TYPE OF COLUMN BASE REPAIR

- A = REMOVE EXIST. CONCRETE COLUMN BASE, REPAIR CORRODED COLUMN BASE STEEL AND CONSTRUCT NEW CONCRETE BASE.
- B = REMOVE EXIST. CAST IRON FENDER, REPAIR CORRODED COLUMN BASE STEEL AND CONSTRUCT NEW CONCRETE BASE.
- C = CONSTRUCT NEW CONCRETE COLUMN BASE. (NO EXIST. CONCRETE COLUMN BASE)
- D = REPLACE EXIST. DETERIORATED CONCRETE PIER SUPPORTING LATTICE COLUMN.
- E = REMOVE EXIST. 15' CORRODED DRAIN PIPE AND INSTALL NEW HEAVY DUTY C.I. PIPE. (DIA. OF NEW DRAIN PIPE TO MATCH EXIST. PIPE)
- F = REMOVE EXIST. 10' ABANDONED CORRODED DRAIN PIPE.
- G = REPLACE BASE PLATE WITH ANCHOR BOLTS AND PROVIDE NEW CONCRETE FOOTING OF SAME SIZE. PROVIDE TEMPORARY SUPPORT. THIS WORK SHALL BE DONE UNDER G.O.

* EXISTING UTILITY CONDUITS & PIPES SHALL BE TEMPORARILY RELOCATED OR MAINTAINED AND PROTECTED AS REQUIRED TO COMPLETE THE REPAIR OF COLUMNS.

<p>New York City Transit Authority</p>		<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p>	
<p>CIVIL/STRUCTURAL ENGINEERING</p>		<p>REPAIR OF COLUMN BASES SCHEDULE - SHEET 2 OF 2</p>	
<p>REVISION</p>	<p>DESCRIPTION</p>	<p>DATE</p>	<p>APPROVED</p>
<p>DRAWN BY</p>	<p>DESIGNED BY</p>	<p>CHECKED BY</p>	<p>APPROVED BY</p>
<p>DATE :</p>	<p>DRAWING NO. RC-1015</p>	<p>RC-2507</p>	<p>REVISION</p>

**STRUCTURAL NOTES ON SLIDING PLATE EXPANSION
JOINT REHABILITATION (DWG. NO. C-41, C-42, AND C-43)**

1. THESE CONTRACT DRAWINGS WERE PREPARED BASED ON THE FIELD INSPECTION AND OTHER INFORMATION AVAILABLE AT THE TIME. IT IS ANTICIPATED THAT THE CONTRACTOR WILL ENCOUNTER VARIATIONS TO THESE EXPANSION JOINTS. EXPANSION JOINTS ARE TO BE REHABILITATED WHERE INDICATED, EXCEPT ON PLATFORM GIRDERS AND WHERE THE TRACKS ARE MISSING OR NOT IN USE. SOME TRACK STRINGER ENDS HAVE TWO SLIDING SURFACES.
2. THE CONTRACTOR IS REQUIRED, IN THE PRESENCE OF THE ENGINEER TO CONDUCT THE SURVEY AND INSPECTION OF THE DEFECTS IN THE EXISTING CONDITIONS OF THE FOLLOWING:
 - a) SOLE PLATE, SEAT ANGLE AND STIFFENERS BELOW SEAT ANGLE AND FILL PLATES.
 - b) HORIZONTAL PLATES AT THE BEARING ENDS OF THE GIRDERS.
 - c) ANY OTHER CORRODED OR DETERIORATED STEEL IN THE VICINITY OF THE EXPANSION JOINT
 - d) BOTTOM FLANGE ANGLE OF THE TRACK GIRDER AT EXPANSION JOINT.
 - e) MISSING BOLTS FOR THE PORTION IN THE VICINITY OF EXPANSION JOINT.
 BASED ON THE SURVEY AND INSPECTION, THE CONTRACTOR SHALL SUBMIT DETAILS OF EXISTING CONDITIONS, RECOMMENDING THE REPAIRING WORK THAT WILL BE DONE AT EACH LOCATION, FOR THE ENGINEER'S APPROVAL. THE COST OF THE ABOVE SURVEY WORK SHALL BE PAID UNDER APPROPRIATE ITEMS.
3. EXPANSION JOINT REPLACEMENT CONSISTS GENERALLY OF THE REPLACEMENT OF THE SOLE PLATE AND SEAT ANGLE SUPPORTING IT AS SHOWN ON DWGS. C-42 & C-43. ALSO EXPANSION JOINT REPLACEMENT INCLUDES 1) REPLACEMENT OF CORRODED STIFFENER ANGLES UNDER SEAT ANGLES, 2) REPLACEMENT OF PART OF THE BOTTOM FLANGE ANGLES OF THE STRINGER PER REPAIR CRITERIA BELOW. 3) REMOVAL AND REINSTALLATION OF THE SAME EXISTING STIFFENER ANGLES UNDER SEAT ANGLE. 4) PROVIDE ADDITIONAL NEW STIFFENER ANGLES UNDER SEAT ANGLE FOR SOME TYPE OF EXPANSION JOINTS AS INDICATED ON DETAILED DRAWINGS. AT SOME LOCATIONS THE EXPANSION JOINT WILL ALSO BE MODIFIED TO MAKE IT CONFORM TO A MORE STANDARD DETAIL. THERE ARE ALSO SOME EXPANSION JOINTS WITH TWO SLIDING SURFACES.
4. EXISTING EXPANSION JOINT STIFFENER ANGLES UNDER SEAT ANGLE SHALL BE REMOVED AND REPLACED BY SAME SIZE AS EXISTING IF ONE OR MORE OF THE FOLLOWING CRITERIA IS MET:
 - a. IF ANY COMPONENT OF THE STIFFENER ANGLES UNDER SEAT ANGLE ARE CRACKED, BENT, OR MISSING.
 - b. IF AVERAGE METAL LOSS ON ANY ONE OR MORE OF THE COMPONENTS OF THE STIFFENER ANGLE IS MORE THAN 25% OF THE ORIGINAL THICKNESS.
 - c. THE ABOVE CRITERIA ARE FOR GENERAL GUIDANCE ONLY AND WILL BE MODIFIED AS DETERMINED BY THE ENGINEER. THE ENGINEER MAY REQUIRE THE REPLACEMENT OF THE SEAT BRACKET STIFFENER ANGLES AND FILL PLATES AT LOCATIONS WHERE THE ABOVE CRITERIA ARE NOT MET, IF IN THE ENGINEER'S OPINION SUCH REPAIR IS NECESSARY.
 - d. IF BOTTOM FLANGE ANGLE OF THE STRINGER IS DAMAGED OR CORRODED AT THE BEARING END, THE DAMAGED PORTION IS TO BE REPLACED AND SPLICED AS PER ABOVE REPAIR CRITERIA.
5. ANY PORTION OF THE EXISTING CORRODED STRUCTURAL STEEL WHICH IS AFFECTED BY THE NEW CONSTRUCTION SHALL BE REPAIRED OR REPLACED AND PAINTED AS PER T.A. SPECIFICATIONS. THE CONTRACTOR IS REQUIRED TO PREPARE SHOP DRAWINGS, BASED ON THE ACTUAL CONDITIONS AND DETAILS ESTABLISHED BY HIS SURVEY AND INSPECTION, SHOWING THE METHOD AND DETAILS OF REPAIRING OR REPLACING CORRODED STEEL, FOR THE ENGINEER'S APPROVAL. ALL SEAT ANGLES AND ALL STIFFENER ANGLES UNDER SEAT ANGLE (OLD OR NEW) AND FILL PLATES SHALL BE PAINTED WITH ONE PRIME COAT (IF REQUIRED) AND TWO ADDITIONAL COATS.
6. STRUCTURAL STEEL IS TO CONFORM TO THE REQUIREMENTS OF A.S.T.M. A36 UNLESS OTHERWISE NOTED.
7. NEW STAINLESS STEEL SHALL CONFORM TO THE REQUIREMENTS OF A.S.T.M. DESIGNATION A240 TYPE 304 WITH NO.4 FINISH.
8. AFTER ENGINEER'S APPROVAL OF THE WORK TO BE DONE, THE CONTRACTOR SHALL PROCEED WITH THE PREPARATION OF THE SHOP DRAWINGS SHOWING THE REPAIR WORK.
9. ALL CONNECTIONS SHALL BE MADE WITH THE SAME NUMBER AND SIZE OF A325 H.S. BOLTS AS EXISTING RIVETS. USE EXISTING HOLES UNLESS OTHERWISE NOTED. ALL NEW BOLT HOLES SHALL BE DRILLED AND REAMED, NOT BURNED.
10. MINOR ELECTRIC FUSING MAY BE FOUND BETWEEN SOME OF THE EXISTING SLIDING PLATES AND THEIR CONTACTING ELEMENTS DUE TO A BROKEN NEGATIVE RETURN CIRCUIT BOND BETWEEN ADJOINING TRACK GIRDERS. CHISELING OFF THE MINOR FUSING MAY BE REQUIRED.
11. THE CONTRACTOR SHALL INSTALL NEW GADWELD TYPE "J" BONDS, AT ALL EXPANSION JOINTS. SEE SPECIFICATIONS.
12. IN THE COURSE OF DOING THE REHABILITATION OF EXPANSION JOINT, IT MAY BE NECESSARY TO REMOVE AND REINSTALL GUSSET PLATES, TIE IN ANGLES, CROSS FRAMES, C.J. BONDS AND OTHER STEEL.
13. DIFFERENT TYPE OF EXPANSION JOINTS HAVE BEEN SHOWN ON THE CONTRACT DRAWINGS BASED ON THE FIELD SURVEY. CONTRACTOR TO VERIFY THE LOCATION AND TYPE OF EXPANSION JOINTS. OTHER TYPE OF EXPANSION JOINTS MAY BE FOUND APART FROM THOSE SHOWN ON THE DRAWINGS. CONTRACTOR TO PREPARE SHOP DRAWINGS FOR SUCH TYPE AND FORWARD TO T.A. FOR ENGINEER'S APPROVAL.
14. FOR EXPANSION JOINTS WITH TWO SLIDING SURFACES, THE LOWER ONE IS TO RECEIVE THE PRIMARY BEARING. SHIMMING IS TO BE ADDED TO LOWER BEARING TO AVOID PRIMARY BEARING ON THE UPPER SLIDING SURFACE.
15. THE FINAL ELEVATION OF THE TOP OF THE STRINGERS IS TO BE AS CLOSE AS POSSIBLE TO THE TOP OF THE FIXED STRINGER ON THE OTHER SIDE OF THE CROSS GIRDER. THE THICKNESS OF THE NEW SLIDING SOLE PLATE SHALL BE THE SAME AS EXISTING. TO ACCOMPLISH THIS, THE THICKNESS OF THE SOLE PLATE MAY BE REDUCED TO 1/2" MINIMUM ONLY IF THE EXPANSION SIDE TRACK GIRDER IS HIGHER. IF THE EXPANSION SIDE IS LOWER USE SOLE PLATE SAME SIZE AS EXISTING AND ADD SHIM PLATES, IF REQUIRED TO ADJUST THE ELEV. IF THE FINAL ELEVATION STILL DIFFERS FROM THAT OF THE FIXED STRINGER, THE ELEVATION DIFFERENCES ARE TO BE MADE UP BY PLACING SHIMS UNDER THE TIE PLATES OF THE TRACK. THE MAX ELEVATION DIFFERENCE BETWEEN ADJACENT TIES ON EITHER SIDE OF CENTERLINE OF BENT IS TO BE 1/8"±.
16. ALL SHIMS PLATES SHALL BE AT LEAST 1/4" THICK AND OF A-36 STEEL, AND SHALL BE PAINTED. THE SHIM PLATES THAT ARE LESS THAN 1/4" THICK SHALL BE STAINLESS STEEL.
17. ALL DIMENSIONS AND CONDITIONS OF EXISTING STRUCTURE CONTROLLING NEW CONSTRUCTION ARE TO BE VERIFIED BY THE CONTRACTOR IN THE FIELD BEFORE THE START OF THE WORK. THE CONTRACTOR SHALL FABRICATE ALL MATERIALS IN ACCORDANCE WITH HIS OWN MEASUREMENTS AND SHALL BE RESPONSIBLE FOR PROPER FIT OF ALL WORK. THE ENGINEER'S APPROVAL OF SHOP DWGS. SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY.
18. PRIOR TO MAKING CONNECTIONS TO EXISTING STEEL, THE CONNECTING AREA SHALL BE THOROUGHLY CLEANED OF RUST, GREASE, OIL, DIRT, AND WELD DEPOSITS IF ANY BY MECHANICAL WIRE BRUSH OPERATED BY POWER TOOLS.
19. USE THE EXISTING HOLES TO MAKE THE CONNECTION. IF A HOLE LOCATION IS NOT SUITABLE, PLUG AND WELD THE HOLE AND DRILL A NEW HOLE TO MAKE THE CONNECTION.

REVISION	DESCRIPTION	DATE	APPROVED



**New York City
Transit Authority**

**STRUCTURAL NOTES ON
SLIDING PLATE EXPANSION
JOINT REHABILITATION**

DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY

DEPARTMENT OF
CAPITAL PROGRAM
MANAGEMENT

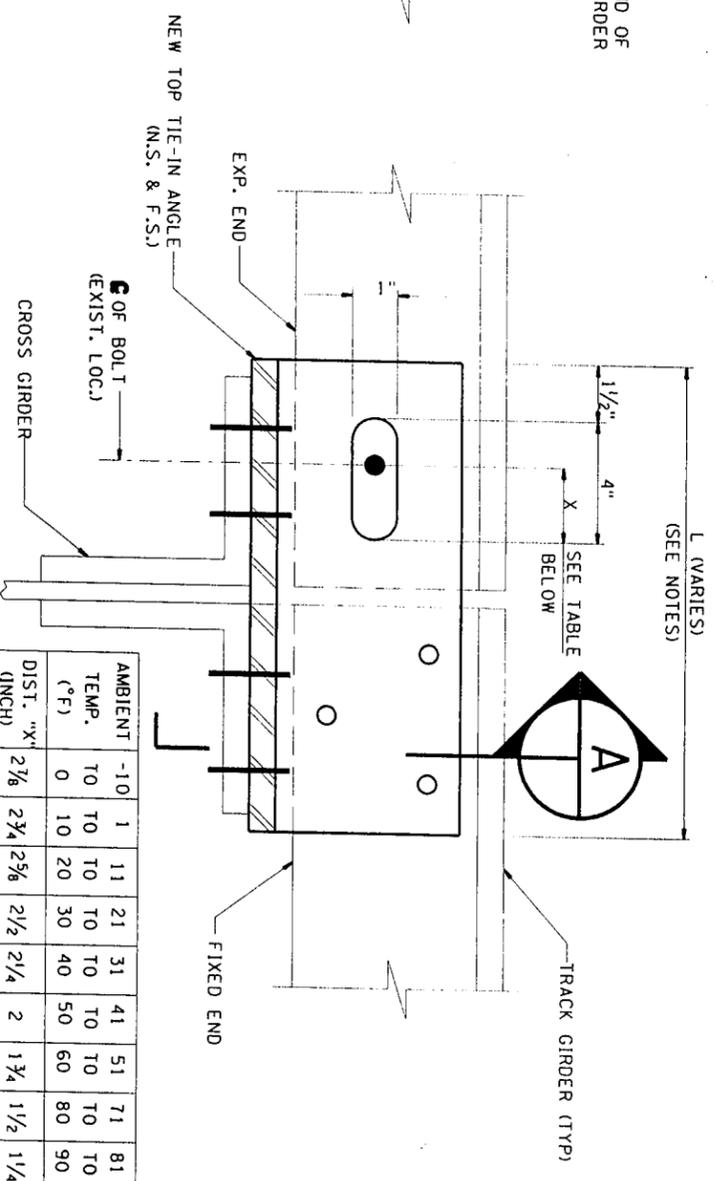
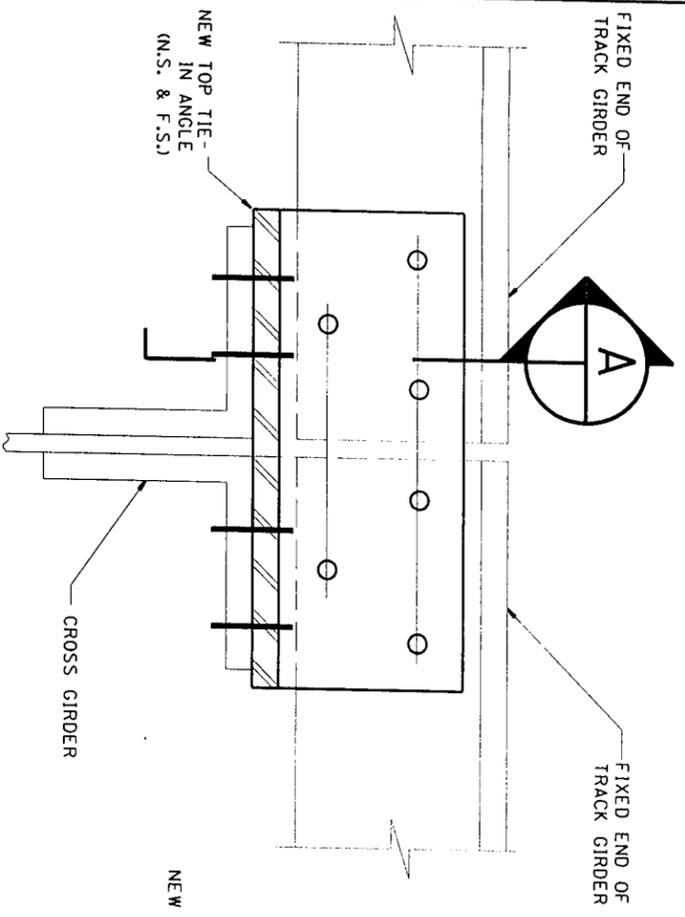
CIVIL/STRUCTURAL ENGINEERING

DATE: _____

DRAWING NO. RC-1015

RC-2508

REVISION



AMBIENT TEMP. (°F)	1	11	21	31	41	51	61	71	81	91	101
TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
DIST. "X" (INCH)	2 7/8	2 3/4	2 5/8	2 1/2	2 1/4	2	1 3/4	1 1/2	1 1/4	1	3/4

TYPICAL DETAIL FOR REPLACEMENT OF TOP TIE-IN ANGLES AT FIXED END (TIA)

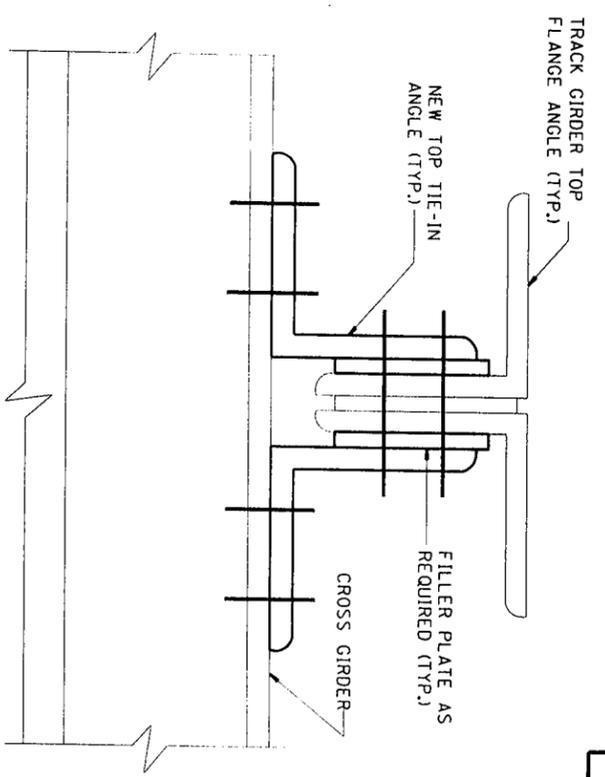
TYPICAL DETAIL FOR REPLACEMENT OF TOP TIE-IN ANGLES AT EXPANSION END (TIA)

NOTES:

- 1.) a. TOP TIE-IN ANGLES ON BOTH SIDES SHALL BE REPLACED USING SAME SIZE AND CONFIGURATION AS THE EXISTING. IT IS ANTICIPATED THAT THE CONTRACTOR WILL ENCOUNTER VARIATIONS IN THE TIE-IN ANGLES AS SOME WERE FABRICATED BY WELDING PLATES OR BY BENT PLATES.
- b. NEW PLATES OR ANGLES, WELDED TO FORM A NEW TOP TIE-IN ANGLE, SHALL BE SHOP WELDED WITH FULL PENETRATION WELDS. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING THE METHOD AND DETAILS OF REPLACEMENT FOR ENGINEER'S APPROVAL.
- c. THE SLOTTED HOLE IN TOP TIE-IN ANGLES SHALL BE AS SHOWN IN DETAIL. PROVIDE OVERSIZED WASHERS UNDER BOLT HEAD AND NUT THAT WILL OVERLAP THE SLOTTED HOLE BY 1/4" MINIMUM ON TOP AND BOTTOM AND CLEAR THE THREAD OF THE LONG BOLT. MAINTAIN A MINIMUM EDGE DISTANCE OF 1 1/2" FROM THE SLOTTED END.
- d. THE NEW TOP TIE-IN ANGLE SHALL BE INSTALLED RELATIVE TO THE EXISTING BOLT IN THE TRACK GIRDER TOP FLANGE, ACCORDING TO THE FOLLOWING TABLE AND BASED ON AMBIENT TEMPERATURE MEASURED DURING ITS INSTALLATION. THE OPERATION WOULD, IN MOST CASES, INVOLVE FIELD DRILLING OF BOLT HOLES IN THE TOP TIE-IN ANGLE TO MATCH THOSE IN THE EXISTING TRACK GIRDERS & CROSS GIRDERS.
- 2.) IN CASES WHERE THE SLOTTED HOLES ALREADY EXIST IN THE TRACK GIRDER FLANGE ANGLES, THE CONTRACTOR IS REQUIRED TO PROVIDE STANDARD HOLES IN THE TOP TIE-IN ANGLES. THE LOCATION OF THE HOLE SHALL BE BASED ON CRITERIA GIVEN IN THE NOTE 1 (d).
- 3.) THE BOLT THRU THE SLOTTED HOLE SHALL BE ONLY 'HAND-TIGHTENED', AND NUT SHALL BE PREVENTED FROM LOOSENING BY TACK WELDING OR BY SPOILING THE THREADS ON THE BOLT PROJECTIONS AFTER THE HAND-TIGHTENING.
- 4.) DURING THE REPLACEMENT OF A TOP TIE-IN ANGLE, THE CORRODED OR CRACKED PORTION OF TRACK GIRDER WHICH WAS COVERED BY THE TOP TIE-IN ANGLE SHALL ALSO BE REPAIRED. (SEE NOTE "A" ON DWG. C-371).

TABLE OF TOP TIE ANGLE REPLACEMENT (TIA)

NO.	SPAN	MEMBER TYPE	GIRDER LOCATION	PIECE NAME	PCN	DEFECT	REMARK
1	754	LG	SBW	LGT	-	CK	FIXED END
2	756	LG	MTE	STR	2	CORR	FIXED END
3	756	LG	MTE	LGT	TPW	MISSING	FIXED END
4	756	LG	MTE	LGT	TPE	CK	FIXED END
5	756	LG	MTE	LGT	TPE	CK	FIXED END
6	757	LG	NBE	LGT	1S	CK	FIXED END
7	757	LG	MTE	LGT	3W	CK	FIXED END
8	757	LG	MTE	LGT	TPW	CK	FIXED END
9	757	LG	MTE	LGT	TPE	CK	FIXED END



SECTION A

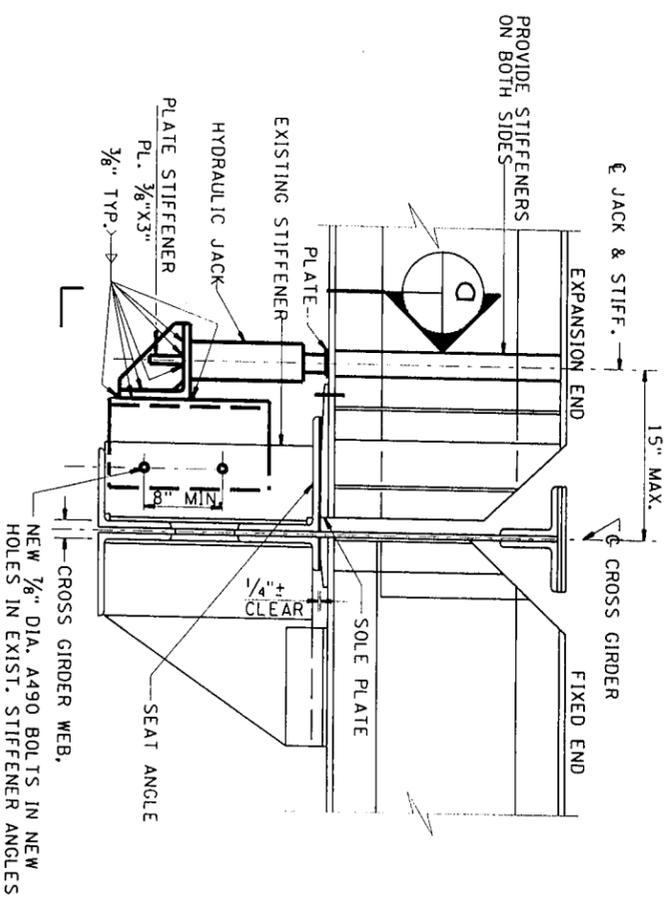
LEGEND:

- CK = CRACK
- LG = LONGITUDINAL TRACK GIRDER
- LGT = LONGITUDINAL TOP CONNECTION
- MTE = MIDDLE TRACK EAST
- NBE = NORTHBOUND EAST
- SBW = SOUTHBOUND WEST
- TPE = TOP EAST
- TPW = TOP WEST

DESIGNED BY	DATE	APPROVED
CHECKED BY	REVISION	
APPROVED BY		

DRAWN BY: **TRANSIT**
 DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT
 CIVIL/STRUCTURAL ENGINEERING
 New York City Transit Authority
TOP TIE-IN ANGLE REPLACEMENT DETAILS

DRAWING NO. RC-1015
RC-2509

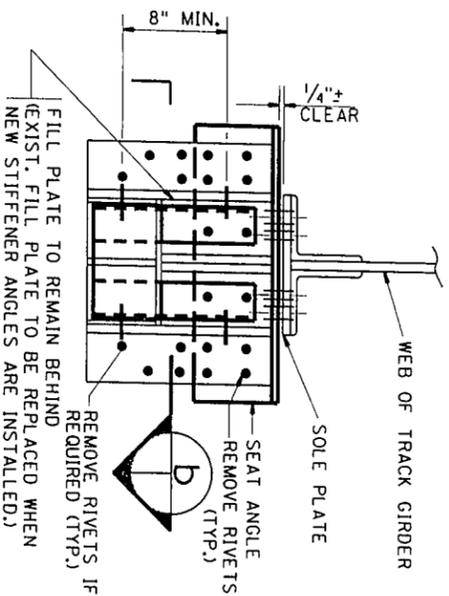


ELEVATION SHOWING JACKING DEVICE

(SUGGESTED TRACK STRINGER JACKING ARRANGEMENT

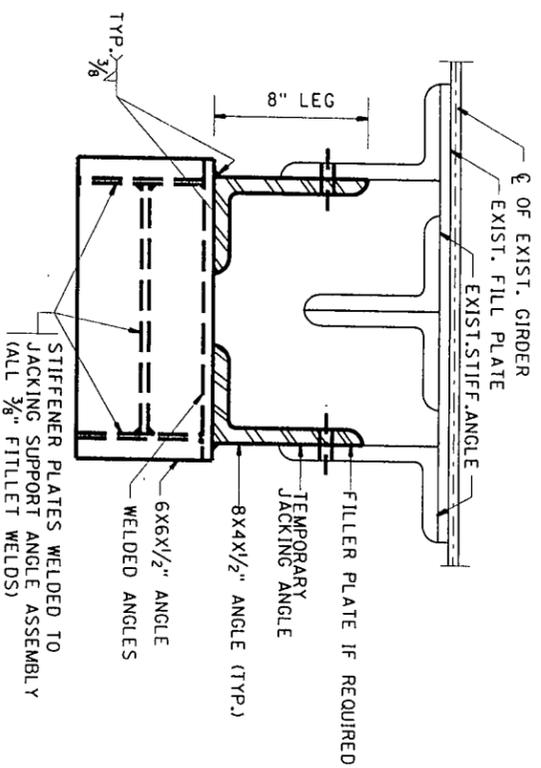
WHERE BOTTOM FLANGE ANGLE OF STRINGER IS TO REMAIN)

NTS



SECTION a

NTS



SECTION b

NTS

A SUGGESTED PROCEDURE FOR CONSTRUCTION:

THIS IS A SUGGESTED PROCEDURE FOR CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO SUBMIT HIS OWN CONSTRUCTION PROCEDURE INCLUDING SCHEME FOR TEMPORARY SUPPORT WITH DESIGN CALCULATIONS AND DRAWINGS FOR ENGINEER'S APPROVAL.

1. INSTALL T.A. APPROVED SHIELDS TO PROTECT STREET TRAFFIC BELOW THE AFFECTED TRACK AREA AND SUBMIT G.O. AND "POWER TURN OFF" REQUEST. INSTALL TEMPORARY SUPPORTS.
2. REMOVE APPROPRIATE RIVETS ONE AT A TIME AND REPLACE THEM WITH H.S. BOLTS UNDER FLAGGING, ON "ONE FOR ONE" BASIS.
3. TAKE THE TRACK OUT OF SERVICE.
4. FIELD DRILL THE EXISTING STIFFENERS AND INSTALL THE TEMPORARY JACKING ASSEMBLY ON THE EXISTING OUTER STIFFENERS AS SHOWN.
5. LOOSEN CROSS FRAME, BRACING, TRACK BOLTS ETC. IF/AS REQUIRED.
6. LOOSEN OR REMOVE BOLTS IN SLOTTED HOLES.
7. JACK UP TRACK STRINGER.
8. REMOVE SEAT ANGLE AND SOLE PLATE.
9. INSTALL NEW STAINLESS STEEL SOLE PLATE, S.S. CLADDING PLATE AND SEAT ANGLE.
10. INSTALL STEEL SHIMS AS REQUIRED TO BRING THE TRACK TO THE ORIGINAL ELEVATION ON EITHER SIDE OF THE EXPANSION JOINT.
11. REMOVE TEMPORARY SUPPORT PLATE H.S. BOLTS IN THE UNUSED HOLES.
12. REMOVE STREET TRAFFIC PROTECTION SHIELDS AND BARRICADES.
13. FIELD PAINT NEW, AND EXISTING STEEL.

NOTE "A":

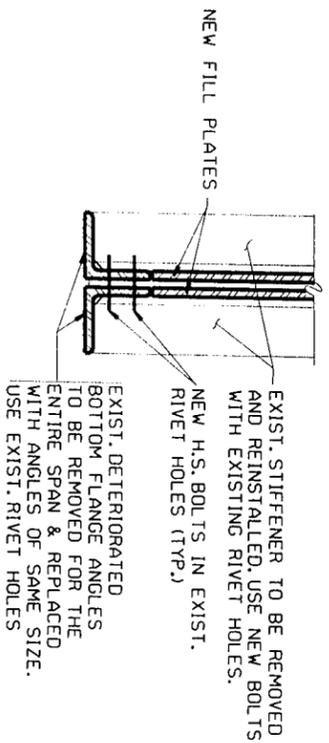
AT VARIOUS LOCATIONS THE EXISTING CONDITIONS COULD DIFFER FROM WHAT IS SHOWN. FOR SUCH CONDITIONS, THE SUGGESTED PROCEDURE MAY NOT APPLY. CONTRACTOR TO VERIFY THESE DIFFERENT CONDITIONS AND SUBMIT THE JACKING SCHEMES WITH DWGS. AND CALCULATIONS FOR EACH OF SUCH DIFFERENT CONDITIONS FOR ENGINEER'S APPROVAL.

NOTE "B":

IF IT IS REQUIRED TO REPLACE THE EXISTING CORRODED STIFFENERS UNDER SEAT BRACKET (AS PER REPAIR CRITERIA), THEN, FOR SUGGESTED JACKING ARRANGEMENT, FOLLOW STEPS 1 THRU 15 WHERE REQUIRED FROM DWG. NO. C-35 (EXCEPT STEP 9)

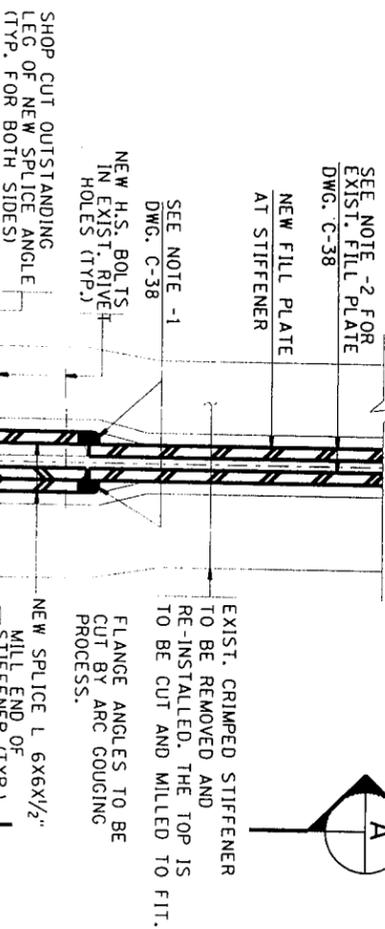
REVISION	DESCRIPTION	DATE	APPROVED

 New York City Transit Authority		TRACK GIRDER JACKING ARRANGEMENT FOR REHAB. OF EXPANSION JOINTS
DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT CIVIL/STRUCTURAL ENGINEERING		
DRAWN BY DESIGNED BY CHECKED BY APPROVED BY	DATE : DRAWING NO. RC-1015 RC-2510	REVISION



DETAIL "D"
N.T.S.

REPLACEMENT OF CORRODED OR CRACKED BOTTOM FLANGE ANGLE OF TRACK GIRDER



DETAIL "E"
N.T.S.

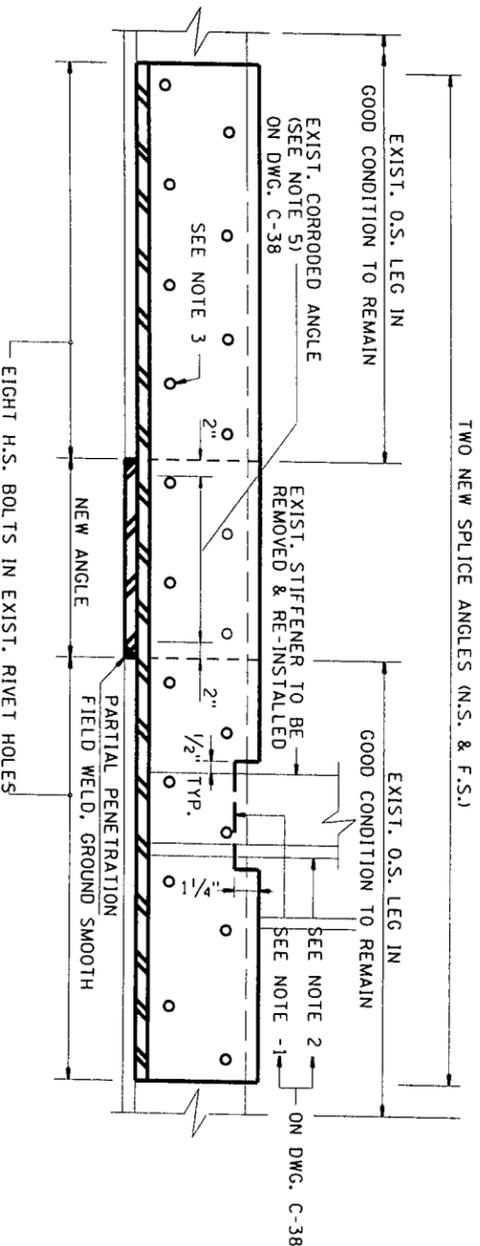
REPAIR OF PARTIALLY CORRODED, CRACKED OR BENT BOTTOM FLANGE ANGLE OF TRACK STRINGER AND CROSS GIRDER

NOTE: SEAL WELD ALL CRACKS FOR CRACKED FLANGE ANGLES AND GRIND SMOOTH PRIOR TO ATTACHMENT OF NEW COVER PLATE

A PROCEDURE FOR BOTTOM FLANGE REPAIR/REPLACEMENT:

THE FOLLOWING IS A PROCEDURE FOR REPAIR/ REPLACEMENT OF BOTTOM FLANGE OF TRACK STRINGERS. THE CONTRACTOR IS REQUIRED TO SUBMIT THE PROCEDURE OF CONSTRUCTION FOR THE ENGINEER'S APPROVAL.

1. INSTALL T.A. APPROVED SHIELDS AND BARRICADES TO PROTECT STREET TRAFFIC AND GENERAL PUBLIC BELOW.
2. REMOVE RIVETS IN THE VERTICAL LEGS OF BOTTOM FLANGE ANGLE. AND REPLACE WITH BOLTS ON A ONE FOR ONE BASIS.
3. TEMPORARILY DISCONNECT OR REMOVE GUSSET PLATES, BOTTOM STRUT ANGLES OF CROSS FRAME, CROSS BRACING, STRUT, SWAY BRACING, BOTTOM COVER PLATES AND LOOSEN STIFFENERS WHICH CONNECT TO BOTTOM FLANGE ANGLES OF TRACK GIRDER.
4. INSTALL TEMPORARY JACKING AND TRACK GIRDER SUPPORTS IF NECESSARY.
5. PROVIDE TEMPORARY LATERAL SUPPORT FOR GIRDER.
6. REMOVE DETERIORATED BOTTOM FLANGE ANGLES AND REPLACE "IN KIND" WITH NEW ANGLES WITH HIGH STRENGTH BOLTS, REUSING EXISTING HOLES.
7. INSTALL NEW GUSSET PLATES AND RECONNECT ALL EXISTING BOTTOM STRUTS OF CROSS FRAME AND CROSS BRACING STRUTS TO BOTTOM FLANGE ANGLES OF TRACK GIRDERS.
8. RECONNECT EXISTING STIFFENERS.
9. PAINT NEW STEEL AND ANY DAMAGE AREAS AS PER T.A. SPECIFICATIONS.
10. REMOVE ALL TEMPORARY SUPPORTS.
11. REMOVE STREET TRAFFIC PROTECTION SHIELDS AND BARRICADES.



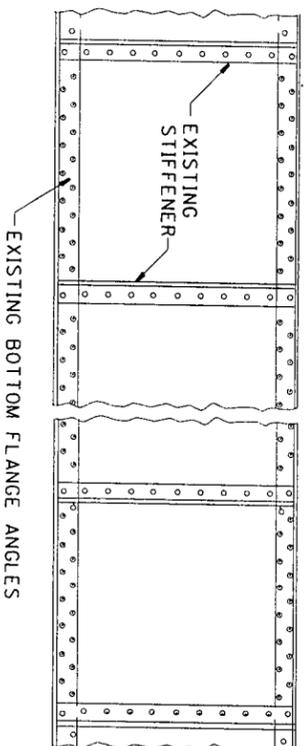
SECTION A

REPAIR OF PARTIALLY CORRODED BOTTOM FLANGE ANGLE

N.T.S.

NOTES:

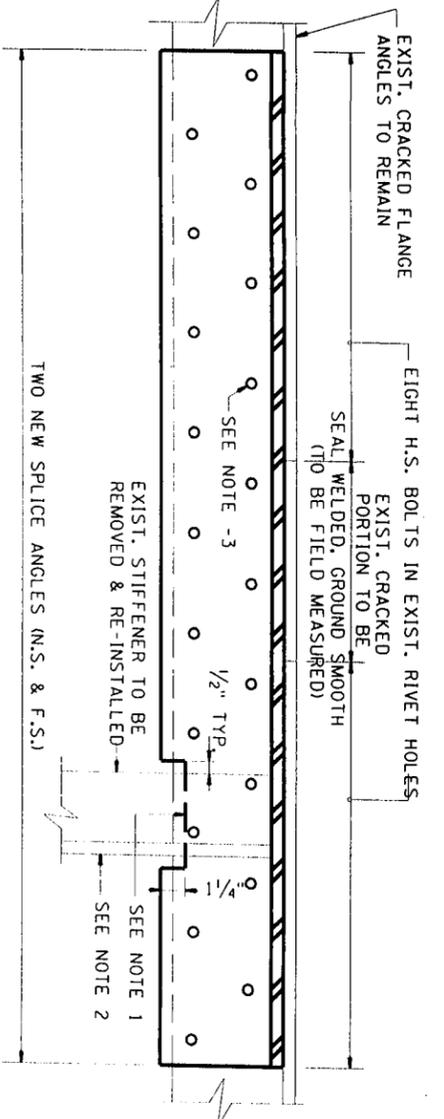
1. STRUCTURAL NOTES AND CRITERIA FOR BOTTOM FLANGE REPAIRS ARE SIMILAR TO TOP FLANGE REPAIR. (SEE DWG. C-35)
2. IF EXISTING COVER PLATE IS CORRODED (AS PER REPAIR CRITERIA) INSTALL NEW SPLICE COVER PLATE SAME WIDTH AND THICKNESS (1/2" MIN.) AS EXISTING. PROVIDE NEW BOLTS IN EXISTING RIVET HOLES. LENGTH OF REPAIR BEYOND CORRODED AREA SHALL BE AT LEAST THE SAME AS FOR REPAIR OF FLANGE ANGLES.
3. IF BOTTOM FLANGE IS BENT, USE THE SAME PROCEDURE AS MENTIONED IN DWGS. C-37 AND C-38, FOR THE REPAIR OF CORRODED ANGLES. SEE NOTE 5 ON DWG. C-38.



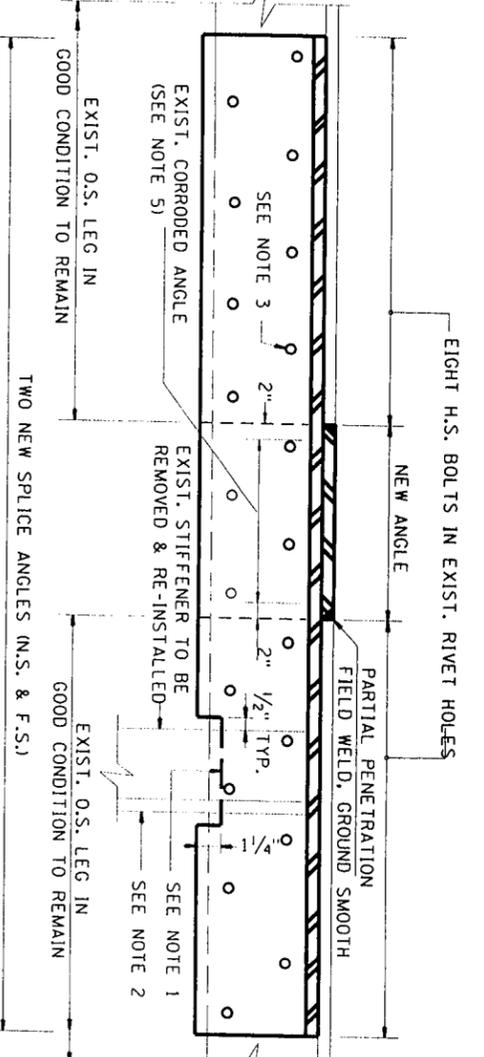
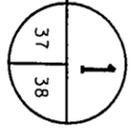
ELEVATION SHOWING BOTTOM FLANGE ANGLE OF TRACK GIRDER
N.T.S.

REVISION	DESCRIPTION	DATE	APPROVED

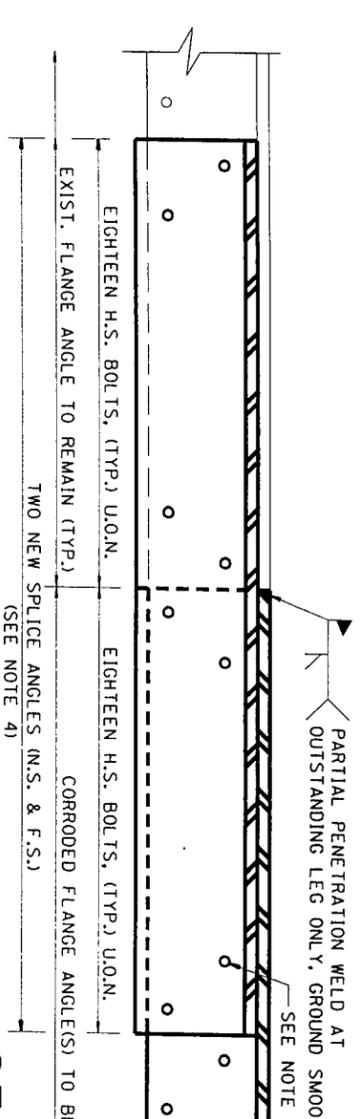
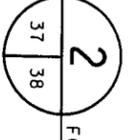
<p>New York City Transit Authority</p>		<p>REFERENCE DRAWING</p> <p>TRACK GIRDERS BOTTOM FLANGE REPAIR</p>
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>CIVIL/STRUCTURAL ENGINEERING</p>		
<p>DRAWN BY</p> <p>DESIGNED BY</p> <p>CHECKED BY</p> <p>APPROVED BY</p>	<p>DATE</p> <p>DRAWING NO. RC-1015</p> <p>RC-2511</p> <p>REVISION</p>	



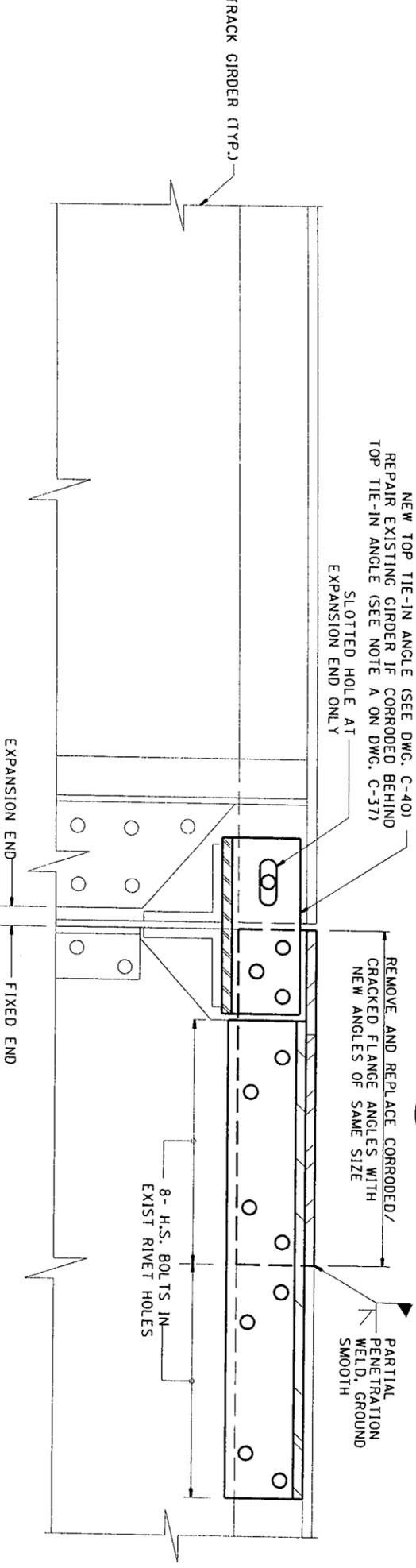
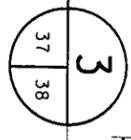
SECTION 1



SECTION 2



SECTION 3



NOTES:

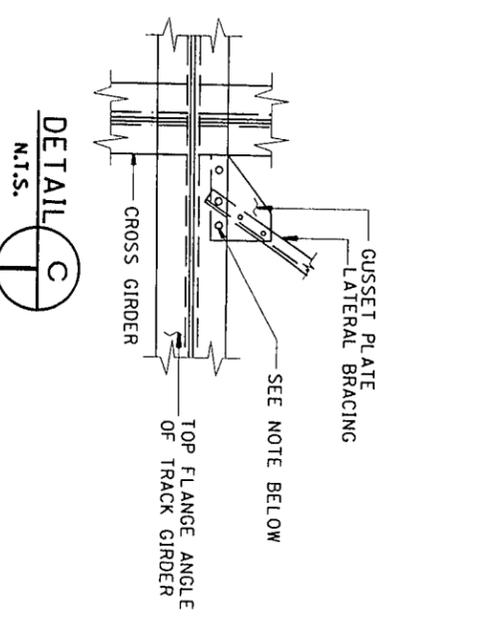
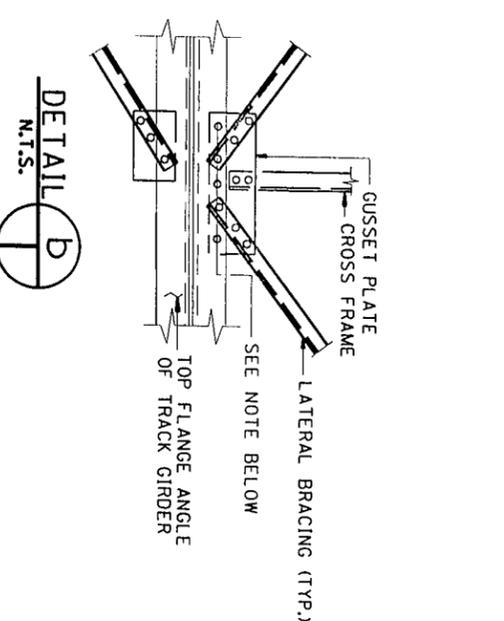
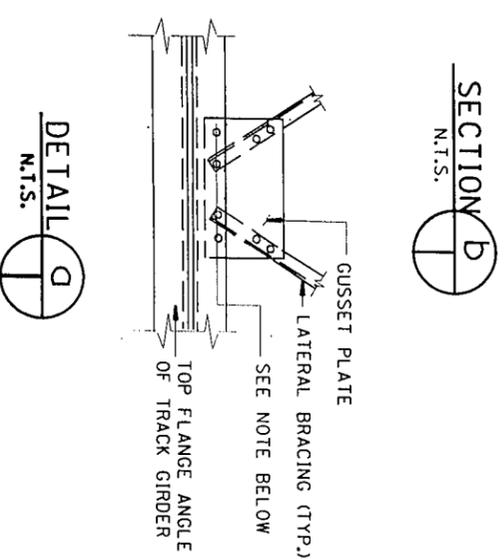
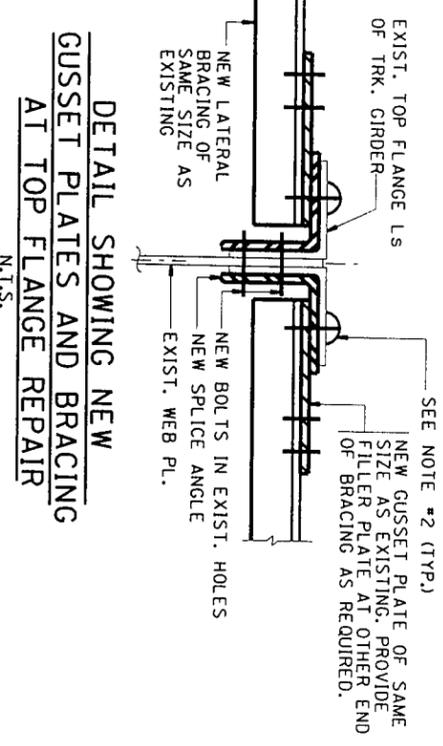
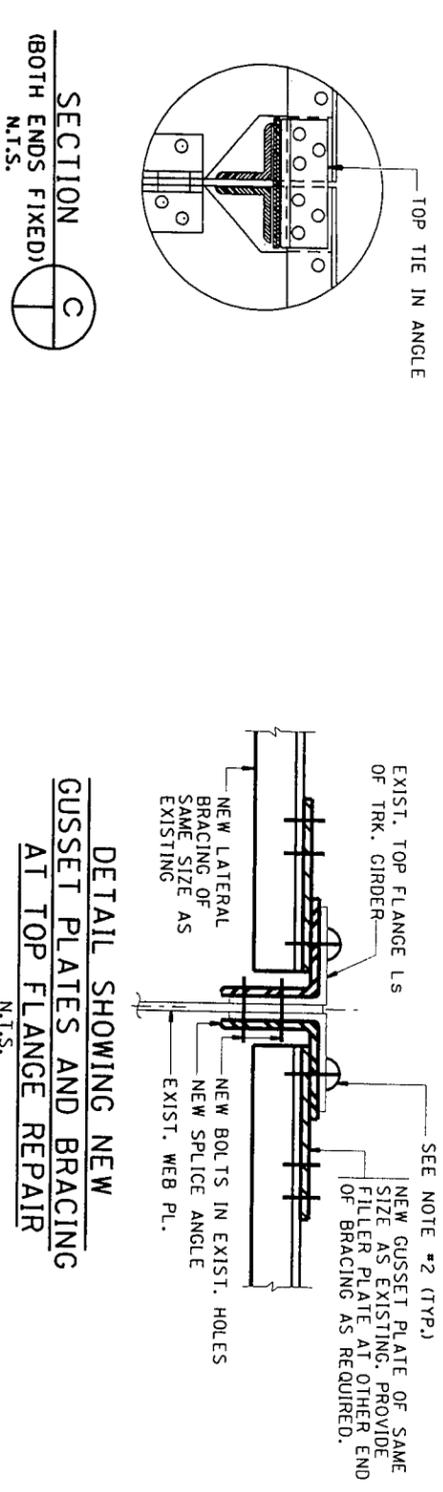
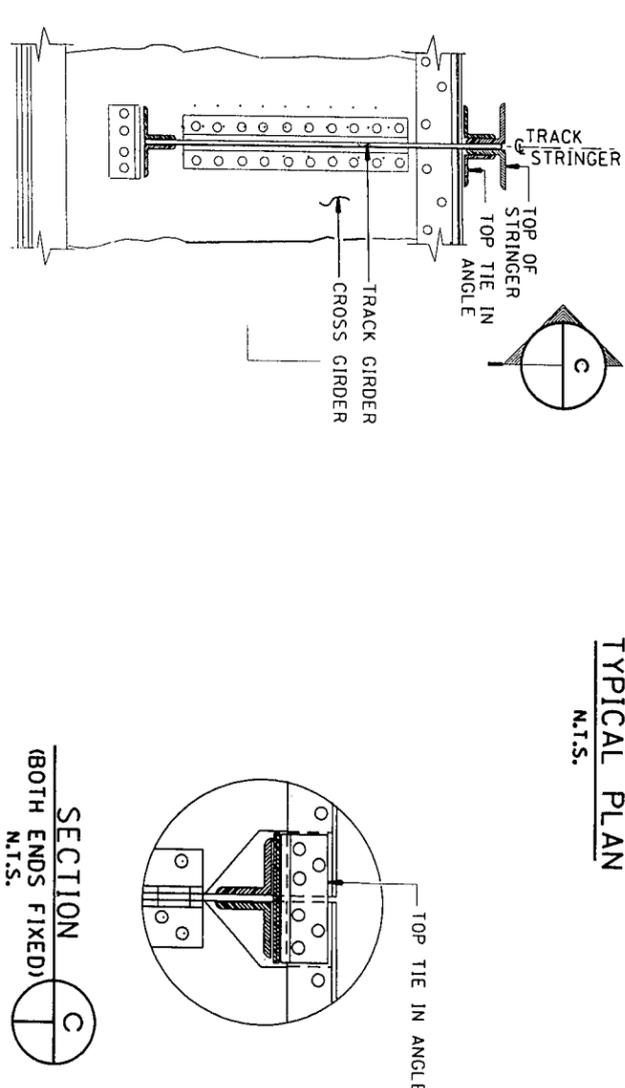
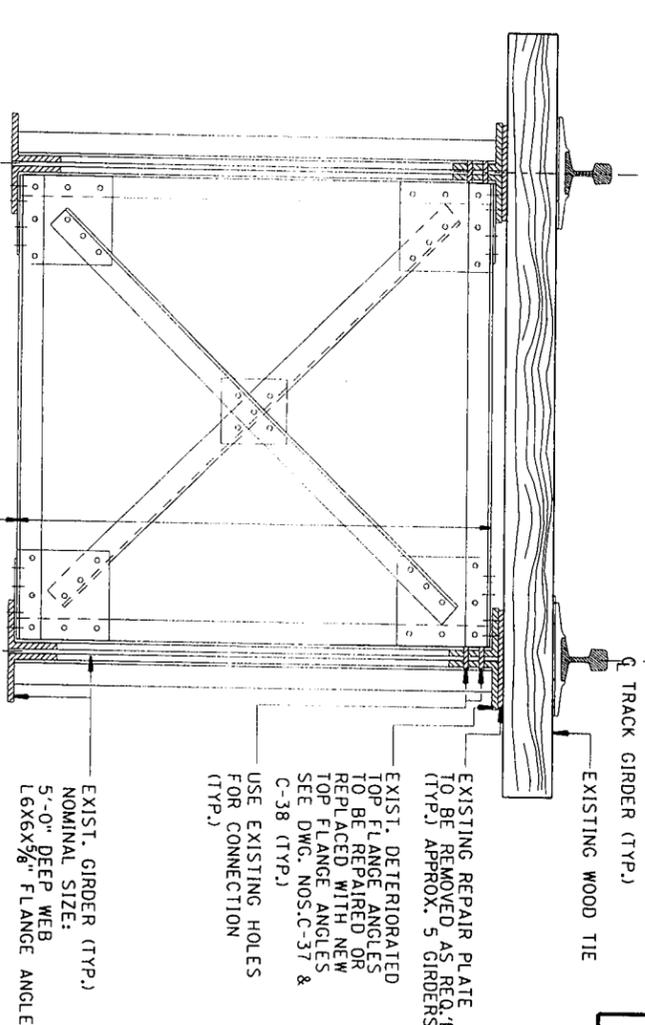
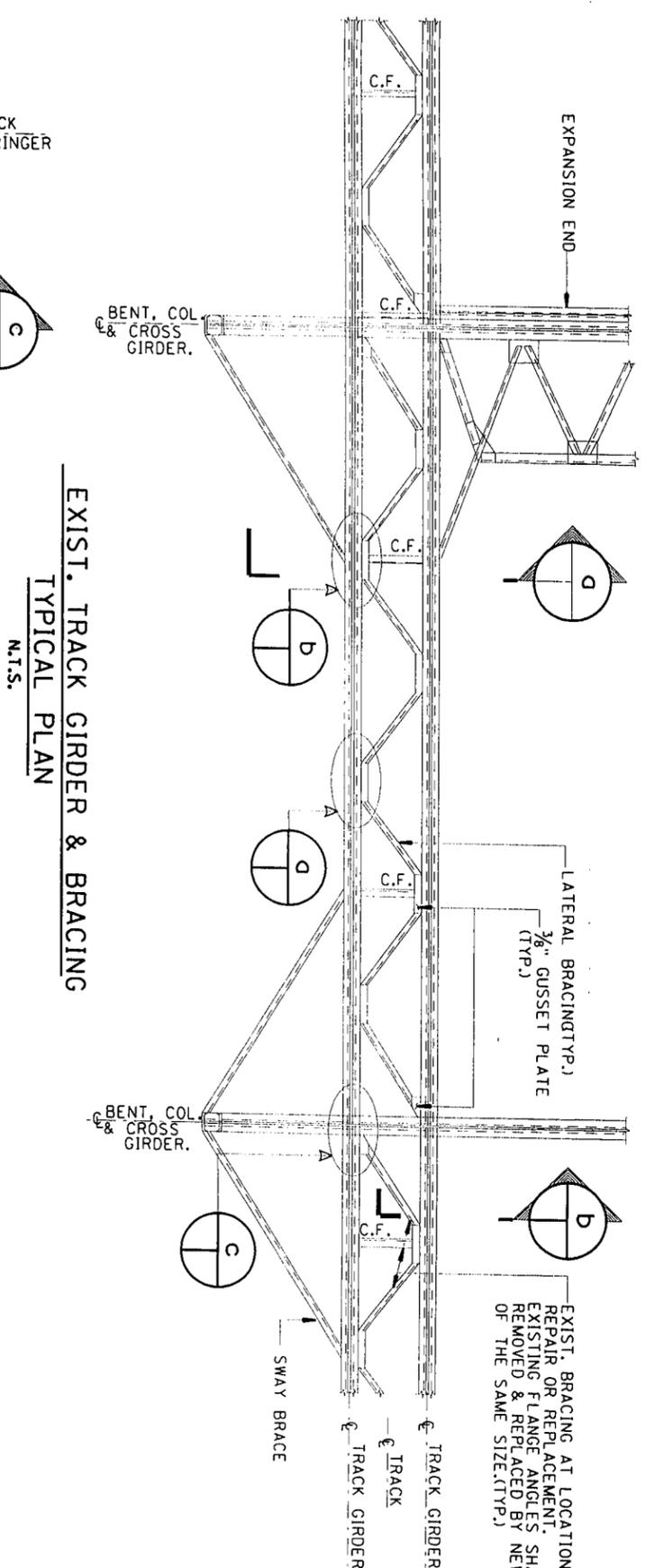
1. AT LOCATION OF EXIST. STIFFENER ANGLE, THE VERTICAL LEG OF NEW SPLICE ANGLE IS TO BE SAW CUT LOCALLY TO CLEAR THE EXIST. STIFFENER ANGLE, AT THE CRIMP. DRILL HOLE TO ALLOW SAID BLOCK ACCESS FOR HORIZONTAL CUT OR USE PLASMA ARC CUTTING.
2. IT IS TO BE GENERALLY ASSUMED THAT A FILL PLATE EXISTS BETWEEN STIFFENER ANGLE (WHICH ARE NOT CRIMPED) AND WEB OF GIRDER. IF IN THE OPINION OF THE ENGINEER THE FILLER PLATE IS DETERIORATED OR CORRODED AS PER REPAIR CRITERIA OR IF THE FILLER PLATE IS MISSING IT SHALL BE REPLACED WITH NEW FILL PLATE. THE CONTRACTOR SHALL FURNISH AND INSTALL NEW FILL PLATE OF THE SAME SIZE AND DIMENSIONS TO FILL THE GAP BETWEEN TOP AND BOTTOM CHORD ANGLES. IF EXIST. FILL PLATE IS NOT CORRODED IT IS TO BE REINSTALLED.
3. IF TOP ROW OF H.S. BOLTS INTERFERES WITH SPLICE ANGLE PROVIDE 5/8" DIA. BOLTS IN 1/4" HOLES, IN TOP ROW ONLY.
4. IN SECTION 3, IF CORRODED LENGTH IS LESS THAN 5'-0", USE TWO SPLICE ANGLES. OTHERWISE USE FOUR ANGLES AS SHOWN. IF BOTH FLANGE ANGLES ARE TO BE PARTIALLY REPLACED THE CUTTING OF THE EXISTING FLANGES IS TO BE STAGGERED BY AT LEAST 16 BOLTS.
5. PRIOR TO REPAIR WORK THE CONTRACTOR SHALL FIELD MEASURE THE EXTENT (LENGTH, WIDTH AND REMAINING THICKNESS OF METAL) OF DEFECT. THE METHOD OF MEASUREMENT IS DESCRIBED IN THE SPECIFICATIONS, SECTION 5A.

REPAIR OF CORRODED OR CRACKED (TFC/TFK)
TOP FLANGE AT END OF TRACK GIRDER (EXP./FIXED ENDS)

(DETAIL AT FIXED/FIXED ENDS ARE SIMILAR EXCEPT AS NOTED)

REVISION	DESCRIPTION	DATE	APPROVED

<p>New York City Transit Authority</p>		<p>TRACK GIRDERS TOP FLANGE REPAIR SECTIONS AND DETAIL</p>
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>CIVIL/STRUCTURAL ENGINEERING</p>		
<p>DRAWN BY</p> <p>DESIGNED BY</p> <p>CHECKED BY</p> <p>APPROVED BY</p>	<p>DATE</p> <p>DRAWING NO. RC-1015</p> <p>REVISION</p>	<p>RC-2512</p>

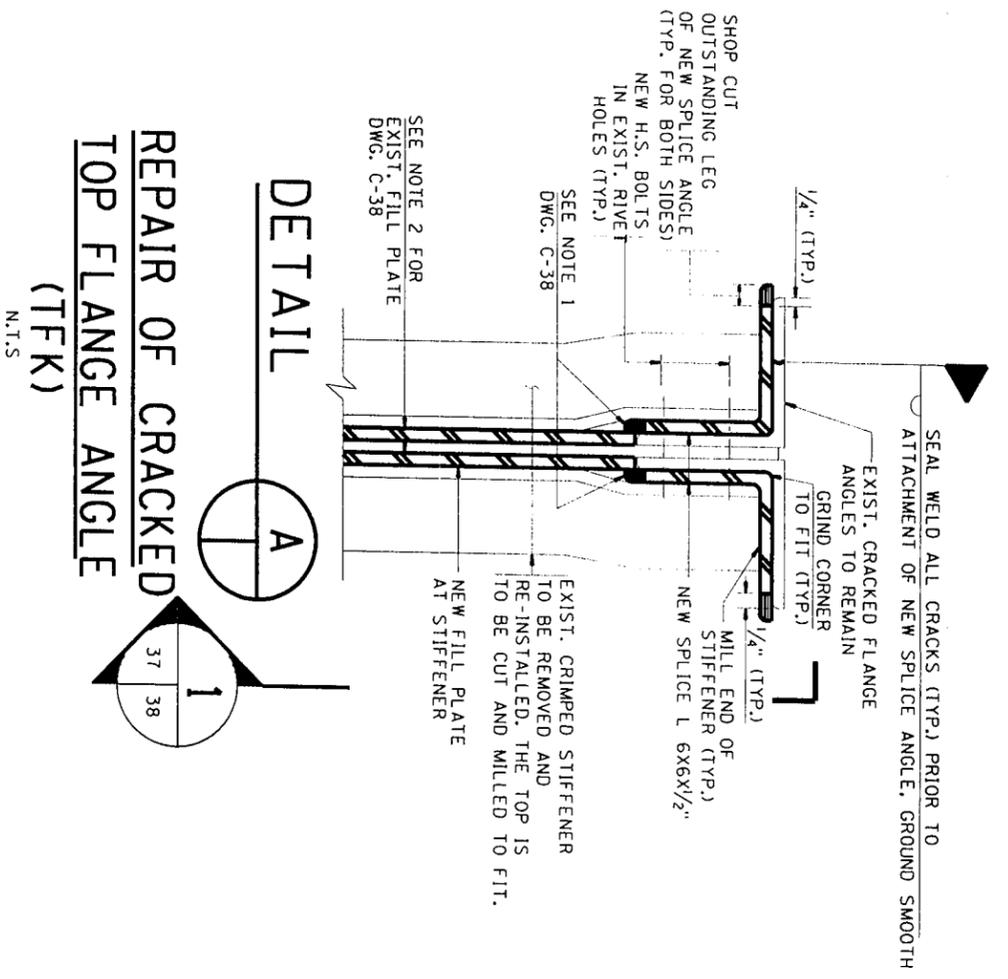


- NOTES**
1. THE PLAN AND DETAILS SHOWN ARE REPRESENTATIVE. THE CONTRACTOR MAY FIND VARIATIONS IN THE FIELD. THE CONTRACTOR IS TO VERIFY THE EXISTING FIELD CONDITIONS AND SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL.
 2. ALL BOLTS CONNECTING TOP FLANGE ANGLES TO GUSSET PLATES SHALL BE ROUND HEAD TENSION CONTROL BOLTS.
 3. USE THIS DRAWING IN CONJUNCTION WITH DWG. C-37.

NOTE: WHERE BRACING ANGLES OR GUSSET PLATES ARE BEING REPLACED, USE ROUND HEAD TENSION CONTROL BOLTS AT TOP FLANGE OF TRACK GIRDER.

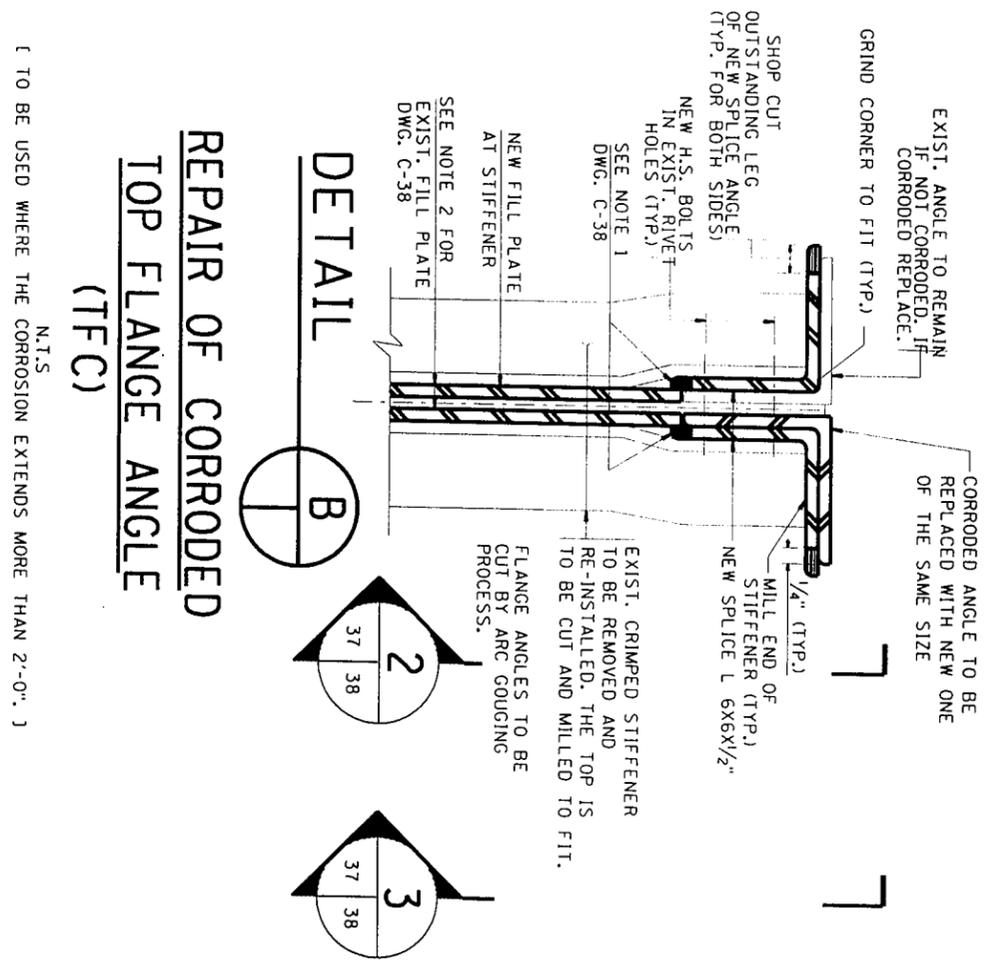
REVISION	DESCRIPTION	DATE	APPROVED

<p>New York City Transit Authority</p>		<p>REFERENCE DRAWING</p> <p>TRACK GIRDERS TOP FLANGE REPAIR/REPLACEMENT TYPICAL DETAILS SHEET-1</p>
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>CIVIL/STRUCTURAL ENGINEERING</p>		
<p>DRAWN BY</p> <p>DESIGNED BY</p> <p>CHECKED BY</p> <p>APPROVED BY</p>	<p>DATE</p> <p>DRAWING NO. RC-1015</p> <p>RC-2513</p> <p>REVISION</p>	



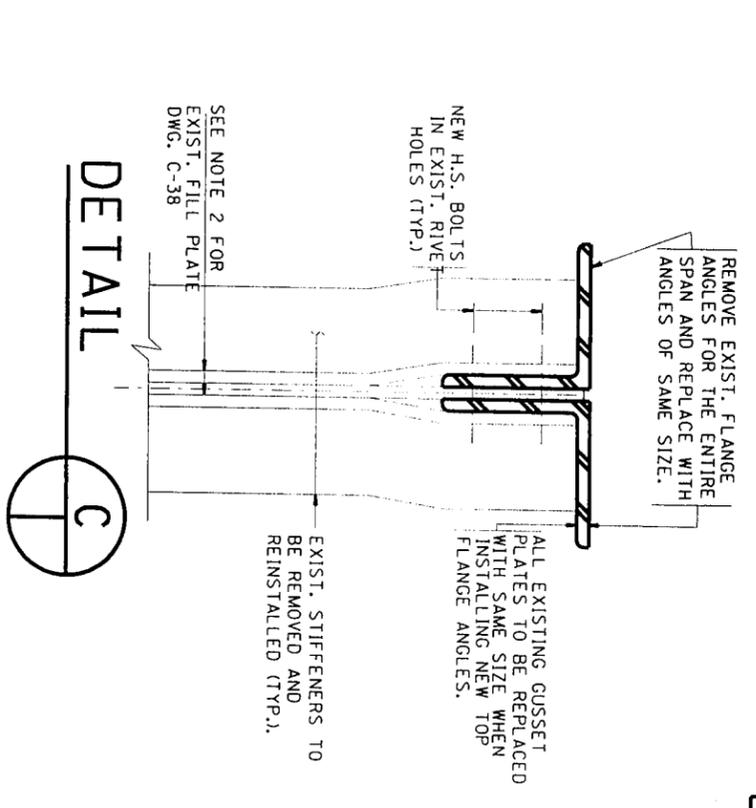
DETAIL A
REPAIR OF CRACKED
TOP FLANGE ANGLE
(TFK)
 N.T.S.

NOTE "A"
 WHILE REPLACING THE EXISTING DETERIORATED TOP FLANGE ANGLES (FULL LENGTH) OR REPAIRING AT THE END OF THE GIRDER (SEE DWG. NO. C-38), THE CONTRACTOR SHALL REPLACE THE PAIR OF TOP TIE IN ANGLES. WHILE REPLACING THE TOP TIE IN ANGLES, IF THE EXISTING STEEL OF THE ADJACENT TRACK GIRDER, WHICH IS EXPOSED DUE TO THE REMOVAL WORK, IS CRACKED/CORRODED, THE SAME SHALL BE REPAIRED AS SHOWN ON THIS DWG. FOR ANTICIPATED QUANTITY OF NEW STEEL REQUIRED FOR THIS REPAIR SEE NOTE 2 ON DWG. C-35.



DETAIL B
REPAIR OF CORRODED
TOP FLANGE ANGLE
(TFC)
 N.T.S.

[TO BE USED WHERE THE CORROSION EXTENDS MORE THAN 2'-0".]



DETAIL C
REPLACEMENT OF CORRODED
TOP FLANGE ANGLE FULL LENGTH
(TFR)
 N.T.S.

REVISION	DESCRIPTION	DATE	APPROVED

REFERENCE DRAWING	
 New York City Transit Authority	TRACK GIRDERS TOP FLANGE REPAIR/REPLACEMENT TYPICAL DETAILS SHEET-2
DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT CIVIL/STRUCTURAL ENGINEERING	DRAWN BY DESIGNED BY CHECKED BY APPROVED BY
DATE : DRAWING NO. RC-1015 RC-2514	REVISION

STRUCTURAL NOTES FOR TOP FLANGE REPAIR/REPLACEMENT (FOR DWGS. C-6 THRU C-30)

1. THE REPAIR CRITERIA STATED ON THE DWGS. IS FOR GENERAL GUIDANCE ONLY. THE ENGINEER MAY REQUIRE REPAIR OR REPLACEMENT OF FLANGE ANGLES, GUSSET PLATES OR OTHER STRUCTURAL ELEMENTS WHICH ARE OUTSIDE THE GIVEN CRITERIA IF IN ENGINEER'S OPINION SUCH REPAIR IS NECESSARY.
2. THE FLANGE ANGLE AND/OR COVER PLATE SHALL BE REPAIRED IF THE AVERAGE METAL LOSS IS MORE THAN 25% OF ORIGINAL MATERIAL OF A CROSS-SECTION OF THE OUTSTANDING LEG. THE ABOVE CRITERIA IS FOR GENERAL GUIDANCE ONLY AND WILL BE MODIFIED AS DETERMINED BY THE ENGINEER. THE ENGINEER MAY REQUIRE THE REPAIR/REPLACEMENT OF THE TOP FLANGE ANGLE AND/OR COVER PLATE, FILL PLATES AT LOCATIONS WHERE THE EXISTING CONDITIONS ARE OUTSIDE THE CRITERIA, IF IN THE ENGINEER'S OPINION SUCH REPAIR IS NECESSARY.
3. ALL VERTICAL BOLTS CONNECTING GUSSET PLATES TO OUTSTANDING LEG OF TOP FLANGE ANGLES AND/OR COVER PLATE. ANY OTHER BOLTS UPON WHICH THE TIES MAY REST SHALL BE ROUNDHEAD TENSION CONTROL BOLTS (A-325N) AS MANUFACTURED BY T.C. BOLTS CORPORATION OR EQUAL WITH MATCHING WASHERS AND NUTS. INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
4. EXISTING CORRODED FLANGE ANGLES AND/OR COVER PLATE SHALL BE REPLACED BY SAME SIZE. IF SAME SIZE ANGLES ARE NOT AVAILABLE, THE NEXT LARGER SIZE (THICKNESS) SHALL BE USED. CONTRACTOR TO INDICATE ON SHOP DWGS., THE NEW ANGLE SIZE HE INTENDS TO USE.
5. ALL CONNECTIONS ARE WITH $\frac{3}{8}$ " DIA. A-325 BOLTS, UNLESS OTHERWISE NOTED. ALL BOLT HOLES SHALL BE DRILLED AND REAMED AS NECESSARY. BURNING OF HOLES SHALL NOT BE ALLOWED.
6. THE WORK INDICATED IS TO BE COMPLETED WITHOUT THE LIVE LOAD ON THE TRACK.
7. ANY EXISTING BOLTS OR RIVETS, IF REMOVED, SHALL NOT BE REUSED.
8. ALL EXISTING CORRODED STEEL SURFACES THAT ARE REPAIRED WITH NEW STEEL SHALL BE SCRAPPED AND CLEANED OF ALL RUST AND LOOSE PAINT AND PAINTED AS PER SPECIFICATIONS SECTION 9V UPTO 6" ALL AROUND IN THE VICINITY OF REPAIR. SEE NOTE 15 BELOW FOR ADDITIONAL REQUIREMENTS. ALL EXISTING PAINT CONTAINS LEAD AND SHALL BE DISPOSED AS PER SPECIFICATION 12L.
9. IT WILL BE NECESSARY TO LATERALLY BRACE THE STRINGER DURING TOP FLANGE AND/OR COVER PLATE REPLACEMENT OR REPAIR. IF SUCH LATERAL SUPPORT IS NECESSARY CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR ENGINEER'S APPROVAL.
10. EXISTING FLANGE ANGLES AND/OR COVER PLATES WHICH ARE TO BE REMOVED SHALL BE CUT BY ARC GOUGING PROCESS. FLAME CUTS WILL NOT BE PERMITTED.
11. PRIOR TO REPAIR/REPLACEMENT OF TOP FLANGE THE CONTRACTOR SHALL SUBMIT THE SHOP DRAWINGS, SHOWING THE FABRICATION DETAILS FOR EACH REPAIR FOR THE ENGINEER'S APPROVAL.
12. EXISTING RIVET HOLES SHALL BE UTILIZED WHEN INSTALLING NEW HIGH STRENGTH BOLTS. IF A EXISTING HOLE LOCATION IS NOT SUITABLE, PLUG WELD THE HOLE, AND DRILL A NEW HOLE TO MAKE THE CONNECTION.
13. ANY PORTION OF THE EXISTING CORRODED STRUCTURAL STEEL WHICH IS AFFECTED BY THE NEW CONSTRUCTION SHALL BE REPAIRED OR REPLACED IN KIND AND PAINTED AS PER I.A. SPECIFICATIONS.
14. PRIOR TO MAKING CONNECTION TO EXISTING STEEL, THE CONNECTING AREA SHALL BE THOROUGHLY CLEANED OF RUST, LOOSE PAINT, GREASE, OIL, DIRT, AND WELD DEPOSITS IF ANY BY MECHANICAL WIRE BRUSH OPERATED BY POWER TOOLS.
15. PAINT NEW STEEL AND EXISTING STEEL WITHIN SIX INCHES OF THE REHABILITATED AREA AS INDICATED IN THE CONTRACT SPECIFICATIONS. FINISH COAT TO MATCH EXISTING COLOR IN THE VICINITY.
16. ALL DIMENSIONS AND CONDITIONS OF EXISTING STRUCTURE CONTROLLING NEW CONSTRUCTION ARE TO BE VERIFIED BY THE CONTRACTOR IN THE FIELD BEFORE THE START OF WORK. THE CONTRACTOR SHALL FABRICATE ALL MATERIALS IN ACCORDANCE WITH HIS OWN MEASUREMENTS AND SHALL BE RESPONSIBLE FOR PROPER FIT OF ALL WORK. THE ENGINEER'S APPROVAL OF SHOP DWGS. IS FOR STRENGTH PURPOSE ONLY AND SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY.

STEEL REPAIR OPERATIONS FOR TOP FLANGE REPAIRS:

A. TOP FLANGE REPAIR

1. REMOVE AND REPLACE TIE CLIPS, REPLACEMENTS SHALL MEET THE LATEST TRACK DEPARTMENT STANDARDS. WHEN REINSTALLING OLD OR NEW BRIDGE TIE CLIPS, INSPECT LOCATION OF EXISTING TRACK SPIKES SO THAT INSTALLATION OF LAG WILL NOT SHORT OUT THE SIGNAL RAIL. MARK BRIDGE CLIP INSTALLATIONS WITH AN IDENTIFICATION MARK. LOG START AND COMPLETION TIMES WITHIN TRACK SPANS SO THAT IF A SHORT SHOULD OCCUR AND CAUSE A SIGNAL DELAY THE LOCATION OF THE CAUSE COULD BE PINPOINTED BY THE CROSS REFERENCE OF THE TIME OF THE DELAY AND THE WORK LOG, WHERE "J" BOLTS CANNOT BE REPLACED, USE BRIDGE CLIPS WITH LAG BOLT RETAINERS. PAINT ALL NEW LAGS.
2. MAKE ALL CUTS AND REPLACE RIVETS BEFORE THE START OF G. O.
3. REPLACE TOP FLANGE ANGLE WITHOUT JACKING TO THE MAXIMUM EXTENT POSSIBLE.

B. JACKING OF TRACK

1. OBTAIN TRACK GEOMETRY READING BEFORE COMMENCING WITH JACKING OPERATIONS.
2. JACK ONE RAIL AT A TIME, 2 INCHES MAXIMUM, EACH INCREMENT.
3. INSTALL TEMPORARY GUIDE ANGLES TIGHT TO TOP FLANGES JUST OUTSIDE THE INSTALLATION AREA UNDER THE WOOD TIES AT BOTH ENDS PRIOR TO THE TRACK JACKING TO MAINTAIN TRACK ALIGNMENT.
4. AT TRACK CURVES THAT OCCUR WITHIN STATION LIMITS ON LOCAL TRACKS, INSTALL MARKING BOARDS (2"x6") ON SIDES OF WOOD TIES TO MAINTAIN AND MARK TRACK LOCATION PRIOR TO, DURING AND AFTER TRACK JACKING FOR STEEL INSTALLATION.
5. CALL FOR TEST TRAIN BEFORE PUTTING TRACK BACK INTO REVENUE SERVICE.
6. BEFORE JACKING, CHECK FOR CONDUITS, AIRLINES, GREASES LINES, ETC., ATTACHED TO TRACK. DISCONNECT THESE FROM THE TRACK AND RECONNECT AFTER COMPLETION.
7. WHEN JACKING TRACK THAT IS IN BALLAST, LOOSEN THE RAILS FROM THE TIES AND DISCONNECT AT NEAREST JOINT, IF POSSIBLE. REMOVE SPIKES AND PANDROL CLIPS. THIS OCCURS AT ABUTMENTS.
8. ALL TRACK AFFECTED BY THE WORK SHALL BE RETURNED TO SERVICE IN A CONDITION WHICH EQUALS OR EXCEEDS THAT WHICH HAD EXISTED PRIOR TO THE WORK ACCORDING TO THE TRACK GEOMETRY CAR READINGS, AND/OR AS DIRECTED BY THE ENGINEER.

C. RIVET REMOVAL

1. IF RIVETS ARE SCORE KEVED AND CANNOT BE PUNCHED OUT, USE A PLASMA LANCE OR EQUIPMENT TO BURN OUT CENTER OF RIVET. FLAME BURNING WILL NOT BE ALLOWED.

D. MEASUREMENT FOR NEW CONNECTOR LOCATIONS

1. MEASURE FOR BOLT PITCH AND GAGE. AFTER THE RIVETS HAVE BEEN REMOVED AND THE BOLTS HAVE BEEN INSTALLED.

E. CONTACT RAIL SAFETY

1. WHEN WORKING UNDER A LIVE CONTACT RAIL (C.R.) NAIL A CONTINUOUS 18" WIDE STRIP OF $\frac{3}{4}$ " PLYWOOD TO THE BOTTOM OF THE TIES TO 6 FEET BEYOND THE REPAIR AREA IN EACH DIRECTION PRIOR TO BEGINNING PREPARATORY RIVET REMOVAL AND BOLT REPLACEMENT. IN WINTER WEATHER, REMOVE THESE BOARDS AFTER EACH WORK DAY TO AVOID ANY SNOW ACCUMULATION UNDER THE THIRD RAIL.
2. WHEN WORKING NEAR A LIVE C. R. UNDER G. O., HAVE RUBBER PROTECTION MAT WRAPPING TO 6 FEET BEYOND THE REPAIR AREA.
3. WHEN WORKING NEAR C. R. WITH POWER OFF, HAVE LIGHT BARK AND AUDIBLE ALARM CONNECTED.

PROCEDURE FOR TOP FLANGE REPAIR/REPLACEMENT

THE FOLLOWING IS A PROCEDURE FOR REPAIR/REPLACEMENT OF TOP FLANGE OF TRACK GIRDERS. THE CONTRACTOR IS REQUIRED TO SUBMIT THE DETAILS OF THIS CONSTRUCTION PROCEDURE FOR THE ENGINEER'S APPROVAL.

1. INSTALL SHIELDS AND BARRICADES APPROVED BY THE TRANSIT AUTHORITY TO PROTECT STREET TRAFFIC AND GENERAL PUBLIC BELOW THE CONSTRUCTION AREA.
2. REMOVE RIVETS IN THE VERTICAL LEGS OF TOP FLANGE ANGLE. TOP TIE-IN ANGLES AND REPLACE WITH H.S. BOLTS ON A ONE FOR ONE BASIS. DO THE SAME WITH STIFFENERS, GUSSET PLATES, CROSS FRAMES AND OTHER MEMBERS WHICH MAY BE TEMPORARILY REMOVED OR DISCONNECTED.
- THE FOLLOWING WORK SHALL BE DONE UNDER A GENERAL ORDER FOR THE AFFECTED TRACK:
 3. DISCONNECT AND REMOVE TOP TIE-IN ANGLES, GUSSET PLATES, LATERAL BRACING, TOP STRUCTURAL ANGLES OF CROSS FRAME, CROSS BRACING, STRUT, SWAY BRACING, C.J. BONDS AND LOOSEN STIFFENERS WHICH CONNECT TO TOP FLANGE ANGLES OF TRACK GIRDER.
 4. REMOVE LAG SCREWS PROTECTION SHIELDS AT BRIDGE TIE CLIPS.
 5. JACK UP TRACK IF NECESSARY. CONTRACTOR SHALL SUBMIT JACKING PROCEDURE AND SHOP DRAWINGS WITH CALCULATIONS FOR APPROVAL.
 6. PROVIDE TEMPORARY LATERAL SUPPORT FOR TOP OF STRINGER.
 7. REMOVE DETERIORATED TOP FLANGE ANGLES AND REPLACE "IN KIND" WITH NEW ANGLES WITH HIGH STRENGTH BOLTS, REUSING EXISTING HOLES. THE TOPS OF OUTSTANDING LEGS OF ANGLES SHALL BE PAINTED ACCORDING TO SPECIFICATIONS PRIOR TO THEIR INSTALLATION. CLEAN WEB OF EXIST. GIRDER TO BRIGHT METAL PRIOR TO INSTALLATION OF NEW FLANGE ANGLES.
 8. INSTALL NEW TOP TIE-IN ANGLES, NEW GUSSET PLATES, NEW CROSS BRACING AND NEW LATERAL BRACING AND RECONNECT ALL EXISTING TOP STRUT OF CROSS FRAME, CROSS BRACING, STRUT, SWAY BRACING AND EXIST. COVER PLATE WHICH CONNECT TO NEW TOP FLANGE ANGLES OF TRACK GIRDERS.
 9. RECONNECT EXISTING STIFFENERS.
 10. RECONNECT OR INSTALL NEW BRIDGE TIE CLIPS TO FLANGE ANGLES. THE NUMBER OF NEW BRIDGE TIE CLIPS AND RETAINERS SHALL BE AS PER TRACK STANDARDS. ANY UNUSED HOLES IN THE TIES SHALL BE FILLED WITH CREOSOTED WOOD PLUGS.
 11. RECONNECT NEW C.J. BONDS.
 12. PAINT NEW STEEL AND EXISTING REPAIRED STEEL AS PER CONTRACT SPECIFICATION
 13. INSTALL LAG SCREWS PROTECTION SHIELDS AT BRIDGE TIE CLIPS.
 14. REMOVE ALL TEMPORARY SUPPORTS.
 15. REMOVE STREET TRAFFIC PROTECTION SHIELDS AND BARRICADES.

REVISION	DESCRIPTION	DATE	APPROVED



**New York City
Transit Authority**

DEPARTMENT OF
CAPITAL PROGRAM
MANAGEMENT

CIVIL/STRUCTURAL ENGINEERING

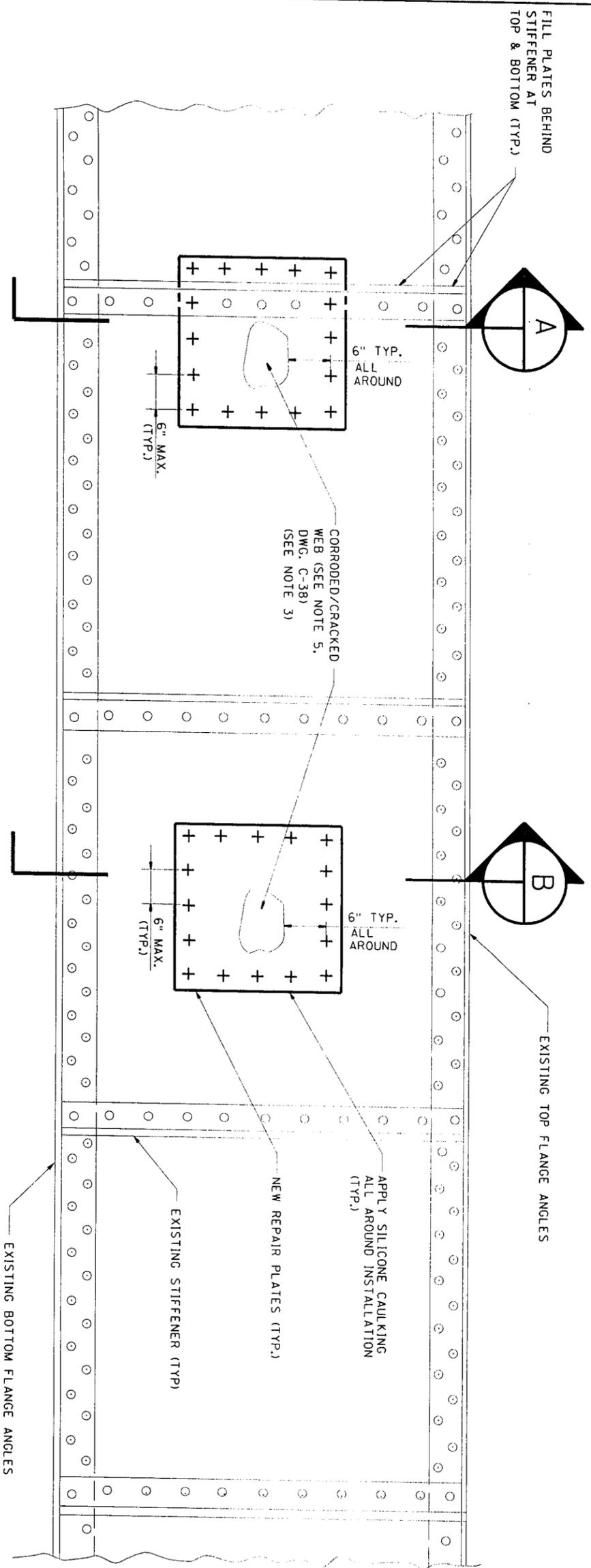
REFERENCE DRAWING

**TRACK GIRDERS TOP FLANGE
REPAIR/REPLACEMENT
NOTES AND PROCEDURE**

DRAWN BY	DATE	DRAWING NO. RC-1015
DESIGNED BY		
CHECKED BY		
APPROVED BY		

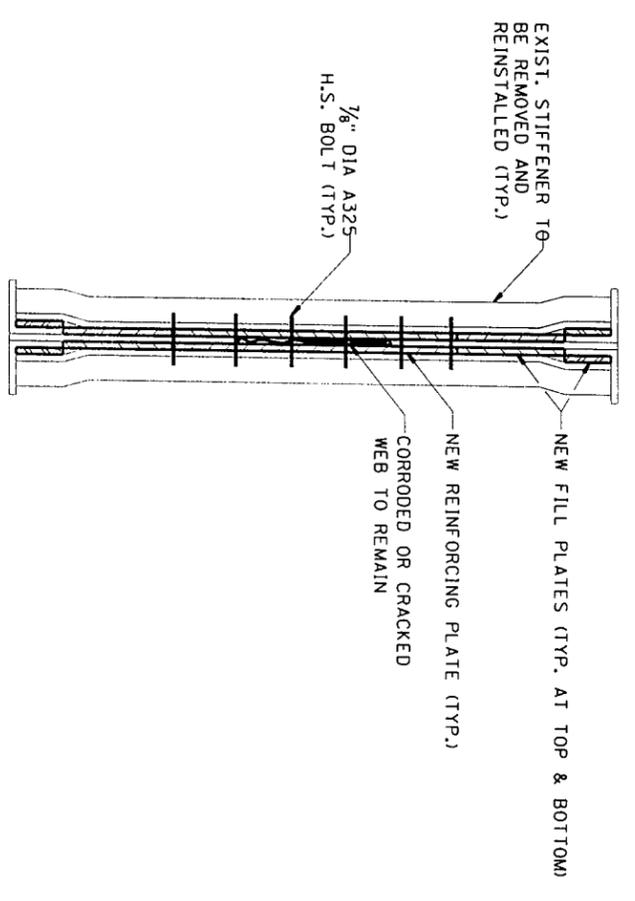
RC-2515

REVISION



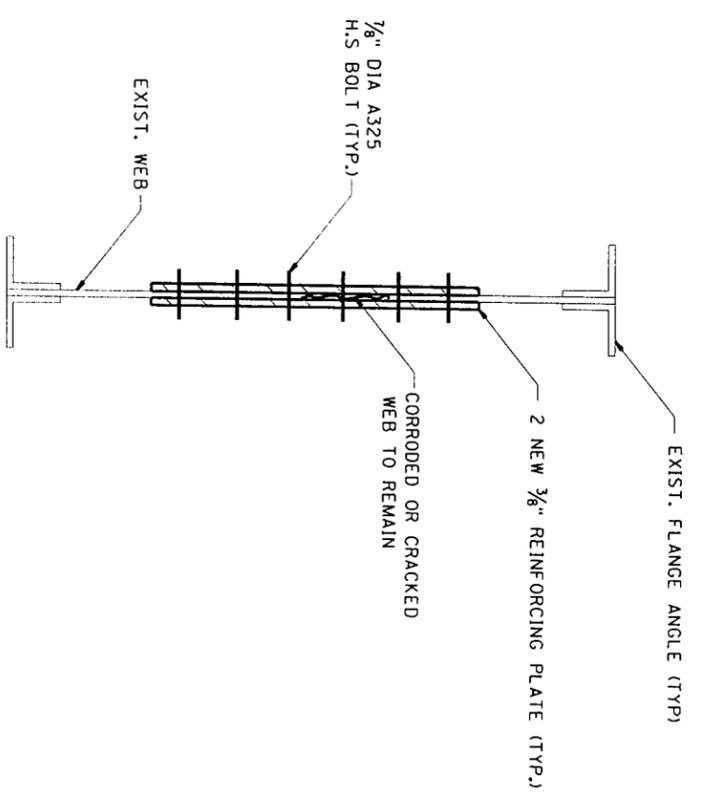
TYPICAL WEB REPAIR DETAIL (WEB)

N.T.S.



SECTION A

N.T.S.



SECTION B

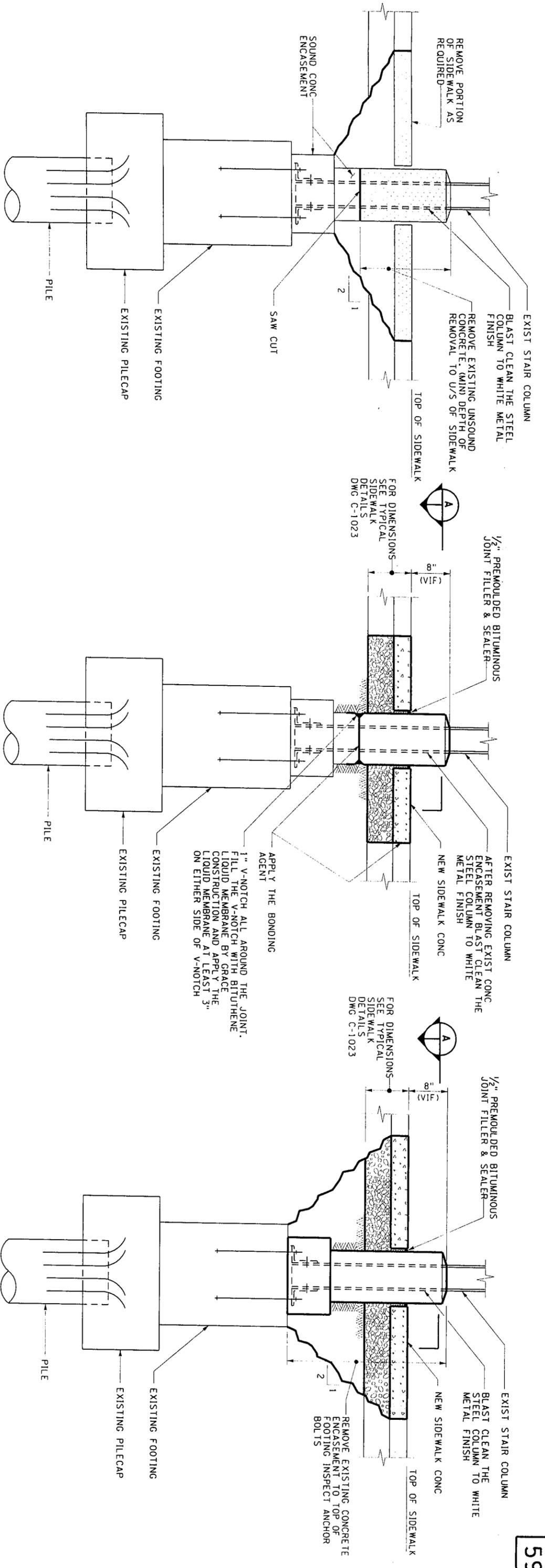
N.T.S.

NOTES:

1. IF REQUIRED, REMOVE EXISTING STIFFENERS AND REINSTALL AFTER WEB REPAIR WORK IS COMPLETED. PROVIDE FILL PLATES AS NECESSARY.
2. FOR THE CRACKED WEB, WELD THE CRACK AND GRIND SMOOTH BEFORE INSTALLATION OF NEW REINFORCING PLATES.
3. PROVIDE STITCH BOLTS AT 9" O.C., E.W. WITHIN CORRODED AREA.

REVISION	DESCRIPTION	DATE	APPROVED

<p>New York City Transit Authority</p>		<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p>	<p>TRACK, PLATFORM AND CROSS GIRDERS WEB REPAIR DETAILS</p>
<p>DRAWN BY</p>	<p>DESIGNED BY</p>	<p>CHECKED BY</p>	<p>APPROVED BY</p>
<p>DATE :</p>	<p>DRAWING NO. RC-1015</p>	<p>RC-2516</p>	<p>REVISION</p>



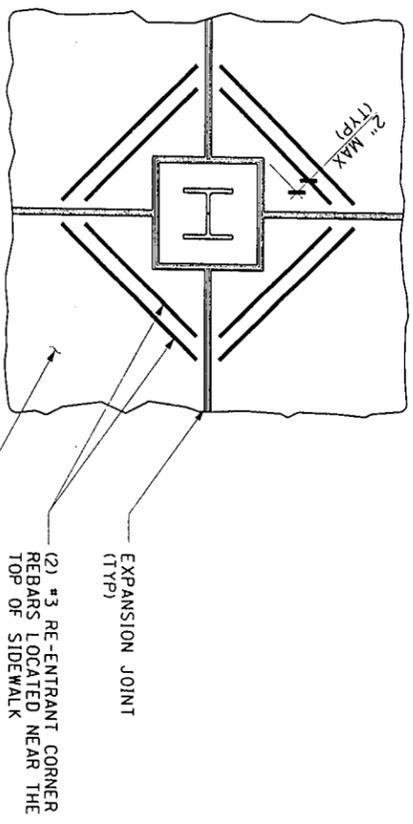
CONCRETE REMOVAL

CONCRETE REPLACEMENT

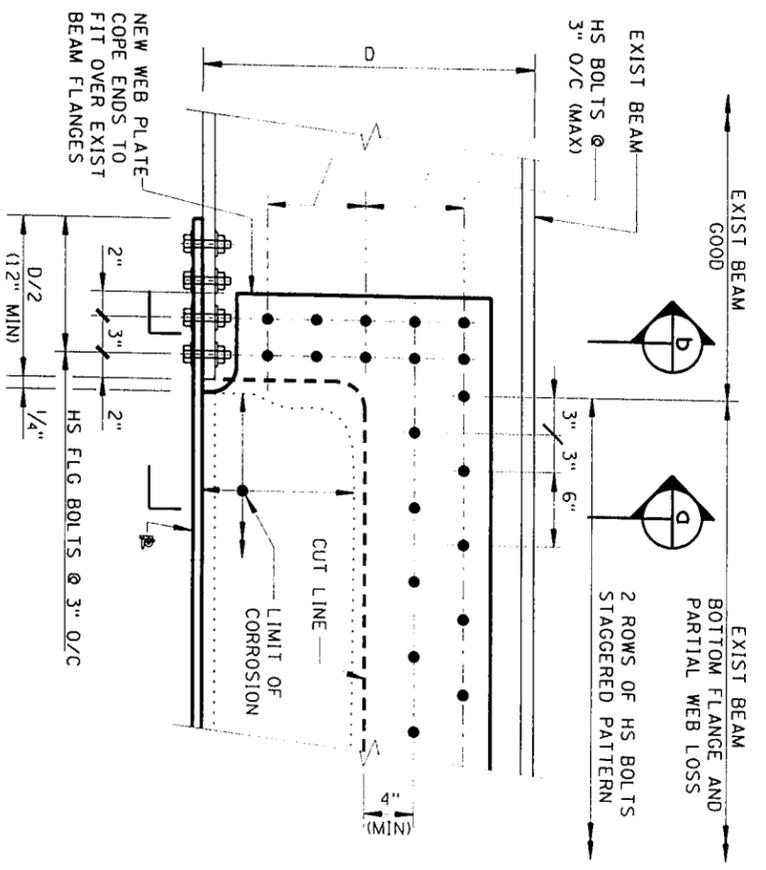
(COMPLETE REMOVAL & REPLACEMENT OF CONC ENCASEMENT)

STAIR COLUMN BASE PARTIAL CONCRETE ENCASEMENT REPAIR DETAIL
(NOT TO SCALE)

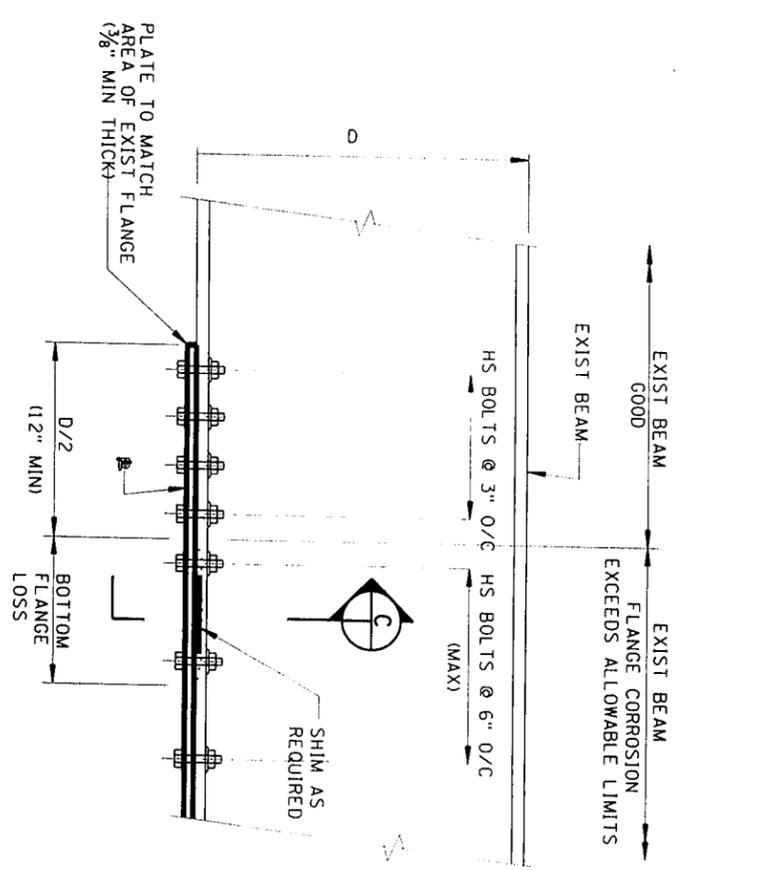
STAIR COLUMN BASE FULL CONCRETE ENCASEMENT REPAIR DETAIL
(NOT TO SCALE)



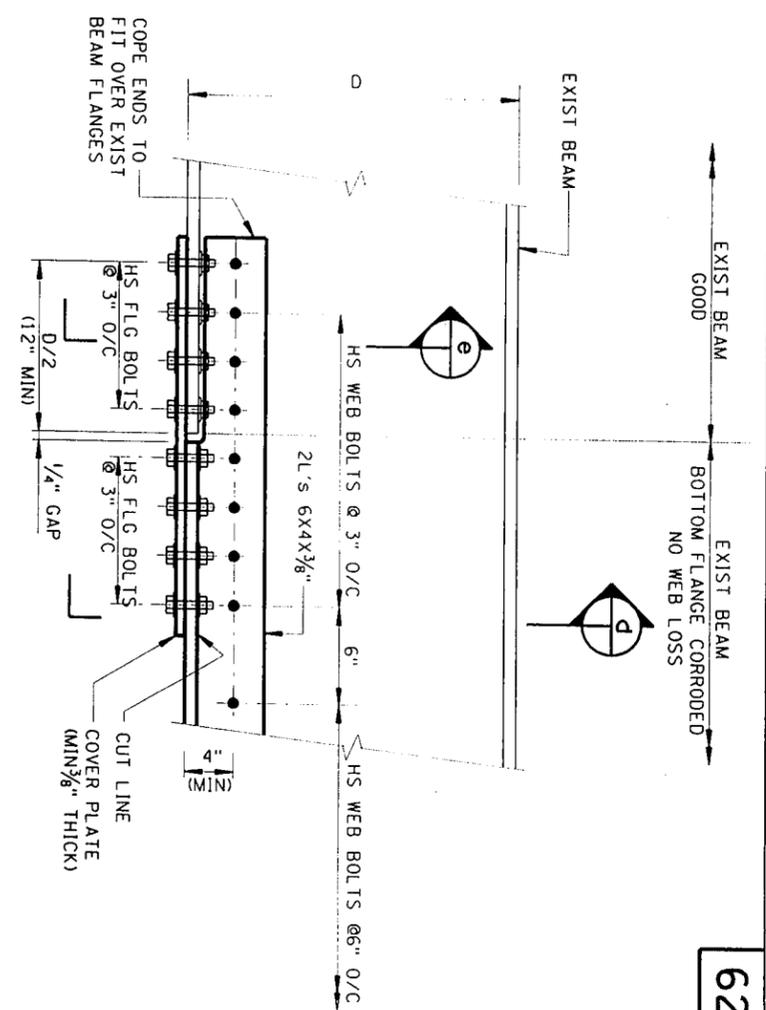
REVISION	0	CONFORMED DRAWING	12/12/08	DATE	APPROVED
COMMON DETAILS					
CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022					
REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS					
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT STRUCTURAL ENGINEERING</p>			<p>DESIGNED BY: G. ESTROPIA CHECKED BY: P. ZHU APPROVED BY: H. LAKHANI</p>		
<p>STAIR COLUMN CONCRETE ENCASEMENT REPAIR DETAILS</p>			<p>DATE: APRIL 25, 2008 DRAWING NO. RC-2517</p>		
<p>SIGNED: G. ESTROPIA</p>			<p>SIGNED</p>		
<p>SIGNED: P. ZHU</p>			<p>SIGNED</p>		
<p>SIGNED: H. LAKHANI</p>			<p>SIGNED</p>		
<p>REVISION</p>			<p>REVISION</p>		



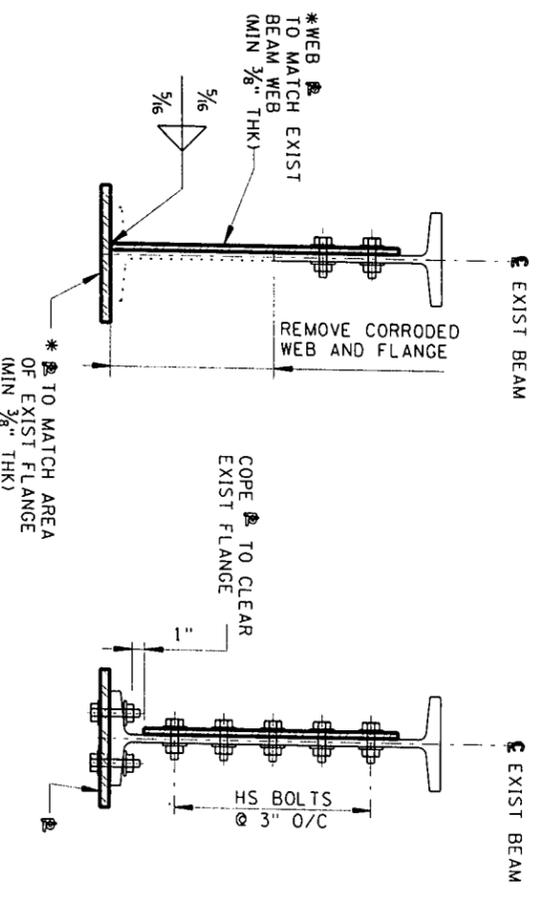
LOSS OF BEAM FLANGE AND PORTION OF WEB (ROLLED SECTION)
DETAIL S1
 NTS



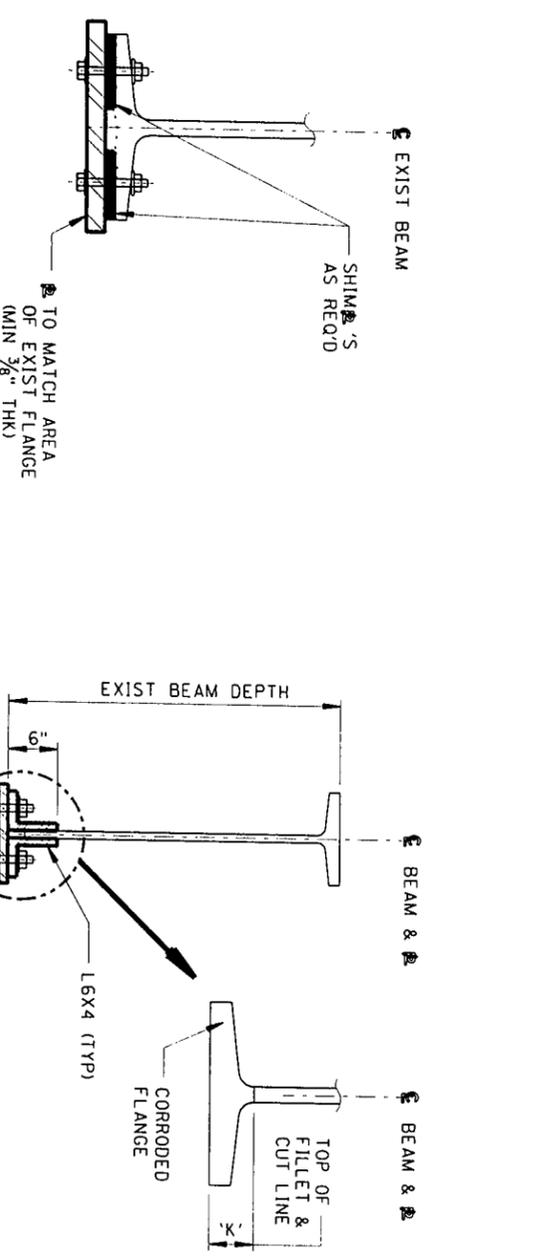
LOSS OF FLANGE THICKNESS (ROLLED SECTION)
 (DETAIL SIMILAR FOR CHANNELS)
DETAIL S2
 NTS



FLANGE REPLACEMENT WEB INTACT (ROLLED SECTION)
DETAIL S3
 NTS



NOTES:
 * CAN REPLACE WITH TEE SECTION CUT FROM W SECTION
 * TO MATCH AREA OF EXIST FLANGE (MIN 3/8" THK)
 * TO MATCH EXIST BEAM WEB (MIN 3/8" THK)



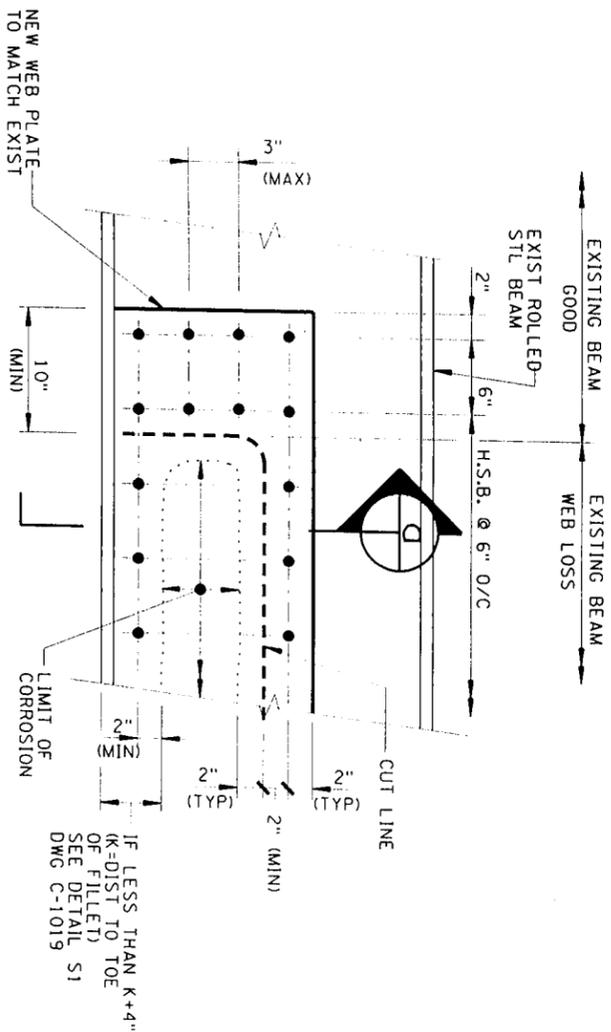
NOTES:
 * CAN REPLACE WITH TEE SECTION CUT FROM W SECTION
 * TO MATCH AREA OF EXIST FLANGE (MIN 3/8" THK)
 * TO MATCH EXIST BEAM WEB (MIN 3/8" THK)



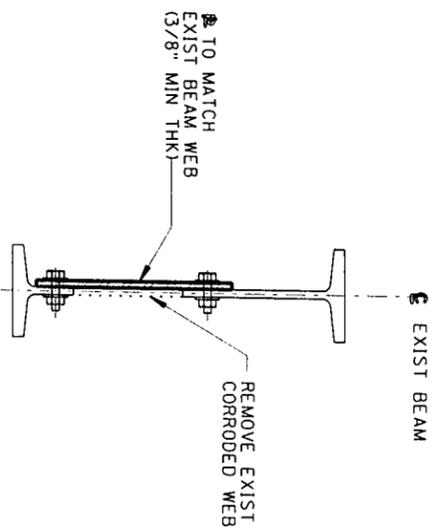
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT STRUCTURAL ENGINEERING</p>		<p>TYPICAL BEAM REPAIR DETAILS SHEET 1 OF 3</p>	
<p>CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p>	<p>DATE: APRIL 25, 2008</p>	<p>DESIGNED BY: G. ESTROPIA</p>	<p>SIGNED</p>
<p>CHECKED BY: P. ZHU</p>	<p>SIGNED</p>	<p>DATE: 12/12/08</p>	<p>APPROVED</p>
<p>APPROVED BY: H. LAKHANI</p>	<p>P.E.</p>	<p>REVISION</p>	<p>0</p>
<p>DRAWN BY: G. ESTROPIA</p>	<p>SIGNED</p>	<p>COMMON DETAILS</p>	<p>RC-2518</p>

NOTES

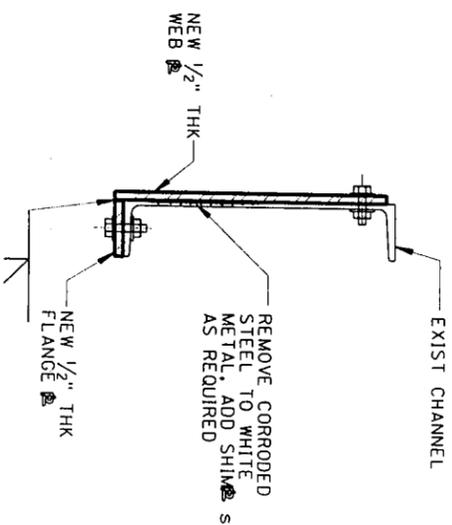
1. FOR NOTES SEE DWG C-1017 & C1018.
2. FOR DETAIL S5, CORROSION LIMITS OF EXISTING STRINGER VARY AND ARE NOT SHOWN FOR CLARITY.



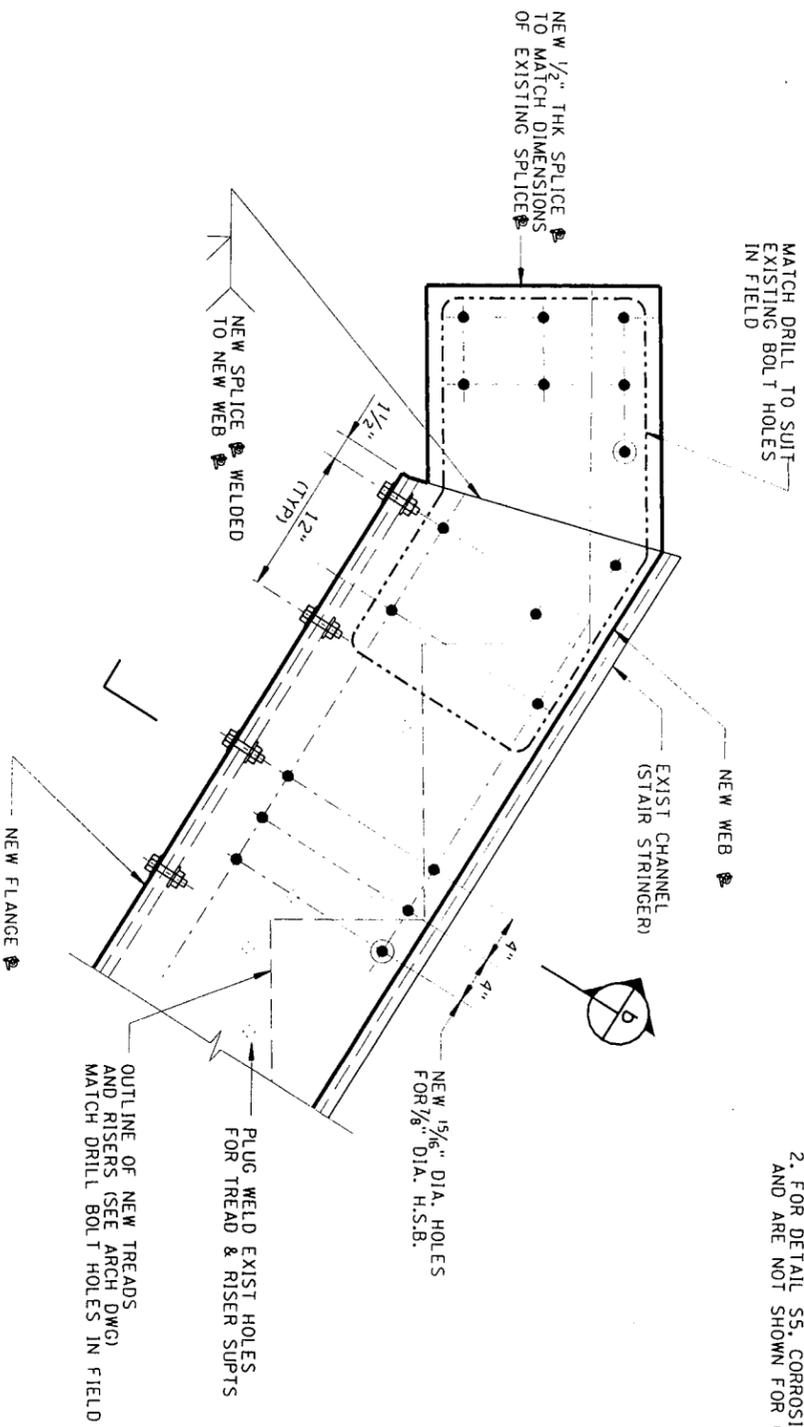
LOSS OF MIDDLE OF WEB, FLANGE INTACT (ROLLED SECTION)
 (DETAIL SIMILAR FOR CHANNELS)
DETAIL S4
 NTS



SECTION a
 NTS



SECTION b
 NTS



PARTIAL LOSS OF CHANNEL FLANGE & PORTION OF WEB
 (DETAIL TO ADDRESS THE REPAIR OF STAIR STRINGER)
DETAIL S5
 NTS

REVISION	DESCRIPTION	DATE	APPROVED
0	CONFORMED DRAWING	12/12/08	



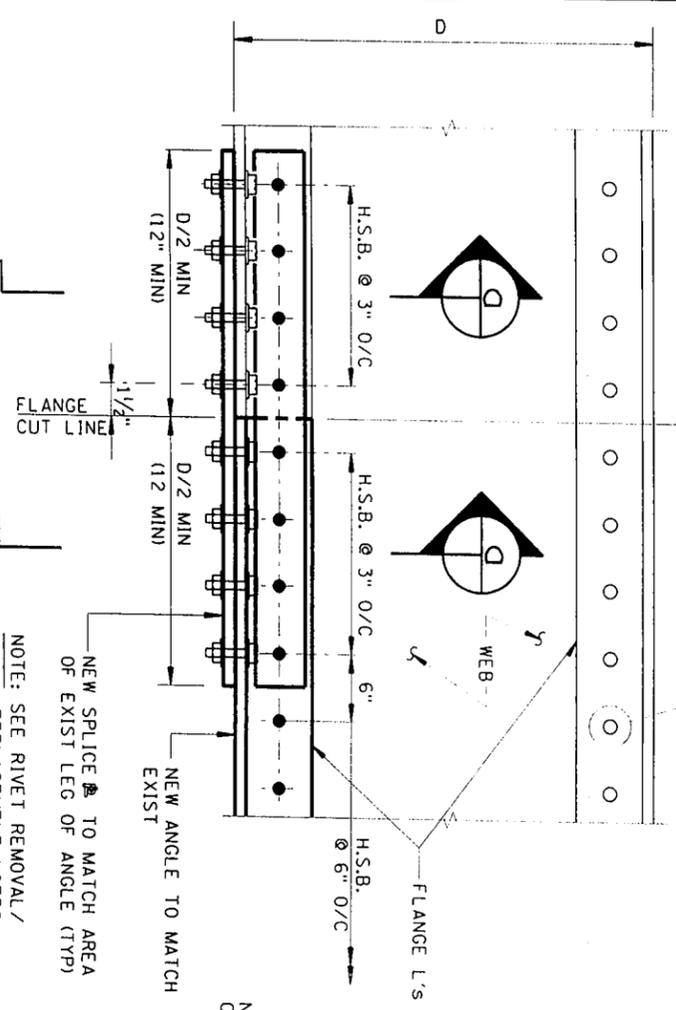
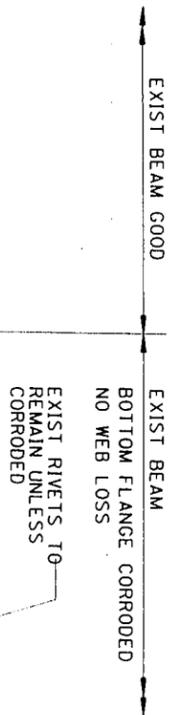
New York City
 Transit Authority

COMMON DETAILS
 CONTRACTS A-36018.A-36019.A-36020.A-36021.A-36022
 REHABILITATION OF 5 STATIONS ON
 THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS

DEPARTMENT OF
 CAPITAL PROGRAM
 MANAGEMENT
STRUCTURAL ENGINEERING

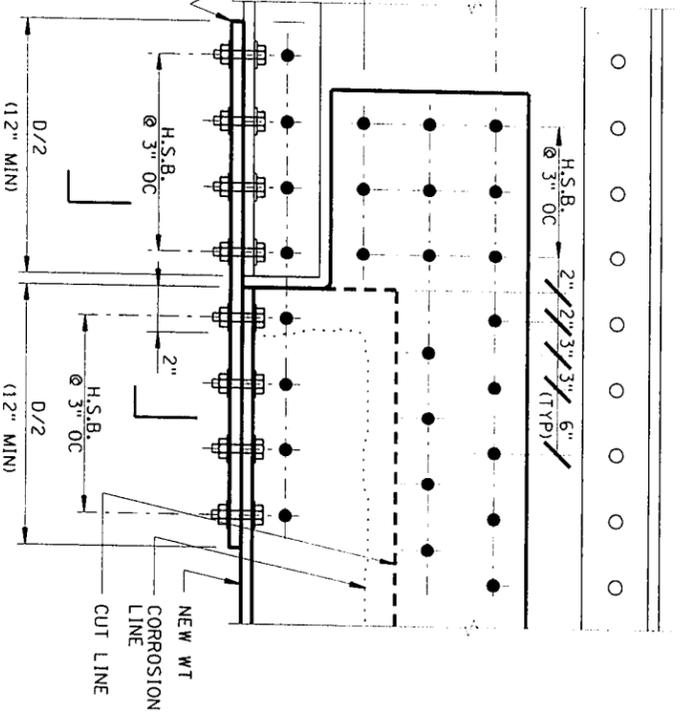
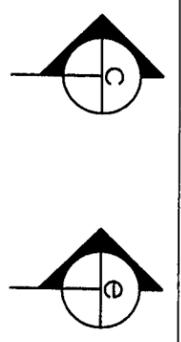
TYPICAL
BEAM REPAIR DETAILS
SHEET 2 OF 3

DRAWN BY	C. ESTROPIA	SIGNED	DATE: APRIL 25, 2008
DESIGNED BY	G. ESTROPIA	SIGNED	DRAWING NO.
CHECKED BY	P. ZHU	SIGNED	RC-2519
APPROVED BY	H. LAHANI	P.E. SIGNED	REVISION



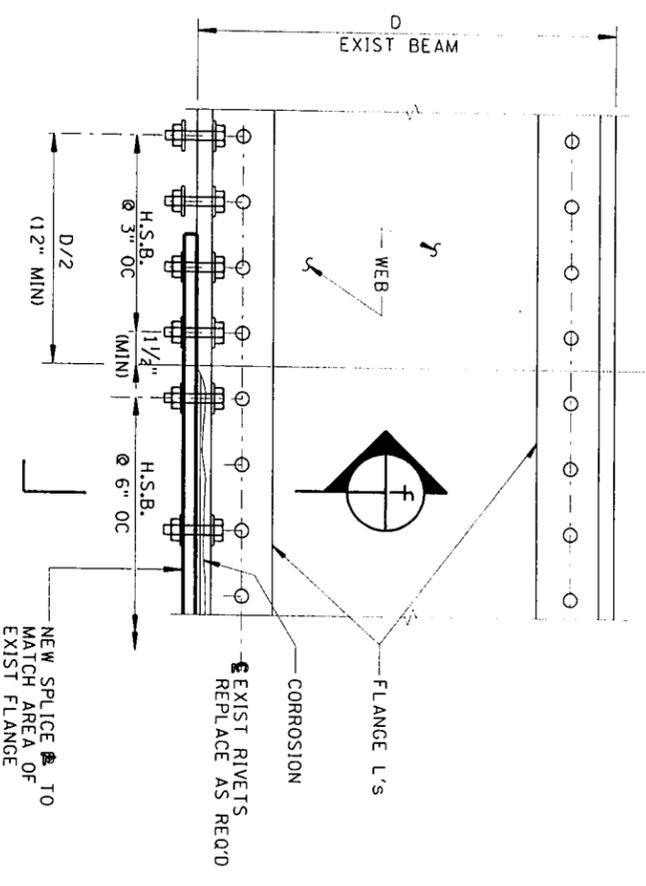
LOSS OF BUILT-UP BEAM FLANGE, WEB INTACT
(BUILT-UP SECTION)

DETAIL S6
NTS



LOSS OF BEAM FLANGE & PARTIAL WEB LOSS
(BUILT-UP SECTION)

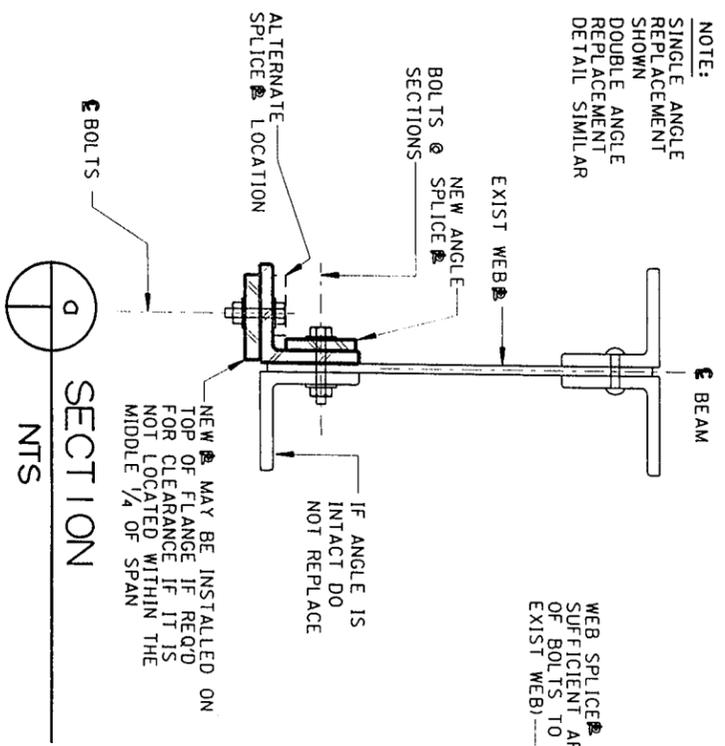
DETAIL S7
NTS



LOSS OF BUILT-UP BEAM FLANGE THICKNESS
(BUILT-UP SECTION)

DETAIL S8
NTS

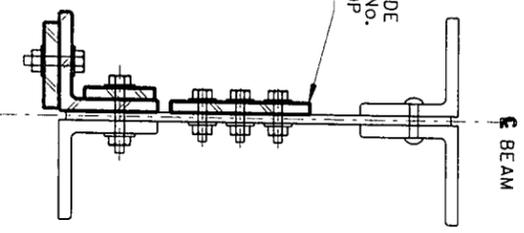
NOTE:
SINGLE ANGLE REPLACEMENT SHOWN
DOUBLE ANGLE REPLACEMENT DETAIL SIMILAR



NEW ANGLE MAY BE INSTALLED ON TOP OF FLANGE IF REQ'D FOR CLEARANCE IF IT IS NOT LOCATED WITHIN THE MIDDLE 1/4 OF SPAN

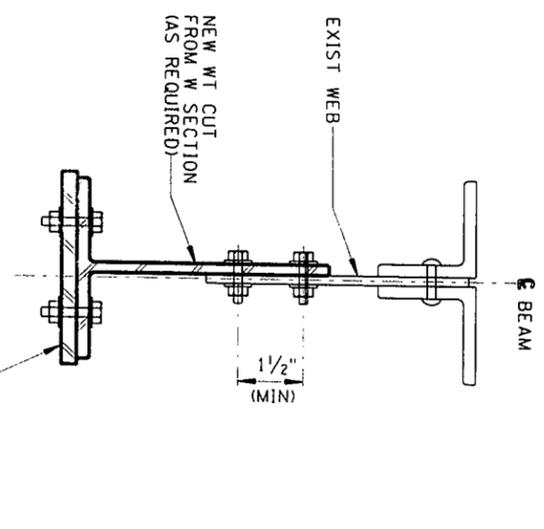
SECTION
NTS

WEB SPLICE (PROVIDE SUFFICIENT AREA & NO. OF BOLTS TO DEVELOP EXIST WEB)

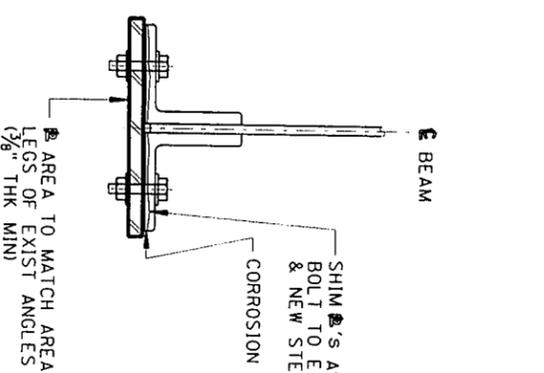


NOTE: FOR DETAILS NOT SHOWN SEE SECTIONS

SECTION
NTS



SECTION
NTS



AREA TO MATCH AREA LEGS OF EXIST ANGLES (1/8" THK MIN)

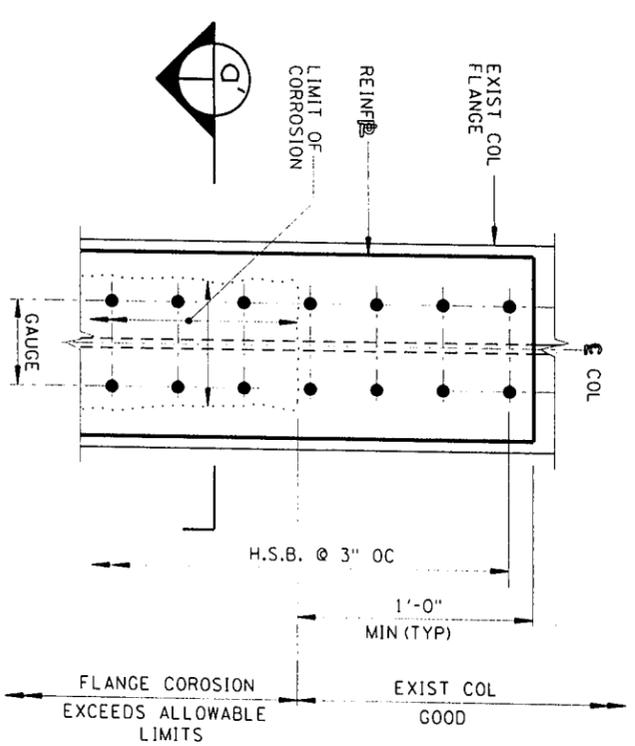
SECTION
NTS

NOTES
1. FOR NOTES SEE C-1017 & C-1018

REVISION	0	CONFORMED DRAWING	DATE	12/12/08	APPROVED
<p>New York City Transit Authority</p> <p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>STRUCTURAL ENGINEERING</p>					
DRAWN BY			C. ESTROPPIA		
DESIGNED BY			G. ESTROPPIA		
CHECKED BY			P. ZHU		
APPROVED BY			H. LAKHANI		
DRAWING NO.			RC-2520		
DATE			APRIL 25, 2001		
SIGNED			SIGNED		
SIGNED			SIGNED		
SIGNED			SIGNED		
REVISION			0		

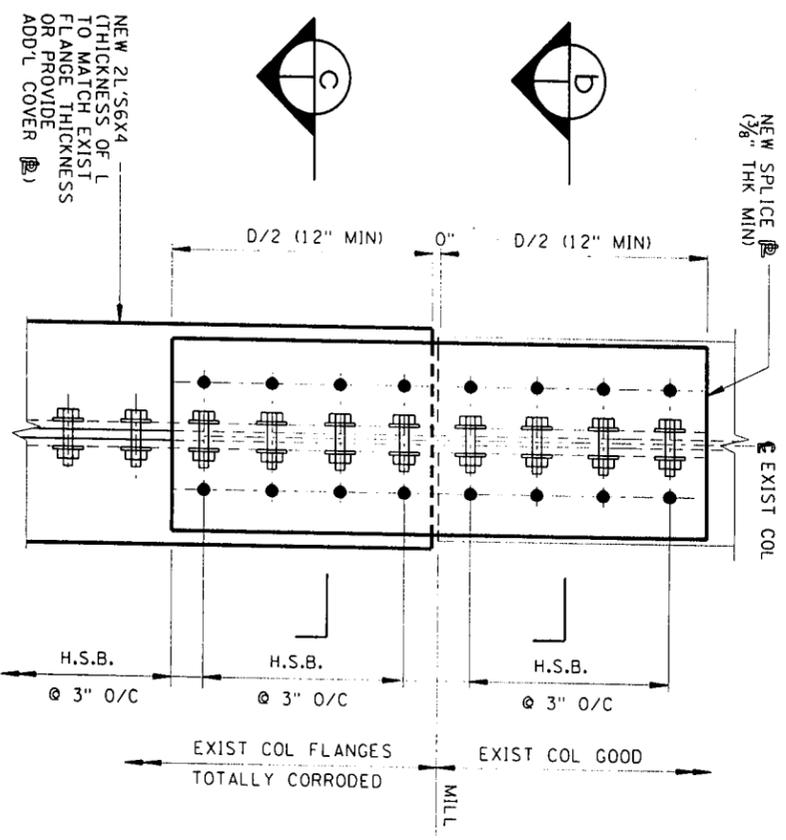
TYPICAL BEAM REPAIR DETAILS
SHEET 3 OF 3

COMMON DETAILS
CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022
REHABILITATION OF 5 STATIONS ON
THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS



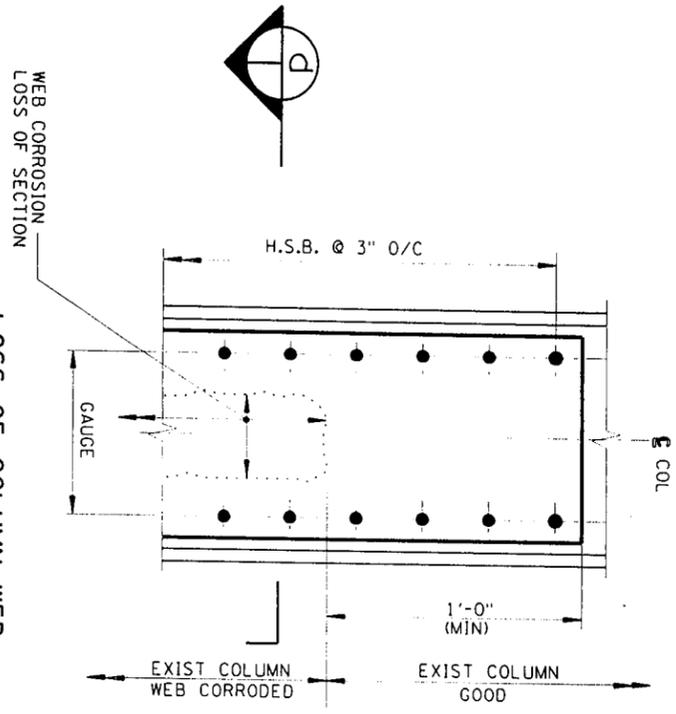
DETAIL S9
NTS

LOSS OF COLUMN FLANGE THICKNESS



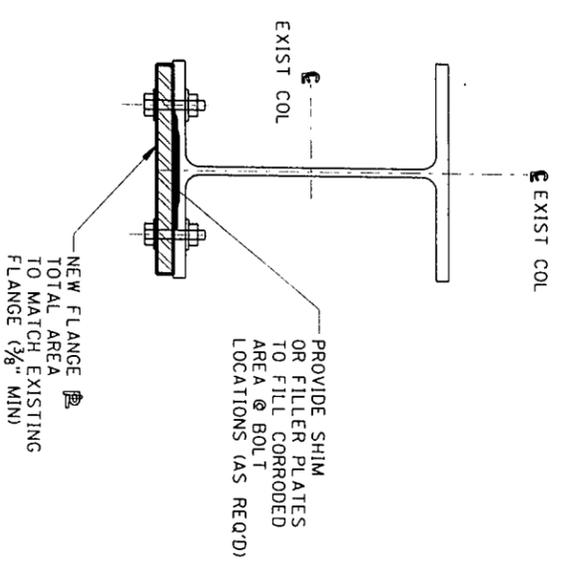
DETAIL S10
NTS

LOSS OF COLUMN FLANGE (WEB GOOD)

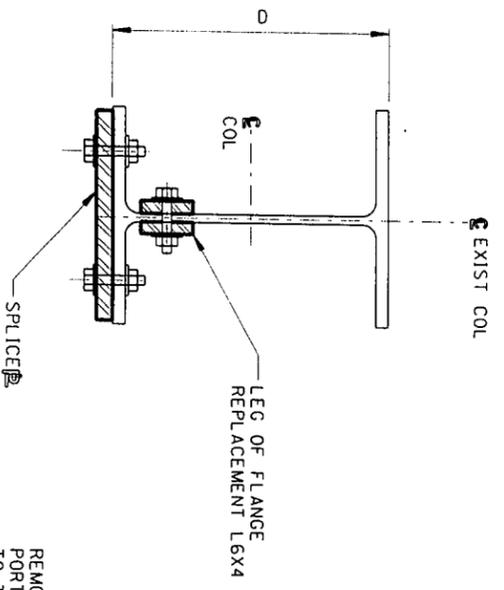


DETAIL S11
NTS

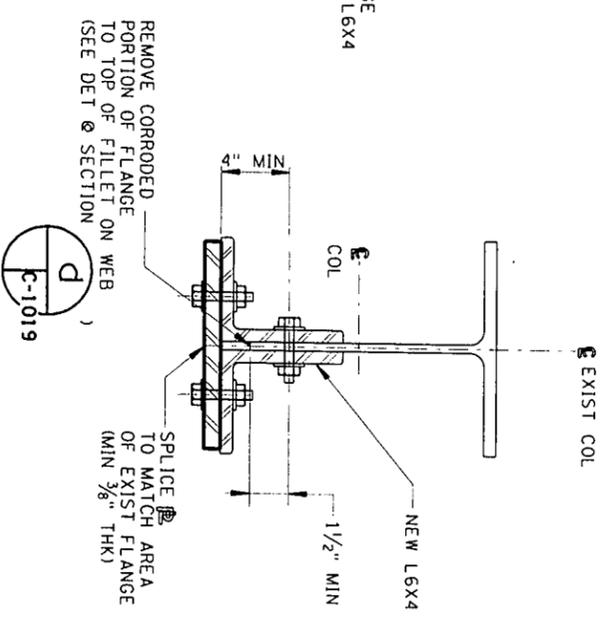
LOSS OF COLUMN WEB



SECTION d'-d'
NTS



SECTION b-b'
NTS



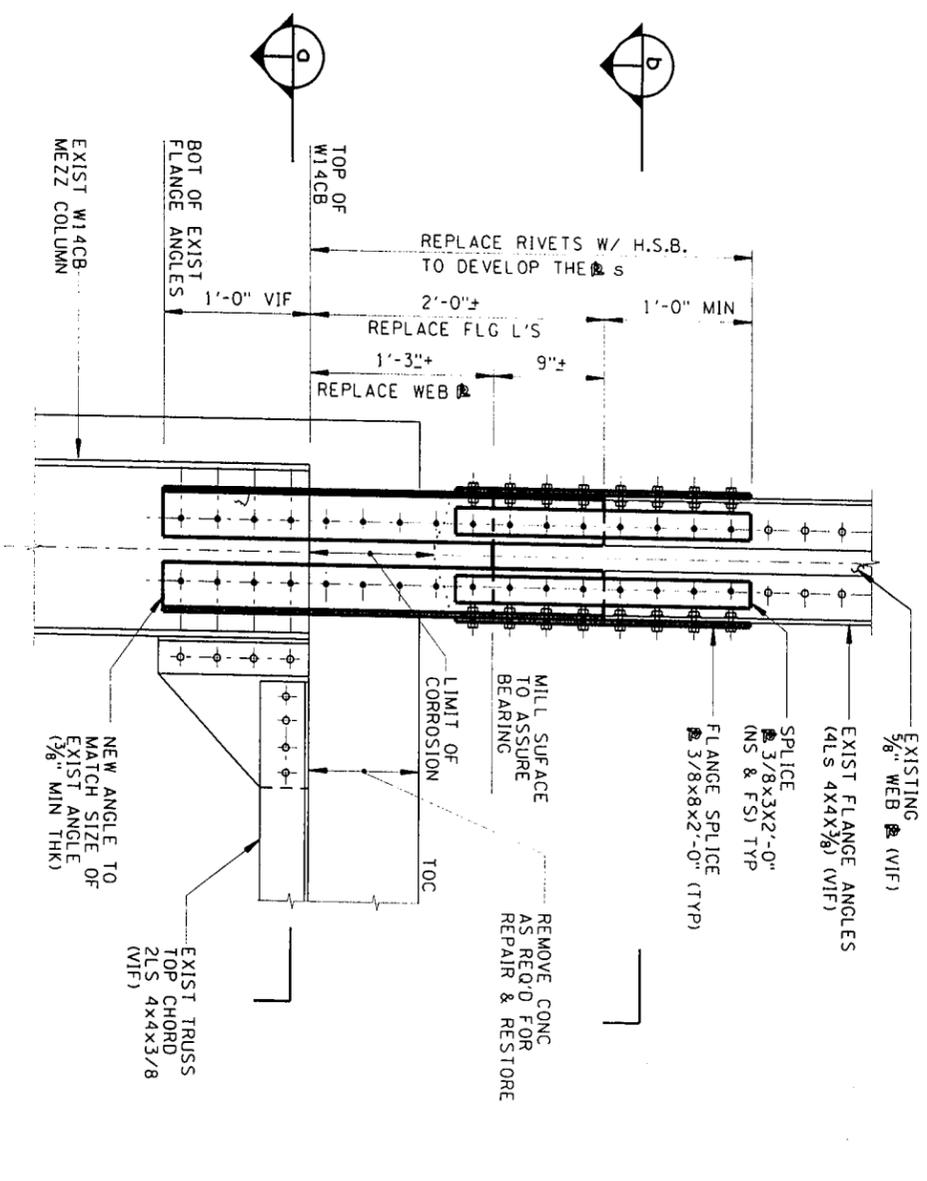
SECTION c-c'
NTS

PROVIDE SHIM OR FILLER PLATES TO FILL CORRODED AREA @ BOLT LOCATIONS (AS REQ'D)

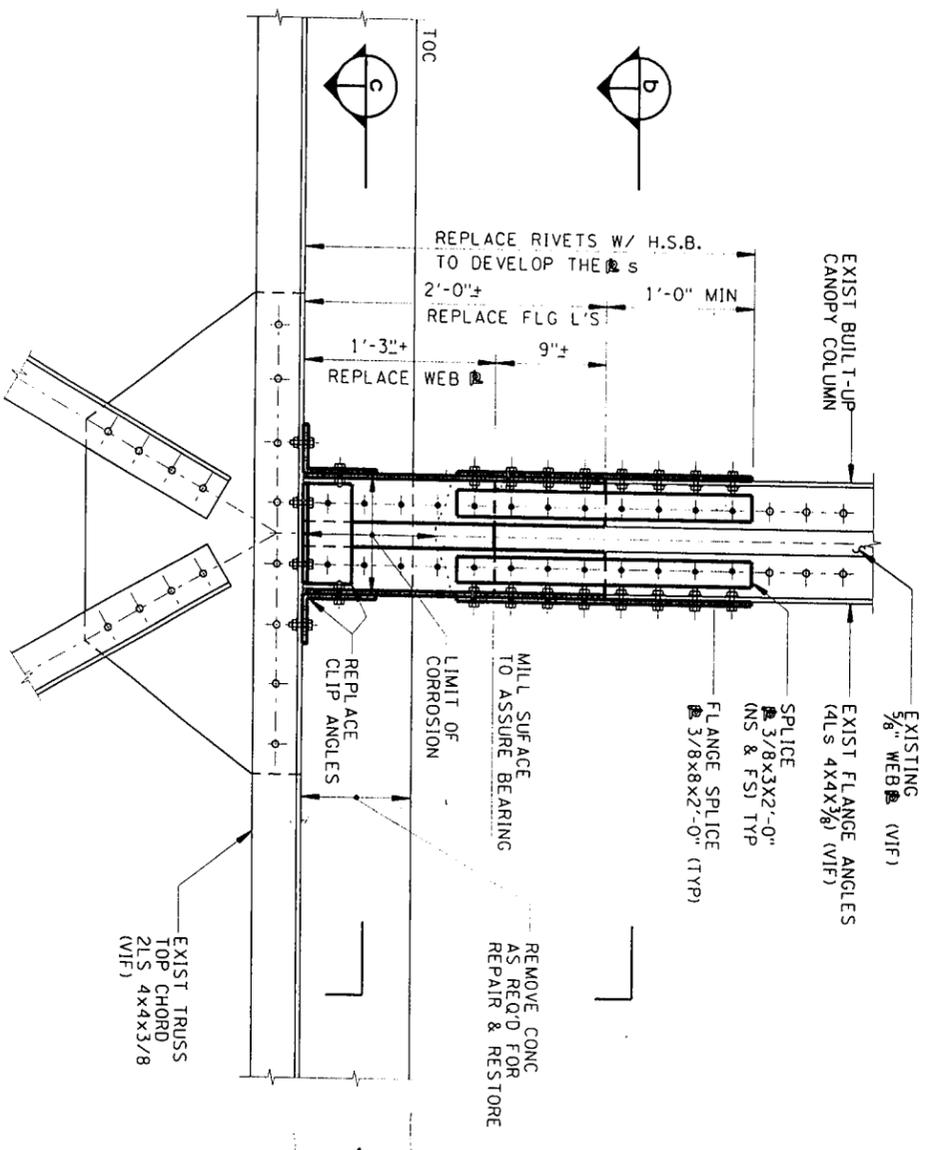
SECTION d-d'
NTS

NEW WEB THICKNESS TO MATCH EXIST WEB (3/8\"/>

REVISION	0	CONFORMED DRAWING	DATE	12/12/08	APPROVED
<p>COMMON DETAILS REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND. BOROUGH OF QUEENS)</p>					
DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT STRUCTURAL ENGINEERING			TYPICAL COLUMN REPAIR DETAILS		
DRAWN BY	G. ESTROPIA	SIGNED	DATE: APRIL 25, 2008		
DESIGNED BY	G. ESTROPIA	SIGNED	DRAWING NO. RC-2521		
CHECKED BY	P. ZHU	P.E.	REVISION		
APPROVED BY	H. LAKHANI	P.E.	0		

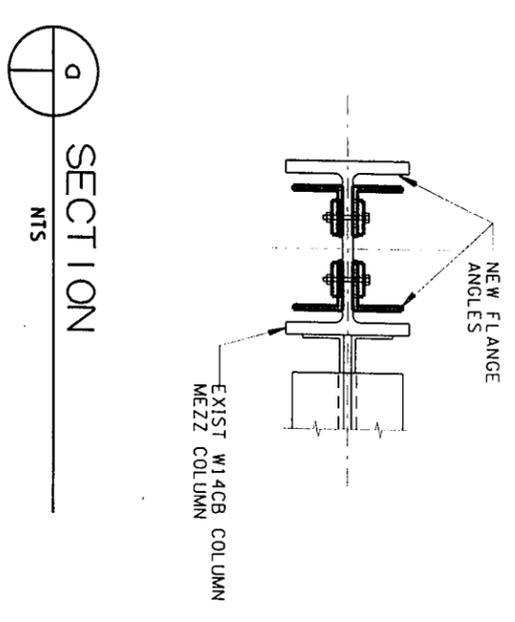


DETAIL S12

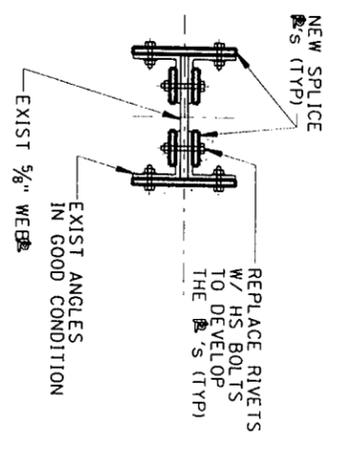


DETAIL S13

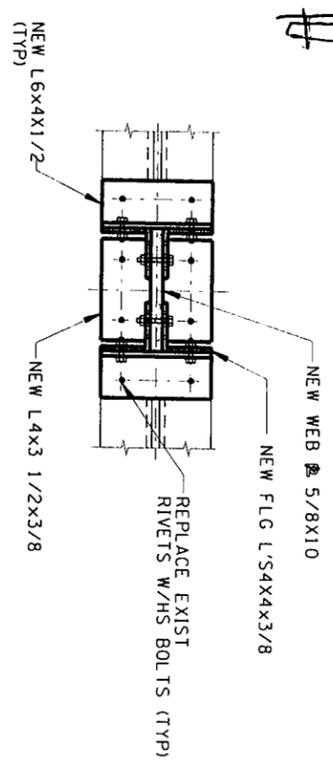
BUILT-UP CANOPY COLUMN BASE REPAIR @ MEZZ COLUMN BUILT-UP CANOPY COLUMN BASE REPAIR @ TRUSS



SECTION d
NTS

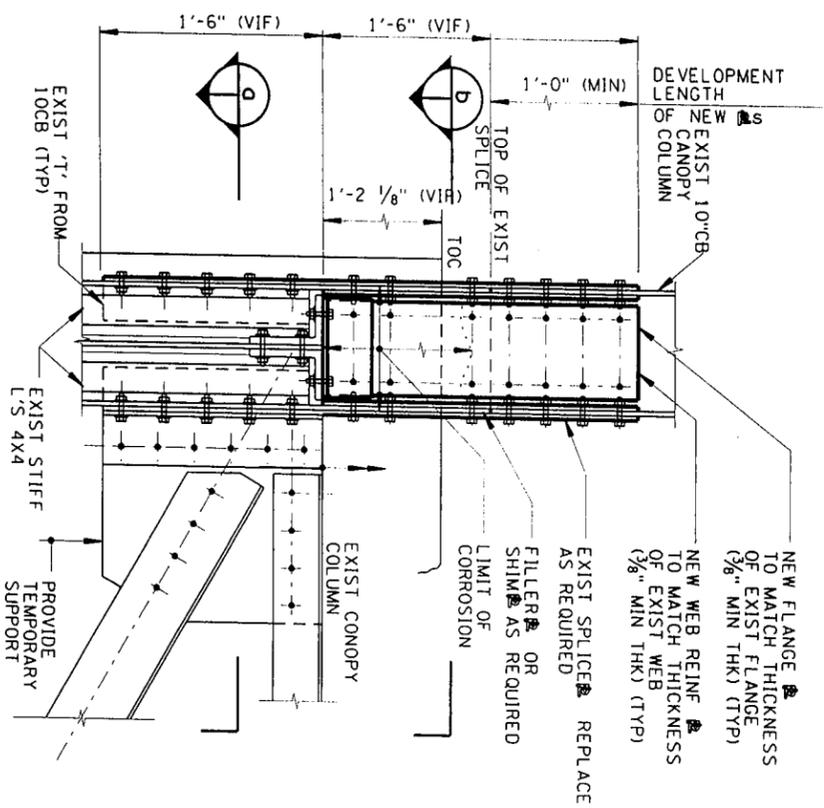


SECTION b
NTS

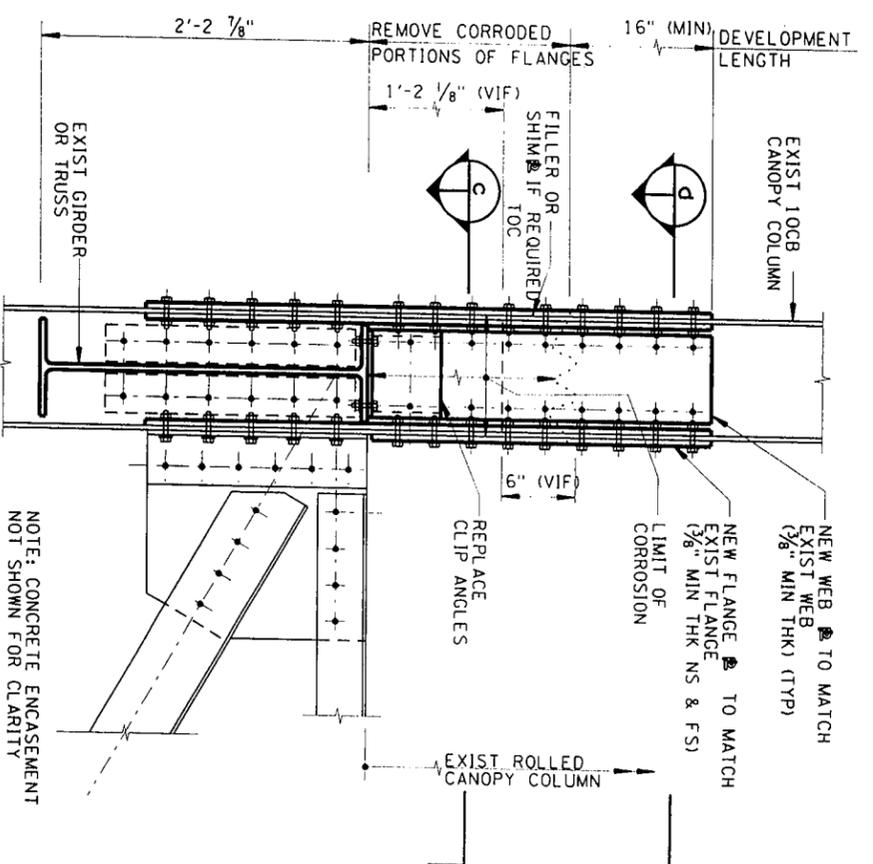


SECTION c
NTS

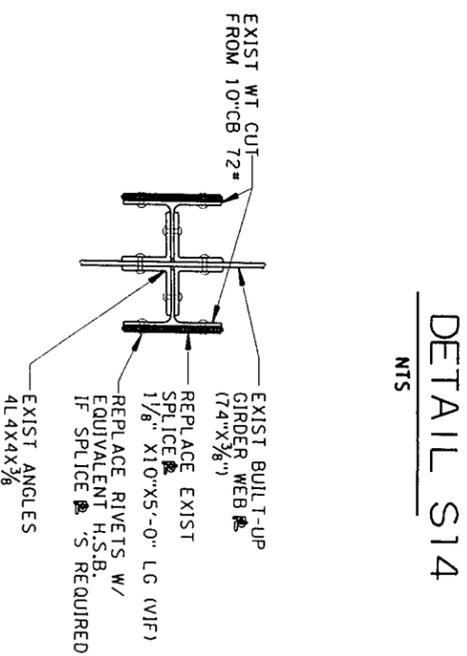
<p>New York City Transit Authority</p> <p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>STRUCTURAL ENGINEERING</p>		<p>COMMON DETAILS</p> <p>CONTRACTS A-36018A-A-36019A-A-36020A-A-36021A-A-36022</p> <p>REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p> <p>TYPICAL CANOPY COLUMN REPAIR DETAILS</p> <p>SHEET 1 OF 2</p>	
DESIGN BY	C. ESTROPIA	SIGNED	DATE - APRIL 25, 2008
DESIGNED BY	C. ESTROPIA	SIGNED	DRAWING NO. RC-2522
CHECKED BY	P. ZHU	SIGNED	REVISION
APPROVED BY	H. LAKHANI	P.E.	0



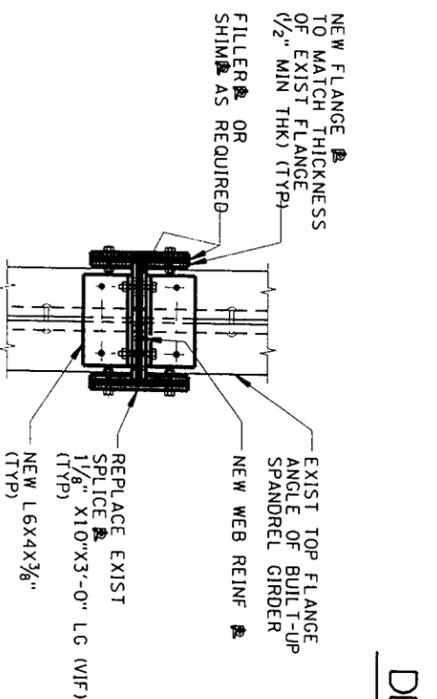
ROLLED CANOPY COLUMN
BASE REPAIR @ SPANREL GIRDERS



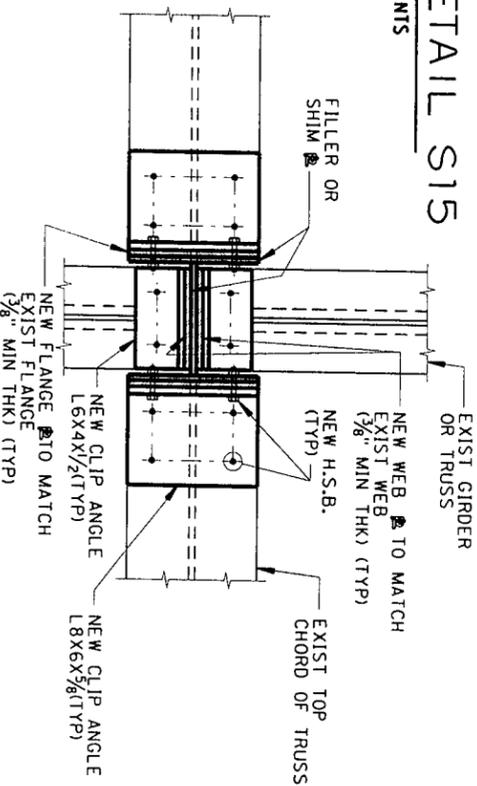
ROLLED COLUMN BASE REPAIR @ BENT LINE



DETAIL S14



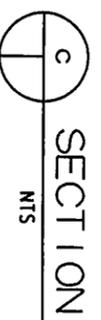
DETAIL S15



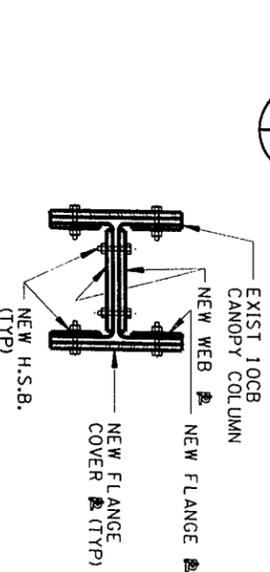
SECTION d



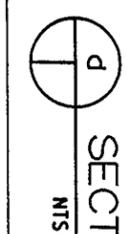
SECTION b



SECTION c



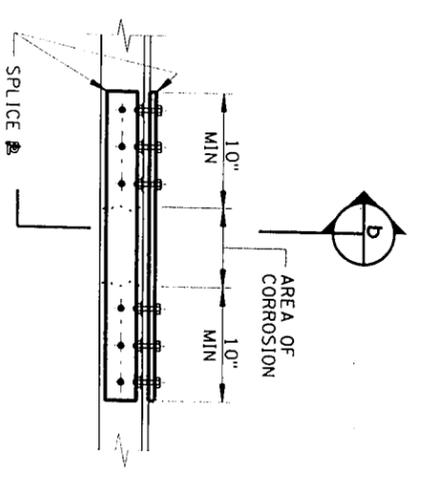
SECTION d



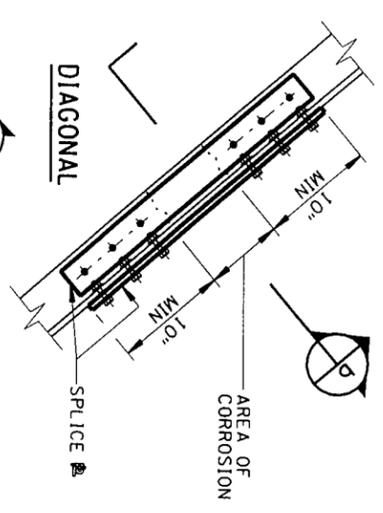
SECTION p

0	CONFIRMED DRAWING	12/12/08	APPROVED
REVISION	DESCRIPTION	DATE	APPROVED
<p>New York City Transit Authority</p> <p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>STRUCTURAL ENGINEERING</p>			
<p>CONTRACTS A-36018A-36019A-36020A-36021A-36022</p> <p>REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p> <p>TYPICAL CANOPY COLUMN REPAIR DETAILS</p> <p>SHEET 2 OF 2</p>		<p>COMMON DETAILS</p>	
DESIGNED BY	G. ESTROPIA	SIGNED	
CHECKED BY	P. ZHU	SIGNED	
APPROVED BY	H. LAKHANI	P.E.	SIGNED
DATE	APRIL 25, 2008	DRAWING NO.	RC-2523
REVISION			0

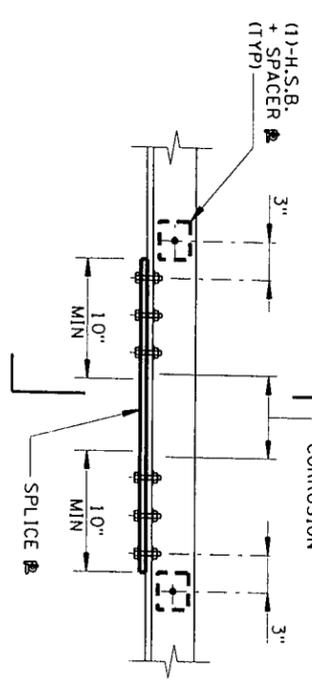
- FOR NOTES SEE DWGS C-1017 AND C-1018.
- REPLACE ENTIRE MEMBER IF THERE IS SIGNIFICANT LOSS OF CROSS-SECTION OVER 30% OR MORE OF THE MEMBERS LENGTH.
- IF DOUBLE ANGLE MEMBERS ARE TO BE REPLACED, PROVIDE HS BOLTS AND SPACERS AT 3'-0" OC TO CONNECT THE OUTSTANDING LEGS OF THE ANGLES.



TOP CHORD



DIAGONAL



BOTTOM CHORD

CORROSION OF TRUSS CHORDS

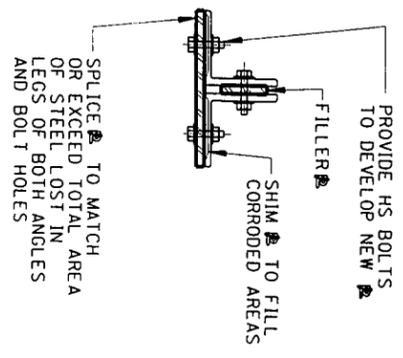
DETAIL S16

NTS



SECTION b

CORROSION IN TOP CHORD OF TRUSS/DIAGONAL MEMBER



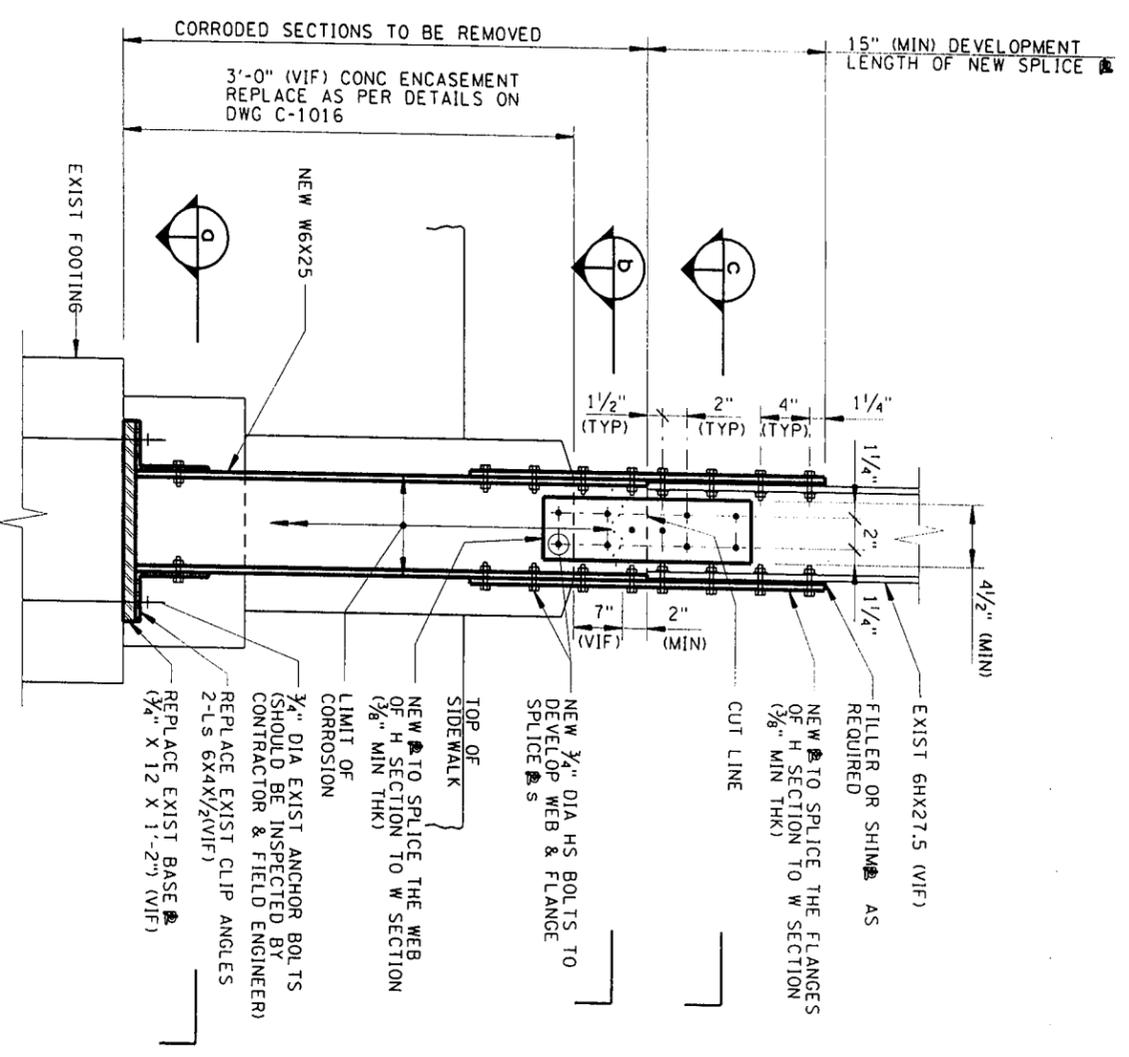
SECTION c

CORROSION IN BOTTOM CHORD OF TRUSS

REVISION	0	CONFIRMED DRAWING	12/12/08	APPROVED
 <p>New York City Transit Authority</p>				
DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT STRUCTURAL ENGINEERING			COMMON DETAILS CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS	
TRUSS MEMBER REPAIR DETAILS				
DRAWN BY	G. ESTROPIA	SIGNED	DATE: APRIL 25, 2008	
DESIGNED BY	G. ESTROPIA	SIGNED	DRAWING NO. RC-2524	
CHECKED BY	P. ZHU	P.E.	SIGNED	REVISION
APPROVED BY	H. LAKHANI	P.E.	SIGNED	0

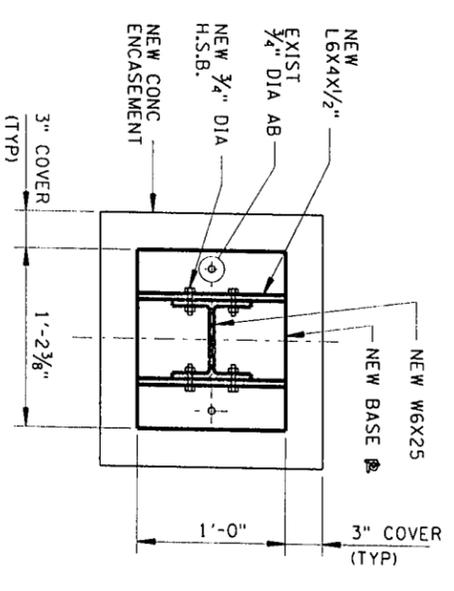
NOTES:

1. FOR NOTES SEE DWGS C-1017 AND C-1018.

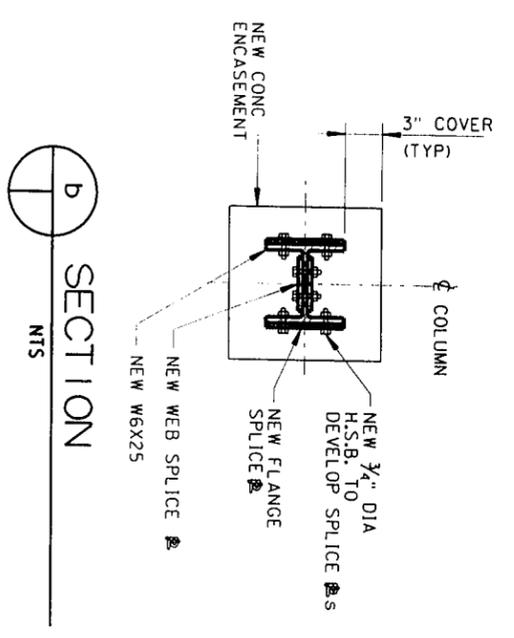


STAIR COLUMN (COMPLETE WEB LOSS)

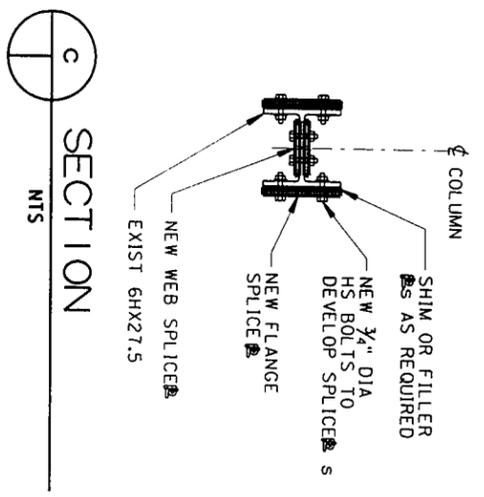
DETAIL S17
NTS



SECTION a-a
NTS



SECTION b-b
NTS

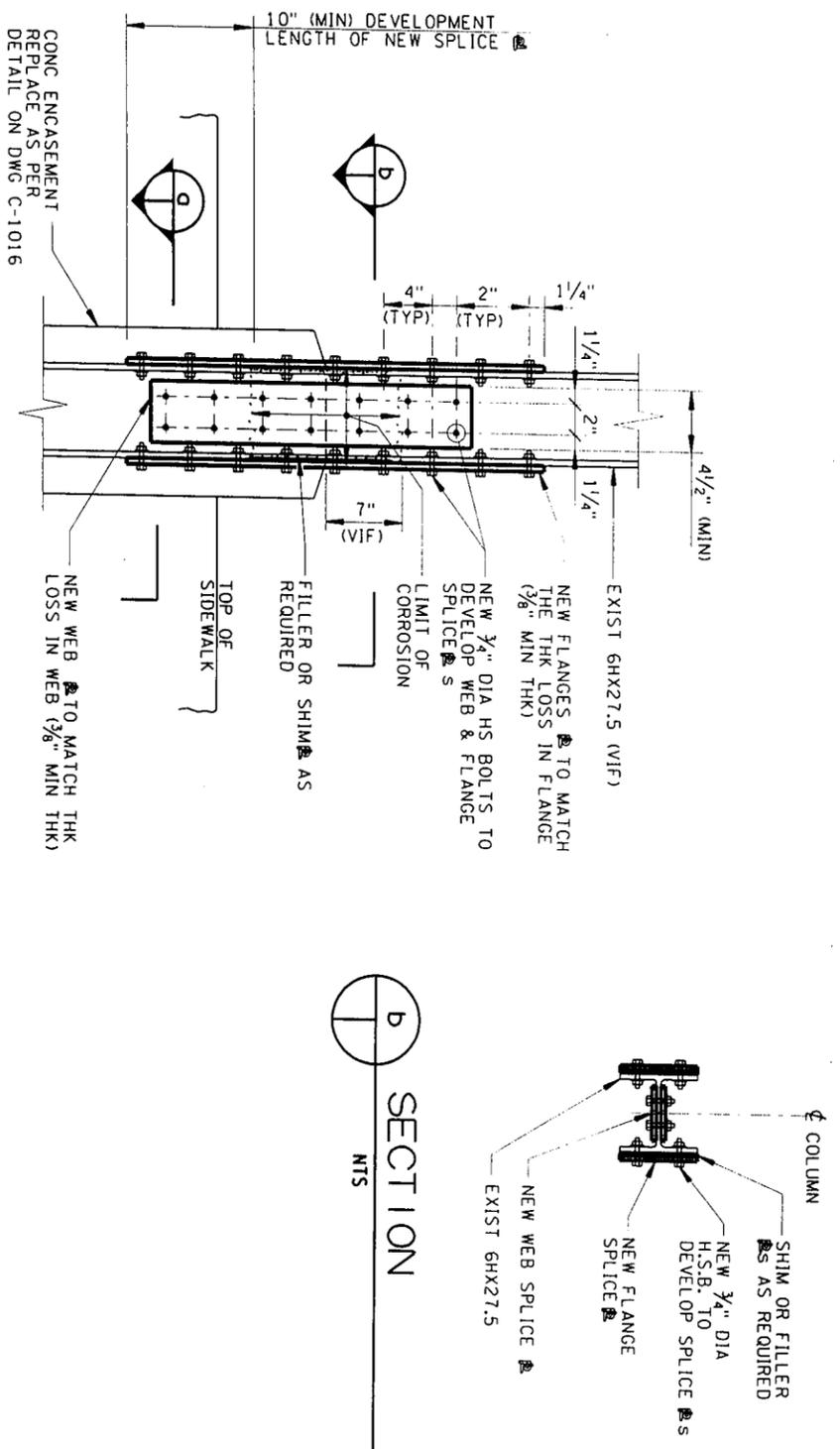


SECTION c-c
NTS

<p>New York City Transit Authority</p>		<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT STRUCTURAL ENGINEERING</p>	
<p>DESIGNED BY: G. ESTROPIA CHECKED BY: P. ZHU APPROVED BY: H. LAKHANI</p>	<p>SIGNED: _____ SIGNED: _____ SIGNED: _____</p>	<p>DATE: APRIL 25, 2008</p>	<p>DRAWING NO.: RC-2525 REVISION: 0</p>
<p>REVISION 0 CONFORMED DRAWING DATE: 12/12/08</p>		<p>COMMON DETAILS CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p>	
<p>TYPICAL STAIR COLUMN REPAIR DETAILS SHEET 1 OF 2</p>			

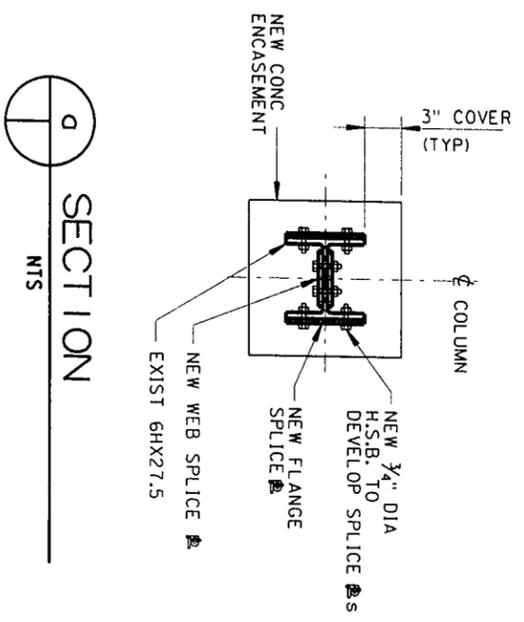
NOTES:

1. FOR NOTES SEE DWGS C-1017 AND C-1018.

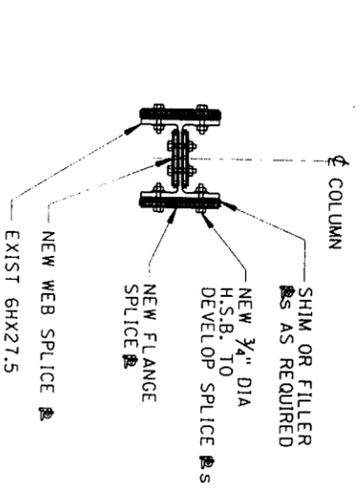


STAIR COLUMN (PARTIAL SECTION LOSS)

DETAIL S18



SECTION a-a
NTS

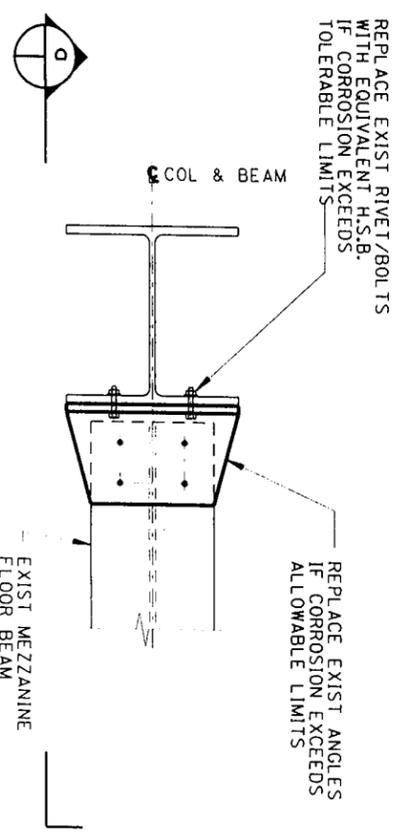


SECTION b-b
NTS

REVISION	0	CONFORMED DRAWING	12/12/08	APPROVED
<p>COMMON DETAILS CONTRACTS A-36018, A-36019, A-36020, A-36021 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p>				
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>New York City Transit Authority</p>			<p>TYPICAL STAIR COLUMN REPAIR DETAILS SHEET 2 OF 2</p>	
DRAWN BY	G. ESTROPIA	SIGNED	DATE: APRIL 25, 2008	
DESIGNED BY	G. ESTROPIA	SIGNED	DRAWING NO. RC-2526	
CHECKED BY	P. ZHU	SIGNED	REVISION	
APPROVED BY	H. LAKHANI	P.E.	0	

NOTES:

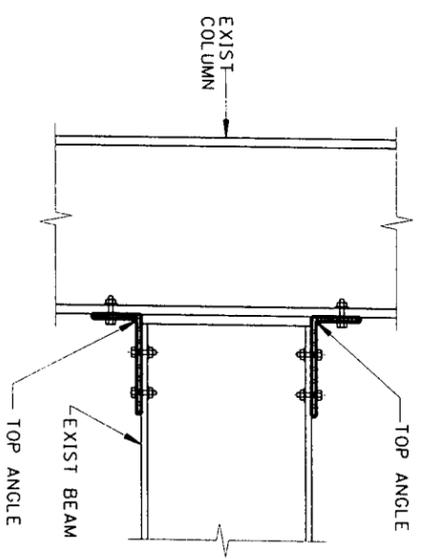
1. FOR NOTES SEE DWGS C-1017 AND C-1018.



MEZZANINE FLOOR BEAM TO COLUMN FLANGE CONNECTION REPAIR DETAIL

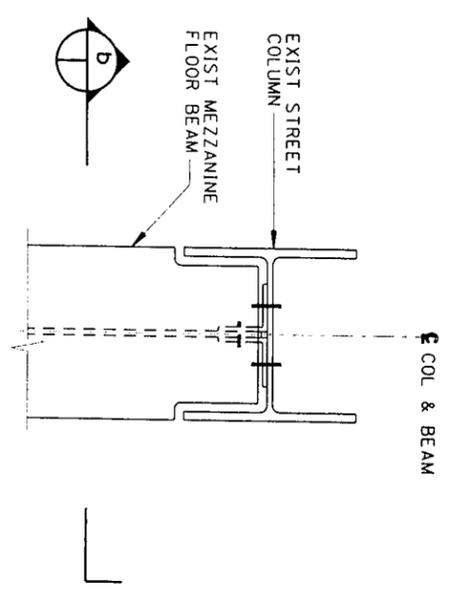
DETAIL S19

NTS



SECTION a

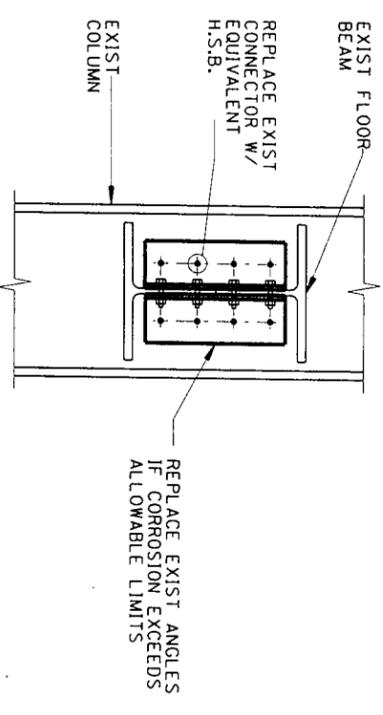
NTS



MEZZANINE FLOOR BEAM TO COLUMN WEB CONNECTION REPAIR DETAIL

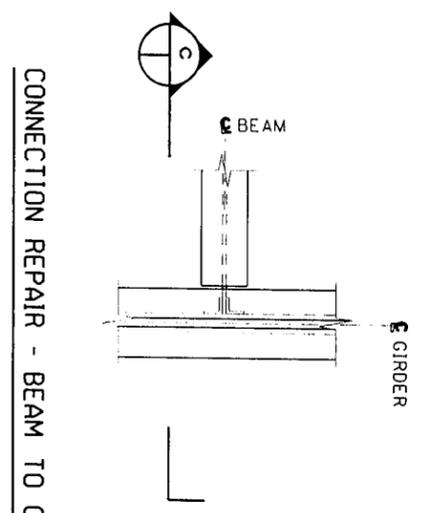
DETAIL S20

NTS



SECTION b

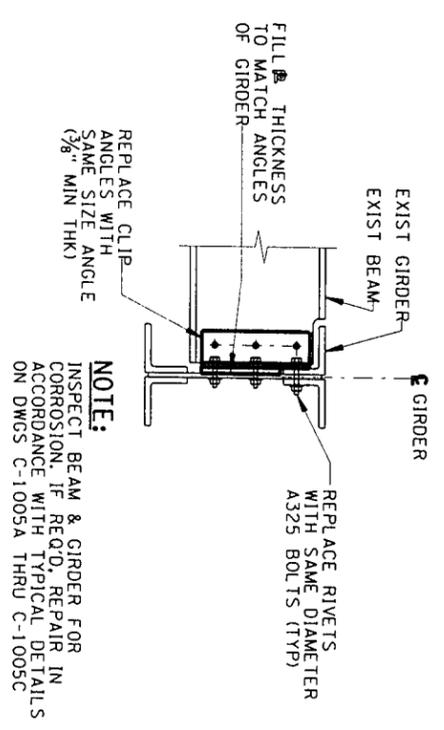
NTS



CONNECTION REPAIR - BEAM TO GIRDER

DETAIL S21

NTS

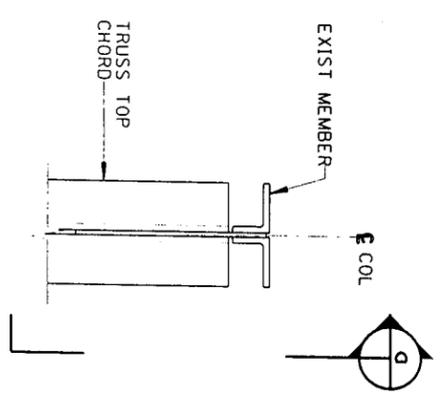


SECTION c

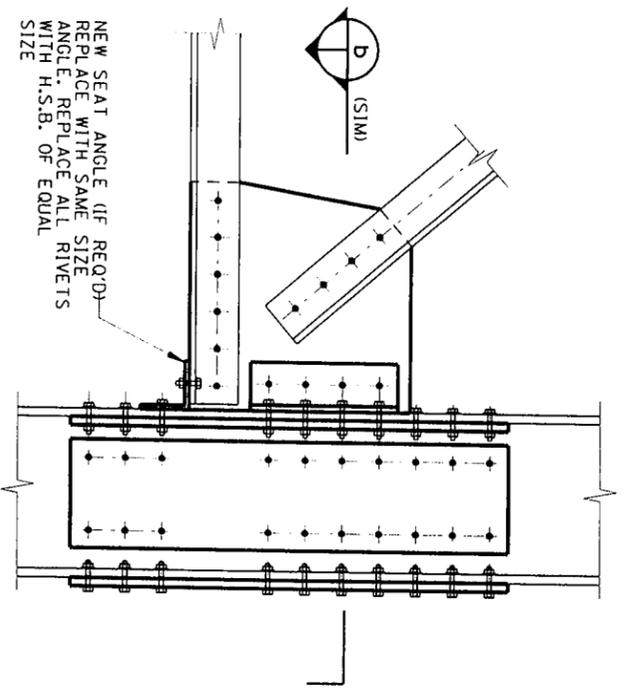
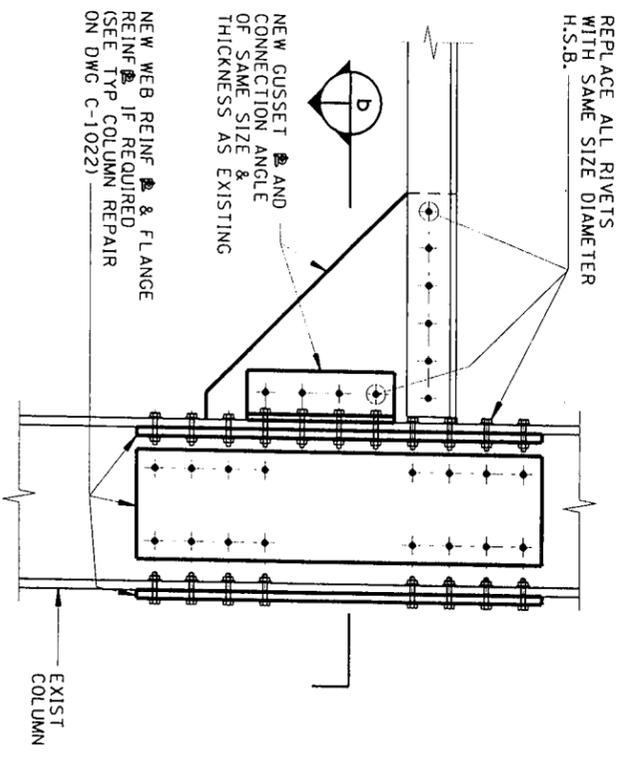
NTS

REVISION	DESCRIPTION	DATE	APPROVED
0	CONFORMED DRAWING	12/12/08	
 New York City Transit Authority			
DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT STRUCTURAL ENGINEERING		COMMON DETAILS CONTRACTS A-36018,A-36019,A-36020,A-36021,A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS	
CONNECTION REPAIR DETAILS SHEET 1 OF 2			
DRAWN BY	G. ESTROPIA	SIGNED	
DESIGNED BY	G. ESTROPIA	SIGNED	
CHECKED BY	P. ZHU	SIGNED	
APPROVED BY	H. LAKHANI	P.E.	SIGNED
DATE	APRIL 25, 2008	DRAWING NO.	RC-2527
REVISION			

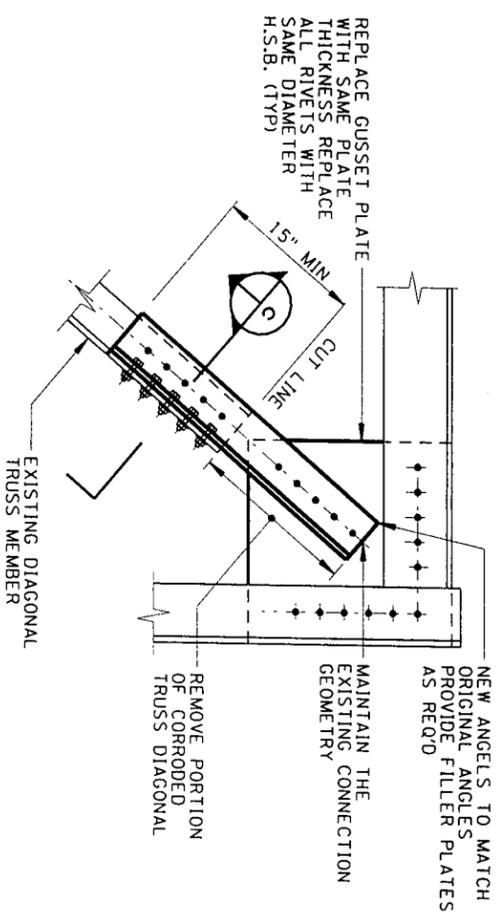
1. FOR NOTES SEE DWGS C-1017 AND C-1018.
2. REPLACE THE ENTIRE MEMBER IF THERE IS SIGNIFICANT LOSS OF CROSS SECTION OVER 30% OR MORE OF MEMBERS LENGTH.
3. IF DOUBLE ANGLE MEMBERS ARE TO BE REPLACED, PROVIDE HS BOLTS AND SPACERS AT 3'-0" OC TO CONNECT THE OUTSTANDING LEGS OF THE ANGLES.



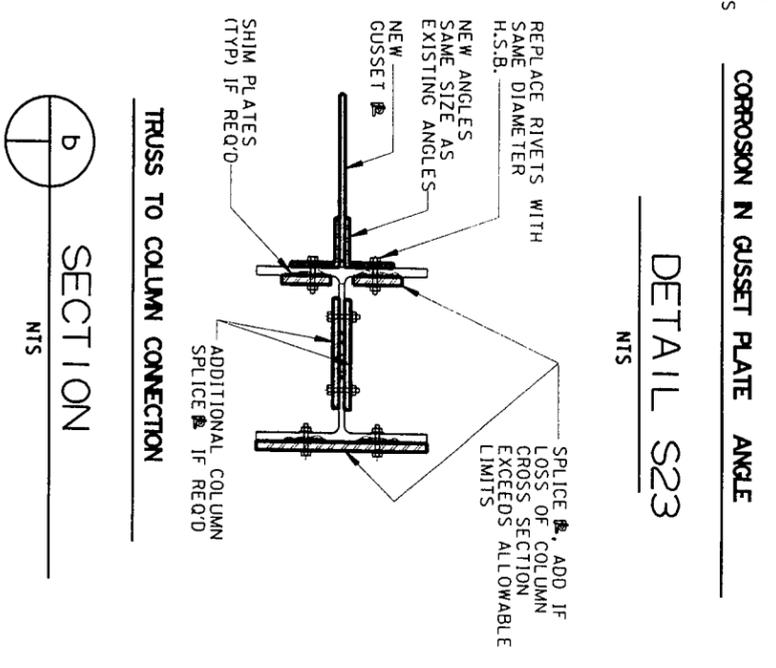
CONNECTION REPAIR TRUSS
DETAIL S22
NTS



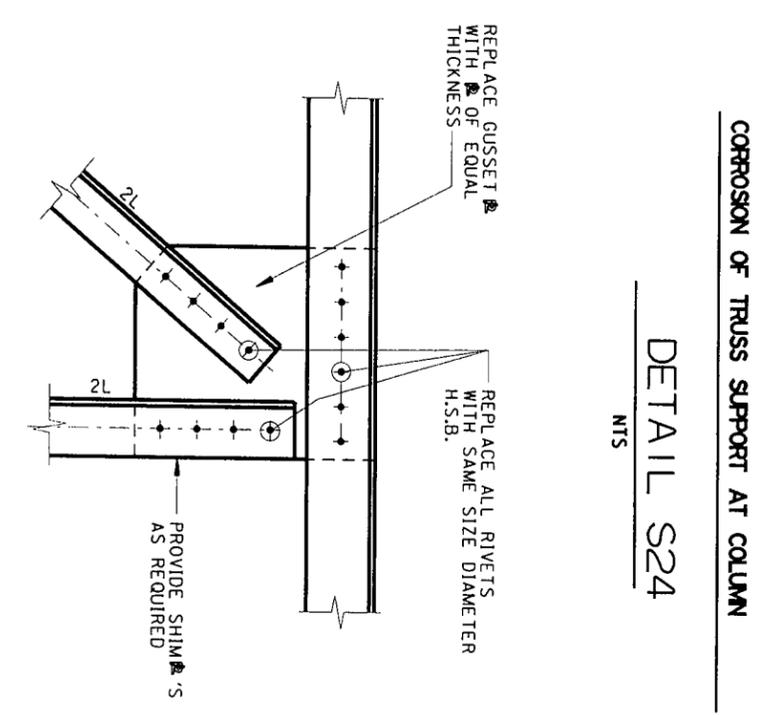
CORROSION OF TRUSS SUPPORT AT COLUMN
DETAIL S24
NTS



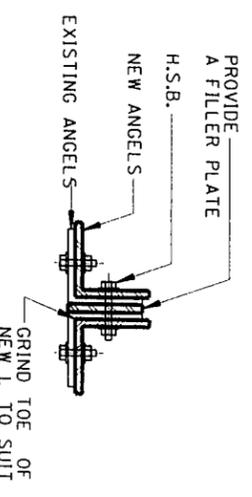
PARTIAL REPLACEMENT OF DIAGONAL
SECTION
NTS



CORROSION IN GUSSET PLATE ANGLE
DETAIL S23
NTS

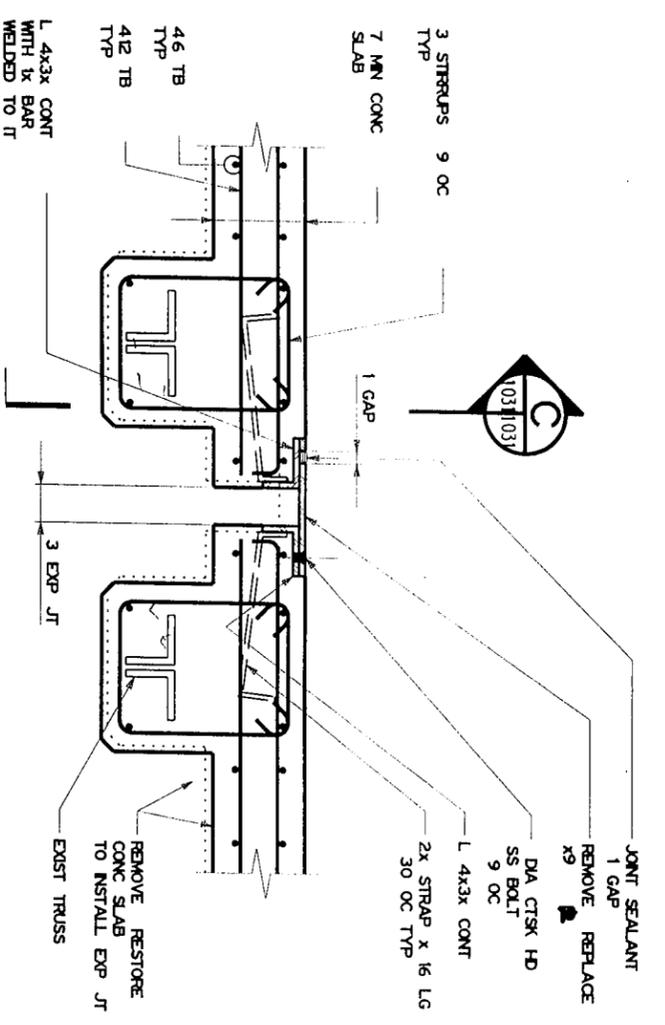


CORRODED GUSSET PLATE
DETAIL S25
NTS



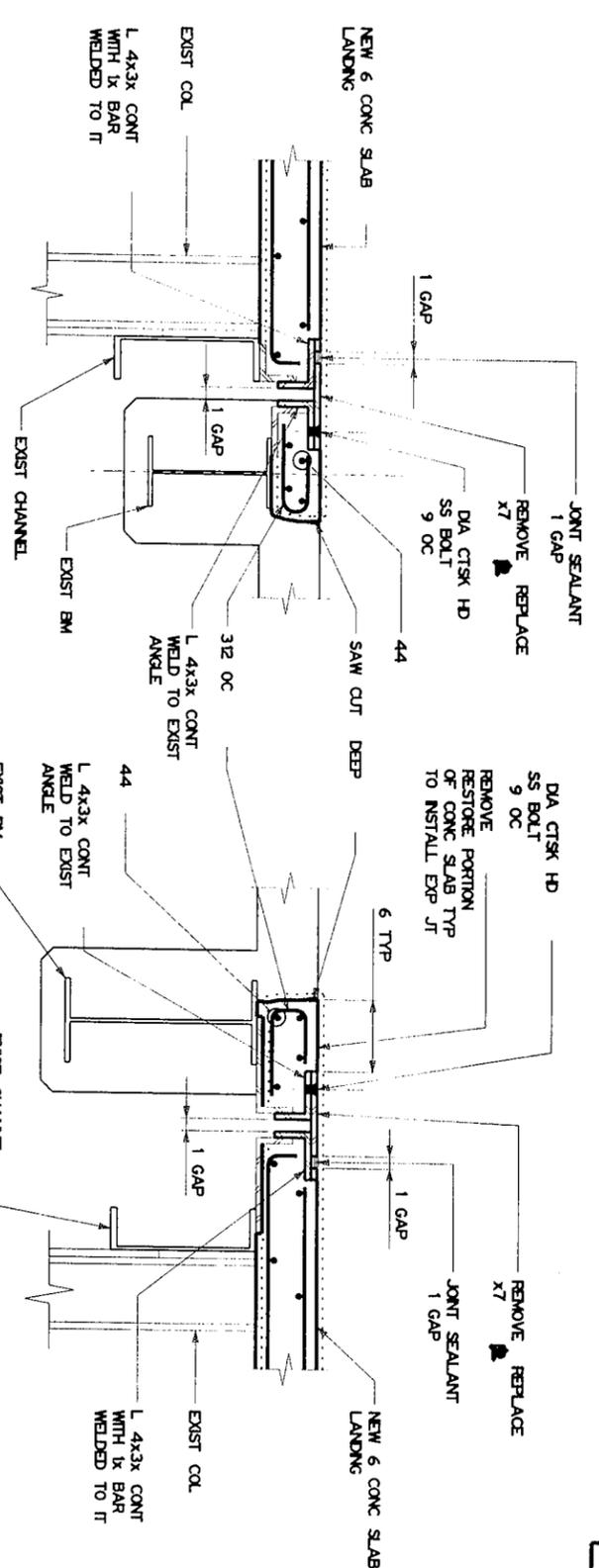
SECTION
NTS

REVISION	0	CONFORMED DRAWING	12/12/08	DATE	APPROVED
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT New York City Transit Authority</p> <p>CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p> <p>COMMON DETAILS CONNECTION REPAIR DETAILS SHEET 2 OF 2</p>					
DRAWN BY	G. ESTROPIA	SIGNED		DATE	APRIL 25, 2008
DESIGNED BY	G. ESTROPIA	SIGNED		DRAWING NO.	RC-2528
CHECKED BY	P. ZHU	SIGNED		REVISION	0
APPROVED BY	H. LAKHANI	P.E.	SIGNED		



DETAIL 6
0 6 12IN. - 1037

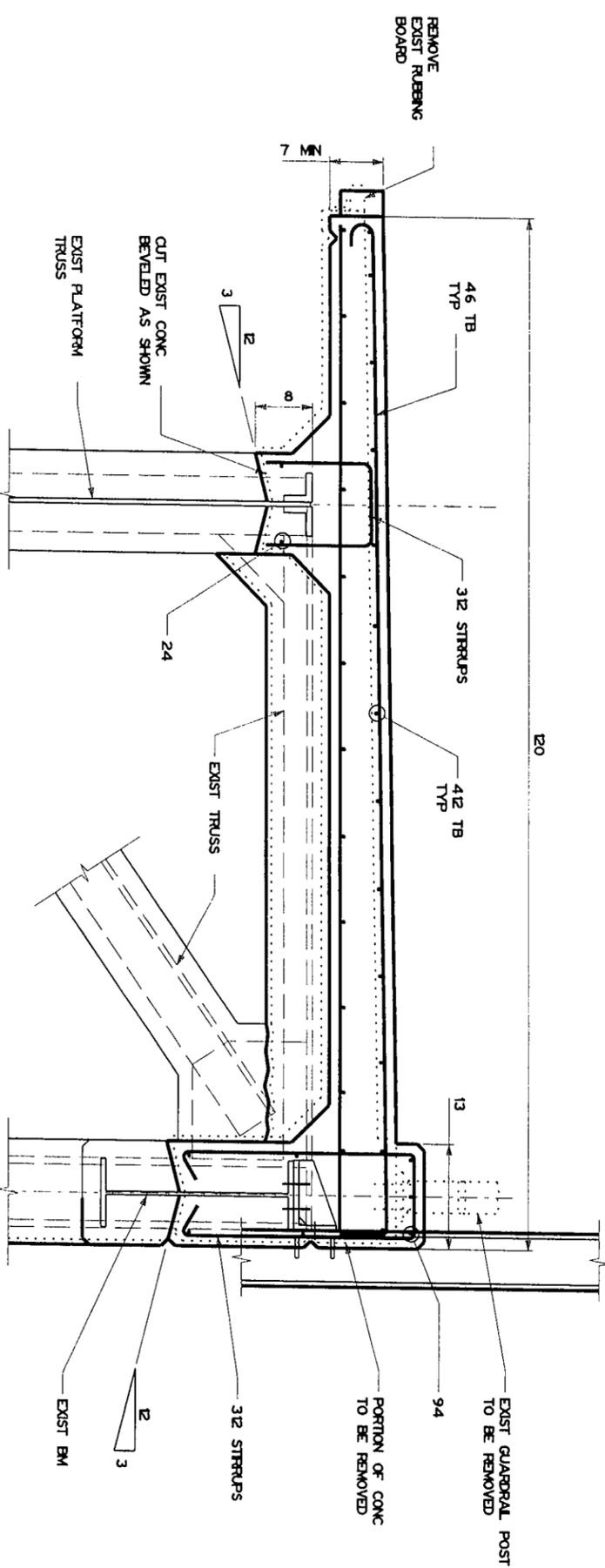
PLATFORM LEVEL EXPANSION JOINT
FOR BEACH 67TH BEACH 60TH BEACH 44TH BEACH 36TH AND BEACH 25TH STATIONS



DETAIL 3
0 6 12IN. - 1037

DETAIL 4
0 6 12IN. - 1037

MEZZANINE LEVEL EXPANSION JOINTS
FOR BEACH 67TH BEACH 60TH BEACH 44TH BEACH 36TH AND BEACH 25TH STATIONS



SECTION C
0 6 12IN. - 1037

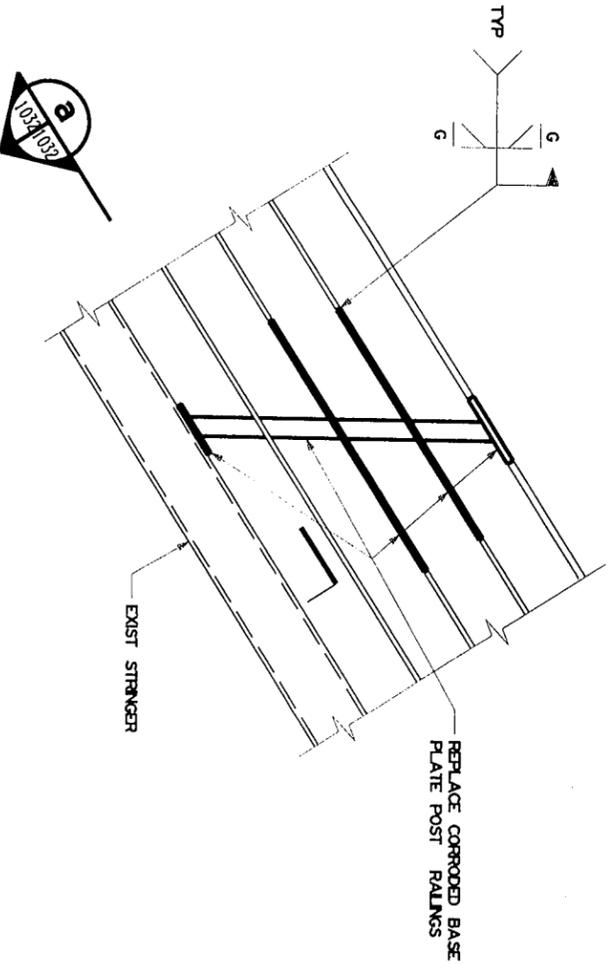
NOTE:

1 STEEL PLATES SHALL BE ABRASIVE PLATES WITH SLP RESISTANT SURFACE

140

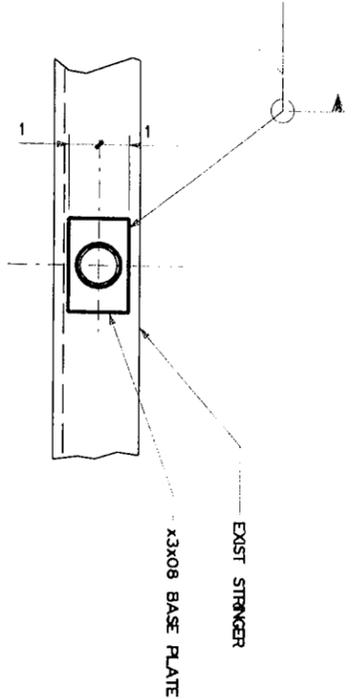
<p>New York City Transit Authority</p>		<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT</p> <p>STRUCTURAL ENGINEERING</p>	
<p>DESIGNED BY C. ESTROPIA</p> <p>CHECKED BY P. ZHU</p> <p>APPROVED BY H. LAJHANI</p>	<p>SIGNED</p> <p>SIGNED</p> <p>SIGNED</p>	<p>DATE: APRIL 25, 2006</p> <p>DRAWING NO. RC-2530</p> <p>REVISION 0</p>	<p>DATE: APRIL 25, 2006</p> <p>DRAWING NO. RC-2530</p> <p>REVISION 0</p>
<p>CONFORMED DRAWING</p> <p>REVISION 0</p>		<p>DESCRIPTION</p> <p>COMMON DETAILS</p> <p>CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022</p> <p>REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p>	
<p>DATE: 12/12/08</p> <p>APPROVED</p>		<p>DATE: 12/12/08</p> <p>APPROVED</p>	

TYPICAL EXPANSION JOINT DETAILS



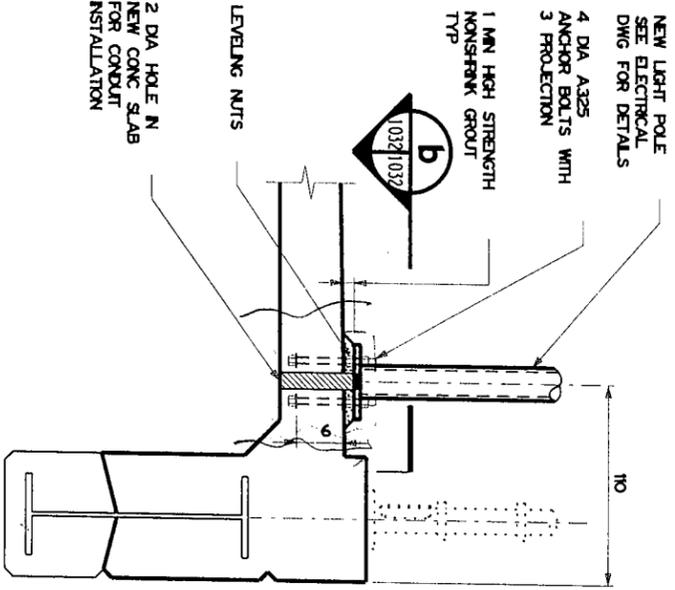
STAIR GUARDRAIL

NTS



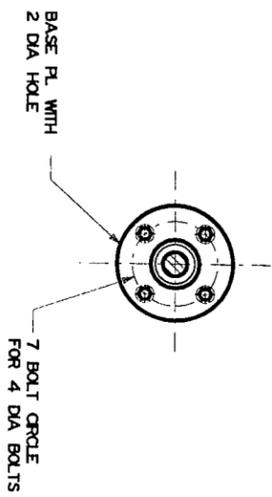
SECTION a

NTS



SECTION b

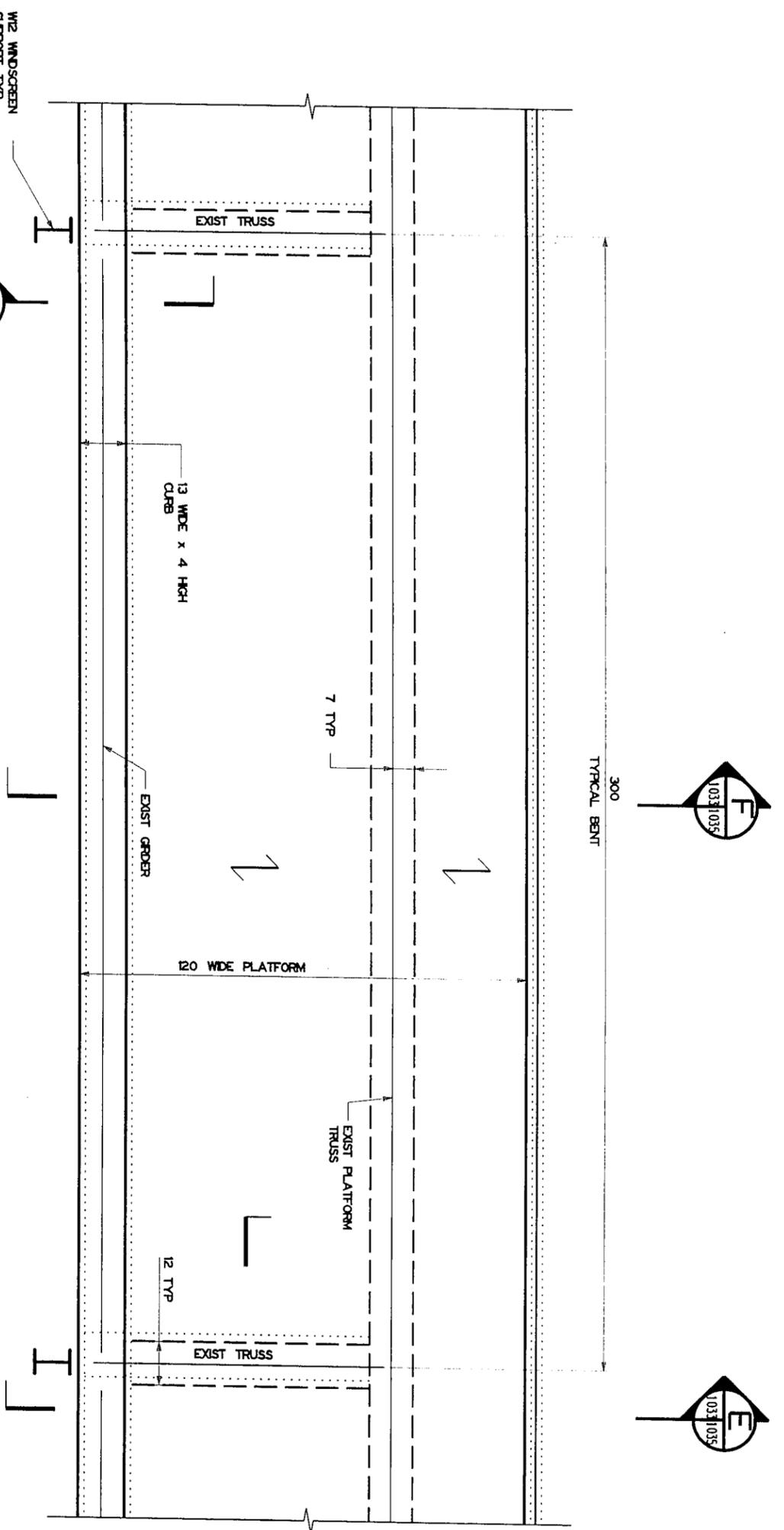
NTS



DETAIL 6

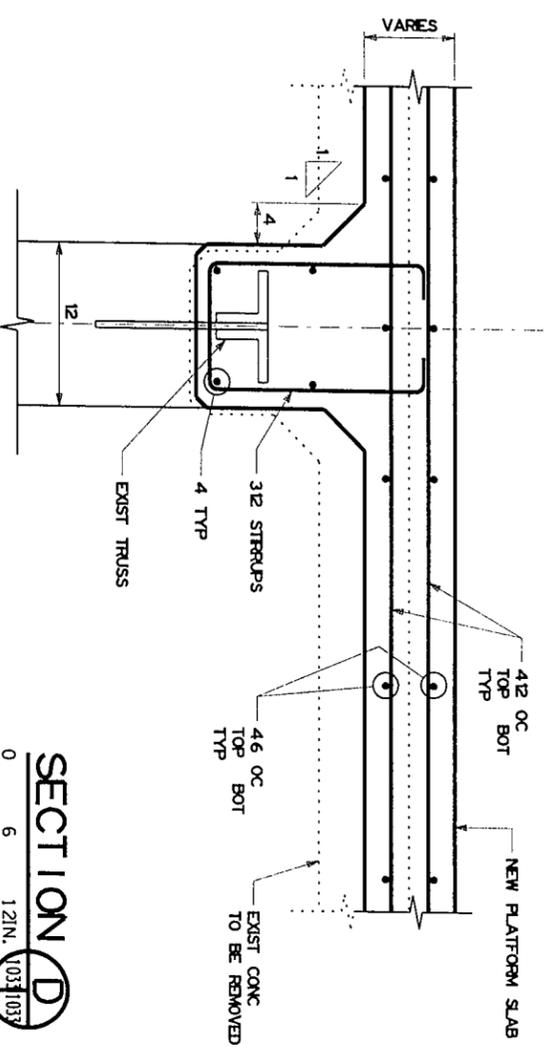
311
411
512
612

<p>New York City Transit Authority</p>		<p>COMMON DETAILS</p> <p>CONTRACTS A-36018, A-36019, A-36020, A-36021, A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p>	
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT STRUCTURAL ENGINEERS</p>		<p>TYPICAL GUARDRAIL AND LIGHT POLE SUPPORT DETAILS</p>	
<p>REVISION 0</p>	<p>CONFIRMED DRAWING</p>	<p>DATE 12/12/08</p>	<p>APPROVED</p>
<p>DRAWN BY G. ESTROPIA</p>	<p>DESIGNED BY G. ESTROPIA</p>	<p>CHECKED BY P. ZHU</p>	<p>APPROVED BY H. LAKHANI</p>
<p>SIGNED</p>	<p>SIGNED</p>	<p>SIGNED</p>	<p>SIGNED</p>
<p>DATE: APRIL 25, 2001</p>	<p>DRAWING NO. RC-2531</p>	<p>REVISION 0</p>	



TYPICAL 12 FT. WIDE NEW ADA COMPLIANT PLATFORM PLAN

0 1 2 FT.

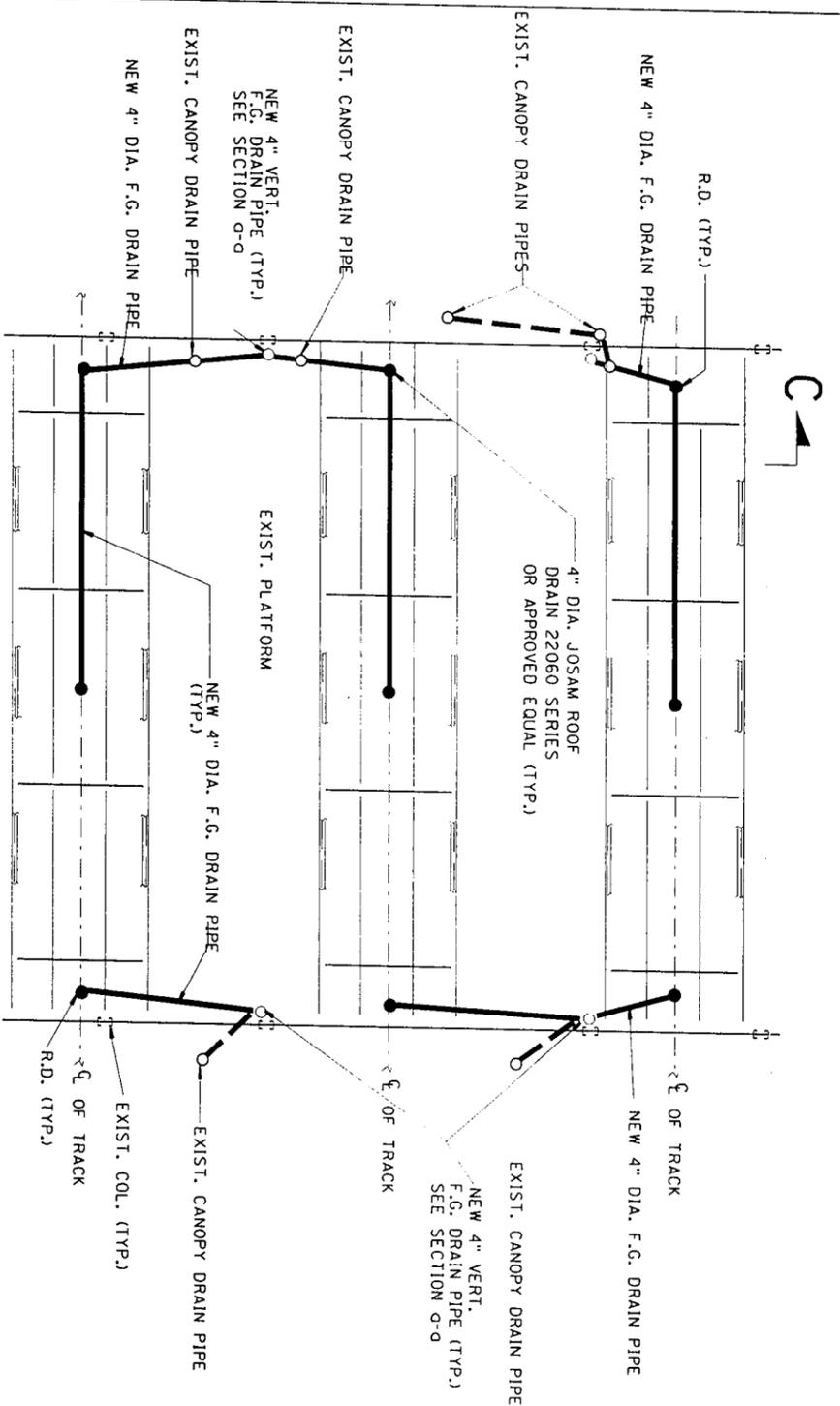


SECTION D

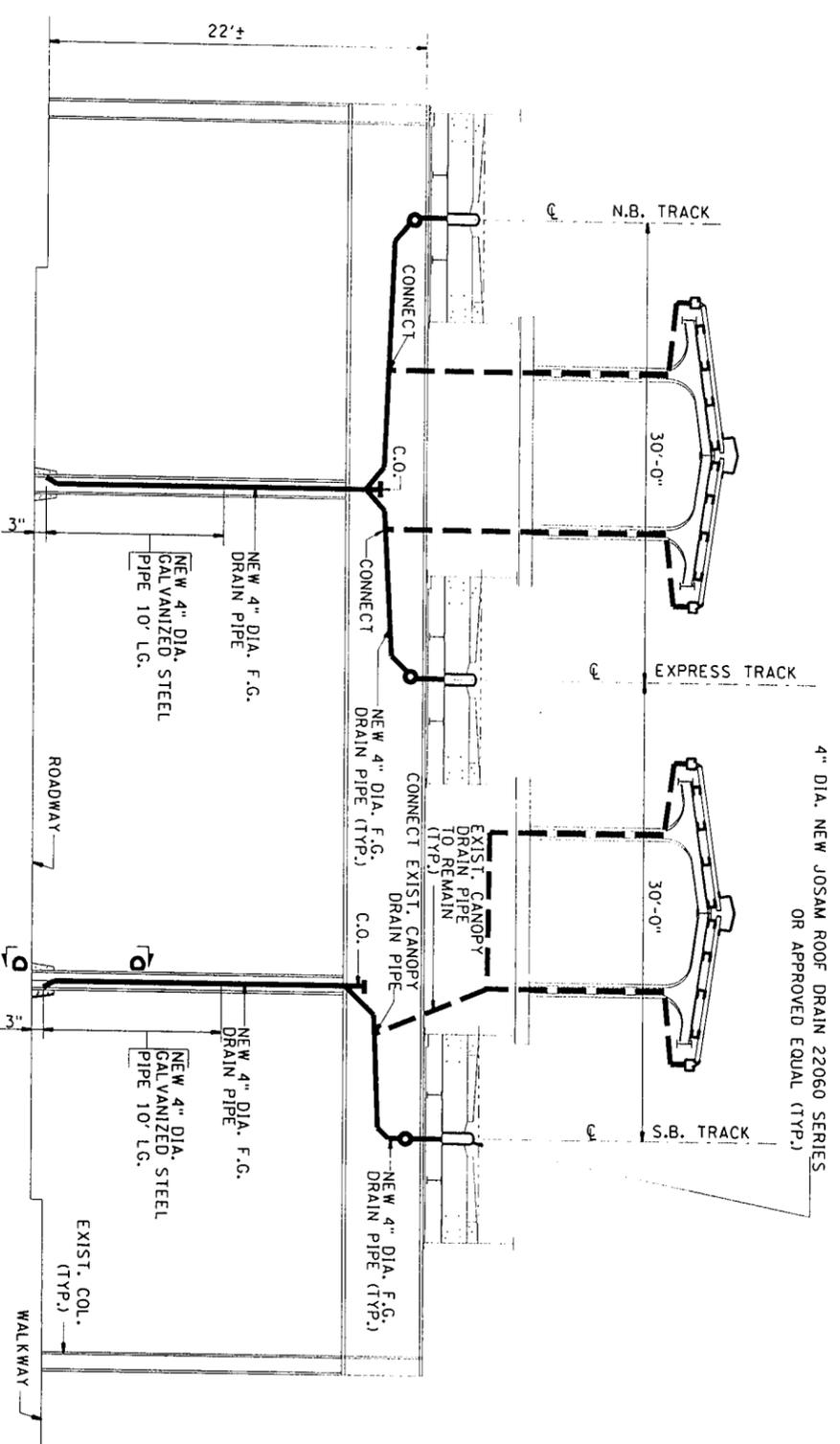
0 6 12 IN.

NOTE:
 ↳ INDICATE MAIN SPAN OF CONC SLAB

<p>New York City Transit Authority</p>		<p>COMMON DETAILS</p> <p>CONTRACTS A-36018,A-36019,A-36020,A-36021,A-36022 REHABILITATION OF 5 STATIONS ON THE FAR ROCKAWAY LINE (IND), BOROUGH OF QUEENS</p>	
<p>DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT STRUCTURAL ENGINEERING</p>		<p>TYPICAL 12 FT. WIDE NEW ADA COMPLIANT PLATFORM SHEET 1 OF 7</p>	
REVISION	0	CONFIRMED DRAWING	DATE: 12/12/08
DESIGNED BY	G. ESTROPIA	SIGNED	DATE: APRIL 25, 2001
CHECKED BY	P. ZHU	SIGNED	DRAWING NO. RC-2532
APPROVED BY	H. LAHIANI	SIGNED	REVISION
			0



PLAN - 2 ISLAND PLATFORMS
N.T.S.



SECTION C-C
(SECTION B-B SIMILAR)
N.T.S.

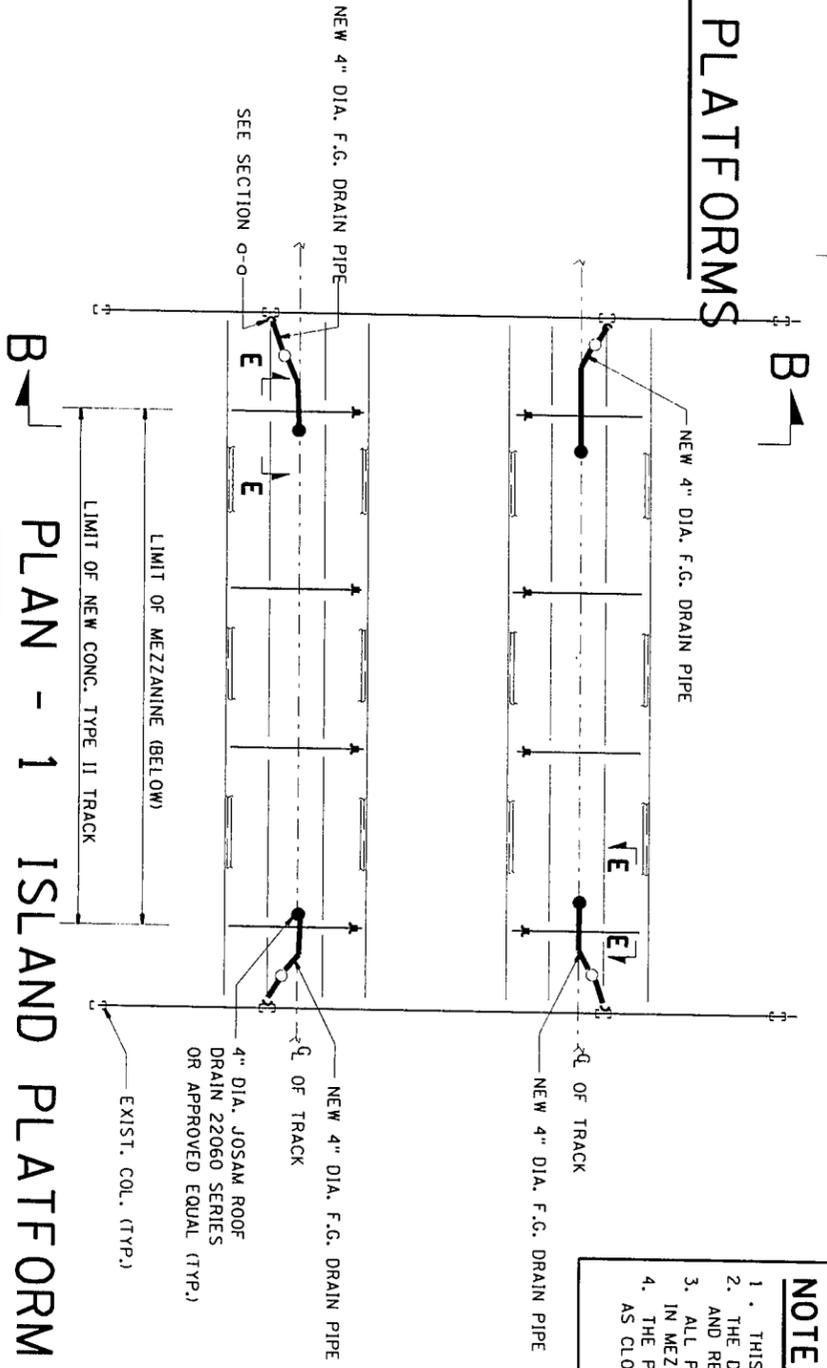
NOTES TO DESIGNER

1. THIS DRAWING IS TO BE USED FOR GENERAL REFERENCE AND GUIDANCE.
2. THE DESIGNER IS TO CHECK THE CONDITION OF EXISTING CANOPY DRAIN PIPES AND REPLACE THEM AS REQUIRED.
3. ALL PIPES ARE TO BE INSTALLED OUTSIDE OF ELECTRICAL DISTRIBUTION ROOM IN MEZZANINES.
4. THE PIPE INSTALLED WITHIN THE MEZZANINE SHALL BE AS CLOSE TO THE CEILING AS POSSIBLE.

LEGEND

- - R.D. = ROOF DRAIN
- ⊥ - C.O. = CLEANOUT

CROSS REFERENCE
FOR SECTIONS O-O & E-E ...SEE REF-CE-103

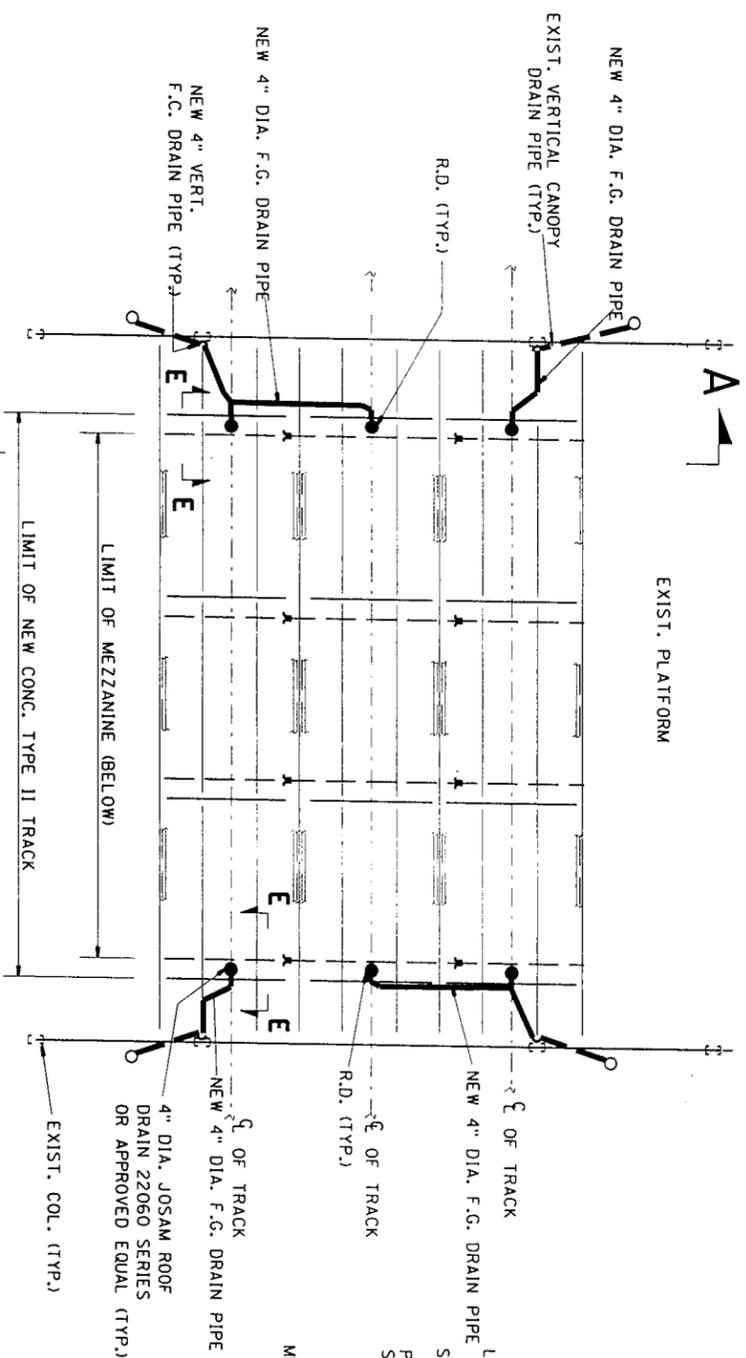


PLAN - 1 ISLAND PLATFORM
N.T.S.

REVISION		DATE		APPROVED	
NO.	DESCRIPTION				

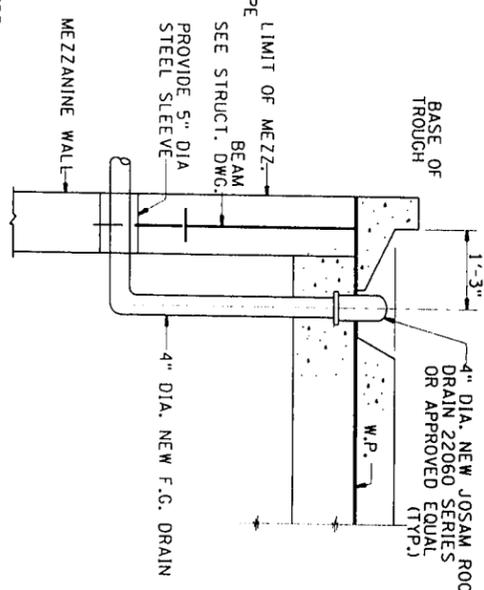
DRAWN BY		COORDINATED BY		DATE	
DESIGNED BY		RECOMMENDED BY		DRAWING NO.	
CHECKED BY		APPROVED BY		RC-2821	
				REVISION	

 NEW YORK CITY TRANSIT AUTHORITY		STANDARD DRAWING	
ENGINEERING AND CONSTRUCTION DEPARTMENT CIVIL ENGINEERING/SPECIFICATIONS DIVISION		THROUGH SPAN ISLAND PLATFORM DRAINAGE	



PLAN - SIDE PLATFORM
N.T.S.

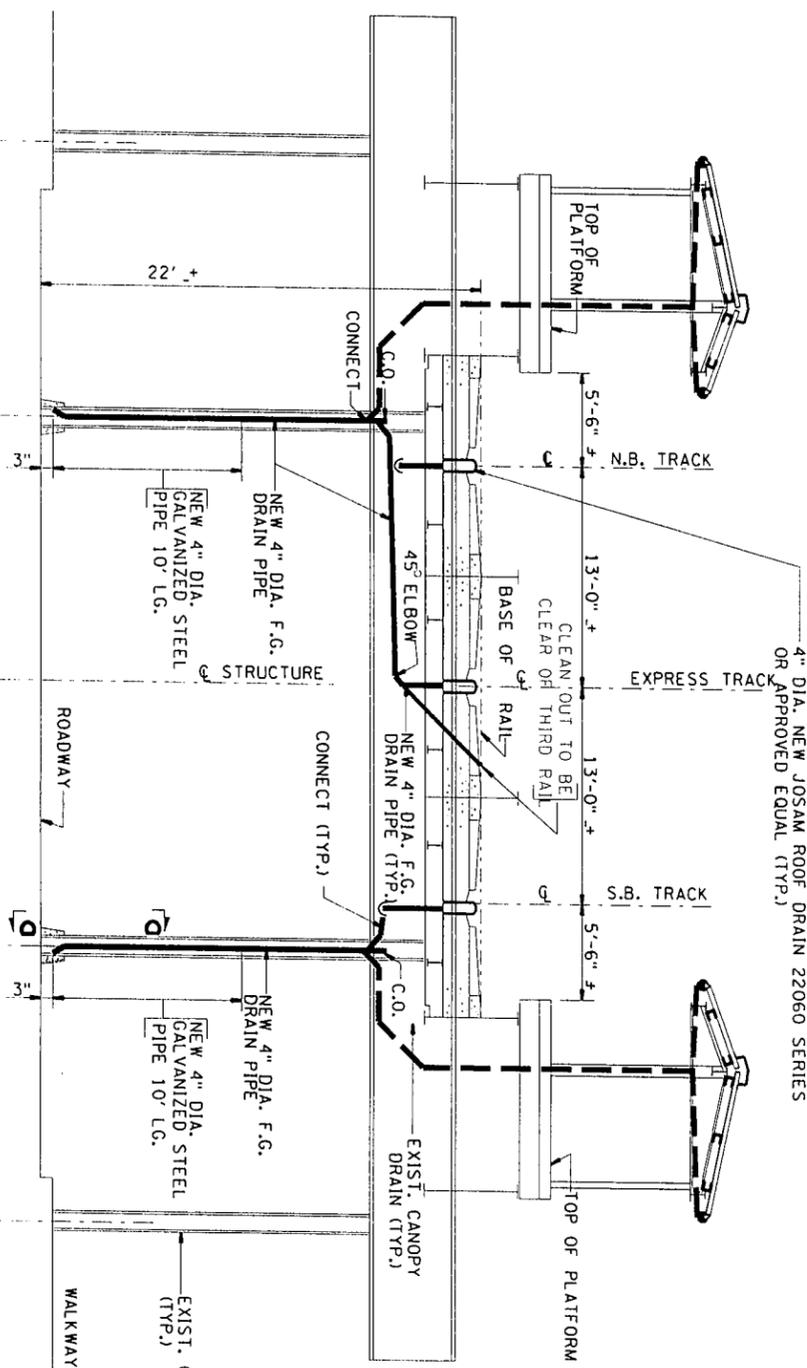
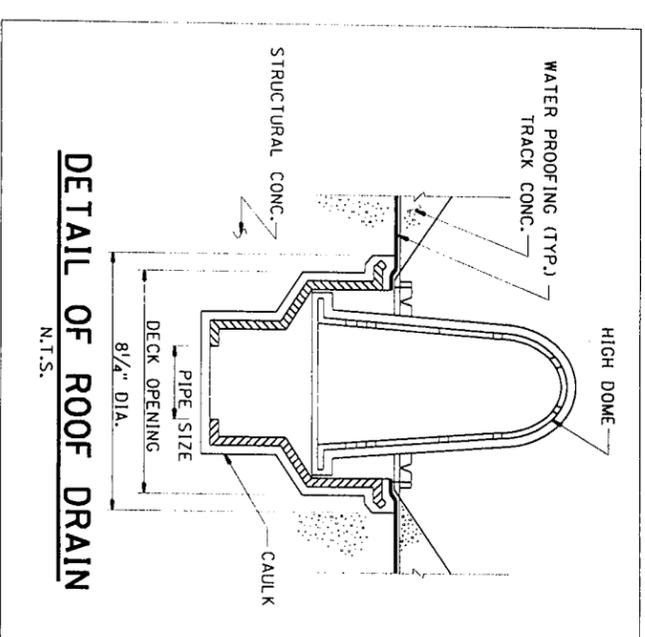
SECTION E-E
N.T.S.



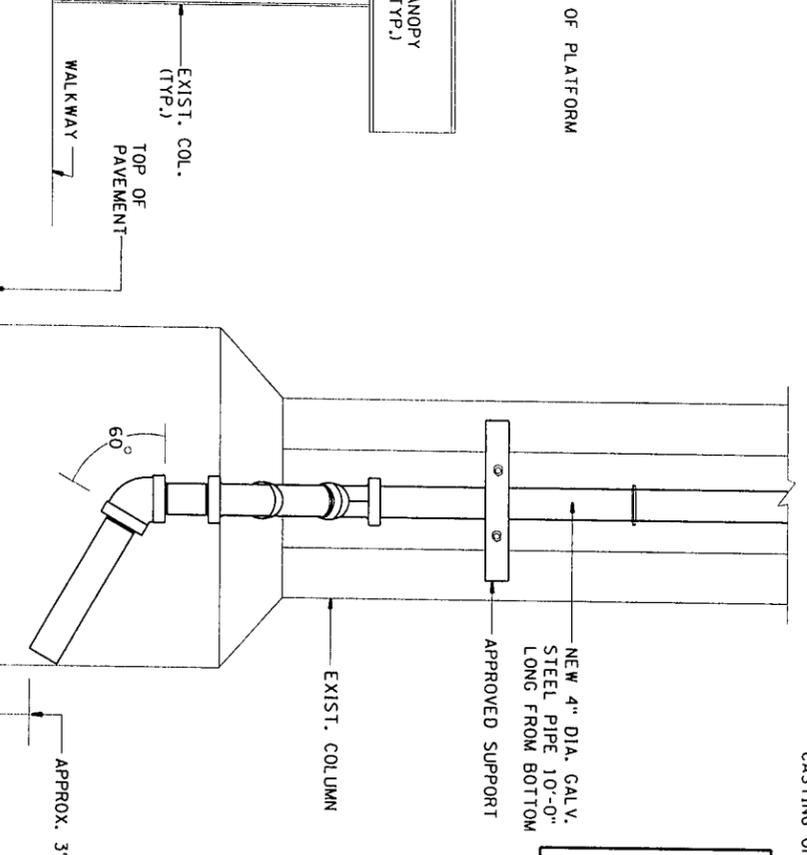
NOTES

1. ALL DIMENSIONS AND CONDITIONS TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
2. ALL PIPES SHALL BE SUPPORTED IN AN APPROVED MANNER AT INTERVALS NOT GREATER THAN 8'.
3. SECTIONS SHOWN ARE TYPICAL. ACTUAL CONFIGURATION MAY VARY ACCORDING TO LOCATION.
4. ADAPTORS AND TRANSITION PIECES SHALL BE PROVIDED AS REQUIRED.
5. ALL LEADERS SHALL HAVE A MINIMUM SLOPE OF 1/4" PER FOOT. FABRICATION AND INSTALLATION OF LEADERS AND ALL APURTANCES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. EXISTING DRAIN PIPE AND SUPPORTS FOR THESE PIPES, DISTURBED DURING CASTING OF NEW TRACK SLAB SHALL BE REPLACED WITH NEW ONES OF THE SAME TYPE.

DETAIL OF ROOF DRAIN
N.T.S.



SECTION A-A
N.T.S.



NOTES TO DESIGNER

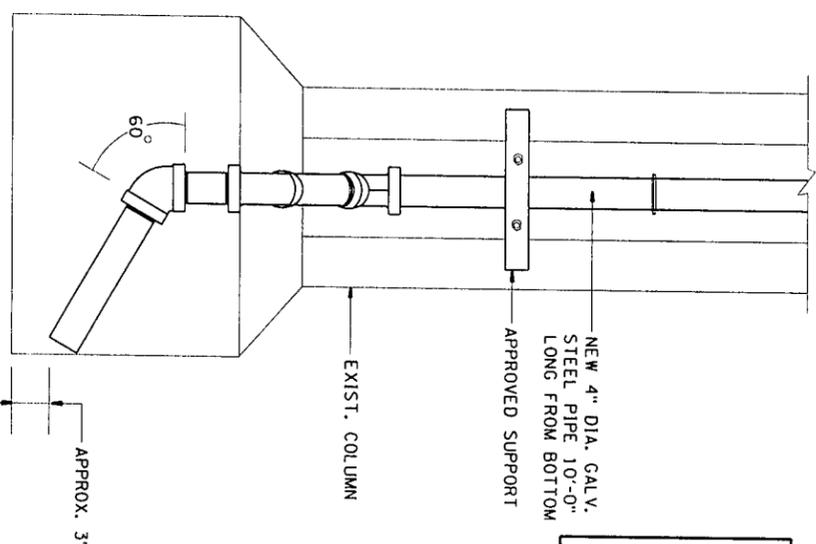
1. THIS DRAWING IS TO BE USED FOR GENERAL REFERENCE AND GUIDANCE.
2. THE DESIGNER IS TO CHECK THE CONDITION OF EXISTING CANOPY DRAIN PIPES AND REPLACE THEM AS REQUIRED.
3. ALL PIPES ARE TO BE INSTALLED OUTSIDE OF ELECTRICAL DISTRIBUTION ROOM IN MEZZANINES.
4. THE PIPE INSTALLED WITHIN THE MEZZANINE SHALL BE AS CLOSE TO THE CEILING AS POSSIBLE.

CROSS REFERENCE

FOR DRAINAGE OF ONE (1) & TWO (2) ISLAND PLATFORMS...SEE REF-CE

- LEGEND**
- - R.D. = ROOF DRAIN
 - C.O. = CLEANOUT

SECTION Q-Q
N.T.S.



<p>NEW YORK CITY TRANSIT AUTHORITY</p>		<p>STANDARD DRAWING</p>	
<p>ENGINEERING AND CONSTRUCTION DEPARTMENT CIVIL ENGINEERING/SPECIFICATIONS DIVISION</p>		<p>THROUGH SPAN SIDE PLATFORM DRAINAGE</p>	
<p>REVISION</p>	<p>DESCRIPTION</p>	<p>DATE</p>	<p>APPROVED</p>
<p>DRAWN BY</p>	<p>COORDINATED BY</p>	<p>DATE</p>	<p>APPROVED</p>
<p>DESIGNED BY</p>	<p>RECOMMENDED BY</p>	<p>DRAWING NO.</p>	<p>RC-2822</p>
<p>CHECKED BY</p>	<p>APPROVED BY</p>	<p>REVISION</p>	

DRAIN INLETS & FLOOR CLEANOUTS

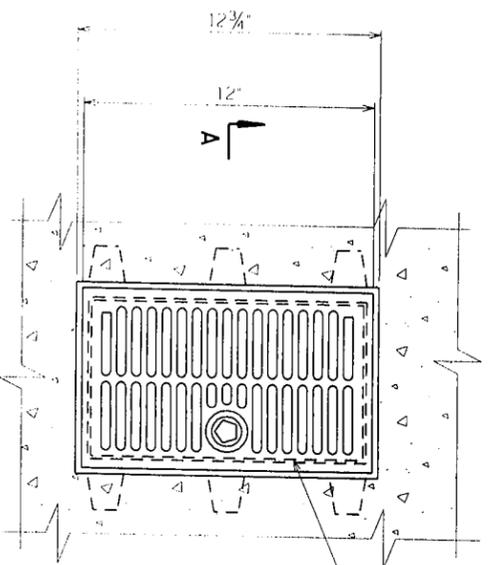
- DRAIN INLET FRAME AND COVER SHALL BE REMOVED AND REPLACED WITH A NEW CAMPBELL FOUNDRY PATTERN 9554 OR NEENAH R-4938-B. SET THE NEW ELEVATION TO MATCH WITH THE TOP ELEVATION OF THE NEW TILE FLOOR. REFER TO ARCHITECTURAL DRAWINGS.
- DRAIN INLET INDICATED TO BE REMOVED ONLY WILL NOT BE REPLACED.
 - WHERE A SINGLE PIPE ROUTES FROM THE DRAIN INLET; THAT PIPE SHALL BE EXPOSED, CUT BACK AND CAPPED/PLUGGED. WHEN THE PIPING IS EXPOSED TO VIEW ALL SUCH PIPING SHALL BE REMOVED.
 - WHERE TWO OR MORE PIPES ROUTE FROM THE DRAIN INLET; THE PIPING SHALL NOT BE DISTURBED AND THE INLET BOX SHALL BE APPROPRIATELY COVERED TO ACCEPT THE NEW FLOORING MATERIAL. (PIPING IS TO REMAIN ACTIVE).
- NEW DRAIN INLET WITH NEW FRAME AND COVER ASSEMBLY, NEW INLET BOX AND NEW PIPING AS INDICATED. (AS PER DETAIL ON THIS DRAWING)
- FLOOR CLEANOUT SHALL BE REMOVED AND REPLACED WITH NEW CLEANOUT WHICH SHALL BE SET TO MATCH THE ELEVATION OF THE NEW TILE FLOORING.
- CONTRACTOR SHALL FLUSH ALL EXISTING DRAIN INLETS AND THEIR PIPING WITH 1000 PSI WATER JET STREAM BY USING A MUSTANG UNIT COMPANY D-141B 'DOMINATOR' PACKAGE WITH 150 FEET JETTER FLEX HOSE, AVAILABLE VIA 1-800 624-5934 OR APPROVED EQUAL. IF, DURING THE CLEANING PROCESS, ANY SEGMENT OF DRAIN PIPE CANNOT BE CLEANED OUT BY USING THE WATERJET, THE CONTRACTOR SHALL USE BLADE-TYPE ROTO-ROOTER TO CLEAN THE DRAIN BLOCKAGE. IN CASE THE BLOCKAGE OF PIPE CANNOT BE REMOVED BY ROTO-ROOTER OR PIPE IS DAMAGED DURING THIS OPERATION, THE CONTRACTOR SHALL REPLACE SUCH SEGMENT OF PIPE.
- AFTER CLEANING EACH PIPE SHALL BE TESTED AS INDICATED IN ITEM BELOW.
- ALL DRAIN INLETS, DRAIN BOXES AND THEIR PIPING SHALL THEN BE REFUSHED, AS & WHEN REQUIRED BY THE T.A. REPRESENTATIVE DURING THE COURSE OF THE CONSTRUCTION.
- AT THE END OF CONSTRUCTION, AT AN APPROPRIATE TIME DETERMINED BY THE T.A. REPRESENTATIVE, ALL DRAIN INLETS SHALL AGAIN BE FLUSHED AS PER ITEM 5 ABOVE IN THE PRESENCE OF THE T.A. REPRESENTATIVE. THE EQUIPMENT SPECIFIED IN PARAGRAPH - 5 ABOVE SHALL BE THEN TURNED OVER TO THE T.A. REPRESENTATIVE.
- REFER TO EXISTING DRAINAGE DRAWING/S WHICH MAY BE INCLUDED AS REFERENCE DRAWING/S TO THIS SET OR REQUEST SAME FROM NYCT.
- WORK DESCRIBED IN ITEM #5 SHALL BE PERFORMED WITHIN 6 MONTHS OF THE START OF WORK SO AS TO FIND ANY PIPE BLOCKAGES ETC. EARLY IN THE PROJECT.

LEGEND:

- N NEW INLET PER NOTE 3 ABOVE
- D INLET FRAME AND COVER TO BE REMOVED AND REPLACED PER NOTE 1 ABOVE
- FCO FLOOR CLEANOUT TO BE REMOVED AND REPLACED PER NOTE 4 ABOVE
- FCO-NW FLOOR CLEANOUT TO REMAIN AS IS
- D EXISTING INLET WHOSE FRAME AND GRATE, INLET BOX AND PIPING TO REMAIN AS IS
- M INLET TO BE REMOVED AND REPLACED PER NOTE 1 ABOVE AND INLET BOX SHAPE SHALL BE MODIFIED AS REQUIRED TO MATCH THE NEW FRAME & COVER
- R INLET TO BE REMOVED PER NOTE 2 ABOVE
- FCO-N NEW FLOOR CLEANOUT
- FCO-R REMOVE FLOOR CLEANOUT

SIDEWALK VENTILATORS DRIP PAN DRAINAGE

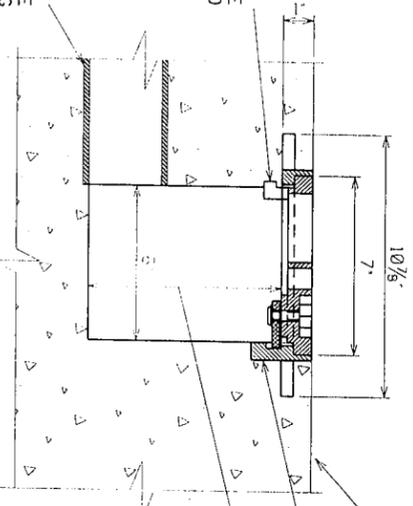
- EXISTING CONCRETE VENTILATOR DRIP 'PANS' ARE TO BE SCRAPPED CLEAN. ALL DEBRIS SHALL BE REMOVED AND THE 'PANS' SHALL BE BROOM CLEANED.
- ALL EXISTING DRAIN PIPING, STARTING AT THE DOMED INLETS, FROM THESE VENTILATOR DRIP 'PANS' ARE TO BE HIGH PRESSURE WATER JET FLUSHED, EMPLOYING THE EQUIPMENT IDENTIFIED IN NOTE 5 ABOVE.
- AFTER CLEANING EACH PIPE SHALL BE TESTED BY FLOODING THE DRAIN INLET AND THE PIPING SYSTEM TO SEE THAT WATER CAN FLOW AT 6 GPM RATE FOR A 3" PIPE, 20 GPM FOR A 4" PIPE AND 100 GPM FOR A 6" PIPE. SUCH TESTING SHALL BE DONE IN THE PRESENCE OF THE T.A. REPRESENTATIVE.
- ALL DOMED COVERS TO THE INLETS SHALL BE REPLACED. DOMED COVERS SHALL BE SIMILAR TO CAMPBELL FOUNDRY PATTERN 9604-0252.
- REFER TO EXISTING DRAINAGE DRAWING/S WHICH MAY BE INCLUDED AS REFERENCE DRAWING/S TO THIS SET.
- WORK DESCRIBED IN ITEMS #2 & #3 SHALL BE PERFORMED WITHIN 6 MONTHS OF THE START OF WORK SO AS TO FIND ANY PIPE BLOCKAGES ETC. EARLY IN THE PROJECT.



NEENAH R-4938-B OR CAMPBELL 9554

NOTCH CONCRETE AS REQUIRED

3" EHCI OR SCH 80 GALV. STEEL PIPE (NUMBER AND ROUTING VARIES. SEE PLANS)

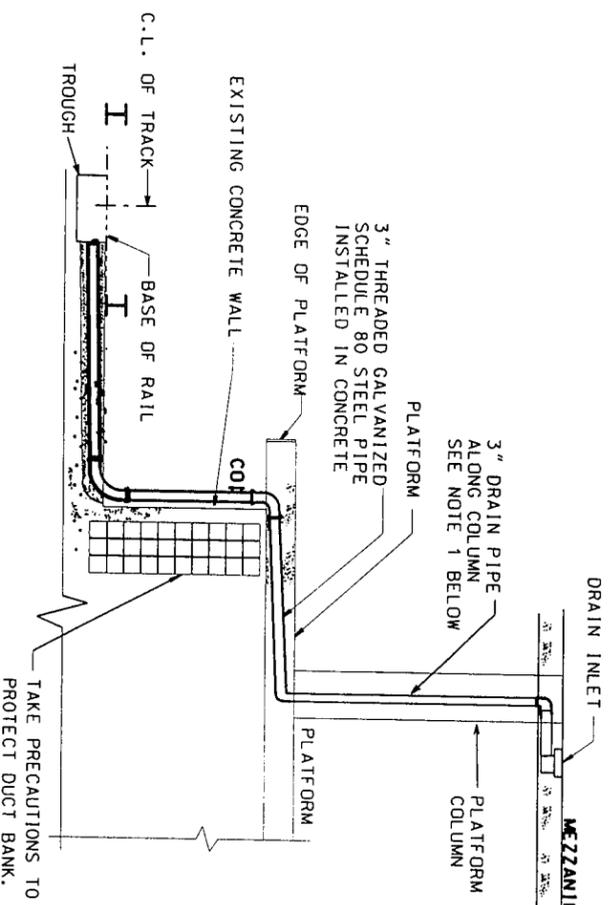


DRAIN INLET CONSIST OF FRAME WITH GRATE, CONCRETE BOX AND PIPING

FINISHED FLOOR (MATERIAL VARIES. SEE PLANS)

NOTCH CONCRETE AS REQUIRED

6" x 11" CONCRETE BOX - DEPTH - 6" PREFERRED (MIN 4") - DEPTH TO ACCOMMODATE SLOPE OF PIPING TO/FROM BOX



3" DRAIN PIPE ALONG COLUMN SEE NOTE 1 BELOW

3" THREADED GALVANIZED SCHEDULE 80 STEEL PIPE INSTALLED IN CONCRETE

EDGE OF PLATFORM

EXISTING CONCRETE WALL

C.L. OF TRACK

BASE OF RAIL

TROUGH

MEZZANINE

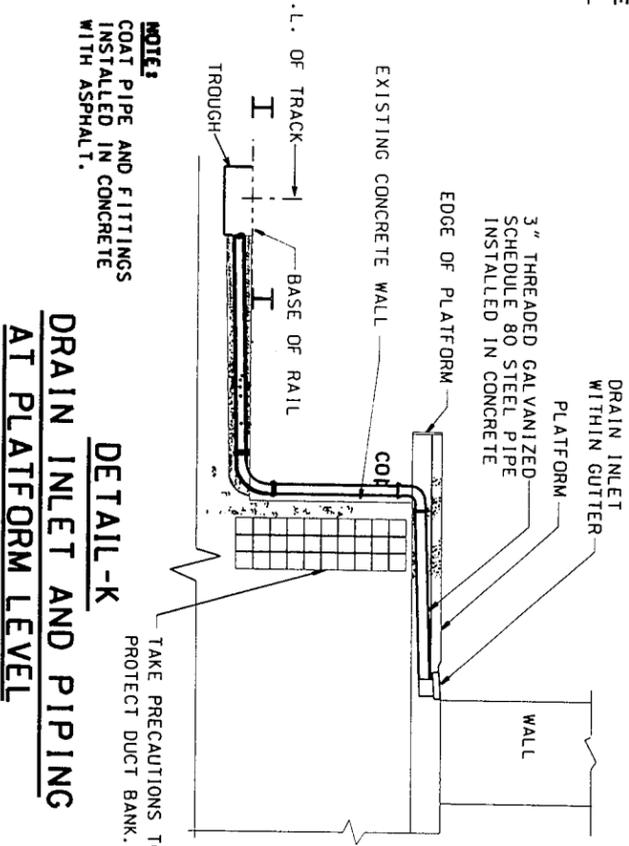
PLATFORM COLUMN

PLATFORM

TAKE PRECAUTIONS TO PROTECT DUCT BANK.

NOTE:

- ALTERNATE ROUTING AT PLATFORM LEVEL MAY BE BEHIND PLATFORM WALL SEE PLANS FOR SPECIFIC STATION.
- REMOVE/REPLACE CONCRETE AS REQUIRED.



NOTE:

- SIMILAR DETAIL FOR DRAIN INLETS IN CONTROL AREAS AT PLATFORM LEVELS.
- REMOVE/REPLACE CONCRETE AS REQUIRED.

CONSULTANTS NOTE :

- IN NYCT IN-HOUSE PROJECTS, STATION DRAINAGE WORK IS DESIGNED BY THE HYDRAULICS GROUP OF THE STRUCTURAL ENGINEERING SUBDIVISION.
- IN A CONSULTANTS' OFFICE, THIS WORK IS USUALLY DESIGNED BY PLUMBING DESIGNERS.
- THE WORK WILL BE LIKELY PERFORMED IN THE FIELD BY THE PLUMBING SUB CONTRACTOR.
- CONSULTANT MAY CONVERT THIS DRAWING TO A PLUMBING DRAWING. INCLUDE IN HIS SET ALONG WITH OTHER CONSULTANT PREPARED DRAINAGE DRAWINGS.
- CONSULTANT IS TO EMPLOY THE LEGEND SYMBOLS & DESIGN TECHNIQUE OF THIS DRAWING.
- SPECIFICATION DIVISION 1580 IS THE APPLICABLE SPECIFICATION.



New York City
Transit Authority

DEPARTMENT OF
CAPITAL PROGRAM
MANAGEMENT

CIVIL/STRUCTURAL ENGINEERING

STATION DRAINAGE DETAILS & NOTES

REVISION	DESCRIPTION	DATE	APPROVED
1			
2			

CONTRACT XXXXXXXX

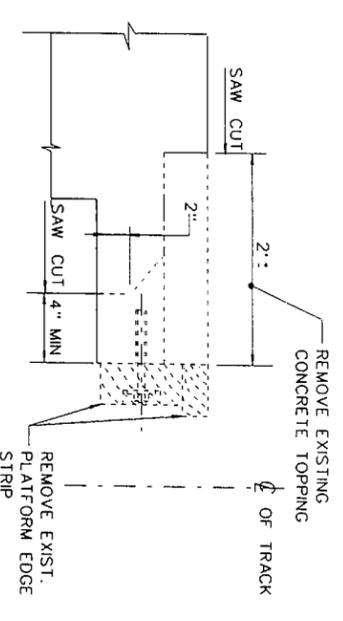
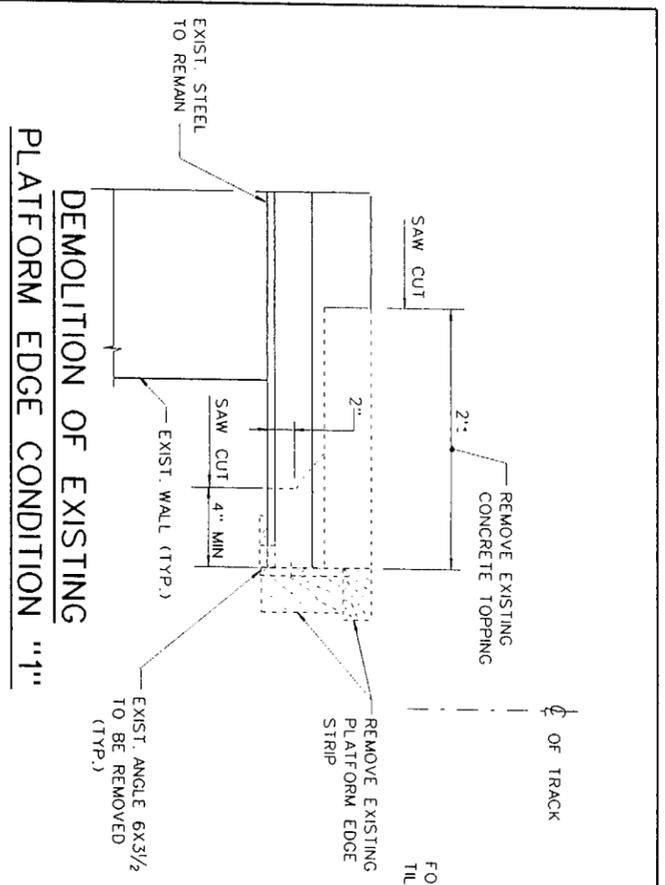
XXXXXXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

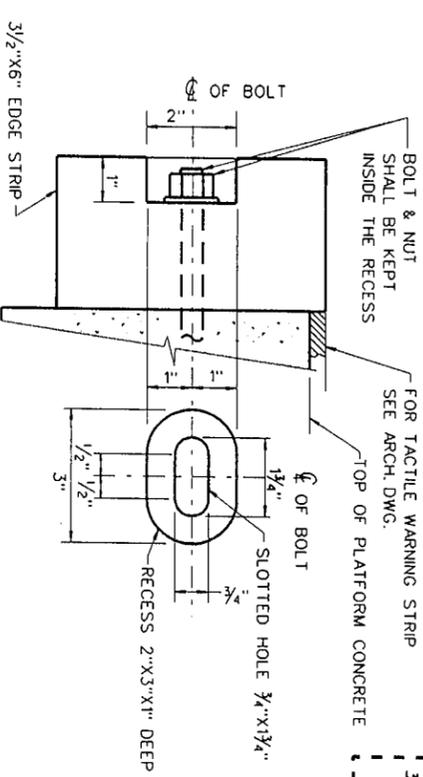
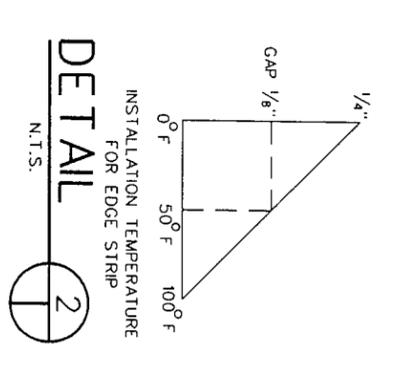
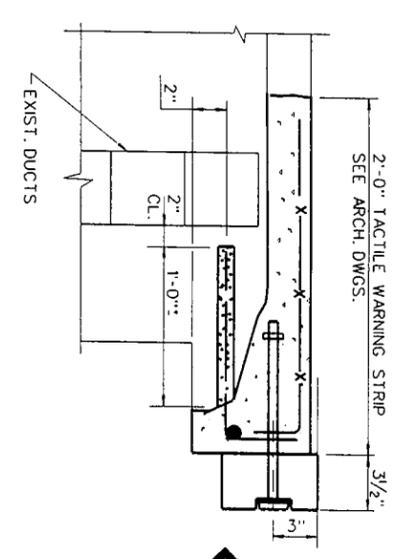
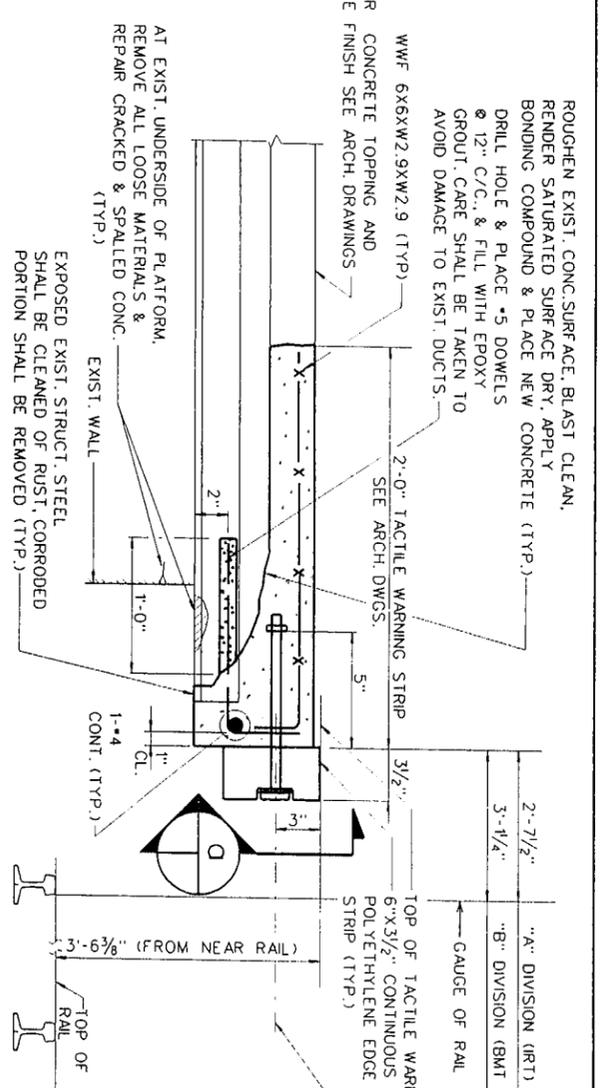
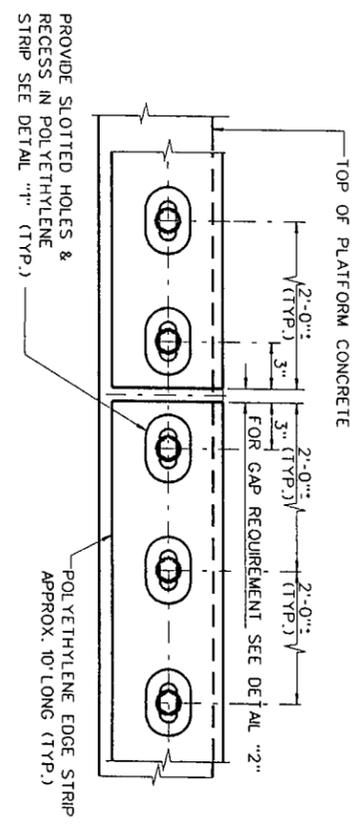
DRAWN BY		DATE	SEPT. 29, 2000
DESIGNED BY		DRAWING NO.	RC-2813
CHECKED BY	L. DAY	REVISION	
APPROVED BY	H. LAKHANI		

XXX



SECTION 9

N.T.S.



NOTES:

1. THE CONTRACTOR SHALL HIRE A NY STATE LICENSED SURVEYOR TO SURVEY THE FOLLOWING POINTS:
 - a. FIELD SIDE OF BOTH RUNNING RAILS
 - b. ENDS OF CONTACT RAILS (IF ANY) (X AND Y COORD. ONLY)
 - c. CONC. EDGE OF PLATFORM
 - d. FREE EDGE OF EXIST. PLATFORM EDGE STRIP
 - e. TOP FLANGE OF TRACK STRINGER (ELEVATED STRUCTURE ONLY)
 2. THE SURVEY SHALL EXTEND FOR THE ENTIRE LENGTH OF THE PLATFORM PLUS MINIMUM 150 FT. DISTANCE BEYOND END OF PLATFORM IN BOTH DIRECTIONS. SURVEY TO BE TAKEN AT 10 FT. INTERVALS ALONG TANGENT TRACK AND 5 FT. INTERVALS ON CURVED TRACK AND IN ADA BOARDING AREA FOR THE LAST 25 FEET OF THE PLATFORM. SURVEY PLATFORM AND EDGE STRIP AT 5 FT. INTERVALS.
 3. ALL POINTS SHOULD CONTAIN 3 DIMENSIONS (X, Y, AND Z) OF DATA, UNLESS OTHERWISE NOTED. SURVEY IS TO BE SUBMITTED IN DGN AND EXCEL FORMATS.
 4. SURVEY IS TO BE CONDUCTED BOTH BEFORE AND AFTER PLATFORM EDGE WORK. IF TRACKS ARE BEING RECONSTRUCTED/ADJUSTED, THIS WORK MUST BE DONE BEFORE NEW PLATFORM EDGE IS CONSTRUCTED. IN THIS CASE AN ADDITIONAL SURVEY IS TO BE PERFORMED AFTER TRACK WORK PRIOR TO PLATF. EDGE WORK.
 5. A DRAWING FOR THE NEW PLATFORM EDGE SHOWING ALL THE VERTICAL AND HORIZONTAL CLEARANCES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BY NYCT, M.O.W. TRACK ENGINEERING PRIOR TO INSTALLATION.
 6. CONCRETE SHALL BE EARLY STRENGTH WITH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI. WHEN TESTED AT 12 HOURS.
 7. CARE SHOULD BE TAKEN TO AVOID DAMAGE TO EXISTING DUCTS WHEN DRILLING FOR DOWEL INSTALLATION.
 8. FOR ADDITIONAL DETAILS, SEE SPECIFICATION SECTION - 6E
 9. THE EDGE STRIP SHALL BE YELLOW POLYETHYLENE EDGE STRIP, "AR" UHMW 819 AS MANUFACTURED BY ULTRA-POLY, INC. OR APPROVED EQUAL. TOP SURFACE OF THE STRIP SHALL BE ROUGHENED BY SCARIFICATION.
 10. FOR PLATFORM EDGE STRIP INSTALLATION AT THE ADA BOARDING AREA, SEE DRAWING NO. C-XX.
- NOTES TO DESIGNER:**
1. DETAILS SHOWN ON THIS DRAWING ARE FOR REFERENCE ONLY. THE EXISTING PLATFORM EDGE CONDITIONS AT INDIVIDUAL STATIONS SHOULD BE THOROUGHLY INVESTIGATED AND THE DETAILS MODIFIED AS REQUIRED.
 2. DURING DESIGN PERFORM SURVEY AT 10 FT. INTERVALS ALONG ENTIRE LENGTH OF THE PLATFORM AND AT LEAST 150 FT. BEYOND EACH END AS FOLLOWS:
 - (a) EXISTING BASE OF RAIL ELEVATION AND TOP OF PLATFORM CONC. EDGE ELEV. TO DETERMINE EXISTING PLATFORM HEIGHT.
 - (b) EXISTING PLATFORM CONCRETE EDGE TO CENTER LINE OF EXISTING TRACK TO DETERMINE EXISTING HORIZONTAL CLEARANCE.
 - (c) FOR ELEVATED STRUCTURE, TOP OF THE STRINGERS SUPPORTING THE TRACK ADJACENT TO THE PLATFORM.
 - (d) ADJACENT RIGHT OF WAY EQUIPMENTS AND APPURTENANCES.
 3. INFORMATION OBTAINED IN NOTE #2 SHALL BE FORWARDED TO LOW TRACK ENGINEERING FOR THEIR EVALUATION AND IF REQUIRED, PREPARATION OF CONTRACT DRAWINGS.

REVISION	DESCRIPTION	DATE	APPROVED

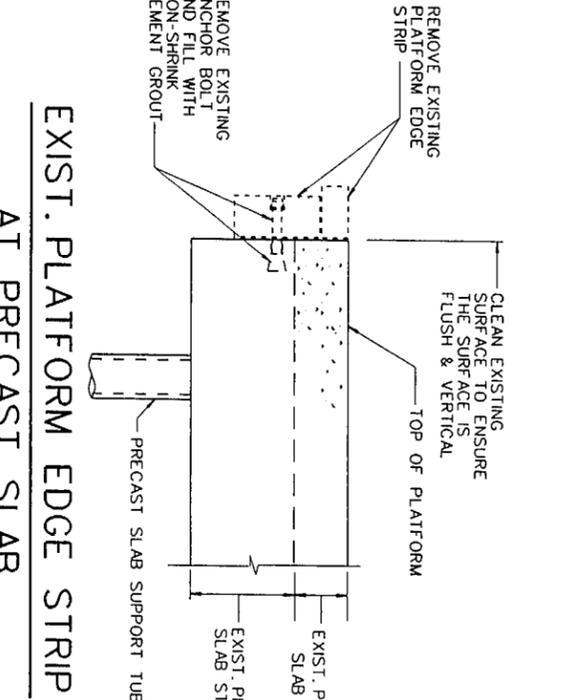
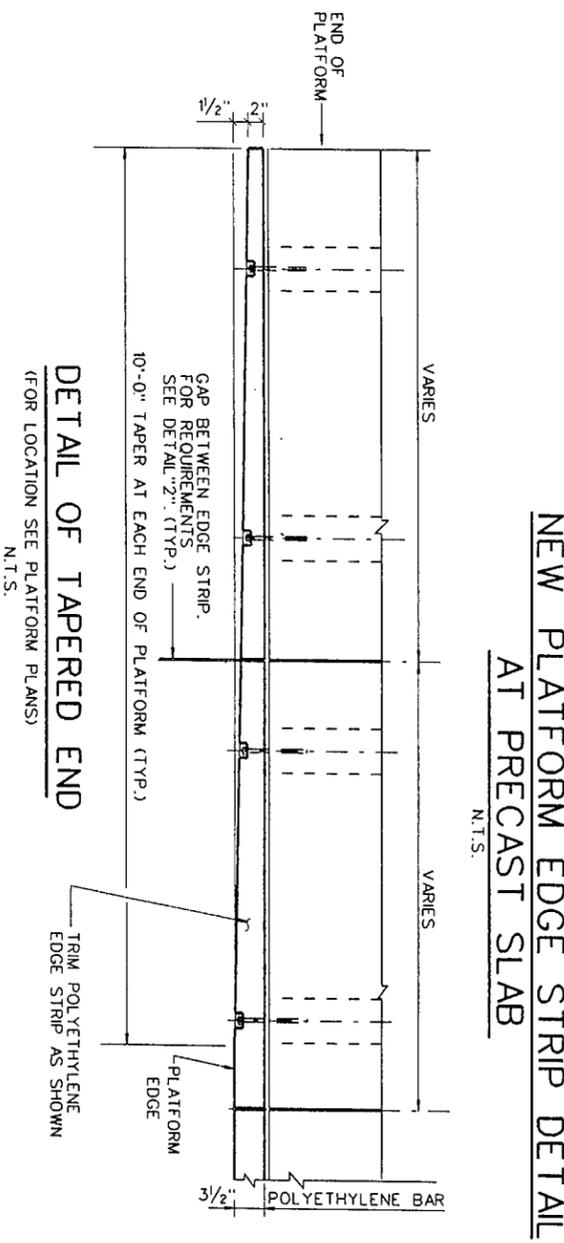
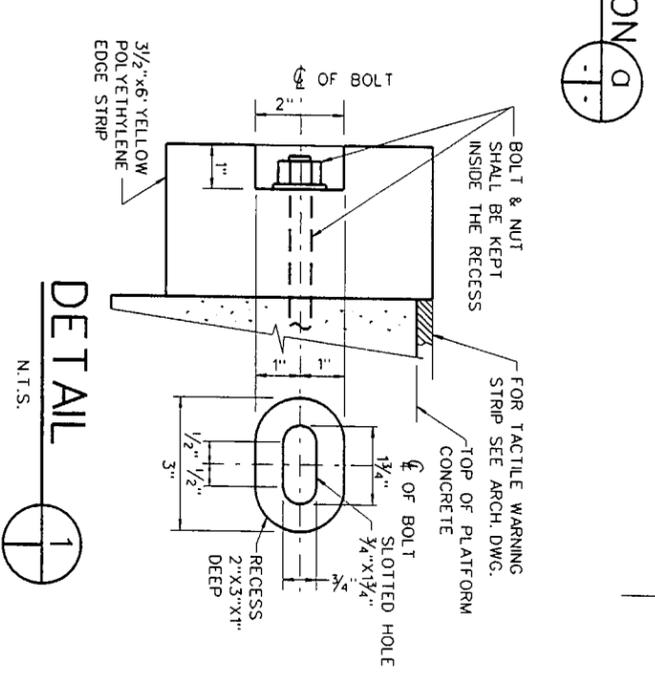
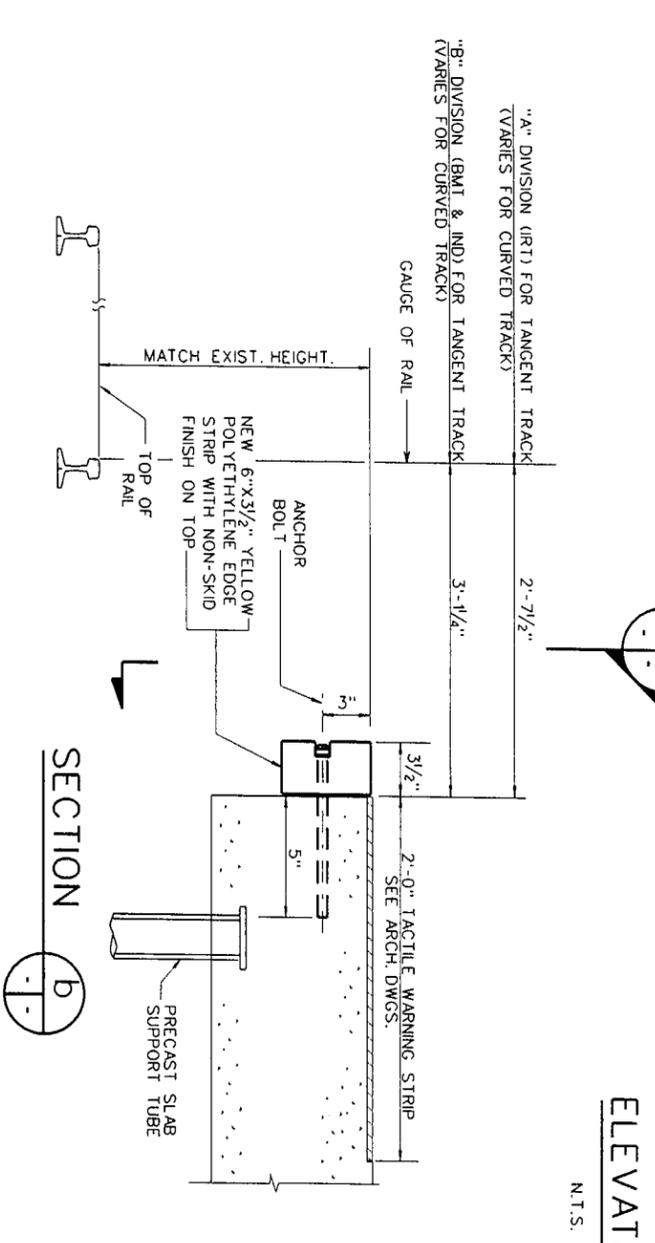
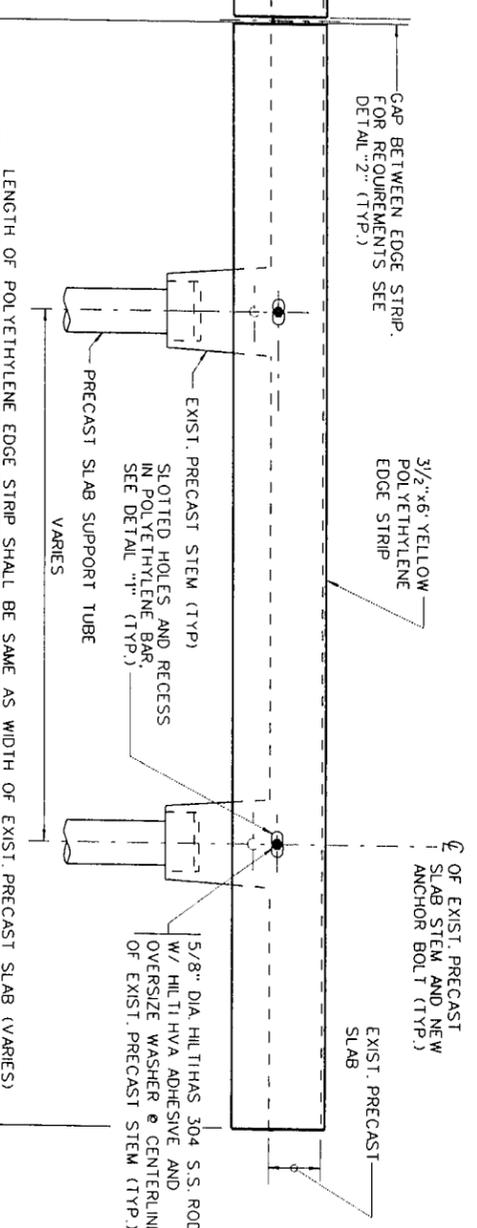
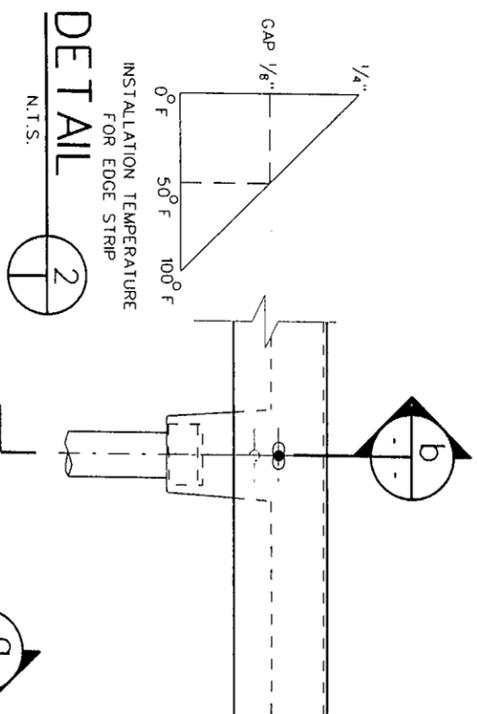
CONTRACT X-XXXXX
(FOR STATION REHABILITATION/
PLATFORM EDGE CONTRACTS)

DEPARTMENT OF CAPITAL PROGRAM MANAGEMENT
New York City Transit Authority
ANSI

CIVIL/STRUCTURAL ENGINEERING
PLATFORM EDGE STRIP DETAILS BEYOND ADA BOARDING AREA CAST-IN-PLACE SLAB (A & B DIVISIONS)

DESIGNED BY	NAME	DATE: XXX, X, 2000
CHECKED BY	NAME	
APPROVED BY	NAME	

DRAWING NO. REF-1

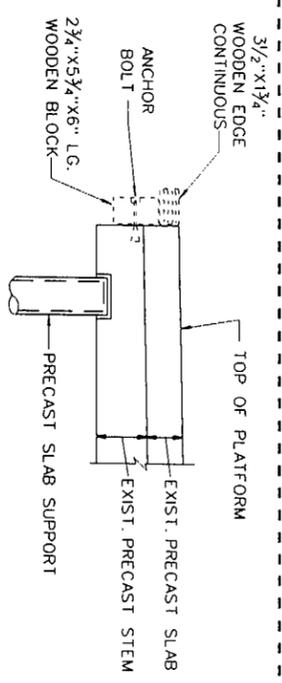


- NOTES:**
1. THE CONTRACTOR SHALL HIRE A NY STATE LICENSED SURVEYOR TO SURVEY THE FOLLOWING POINTS:
 - a. FIELD SIDE OF BOTH RUNNING RAILS
 - b. ENDS OF CONTACT RAILS (IF ANY) (X AND Y COORD. ONLY)
 - c. CONC. EDGE OF PLATFORM
 - d. FREE EDGE OF EXIST. PLATFORM EDGE STRIP
 - e. TOP FLANGE OF TRACK STRINGER (ELEVATED STRUCTURE ONLY)
 2. THE SURVEY SHALL EXTEND FOR THE ENTIRE LENGTH OF THE PLATFORM PLUS MINIMUM 150 FT. DISTANCE BEYOND END OF PLATFORM IN BOTH DIRECTIONS. SURVEY TO BE TAKEN AT 10 FT. INTERVALS ALONG TANGENT TRACK AND 5 FT. INTERVALS ON CURVED TRACK AND IN ADA BOARDING AREA. FOR THE LAST 25 FEET OF THE PLATFORM, SURVEY PLATFORM AND EDGE STRIP AT 5 FT. INTERVALS.
 3. ALL POINTS SHOULD CONTAIN 3 DIMENSIONS (X, Y, AND Z) OF DATA, UNLESS OTHERWISE NOTED. SURVEY IS TO BE SUBMITTED IN DGN AND EXCEL FORMATS.
 4. SURVEY IS TO BE CONDUCTED BOTH BEFORE AND AFTER PLATFORM EDGE WORK.
 5. IF TRACKS ARE BEING RECONSTRUCTED/ADJUSTED, THIS WORK MUST BE DONE BEFORE NEW PLATFORM EDGE IS CONSTRUCTED. IN THIS CASE, AN ADDITIONAL SURVEY IS TO BE PERFORMED AFTER TRACK WORK PRIOR TO PLATF. EDGE WORK.
 6. A DRAWING FOR THE NEW PLATFORM EDGE SHOWING ALL THE VERTICAL AND HORIZONTAL CLEARANCES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BY NYCT, M.O.W. TRACK ENGINEERING PRIOR TO INSTALLATION.
 7. CONCRETE SHALL BE EARLY STRENGTH WITH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI. WHEN TESTED AT 12 HOURS.
 8. CARE SHOULD BE TAKEN TO AVOID DAMAGE TO EXISTING DUCTS WHEN DRILLING FOR DOWEL INSTALLATION.
 9. FOR ADDITIONAL DETAILS, SEE SPECIFICATION SECTION - 6E
 10. THE EDGE STRIP SHALL BE YELLOW POLYETHYLENE EDGE STRIP, "AR" UHMW • 819 AS MANUFACTURED BY ULTRA-POLY, INC. OR APPROVED EQUAL. TOP SURFACE OF THE STRIP SHALL BE ROUGHENED BY SCARIFICATION. TOP SURFACE OF PLATFORM EDGE STRIP INSTALLATION AT THE ADA BOARDING AREA, SEE DRAWING NO. C-XX.
- NOTES TO DESIGNER:**
1. DETAILS SHOWN ON THIS DRAWING ARE FOR REFERENCE ONLY. THE EXISTING PLATFORM EDGE CONDITIONS AT INDIVIDUAL STATIONS SHOULD BE THOROUGHLY INVESTIGATED AND THE DETAILS MODIFIED AS REQUIRED.
 2. DURING DESIGN PERFORM SURVEY AT 10 FT. INTERVALS ALONG ENTIRE LENGTH OF THE PLATFORM AND AT LEAST 150 FT. BEYOND EACH END AS FOLLOWS:
 - (a) EXISTING BASE OF RAIL ELEVATION AND TOP OF PLATFORM CONC. EDGE ELEV. TO DETERMINE EXISTING PLATFORM HEIGHT.
 - (b) EXISTING PLATFORM CONCRETE EDGE TO CENTER LINE OF EXISTING TRACK TO DETERMINE EXISTING HORIZONTAL CLEARANCE.
 - (c) FOR ELEVATED STRUCTURE, TOP OF THE STRINGERS SUPPORTING THE TRACK ADJACENT TO THE PLATFORM.
 - (d) ADJACENT RIGHT OF WAY EQUIPMENTS AND APPURTENANCES.
 3. INFORMATION OBTAINED IN NOTE #2 SHALL BE FORWARDED TO MOW TRACK ENGINEERING FOR THEIR EVALUATION AND IF REQUIRED, PREPARATION OF CONTRACT DRAWINGS.

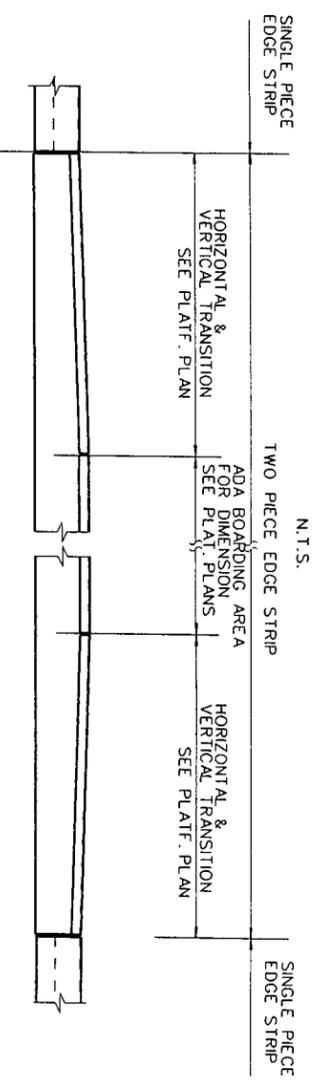
PLATFORM EDGE STRIP DETAILS
(BEYOND ADA BOARDING AREA)
PRECAST SLAB (A & B DIVISIONS)

NOTES IN DESCRIPTION:

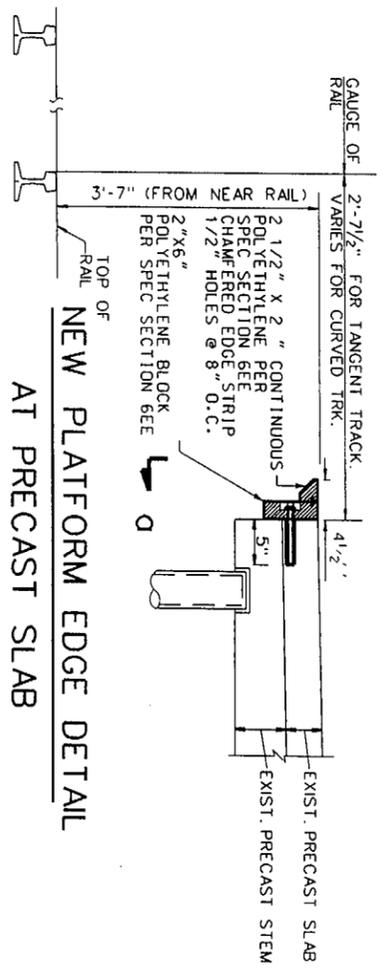
1. DETAILS SHOWN ON THIS DRAWING ARE FOR REFERENCE ONLY. THE PROPOSED ADA BOARDING ZONES AT INDIVIDUAL STATIONS SHOULD BE DETERMINED AND DETAILS MODIFIED TO MEET REQUIREMENTS OF 1/8/09 AND 1/8/09 AND THE EQUIPMENT CLEARANCES.
2. DURING DESIGN, PERFORM SURVEY AT 10 FT INTERVALS ALONG ENTIRE LENGTH OF THE PLATFORM AND AT LEAST 150 FT FROM EACH END AS FOLLOWS:
 - (a) EXISTING BASE OF RAIL ELEVATION AND TOP OF PLATFORM CONCRETE ELEVATION TO DETERMINE EXISTING PLATFORM HEIGHT
 - (b) EXISTING PLATFORM CONCRETE EDGE TO CENTER LINE OF EXISTING TRACK TO DETERMINE EXISTING HORIZONTAL CLEARANCE.
 - (c) FOR ELEVATED STRUCTURE, TOP OF THE STRINGERS SUPPORTING THE TRACK ADJACENT TO THE PLATFORM.
 - (d) ADJACENT RIGHT OF WAY EQUIPMENTS AND APPURTENANCES.
3. INFORMATION OBTAINED IN NOTE #2 SHALL BE FORWARDED TO MOW TRACK ENGINEERING FOR THEIR EVALUATION AND IF REQUIRED, PREPARATION OF CONTRACT DRAWINGS.
4. FOR PLATFORMS WHICH ARE CONSTRUCTED ENTIRELY AT ADA HEIGHT, REMOVE "TYPICAL PLATFORM EDGE STRIP ELEVATION" AND REPLACE WITH "DETAIL OF TAPERED END" FROM REF-2.



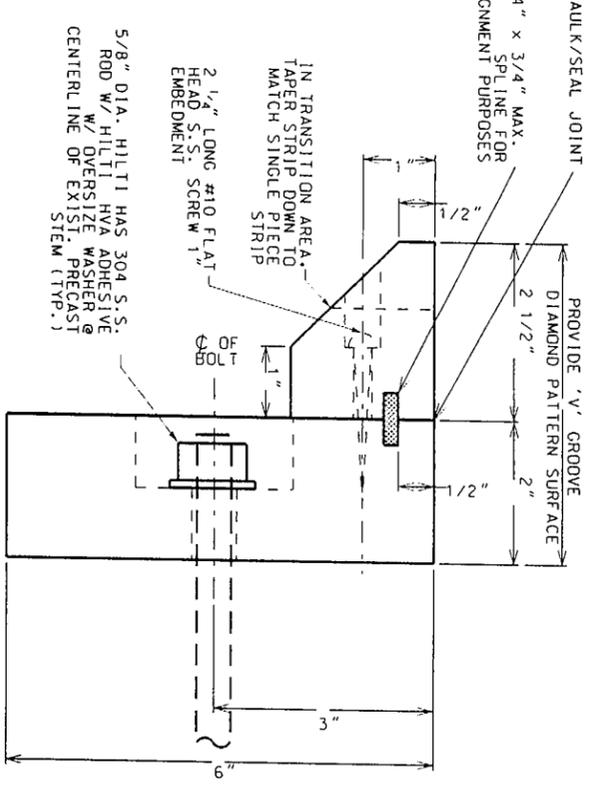
EXIST. PLATFORM EDGE DETAIL AT PRECAST SLAB
N.T.S.



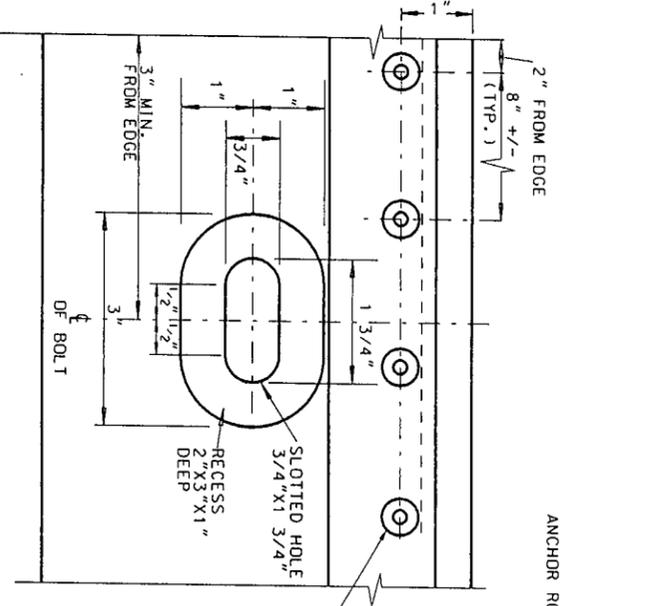
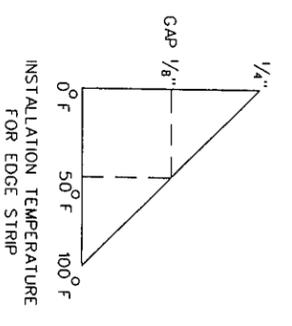
TYPICAL PLATFORM EDGE STRIP ELEVATION
N.T.S.



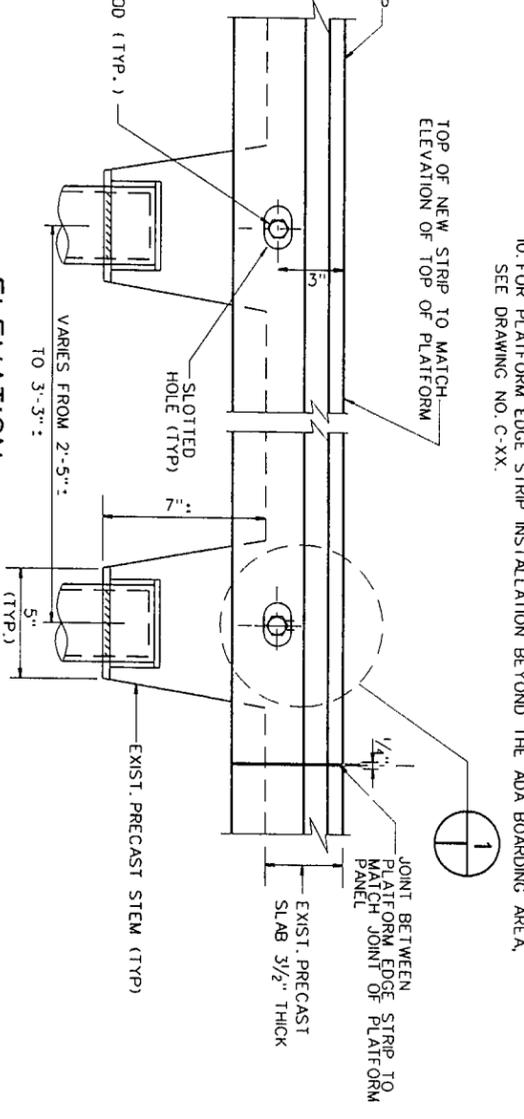
NEW PLATFORM EDGE DETAIL AT PRECAST SLAB
N.T.S.



- NOTES:**
1. THE CONTRACTOR SHALL HIRE A NY STATE LICENSED SURVEYOR TO SURVEY THE FOLLOWING POINTS:
 - a. FIELD SIDE OF BOTH RUNNING RAILS
 - b. ENDS OF CONTACT RAILS (IF ANY) (X AND Y COORD. ONLY)
 - c. CONC. EDGE OF PLATFORM
 - d. FREE EDGE OF EXIST. PLATFORM
 - e. TOP FLANGE OF TRACK STRINGER (ELEVATED STRUCTURE ONLY)
 2. THE SURVEY SHALL EXTEND FOR THE ENTIRE LENGTH OF THE PLATFORM PLUS MINIMUM 150 FT. DISTANCE BEYOND END OF PLATFORM IN BOTH DIRECTIONS. SURVEY TO BE TAKEN AT 10 FT. INTERVALS ALONG TANGENT TRACK AND 5 FT. INTERVALS ON CURVED TRACK AND IN ADA BOARDING AREA FOR THE LAST 25 FEET OF THE PLATFORM. SURVEY PLATFORM AND EDGE STRIP AT 5 FT. INTERVALS.
 3. ALL POINTS SHOULD CONTAIN 3 DIMENSIONS (X, Y, AND Z) OF DATA, UNLESS OTHERWISE NOTED. SURVEY IS TO BE SUBMITTED IN DGN AND EXCEL FORMATS.
 4. SURVEY IS TO BE CONDUCTED BOTH BEFORE AND AFTER PLATFORM EDGE WORK. IF TRACKS ARE BEING RECONSTRUCTED/ADJUSTED, THIS WORK MUST BE DONE BEFORE NEW PLATFORM EDGE IS CONSTRUCTED. IN THIS CASE, AN ADDITIONAL SURVEY IS TO BE PERFORMED AFTER TRACK WORK PRIOR TO PLAT. EDGE WORK.
 5. A DRAWING FOR THE NEW PLATFORM EDGE SHOWING ALL THE VERTICAL AND HORIZONTAL CLEARANCES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BY NYCT, M.O.W. TRACK ENGINEERING PRIOR TO INSTALLATION.
 6. CONCRETE SHALL BE EARLY STRENGTH WITH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI WHEN TESTED AT 12 HOURS.
 7. CARE SHOULD BE TAKEN TO AVOID DAMAGE TO EXISTING DUCTS WHEN DRILLING FOR DOWEL INSTALLATION.
 8. FOR ADDITIONAL DETAILS, SEE SPECIFICATION SECTION - BEE
 9. FOR LOCATION AND EXTENT OF ADA BOARDING AREA, SEE PLATFORM PLAN DRAWINGS.
 10. FOR PLATFORM EDGE STRIP INSTALLATION BEYOND THE ADA BOARDING AREA, SEE DRAWING NO. C-XXX.

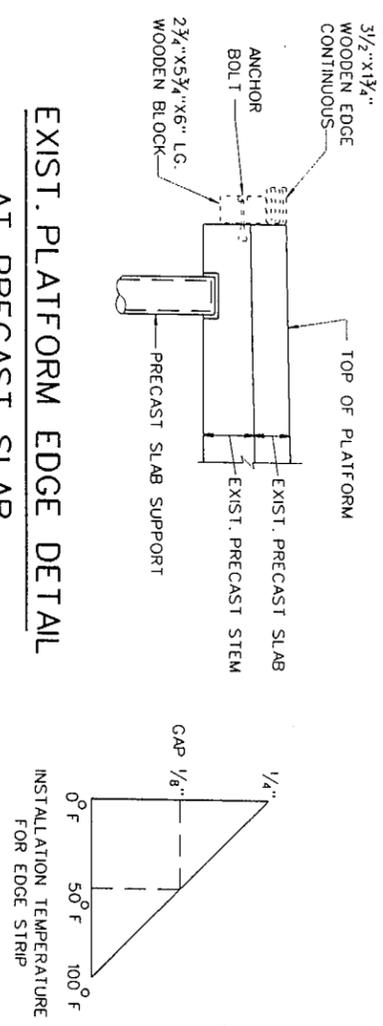


ELEVATION Q-Q
N.T.S.

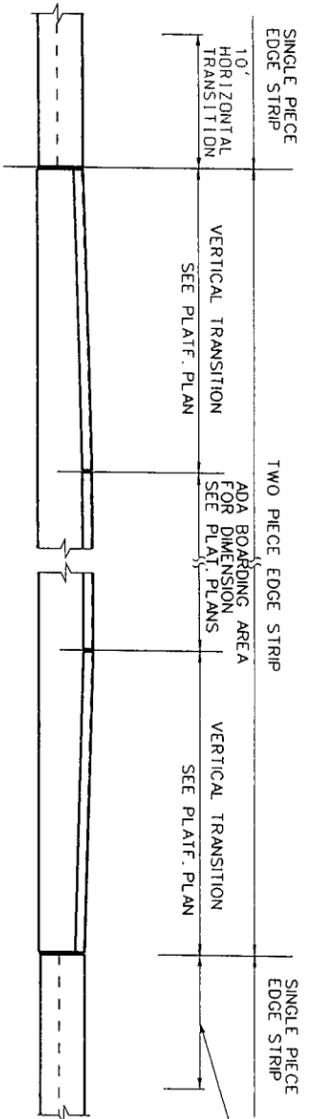


PLATFORM EDGE STRIP DETAILS AT ADA BOARDING AREA PRECAST SLAB (A DIVISION)
N.T.S.

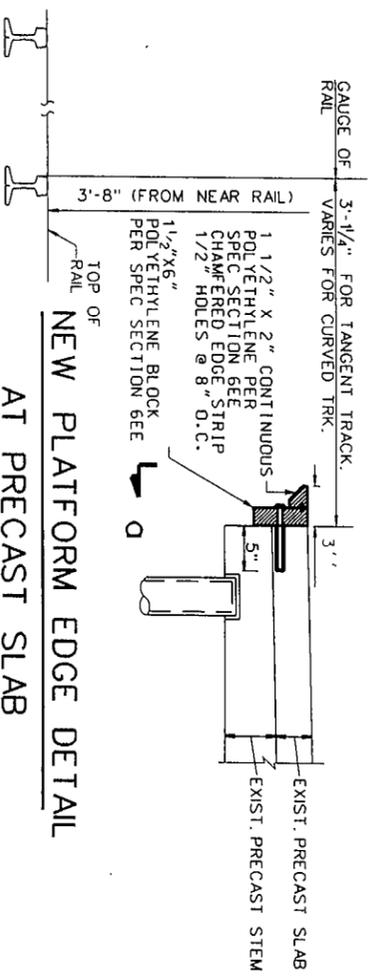
1. DETAILS SHOWN ON THIS DRAWING ARE FOR REFERENCE ONLY. THE PROPOSED ADA BOARDING ZONES AT INDIVIDUAL STATION SHOULD BE PROVIDED AND DETAILS MODIFIED TO MEET REQUIREMENTS OF 1/8/09 ADA SLAB AND LINE EQUIPMENT DRAWINGS.
2. DURING DESIGN PERFORM SURVEY AT 10 FT INTERVALS ALONG ENTIRE LENGTH OF THE PLATFORM AND AT LEAST 150 FT BEYOND EACH END AS FOLLOWS: PLATFORM CONC. EDGE ELEV. TO DETERMINE EXISTING PLATFORM HEIGHT. (a) EXISTING BASE OF RAIL ELEVATION AND TOP OF PLATFORM CONC. EDGE ELEV. TO DETERMINE EXISTING PLATFORM HEIGHT. (b) EXISTING PLATFORM CONCRETE EDGE TO CENTER LINE OF EXISTING TRACK TO DETERMINE EXISTING HORIZONTAL CLEARANCE. (c) FOR ELEVATED STRUCTURE TOP OF THE STRINGERS SUPPORTING THE TRACK ADJACENT TO THE PLATFORM. (d) TRACK ADJACENT TO THE PLATFORM. (e) ADJACENT RIGHT OF WAY EQUIPMENTS AND APPURTENANCES.
3. INFORMATION OBTAINED IN NOTE #2 SHALL BE FORWARDED TO MDOT TRACK ENGINEERING FOR THEIR EVALUATION AND IF REQUIRED, PREPARATION OF CONTRACT DRAWINGS.
4. FOR PLATFORMS WHICH ARE CONSTRUCTED ENTIRELY AT ADA HEIGHT, REMOVE "TYPICAL PLATFORM EDGE STRIP ELEVATION" AND REPLACE WITH "DETAIL OF TAPERED END" FROM REF-2.



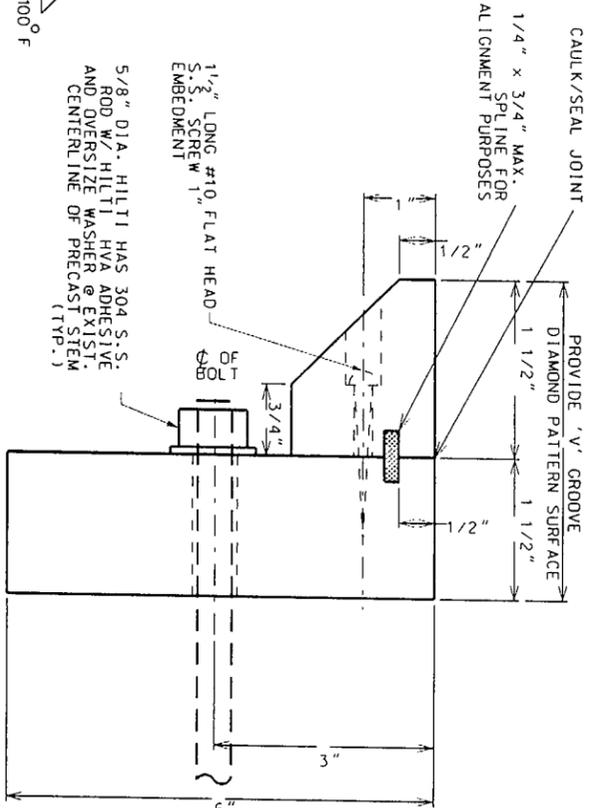
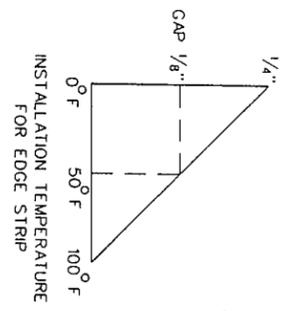
EXIST. PLATFORM EDGE DETAIL
AT PRECAST SLAB
N.T.S.



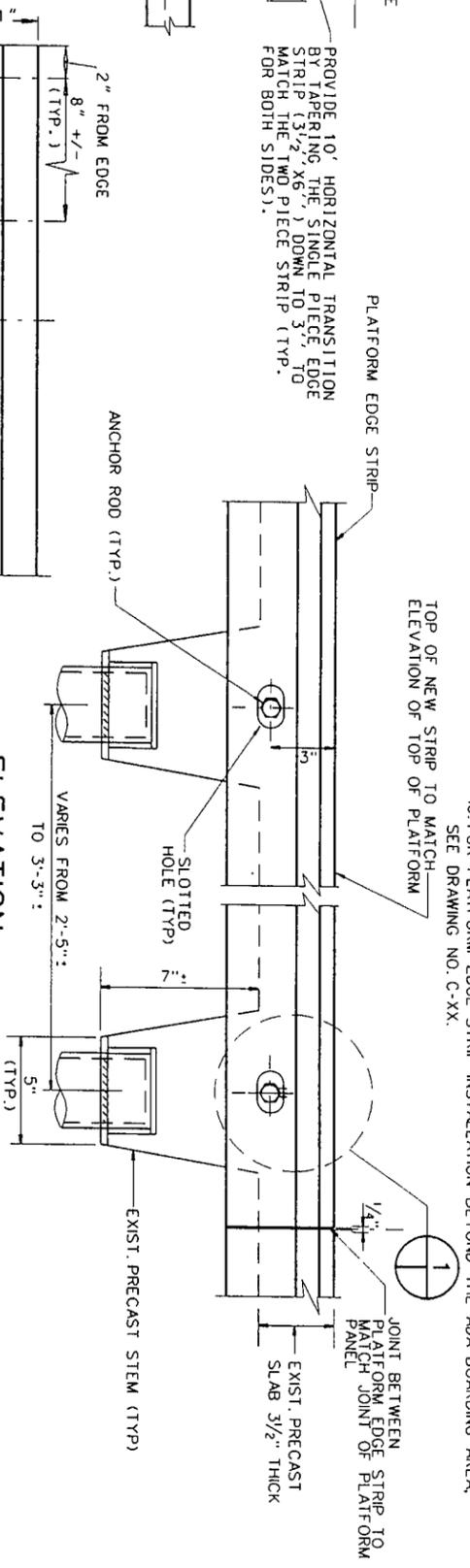
TYPICAL PLATFORM EDGE STRIP ELEVATION
N.T.S.



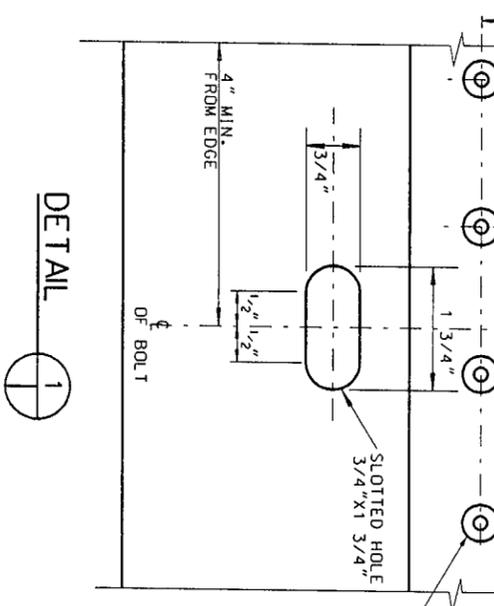
NEW PLATFORM EDGE DETAIL
AT PRECAST SLAB
N.T.S.



DETAIL 1



ELEVATION 0-0
N.T.S.



DETAIL 1

NOTES:

1. THE CONTRACTOR SHALL HIRE A NY STATE LICENSED SURVEYOR TO SURVEY THE FOLLOWING POINTS:
 - a. FIELD SIDE OF BOTH RUNNING RAILS
 - b. ENDS OF CONTACT RAILS (IF ANY) (X AND Y COORD. ONLY)
 - c. CONC. EDGE OF EXIST. PLATFORM
 - d. FREE EDGE OF EXIST. PLATFORM EDGE STRIP
 - e. TOP FLANGE OF TRACK STRINGER (ELEVATED STRUCTURE ONLY)
2. THE SURVEY SHALL EXTEND FOR THE ENTIRE LENGTH OF THE PLATFORM PLUS MINIMUM 150 FT. DISTANCE BEYOND END OF PLATFORM IN BOTH DIRECTIONS. SURVEY TO BE TAKEN AT 10 FT. INTERVALS ALONG TANGENT TRACK AND 5 FT. INTERVALS ON CURVED TRACK AND IN ADA BOARDING AREA FOR THE LAST 25 FEET OF THE PLATFORM. SURVEY PLATFORM AND EDGE STRIP AT 5 FT. INTERVALS.
3. ALL POINTS SHOULD CONTAIN 3 DIMENSIONS (X, Y, AND Z) OF DATA, UNLESS OTHERWISE NOTED. SURVEY IS TO BE SUBMITTED IN DGN AND EXCEL FORMATS.
4. SURVEY IS TO BE CONDUCTED BOTH BEFORE AND AFTER PLATFORM EDGE WORK. IF TRACKS ARE BEING RECONSTRUCTED/ADJUSTED, THIS WORK MUST BE DONE BEFORE NEW PLATFORM EDGE IS CONSTRUCTED. IN THIS CASE, AN ADDITIONAL SURVEY IS TO BE PERFORMED AFTER TRACK WORK PRIOR TO PLAT. EDGE WORK.
5. A DRAWING FOR THE NEW PLATFORM EDGE SHOWING ALL THE VERTICAL AND HORIZONTAL CLEARANCES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BY NYCT. M.O.W. TRACK ENGINEERING PRIOR TO INSTALLATION.
6. CONCRETE SHALL BE EARLY STRENGTH WITH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI, WHEN TESTED AT 12 HOURS.
7. CARE SHOULD BE TAKEN TO AVOID DAMAGE TO EXISTING DUCTS WHEN DRILLING FOR DOWEL INSTALLATION.
8. FOR ADDITIONAL DETAILS, SEE SPECIFICATION SECTION - GEE
9. FOR LOCATION AND EXTENT OF ADA BOARDING AREA, SEE PLATFORM PLAN DRAWINGS.
10. FOR PLATFORM EDGE STRIP INSTALLATION BEYOND THE ADA BOARDING AREA, SEE DRAWING NO. C-XX.

PLATFORM EDGE STRIP DETAILS
AT ADA BOARDING AREA
PRECAST SLAB (B DIVISION)