DRAWING LIST	
NO.	DRAWING NAME
T-001	TITLE SHEET, INDEX, LOCATION, TOPOGRAPHIC & ZONING MAPS
	CIVIL
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	ARCHITECTURAL
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	STRUCTURAL
SD-01	EXISTING ASSESSMENT FLOOR PLAN
SD-02	EXISTING ASSESSMENT ROOF PLAN
SD-03	EXISTING ASSESSMENT SECTIONS
SD-04	EXISTING ASSESSMENT DAMAGE REPRESENTATIVE PHOTOS
SD-05	DEMOLITION ROOF PLAN
SD-06	DEMOLITION SECTIONS
S-01	STRUCTURAL NOTES
S-02	NEW FRAMING PLAN
S-03	NEW FRAMING SECTIONS
S-04	STRUCTURAL DETAILS
S-05	ROOF DETAILS
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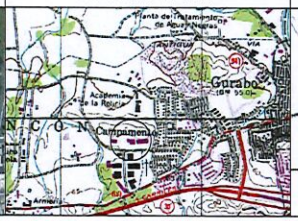
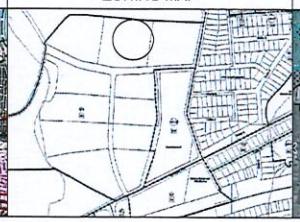
PROJECT INFORMATION	
CADASTRE:	200-083-180-02
MUNICIPALITY:	GURABO
SECTOR:	RINCON
APROX. AREA:	14012.4766
COORD. X:	247591.5095
COORD. Y:	246499.5511
FLOOD ZONE:	X
FLOOD PANEL:	72000C0765J
CLASSIFICATION:	SU
QUALIFICATION:	I-L

LOCATION MAP

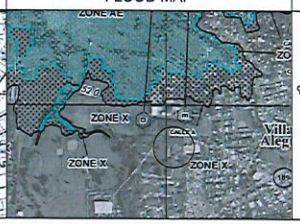
TOPOGRAPHIC MAP



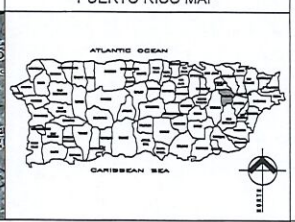
ZONING MAP



FLOOD MAP



PUERTO RICO MAP



PRIDCO
T-0953-0-70

PARQUE INDUSTRIAL RINCON, CALLE INDUSTRIAL 2, GURABO, PUERTO RICO

ENVIRONMENTAL DOCUMENT	CONSOLIDATED CONSTRUCTION PERMIT	OTHERS
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Web: www.sharetechgroup.com

SEAL & SIGNATURE:

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PRIDCO
Puerto Rico Industrial Development Company

ESTRUCTURA PRIDCO GURABO EDIFICIO NUM. T-0953-0-70
GURABO, PUERTO RICO

REVISION NO.	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	06-28-21
B	ISSUED FOR CONSTRUCTION	08-30-21
C	ISSUED FOR CONSTRUCTION REVISED	09-22-21
D	REVISION 1	01-28-22
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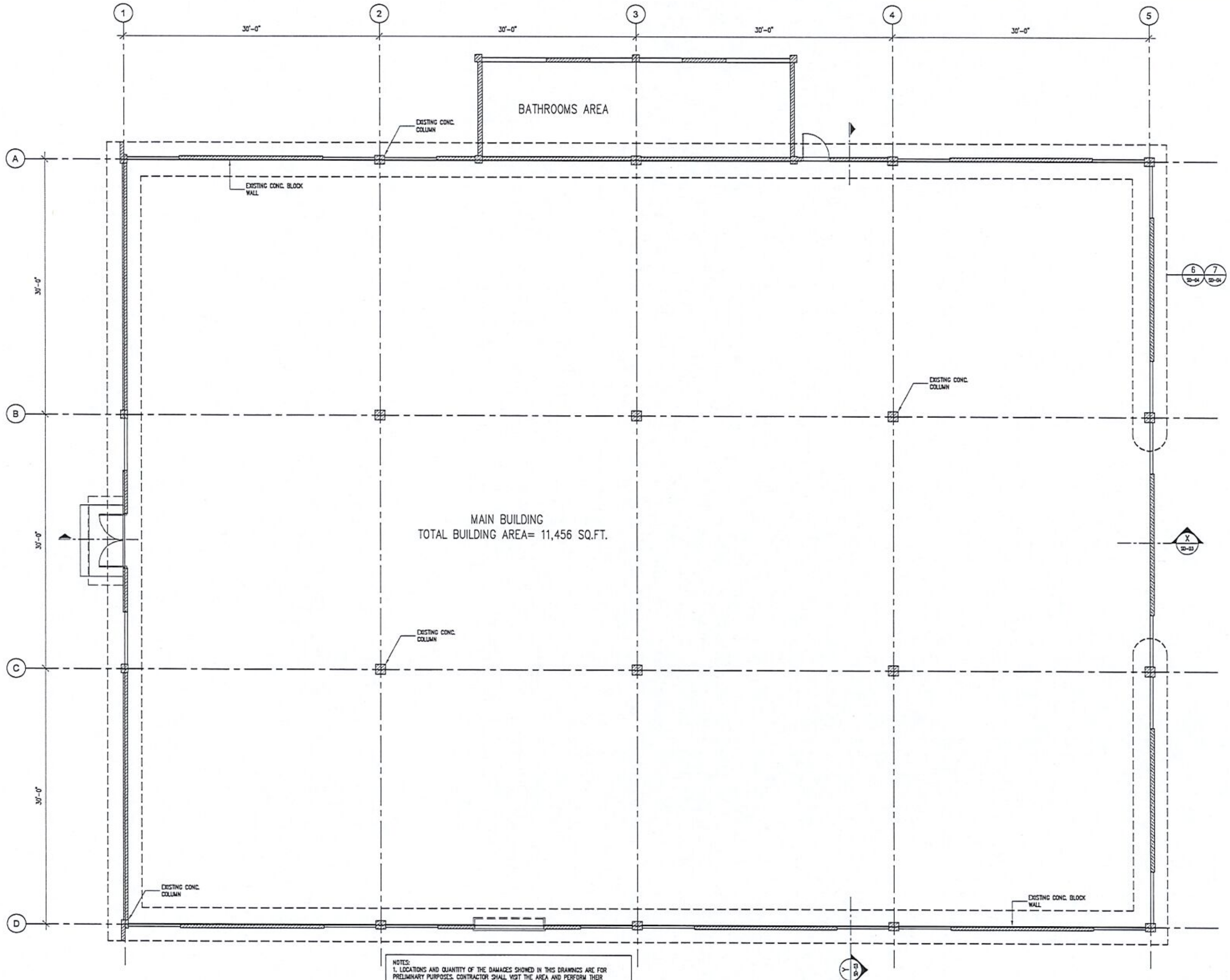
PROJECT NAME:

PRIDCO T-0953-0-70

DRAWING TITLE:

TITLE SHEET

APPROVED BY:	REVISED BY:	DRAWN BY:
E.LLOPS	L.MONTES	E.LLOPS
DATE: 06/25/2021	SCALE: AS SHOWN	REVISION: C
NORTH:		DRAWING NUMBER T-001



NOTES:
1. LOCATIONS AND QUANTITY OF THE DAMAGES SHOWED IN THIS DRAWINGS ARE FOR PRELIMINARY PURPOSES. CONTRACTOR SHALL VISIT THE AREA AND PERFORM THEIR ESTIMATE OF DAMAGES BEFORE BIDDING.

EXISTING ASSESSMENT FLOOR PLAN
SCALE: 3/16"=1'-0"

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GURABO, PUERTO RICO

REVISION NO.	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	05-28-21
B	ISSUED FOR CONSTRUCTION	08-30-21
C	ISSUED FOR CONSTRUCTION REVISED	09-22-21
D	REVISION 1	1-26-22
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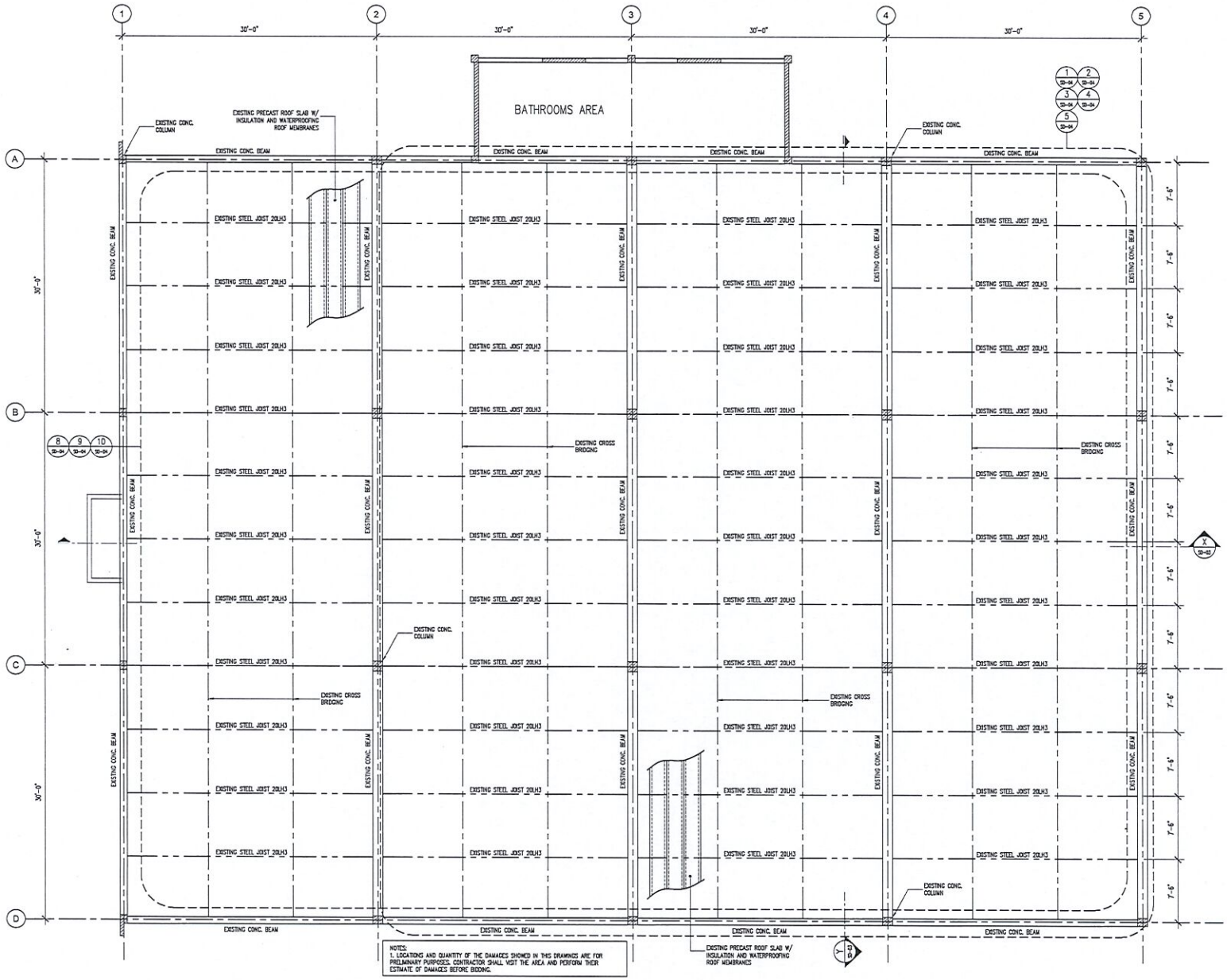
PROJECT NAME:
PRIDCO
T-0953-0-70

DRAWING TITLE:
EXISTING ASSESSMENT
FLOOR PLAN

APPROVED BY: E.LLOPS	REVISED BY: L.MONTES	DRAWN BY: E.LLOPS
DATE: 6/25/2021	SCALE: AS SHOWN	REVISION: C

NORTH:
DRAWING NUMBER
SD-01



EXISTING ASSESSMENT ROOF PLAN
SCALE: 3/16"=1'-0"

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GURABO, PUERTO RICO

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D	REVISION 1	1-26-22
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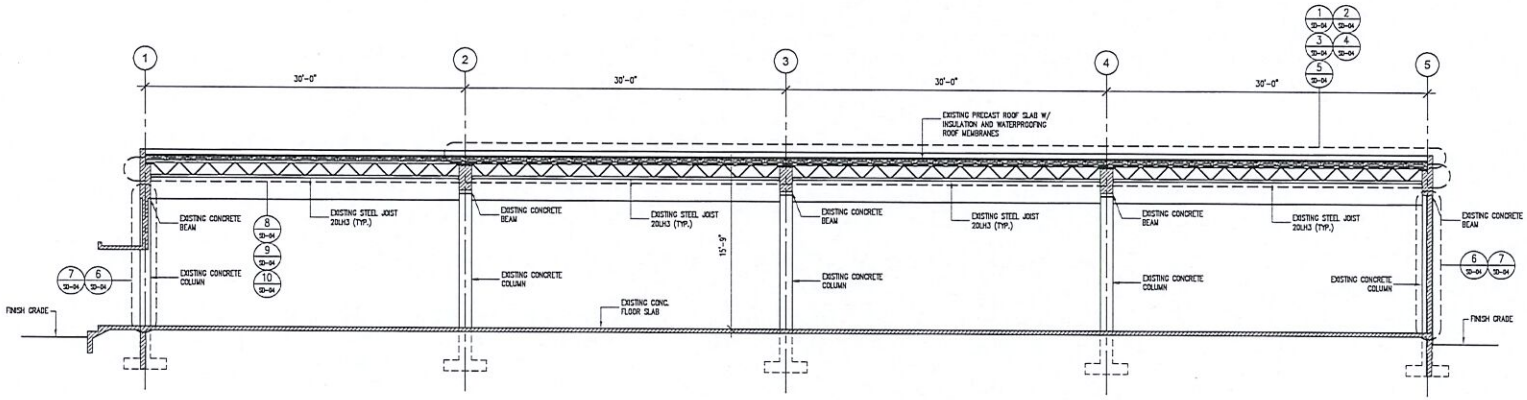
PROJECT NAME:
PRIDCO
T-0953-0-70

DRAWING TITLE:
EXISTING ASSESSMENT
ROOF PLAN

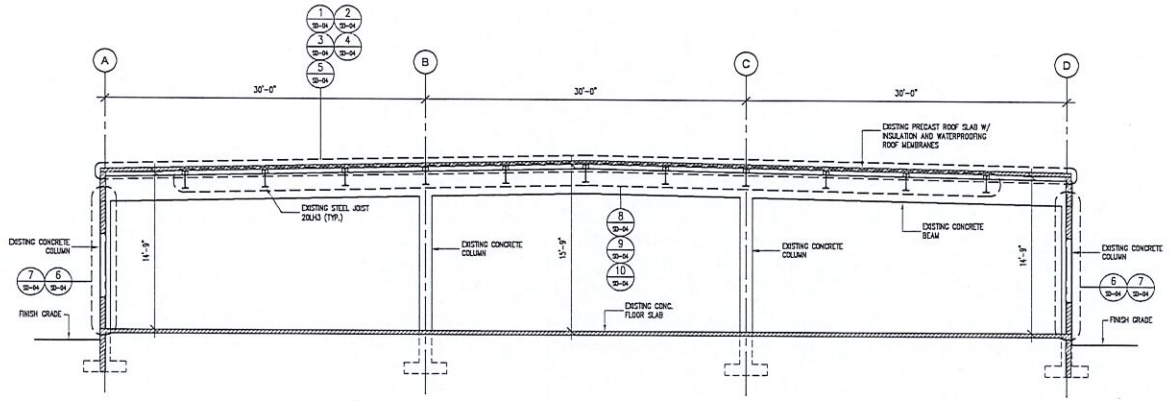
APPROVED BY:	REVISED BY:	DRAWN BY:
E.LLOPS	L.MONTES	E.LLOPS
DATE: 6/25/2021	SCALE: AS SHOWN	REVISION: C

NORTH:

DRAWING NUMBER
SD-02



EXISTING ASSESSMENT SECTION X
SCALE: 3/16"=1'-0"



EXISTING ASSESSMENT SECTION Y
SCALE: 3/16"=1'-0"

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SEAL & SIGNATURE:

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GURABO, PUERTO RICO

REVISION NO.	DESCRIPTION	DATE
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C	ISSUED FOR CONSTRUCTION REVISED	09-22-21
D	REVISION 1	1-26-22
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PROJECT NAME:
PRIDCO
T-0953-0-70

DRAWING TITLE:
EXISTING ASSESSMENT SECTIONS

APPROVED BY:	REVISED BY:	DRAWN BY:
E.LLOPS	L.MONTES	E.LLOPS
DATE: 6/25/2021	SCALE: AS SHOWN	REVISION: C

NORTH:

DRAWING NUMBER
SD-03

WATERPROOFING AND INSULATION ROOF MEMBRANE DAMAGE (1 / SD-04)

WATERPROOFING AND INSULATION ROOF MEMBRANE DAMAGE (2 / SD-04)

WATERPROOFING AND INSULATION ROOF MEMBRANE DAMAGE (3 / SD-04)

WATERPROOFING AND INSULATION ROOF MEMBRANE DAMAGE (4 / SD-04)

WATERPROOFING AND INSULATION ROOF MEMBRANE DAMAGE (5 / SD-04)

SHORT-COLUMN CONDITION IN PERIMETER COLUMNS (6 / SD-04)

SHORT-COLUMN CONDITION IN PERIMETER COLUMNS (7 / SD-04)

RUSTED STEEL JOISTS AND CONCRETE ROOF SPALLING AND CRACKING (8 / SD-04)

RUSTED STEEL JOISTS AND CONCRETE ROOF SPALLING AND CRACKING (9 / SD-04)

RUSTED STEEL JOISTS AND CONCRETE ROOF SPALLING AND CRACKING (10 / SD-04)

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GURABO, PUERTO RICO

REVISION NO.	DESCRIPTION	DATE
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C	ISSUED FOR CONSTRUCTION REVISED	09-22-21
D	REVISION 1	1-26-22
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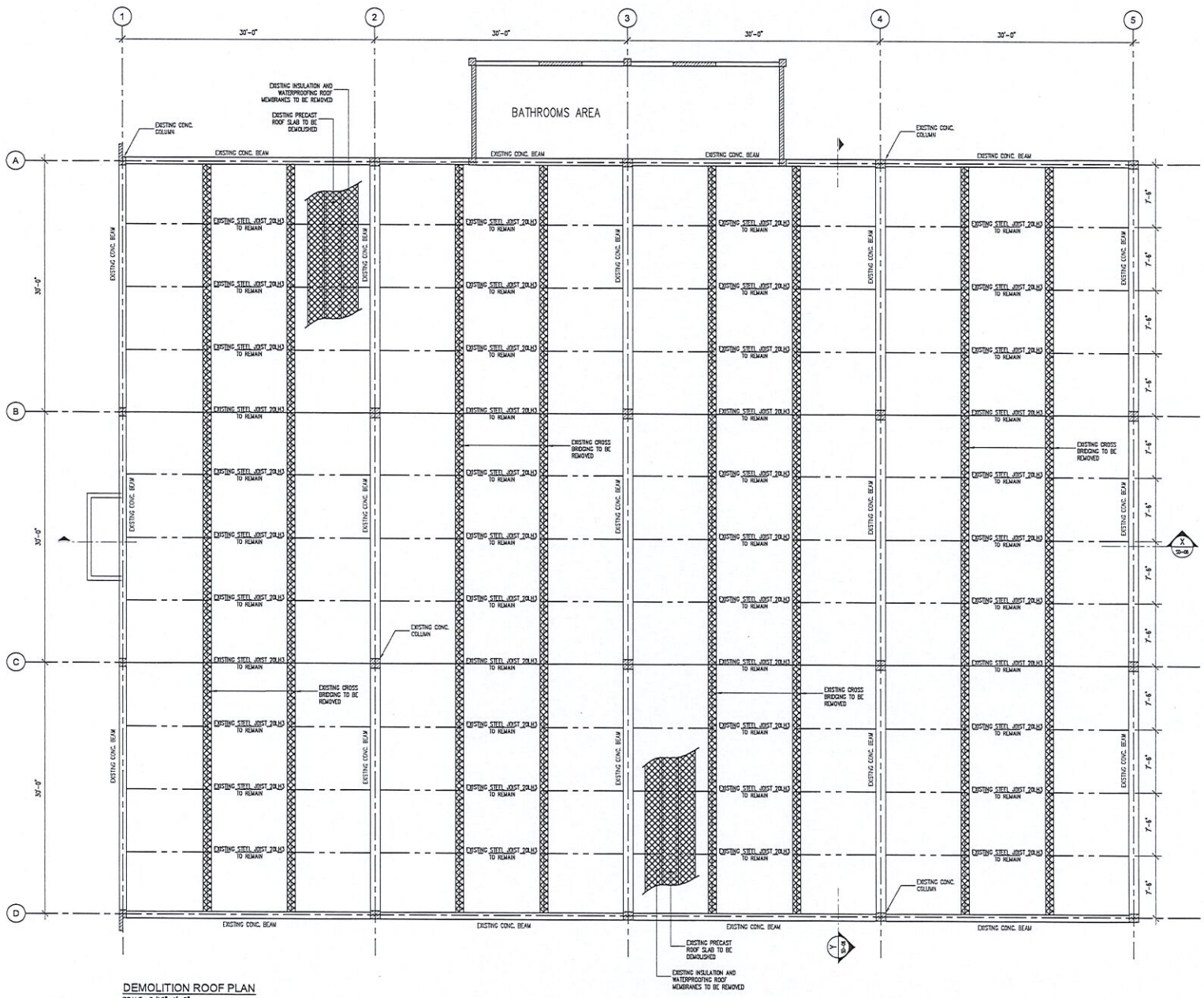
PROJECT NAME: PRIDCO T-0953-0-70

DRAWING TITLE: EXISTING ASSESSMENT DAMAGE REPRESENTATIVE PHOTOS

APPROVED BY: C.LLOPS	REVISED BY: L.MONTES	DRAWN BY: C.LLOPS
DATE: 6/25/2021	SCALE: AS SHOWN	REVISION: C
NORTH:	DRAWING NUMBER	SD-04



DEMOLITION ROOF PLAN
SCALE: 3/16"=1'-0"

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SEAL & SIGNATURE:

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GURABO, PUERTO RICO

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B	ISSUED FOR CONSTRUCTION	06-30-21
C	ISSUED FOR CONSTRUCTION REVISED	09-22-21
D	REVISION 1	1-26-22
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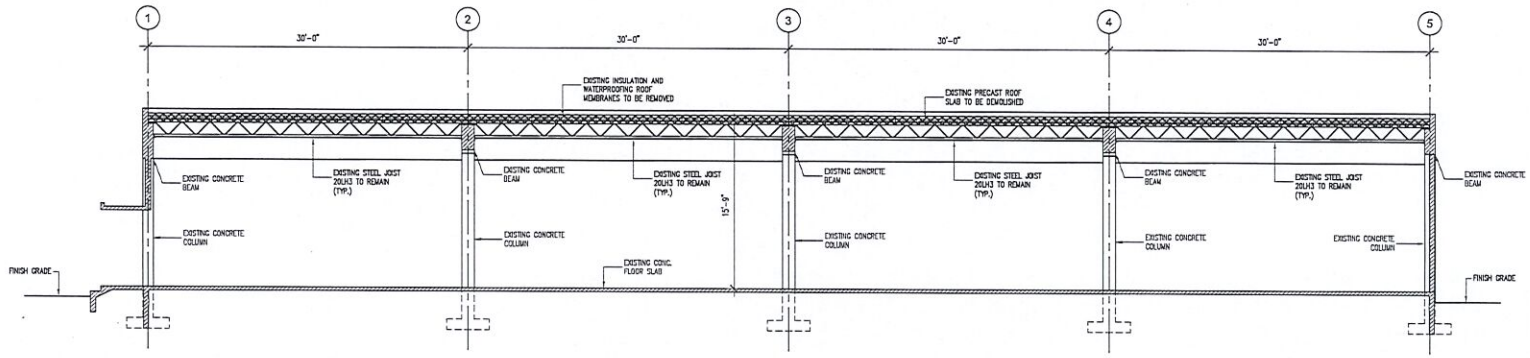
PROJECT NAME:
PRIDCO
T-0953-0-70

DRAWING TITLE:
DEMOLITION ROOF PLAN

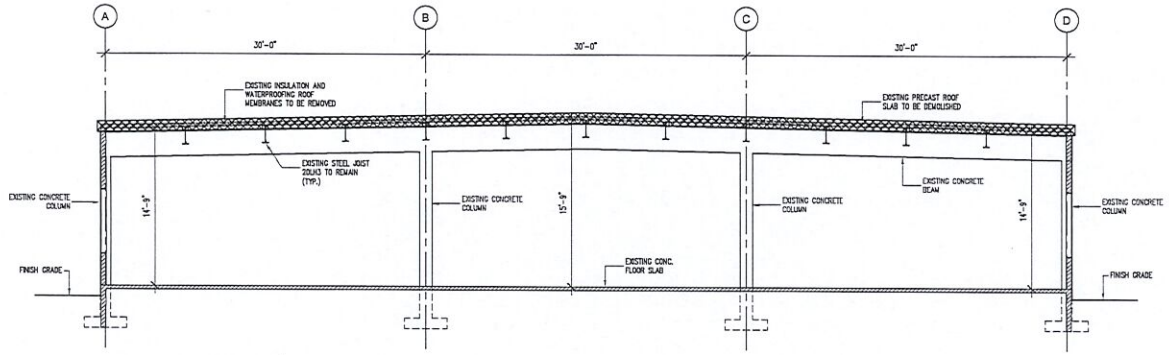
APPROVED BY:	REVISED BY:	DRAWN BY:
E.LLOPS	L.MONTES	E.LLOPS
DATE: 6/25/2021	SCALE: AS SHOWN	REVISION: C

NORTH:

DRAWING NUMBER
SD-05



DEMOLITION SECTION (X / SD-06)
SCALE: 3/16"=1'-0"



DEMOLITION SECTION (Y / SD-06)
SCALE: 3/16"=1'-0"

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SEAL & SIGNATURE:

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GURABO, PUERTO RICO

REVISION NO.	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	08-26-21
B	ISSUED FOR CONSTRUCTION	08-30-21
C	ISSUED FOR CONSTRUCTION REVISED	09-22-21
D	REVISION 1	1-26-22
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PROJECT NAME:
PRIDCO
T-0953-0-70

DRAWING TITLE:
DEMOLITION SECTIONS

APPROVED BY:	REVISED BY:	DRAWN BY:
E.LLOPS	L.MONTES	E.LLOPS
DATE: 6/25/2021	SCALE: AS SHOWN	REVISION: C

NORTH:

DRAWING NUMBER
SD-06

GENERAL NOTES:

1. THESE GENERAL NOTES SUPPLEMENT THE PROJECT SPECIFICATIONS. REFER TO THE PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. SPECIFICATIONS NOTED ON THESE DRAWINGS SHALL BE OF THE LATEST REVISION.
3. STRUCTURAL DRAWINGS ARE INTENDED TO BE USED WITH ARCHITECTURAL, ELECTRICAL AND MECHANICAL DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING SUCH REQUIREMENTS INTO THEIR SHOP DRAWINGS AND WORK.
4. NO OPENINGS, OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS, SHALL BE MADE IN ANY STRUCTURAL MEMBER WITHOUT THE WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER.
5. NO CHANGE IN SIZE OR DIMENSION OF STRUCTURAL MEMBERSHIP SHALL BE MADE WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER.
6. OPENINGS 1'-4" AND LESS ON A SIDE ARE GENERALLY NOT SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO ARCHITECTURAL AND MECHANICAL DRAWINGS FOR SUCH OPENINGS.
7. THE CONTRACTOR IS RESPONSIBLE FOR LIMITING THE AMOUNT OF CONSTRUCTION LOAD IMPOSED UPON STRUCTURAL FRAMING. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN CAPACITY OF THE FRAMING AT THE TIME THE LOADS ARE IMPOSED.
8. HORIZONTAL MOVEMENT OF ANY HEAVY EQUIPMENT OVER STRUCTURAL FLOORS OR ROOF AND ITS TEMPORARY AND/OR DEFINITE LOCATIONS MUST BE PREVIOUSLY APPROVED BY THE ENGINEER SO AS NOT TO OVERLOAD THE STRUCTURE OR IN ANY OTHER WAY IMPAIR THE STRUCTURE. SAME PRECAUTION SHALL BE TAKEN FOR THE PILING OF CONSTRUCTIONS MATERIALS.
9. THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL TEMPORARY BRACING AND/OR SUPPORT THAT MAY BE REQUIRED AS THE RESULT OF THE CONTRACTOR'S CONSTRUCTION METHODS AND/OR SEQUENCES. OBSERVATION VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS.
10. ALL STRUCTURES HAVE BEEN DESIGNED ACCORDING TO FINAL BEHAVIOR AND CONDITIONS. HOWEVER, DURING ERECTION OF SAME, CERTAIN CONDITIONS CAN ARISE FOR WHICH THE BEHAVIOR OR THE STRUCTURE HAS NOT BEEN CONTEMPLATED. THEREFORE, THE CONTRACTOR SHOULD PROVIDE AT ALL TIME ADEQUATE SHORING AND RESTORING UNTIL THE DESIGN CONDITIONS HAVE BEEN MET. IF THERE IS ANY DOUBT DURING ANY PHASE OF THE CONSTRUCTION, PLEASE CONSULT AND/OR NOTIFY THE STRUCTURAL ENGINEER.
11. DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON DRAWINGS. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS NOT SHOWN ON STRUCTURAL DRAWINGS.
12. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
13. CONTRACTOR'S CONSTRUCTION AND/OR ERECTION SEQUENCES SHALL RECOGNIZE AND CONSIDER THE EFFECTS OF THERMAL MOVEMENTS OF STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PERIOD.
14. THE CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING OF ANY DEVIATION FROM THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL NOT BE RELIEVED OF THE RESPONSIBILITY OF SUCH DEVIATION BY THE PROFESSIONAL OF RECORD REVIEW OF SHOP DRAWINGS, PRODUCT DATA, ETC., UNLESS THE CONTRACTOR HAS SPECIFICALLY INFORMED THE PROFESSIONAL OF RECORD OF SUCH DEVIATION AT THE TIME OF SUBMISSION, AND THE PROFESSIONAL OF RECORD HAS GIVEN WRITTEN APPROVAL TO THE SPECIFIC DEVIATION.
15. WHERE "OWNER" IS MENTIONED IN PLANS IT IS TO BE UNDERSTOOD EITHER OWNER OR HIS AUTHORIZED REPRESENTATIVE.
16. CONTRACTOR SHALL SUBMIT FOR OWNERS APPROVAL LOCATION AND DETAILS OF CONSTRUCTION JOINTS IN SLABS AND BEAMS, AND IN ANY OTHER STRUCTURAL MEMBERS.
17. CONTRACTOR MUST VERIFY ALL DIMENSIONS ON STRUCTURAL PLANS AGAINST THE DIMENSIONS ON ARCHITECTURAL PLANS BEFORE LAYING OUT THE WORK.
18. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING FIELD CONDITIONS PRIOR TO STARTING CONSTRUCTION. IF ANY DISCREPANCY ARISES IN THE STRUCTURAL AND ARCHITECTURAL PLANS. THE ARCHITECTS AND ENGINEERS SHALL BE NOTIFIED IMMEDIATELY.
19. CONTRACTOR MUST PROVIDE, SET AND VERIFY DIMENSIONS AND LOCATION OF ALL ANCHORS, INSERTS BOLTS, SLEEVES, CONDUITS, ETC., SHOWN OR NOTED IN ARCHITECTURAL AND/OR MECHANICAL AND PLUMBING PLANS BEFORE THE CONCRETE IS POURED.
20. PROVISIONS FOR DETAILS NOT SPECIFICALLY DRAWN SHALL BE MADE BY THE CONTRACTOR IN ACCORDANCE WITH THE LATEST VERSION OF THE ACI BUILDING CODE AND/OR AISC SPECIFICATIONS AND CLARIFIED WITH THE STRUCTURAL ENGINEER.
21. ALL DETAILS, SECTIONS AND NOTES SHOWN ON DRAWINGS AND INTENDED TO BY TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS ELSEWHERE UNLESS NOTED OTHERWISE.
22. IN CASE OF DOUBT IN THE INTERPRETATION OF ANY ASPECT OF THESE STRUCTURAL DRAWINGS AND/OR SPECIFICATIONS, THE STRUCTURAL ENGINEER SHALL BE CONSULTED.
23. NOTIFY THE STRUCTURAL ENGINEER IN ADVANCE OF CONDITIONS NOT SHOWN OR OMITTED ON THE DRAWINGS.

REFERENCES:

DESIGN, FABRICATION & CONSTRUCTION WORK SHALL COMPLY WITH THE REQUIREMENTS AND PROVISIONS OF THE FOLLOWING CODES AND SPECIFICATIONS THEIR COMMENTARIES AND THE STANDARDS REFERENCED THEREIN:

1. AMERICAN CONCRETE INSTITUTE (ACI 318-14)
2. INTERNATIONAL BUILDING CODE, 2018 (IBC)
3. PUERTO RICO BUILDING CODE 2018 (PRBC-2018)
4. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
5. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
6. AMERICAN WELDING SOCIETY (AWS)
7. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)
8. STEEL DECK INSTITUTE (SDI)
9. STEEL JOIST INSTITUTE (SJI)
10. MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES - ASCE/SEI 7-16

DESIGN LOADS:

1. WIND, LATERAL LOADS : PRBC-2018
   - A) BASIC WIND SPEED — 165mph
   - B) RISK CATEGORY — II
   - C) Kzt — 1.0
   - D) EXPOSURE — C
2. SEISMIC LATERAL LOADS : IBC 2018
   - A) RISK CATEGORY — II
   - B) SITE CLASS — DEFAULT
   - C) SDS — 0.757
   - D) SD1 — NULL
   - E) Ss — 0.946
   - F) S1 — 0.360
   - G) TL — 12s
3. ROOF DEAD LOAD — 10 psf
4. ROOF LIVE LOAD — 20 psf

MATERIALS:

1. ALL CONCRETE SHALL DEVELOP A MINIMUN 28 DAYS COMPRESSIVE STRENGHT AS FOLLOWS:
   - A) FOUNDATIONS — 4,000 PSI
   - B) SLAB ON GRADE — 4,000 PSI
2. PORTLAND CEMENT SHALL CONFORM TO ASTM C-150, TYPE I.
3. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
4. ALL REINFORCING BARS SHALL BE HIGH TENSILE DEFORMED MEETING ASTM A-615 GRADE 60, UNLESS NOTED OTHERWISE ON SPECS AND/OR DRAWINGS.
5. CONTINUOUS WIRE REINFORCING (JOINT REINFORCING) SHALL BE GALVANIZED TRUSS TYPE FABRICATED UNITS WITH A SINGLE PAIR OF 9 GAUGE SIDE RODS AND 9 GAUGE CONTINUOUS DIAGONAL CROSS RODS FABRICATED FROM COLD-DRAWN STEEL WIRE COMPLYING WITH ASTM A-82.
6. STEEL SHALL CONFORM TO THE FOLLOWING GRADES:
   - A) W STEEL SHAPES — ASTM A-992 Gr.50
   - B) PLATES & CONNECTIONS — ASTM A-36
   - C) STRUCTURAL TUBE (Fy=46 Ksi) — ASTM A-500
   - D) STEEL PIPE (Fy=35 Ksi) — ASTM A-53
   - E) ANCHOR BOLTS AND UNFINISHED BOLTS — ASTM A-325
   - F) BOLTS, NUTS AND WASHERS — ASTM A-325
   - G) WELDING ELECTRODES (E333, CLASS E7018XX) — ASTM A-223
7. METAL STUDS SHALL CONFORM TO ASTM A-108.

CAST IN PLACE REINFORCED CONCRETE:

1. CONCRETE ITEMS AND REINFORCEMENT SHALL BE ERECTED IN STRICT ACCORDANCE WITH OWNER APPROVED SHOP AND ERECTION DRAWINGS FOLLOWING THE DETAILS SHOWN ON PLANS.
2. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PRODUCE CORRECTLY ALIGNED CONCRETE CONSIDERING AMONG OTHER THINGS, THE ELASTIC DEFORMATION OF THE STRUCTURAL MEMBERS.
3. CONCRETE SHALL BE NON-AIR ENTRAINED. AIR CONTENT SHALL BE BETWEEN 0 AND 2 PERCENT.
4. THE NOMINAL MAXIMUM AGGREGATE SIZE SHALL BE OF 3/4".
5. SLUMP OF CONCRETE SHALL NOT EXCEED 4" UNLESS A HIGHRANGE WATER-REDUCING ADMIXTURE IS USED. THE SLUMP OF CONCRETE PRIOR TO ADDITION OF A HIGH RANGE WATER- REDUCING ADMIXTURE SHALL NOT EXCEED 4". THE SLUMP OF CONCRETE CONTAINING A HIGH RANGE WATER-REDUCING ADMIXTURE SHALL NOT EXCEED 7".
6. CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGNS FOR REVIEW WELL IN ADVANCE OF CONCRETE PLACEMENT. CONCRETE MIX DESIGN SHALL INCLUDE ALL STRENGTH DATA NECESSARY TO SHOW COMPLIANCE WITH THE PROJECT SPECIFICATIONS FOR EITHER THE TRIAL BATCH OR FIELD EXPERIENCE METHOD AND SHALL BE CERTIFIED BY A REGISTERED LICENSED ENGINEER. PHYSICAL TESTS RESULTS FOR COARSE AND FINE AGGREGATES SHALL ALSO BE SUBMITTED CERTIFIED BY A REGISTERED ENGINEER.
7. MINIMUM CONCRETE COVER, UNLESS NOTED OTHERWISE: UNFORMED SURFACE IN CONTACT WITH THE GROUND — 3 IN.

   FORMED SURFACES EXPOSED TO EARTH OR WEATHER:
   - #6 BARS AND LARGER — 2 IN.
   - #5 BARS AND SMALLER — 1-1/2 IN.
8. ALL REINFORCING SHALL BE DETAILED, FABRICATED AND PLACED, IN ACCORDANCE WITH ACI DETAILING MANUAL (SP-66) AND "THE MANUAL OF STANDARD PRACTICE FOR REINFORCED CONCRETE CONSTRUCTION" BY THE CRSI.
9. ALL REINFORCING SHALL BE SUPPORTED IN FORMS USING STEEL CHAIRS, SPACED WITH NECESSARY ACCESSORIES AND SHALL BE SECURELY WIRED TOGETHER, IN ACCORDANCE WITH CRSI "MANUAL OF STANDARD PRACTICE".
10. BASE PLATES, ANCHOR BOLTS, SUPPORT ANGLES, ETC., BELOW GRADE SHALL BE COVERED WITH A MINIMUM OF 3" OF CONCRETE.
11. NO DEFECTIVE CONCRETE SHALL BE CORRECTED OR COVERED WITH MORTAR, PLASTER ETC. WITHOUT THE INSPECTORS' APPROVAL.
12. CONCRETE WORK SHALL BE SUBJECT TO QUALITY ASSURANCE TESTING AND INSPECTIONS. SEE QUALITY ASSURANCE GENERAL NOTES AND PROJECT SPECIFICATIONS.
13. ALL SYMBOLS AND STRESSES AS WELL AS CONCRETE WORK SHALL CONFORM TO THE STANDARD OF THE LATEST VERSION OF THE ACI BUILDING CODE.
14. ALL SLAB AND CORRESPONDING BEAMS, CURBS, OR APRONS SHALL BE POURED MONOLITHICALLY.
15. ALL REINFORCING, SLEEVES, CONDUITS, INSERTS AND BOLTS SHALL BE WELL SECURED AND IN PLACE BEFORE CONCRETE IS POURED.
16. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL SO AS TO CAUSE SEGREGATION OF AGGREGATES IN SUCH CASES, HOOPERS OR VERTICAL CHUTES OR TRUNKS SHALL BE USED. THE FREE UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED THE ABOVE REQUIREMENTS.
17. LAP SPLICES SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE, UNLESS NOTED OTHERWISE, WHERE CLASSES ARE NOT CALLED OUT ON DRAWINGS, USE CLASS "B" SPLICE.
18. FOR CONSTRUCTION JOINTS IN STRUCTURAL MEMBERS A VERTICAL BULKHEAD AND KEY JOINT MUST BE PROVIDED.
19. MINIMUM LAP OF WELDED WIRE FABRIC SHALL BE 6 INCHES OR ONE FULL MESH, WHICHEVER IS GREATER.
20. SLAB ON GROUND, AS INDICATED ON DRAWINGS.
21. FOR CONCRETE FORMWORK, SURFACE FINISHING, BEVELED CORNERS AND DRIPS, SEE ARCHITECTURAL PLANS.
22. PLACEMENT OF CONCRETE SHALL CONFORM TO ACI STANDARD 304 AND PROJECT SPECIFICATIONS.

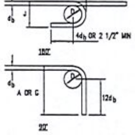
SPLICES TABLE (GRADE 60)

BAR SIZE	f'c (psi)	TENSION: TOP BARS SPLICE CLASS A	TENSION: TOP BARS SPLICE CLASS B	TENSION: OTHER BARS SPLICE CLASS A	TENSION: OTHER BARS SPLICE CLASS B	COMPRESSION: SPLICE
#3	3,000	22"	28"	17"	22"	12"
	4,000	19"	25"	18"	19"	12"
	5,000	17"	22"	13"	23"	12"
#4	3,000	29"	38"	22"	17"	15"
	4,000	25"	33"	19"	25"	15"
	5,000	23"	29"	17"	23"	15"
#5	3,000	36"	47"	28"	36"	19"
	4,000	31"	41"	24"	31"	19"
	5,000	28"	36"	22"	28"	19"
#6	3,000	43"	56"	33"	43"	23"
	4,000	37"	48"	29"	37"	23"
	5,000	34"	44"	26"	34"	23"
#7	3,000	63"	81"	48"	63"	27"
	4,000	54"	71"	42"	54"	27"
	5,000	49"	63"	38"	49"	27"
#8	3,000	72"	93"	55"	72"	30"
	4,000	62"	81"	48"	62"	30"
	5,000	56"	72"	43"	56"	30"
#9	3,000	81"	105"	62"	81"	34"
	4,000	70"	91"	54"	70"	34"
	5,000	63"	81"	48"	63"	34"

COMPRESSION DOWEL EMBEDMENT: 22 BAR DIAMETERS LAP WELDED WIRE FABRIC ONE SPACING OF CROSS WIRES PLUS 2". THE DEVELOPMENT LENGTH INDICATED ABOVE IS VALID WHEN ONE OF THE FOLLOWING CONDITIONS IS MET: - CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN d_b, CLEAR COVER NOT LESS THAN d_b, AND STIRRUPS OR TIES THROUGHOUT l_b NOT LESS THAN THE CODE MINIMUM. - CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN $2d_b$ AND CLEAR COVER NOT LESS THAN d_b.

END HOOKS FOR ALL GRADES

BAR SIZE	FINISHED BEND DIAMETER "D", IN.	180° HOOKS: A OR G	180° HOOKS: J	90° HOOKS: A OR G
#3	3"	6"	4"	7"
#4	3"	7"	5"	8"
#5	4"	8"	7"	11"
#6	5"	9"	8"	13"
#7	6"	11"	9"	15"
#8	6"	12"	10"	17"
#9	10"	16"	12"	21"
#10	11"	18"	13"	23"
#11	12"	20"	15"	26"
#14	17"	28"	21"	33"
#18	23"	37"	28"	43"



23. PROVIDE DOWELS IN PEDESTAL AND/OR WALL FOOTINGS EQUAL IN GRADE, SPACING, SIZE AND NUMBER TO VERTICAL REINFORCEMENT, EXTENDING A TENSION SPLICE LENGTH INTO THE PEDESTAL AND/OR WALL AND 40 BAR DIAMETER INTO FOOTING. (THE LATERAL EMBEDMENT SHALL BE EXTENDED AS NECESSARY TO PROVIDE A MINIMUM HORIZONTAL LEG RESTING ON FOOTING REINFORCEMENT EQUAL TO THE CORRESPONDING "G" LENGTH FOR THE BAR SIZE.)
24. THE SIZE OF NAILS AND SIMILAR FASTENERS DRIVEN INTO CONCRETE SHALL BE SUCH, AS NOT TO CRACK OR IMPAIR IT. NEVERTHELESS, IF THE CONCRETE IS DAMAGED, IT SHALL BE PROPERLY REPAIRED AFTER REMOVING THE DAMAGED PORTION AND SUITABLE JOINT SURFACE ARE PROVIDED.
25. ALL CAST IN PLACE REINFORCED CONCRETE STRUCTURAL MEMBERS SHALL BE PROPERLY CURED IN ACCORDANCE WITH THE LATEST VERSION OF THE ACI CODE, CHAPTER V AND ACI 308.
26. ALL LAPPING, BENDING AND PLACING OR REINFORCEMENT SHALL BE DONE IN ACCORDANCE WITH THE LATEST VERSION OF THE ACI BUILDING CODE.
27. ALL REINFORCING BAR BENDS SHALL BE MADE COLD.
28. ALL NEGATIVE REINFORCEMENT (TOP REINF.) AND POSITIVE REINFORCEMENT (BOTTOM REINF.) IN SLABS AND BEAMS SHALL BE EXTENDED BEYOND THE CENTER LINE OF THE END SUPPORTS IN ACCORDANCE WITH THE LATEST VERSION OF THE ACI BUILDING CODE, UNLESS OTHERWISE SPECIFIED.
29. WELDING OF REINFORCEMENT SHALL BE WITH LOW HYDROGEN ELECTRODES IN CONFORMANCE WITH "REINFORCING STEEL WELDING CODE" AND "RECOMMENDED PRACTICES FOR WELDING REINFORCING STEEL" BOTH BY THE AWS (AWS D12.1. & AWS D1.4 RESPECTIVELY).
30. ALL FORMWORK FOR FLEXURAL MEMBERS SHALL BE BUILT WITH A CAMBER CORRESPONDING TO ITS OWN DEFORMATION PLUS THE STRUCTURE DEAD LOAD DEFORMATIONS. IN DETERMINING THE AMOUNT OF CAMBER, THE CONTRACTOR SHALL HAVE THE ASSISTANCE OF THE DESIGNER WHERE SO REQUESTED.
31. PROVIDE SLEEVES FOR PLUMBING AND ELECTRICAL OPENINGS IN CONCRETE BEFORE PLACING. DO NOT CUT ANY REINFORCEMENT BAR WHICH MAY CONFLICT. CORING IN CONCRETE IS NOT PERMITTED U.N.O.
32. NO JOINT, OPENING, SLOT OR GROOVE OTHER THAN THAT SHOWN ON DRAWINGS SHALL BE PERMITTED WITHOUT PREVIOUS APPROVAL BY THE ENGINEER. ALL CONSTRUCTION JOINT SURFACES SHALL BE CLEANED AND ROUGHENED IMMEDIATELY BEFORE CONCRETING AND TREATED AS INSTRUCTED IN THE "ACI MANUAL OF CONCRETE PRACTICE".
33. CONDUIT OF PIPE SIZE (O.D.) SHALL NOT EXCEED 30 PERCENT OF TOTAL SLAB THICKNESS AND SHALL BE PLACED BETWEEN THE TOP & BOTTOM REINFORCEMENT, UNLESS SPECIFICALLY DETAILED OTHERWISE. CONCENTRATIONS OF CONDUITS OR PIPES SHALL BE AVOIDED EXCEPT WHERE DETAILED OPENINGS ARE PROVIDED.
34. WATER-CEMENT RATIO REQUIREMENTS FOR DIFFERENT COMPRESSIVE STRENGHTS OF CONCRETE.

COMPRESSIVE STRENGHT AT 28 DAYS, psi	WATER-CEMENT RATIO BY WEIGHT: NON-AIR ENTRAINED CONCRETE	WATER-CEMENT RATIO BY WEIGHT: AIR ENTRAINED CONCRETE
4,000	0.57	0.48
3,000	0.68	0.59
2,000	0.82	0.74

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST VERSION OF THE AISC CODE OF STANDARD PRACTICE. EXCEPT AS MODIFIED IN THESE NOTES ANDTHE PROJECT SPECIFICATIONS AND/OR DRAWINGS.
2. THE STEEL STRUCTURE IS A PARTIAL-SELF-SUPPORTING STEEL FRAME AND IS DEPENDENT UPON DIAPHRAGM ACTION OF THE METAL ROUGH DECK AND ATTACHMENT TO THE EXISTING MASONRY AND CONCRETE WALLS FOR STABILITY AND FOR RESISTANCE TO WIND AND SEISMIC FORCES. PROVIDE ALL TEMPORARY SUPPORTS REQUIRED FOR STABILITY AND FOR RESISTANCE TO WIND AND SEISMIC FORCES UNTIL THESE ELEMENTS ARE COMPLETED AND ARE CAPABLE OF PROVIDING THIS SUPPORT.
3. THE FABRICATOR IS RESPONSIBLE FOR THE SHOP DRAWINGS OF ALL CONNECTIONS. CONNECTION DETAILS INDICATED ON THE DRAWINGS SHALL BE INCORPORATED INTO FABRICATOR'S CONNECTION SHOP DRAWING. ALL SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY THE FABRICATOR'S ENGINEER WITH THE ENGINEER'S SEAL.
4. SPLICING OF STEEL MEMBERS, UNLESS SHOWN ON THE DRAWING,IS PROHIBITED WITHOUT WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER.
5. UNLESS NOTED OTHERWISE, BEAMS SHALL BEAR 8" MINIMUM ON CONCRETE OR MASONRY. UNLESS NOTED OTHERWISE, ANCHOR BEAMS TO MASONRY WITH TWO (2) 3/4" DIAMETER ANCHOR BOLTS WITH 4" HOOK AND 1'-4" EMBEDMENT.
6. STRUCTURAL STEEL WORK SHALL BE SUBJECT TO QUALITY ASSURANCE TESTING AND INSPECTIONS. SEE QUALITY ASSURANCE GENERAL NOTES AND PROJECT SPECIFICATIONS. AISC, ASTM & AWS SPECIFICATIONS WILL GOVERN ALL STRUCTURAL STEEL WORKS.
7. DESIGN AND CONSTRUCTION SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION STANDARD PRACTICE.
8. STRUCTURAL STEEL WELDING SHALL BE PERFORMED BY A CERTIFIED WELDER AND IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY, (AWS), REQUIREMENTS.
9. ALL INSPECTION AND TESTING OF WELDING SHALL BE DONE IN ACCORDANCE TO SECTION 501 THRU 607 OF THE AWS CODE FOR WELDING IN BUILDING CONSTRUCTION.
10. ALL CONNECTIONS SHALL BE BEARING TYPE UNLESS OTHERWISE SPECIFIED ON PLANS.
11. VERTICAL BRACING CONNECTIONS SHALL DEVELOP THE TENSION CAPACITY OF THE CONNECTED MEMBER.
12. MOMENT CONNECTIONS SHALL BE DESIGNED TO DEVELOP THE PLASTIC MOMENT CAPACITY OF THE BEAM U.N.O.
13. SHOP DRAWINGS FOR ALL STRUCTURAL STEEL FABRICATION AND ERECTION SHALL BE SUBMITTED TO THE DESIGNER FOR APPROVAL WELL IN ADVANCE OF CONSTRUCTION.
14. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER FOR REVIEW AND APPROVAL OR REJECTION, PRIOR TO REMEDIAL OR CORRECTIVE ACTION TO BE IMPLEMENTED.
15. UNLESS OTHERWISE NOTED, THE FOLLOWING MINIMUMS SHALL APPLY:
   - A) WELD SIZE — 3/16"
   - B) BOLT DIAMETER — 3/4"
   - C) PLATE THICKNESS — 3/8"
   - D) CLIP ANGLE THICKNESS — 5/16"
   - E) BOLTS/ANGLE LEG — 2"
16. ONE BOLT ASSEMBLY SHALL CONSIST OF:
   - A) A HEAVY HEX STRUCTURAL BOLT
   - B) A HEAVY HEX NUT
   - C) A HARDENED STEEL WASHER
17. COLUMN STIFFENERS SHALL BE PROVIDED AS REQUIRED TO DEVELOP THE PLASTIC MOMENT CAPACITY OF THE CONNECTED BEAM U.N.O.
18. FRAMED BEAM CONNECTIONS SHALL BE OF A TYPE SIMILAR TO AND OF EQUAL CAPACITY AS THOSE SHOWN IN TABLES II , III AND IV OF THE AISC MANUAL, AND SHALL DEVELOP THE SHEAR CAPACITY (Wc/2L) GIVEN IN THE UNIFORM LOAD CONSTANTS TABLE.
19. CONNECTIONS SHALL BE DESIGNED AS SLIP CRITICAL, WITH BOLT LENGTH AS PER BEARING TYPE X.
20. HORIZONTAL BRACING CONNECTIONS SHALL DEVELOP THE COMPRESSION CAPACITY OF THE CONNECTED MEMBER.

DEMOLITION NOTES:

1. THIS SECTION DESCRIBES THE DEMOLITION AND REMOVAL OF SELECTED INTERIOR PORTIONS OF BUILDING OR STRUCTURE, AND SALVAGE OF EXISTING ITEMS TO BE REUSED.
2. THE CONTRACTOR MUST SUBMIT A SCHEDULE OF SELECTIVE DEMOLITION ACTIVITIES. INDICATE THE FOLLOWING:
   - DETAILED SEQUENCE OF SELECTIVE DEMOLITION AND REMOVAL WORK, WITH STARTING AND ENDING DATES FOR EACH ACTIVITY.
   - INTERRUPTION OF UTILITY SERVICES. INDICATE HOW LONG UTILITY SERVICES WILL BE INTERRUPTED.
   - COORDINATION FOR SHUTOFF, CAPPING, AND CONTINUATION OF UTILITY SERVICES.
   - USE OF ELEVATOR AND STAIRS.
   - LOCATIONS OF PROPOSED DUST- AND NOISE-CONTROL TEMPORARY PARTITIONS AND MEANS OF EGRESS.
   - COORDINATION OF CONTINUING OCCUPANCY OF PORTIONS OF EXISTING BUILDING AND OF PARTIAL OCCUPANCY OF COMPLETED WORK SO THAT OPERATIONS CONTINUE UNINTERRUPTED.
   - MEANS OF PROTECTION FOR ITEMS TO REMAIN AND ITEMS IN PATH OF WASTE REMOVAL FROM BUILDING.
3. AFTER SELECTIVE DEMOLITION IS COMPLETE, SUBMIT A INVENTORY OF ITEMS THAT HAVE BEEN REMOVED AND SALVAGED.
4. ALL DEMOLITION WORKS MUST COMPLY WITH GOVERNING EPA NOTIFICATION REGULATIONS BEFORE BEGINNING SELECTIVE DEMOLITION. COMPLY WITH HAULING AND DISPOSAL REGULATIONS OF AUTHORITIES HAVING JURISDICTION.
5. THE AREAS OF SELECTIVE DEMOLITION ARE WITHIN AN EXISTING BUILDING WITH ONGOING OCCUPANT ACTIVITIES. CONDUCT SELECTIVE DEMOLITION SO ONGOING OPERATIONS
6. PROVIDE NOTIFICATION OF DISCREPANCIES BETWEEN EXISTING CONDITIONS AND DRAWINGS BEFORE PROCEEDING WITH SELECTIVE DEMOLITION.
7. IT IS NOT EXPECTED THAT HAZARDOUS MATERIALS WILL BE ENCOUNTERED IN THE WORK. IF MATERIALS SUSPECTED OF CONTAINING HAZARDOUS MATERIALS ARE ENCOUNTERED, DO NOT DISTURB; IMMEDIATELY NOTIFY THE PORT AND TENANT. THE PORT WILL REMOVE HAZARDOUS MATERIALS UNDER A SEPARATE CONTRACT.
8. STORAGE OR SALE OF REMOVED ITEMS OR MATERIALS ON-SITE IS NOT PERMITTED.
9. MAINTAIN EXISTING SYSTEMS AND UTILITIES INDICATED TO REMAIN AND PROTECT THEM AGAINST DAMAGE DURING SELECTIVE DEMOLITION OPERATIONS.
10. REMOVE, REPLACE, PATCH, AND REPAIR MATERIALS AND SURFACES CUT OR DAMAGED DURING SELECTIVE DEMOLITION, BY METHODS AND WITH MATERIALS SO AS NOT TO VOID EXISTING WARRANTIES.
11. WHEN UNANTICIPATED MECHANICAL, ELECTRICAL, OR STRUCTURAL ELEMENTS THAT CONFLICT WITH INTENDED FUNCTION OR DESIGN ARE ENCOUNTERED, INVESTIGATE AND MEASURE THE NATURE AND EXTENT OF CONFLICT. PROMPTLY SUBMIT A WRITTEN REPORT.
12. ENGAGE A PROFESSIONAL ENGINEER TO SURVEY CONDITION OF BUILDING TO DETERMINE WHETHER REMOVING ANY ELEMENT MIGHT RESULT IN STRUCTURAL DEFICIENCY OR UNPLANNED COLLAPSE OF ANY PORTION OF STRUCTURE OR ADJACENT STRUCTURES DURING SELECTIVE DEMOLITION OPERATIONS.
13. LOCATE, IDENTIFY, DISCONNECT, AND SEAL OR CAP OFF INDICATED UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS SERVING AREAS TO BE SELECTIVELY DEMOLISHED.
14. PROVIDE TEMPORARY BARRICADES AND OTHER PROTECTION REQUIRED TO PREVENT INJURY TO PEOPLE AND DAMAGE TO ADJACENT AREAS TO REMAIN.
15. PROVIDE PROTECTION TO ENSURE SAFE PASSAGE OF PEOPLE AROUND SELECTIVE DEMOLITION AREA AND TO AND FROM OCCUPIED PORTIONS OF BUILDING.
16. PROVIDE TEMPORARY WEATHER PROTECTION, DURING INTERVAL BETWEEN SELECTIVE DEMOLITION OF EXISTING CONSTRUCTION ON EXTERIOR SURFACES AND NEW CONSTRUCTION, TO PREVENT WATER LEAKAGE AND DAMAGE TO STRUCTURE AND INTERIOR AREAS.
17. PROTECT WALLS, CEILINGS, FLOORS, AND OTHER EXISTING FINISH WORK THAT ARE TO REMAIN OR THAT ARE EXPOSED DURING SELECTIVE DEMOLITION OPERATIONS.
18. COVER AND PROTECT FURNITURE, FURNISHINGS, AND EQUIPMENT THAT HAVE NOT BEEN REMOVED.
19. COMPLY WITH REQUIREMENTS FOR TEMPORARY ENCLOSURES, DUST CONTROL, HEATING, AND COOLING SPECIFIED ELSEWHERE.
20. PROVIDE AND MAINTAIN SHORING, BRACING, AND STRUCTURAL SUPPORTS AS REQUIRED TO PRESERVE STABILITY AND PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF CONSTRUCTION AND FINISHES TO REMAIN, AND TO PREVENT UNEXPECTED OR UNCONTROLLED MOVEMENT OR COLLAPSE OF CONSTRUCTION BEING DEMOLISHED.STRENGTHEN OR ADD NEW SUPPORTS WHEN REQUIRED DURING PROGRESS OF SELECTIVE DEMOLITION.
21. DEMOLISH AND REMOVE EXISTING CONSTRUCTION ONLY TO THE EXTENT REQUIRED BY NEW CONSTRUCTION AND AS INDICATED. USE METHODS REQUIRED TO COMPLETE THE WORK WITHIN LIMITATIONS OF GOVERNING REGULATIONS.
22. DO NOT DEMOLISH BUILDING ELEMENTS BEYOND WHAT IS INDICATED ON DRAWINGS WITHOUT APPROVAL.
23. PROCEED WITH SELECTIVE DEMOLITION SYSTEMATICALLY, FROM HIGHER TO LOWER LEVEL. COMPLETE SELECTIVE DEMOLITION OPERATIONS ABOVE EACH FLOOR OR TIER BEFORE DISTURBING SUPPORTING MEMBERS ON THE NEXT LOWER LEVEL.
24. NEATLY CUT OPENINGS AND HOLES PLUMB, SQUARE, AND TRUE TO DIMENSIONS REQUIRED. USE CUTTING METHODS LEAST LIKELY TO DAMAGE CONSTRUCTION TO REMAIN OR ADJOINING CONSTRUCTION. USE HAND TOOLS OR SMALL POWER TOOLS DESIGNED FOR SAWING OR GRINDING, NOT HAMMERING AND CHOPPING, TO MINIMIZE DISTURBANCE OF ADJACENT SURFACES. TEMPORARILY COVER OPENINGS TO REMAIN.
25. CUT OR DRILL FROM THE EXPOSED OR FINISHED SIDE INTO CONCEALED SURFACES TO AVOID MARRING EXISTING FINISHED SURFACES.
26. DO NOT USE CUTTING TORCHES UNTIL WORK AREA IS CLEARED OF FLAMMABLE MATERIALS. AT CONCEALED SPACES, SUCH AS DUCT AND PIPE INTERIORS, VERIFY CONDITION AND CONTENTS OF HIDDEN SPACE BEFORE STARTING FLAME-CUTTING OPERATIONS. SEE DIVISION 1 FOR FIRE SUPPRESSION REQUIREMENTS AND FOR WELDING, CUTTING, AND BURNING PERMIT.
27. MAINTAIN ADEQUATE VENTILATION WHEN USING CUTTING TORCHES.
28. REMOVE DECAYED, VERMIN-INFESTED, OR OTHERWISE DANGEROUS OR UNSUITABLE MATERIALS AND PROMPTLY DISPOSE OF OFF-SITE.
29. REMOVE STRUCTURAL FRAMING MEMBERS AND LOWER TO GROUND BY METHOD SUITABLE TO AVOID FREE FALL AND TO PREVENT GROUND IMPACT OR DUST GENERATION.
30. LOCATE SELECTIVE DEMOLITION EQUIPMENT AND REMOVE DEBRIS AND MATERIALS SO AS NOT TO IMPOSE EXCESSIVE LOADS ON SUPPORTING WALLS, FLOORS, OR FRAMING.
31. PROTECT CONSTRUCTION INDICATED TO REMAIN AGAINST DAMAGE AND SOILING DURING SELECTIVE DEMOLITION. WHEN PERMITTED, ITEMS MAY BE REMOVED TO A SUITABLE, PROTECTED STORAGE LOCATION DURING SELECTIVE DEMOLITION, CLEANED, AND REINSTALLED IN THEIR ORIGINAL LOCATIONS AFTER SELECTIVE DEMOLITION OPERATIONS ARE COMPLETE.
32. EXCEPT FOR ITEMS OR MATERIALS INDICATED TO BE RECYCLED, REUSED, SALVAGED, OR REINSTALLED, REMOVE DEMOLISHED MATERIALS FROM PROJECT SITE AND LEGALLY DISPOSE OF THEM IN AN EPA-APPROVED LANDFILL. DO NOT ALLOW DEMOLISHED MATERIALS TO ACCUMULATE ON-SITE.
33. REMOVE AND TRANSPORT DEBRIS IN A MANNER THAT WILL PREVENT SPILLAGE ON ADJACENT SURFACES AND AREAS.
34. REMOVE DEBRIS FROM ELEVATED PORTIONS OF BUILDING BY CHUTE, HOIST, OR OTHER DEVICE THAT WILL CONVEY DEBRIS TO GRADE LEVEL IN A CONTROLLED DESCENT.
35. CLEAN ADJACENT STRUCTURES AND IMPROVEMENTS OF DUST, DIRT, AND DEBRIS CAUSED BY SELECTIVE DEMOLITION OPERATIONS. RETURN ADJACENT AREAS TO CONDITION EXISTING BEFORE SELECTIVE DEMOLITION OPERATIONS BEGAN.

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SEAL & SIGNATURE:

ENGINEERING & ARCHITECTURAL DESIGN NOTE:

THIS DESIGN IS BASED ON SITE DRAWINGS SUBMITTED BY OWNER. ANY DISCREPANCY BETWEEN THE FIELD CONDITIONS AND THE DRAWINGS SHALL BE IMMEDIATELY NOTIFY TO THE DESIGNER OR OWNER SO HE CAN RENDER A DECISION ON THIS MATTER. SHARE TECH GROUP IS ACCOUNTABLE ONLY FOR THE NEW WORK SHARE TECH GROUP AND ITS PERSONNEL ARE ACCOUNTABLE ONLY FOR WORK PERFORMED BY THEM WITHIN THE DEFINED SCOPE LIMITS.

THIS DRAWING AND THE INFORMATION IT CONTAINS IS THE PROPERTY OF PRIDCO. WRITTEN DIMENSIONS TAKE PREFERENCE OVER SCALED DIMENSIONS AND SHALL BE VERIFIED ON THE JOB SITE. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.

PRIDCO
Puerto Rico Industrial Development Company

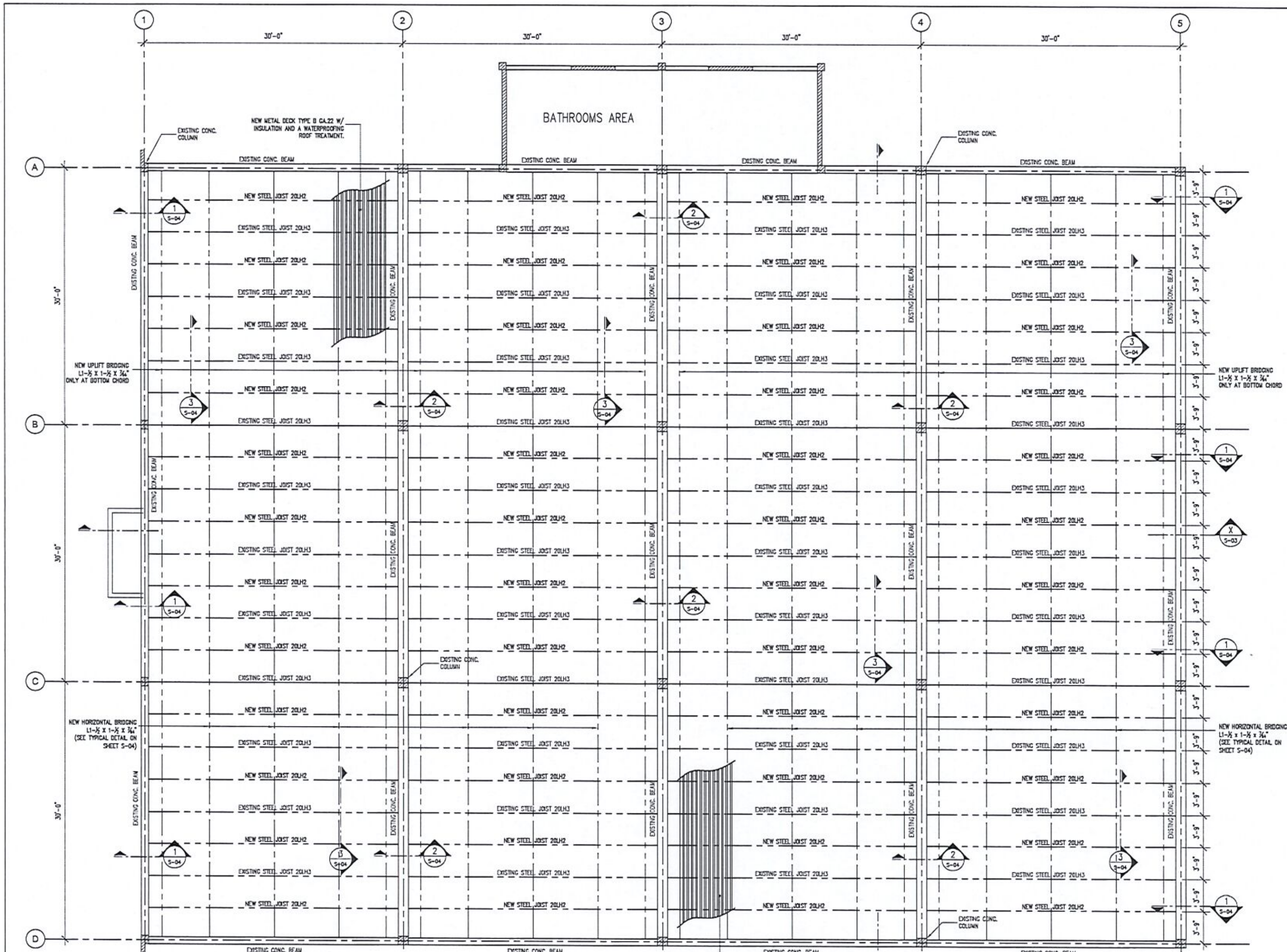
ESTRUCTURA PRIDCO GURABO EDIFICIO NUM. T-0953-0-70
GURABO, PUERTO RICO

REVISION NO.	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	06-28-21
B	ISSUED FOR CONSTRUCTION	08-30-21
C	ISSUED FOR CONSTRUCTION REVISED	09-22-21
D	REVISION 1	1-26-22
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

PROJECT NAME: PRIDCO T-0953-0-70

DRAWING TITLE: STRUCTURAL NOTES

APPROVED BY: E.LLOPS	REVISED BY: L.MONTES	DRAWN BY: E.LLOPS
DATE: 6/25/2021	SCALE: AS SHOWN	REVISION: C
NORTH:		DRAWING NUMBER: S-01



NOTES:
1. ALL EXISTING STRUCTURAL STEEL TO REMAIN SHALL BE CLEANED ACCORDING TO THE STEEL PREPARATION STANDARD SSPC-SP3: POWER TOOL CLEANING TO REMOVE ANY LOOSE RUST OR PAINT. APPLY ONE COAT OF SHOPCOAT PRIMER AND TWO COAT OF POLYURETHANE ENAMEL BY SHERWIN WILLIAMS OR SIMILAR. ALL COATS SHALL BE APPLIED WITH A MINIMUM FILM THICKNESS OF 3 MILS PER COAT.

2. ALL NEW STRUCTURAL STEEL SHALL BE CLEANED AND PAINTED WITH SHOPCOAT PRIMER AND TWO COAT OF POLYURETHANE ENAMEL BY SHERWIN WILLIAMS OR SIMILAR. ALL COATS SHALL BE APPLIED WITH A MINIMUM FILM THICKNESS OF 3 MILS PER COAT.

NEW ROOF FRAMING PLAN
SCALE: 3/16"=1'-0"

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PR #1 KM 34.4
PLAZA BAIROA- SUITE 215
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web: www.sharetechgroup.com

SEAL & SIGNATURE:

ENGINEERING & ARCHITECTURAL DESIGN NOTE:

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PRIDCO
Puerto Rico Industrial Development Company

ESTRUCTURA PRIDCO GURABO EDIFICIO NUM. T-0953-0-70
GURABO, PUERTO RICO

REVISION NO.	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	06-28-21
B	ISSUED FOR CONSTRUCTION	06-30-21
C	ISSUED FOR CONSTRUCTION REVISED	09-22-21
D	REVISION 1	1-26-22
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

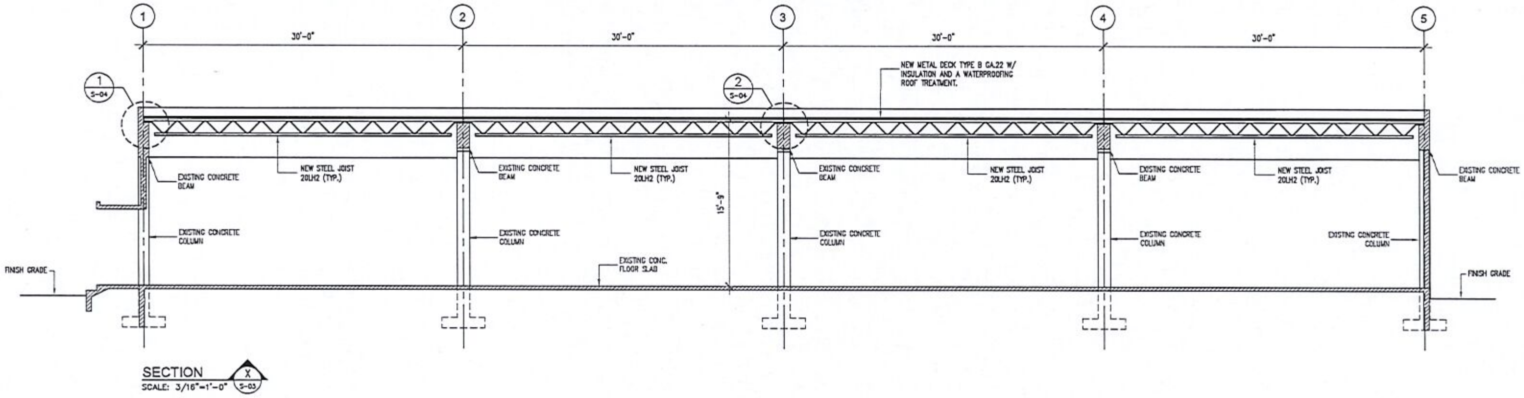
PROJECT NAME: PRIDCO
T-0953-0-70

DRAWING TITLE: NEW ROOF FRAMING PLAN

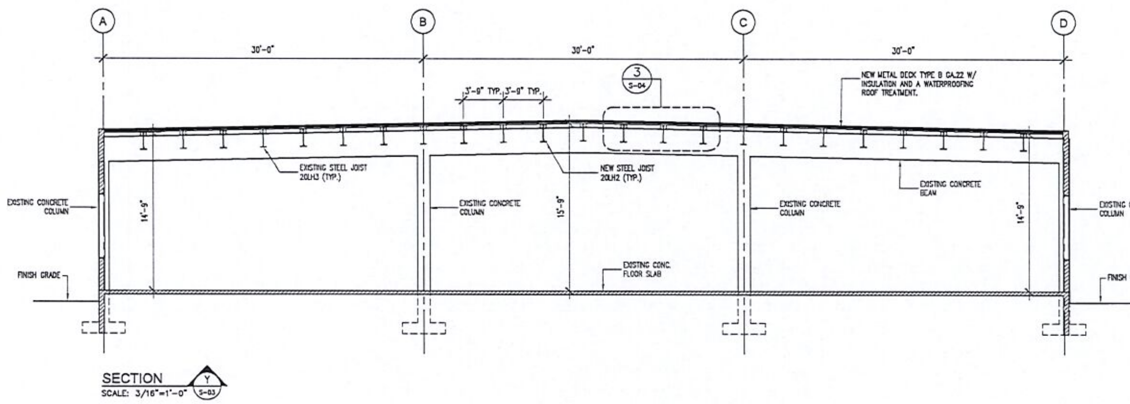
APPROVED BY:	REVISED BY:	DRAWN BY:
E.LLOPS	L.MONTES	E.LLOPS
DATE: 6/25/2021	SCALE: AS SHOWN	REVISION: C

NORTH:

DRAWING NUMBER
S-02



SECTION X S-03
SCALE: 3/16"=1'-0"



SECTION Y S-03
SCALE: 3/16"=1'-0"

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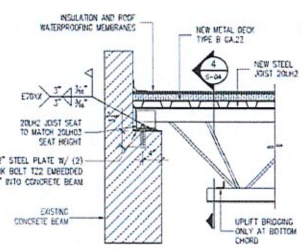
-	-	-
-	-	-
-	-	-

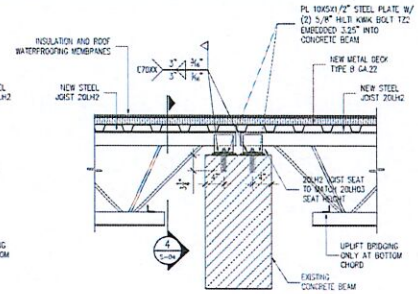
PROJECT NAME:
PRIDCO
T-0953-0-70

DRAWING TITLE:
NEW FRAMING SECTIONS

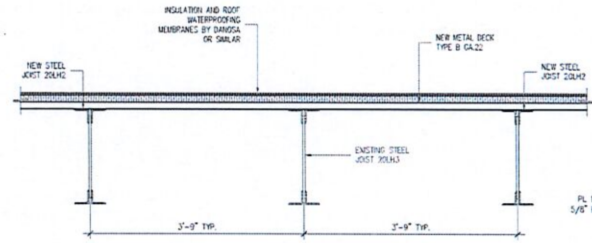
APPROVED BY: E.LLOPS	REVISED BY: L.MONTES	DRAWN BY: E.LLOPS
DATE: 6/25/2021	SCALE: AS SHOWN	REVISION: C
NORTH:		DRAWING NUMBER S-03



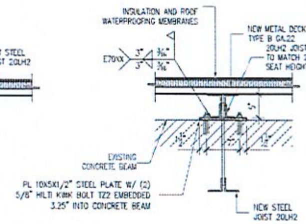
CONNECTION DETAIL 1 / S-04
SCALE: 1"=1'-0"



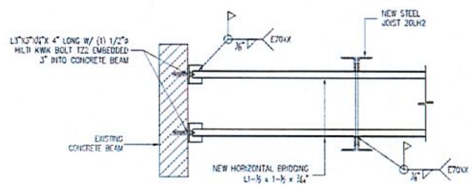
CONNECTION DETAIL 2 / S-04
SCALE: 1"=1'-0"

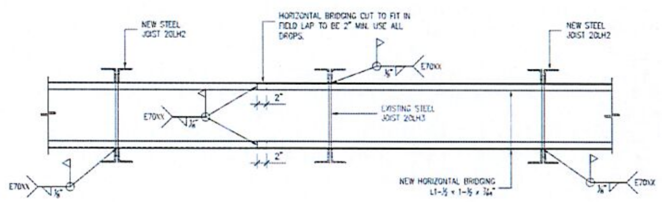


CONNECTION DETAIL 3 / S-04
SCALE: 1"=1'-0"

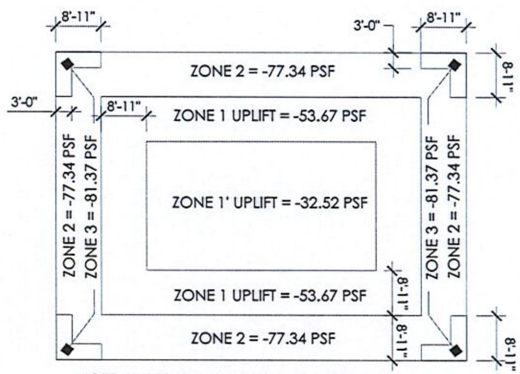


CONNECTION DETAIL 4 / S-04
SCALE: 1"=1'-0"



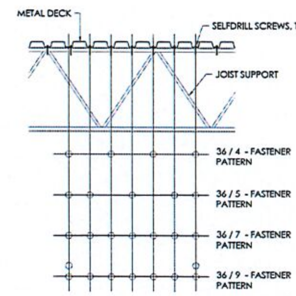


HORIZONTAL BRIDGING DETAILS (TYP.)
SCALE: 1"=1'-0"



NOTE: BASED ON LRFD COMB. 0.9DL+1.0W
*DL DOES NOT INCLUDE JOIST SELF WEIGHT.

NET ROOF UPLIFT FORCES FOR JOIST DESIGN



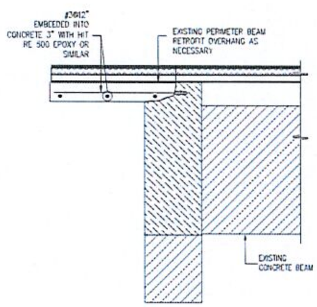
NOTES:

1. ATTACH DECK TO SUPPORTING MEMBERS WITH SELF-DRILLING SELF-TAPPING HEX WASHER HEAD SCREWS. USE #12-24 X 2.0" TEK/5 FOR DECK ATTACHMENT TO SUPPORTS AND #12-14 X 1.25" TEK/2 SCREWS FOR SEAM/SIDELAP ATTACHMENT.

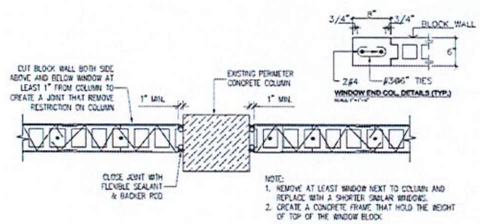
2. CONTRACTOR SHALL ATTACH ROOF DECK AS FOLLOW:
   A. AT DECK BEARING SUPPORTS ON ZONE 3 AND 2 PROVIDE SCREWS @ A 36/7 PATTERN
   B. AT DECK BEARING SUPPORTS ON ZONE 1 AND 1' PROVIDE SCREWS @ A 36/4 PATTERN
   C. AT SUPPORTS PARALLEL TO DECK SPAN PROVIDE SCREWS @ 6" ON CENTER ON ZONE 3 & 2, AND AT 12" ON CENTER ON ZONE 1 AND 1'.
   D. AT DECK SEAMS/SIDELAPS PROVIDE SCREWS @ 12" ON CENTER, TYPICAL.

3. DECK SHALL BE CONTINUOUS OVER (3) OR MORE SPANS, TYP.

TYPICAL FASTENER PATTERNS DETAIL
SCALE: NTS

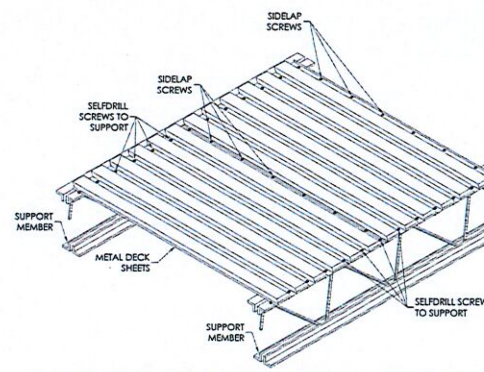


CONNECTION DETAIL 5 / S-04
SCALE: 1"=1'-0"



NOTE:
1. REMOVE AT LEAST WINDOW NEXT TO COLUMN AND REPLACE WITH A SHORTER SIMILAR WINDOWS.
2. CREATE A CONCRETE FRAME THAT HOLD THE WEIGHT OF TOP OF THE WINDOW BLOCK.

SHORT COLUMN MITIGATION DETAILS FOR PERIMETER COLUMNS(TYP.)
SCALE: 1"=1'-0"



ISOMETRIC VIEW OF FASTENER LAYOUT DETAIL
SCALE: NTS

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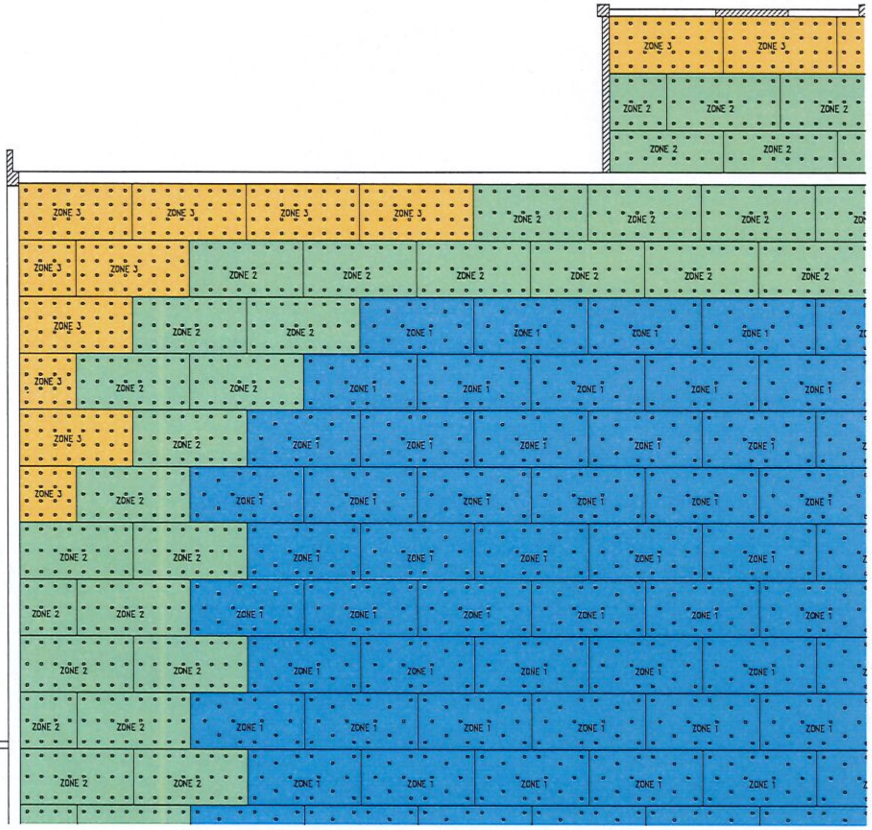
-	-	-
-	-	-
-	-	-
-	-	-

PROJECT NAME: PRIDCO T-0953-0-70

DRAWING TITLE: STRUCTURAL DETAILS

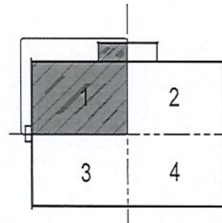
APPROVED BY: E.LLOPS	REVISED BY: L.MONTES	DRAWN BY: E.LLOPS
DATE: 6/25/2021	SCALE: AS SHOWN	REVISION: C
NORTH:	DRAWING NUMBER: S-04	



ROOF MEMBRANE FASTENING AREA QUADRANT 1

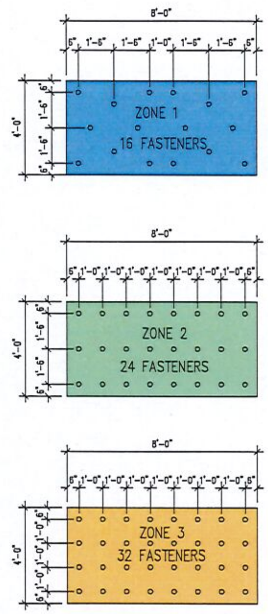
SCALE: ¼"=1'-0"

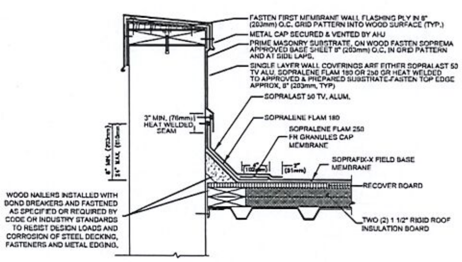
REPEAT SAME PATTERN FOR THE OTHER QUADRANTS



QUADRANT LOCATION

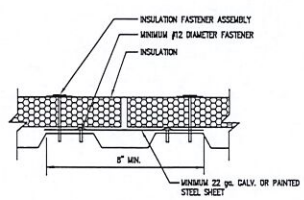
SCALE: N.T.S.





ROOF MEMBRANE DETAIL

SCALE: N.T.S.



ROOF INSULATION ANCHORING DETAIL

SCALE: N.T.S.

NOTES:

1. ALL INSULATION FASTENERS SHALL BE INSTALLED IN COMPLIANCE WITH THE FASTENER MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS AND THE LIMITATIONS SET FORTH IN THE PRODUCT APPROVAL.
2. FASTENERS INSTALLED AT INSULATION PANEL EDGES SHALL BE SPACED NOT GREATER THAN 131/2 INCHES NOR LESS THAN 41/2 INCHES FROM THE EDGE OF THE PANEL UNLESS OTHERWISE SPECIFIED IN THE PRODUCT APPROVAL.
3. FOR RECOVER OR REROOF APPLICATIONS OVER AN EXISTING STEEL DECK, HAVING A THICKNESS LESS THAN 22 GAGE, INSULATION FASTENERS SHALL BE TESTED FOR WITHDRAWAL RESISTANCE IN COMPLIANCE WITH TAS 105.
4. INSULATION FASTENERS AND STRESS PLATES, AND MINIMUM ACCEPTABLE INSULATION PANEL SIZE AND THICKNESS SHALL BE AS LISTED IN THE ROOF ASSEMBLY PRODUCT APPROVAL.
5. INSTALLATION OF MORE THAN ONE INSULATION LAYER USING A SINGLE FASTENER SHALL UTILIZE THE FASTENING PATTERN AND FASTENER DESIGNATED FOR THE TOP INSULATION PANEL.
6. MIXING OF INSULATION PANELS (E.G., DIFFERENT MANUFACTURER'S, INSULATION TYPES) SHALL NOT BE ACCEPTABLE WHEN APPLIED IN THE SAME LAYER.
7. INSULATION PANELS SHALL BE INSTALLED WITH MINIMUM JOINT DIMENSIONS AND SHALL BE TIGHTLY BUTTED. MAXIMUM JOINT WIDTHS SHALL BE 3/8 IN.
8. ALL INSULATION JOINTS SHALL BE STAGGERED. TAPERED INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
9. TAPERED INSULATION MAY BE SUBSTITUTED FOR ANY FLAT STOCK TYPE LISTED IN THE ROOF SYSTEM ASSEMBLY PRODUCT APPROVAL. THE FASTENING REQUIREMENTS SHALL REMAIN THE SAME AND HAVE A MINIMUM THICKNESS AS SPECIFIED IN THE ROOF SYSTEM ASSEMBLY PRODUCT APPROVAL.
10. ALL INSULATED DECKS CONTAINING INTERIOR DRAINS SHALL BE SUMPED AT THE DRAINS. SUMP AREA INSULATION SHALL BE TAPERED AT A MINIMUM SLOPE OF 1/8 OF AN INCH PER FOOT TO THE DRAIN. THE DRAIN SUMP AREA SHALL BE A MINIMUM OF (24 IN. BY 24 IN.) 576 SQUARE INCHES, UNLESS RESTRICTED BY A WALL OR ANY OTHER OBSTRUCTION.
11. ALL OVERDRIVEN FASTENERS OR FASTENERS DRIVEN AT AN ANGLE, SHALL BE REMOVED AND REPLACED. IF THE INSULATION FACER HAS BEEN BROKEN BY A STRESS PLATE, THAT SECTION OF INSULATION PANEL SHALL BE REMOVED AND REPLACED.
12. STEEL DECK INSULATION FASTENERS SHALL PENETRATE THE TOP FLANGE OF A STEEL DECK NOT LESS THAN 1/2 IN.
13. THE TWO OPPOSITE EDGES OF ANY INSULATION PANEL SHALL BE SUPPORTED ON THE TOP FLANGES OF THE STEEL DECK, AND SHALL HAVE A MINIMUM BEARING WIDTH OF 11/2 IN. UNLESS RESTRICTED BY TOP FLANGE WIDTH. ALTERNATIVELY, MINIMUM 22 GAGE GALVANIZED OR PAINTED SHEET STEEL MAY BE PLACED OVER THE DECK RIBS AND SECURED WITH MINIMUM #12 DIAMETER FASTENERS SPACED 18 IN. O.C.
14. STEEL DECK SECTIONS SHALL PROPERLY "NEST," ALLOWING INSULATION PANELS TO HAVE FULL CONTACT WITH THE TOP FLANGES. IF ANY DECK SECTIONS DO NOT "NEST" PROPERLY, THE SECTIONS SHALL BE REPAIRED PRIOR TO THE APPLICATION OF THE ROOF INSULATION. CUTTING, SCORING OR HOLLOWING OF THE INSULATION PANELS IS NOT ACCEPTABLE.

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SEAL & SIGNATURE:

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-	-	-

PROJECT NAME: PRIDCO T-0953-0-70

DRAWING TITLE: ROOF SYSTEM DETAILS

APPROVED BY: E.LLOPS	REVISED BY: L.MONTES	DRAWN BY: E.LLOPS
DATE: 6/25/2021	SCALE: AS SHOWN	REVISION: C

NORTH:

DRAWING NUMBER S-05

SPECIFICATIONS

STG-0978
PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

APRIL 27, 2022

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

LIST OF SPECIFICATIONS

DIVISION 1 – GENERAL REQUIREMENTS

SECTION	TITLE	PAGES
01000	General Requirements	5 pages
01010	Scope of Work	2 pages
01500	General Site Requirements	3 pages

DIVISION 3 – CONCRETE

SECTION	TITLE	PAGES
03110	Concrete Formwork	3 pages
03210	Concrete Reinforcement	3 pages
03310	Cast-In-Place Concrete	13 pages

DIVISION 5 - METALS

SECTION	TITLE	PAGES
05120	Structural Steel	7 pages
05310	Metal Deck	3 pages
05990	Miscellaneous Metals	5 pages

DIVISION 7	- THERMAL AND MOISTURE PROTECTION	PAGES
07512	Thermal and Moisture Protection	7 pages

DIVISION 8 – DOORS & WINDOWS

SECTION	TITLE	PAGES
08100	Hollow Metal Doors and Frames	3 pages

DIVISION 9 – FINISHES

DIVISION 10 - SPECIALTIES

DIVISION 16 – ELECTRICAL

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

LIST OF SPECIFICATIONS

DIVISION 1 – GENERAL REQUIREMENTS

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01000 - GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 of the Specification Sections, apply to work of this Section.

1.02 DEFINITIONS

A. These definitions apply wherever such terms are used:

1. Architect/Engineer or Engineer: Owner's designated Engineering Representative.

2. Owner: PRIDCO

3. Contractor: Appropriate individual, partnership, company or corporation as established by work assignments set forth by PRIDCO or designated representative who becomes contractually obligated to Owner.

4. Shop Drawings: Drawings, diagrams, schedules and other data specially prepared for the work by Contractor to illustrate some portion of the work.

5. Product Data: Manufacturer's standard specifications, illustrations, schedules, performance charts, instructions, diagrams and other information furnished by Contractor to illustrate some portion of the work.

6. Operation and Maintenance Data: Operational instructions, electrical and mechanical diagrams, maintenance instructions and schedules, trouble-shooting guides and other information furnished by Contractor necessary for proper operation and maintenance of various installed items of work.

7. Words and Abbreviations which have well known technical or trade meanings are used in the specifications and drawings in accordance with such recognized meanings.

1.03 FIELD QUALITY CONTROL

A. All installation work shall be performed by skilled craftsmen specifically trained for the work or trade which they are performing. Contractor shall replace any workers who, in the opinion of Owner's Representative, are insufficiently trained to perform the installation work in a quality, first class manner.

B. Contractor shall maintain an adequate number of supervisory personnel on the project to assure that all areas of work are properly supervised and well coordinated with other trades. At least one supervisor shall be present at all times that Contractor's personnel are on the project site.

C. Workmanship performed under this project shall be first class in every respect. All surfaces, members, frames and units shall be true, even and in alignment. No warped, bent, dented or otherwise damaged members, frames or units shall be built into the work. Finishes shall be free from chips, dents or other imperfections not in conformance with first class work.

D. Factory assemblies shall conform to the first class standards of the trades concerned.

E. Defective materials shall not be installed and, if installed, shall be removed at Contractor's expense. Where, in the opinion of Owner's Representative, doubt exists as to the quality or effectiveness of the work, the work shall be reinstalled as directed.

F. Contractor shall be responsible for the coordination of his work including all excavation, demolition, cutting, chipping, etc., required with all existing installations and with all new work (including electrical, mechanical, and concrete work) where a hazardous situation and interruptions to existing services to any of the other trades are encountered. In the case of existing buildings, as-built conditions and record drawings shall be consulted as well as Owner's Representative, Maintenance Personnel, or Administrator, or any other authorized personnel before starting work.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS

A. Substitution for items described in the Contract Documents shall be as follows:

1. Where "Approved Equal" is omitted for the item, product, material, system or equipment, provide exactly as specified. No substitutions shall be considered or approved.

2. Where "Approved Equal" is included for an item, product, material, system or equipment, substitution may be submitted to Owner's Representative for approval. Owner's Representative reserves the right to reject any or all substitutions which Contractor may submit for approval. The proposed substitutions shall be:

   a. Accompanied by certified data.

   b. Available in sufficient quantity to prevent delay of work.

   c. Provide in the same range of colors, textures, gauges, dimensions, capacities, functions and finishes.

   d. Equal or shall exceed the specified item in strength, durability, efficiency, serviceability, ease and cost of maintenance.

   e. Compatible with design without design modifications by Owner's Representative or additional cost.

B. All proposed substitutions shall be submitted to Owner's Representative for approval, in writing, prior to bid. The Contractor shall include with his submittal, and data pertinent to the proposed substitution so that the Engineer can properly evaluate it. Approval of substitutions shall be at the sole discretion of Owner's Representative and shall be in writing to be effective.

C. Any additional cost incurred by an approved substitution shall be at Contractor's expense. Responsibility for proper performance of an approved substitution shall continue to rest with Contractor.

2.02 SUBMITTALS

A. Prior to fabrication or installation of work, Contractor shall submit shop drawings, product data and samples to Owner's Representative in accordance with the procedure below.

1. For shop drawings transmit five (5) prints for each submittal to Owner's Representative.

2. For product data transmit three (3) copies for each submittal to Owner's Representative.

B. Submittals shall include the following data:

1. Dimensioned equipment, layout and construction drawings.

2. Schematics for controls, piping, electrical power, instruments loops.

3. Equipment or product specifications, code compliance, certifications, etc.

4. Nameplate data.

5. Other information as required for proper evaluation by Owner's Representative.

C. Review of submittals by Owner's Representative will be general only. Review shall not be interpreted as a checking of detailed dimensions of approval of deviations from contract documents. The review shall not relieve Contractor from his responsibility for the accuracy of submittals, including coordination with and clearances for the other trades, nor from the furnishing of all materials as required by the contract documents but not necessarily shown on the submittal.

D. After review of submittals, Owner's Representative will note any comments or corrections and will also place a stamp thereon to indicate disposition of the review.

1. When the submittal is returned stamped "Rejected" or "Revise and Resubmit", Contractor shall make necessary corrections and resubmit before proceeding with the work.

2. When the submittal is returned stamped "Furnish as Corrected", Contractor may proceed with the work subject to changes noted on the submittal. The submittal must be corrected for record drawings.

3. When the submittal is returned stamped "Reviewed" Contractor may proceed with the work.

2.03 RECORD DRAWINGS

A. Contractor shall maintain at the site, one (1) record copy of all contract drawings, specifications, addenda, change orders and other modifications, in good order, and marked currently to record all changes made during construction, and shall maintain at the site copies of reviewed shop drawings, product data, operation and

maintenance data and samples. These shall be available to Owner's Representative and shall be delivered to Owner upon completion of the work.

B. Upon completion of work, Contractor shall deliver the following record drawing to Owner's Representative:

1. Three (3) copies of all Contract and shop drawings. All record drawings shall be in "as-built" condition.

2. Four (4) copies of all approved product data and operation and maintenance data.

3. All drawings and sepia shall be clearly legible and in good condition; all other documentation shall be neatly bound, indexed and clearly legible.

PART 3 - EXECUTION

3.01 GUARANTEES AND WARRANTIES

A. Upon completion of the work, Contractor shall submit to Owner's Representative, in triplicate, the following properly executed, signed documents:

1. Contractor shall provide a one (1) year written guarantee against faulty workmanship or installation of equipment and materials.

2. Correction of any faulty or defective workmanship or installations shall be performed at Contractor's own expense.

3. Warranty period shall begin on Date of Acceptance of the project by Owner.

4. All manufacturer's guarantees and warranties for installed equipment.

3.02 CLEAN UP

A. Contractor shall, at the end of each work day, clean up all waste materials and rubbish caused by his operations and shall remove them from the project site. Contractor shall also sweep and/or vacuum the work area at the end of each work day in order to remove any dust, concrete, fireproofing or other waste so as to maintain the area in a clean condition. Work which is performed within actual production, packing or warehouse areas must be cleaned up as the work proceeds.

B. Contractor shall maintain his material storage area, tools and construction equipment in a neat and orderly manner. At completion of the work, all tools, equipment and surplus material must be removed from the project site.

C. If Contractor fails to clean up and maintain the work area as stipulated, Owner may do so and the cost thereof shall be charged to Contractor.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
CANOVANAS, PR

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010 – SCOPE OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and all Divisions and Sections of this Specification.

1.02 DEFINITIONS

A. This document covers furnishing and installation of all materials, tools, equipment and qualified personnel necessary to completely install the specified work in this phase of the contract.

B. Major items of work which are incorporated into this document include, but are not limited to the following:

1. Existing insulation and water proofing roof membranes shall be replaced.
2. Existing precast roof slab shall be removed.
3. Existing cross bridging shall be removed.
4. New steel joist 20K3 shall be installed according to drawings.
5. New and existing steel joist must be cleaned and painted with shop coat primer and two coat of polyurethane enamel.
6. New metal deck type B GA. 22 shall be installed.
7. New insulation and waterproofing roof treatment shall be installed.
8. Attach deck to supporting member following the drawing screw schedule.
9. New uplift and horizontal bridging shall be installed.
10. New rigid steel metal conduit shall be installed.
11. New electrical wire shall be installed.

12. New metal roof deck shall be painted.

13. Building walls shall be painted, scratch and clean surfaces before apply primer and two coats of paint.

14. Cleaning and removal of all debris from site.

15. All shop drawings and product submittals.

16. Secure and pay for all permits.

17. All required record drawings.

1.03 RESPONSIBILITY

A. Contractor shall check carefully the site conditions affecting the work. Arrange the work and supply the labor and materials in accordance with the needs to fulfill the conditions of the Contract.

B. Contractor shall complete all work in accordance with an approved work schedule maintaining the intermediate dates and the completion date. Submit all changes in the work programs to Owners Representative for approval if such changes are necessary.

C. Before commencing work Contractor shall visit site and verify that requirements of the plans and specifications are consistent with site conditions.

D. Contractor shall consult soils Engineer, boring reports and soil reports before commencing work.

PART 2 - MATERIALS NOT APPLICABLE

PART 3 - EXECUTION NOT APPLICABLE

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01500 - GENERAL SITE REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 of the Specification Sections, apply to work of this Section.

1.02 DESCRIPTION OF WORK

A. Contractor shall be responsible to see that all of his employees, subcontractors, subcontractors' employees, and material deliverymen obey the requirements outlined in this section of the specifications. Whatever is mentioned for Contractor shall automatically apply to all of the above.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 PLANT SECURITY

A. Contractor shall obey all plant security regulations established by Construction Manager and shall abide by all plant rules and regulations. Contractor shall first check with Construction Manager before entering plant buildings. No contractor nor his employees shall use the plant lunchroom or washroom facilities other than the construction toilets specified herein. Picture passes issued by Construction Manager shall be mandatory for all contractor's employees, subcontractors and vendors and shall be issued before entering plant proper.

3.02 RESTRICTED AREAS

A. All construction personnel shall be restricted to the area of the plant which is under construction. This area will be designated as the work area and all other

areas of the plant will be considered off-limits and closed to construction personnel.

3.03 EMPLOYEE PARKING

A. Contractor shall make sure that all of his employees park their private automobiles in areas designated for this purpose by Construction Manager.

3.04 LAWS, PERMITS, CERTIFICATES, ETC

A. All materials, unless noted otherwise, shall be the best of their respective kinds and suitable for the duties imposed. Materials and workmanship shall comply with all Local, County, and State Codes and Ordinances having jurisdiction; also included will be all necessary supervision to insure the compliance of O.S.H.A. requirements in all phases of work.

B. Contractor shall secure and pay for all necessary permits and certificates, if applicable.

3.05 PROTECTION OF OWNER'S PROPERTY

A. Contractor shall at all times protect Owner's property, buildings, equipment and employees from all hazards that may occur from or while doing his demolition or construction work.

3.06 CONTRACTOR'S GATE

A. All construction personnel, equipment and deliveries shall be admitted to the plant ground via a designated Contractor's gate.

3.07 NOISE AND DUST

A. Contractor shall coordinate and perform his work in such a manner that dust and noise from this project shall not interfere with Owner's regular plant operations. If there develops a problem in this regard Contractor shall re-schedule these problem phases of work to when the plant is shutdown.

3.08 AFTER HOURS WORK

A. Any construction personnel planning to be on the construction site beyond the normal 6:30 A.M. to 5:30 P.M. working hours must advise Construction Manager

in advance so that he can make appropriate arrangements with the Security Director.

3.09 TEMPORARY FIELD OFFICE - CONTRACTOR AND SUBCONTRACTORS

A. Contractor shall provide, for his own use and at his expense for the duration of the project, a field office and telephone. Owner shall not provide any office space or telephone service for contractor. The field office location shall be designated by Construction Manager.

3.10 WORKMEN'S TEMPORARY TOILET FACILITIES

A. Construction Manager shall furnish and service three (3) chemical toilets for all workmen on the project until his phase of the work is completed. The toilets shall be the portable chemical type which shall be installed in a designated area and shall be of sufficient size and meet all requirements of the New York Department of Labor. The facilities shall be equipped with urinals and water closets. The units shall be kept clean at all times and shall be routinely cleaned and serviced a minimum of three (3) times a week.

3.11 ELECTRICITY

A. Contractor shall obtain approval from Construction Manager for all temporary electrical power tie-ins required for his work. Contractor shall provide temporary generators, if so required, and make all necessary arrangements for his subcontractors.

3.12 WATER

A. Contractor shall coordinate with Construction Manager arrangements for all water required for his work. Contractor shall furnish all hoses and piping required. Contractor shall furnish drinking water for his employees and subcontractor's employees.

3.13 STORAGE OF CONSTRUCTION MATERIALS AND EQUIPMENT:

A. Contractor shall store all construction materials that shall be used in his phase of the work outside the building area under construction and in areas designated by Construction Manager in advance of placing the materials. If required for security reasons, Contractor shall bring storage trailers on site and store in designated area as approved by Construction Manager.

3.14 CLEAN UP:

A. Each Contractor shall remove all of his debris, packaging materials and excess materials from the site daily. A general clean up of the site shall take place every Thursday. It is Contractor's responsibility to have sufficient manpower available for this purpose. If Contractors' manpower is not available, Construction Manager shall have area cleaned and cost of same shall be back charged to contractor responsible for debris.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

LIST OF SPECIFICATIONS

DIVISION 3 – CONCRETE

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 3 - CONCRETE

SECTION 03110 - CONCRETE FORMWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1, and Division 3 of the Specification Sections, apply to work of this Section.

1.02 DESCRIPTION OF WORK

A. Work includes the formwork for all cast-in-place concrete work shown on the drawings.

1.03 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following codes, Specifications and standards, except where more stringent requirements are shown or specified:

1. ACI 301 "Specifications for Structural Concrete for Buildings".

2. ACI 318 "Building Code Requirements for Reinforced Concrete".

3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".

PART 2 - PRODUCTS

2.01 FORMS FOR EXPOSED FINISH CONCRETE

A. Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes

to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

B. Use overlaid plywood complying with U.S. Product Standard S-1 "A-C or B-B High Density Overlaid Concrete Form", Class I.

2.02 FORMS FOR UNEXPOSED FINISH CONCRETE

A. Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

2.03 FORM COATINGS

A. Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

PART 3 - EXECUTION

3.01 FORMWORK

A. Design, erect, support, brace, and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevations, and position.

B. Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.

C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.

D. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

F. Control "V" Joints shall be installed on all exposed faces of continuous wall foundations and spaced not greater than 30 ft. o.c. "V" joints shall also be placed wherever the wall foundation changes in thickness due to wider column foundations or the intersection of other foundations.

G. Form Ties: Factory fabricated, adjustable-length, removable or snapoff metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal. Unless otherwise indicated, provide ties so portion remaining within concrete after removal is 1" inside concrete and will not leave holes larger than 1" diameter in concrete surface.

H. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retighten forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

J. All formwork is to be removed from excavations. No formwork is to remain in place during backfilling.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 3 - CONCRETE

SECTION 03210 - CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 and Division 3 of the Specification Sections, apply to work of this Section.

1.02 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following codes, Specifications and standards, except where more stringent requirements are shown or specified:

1. ACI 301 "Specifications for Structural Concrete for Buildings".

2. ACI 318 "Building Code Requirements for Reinforced Concrete".

3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".

1.03 SUBMITTALS

A. Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others as requested by Owner's Representative.

B. Shop Drawings; Reinforcement: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required and openings through concrete structures.

PART 2 - PRODUCTS

2.01 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Galvanized Reinforcing Bars: ASTM A 767, Class II (2.0 oz. zinc psf) hot-dip galvanized, after fabrication and bending.

C. Epoxy-Coated Reinforcing Bars: ASTM A 775.

D. Steel Wire: ASTM A 82, plain, cold-drawn, steel.

E. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.

F. Welded Deformed Steel Wire Fabric: ASTM A 497.

G. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars, and welded wire fabric in place. Use wire bar type supports complying with CRSI Specifications, unless otherwise acceptable.

1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

PART 3 - EXECUTION

3.01 PLACING REINFORCEMENT

A. Clean reinforcement of loose rust and mill scale, earth, and other materials which reduce or destroy bond with concrete.

B. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.

C. Concrete protection of reinforcement - provide minimum cover as specified in ACI-318 and as follows:

Bottom bars structural slabs on ground	3 inches
Top bars structural slabs on ground	1 inch
Formed structural slabs	1 inch
Footings and bottom bars of grade beams	3 inches

Pedestals	2 inches
Walls: Interior	3/4 inch

The system of holding bars in place must insure that all steel in top section will support the weight of workmen without displacement.

D. All chairs, devices, nails or wiring for positioning reinforcing steel shall be galvanized.

E. All reinforcing steel within the limits of a day's pour shall be in place and firmly wired before concreting starts. Placing or wiring steel less than six hours ahead of the concrete will not be permitted. Bending of bars by use of heat shall not be permitted.

F. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

G. Splicing Reinforcement: When it is necessary to splice reinforcements at points other than shown on drawings, the character of the splice shall be determined by Engineer. Whenever possible, splices of adjacent bars shall be staggered.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 3 - CONCRETE

SECTION 03310 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 1, and Sections 03110 and 03210 of the Specification, apply to work of this Section.

1.02 DESCRIPTION OF WORK

A. Contractor shall furnish all labor, materials, tools, equipment, reinforcing, lumber, formwork, layout and supervision required to complete the Concrete and Cement Finishing Work for the project. The work shall be as shown on the drawings and herein specified, but not limited to, the following:

1. Work Included:

a. All excavation and backfilling for footings, piers, beams and foundation walls.

b. The contractor shall be made aware of and furnish all underpinning and all measures necessary to prevent undermining of all existing footings and foundation due to the depth of excavation required as per the "Geotechnical Engineering Report".

c. Construct all wall and column footings, piers, beams, and wall foundations as shown on drawings.

d. All floor slabs.

e. Set all anchors, leveling and base plates and bolts. Furnish and set all inserts, sleeves, dowels, embedded items and expansion joints shown on drawings and embedded in concrete.

f. Furnish and install all waterstops as shown on drawings.

g. Patching and cleaning of all concrete after removal.

h. Line and grade of all work under this section.

i. All pumping and de-watering required to perform the work.

j. All testing of concrete as specified herein.

k. All temporary barricades and railings.

l. Obtain and pay for all permits from local authorities.

1.03 QUALITY ASSURANCE

A. All concrete construction, unless otherwise specified, shall comply with American Concrete Institute's Standards and Recommendations, including "Building Code Requirements for Reinforced Concrete" (ACI-318) and the Recommendations of the Concrete Reinforcing Steel Institute, latest editions, all local and municipal codes, and OSHA.

B. Ready-mixed concrete shall be in strict accordance with "Specifications for Ready-Mixed Concrete" ASTM C-94, latest edition.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C-150, Type I or Type II. All cement shall be from the same mill and manufacturer and shall be of uniform color.

B. Aggregates: Shall conform to ASTM Specification C-33. Fine aggregate shall be clean, natural sand, well graded from coarse to fine. Coarse aggregate shall be clean gravel or crushed stone 1" maximum size for all footings, grade beams, piers, walls over 8" thick and slabs on grade; 3/4" maximum size for all other locations.

C. Water: Clean and free from oils, acids, salts or other injurious substances.

D. Admixtures: Admixtures shall be used only with the approval of Owner's Representative. Admixtures shall be Pozzolith or similar and shall be equal to water reducing, set control admixture capable of exceeding minimum requirements of ASTM C-494-63T when used with local material.

E. Curing Compound: Shall be "MASTERSEAL" - Master Builders Company, Cleveland, Ohio or an equal approved by Owner's Representative.

F. Air Entraining Agent: Shall be as manufactured by the following:

1. Master Builders Company (MB-NUR).

2. Dewey & Almy Chemical Co. (Darex AEA).

G. Metal Accessories: Include all spacers, chairs, ties, and other devices necessary for properly placing, spacing, supporting and fastening reinforcement in place. All metal accessories and tie wires to be galvanized.

H. Non-Shrink Grout: Shall be "Imperial Grout" manufactured by Penn-Dixie Chemical Co. of North Arlington, New Jersey or an approved equal. Grout shall be used under column leveling plates and where shown in pits. The grout shall be non-metallic type mixed and applied in accordance with manufacturer's directions.

I. Concrete Sealer: Shall be "Seal Hard" as manufactured by L & M Construction Chemicals, Inc. of Omaha, Nebraska or approved equal. Sealer shall be used as shown on drawings. No sealer shall be used in areas with special finishes. Verify with Owner's Representative. Sealer shall be non-metallic type. Contractor shall verify.

2.02 CONCRETE

A. Proportions of the concrete mixture shall produce a mixture of adequate workability free from segregation, honeycombing and bleeding. The percentage of sand will be the minimum practical that will permit adequate workability. Temperature of the concrete at the time of placing shall not be lower than 65°F, nor higher than 85°F.

B. Control Concrete Mixture:

1. Consistency: Test for slump shall be performed at the job site immediately prior to placing in accordance with Method of Slump Test for Consistency of Portland Cement - ASTM C-143. If the slump is greater than that specified, the concrete shall be rejected. If the slump is within the allowable limit, but excessive bleeding, poor workability or poor finishing are observed, changes in the concrete mix shall be obtained only by any adjustment of one or more of the following:

   a. The graduation of fine coarse aggregate.
   b. The proportion of fine and coarse aggregate.
   c. The percentage of entrained air within the allowable limits.

2. Air Content: Test for air content shall be made with (Chace) Air Indicator

on a concrete sample that has been removed from the slab when consolidation has been completed. Air content for concrete made of ordinary aggregates having low absorption shall be made in accordance with either Method of Test for Air Content or Freshly Mixed Concrete by the Pressure Method, ASTM C-231, or Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method, ASTM C-173. If lightweight aggregates or aggregates with high absorptions are used, the latter test method shall be used.

3. Unit Weight Test: In accordance with Method Test for Weight per cubic foot, yield, and air content (gravimetric) of concrete, ASTM C-138, may be used in lieu of the air content test, provided the relationship between air content and unit weight has been established for the materials being used.

4. Compression Test: Specimens shall be made and cured in accordance with method of Making and Curing Compression and Flexural Test Specimens in the Field ASTM C-31. During the progress of the work six (6) 6" x 12" cylinders shall be taken from each full day's concreting or from each 150 cu. yds. of concrete placed - three for a 7-day test and three for a 28-day test. Specimens shall be tested in accordance with Method of Test for Compressive Strength of Molded Concrete Cylinders, ASTM C-39.

5. Tests: Three cylinders shall be tested at seven days and three cylinders at twenty-eight days; the air content and slump test shall be made at the same time the test cylinder specimens are made. Contractor shall arrange and pay for all tests specified above. Concrete testing laboratory shall be approved in writing by Owner's Representative. Two copies of all tests shall be forwarded promptly and directly to Owner's Representative from testing laboratory.

C. Strength, Slump and Air Entraining:

1. Concrete - Type A (mat foundations)

Minimum compressive strength @ 28 days	3000 psi
Maximum slump	5"
Air entrainment (plus or minus 1%)	5.7%
Maximum water cement ratio	0.58
Maximum cement content	6.0 bags

2. Concrete - Type B (footings, wall foundations, beams, and piers)

Minimum compressive strength @ 28 days	3500 psi
Maximum slump	4"

Air entrainment (plus or minus 1%)	5.7%
Maximum water cement ratio	0.55
Maximum cement content	6.0 bags

3. Concrete - Type C (all floor slabs).

Minimum compressive strength @ 28 days	4000 psi
Maximum slump (using Pozzolith)	5"
Air entrainment (plus or minus 1%)	5.6%
Maximum water cement ratio	0.50
Maximum cement content	6.5 bags

D. Air Entraining Agent: Add sufficient air entraining agent to reduce the weight of concrete per cubic foot as specified in preceding articles of the Specifications.

E. Design Procedure: To determine proportions of ingredients including water reducing, set control admixture necessary to produce durability and strength requirements mentioned above, concrete producer shall submit certified test reports, showing compliance with maximum W/C, air entrainment, slump, and compressive strengths of approved materials. Contractor shall be responsible for concrete as delivered to the forms meeting all requirements as specified heretofore.

In lieu of this data, an approved independent testing laboratory is to design concrete mixtures capable of meeting, or exceeding, all the quality requirements as specified using approved material (cement, sand gravel, water reducing, set control admixtures) as selected by Contractor.

F. Plasticity: Proportions of concrete ingredients shall produce concrete which will readily work into angles of forms and around reinforcements without segregation or free water gain on top of surfaces.

PART 3 - EXECUTION

3.01 PREPARATION OF FORM SURFACES

A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.

B. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

C. Thin form coating compounds only with thinning agent of type and in amount and under conditions of form-coating compound Manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact

with in place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

D. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

3.02 MIXING AND PLACING

A. No concrete shall be placed which has contained its water content more than 60 minutes.

B. Remove water from trenches and keep moist while placing concrete. Never pour concrete on dry porous earth or on mud. All pumping of water necessary to keep trenches dry shall be by this Contractor.

C. Equipment and forms shall be cleaned before reuse.

D. Place concrete as near as practicable to its ultimate position in forms. Prevent segregation and loss of ingredients. Use mechanical vibration to insure contact with forms and reinforcing as concrete is poured.

E. Plumb bulkheads with keys at joints for day's work. See details of construction joint. Clean and roughen hardened concrete surface and slush before placing additional concrete.

F. After suitable bulkheads and screeds have been positioned, the concrete shall be placed continuously between construction joints beginning at a bulkhead edge form of corner. Each batch shall be placed into the edge of the previously placed concrete to avoid stone pockets and segregation.

G. Water stops shall have all joints welded together as per manufacturer's directions and shall be cleaned and secured in place before concreting is permitted.

H. Hot Weather Placing:

1. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

2. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90°F. (32°C.). Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.

3. Cover reinforcing steel with water-soaked burlap if it becomes too hot so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

4. Fog spray forms, reinforcing steel and subgrade just before concrete is placed.

5. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

3.03 CURING

A. Concrete Curing and Protection:

1. General:

a. Protect freshly placed concrete from premature drying and excessive hot temperatures.

b. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than seven (7) days.

c. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least seven (7) days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

2. Curing Methods:

a. Perform curing of concrete by curing and sealing compound, by moist curing, by moisture retaining cover curing, and by combinations thereof, as herein specified.

b. Provide moisture curing by following methods:

1. Keep concrete surface continuously wet by covering with water.

2. Continuous water fog spray.

3. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap

over adjacent absorptive covers.

c. Provide moisture-cover curing as follows:

1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

d. Provide curing and sealing compound to interior slabs with resilient flooring, carpet over cushion, or left exposed; and to exterior slabs, walks, and curbs, as follows:

1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

e. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, damp proofing, membrane roofing, flooring, (such as acid brick or quarry tile, glue-down carpet), painting, and other coatings and finish materials, unless otherwise acceptable to Owner's Representative. Concrete to receive the above toppings are to be water cured only.

3. Curing Unformed Surfaces:

a. Cure unformed surfaces such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.

b. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

4. Sealer and Dustproofer:

a. Apply a second coat of specified curing and sealing compound only to surfaces given a first coat.

b. Comply with ACI 347 for shoring and reshoring in multi-story construction, and as herein specified.

3.04 FORMS

A. Removal of Forms:

1. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50°F. (10°C.) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

3.05 MISCELLANEOUS

A. Miscellaneous Concrete Items:

1. Filling In:

a. Fill in holes and openings left in concrete structures for passage of work by other trades unless otherwise shown or directed after work of other trades is in place. Mix, place, and cure concrete as herein specified to blend with in place construction. Provide other miscellaneous concrete filling shown or required to complete work.

3.06 REPAIRS

A. Concrete Surface Repairs:

1. Patching Defective Areas:

a. Repair and patch defective areas with cement mortar immediately after removal of forms when acceptable to Owner's Representative.

b. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

c. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will

match surrounding color. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

2. Repair of Formed Surfaces:

   a. Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Owner's Representative. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.

   b. Repair concealed formed surfaces where possible that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

3. Repair of Unformed Surfaces:

   a. Test unformed surfaces such as monolithic slabs for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.

   b. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01-inch-wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop outs, honeycomb, rock pockets, and other objectionable conditions.

   c. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.

   d. Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Owner's Representative.

   e. Repair defective areas, except random cracks and single holes not

exceeding 1 inch diameter, but cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

f. Repair isolated random cracks and single holes not over 1 inch in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

g. Perform structural repairs with prior approval of Owner's Representative for method and procedure, using specified epoxy adhesive and mortar.

h. Repair methods not specified above may be used, subject to acceptance of Owner's Representative.

3.07 BONDING FRESH AND HARDENED CONCRETE

A. Before new concrete is deposited on or against concrete that has set, forms shall be retightened, surface of the set concrete roughened, cleaned of foreign matter and laitance and saturated with water. The cleaned and wetted surfaces of the hardened concrete, including vertical and inclined surfaces, shall be slushed with a 1:2 mortar and a bonding agent composed of anti-shrinkage aggregate brushed onto the slab and the new concrete shall be placed before the bond coat has attained its initial set. All contact surfaces shall be clean and wet but free from pools of water at the moment the fresh concrete is placed.

3.08 OPENINGS

A. Openings through concrete walls for sleeves, other mechanical, plumbing and electrical equipment shall be built and set by Contractor.

B. Consult with mechanical, plumbing and electrical trades for size and locations and

accurately locate same before placing of reinforcing and pouring of concrete.

C. Provide two (2) 3/4" deformed bars on all sides for all openings in concrete walls unless otherwise noted. Extend bars two feet (2') beyond openings.

3.09 PROTECTION OF CONCRETE

A. The following rules are for the minimum requirements of protection and do not relive Contractor from producing concrete which has not been weakened.

1. All concrete shall be adequately and continuously protected from mechanical injury or actions of the elements until such time as the concrete is thoroughly set.

3.10 PATCHING

A. Directly after forms have been removed, all exposed tie wires, etc. shall be removed from concrete surfaces to be exposed. Rub smooth or cut off fins and projections. Remove all loose concrete and fill honeycomb surfaces, stone pockets and other irregularities with 1:2 cement mortar to match existing concrete. Do not patch any surface until examined by Owner's Representative and permission is given. All patching of concrete in pit walls shall be with non-shrink grout.

3.11 CURING AND HARDENING

A. Exposed surfaces of concrete shall be protected from premature drying and freshly placed concrete shall be protected against wash by rain. Concrete shall be kept wet for a period of six days after placing. An acceptable pigmented curing compound may be used in lieu of "wet" curing.

B. Cement finish of every description shall be protected against frost or rapid drying paper covering and kept moist for at least seven (7) days. Paper shall be 2-ply Kraft, with membrane in the center, reinforced with cross fibers completely embedded in asphalt. Paper shall be laid with as few joints as practicable and lapped at least 3". A pigmented curing compound may be used in lieu of "wet" curing if approved by Owner's Representative for application.

3.12 LINE AND GRADE

A. Contractor shall be responsible for establishing all line and grade required for the work covered under this section. Contractor shall employ a licensed land

surveyor to establish all corners of buildings, all column center lines and all elevations. Bench marks showing elevations shall be installed in both buildings for use of other Contractors. Upon completion of this phase of work, Contractor shall submit "Record" drawings of the site showing exact location of building in relation to property lines, adjacent buildings, and road areas.

3.13 JOINTS

A. Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate them in order as not to impair strength and appearance of the structure and as approved by Architect/Engineer.

1. Provide keyways at least 1-1/2 inches deep in construction joints in slabs.

2. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints.

3.14 INSTALLATION OF EMBEDDED ITEMS

A. General:

Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast in place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.

3.15 GUARANTEE

A. Contractor shall guarantee that the materials and workmanship covered by this Section of the Specifications shall be first class in every respect and that he shall make good any defects, not due to ordinary wear and tear or improper use, which may develop within one (1) year from the date of Final Acceptance by Owner.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

LIST OF SPECIFICATIONS

DIVISION 5 - METALS

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 5 - METALS

SECTION 05120 – STRUCTURAL STEEL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 1 and Division 5, of the Specification Sections, apply to work of this Section.

1.02 DESCRIPTION

A. Contractor shall provide all materials, labor, tools, equipment, transportation and other facilities for the supply, erection and completion of all Structural Steel as shown on drawings and required to make a complete project. Work shall include all fabrication, delivery, and erection of steel for the new facility.

B. The work shall include, but not be limited to, the following:

1. Furnish and erect all structural steel columns, girders, beams, masonry anchors, channels, bracing, girts, outriggers, hanger rods, angles, pour stops, seats, etc., as shown on drawings.

2. Furnish all foundation leveling plates and anchor bolts and deliver them to Foundation Contractor for installation.

3. Furnish and install adjustable masonry wall anchors on center on all columns and beams located in masonry walls.

4. Installation of structural steel for metal wall panel including girts, angles, channels, etc., and framing of openings as required and as shown on drawings.

5. Furnish and erect all roof and floor openings and roof dunnage as shown on drawings.

6. Furnish and erect all pipe trestles.

7. Shop prime paint all structural steel and field touch up after erection.

8. All field checking of anchor bolts, embedded items installed by others and all line and grade required for this work.

1.03 SHOP DRAWINGS

A. Contractor, immediately upon the award of the contract, shall prepare shop drawings and engineering calculations for connections of all structural steel based on the architectural and structural drawings for the approval of Engineer. These drawings and calculations shall give the necessary information for the design, fabrication, erection and painting of the structure and shall be based on A.I.S.C. Specifications and all local codes for loadings and design requirements. Before submitted to Engineer for review, shop drawings and engineering calculations shall be sealed by Professional Engineer.

B. Each submittal of shop drawings shall consist of five (5) sets of prints. No fabrication shall be conducted until approved drawings are in the hands of the shop inspector. Index sheets shall be furnished with all beam and column details. The approval of shop drawings shall not relieve Contractor of his responsibility for strength and fit of connection.

1.04 MILL REPORTS

A. Contractor shall furnish at his cost, two (2) certified copies of all mill reports covering the chemical and physical properties of the steel used in the work under this Specification and deliver to the Engineer.

1.05 DESIGN

A. Design shall conform to the requirements of the latest edition of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" of the American Institute of Steel Construction and shall also meet all requirements demanded by local codes for loadings and steel requirements. The shop drawings and calculations shall be submitted to Engineer for approval before any material is fabricated. Subsequent to approval by the Engineer, any substitutions of sections or modifications of details or both, shall be made only when approved by Engineer, but such approval shall not relieve Contractor of responsibility for design.

1.06 RESPONSIBILITY FOR ERRORS

A. Contractor alone shall be responsible for all errors of design and fabrication and for the correct fitting of the structural members shown on the drawings.

1.07 WORKMANSHIP AND FABRICATION

A. Measurements shall be taken in the field, as required, to verify or supplement dimensions or conditions shown on the drawings. Contractor shall take all

responsibility for the perfect fit of all work contained in this Contract including the proper connection to adjoining work of other trades. Contractor shall be responsible for checking all anchor bolt locations and leveling plates before starting erection and shall report all discrepancies in writing to Engineer. All work shall be fabricated in ample time so as not to delay the progress of the project and shall be delivered at such times and in such sequence as required for the proper coordination of all the work as determined by Owner's Representative.

B. All column leveling plates and all items to be embedded in concrete shall be delivered as a separate item as soon as possible after award of contract to allow for completion of foundation work.

C. All structural steel work shall be cut, punched, drilled or tapped as required for the attachment of, or to other work where shown on the drawings, or where instructions for same are given prior to or with the approval of the shop drawings. All cutting and field connections shall be made where shown on drawings or where required.

D. All necessary temporary bracing and similar members shall be provided to support all loads to which the framing may be subjected including erection equipment. The temporary guy wires, falsework, bracing and other supports shall be left in place as long as may be required for safety and until approval is given by Engineer for their removal.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All metals shall be clean and free from loose mill scale, flake rust, pitting and other defects, which would impair their strength, durability and appearance. All metals shall be new and of the best commercial quality for the purposes specified.

B. All structural steel shapes and plates shall comply with the requirements of the standard Specifications of the A.S.T.M. for "Structural Steel for Buildings", latest edition.

C. Steel pipe shall conform to the requirements of A.S.T.M. Specification A-53, latest edition.

D. Bolts and nuts shall comply with the requirements of the standard specification of A.S.T.M. latest designation A-9, latest edition. Nuts shall be U.S. standard size. High strength bolts shall conform to ASTM A325, anchor bolts shall conform to ASTM A36, all other bolts shall conform to ASTM 307.

E. No structural steel shall be stored on ground without proper protection from dirt and mud. All steel shall be cleaned of all dirt and mud before it is erected in place and before any touch-up painting.

F. Threads shall be U.S. Standard. Heavy, approved type lock washers shall be used under all nuts. The threads of bolts shall not extend into the bearing area.

G. Stock materials shall be of quality equal to that herein before specified for the classifications covering its intended use Mill test reports shall constitute sufficient record as to the quality of material carried in stock.

H. No materials containing plugged or filled holes shall be accepted.

PART 3 - EXECUTION

3.01 FABRICATION AND ERECTION

A. All steel work shall be designated, fabricated, delivered and erected to comply and be in accordance with:

1. Requirements of all local codes as amended to date and all applicable directives of the department having jurisdiction.

2. The latest edition of the American Institute of Steel Construction publication entitled "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings".

3. "Code of Standard Practice for Steel Buildings and Bridges" and the "Standard Code for Arc and Gas Welding in Building Construction" by the American Welding Society, as in effect on the date the shop drawings are approved.

4. These codes shall apply to the design and construction of all work performed under this Section provided, however, that no provisions therein, which are either in conflict with the requirements of the current edition of Local Building Codes or any directives of the department having jurisdiction over this Section of the Specifications, shall be applicable.

B. Structural steel shall be delivered to the job site precut, ready for field connections and prime painted.

C. All welders shall be certified in accordance with the A.S.M.E. Code Test for Building Construction Industries and shall comply with all local laws and ordinances.

D. Welding shall be continuous along entire line of contact unless otherwise noted on drawings. Exposed welds shall be ground smooth and all slag chipped off.

E. All workmanship shall be equal to the best practice in use in modern structural shops.

3.02 CONNECTIONS

A. Weld or high strength bolt all shop connections. Design connections to develop reactions and stresses shown on the design drawings. Where the reaction or stress is not noted, design connections to develop the full working strength of the members in accordance with AISC standards. Notwithstanding any provision to the contrary in "Code of Standard Practice for Steel Buildings and Bridges" or in this Section, all connections designed by the fabricator shall be his responsibility and review of shop drawings by Engineer shall not relieve fabricator of this responsibility. Design connections to provide suitable access for field connection.

B. Bolted Connections:

1. Assemble high strength bolted connections in accordance with "Specifications for Structural Joints using ASTM A325 or A490 Bolts". Unless otherwise noted on the drawings, design high strength bolted connections as bearing type with threads in shear planes. Where friction type connections are called for on the drawings, they shall be designed on the basis of threads in the shear plane. The maximum allowable working stress for friction type shear connections shall not exceed the allowable stress for bearing type connections with threads included in shear plane. Include in the design of connections consideration for web tear-out (block shear).

2. Washers: In tightening all high strength bolts, regardless of method of tightening, a hardened washer should be used under the element. When an outer face of bolted parts has a slope greater than 1/20 with respect to a plane normal to the bolt axis, use a beveled washer to compensate for lack of parallelism.

3. Torquing of Bolts:

a. All bolts on structural steel framing shall be torqued as called for on Table 3, Section 5-214 Specification for Structural Joints in the 8th edition of the AISC Manual of Steel Construction.

b. Load Indicator Bolt: Load indicator bolts meeting the requirements of ASTM A325 may be used to provide specified bolt tension. Load indicator bolts shall be installed in accordance with the manufacturer's recommended procedure, using wrenches as recommended by the manufacturer. Bethlehem Steel Corp. load indicator bolts or LeJeune Bolt Co. Tension Control Bolts may be used. Equivalent products of other manufacturer's may be used if approved in writing by Engineer.

c. Tighten each bolt to provide, when all fasteners in a joint are tight, at least the minimum tension listed below:

Bolt Size	A325 Bolts

5/8"	19 Kips
3/4"	28 Kips
7/8"	39 Kips
1"	51 Kips

d. Contractor shall have an independent testing laboratory test and certify in writing to Engineer that at least 10% of all bolts, maximum one bolt at each connection unless connection has more than ten (10) bolts, have been tested and found to be torqued as specified. If any one of the bolts in a connection is found to be defective, then all bolts in that connection shall be tested and retorqued as required.

The independent testing laboratory used for this work shall be approved by the Engineer.

e. The costs for all testing and retesting shall be paid for by Contractor and shall be included in his Contract amount.

4. Welded Connections:

Execute welding with welders qualified in accordance with AWS D1.1. Unless otherwise shown on the drawings, only prequalified welded joints shown in AWS D1.1 shall be used. Use current and voltage for welding in accordance with the requirements of AWS D1.1. Clean surfaces as outlined in AWS D1.1. Remove fins and burrs from joint surfaces. Finish members true to line and free from twists, bends and open joints.

3.03 PAINTING

A. Thoroughly clean all structural steel of all rust, loose scale, grease and dirt and other foreign matter before painting. Then apply one shop coat of an approved Devguard 4160 metal primer as manufactured by ICI Devoe Coatings of Cleveland, Ohio or Engineer approved equal and applied as per manufacturer's recommendations. All painting shall be done on dry surfaces. After erection, clean and wire brush where necessary, then touch up field connections and abraded surfaces with above specified paint. All steel covered under this section for erection shall be free of all mill scale peeling, paint runs, rust, dirt, etc., before it shall be approved by Engineer.

B. At weld locations, steel contact surfaces shall remain unpainted. Do not paint steel surfaces to be embedded in concrete.

C. Steel surfaces to be adjacent to concrete or masonry or to be otherwise inaccessible after erection, shall receive a field coat of bituminous paint such as Kopper's "Inertil No. 49 Thick" or other bituminous paint certified as permanently compatible with shop coat paint. If compatibility is not possible, steel shall not be shop painted in these areas.

3.04 RECORD DRAWINGS

A. Contractor shall keep at the job site a complete up-to- date set of drawings showing all dimensional and other changes made in the field due to job conditions. Upon completion of the project, Contractor shall submit to Engineer a complete "As-Built" set with all these changes clearly made and noted.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 5 - METALS

SECTION 05310 - METAL DECK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 1 and Division 5 of the Specification Sections, apply to work of this Section.

1.02 DESCRIPTION

A. Contractor shall furnish all materials, equipment and labor necessary for the complete installation of all galvanized metal roof decks for the new facility in accordance with these specifications and drawings. Galvanized 14 gauge recessed roof sumps to be furnished and installed as per plan requirements. Furnish and install roof sump pans.

B. Contractor shall coordinate his work with other trades and shall cut all roof openings as shown on drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Metal roof decks shall be hot dipped galvanized type "B", 1-1/2" deep, 18 gage with 2 1/2" wide ribs (6 inches on center) and shall have overlap type side joint. Deck manufacturer shall be a member of the SDI.

B. Weld washers shall be used at all connections of deck to structural steel.

C. Basic steel to be ASTM designation A 446-72 (latest edition) for galvanized steel.

D. Sump pans shall be stock pattern and shall consist of 14 gage galvanized steel. Contractor shall field cut and install sump pans for each roof drain in field.

E. All closure pieces at metal deck edges.

2.02 DESIGN

A. The maximum design stress shall not exceed 20 KSI under total dead and live load. Properties shall conform to AISC "Specifications for the Design of Cold Formed Steel Structural Members", latest edition.

2.03 FINISHES

A. Before forming, the steel sheets are to receive a hot-dip protective coating of zinc conforming to ASTM-A-525 class G 60.

PART 3 - EXECUTION

3.01 ERECTION

A. Furnish erection shop drawings for approval before starting erection.

B. Check alignment and level of structural steel and report inaccuracies to the Engineer for correction by others.

C. Place and adjust panels in initial bay. Check coverage, dimensions, and alignment to avoid "fanning" and then weld original bay to act as staging area.

D. Attachment of roof deck to supporting structural members shall be as follows:

5/8" Diameter puddle welds at 12" on center at all cross members (minimum 3 per sheet).

#12 Self-drilling screws at mid-span of side joints (3'-0" O/C max.). 5/8" Diameter puddle welds at 2'-0" at perimeters. Split of partial panels shall be attached to supporting members at each valley.

E. Paint all field welds on top surface with an approved metal primer.

F. Cut all openings as indicated and dimensioned on structural and architectural drawings.

G. Openings larger than 12" x 12" require sub-framing and must be shown on the shop drawings or reviewed by the Engineer before installation.

H. Touch up all abrasions in the galvanized coating and weld marks with oil base paint. Upon completion of all work, wipe down the underside of decks with mineral spirits to remove erection markings, stencils, trademarks, and soil of any character leaving the exposed underside clean and in acceptable condition.

3.02 WORK WITH OTHER TRADES

A. Contractor shall cooperate with other contractors who furnish and install work in connection with the work of this section, giving them complete data as to his requirements, and shall notify the Engineer of any condition that will interfere with proper completion of this work.

3.03 STORAGE AND HANDLING

A. Contractor shall store all materials on site as directed by Owner's Representative, and is to start deck installation immediately after the steel erection in the area concerned is completed and is to proceed as rapidly as possible under the direction of Engineer. All stored materials shall be protected from the elements and physical damage. All damaged material shall not be installed but shall be replaced by Contractor. All deck shall be cleaned of all mud and dust before erection.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 5 - METALS

SECTION 05990 - MISCELLANEOUS METALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 1, and Division 5 of the Specification Sections, apply to work of this Section.

1.02 DESCRIPTION OF WORK

A. The intent of this Section is to provide all additional miscellaneous metal items required to complete this phase of work. Contractor shall physically field check and verify extent of work existing against limits of new work specified herein and as shown on drawings.

B. Contractor shall provide all materials, labor, tools, equipment, transportation and other facilities to furnish and install all miscellaneous metal items shown on the drawings and not specified under other sections of the specifications. All such miscellaneous items for this phase of work, except those definitely indicated to be furnished by others or "Not in Contract" on the drawings, shall be furnished and installed regardless of whether no specific mention is made of them in this section.

C. Work Included:

Contractor shall furnish and install, but not be limited to, the following:

1. All steel framing and miscellaneous angles required for rooftop pipe trestles as shown on drawings.

2. Steel framing for roof openings and support framing for exhaust fans and rooftop duct work.

3. All rooftop protective steel pipe railings and roof ladders as shown on drawings.

4. All steel platforms including toe plates, checkered steel plate, railings,

ladders, etc.

5. All steel framing and miscellaneous angles required for interior pipe racks and trapeze.

6. Prime painting of all steel items supplied by this contractor.

7. All other miscellaneous metal items shown on drawings.

1.03 SUBMITTALS

A. Contractor shall submit shop drawings to Owner's Representative for approval on all miscellaneous metal items showing thickness of metals, connections, and installation details. Each submittal of shop drawings shall consist of one (1) sepia and three (3) prints. Contractor shall resubmit shop drawings until marked "Reviewed" by Owner's Representative.

1.04 RESPONSIBILITY FOR ERRORS

A. Contractor alone shall be responsible for all errors of design and fabrication and for the correct fitting of the miscellaneous metal items shown on the drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Stock material patterns, products or fabricated items of manufacturers meeting the general requirements specified herein will be accepted. Metals, paints, and related items used in the manufacture, unless otherwise specified shall conform to the applicable requirements of the A.S.T.M. Standards of Federal Specifications. In addition to the above, the following shall apply:

1. All metals shall be clean and free from loose mill scale, flake rust, pitting and other defects which would impair their strength, durability and appearance. All metals shall be new and of the best commercial quality for the purposes specified.

2. All structural steel shapes and plates shall comply with the requirements of the standard Specifications of the A.S.T.M. for "Structural Steel for Buildings", latest edition.

3. Steel pipe shall conform to the requirements of A.S.T.M. Specification A-53, latest edition.

4. Bolts and nuts shall comply with the requirements of the standard

specification of A.S.T.M. latest designation A-9, latest edition. Nuts shall be U.S. standard size. High strength bolts shall conform to ASTM A325, anchor bolts shall conform to ASTM A36, all other bolts shall conform to ASTM 307.

5. No metals shall be stored on ground without proper protection from dirt and mud. All metals shall be cleaned of all dirt and mud before they are erected in place and before any touch-up painting.

6. No materials containing plugged or filled holes shall be accepted.

7. Steel railings shall be as shown on drawings.

8. All screws, miscellaneous fasteners and so forth shall be hot dipped galvanized steel except as otherwise indicated.

B. Metal Parts and Fittings:

1. Contractor shall provide the required steel angles, channels, U-shaped clamps and whatever other necessary fittings to properly assemble the various construction items of this section, and these shall be of dimensions as given on the drawings or as necessary.

C. Steel Ladders:

1. All materials shall be structural steel conforming to A.S.T.M. Standard Specification A-7 latest issue.

2. All work shall be fitted together at the shop as far as possible and shall be delivered complete and ready for erection and shall include all lugs, bolts, anchors and other such items.

D. Supplementary Framing:

1. Contractor shall prepare shop drawings of all supplementary framing including all rods, beam sections, angles, bridging, clips, masonry anchors and all other miscellaneous items to form a complete system as per the drawings.

2. Contractor shall coordinate his shop drawings with those of the Mechanical Contractor. All supplementary framing and hangers shall be installed only after all HVAC duct/piping work has been installed and insulated. This Contractor shall not use ductwork for any supports nor use it as a means of access for working on.

PART 3 - EXECUTION

3.01 WORKMANSHIP AND FABRICATION

A. Measurements shall be taken in the field, as required, to verify or supplement dimensions or conditions shown on the drawings. Contractor shall take all responsibility for the perfect fit of all work contained in this Contract, including the proper connection to adjoining work of other trades. All work shall be fabricated in ample time so as not to delay the progress of the project and shall be delivered at such times and in such sequence as required for the proper coordination of all the work as determined by the Owner's Representative.

B. All structural steel work shall be cut, punched, drilled, tapped or welded as required for the attachment of or to other work where shown on the drawings or where instructions for same are given prior to or with the approval of the shop drawings. All cutting and field connection shall be made where shown on drawings or where required.

C. All necessary temporary bracing and similar members shall be provided to support all loads to which the framing may be subjected, including erection equipment. The temporary guy wires, false work, bracing and other supports shall be left in place as long as may be required for safety and until approval is given by the Owner's Representative for their removal.

D. All support members and bridging members shall be securely anchored at their ends to provide lateral stability.

E. Horizontal members shall be installed level to the heights shown on drawings.

3.02 CUTTING FITTING AND DRILLING

A. Contractor shall do all cutting, fitting and drilling that may be necessary in connection with the miscellaneous and ornamental metal work properly set in place and to permit other engaging work to be properly installed.

B. Contractor shall furnish screws, bolts, and other fastening devices necessary for attachment of other engaged work. Screws and bolts shall be standard, and proper washers shall be provided where necessary.

3.03 WELDING

A. Execute all shop and field welding with welders qualified in accordance with AWS D1.1. Unless otherwise shown on the drawings, only prequalified welded joints shown in AWS D1.1. shall be used. Use current and voltage for welding in accordance with the requirements of AWS D1.1. Clean surfaces as outlined in AWS D1.1. Remove fins and burrs from joint surfaces. Finish members true to line and free from twists, bends and open joints.

3.04 RECORD DRAWINGS

A. Contractor shall keep at the jobsite a complete up-to-date set of prints and sepia showing all dimensional and other changes in the field due to job conditions. Upon completion of the project, Contractor shall submit to Owner's Representative a complete set of red-marks drawings showing all of these changes.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

GENERAL INDEX

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07512 - BUILT-UP ROOFING SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including Section 01000 Section 06100 of the Specification Sections, apply to work of this Section.

1.02 DESCRIPTION OF WORK

A. Furnish and install built-up roofing system. Install roofing system from approved Danosa products and by a Danosa certified installer or approved equivalent.

B. Clean surface substrate and apply light weight concrete at the minimum slopes indicated at drawings.

C. Install a 3' x 3' cant strips at exhaust fans and penetrations perimeter.

D. Install cellular concrete near roof drains as show in drawings to level the surface up to the roof drain height to provide proper draining.

E. Install a 1 inch insultation panel.

F. Install roof board (securock roof board or approved equivalent).

G. Install an asphaltic base membrane Esterdan R-36 or approved equivalent.

H. Install an asphaltic top membrane Esterdan RM-5 or approved equivalent.

I. Install flashing membrane Glasdan AL 80-4 or approved equivalent at all parapets (vertical portion and horizontal portion). Extend a minimum of 6 inches at the horizontal portion over the top membrane (Esterdan RM-5)

J. Install flashing membrane Glasdan AL 80-4 at all penetrations.

K. Apply aluminum paint (Richport or approved equivalent) over each top membrane overlaps. All membranes overlaps shall be at least 4 inches.

L. All roofing works shall be warrantee for a period of 15 years.

1.03 SHOP DRAWINGS AND SAMPLES

A. Submit shop drawings for review. Shop drawings are required for Final Inspection of the Warranty Roof. Shop drawings shall be approved by Manufacturer Representative. Each submittal of shop drawings shall consist of one (1) sepia and four (4) prints.

B. Shop drawings shall include plans, sections, details and attachments for the following:

1. Outline of roof and roof size.

2. Location and type of roof penetration.

3. Pipe and duct penetrations.

4. Expansion joints.

5. Base flashing, cants and membrane terminations.

6. Tapered insulation, including slopes, crickets, saddles and tapered edge strips.

C. Submit product data for each type of roofing product specified.

D. Submit data substantiating that roofing system complies with the following:

1. UL classified fire rating - UL 790

a) Class A.

2. FM 4470

b) Minimum Class 1, I-135 Windstorm

E. Submit installer certificates, signed by Danosa certifying that installer is approved, authorized, or licensed by manufacturer to install specified roofing system and is eligible to receive the standard roofing manufacturer's warranty.

F. Approved applicators shall supply manufacturer with a record shop drawing for Final Inspection. Record shop drawings must be reviewed and given a shop drawing number by manufacturer.

G. Contractor shall furnish to Owner's Representative samples of all materials to be used for the work under this section of the Specifications.

1.04 QUALITY ASSURANCE

A. Apply roofing systems using a roofing contractor approved by Danosa.

B. Provide roofing materials classified by Underwriters Laboratories as a Class A sheathing materials for use in construction of Class A built-up roofing coverings (R8103, dated 7/17/80).

C. Inspection: Periodically during installation and upon completion of the installation an inspection shall be made by a technical representative of manufacturer to ascertain that the roofing system has been installed according to manufacturer's published specifications and/or recommendations and details.

1. There shall be no deviation made from this specification without prior written approval by Tremco and by Owner's Representative.

D. Contractor shall deliver all materials to the job site in manufacturer's original unopened containers, properly labeled for identification.

E. Contractor must be qualified to install roofing systems and must be approved by the manufacturer of the roofing materials.

F. Installation of all material, including thermal barrier, insulation, roofing, flashings, expansion joints and pitch pockets shall be in accordance with manufacturer's recommendations.

G. Contractor shall cooperate with all other contractors (i.e. mechanical, structural contractors, etc.) who furnish and install work in connection with the work of this section giving them complete data as to his requirements and shall notify Owner's Representative of any condition that will interfere with proper completion of this work.

H. Contractor shall store all materials on site as directed by Owner's Representative and shall start roof covering immediately after the deck has been placed and follow the deck subcontractor as rapidly as possible, weather permitting, under the direction of Owner's Representative.

I. The insulation and roofing system shall be installed only when weather conditions insure proper application of all materials.

J. All surfaces must be dry and free of foreign materials, standing water or other conditions which would interfere with good application practices.

K. Contractor shall inspect all surfaces to receive roofing materials and ascertain that they are sound, clean, smooth, dry and free from debris, loose material or defects which would have an adverse effect on the roofing application or performance.

L. All details relating to the installation of the roof system shall be approved by Contractor and/or by roofing system manufacturer and installed in such a manner that Manufacturer will continue its total roofing system guarantee for the installation. Details shall meet requirements of Tremco's process for built-up roofing system.

M. All wood nailers on roof shall be fastened in accordance with Factory Mutual Loss Prevention Data. 1-49, dated Oct. 1979.

1.05 JOB CONDITIONS

A. Contractor shall provide raised platform and waterproof covers to protect the materials from the weather and from contamination, dirt, etc.

B. Materials necessary for two (2) day's work may be stockpiled on roof. Disperse material to avoid concentrated loading.

C. Roof deck shall be properly sloped to drains and free of ponded water.

D. Do not apply roofing membrane during inclement weather or when ambient conditions will not allow for proper application.

E. Contractor shall assume full responsibility for the protection and safekeeping of products stored on premises.

F. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.

G. Comply with federal, state, local and Owner fire and safety requirements.

H. Do not re-use, re-cycle or dispose of material manufacturers product containers except in accordance with all applicable regulations. The user of manufactured products is responsible for proper use and disposal of product containers.

1.06 SECURITY REQUIREMENTS

A. Contractor and contractor employees shall comply with owner security requirements.

B. Provide owner with current list of accredited persons.

C. Require identification to be displayed by all persons employed on this project.

1.07 SITE CONDITIONS

A. Field measurements and material quantities:

1. Contractor shall have sole responsibilities for the accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.

PART 2 - PRODUCTS

2.01 NOT APPLICABLE

2.02 MECHANICAL FASTENERS

A. Wood to wood:

1. Galvanized, common, annular ring nail.

2. Length: Sufficient to penetrate underlay blocking 1 1/4 inches (32 mm).

B. Wood to concrete:

1. Deckfast #14 screw, by Construction Fasteners, Inc., Wyomissing, PA.

2. Insul-Fixx #14, by SFS Stadler, Brunswick, OH.

3. Insul-Tite #14, by Burlington Mfg. Corp., Archbold, OH.

4. Olympic Fastener #14-10, by Olympic Manufacturing Group, Agawam, MA.

5. Tapcon 1/4 inch (6.35 mm) diameter, Phillips flat head anchor, by ITW Buildex, Itasca, IL.

6. Roofgrip #14-10, by ITW Buildex, Itasca, IL.

7. Rawl Drive or Rawl Spike, by the Rawlplug Co., Inc., New Rochelle, NY.

8. Rawl Deck #14 Deck Screw, by the Rawlplug Co., Inc., New Rochelle, NY.

9. Length: Sufficient to provide 1 1/2 inch (38 mm) embedment.

C. Wood to concrete:

1. Kwik-Bolt 3/8 inch (9.53 mm) diameter countersunk stud anchors by Hilti Fastening Systems, Tulsa, OK.

2. Rawl-Stud 3/8 inch (9.53 mm) diameter stud anchors by the Rawlplug Co., Inc., New Rochelle, NY.

3. Length: sufficient to provide minimum 1 1/2 inches (38 mm) embedment.

D. Aluminum sheet metal to wood blocking:

1. FS FF-N-105B (3) Type II, Style 20, roofing nails; 6061-t913 alloy wire, flat head, diamond point, round, barbed shank.

2. Length: Sufficient to penetrate wood blocking 1 1/4 inches (32 mm) minimum.

E. Termination bar to masonry/concrete:

1. Lead masonry anchors.

2. Length: sufficient to provide 1 1/4 inches (32 mm) embedment minimum.

H. Drawband:

2. Gold Seal stainless steel worm gear clamp by Murray Corporation, Cockeysville, MD.

2. Power-Seal stainless steel worm drive clamps by Breeze Clamp Company, Saltsburg, PA.

I. Roof insulation to metal deck:

1. Use only "ULTRA FAST" fasteners and metal plates.

2.03 ROOFING MATERIALS

A. According to section 1.02

2.04 METAL FLASHINGS

A. Termination bar:

1. ASTM B 221-93 -- aluminum bar:

a) 1/8 x 1 inch (3.2 x 25.4 mm).

B. Counterflashing:

1. Aluminum: ASTM B209-89, alloy and temper -- 3003-H14, mill finish.

a) Thickness: 0.040 inches (1.0 mm).

C. Coping cap:

1. The coping cap shall be 22 gauge galvanized steel. Provide concealed splice plates at all joint locations. Splice plates shall be a minimum of 4 inches wide. Color and finish of all exposed metals shall match metal wall panels.

D. Pitch pans with hood:

1. Aluminum: ASTM B209-89, alloy and temper -- 3003-H14, mill finish. Weld all joints; riveted or soldered joints are not acceptable.

E. Lead Flashings:

1. ASTM B 29-79 (1984), 4 lb. (1.82 kg) sheet lead.

F. Details not addressed in specification shall be in accordance with Architectural Sheet Metal Manual, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA).

PART 3 - EXECUTION

3.01 GENERAL WORKMANSHIP

A. Contractor shall install built-up roofing system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA'S Quality Control Guidelines For The Application Of Built-Up Roofing.

1. Install roofing system according to applicable specification plates of NRCA's "The NRCA Roofing and Waterproofing Manual".

B. Install and secure preformed 45 degree wood cants at all horizontal/ vertical interfaces.

C. All work performed by Contractor shall conform to this specification.

D. The presence and activity of the manufacturer's representative, architect's representative, and/or Owner's representative shall in no way relieve contractor of contract responsibilities or duties.

E. Substrate: Free of foreign particles prior to laying roof membrane.

F. Provide additional fastening of mechanically attached base sheets in roof perimeter and corner areas.

G. Phased application: Not permitted. All plies shall be completed each day.

H. Traffic and equipment: Keep off completed plies until adhesive has set.

I. Wrapper and packaging materials: Not to be included in roofing system.

J. Ply shall never touch ply, even at roof edges, laps, tapered edge strips, and cants.

K. Fit plies into roof drain rims; install lead flashing and finishing plies; secure clamping collars; install domes.

L. Extend roofing membrane to top edge of cant at wall and projection bases.

M. Adhere wall flashing (two plies) to all parapet walls. Flashing to extend from top of wood blocking on parapet wall to at least 6 inches beyond toe of cant onto new roof. Provide continuous termination bar above cant to securely fasten wall flashing directly to substrate.

N. Cut out fishmouths/side laps which are not completely sealed; patch. Replace all sheets which are not fully and continuously bonded.

3.02 PREPARATION

A. Protection

1. Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage at no extra cost to Owner.

2. Provide at site prior to commencing removal of debris, a dumpster or dump truck to be located adjacent to building where directed by Owner's representative.

3. Roofing, flashing, membrane repairs, and insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.

4. At start of each work day drains within daily work area shall be plugged. Plugs to be removed at end of each work day or before arrival of inclement weather.

5. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day and before arrival of inclement weather.

6. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Move equipment and ground storage areas as work progresses.

7. Protect building surfaces at set-up areas with secured tarpaulin. Remove dumpster from premises when full and empty at approved dumping or refuse area. Deliver empty dumpster to site for further use. Upon job completion, dumpster shall be removed from premises. Spilled or scattered debris shall be cleaned-up immediately. Removed material to be disposed from roof as it accumulates.

8. At end of each working day, seal removal areas with water stops along edges to prevent water entry.

9. Provide clean plywood walkways and take other precautions required to prevent tracking of aggregate/debris from existing membrane into new work area where aggregate/debris pieces can be trapped within new roofing membrane. Contractor shall instruct and police workmen to ensure that aggregate/debris is not tracked into new work areas on workmen's shoes or equipment wheels.

Discovery of entrapped aggregate/debris within new membrane is sufficient cause for its rejection.

B. Surface Preparation:

1. Sweep clean roof deck.

3.03 CARPENTRY

A. Wall flashings:

1. Mechanically attach wood blocking to flashing base.

2. Fasteners shall be installed in two (2) rows staggered. Spacing in any one (1) row shall not exceed 24 inches (610 mm). Within 8 feet (2.4 meter) of outside corners, spacing shall not exceed 12 inches (300 mm) in any one (1) row.

3. Offset blocking layers 12 inches (300 mm); weave corners.

a) Blocking thickness: Equal to final insulation thickness including tapered edge.

B. Expansion joints(s):

1. Install horizontal and vertical blocking.

a) Vertical blocking:

1) Thickness: 2 inches (50 mm), nominal.

2) Height: 8 inches (200 mm) above final surface of roofing.

b) Horizontal blocking:

1) Thickness: Equal to final insulation thickness, including tapered edge.

2) Width: 4 inches (100 mm), nominal.

2. Mechanically attach horizontal blocking to deck. Fasteners shall be installed in two (2) rows staggered. Spacing in any one (1) row shall not exceed 12 inches (61 cm).

3. Install wood cants to blocking. Nail two (2) rows staggered to

horizontal and vertical blocking. Spacing in any one (1) row shall not exceed 12 inches (610 mm).

C. Wood curb locations:

1. Mechanically attach wood blocking to deck at all wood curb locations. Minimum 2 fasteners per section.

2. Offset blocking layers 12 inches (300 mm), weave corners.

a) Blocking thickness: Equal to final insulation thickness.

b) Blocking width: 4 inches (100 mm) nominal.

3. Install wood cants to blocking. Nail two (2) rows staggered to horizontal and vertical substrates. Spacing in any one (1) row shall not exceed 24 inches (610 mm).

D. Pitch pocket locations:

1. Mechanically attach wood blocking to structural deck at all pitch pan locations; minimum 2 fasteners per section.

2. Offset blocking layers 12 inches (300 mm); weave corners.

3. Blocking thickness: Equal to final insulation thickness including tapered edge.

1. Width: 4 inches (100 mm), nominal.

E. Wood blocking fastening pattern:

X X X X X X X X

X X X X X X X X

F. Light metal parapet cap locations:

1. Mechanically attach wood blocking to top of parapet with 3/8 inch (9.5 mm) diameter wedge anchors 2 feet o.c., minimum 2 fasteners per section of blocking. Countersink anchors flush with blocking surface.

a) Blocking thickness: 2 inches (50 mm) nominal.

b) Blocking width: Flush with edges.

3.04 THERMAL INSULATION

A. Shall be installed as per Factory Mutual wind uplift standards.

B. Adhere second layer with a full mopping of Thermastic 50 hot asphalt at a rate of 20 to 25 lbs per square. Immediately after placement, walk insulation boards into adhesive to achieve solid contact.

C. Offset joints of second layer 6 inches (150 mm) in both directions from joints of base layer.

3.05 CRICKETS

A. Install factory tapered fiberboard crickets where indicated.

B. Adhere crickets to substrate with Thermastic 50 hot asphalt.

3.06 ROOF SYSTEM APPLICATION

A. Install four (4) plies of ply sheet, shingle fashion. Overlap starter strips 9 inches (660 mm) with first ply, then overlap each succeeding ply 9 inches (630 mm). Place ply sheets to ensure water will flow over or parallel to, but never against exposed edges. Install all plies using specified hot asphalt with in its Equivisccous temperature. EVT

B. Roofing ply shall never touch roofing ply, even at roof edges, laps, tapered edge strips, and cants. Cut out fishmouths/side laps which are not completely sealed; patch. Replace all sheets which are not fully and continuously bonded.

C. Adhesive application rate: Minimum 20 to 25lbs per 100 sq. ft.

D. Use 9,18, 24 and, 36 inch wide plies to start and finish roof membrane along roof edges and terminations.

E. Immediately after installation, broom and/or roll ply sheet. Ensure complete and continuous seal and contact between adhesive and felts, including ends, edges and laps without wrinkles, fish mouths, or blisters. Broom/roller width: 34 inches (860 mm) minimum

F. Apply uniform and continuous pressure to exposed edge and end laps to ensure complete adhesion.

G. Overlap previous day's work 24 inches (610 mm).

H. Lap ply membrane ends 4 inches (100 mm). Stagger end laps 3 feet (910 mm) minimum.

3.07 FLASHINGS

A. General flashing requirements:

1. Composition flashing (Two Plies First ply is Burmastic composite ply set in EIS, second ply is Hypalon Elastomeric set in Sheeting bond adhesive)

a) Cut flashing ply in lengths not to exceed 10 feet (3 meter).

b) Adhere first flashing ply to flashing substrate in a continuous application of asphalt mastic. Remove wrinkles and voids. Overlap sections 4 inches (100 mm).

c) Extend flashing ply 4 inches (100 mm) beyond toe of cant.

d) Cut additional flashing ply in lengths not to exceed 10 feet (3 meter). Apply asphalt mastic to first flashing ply in a continuous 1/16 inch (1.6 mm) thick application. Embed second flashing ply into mastic. Lap flashing membrane ends 4 inches 100 mm); extend membrane 6 inches (150 mm) beyond toe of cant; press sheet firmly in place. Ensure complete bond and continuity without wrinkles or voids. Adhere laps with asphalt mastic. Seal vertical laps of flashing membrane with reinforcing membrane embedded between alternate continuous courses of asphalt mastic.

e) Two-Ply Stripping for metal flanges.

f) Set flange in asphalt mastic. Seal flange with two (2) stripping plies embedded between alternate applications of stripping adhesive/bitumen. Extend first ply 4 inches (100 mm) beyond flange; second ply 2 inches (50 mm) beyond first ply.

B. At wall flashings:

1. Secure top edge of composition flashing to wood blocking at top of parapet wall and provide termination bar above roof cant to secure lower section of flashing to wall. Provide fasteners at 8 inches (200 mm) o.c. maximum.

2. Provide five-course seal/reinforcement at top of flashing membrane.

a) Embed two (2) courses reinforcing mesh in alternate continuous applications of asphalt mastic; leave no voids. Cover reinforcing mesh with a top course of asphalt mastic.

C. At expansion joint (s):

1. Extend new roofing to top edge of cant. Nail 8 inches (200 mm) o.c. with spiral or annular shank nails, with 1 inch (25 mm) cap.

2. Install vinyl water barrier over joint opening. Allow barrier to drape 4 inches (100 mm) within joint opening. Nail both sides of barrier 4 inches (100 mm) o.c.

3. Insert fiberglass batt insulation into expansion joint opening; fill entire opening.

4. Secure top edge of flashing membrane to substrate with spiral or annular shank nails, with 1 inch (25 mm) cap, 8 inches (200 mm) o.c.

5. Fabricate and install expansion joint cover to curb.

6. Bevel curb top for drainage:

a) Mechanically fasten to vertical portion of curb with neoprene-grommeted screws 12 inches (300 mm) o.c.

b) Overlap sections 1 inch (25 mm).

D. At plumbing vents:

1. Wedge plumbing vent tight against deck.

2. Apply 1/16 inch (1.6 mm) uniformly thick layer of asphalt mastic to surface receiving metal flange.

3. Fabricate and install plumbing vent flashing from lead. Flange: 4 inches (100 mm) wide minimum; extend completely around periphery of vent flashing. Set flange into mastic. Neatly dress flange with wood block.

4. Prime metal flange with asphalt primer.

a) Pipe outside diameter greater than 2 inches (50 mm): Bend lead inside pipe 1 inch (25 mm) minimum with pliers or

rubber/plastic mallet; replace cracked lead.

b) Pipe outside diameter 2 inches (50 mm) or less: Cut lead at vent top; fabricate and install integral lead cap.

5. Fabricate plumbing vent flashing from copper. Wrap iron and steel vent pipes with asphalt coated base sheet (ASTM D 4601) to prevent direct contact of metal with copper. Install copper plumbing vent flashing. Flange: 4 inches (100 mm) wide minimum; extend completely around periphery of vent flashing. Prime metal flange with asphalt primer. Set flange into mastic. Fabricate and install integral copper cap at vent top.
   a) Mechanically fasten plumbing vent to substrate, 3 inch (75 mm) o.c. staggered.

6. Install two (2) ply stripping for metal flanges as described in general flashing requirements section.

E. At copings:

1. Installation of light metal parapet cap.

   a) Install wood blocking.

   b) Install continuous bent cleat on outside edge of wood blocking. Cleat shall be 20 gage mill finished steel, a gage heavier than coping cover. Lap ends 1 inch (25 mm). Nail 8 inches o.c. (200 mm).

   c) Install shims or beveled wood strips to provide inward slope to finished coping cap.

   d) Fully adhere composite wall flashing (2 ply) to top and vertical surfaces of parapet. Sheet width shall be sufficient to extend at least 6 inches beyond toe of cant onto new roof.

   e) Fabricate and install coping cover. Install concealed splice plates at all joint connections. All corners shall be factory mitered and fully welded. Extend front and rear sides of cover 2 inches (50 mm) beyond wood blocking. Bend lower edges out 30 degrees maximum to form drip edge. Attach outside edge to continuous cleat with ¾ inch (19 mm) lock. Attach inside edge to wood blocking 12 inches O.C.

F. At pitch pans:

1. Fabricate pitch pans. Sides: 4 inches (100 mm) high, hemmed to outside at top edge. Flange: 4 inches (100 mm) wide, completely around periphery. Clearance between projection and pitch pan: 2 inches (50 mm). Set flange in mastic.

2. Pack gap between roof-penetrating element and deck with compressible insulation. Seal with reinforcing membrane embedded between alternate courses of asphalt mastic.

3. Nail flange to wood blocking 3 inches (75 mm) o.c., staggered.

4. Prime metal flange, projection, and pitch pan interior with asphalt primer.

5. Install two (2) ply stripping described in general flashing requirements section.

6. Fill pitch pan with asphalt mastic. Double fill if necessary.

7. Fabricate and install umbrella with drawband over pitch pan. Tighten drawband.

8. Wipe clean top of umbrella and projection with metal cleaner. Prime surface with metal primer.

9. Caulk stack/sheet metal interface. Provide watershed. Tool neatly.

G. At roof drains:

1. Install tapered edge strip around drain to create approximate 24 x 24 inch (610 x 610 mm) sump. Miter corners. Seal toe of tapered edge to drain rim with reinforcing membrane embedded between alternate courses of asphalt mastic.

2. Install roofing system into sump and onto drain rim.

3. Plug drain to prevent water entry until service connection is completed.

4. Prime the bottom side of the lead flashing.

5. Apply 1/16 inch (1.6 mm) uniformly thick layer of asphalt mastic to surface receiving lead flashing.

6. Set single piece lead flashing in mastic centered over drain; extend lead 6 inches (150 mm) beyond drain rim. Neatly dress lead with

wood block.

7. Clamp flashing collar to drain in bed of mastic.

8. Neatly cut lead/felts within drain at rim. Lead to extend 1 inch (25 mm) into bowl.

9. Prime lead with asphalt primer.

10. Install two (2) ply stripping described in general flashing requirements section. Stripping shall not extend under clamping ring.

11. For working drains, remove drain plug upon completion of work each day.

3.08 SURFACING TREATMENT ON FLASHINGS

A. Apply surfacing emulsion to flashing at 4 gallons per 100 sq. ft. (1.2 L/m^2).

B. Allow surfacing emulsion to set for 15 days prior to coating.

C. Coat flashing surface with 2 coats of aluminized heat reflective coating applied at 130sq. ft. per gallon (3.2 m^2/L per coat).

3.09 SURFACING APPLICATION

A. Flood coat:

1. Prior to application of surface treatment system, contractor shall inspect roof with manufacturer's representative.

2. Over entire roof surface mop a full layer of Thermastic 50 hot asphalt then proceed to install the gravel.

   a) Coverage rate: 60 lbs per 100 sq. ft.

3. Immediately broadcast minimum 500 lbs./100 sq. ft. of new, clean roofing gravel. Cover flood coat material completely.

3.10 ROOF WALKWAYS

A. Prior to installation, turn over and layout each Trem-Tred for approximately 30 minutes to allow any moisture condensation from panel surface to dissipate.

B. Sweep dirt and debris from the area to accept Trem-Tred. Fully adhere Trem-Treds with BURmastic adhesive directly to roof membrane. Press to ensure full contact. Pads should be installed 1 inch to 3 inches apart to permit water flow.

3.11 ADJUSTING AND CLEANING

A. Repair of deficiencies:

1. Installations of details noted as deficient during final inspection must be repaired and corrected by applicator, and made ready for re-inspection, within five (5) working days.

B. Clean-Up:

1. Immediately upon job completion, roof membrane and flashing surfaces shall be cleaned of debris.

2. Clean gutters and downspouts of debris.

3.12 WARRANTY

A. Upon completion, Tremco acceptance, and once complete payment has been received by both contractor and Tremco, Tremco shall deliver to the owner's representative a fifteen (15) year Total Roofing System Warranty against defects in materials and workmanship.

B. Guarantee will be in effect upon notice of completion and Final Acceptance of work by Owner.

C. The Guarantee shall provide for all repairs of roofing and flashing under this section, where leaks occur due to faulty materials or workmanship, as well as the repair or replacement of damage to the building and its finishes and contents resulting from such leaks, at no cost to Owner.

3.13 MAINTENANCE SERVICE AGREEMENT

Upon project acceptance by Tremco, deliver a maintenance service agreement to owner. The Service Agreement must include:

A. Yearly Roof Inspection Report:

1. Provide report of roof conditions based upon roof bi- annual visits inspections.

B. Bi-Annual Roof Top Housekeeping (Before Hurricane season and After):

1. Inspect roof membrane, drains, gutters and scuppers for debris.

2. Remove, bag and properly dispose of, all debris from the roof membrane, drains, gutters and scuppers.

C. Bi-Annual Roof Preventive Maintenance to Include the Following:

1. Metal Edge Flashing Components

a) Tears, splits, and breaks in the membrane flashings will be repaired with appropriate repair mastics and membranes.

b) Open flashing strip-ins will be repaired with appropriate repair mastics and membranes.

c) Metal edge cleats and clips will be re-secured.

d) Exposed fasteners will be re-sealed.

2. Parapet Wall and Counterflashing Systems

a) Tears, splits and breaks in the flashings will be repaired with appropriate repair mastics and membranes.

b) Breaks, tears and splits in flashing strip-ins will be repaired with appropriate repair mastics and membranes.

c) Coat all exposed reinforcing membranes with approved mastic.

d) Exposed fasteners will be re-sealed.

e) Voids in termination bars, counterflashings and parapet caps will be cleaned and re-sealed.

f) Re-secure termination bars and counterflashings.

g) Check and re-secure loose metal coping caps to cleats.

3. Equipment / Projection Flashing Components

a) Tears, splits and breaks in the flashings will be repaired with appropriate repair mastics and membranes.

b) Open or split flashing strip-ins will be repaired with

appropriate repair mastics and membranes.

c) Unsecured roof top equipment will be secured.

d) Exposed fasteners will be tightened and re-sealed.

e) Termination bars and counterflashings will be sealed.

f) All pitch pans will be refilled and topped off.

g) Metal projections (hoods and clamps) will be checked and resealed.

4. Roof Membrane Preventive Maintenance and Repair

a) Tears, splits and breaks in the flashings will be repaired with appropriate repair mastics and membranes

b) Open or split flashing strip-ins will be repaired with appropriate repair mastics and membranes.

c) All membrane repairs will follow the Manufacturer's written repair and maintenance guidelines.

d) Dress-up reflective coatings on flashings.

e) Coat all exposed reinforcing membranes with approved mastic.

5. Drains, Gutters and Scuppers

a) Check and re-secure drain bolts and clamping rings.

b) Advise owner of missing drain dome strainers.

c) Check strip-ins around drain leads, coat with approved mastic.

d) Check gutter straps, joints and strip-ins.

e) Check inside and exterior of scupper for open solder or caulking seals

D. TremSource® Leak Response and Management Program:

1. Provide a Toll Free 1-800 telephone number to report any roof leaks.

2. The 1-800 telephone number will be in operation 24 hours a day, 365

days per year.

3. Provide a 48-hour or less, on site response to the reported roof leak.

4. Provide a follow-up roof repair inspection, as required, to ensure repairs were made properly.

5. Monitor all leak events and provide quarterly reports as follows:

   a) Time and date leak call reported.

   b) Time repair crew was on site, initiating leak repair activities.

   c) Time repair crews complete the roof repair.

   d) What type of roof leak was located?

   e) How was the roof leak repaired?

   f) What the repair long-term or short-term?

   g) What additional work is required?

E. Severe Storm Report Inspection and Report:

1. Per the owner's request, after a severe storm such as a hurricane or tornado, a Tremco representative will complete a walk over, visual roof top inspection, noting any conditions that may affect the performance of the roof system.

2. The Tremco representative will advise the building owner of any potential damage that may have occurred to the roof system or related roofing components, due to the presence of the severe weather.

-End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

LIST OF SPECIFICATIONS

DIVISION 8 – DOORS & WINDOWS

DIVISION 8 - DOORS AND WINDOWS

SECTION 08100 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract apply to work of this Section.

1.02 DESCRIPTION OF WORK

A. Contractor shall furnish all materials, labor, tools, equipment, transportation and other facilities for the furnishing and installation of the Hollow Metal Doors and Frames shown on the drawings and specified herein.

B. Doors missing or damaged at time of Final Acceptance of the job by Owner shall be replaced or repaired satisfactorily to Owner's Representative and at no extra cost to Owner.

1.03 QUALITY ASSURANCE

A. Recommended Specifications of the Steel Door Institute for Standard Steel Doors and Frames (dated September 1969) shall be incorporated as part of this section. Table IV, "Hardware Reinforcing Gauges", and Table V, "Hardware Locations" of the above specification shall govern the reinforcement for and the locations of the hardware.

PART 2 - PRODUCTS

2.01 FRAMES

A. Combination frames with integral trim are to be formed from the best grade commercial furniture stock steel, No. 16 gauge for interior doors and view windows and No. 14 gauge for exterior doors. Frames shall be welded together in shop and shall not be the knock down type.

B. Corners shall be mitered, fitted, reinforced, welded full length and ground smooth. Not less than three (3) anchors on each jamb to suit wall condition, and floor angle clips with two holes for sill anchorage are to be provided for each

frame. Steel angle spreaders shall be welded at the bottom to insure parallel alignment. All jambs and heads in masonry shall be filled solid with grout.

C. All frames shall be mortised and reinforced properly and as necessary for the installation of finish hardware as per Hardware Schedule. Reinforcing plates at the butts shall not be less than 3/16" thick, 3" x 10", with #26 gauge mortar guards, spot welded to protect tapped holes from mortar.

D. Drilling and tapping for door checks, brackets and automatic door bottoms shall be done in the field.

E. Frames shall be prepared to receive rubber door silencers and these shall be installed in the field.

2.02 DOORS

A. Hollow metal doors shall be 1-3/4" thick (unless otherwise noted on drawings) and constructed of two (2) plates of not less than #18 gauge, assembled and reinforced with interlocking vertical stiffeners spaced approximately 5" on centers and spot welded to both sides not over 4" on centers. All doors shall be provided with suitable sound deadening material. Sound deadening material shall be honeycomb polyurethane, polystyrene or solid structural mineral core bonded to the inside of both faces.

B. All exterior doors shall have 1-3/4" thick polyisocyanurate insulation between door sheets.

C. Door edges and faces shall have continuous welded seams ground smooth. All doors shall have flush tops and bottoms. Inverted channel framing will not be accepted.

D. Where glass panels are indicated, #18 gauge removable stops shall be provided.

E. All doors shall be mortised and reinforced for required hardware and drilled and tapped to receive mortise hardware. Drilling and tapping for surface mounted hardware shall be done in the field.

2.03 FIRE RATED DOORS

A. Where doors and frames are called for on drawings as labeled, their construction shall conform to all requirements of the National Board of Fire Underwriters and both door and frame shall bear the required labels. Labels shall be stamped metal and securely attached to doors.

2.04 FINISHES

A. All exposed and unexposed surfaces shall be cleaned and a rust inhibiting coat of chromate primer shall be baked on. Surface shall be free of dents, warps, buckles, or other defects and corners and angles shall be straight, true and sharp.

PART 3 - EXECUTION

3.01 ERECTION

A. Doors, frames and view windows shall be installed plumb, rigid and in true alignment, with all clearances accurately maintained. Frames and view windows shall be grouted and securely braced until mortar has set.

3.02 SHOP DRAWINGS

A. Contractor shall prepare and submit to Owner's Representative for approval three (3) prints and one (1) sepia of the complete shop drawings showing sizes of doors and frames, swing locations, reinforcement and such other pertinent information required to properly fabricate and erect these materials. Contractor shall resubmit shop drawings until approved by Owner's Representative.

3.03 GUARANTEE

A. Contractor shall guarantee that the materials and workmanship covered by this section of the specifications shall be first class in every respect, and that he shall make good any defects, not due to any ordinary wear and tear or improper use, which may develop within one (1) year from the date of Final Acceptance by Owner.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

LIST OF SPECIFICATIONS

DIVISION 9 – FINISHES

DIVISION 9 - FINISHES

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, General and Supplementary Conditions, including Division 7 of the Specification Sections, apply to work of this Section.

1.02 DESCRIPTION OF WORK

A. Contractor shall provide all materials, labor, tools, equipment, scaffolding, transportation and other facilities for the complete painting of all work as shown on the drawings, as set forth in the Room Finish Schedule, and as specified herein.

B. Work included:

1. The work shall include but not be limited to:

a. Complete painting of all interior walls, exposed metal deck, all exposed columns and structural steel, all hollow metal doors and frames, platforms, stairs and railings, and all exposed steel lintels, frames, and exposed concrete.

b. Complete painting of all access doors, ductwork, and sprinkler piping exposed in the finished work, including fittings, hangers, etc. (Sprinkler piping to be painted red).

c. All items of mechanical and electrical equipment not finish painted in the plant such as: conduit, pull boxes, meter boards, distribution boxes, panel boxes, registers, grills, diffusers, air handlers, utility equipment, etc.

d. Caulking of interior control and expansion joints and between all interior door frames and masonry or concrete walls.

e. Covering and/or protection of all floors, lighting fixtures, sprinkler heads, hardware, acoustical ceilings, Owner's equipment and all other items with factory finished coats of paint that will be damaged by paint spray and drippings.

C. Work Not Included:

1. The following items are not part of the work under this Section:

a. Owner's equipment, except as specified.

b. All stainless steel.

c. Acoustical ceilings.

d. All items with factory applied finished coats of paint, unless otherwise noted.

D. Before starting the work, Contractor shall check all walls, ceilings and items to be painted and shall inform Owner' Representative of any areas that require patching or need to be rubbed down. Upon his acceptance of the areas to be painted, Contractor shall be responsible for the final finish. Contractor shall be responsible for any minor patching that might be required. All materials shall be applied in accordance with the recommendations of the Manufacturer.

E. The intent of this Section is for a complete painting job. Contractor shall check the project for work already installed as well as Contract, Architectural, Mechanical and Electrical Drawings for possible items of the work to be installed.

F. Standard color charts shall be submitted for selection of colors.

1.03 SAMPLES

A. Contractor shall prepare three (3) paint samples on 12" x 12" boards of all paint colors to be used on the project. Samples are to be submitted to Owner's Representative for final approval before Contractor orders paint for the project. Two (2) sets of sample boards shall be given to Owner and one (1) set of sample boards to Owner's Representative. One (1) set of approved samples shall be kept at the job site as a standard of finish and color.

1.04 NUMBER OF COATS

A. The number of coats specified are a minimum and are in addition to any shop prime coats. The finished application shall have adequate coverage and be uniform in finish and color.

1.05 DELIVERY AND STORAGE

A. Paints shall be delivered to the job site ready-mixed, except as otherwise approved.

B. Store materials and equipment used on the job in a single designated space. Keep storage area neat and clean, and floor adequately protected from paint spillage. Place cloths and cotton waste, which might constitute a fire hazard, in metal containers; remove at the end of each workday. Contractor shall comply with all local ordinances and regulations.

PART 2 - PRODUCTS

2.01 MATERIAL

A. All paints used shall be Sherwin-Williams or approved equal by Owner's Representative. All paint products shall be delivered to the job site in unopened containers bearing the Manufacturer's labels. Contractor shall verify with Owner that all paints match Owner's standards including paint for metals, gypsum board, concrete block, etc.

B. All materials used in the work shall be exactly as hereinafter specified in quality. All materials shall be used only as specified by the Manufacturer's direction label on the container or separate specific instructions.

C. All painting materials such as epoxies, linseed oil, shellac, turpentine, solvents, etc., shall be pure and of the highest quality approved by Owner's Representative. Bids shall be based on the use of materials of the quality hereinafter specified.

D. No claim by Painting Contractor as to unsuitability or unavailability of any material specified, or his unwillingness to use same, or his inability to produce first class work with same will be entertained unless such claims are made in writing, and submitted with his bid. After award, no substitution of materials for those mentioned in the accepted bid will be permitted.

E. Caulking:

1. All door frames abutting masonry or dry wall construction, control and expansion joints and acoustic tile wall angles shall be caulked by Contractor using a paintable latex caulking compound, color as selected. (See specification Section 07900.)

PART 3 - EXECUTION

3.01 WORKMANSHIP

A. All paint shall be applied in accordance with Manufacturer's detailed directions.

B. All materials shall be applied by skilled mechanics. Paint shall be evenly spread and thoroughly brushed out. Enamels shall be evenly and smoothly flowed on. On painted work, each succeeding coat shall be tinted a slightly different shade than the preceding coat.

C. All workmanship shall be executed in accordance with the best practices of the trade, applying to class of work, grade, type and kinds of material specified.

D. All indentations in block work shall be filled and all joints pointed before painting commences.

E. All rooms where paint is to be applied shall be free of dust. All surfaces shall be thoroughly cleaned and dusted by Contractor before applying paint. All rough spots shall be sanded with an emery wheel before applying any paint materials.

3.02 APPLICATION

A. Paint colors shall be as selected by Owner.

B. Finishing shall be as specified herein.

C. Materials for succeeding coats on any one surface shall be the products of the same Manufacturer furnishing the first or primer-sealer coat for that particular surface, except where factory applied metal primer is used.

D. Do not apply paint to any surface where the ambient temperature is less than 50°F. or more than 90°F. Each coat of paint shall be thoroughly dry before a succeeding coat is applied.

E. Each coat of paint shall be inspected and approved by Owner's Representative before the succeeding coat is put on.

F. Painting Schedule:

1. Galvanized metal (on exterior):

   a. Remove all rust and paint with a power tool and wire brush.

   b. Apply one coat of Macropoxy 920 Pre-Prime 1.5 – 2.0 Mils

   c. Apply one coat Macropoxy 646 3.0 – 6.0 Mils

   d. Apply two coats Acrolon 218 HS Acrylic Polyurethane 3.0 - 6.0 Mils

3. Exposed columns and structural steel:

   a. Remove all loose rust and paint with a power tool and wire brush.

   b. Apply one coat of Macropoxy 920 Pre-Prime 1.5 – 2.0 Mils

   c. Apply one coat Macropoxy 646 3.0 – 6.0 Mils

   d. Apply two coats Acrolon 218 HS Acrylic Polyurethane 3.0 - 6.0 Mils

4. Hollow metal and steel (on exterior):

   a. Remove all loose rust, mill scale and/or paint with a power tool and wire brush.

   b. Apply one coat Macropoxy 646 3.0 – 6.0 Mils

   c. Apply two coats Acrolon 218 HS Acrylic Polyurethane 3.0 - 6.0 Mils

5. Uninsulated piping:

   a. Remove all rust by power tool and wire brush.

   b. Apply one coat of Macropoxy 920 Pre-Prime 1.5 – 2.0 Mils

   c. Apply one coat Macropoxy 646 3.0 – 6.0 Mils

   d. Apply two coats Acrolon 218 HS Acrylic Polyurethane 3.0 - 6.0 Mils

6. Concrete floors (new):
   a. For chemical resistant coating areas:

      i. Apply two coatings of Phenicon HS Epoxy Phenolic 5.0- 7.0 Mils

3.03 TOUCH-UP AND REMEDIAL WORK

A. Prior to Final Acceptance, Contractor and Owner's Representative shall inspect the entire building both inside and outside. Those areas requiring touch-up and/or adjustment shall be noted. This remedial work shall be completed to the satisfaction of Owner and Owner's Representative prior to Final Acceptance of the work.

3.04 REMOVAL

A. Contractor shall, during the job, maintain all working areas free from rubbish and debris. Rubbish and debris shall be removed from the premises daily. At the completion of the work, all surfaces not requiring paint shall be left clean and undamaged.

3.05 GUARANTEE

A. All work under this Section shall be guaranteed to be free from defects in material and workmanship for a period of one (1) year from the date of Final Acceptance, by the Owner.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

LIST OF SPECIFICATIONS

DIVISION 10 - SPECIALTIES

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 10 - SPECIALTIES

SECTION 10810 - TOILET ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 1 and Division 10 of the Specification Sections, apply to work of this Section.

1.02 SUBMITTALS

A. Contractor shall provide all materials, labor, tools, equipment, transportation and other facilities to furnish and install all Toilet Accessories and Hardware as per drawings. Contractor shall supply all fasteners, blocking and all accessories to make for a complete installation.

B. Contractor shall verify manufacturer of Owner's existing toilet facilities and shall match toilet accessories in this Section.

PART 2 - PRODUCTS

A.	B-822	Bobrick under counter soap dispenser
B.	B-36903	Bobrick recessed paper towel dispenser and waste receptacle
C.	B-352.25	Bobrick recessed napkin/tampon vendor
D.	B-3574	Bobrick recessed toilet seat cover dispenser, sanitary napkin disposal and toilet tissue dispenser
E.	B-3571	Bobrick partition mounted toilet seat cover dispenser, sanitary napkin disposal and toilet tissue dispenser
F.	B-3471	Bobrick toilet seat cover and toilet tissue dispenser
G.	B-39003	Bobrick recessed paper towel dispenser and waste receptacle
H.	B-3474	Bobrick recessed toilet seat cover dispenser and toilet tissue dispenser

PART 3 - EXECUTION

3.01 SHOP DRAWINGS

A. Contractor shall prepare shop drawings for submittal to Owner's Representative for review. Shop drawings shall show all dimensions, construction details, and wall openings required. Each submittal of shop drawings shall consist of four (4) prints.

3.02 GUARANTEE

A. This Contractor shall guarantee that the materials and workmanship covered by this Section of the Specifications shall be first class in every respect, and that he shall make good any defects, not due to ordinary wear and tear or improper use, which may develop within one (1) year from the date of Final Acceptance by the Owner.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

LIST OF SPECIFICATIONS

DIVISION 16 - ELECTRICAL

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16001 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including all other Division 16 Specification Sections, apply to work of this Section.

1.02 SUMMARY

A. This Section includes general administrative and procedural requirements for electrical installations.

1. Submittals.
2. Coordination drawings.
3. Record documents.
4. Maintenance manuals.
5. Electrical installations.
6. Cutting and patching.
7. General clean-up.

B. All electric wiring except that furnished as an integral part of factory assembled equipment, all control wiring and any specialty power and/or control wiring indicated in Contract Documents.

C. Electrical requirements for the various types of equipment are indicated on the Drawings and Specifications.

1.03 WORK UNDER OTHER SECTIONS

A. All finish painting.

1.04 EQUIPMENT FURNISHED BY OTHERS

A. Contractor shall furnish all labor, tools and equipment necessary to wire to and connect Owner furnished equipment and equipment furnished under other Sections of these Specifications.

1.05 CODES, LAWS AND ORDINANCES

A. All work and equipment under this Contract shall be installed in strict accordance with the National Electrical Code and all Federal, State, Local Codes, Laws, Ordinances, Rules and Regulations of Public Administrative Authorities, including all Health and Safety Codes and Pollution Control and OSHA requirements.

1.06 FILING OF PLANS

A. All necessary Electrical Drawings and applications shall be filled with the local National Electrical Code Inspecting Agency and with the Federal, State, County, and Local Authorities, if their approval is required.

B. Copies of these drawings bearing the stamp of approval of the authorities having jurisdiction shall be submitted to the Owner's Representative, prior to starting Work.

1.07 PERMITS

A. All required permits, licenses, and arrangements for inspection of the Work by all authorities shall be the Contractor's responsibility. In addition, the Contractor shall deliver without cost to Owner, such certifications of inspection and approval as are required, and shall pay all charges and fees in connection with the Work.

B. Upon completion of the project, Contractor shall deliver to Owner a certificate of approval from the National Electrical Code Inspecting Agency.

1.08 SUBMITTALS

A. General: Follow the procedures specified in Division 16 Section 16004 "Submittals".

1.09 COORDINATION DRAWINGS

A. Coordination drawings detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components shall be prepared under Division 15 of these Specifications. The Drawings shall indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the items listed below. This Contractor shall provide the following information necessary for the preparation of the Coordination Drawings:

1. Indicate the proposed locations of distribution equipment, panels, transformers, motor controllers, disconnect switches, pushbutton stations, lighting fixtures, major banks of conduits, and other electrical equipment and materials. Include the following:

   a. Clearances for installation.

   b. Clearances for servicing and maintaining equipment.

   c. Equipment connections and support details.

   d. Exterior wall and foundation penetrations.

   e. Fire-rated wall and floor penetrations.

   f. Sizes and location of required concrete pads and bases.

2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.

3. Prepare floor plans, elevations, and details as required to indicate penetrations in floors, walls and ceilings and their relationship to other penetrations and installations.

1.10 RECORD DOCUMENTS

A. Prepare Record Drawings to indicate the following installed conditions:

1. Electrical service and distribution system plans and one line diagrams indicating the locations, ratings and electrical characteristics of all equipment and feeders.

2. Power wiring plans indicating wiring for all electrically operated mechanical equipment.

3. Approved substitutions, Contract Modifications and actual equipment and materials installed.

4. Contract Modifications, actual equipment and materials installed.

1.11 DELIVERY, STORAGE AND HANDLING

A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels and other information needed for identification.

PART 2 - PRODUCTS

2.01 QUALITY OF EQUIPMENT

A. The minimum quality of construction for the product is established by naming the product in the Specifications by type or catalog number. The order in which manufacturer's names are listed does not indicate a preference.

B. Where non-standard construction or performance features are described, the manufacturer must modify the standard product to comply with the specified requirements.

2.02 MOVING OF EQUIPMENT

A. Investigate each space through which equipment must be moved. Where necessary, equipment shall be shipped from manufacturer in crated sections of size suitable for moving through restricted spaces available.

PART 3 - EXECUTION

3.01 ROUGH-IN

A. Verify final locations for electrical rough-ins with field measurements and with the requirements of the actual equipment to be connected.

B. Refer to Equipment Specifications and approved shop drawings for electrical rough-in requirements.

3.02 ELECTRICAL INSTALLATIONS

A. General: Sequence, coordinate and integrate the various elements of electrical systems, materials and equipment. Comply with the following requirements:

1. Coordinate electrical systems, equipment and materials installation with other building components and other trades.

2. Verify all dimensions by field measurements.

3. Where mounting heights are not detailed or dimensioned, install systems, materials and equipment to provide the maximum headroom possible.

4. Install systems, materials and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Owner's Representative.

5. Install systems, materials and equipment level and plumb, parallel and perpendicular to other building systems and components.

6. Install electrical equipment to facilitate servicing, maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.

3.03 CLEANING

A. Thoroughly clean all electrical apparatus before being placed in operation. Restore finished surfaces if damaged and deliver the entire installation in an approved condition.

B. All electrical equipment shall be free of all debris and dust and shall be free of obstructions.

3.04 MAINTENANCE OF EQUIPMENT

A. Insure adequate protection of all equipment and materials during delivery, storage, installation and shutdown conditions.

B. Maintain all installed equipment and systems until final acceptance by the Owner's Representative and the Owner.

3.05 TESTS - ALL INSTALLED SYSTEMS

A. Perform tests of equipment, systems and controls as described in the Specifications, in the presence of the Owner's Representative and/or other parties as may have legal jurisdiction.

B. Supply all labor, materials, instruments, power, etc. required for testing.

C. The duration of tests shall be as determined by the authorities having jurisdiction.

D. Equipment shall be tested under field conditions to demonstrate capability to meet Specification requirements.

E. All defective work shall be promptly repaired or replaced and the tests repeated until the particular system and component parts thereof receive the approval of the Owner's Representative and/or the authorities having jurisdiction.

F. Any damages resulting from tests shall be repaired and/or damaged materials replaced, all to the satisfaction of the Owner's Representative, at no cost to the Owner.

G. Submit test records on reproducible sheets to the Owner's Representative for approval and include a copy in the Instruction Manual. The format of the record sheet shall be approved by the Owner's Representative prior to actual testing of equipment.

3.06 INSTRUCTION PERIOD

A. This Contractor shall instruct the Owner's personnel and the Owner's Representative in the proper operation and maintenance of the equipment and systems provided under this Contract.

3.07 INSTRUCTION AND MAINTENANCE MANUAL

A. Compile and submit bound instruction manuals of equipment and systems to the Owner's Representative in triplicate. Provide the Instruction Manuals with an index sheet listing the contents in alphabetical order together with reference pages, containing the following material:

1. Operation instructions for each piece of equipment and/or system.

2. Manufacturer's literature describing each piece of equipment furnished giving the Manufacturer's Model No., parts list, wiring diagrams, and other pertinent data.

3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair and reassembly; and adjusting instructions.

4. List of nearest local suppliers of all equipment.

3.08 CODES AND STANDARDS

A. The Codes and Standards listed in the Specifications can be obtained from the organizations listed as follows:

ABBREVIATIONS

ADA	American Disabilities Act
ANSI	American National Standard Institute, Inc.
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
CBM	Certified Ballast Manufacturers
EIA	Electronics Institute of America
ETL	Electrical Testing Laboratories
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical & Electronics Engineering, Inc.
NEC	National Electrical Code
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association

OSHA	Occupational Safety & Health Act
UL	Underwriters Laboratories, Inc.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16004 - SUBMITTALS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENT:

A. Submit to Owner's Representative for product review information required for use by various trades or called for in different Sections of Specification. Submit data before commencing work affected by data.

B. Shop drawings shall be submitted for all electrical equipment and materials including but not limited to the following:

1. Distribution panelboard.
2. Motor control centers.
3. Lighting panels, power panels, transformers, and appliance panels.
4. Safety disconnects switches.
5. Wiring devices.
6. Wire and cables.
7. All material used in the Grounding System.
8. Fuses and over current protective devices.

1.02 SHOP DRAWINGS AND PRODUCT DATA

A. Shop Drawings: Submit three prints of each shop drawing.

B. Product Data: Submit three copies of manufacturer's data with bulletins, Specifications, catalog cuts or similar materials not reproducible by the diazo process.

C. Identification: Identify shop drawings and product data with following data:

1. The owner's name.

2. Project location.

3. Project title.

4. Specification and Section numbers relating to drawing or data.

D. Contractor's Stamp: Each submittal to bear Contractor's stamp indicating data set forth thereon has been checked for compliance with Contract Documents; shop drawings of equipment to bear the seal of certification of vendor or manufacturer.

E. Review Notations: Owner's Representative will review shop drawings, and product data received and return one reproducible transparency or two copies of product data or similar material bearing notations as follows:

1. "Reviewed": Contractor may proceed with work.

2. "Furnish as Corrected or Revise as noted": Contractor may proceed with work taking into account corrections noted; Contractor shall make corrections and resubmit revised documents without delay.

3. "Rejected": Contractor shall submit new documents.

F. Resubmittal

1. If documents are marked "Revise and Resubmit", resubmittal shall incorporate all marked revisions.

   Where exceptions are taken to markings, Contractor shall state reasons for omitting and modifying marks in the transmittal letter.

2. Make resubmittals in same manner as original submittals.

G. Review by Owner's Representative

1. Corrections or comments made on the shop drawings during this review do not relieve Contractor from compliance with requirements of the Drawings and Specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions; selecting fabrication process and techniques of construction; coordinating his work with that of all other trades, and performing his work in a safe and satisfactory manner.

1.03 MAINTENANCE AND OPERATING INSTRUCTION

A. Submit three (3) copies of the following data to Owner's Representative for materials and equipment as requested or called for in Specifications:

1. A copy of all reviewed shop drawings, including final comments, folded in a manner to be placed in a loose-leaf binder of standard size and to be fully opened without removal from the binder.

2. Complete detailed parts lists and assembly drawings.

3. Governing agencies and manufacturers test certificates, permits and inspection reports, and all shop or field performance tests.

4. Certified performance reports required by Specification.

5. Operating and maintenance manuals required by Specifications, edited to identify equipment furnished.

6. Materials list required by Specification.

7. Applicable manufacturer's specifications, including tabulation of sizes and identifying numbers for all installed material and equipment such as switches, fuses, circuit breakers, motor starters, electrical devices, and equipment, with items in each brochure clearly defined and marked.

B. Forward to Owner's Representative all materials requested and identify by applicable Specifications Section, project title and building location or locations.

C. Information in the form stated above must be received by Owner's Representative before delivery of equipment involved.

1.04 TIMELY SUBMISSIONS

A. Timely submissions of shop drawings and performance data are required by Owner to ensure compliance with Specifications and continued progress of work.

PART 2 – PRODUCTS Not Applicable

PART 3 - EXECUTION Not Applicable

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16020 - ELECTRICAL RACEWAYS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary conditions, Division 1 and Division 16 of the specification Sections, apply to work of this Section.

1.02 WORK INCLUDED

A. Provide conduit, including straight and curbed sections, fittings, couplings, connectors and supports, for the protection of wires and cables as required.

1.03 GENERAL

A. All wire and cable provided under this division shall be installed in conduits as specified in this section.

B. All conduit bodies, fittings, connectors, couplings, elbows, nipples and the like shall be UL listed and shall be of suitable materials and construction for the conduit system with which they are to be used.

C. Refer to Electrical Classification Drawing for areas in the building which are classified Hazardous Class I, Division I and Division II, Group D, wet and dusty.

PART 2 - PRODUCTS

2.01 CONDUIT AND FITTINGS

A. All conductors shall be run in hot-dipped galvanized rigid steel conduit (RSC), except as otherwise noted in this section. RSC shall be furnished and stored at the jobsite with a galvanized coupling on one end and plastic thread protector on the other.

2.02 CABLE TRAYS

A. General

1. Cable trays shall be heavy duty, solid bottom NEMA 1 aluminum, straight, curved and special sections equipped with fittings, connections, supports and hardware.

B. Products

1. The cable tray straight sections shall be at least 12 feet long.

   a. Tray width shall be 12" and depth shall be 6".

2. Cable trays and supports shall provide a wiring installation which will achieve the required strength and rigidity and to meet seismic zone 3 installation.

3. Provide shop drawings for the cable tray installations.

   a. Shop drawings shall indicate routing, elevations and details, and shall include equipment description and installation data.

4. The cable trays shall be products designed and fabricated by:

   a. Globe
   b. Cope
   c. Husky

PART 3 - EXECUTION

3.01 RACEWAY SYSTEMS

A. All wiring shall be installed in steel conduit. Steel conduit shall be zinc coated and shall comply with corresponding Federal Specifications for rigid conduit. Sizes of conduits used for various feeders, circuits, etc., shall be as noted on drawings or in accordance with National Electric Code, latest edition. Minimum size of conduit shall be 3/4 inches. Rigid galvanized conduit shall be used for all work.

B. Exposed conduits shall run in a neat, workmanlike manner at right angles and parallel to the walls and partitions. Suitable approved conduit fittings shall be

used in place of outlet boxes in all such cases.

C. All conduits shall be securely fastened to outlet boxes and cabinets with locknuts and bushings of an approved type, special care being exercised that the full number of threads project through, to allow the bushing to butt up tight against the end of threads after which the locknut shall be screwed up to bring the bushing into firm contact with the box. Double locknuts and bushings shall be used when required to provide appropriate mechanical and electrical connection. All joints shall be made with approved conduit couplings and in such a way that end of conduits couplings and in such a way that end of conduits shall butt together as to make all joints water tight throughout the system.

D. Conduits terminating in panels, boxes, and cabinets shall enter perpendicular to the corresponding side.

E. Circuit runs to all panels shall be installed with as few crossings as possible in straight line between outlets. Bends shall be avoided whenever possible.

F. All conduit shall be cut with a hacksaw, ends reamed and squared, and thread cut and cleaned before reaming.

G. The maximum length of any conduit run shall not exceed 100 feet, including two (2) 90 degree bends. Pull and junction boxes shall be used as required.

H. In hazardous locations, seals shall be installed at all arc producing devices and in conduit runs in accordance with NEC Article 501. Sealing compound and sealing dam materials shall be installed in accordance with manufacturer's instructions. Duct seal shall not be permitted as dam material.

I. Union shall be installed where necessary and/or where required for the future removal of devices.

J. All exposed conduits in process area shall be stainless steel with stainless steel fittings. All stainless steel piping to be UL approved.

3.02 BOXES - STANDARD WIRING

A. All outlet, junction, pull boxes and fittings shall be galvanized metal and shall be installed plumb, rigidly and securely, in a satisfactory manner with an alignment tolerance of 1-1/16th inch.

B. Ceiling outlets in a slab shall be 4" octagonal outlet boxes, 2-1/2" minimum depth

with K.O. to fit conduit except when so advisable, 4" square or larger, 2-1/8" minimum depth outlet boxes equipped with a canopy cover may be used in lieu of octagonal boxes. Ceiling outlets shall be provided with 3/8" fixture stud when necessary to support fixtures. Outlet boxes shall be flush with the ceiling surface or as indicated in plans. For size and type of boxes for recess ceiling fixture, see Lighting Fixtures General Section.

C. Wall outlets for lighting fixtures shall be 4" octagonal by 2 1/8" depth with 3/8" fixture studs, and with K.O. to fit conduit. Boxes shall be flush with the finished wall surface, or if necessary, raised covers used for this purpose.

3.03 BOXES - EXPLOSION PROOF

A. All explosion proof junction boxes shall be of the screw cover type with necessary hubs to accommodate conduits as shown on drawings.

B. Four inch nominal size boxes shall be of the Crouse-Hinds GUE Series.

C. Larger junction boxes shall be Type GUB 02 and GUB 01110 as required.

3.04 SEALING FITTINGS

A. The sealing fittings for conduit system shall be of the EYS type for vertical and horizontal runs. Minimum size shall be 3/4 inch. Fittings shall be manufactured by Crouse-Hinds or equal.

B. Provide Chico "X" fibre material before the installation of Chico A filling compound.

C. All wiring shall be checked for grounds before this installation of the above fillers.

3.05 FLEXIBLE COUPLINGS

A. All connections to motors shall be made with male and/or female flexible couplings complete with unions.

B. All pendant type light fixtures shall be wired with flexible couplings or swivel covers.

C. Flexible couplings shall be equal to Crouse-Hinds type ECLK or ECGJH.

3.06 CABLE TRAY EXECUTION

A. Cable tray systems shall be supported from the building structure above using strut type trapeze hangers and threaded rods. Refer to seismic restraints drawings.

1. In no case shall the cable tray system share supports with piping and HVAC equipment.

2. Where indicated on the Drawings, provide support brackets mounted on adjacent building surfaces.

B. The cable trays shall be secured to the strut using clips to permit lateral adjustment.

C. Provide expansion splice plates where indicated. All expansion joints shall be bonded using bonding jumpers.

D. Cable trays shall be run parallel to walls and ceilings.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16021 - BUILDING WIRE AND CABLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 16 of the Specification Sections, apply to work of this Section.

1.02 WORK INCLUDED:

A. This section specifies:

1. 600 volt building wire and cables.

2. 600 volt remote control wire and cables.

3. Splicing materials.

1.03 GENERAL:

A. All building wire and cables for branch circuit wiring, power wiring, feeders and remote control wiring operating at 600 volts or less shall be as specified in this section.

PART 2 - PRODUCTS

2.01 BUILDING WIRES AND CABLES:

A. All conductors and cables shall be high conductivity copper; 600 volt insulated in accordance with the NFPA standards for type THWN/THHN 90°C. insulated conductors

B. Conductors for power and lighting shall not be less than No. 12 AWG. All conductors no. 8 and larger shall be stranded.

C. Identification on the conductors and cables shall be continuous and include the type, voltage rating, manufactured date and name of the manufacturer.

D. Wires shall be color-codes as follows:

208 Volt Systems - Black, Red and Blue
480 Volt Systems - Brown, Orange and Yellow
Neutral - White
Equipment Ground - Green
Isolated Ground - Green with Yellow Stripe

E. Wire and cable shall be products of the following manufacturers:

1. American Insulated Wire Corp.

2. Collyer Insulated Wire

3. General Cable

2.02 REMOTE CONTROL WIRE AND CABLES:

A. All conductors shall be high conductivity copper, 600 volt insulated in accordance with the NFPA standards for type THWN/THHN 90°C insulated conductors, except as noted on the drawings or otherwise specified herein.

B. Identification on the conductors and cables shall be continuous and shall include the type, voltage rating, manufactured date and name of the manufacturer.

C. Conductors for control wiring shall be not less than no. 14 AWG, stranded single conductors and multi-conductor cables.

1. Control wiring shall consist of multi-conductor cables wherever possible. Cables shall be provided with an overall flame retarding extruded jacket.

2. Multi-conductor cables shall contain a minimum of 10% spare conductors, but not less than two spare conductors.

D. Color coding of control wires shall match the existing color-coding system.

E. Control wires and cables shall be products of the following manufacturers:
1. American Insulated Wire Corp.

2. Collyer Insulted Wire

3. General Cable

2.03 SPLICING MATERIALS:

A. Spring wire connectors shall be provided for all splices in conductors No. 10 AWG and smaller. Spring wire connectors shall be manufactured by:

1. Scotchlok, Type B

2. Thomas & Betts, Type PT

3. Ideal

B. Solderless bolted style or compression style wire connectors shall be used for all splices in conductors no. 8 AWG and larger. Connectors shall be manufactured by:

1. Thomas & Betts

2. Burndy

3. Buchanan

C. Encapsulating compound shall be manufactured by Minnesota Mining and Manufacturing Co., or equal and installed in accordance with manufacturer's recommendations.

D. Tape shall be plastic, 0.007 inch thick, and resistant to abrasion, alkalies, acids, corrosion, moisture, low and high temperatures. Tape shall be manufactured by:

1. Scotch No. 33 Plus

2. Slipnot No. 7

E. Lubricants shall be used to ease the pulling of cables and conductors in conduits. Lubricant shall be manufactured by:

1. Burndy "Slikon"

2. Holub "Hi-Green"

3. Ideal "Yellow 77"

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Conductors shall be brought to the job in unbroken packages, bearing date of manufacture not more than 12 months prior to delivery to site.

B. Wire previously pulled into conduit is considered used and shall not be repulled.

C. Wire shall not be pulled until all work which may cause injury to the conductors or insulation has been completed and conduits are cleaned.

D. Conductors shall be completely installed and connected. Apply wire lubricant to ease the pulling of conductors in conduits.

E. Vertical runs of cable shall be supported at the top of the run by proper supports.

F. Number all wires and label with permanent wire markers at all junction boxes and terminations. Wire markings shall be clearly shown on all schematics. Consistent color coding shall be used throughout.

3.02 CIRCUIT ARRANGEMENTS:

A. All wiring required by the various operational requirements specified shall be furnished and installed under this division whether or not specifically mentioned or shown on the drawings.

B. The circuit numbers indicated on the drawings are intended as a guide for proper connection of circuits at panels. However, it shall be the responsibility of the Contractor to see that the circuiting work is complete as required herein.

C. Single phase branch circuit wiring shall be alternately connected to circuit breakers in a manner to effect balancing the branch circuit connections as nearly as possible over each of the three phases. Loads on each panel bus shall be balanced to within 10% of each other.

D. Branch circuit wiring for single phase applications shall be multiwire, utilizing common neutrals where indicated, in a manner consistent with the type of service furnished to the Project. Under no circumstances shall any switch or circuit breaker

break a neutral conductor.

E. No neutral conductor shall be common to more than one circuit conductor connected to the same phase leg of the supply system.

F. Home runs and branch circuit wiring for 277 Volt circuits shall be as follows:

LENGTH, FT.	HOME RUN WIRE SIZE	CIRCUIT WIRE SIZE
0 to 100	No. 12	No. 12
101 to 200	No. 10	No. 12
201 to 300	No. 8	No. 10

G. Home runs and branch circuit wiring for 120 Volt circuits shall be as follows:

LENGTH, FT.	HOME RUN WIRE SIZE	CIRCUIT WIRE SIZE
0 to 50	No. 12	No. 12
51 to 100	No. 10	No. 12
101 to 150	No. 8	No. 10

3.03 SPLICING AND CONNECTIONS:

A. Splices in wires and cables shall be avoided wherever possible, and where necessary shall be made only in accessible pull, junction or outlet boxes. Connections in outlet boxes shall be made with solderless wire connectors with insulating caps.

B. All connections and taps in pull, junction and panel boxes shall be made with solderless taps complete with bakelite covers.

C. Splice and terminal connections shall be made tight with spring and compression connectors. The connectors shall be crimped with a tool that provides uniform and tight connections.

D. Insulate all connections with tight wraps of plastic tape. Apply insulation putty to fill irregularities and voids in splices.

E. Wire connectors shall be provided for splices and terminal connections of all copper conductors and cables.

F. Wire connectors shall fit the conductor to which it is connected, and the assembly shall have joint contact surfaces not less than 50 percent.

G. Compression wire connectors for conductors No. 8 AWG and larger shall be copper lugs for terminal connections and two way copper sleeves and taps for splice connections.

H. Spring connectors shall have live springs attached to inner steel housings and be enclosed with plastic insulators.

I. Lubricants shall be used to ease the pulling of conductors and cables in conduits.

3.04 TESTING:

A. All new 600 volt completed cable installations shall be field tested in accordance with cable manufacturer's recommendations.

B. An insulation resistance test (megger) shall be performed with all test results delivered to the Engineer.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16022 - MEDIUM VOLTAGE CABLE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract including other sections of Division 16 of the Specification, apply to work of this Section.

1.02 WORK INCLUDED

A. This Section specifies:

1. 5KV medium voltage cable.
2. Termination of 5KV cables.
3. Splicing of 5 KV cables.

1.03 GENERAL

A. Medium voltage cables for use for 4,160 volts grounded neutral shall be rated 5KV.

PART 2 - PRODUCTS

2.01 MEDIUM VOLTAGE CABLES

A. Medium voltage cables shall be suitable for outdoor installation in conduit and for indoor installation in conduit.

B. Cables for 4.16KV feeders shall be preinsulated and rated for 5KV nominal.

C. Cables shall be single conductor, stranded copper, shielded, insulated and jacketed.

D. Conductor stranding shall be Class B, per ASTM B-8.

E. Conductor stranded shield shall be extruded thermoset semiconducting material per ICEA S-19-81 and suitable for integration with the insulation.

F. Insulation shall be ethylene-propylene rubber per ICEA S-68-516, NEMA WC-8-1976 and UL-1072. The average thickness of the insulation shall be 115 mils and the minimum spot thickness shall not be less than 90% of average thickness.

G. The insulation shield shall be extruded thermoset semi-conducting material which shall be identified as semi-conducting.

H. Shield shall be 5 mil coated copper tape, overlap 20%, minimum.

I. Provide non-metallic barrier tape over the shield tape edge from jacket interference.

J. Jacket shall be polyvinyl chloride (PVC) per ICEA S-68-516, 60 mil minimum.

K. Medium voltage cables shall be a product of one of the following manufacturers:

1. Okonite
2. General Wire and Cable
3. American Insulated Wire Corp.
4. Kerite
5. BICC Cables Company

2.02 SPLICES AND TERMINATIONS

A. Splicing of 5KV cables shall be avoided to the maximum extent possible. Continuous cable runs from the source to the load shall be used where practical.

1. Splicing of 5KV cables shall be performed only with prior approval from the Owner.

B. Splices shall be made with approved splice kits, MAC Products Type SRIG encapsulated with E5-520 epoxy kit, or approved equal.

C. Terminations shall be made with approved termination kits, MAC Products Type TRIG, or engineer approved equal.

D. Splicing and termination kits of the resin, mold, in-line quick-splice or rubber type will not be permitted.

PART 3 - EXECUTION

3.01 CABLE INSTALLATION

A. Conductors shall be pulled in from reels. In no case shall conductors be laid on the ground or floor and pulled in.

1. Conductors shall be factory reeled on returnable wood reels furnished by the cable manufacturer.

2. Conductors shall be pulled with an appropriate wire pulling device. The use of an automobile to pull cables is prohibited.

B. Cable pulling tension, side wall pressure and bending radii shall not exceed cable manufacturer's written recommendations. Calculations for tension and side wall pressure shall be completed by the Contractor prior to pull, and submitted to the Engineer for review.

1. Pulling tension shall be constantly monitored during the pull.

2. A pulling lubricant as recommended by the cable manufacturer shall be used to facilitate cable pulling.

C. Conductors shall be fitted with pulling eyes, or at the option of the Contractor, fitted in the field with pulling baskets, Kellems Grips, or equal.

1. When using factory fitted pulling device or other pulling devices, discard two feet minimum of the conductors prior to splicing or terminating.

D. Splices in primary cable are not permitted. The cable shall be continuous from termination to termination.

3.02 SPLICES AND TERMINATIONS

A. Splices of medium voltage cable shall only be made in accessible manholes or pullboxes and shall be made with waterproof splice kits recommended by the cable manufacturer and shall be in accordance with the cable manufacturer's published instructions.

B. Conductor shields shall be grounded, at each splice and termination, in accordance with the conductor manufacturers written instruction sheet.

C. All terminations and splices shall be performed by qualified high voltage cable splicers.

D. After pulling and before splicing cables shall be protected at exposed ends to prevent the entrance of moisture and other damage.

E. Conductor shields shall be grounded, locally, in accordance with the conductor manufacturer's written instruction sheet and shall consist of:

a. A non-metallic semi-conducting tape applied directly over the insulation, followed by:

b. A non-magnetic metallic tinned copper shielding tape, minimum 0.005 inch thickness, helically wrapped with a minimum overlap of 20% to uniformly distribute the dielectric field around the conductor insulation and form a continuous shield along the entire length of cable.

3.03 CABLE FIREPROOFING

A. All medium voltage cables installed in manholes and pull boxes shall be fireproofed.

B. Fireproofing tape shall be approximately $^{1}/_{16}$ inch thick by three inches wide and applied tightly around each cable spirally in one half lapped wrapping or in a butt jointed wrapping with a second wrapping covering the joints of the first wrapping.

C. Even-out irregularities in cables, as at splices, with insulating putty before applying fireproofing tape.

D. Install tape with coated side toward cable and extending not less than one inch into conduit.

E. Install random wrapping or plastic tape around installed fireproofing tape to prevent unravelling.

F. Fireproofing tape shall consist of a flexible, conformable fabric which has one side coated with a flame-retardant, flexible, polymeric coating and/or a chlorinated elastomer. Tape shall be not less than 0.05 inch thick, and weigh not less than 2.5 pounds per square yard. Tape shall be non-corrosive to the cable sheath, and shall not support combustion.

3.04 TESTING

A. The cable shall be factory tested in accordance with latest procedures specified in ICEA S-68-516. Tests shall include insulation resistance (megger) and D.C. high

potential test.

B. The new cable installation shall be field tested in accordance with the cable manufacturer's recommendations. Tests shall include insulation resistance test and D.C. high potential test. Tests shall be performed:

1. After cable is installed in conduit, but before splices or terminations are made.

2. After splices and terminations are made

C. Contractor shall deliver all test results, neatly organized and tabulated, to the Engineer.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16025 - BOXES AND ENCLOSURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 16 of the Specification Sections, apply to work of this Section.

1.02 WORK INCLUDED:

A. This Section specifies:

1. Outlet boxes
2. Junction boxes
3. Pull boxes
4. Conduit bodies
5. Wireways

1.03 GENERAL

A. Furnish and install outlet boxes, junction boxes, pull boxes, conduit bodies and wireways as required to complete the installation.

B. All boxes in finished areas shall be concealed to the maximum extent possible.

C. Box sizes, types and configuration shall be selected by the Contractor to suit the wiring requirements and shall conform to the applicable sections of the National Electrical Code latest edition.

PART 2 - PRODUCTS

2.01 OUTLET BOXES

A. Provide galvanized pressed steel outlet boxes of proper size and type as required by the building conditions for all interior outlets for lighting, switches, receptacles, signals, devices, etc.

B. Outlet boxes for NEMA 4X wet areas, exterior area, damp areas and "dust tight" and "dust tight ignition proof" installations as indicated on the Drawings shall be cast malleable iron type FS boxes or FD boxes with threaded conduit connections and gasket device covers specified. Screws for covers shall be stainless steel.

1. Receptacle outlets and switch outlets shall have a gasket, spring-loaded cover.

C. Where more than one wiring device is indicated, multi-gang or tandem boxes shall be used.

2.02 CONDUIT BODIES

A. Provide cast malleable iron conduit bodies for exposed conduit installations.

B. Conduit bodies shall be installed where suitable for changes in conduit direction and at junction points. Selection of conduit body configuration shall be made by the Contractor to suit the application.

2.03 PULL BOXES AND JUNCTION BOXES

A. Pull boxes and junction boxes shall be code gauge galvanized steel, of required dimensions, with accessible, removable screw-on covers.

1. Pull boxes shall be sized so that future use of spare conduits is not compromised. Box size calculations shall be based on the largest possible three phase feeders and largest bending radius for future conductors for the specified spare conduits.

2. Where required by the building construction, furnish and install pull boxes and junction boxes in special sizes and shapes determined in the field.

3. Each pull box and junction box shall be neatly stenciled to indicate the feeders, control or signal system wiring passing through the box.

2.04 WIREWAYS

A. Wireways shall be provided where indicated, or as required of standard or special shapes, design and construction to install, support and enclose wires and cables.

1. Wireways shall be constructed as specified above for pull and junction boxes, with required reinforcing for rigidity. Provide insulating supports and clamping for the cable installation.

2. Cables shall be continuous throughout the wireways and shall be racked in distributed phase groupings arranged with phase cables surrounding the neutral conductors.

2.05 MANUFACTURERS

A. Sheet metal outlet boxes junction boxes, pull boxes and wireways shall be manufactured by:

1. Raco, Inc.

2. Spring City Electrical Manufacturing Co.

3. Steel City, Electric Products Division, Midland Ross Co.

B. Cast metal outlet boxes and conduit bodies shall be manufactured by:

1. Appleton Electric Co.

2. Crouse-Hinds Co.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Location, size and configuration of outlet boxes for wiring to equipment shall be verified in the field prior to starting the installation.

1. Outlets shall be of the type suitable for the purpose.

2. Locations of outlet boxes shall be adjusted in the field to suit the equipment.

B. Outlet boxes shall be securely fastened in place flush with finished wall and ceiling surfaces. Boxes at all lighting fixture outlets shall be provided with 3/8" malleable iron fixture studs, securely fastened to same if required. Follow manufacturers installation lighting fixture recommendation.

C. Installation of boxes shall comply with The National Electrical Code latest edition:

1. Boxes shall not be supported by conduits.

2. Covers of all boxes shall be accessible after completion of construction.

3. Outdoor boxes shall be installed to prevent the collection of standing water. Conduit connections at boxes exposed to the weather shall be made with gasketed hubs.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16026 - WIRING DEVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 1 and Division 16 of the Specification Sections, apply to work of this Section.

1.02 WORK INCLUDED:

A. This section specifies:

1. Switches
2. Receptacles
3. Device Plates

1.03 GENERAL:

A. Furnish and install specification grade wiring devices as herein specified.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. The wiring devices specified herein, unless otherwise listed, are those of Pass and Seymour. However, equal devices are also acceptable, as approved by the Owner, made by:

1. Hubbell

2. Arrow-Hart and Hegeman (AH&H)
3. General Electric Company

2.02 SWITCHES:

A. Lighting control switches shall be toggle type, 120-277 volt AC, rated 20 amperes, quiet-type with silent operating mechanism, totally enclosed in a molded composition base. Switches shall be P&S #20AC1, #20AC2, #20AC3 and #20AC4 for single pole, two pole, three or four way as indicated.

B. Switch and pilot light combination, where indicated shall be as specified above, but with a lighted toggle with an integral neon lamp.

C. Where "explosion proof" local switches are indicated, provide front operated factory sealed 20A-1P-277V switch with aluminum sealing chamber, malleable cast iron body and cover and nylon handle. Switch shall be UL listed for use in Class 1, Division 1 and Division 2, Group D Atmospheres and shall be Appleton Catalog No. EDS 175-F1.

2.03 RECEPTACLES:

A. All receptacles installed in this project shall be grounding type, with grounding pin slot connected to device ground screw for ground wire connection to conduit system.

B. Wall mounted receptacles shall be mounted 18 inches minimum above the floor, unless otherwise noted. Refer to Architect for exact height.

C. Duplex convenience receptacles shall be P&S #CR15 rated 15 Amperes, 125 Volts, totally-enclosed in molded composition base, third-leg grounded to conduit system.

D. Single receptacles on dedicated 20 amperes, 125 volts branch circuits shall be P&S #CR20 rated 20 amperes, 125 volts, totally-enclosed in a molded composition base.

E. Where indicated, provide termination type duplex, ground fault circuit interrupter receptacle devices, P&S #2091.

1. For exterior use, these receptacles shall be horizontally mounted in cast aluminum boxes with General Electric Company No. T11H weatherproof, gasketed cover.

F. Single 480V receptacle to be Pass & Seymour #20403 rated 30 amperes, 480V

totally enclosed with waterproof cover.

G. Where "dust-tight" convenience receptacles are indicated, provide device as specified above with weatherproof, gasketed, stainless steel, double lift plate, Pass and Seymour WP-Series to suit outlet box WP-1, WP-8 or WP-26.

H. Where "explosion-proof" local convenience receptacles are indicated, provide 20A-125 volts 2W-3P dead front device consisting of a sealing chamber, receptacle and cast malleable iron mounting box with spring cover. Device shall be UL listed for use in Class 1, Division 1 and Division 2 Atmospheres and shall be Crouse Hinds No. ENR-21201. Contractor shall furnish a minimum of six (6) 15A-2W-3P matching plugs. Blade arrangement shall fit NEMA-5-15R and 5-20R receptacles in non-classified areas. Plugs shall have integral cord grips.

I. Where special receptacles are indicated on the drawings for connection of specific equipment, which operates at more than 120 volts and/or more than 20 amperes, provide "Specification Grade" receptacles by manufacturers as previously specified the ampere and voltage characteristics and with the required number of poles shall conform with the data on the drawings.

1. For each special receptacle installed, furnish a suitable cordgrip-type attachment plug. These attachment plugs shall be connected under this division to the cords of the appliances associated with special purpose receptacle outlets.

2.04 DEVICE PLATES:

A. Plates for all wiring devices, except as specified otherwise, shall be .040-inch thick satin finished stainless steel.

PART 3 - EXECUTION

3.01 A. All connections of branch circuit wiring-to-wiring devices shall utilize the side binding screws provided. The use of "push-in" back wiring holes will not be permitted.

B. Combination switch and receptacle outlets shall consist of a switch with a duplex convenience receptacle, as specified, mounted under a single two-gang plate.

C. Double-duplex convenience outlets shall consist of two duplex receptacles mounted under a single two-gang device plate.

D. A multi-gang plate shall cover all devices which are indicated at a common location.

E. On the outside of each device plate, write the panelboard designation and circuit number of the circuit serving the device.

F. It is the intent of these specifications to provide connections for, and to leave completely connected and in operating condition, all equipment furnished by the Owner or furnished under other divisions.

G. Determine the final connection requirements for permanently-mounted equipment, as outlined above, and provide a solid connection or a receptacle connection as required by the equipment supplied. Provide and attach suitable cords and plugs, as specified above, and leave equipment ready for use.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16030 - DISCONNECT SWITCHES AND FUSES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 1 and Division 16 of the Specification Sections, apply to work of this Section.

1.02 WORK INCLUDED:

A. This Section specifies:

1. Non-fused safety disconnect switches.

2. Fused safety disconnect switches.

3. Fuses.

1.03 GENERAL:

A. Furnish and install safety disconnect switches as indicated on the Drawings and as required by The National Electric Code.

PART 2 - PRODUCTS

2.01 DISCONNECT:

A. Safety switches shall be voltage rated to suit the electrical characteristics of the system from which they are supplied.

B. Switches shall be heavy-duty, metal-enclosed, externally-operated safety switches, fused or unfused as noted, of the type and size required to properly protect or disconnect the loads for which they are intended.

C. Fuse clips shall be rejection type for use with Class R rejection type fuses.

D. Operating mechanisms shall be designed so that the switches may be locked in the ON or OFF positions. The switch shall have an interlock to prevent unauthorized opening of the hinged cover when the switch is in the ON position, and an interlock to prevent closing the switch mechanism with the hinged cover open.

E. All disconnect switches shall be furnished with a factory installed auxiliary contact which shall be field wired to open the equipment control circuit simultaneously with the opening of the equipment power circuit.

F. Unless otherwise noted on the Drawings, safety disconnect switch enclosures shall be NEMA 1, factory finished, for interior installation.

1. Switches located in process area or as indicated as "wet" or' dust' areas (Refer to Electrical Classification) shall be in NEMA 4X stainless steel enclosures.

2. Switches for exterior installation shall be provided with NEMA 3R enclosures.

3. Other enclosure types for specific environments shall be as indicated on the drawings.

G. Each fusible switch shall be equipped with a complete set of fuses as specified herein or indicated on the Drawings.

H. Switches shall be manufactured by:

1. Square D Company - Type "HD"

2. General Electric Company - Type "TH"

2.02 FUSES:

A. Fuses shall be voltage rated to suit the electrical characteristics of the electrical system from which they are supplied.

B. All fuses shall be of the same manufacturer and shall be installed in all cutouts, switchboards, panelboards and fused safety disconnect switches as indicated on the

drawings.

C. Fuses shall be manufactured by Bussman or approved equal.

D. Upon completion of the work, provide to the Owner six spare fuses of each size and type installed in the fused switches provided under this division.

E. Unless otherwise indicated, all fuses 601 amperes and above shall conform to UL Class L standards and shall be Bussman Hi-Cap time-delay fuses Type KRP-C, or equal.

F. Unless noted otherwise, fuses 600 amperes and below shall conform to UL Class RK-1 standards and shall be Bussman "low-peak" dual-element fuses, types LPN-RK and LPS-RK, or equal.

2.03 EXPLOSION PROOF DISCONNECT SWITCH:

A. Rugged corrosion resistant cast copper free aluminum construction.

B. Stainless steel quick release captive hex-head cover bolts. Stainless steel springs provide clear indication that cover bolts are fully retracted from the body.

C. Switch operating handle shall be padlockable in either "on" or "off" positions.

D. Neoprene cover gasket permanently attached to the cover to seal out moisture.

E. Switch to be Class 1, Division 1 & 2, Groups B, C, D rated and watertight.

F. Switch to be Crouse-Hinds EBM Series voltage and rating as indicated on drawings.

PART 3 - EXECUTION Not Applicable

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16031 - UNDERGROUND ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 1, and Division 16 of the Specification Sections, apply to work of this Section.

B. CONDITIONS SPECIFIED ELSEWHERE:

Section 16020 - Electrical Raceways
Section 16035 - Grounding

PART 2 - PRODUCTS

2.01 MATERIALS

A. Underground Power Control and Communication Ducts shall be designed using hot dipped galvanized rigid steel conduit in all areas unless otherwise noted on contract drawings.

B. P.V.C. conduit, when noted for use on the contract drawings, shall be minimum Schedule 40; all fittings and accessories shall be approved by the conduit manufacturer for use with his product.

C. Non-Metallic Conduit or ducting, when noted for use on the contract drawings, shall be Johns-Manville "Transite Corduct Type-1" or approved equal.

D. Refer to Specification #16020. (Conduit for detailed specification of conduits to be used.)

E. Unless otherwise indicated on the contract drawings, concrete for encasement of conduit or ductbank shall be minimum 3000 p.s.i. and colored red; dye may be premixed with concrete or may be added to concrete during pouring. See Architectural Specification for details on concrete.

F. Reinforcing steel shall be minimum Grade 40 (ASTM Standard A615) or as indicated on the contract drawings.

G. Manholes, handholes, etc. shall be precast and shall be designed and constructed as indicated on the contract drawings.

H. Marker tape shall be minimum of six (6) inches wide, shall be polyethylene, bright yellow with black lettering with the message "CAUTION BURIED ELECTRIC LINE BELOW" or approved equivalent.

I. Conduit sealer shall be non-thermoplastic compounds and shall have no adverse effects on cable insulation, lead, aluminum or ferrous alloys, shall be insoluble in water and capable of withstanding maximum temperature extremes of the locality.

PART 3 - EXECUTION

3.01 GENERAL

A. Unless indicated otherwise on the contract drawings, all underground conduit and ducts shall be installed using galvanized rigid steel conduit.

B. Unless indicated otherwise on the contract drawings, all underground conduit and ducts shall be encased along their entire length in concrete.

1. Single runs of P.V.C. or non-metallic conduit shall be concrete encased with reinforcing steel.

2. Ductbanks consisting of two or more conduit runs shall be concrete encased with reinforcing steel.

C. Concrete encasement shall extend a minimum of three (3) inches on top, bottom and sides of outer edges on conduit and reinforcing steel.

D. Contractor shall submit detailed drawings showing ductbank dimensions, reinforcing steel, etc. to the Engineers for approval prior to installation.

3.02 TRENCHES

A. Trenches shall be dug to the required depth without pockets or dips. All large stones shall be removed from the bottom of the trench and loose fill in the trench bottom shall be firmly tamped before conduit is laid.

B. All underground conduit shall be installed having a minimum 3" to 100' slope. The conduit shall slope to a suitable sump area. Refer to the drawings for desired slope and sump area.

C. Backfill shall be soft dirt or sand tamped into place. Trench shall be filled to the top and surface restored to its original condition. All excess earth to be removed. Conduit ductbank to have a minimum earth cover of 18".

D. Underground ductbanks and conduit runs shall be marked with polyethylene marker type buried 6" under the surface directly over the duct banks.

3.03 CONDUIT INSTALLATION

A. All buried or encased rigid steel conduit shall be coated with two (2) coats of bituminous coating Koppers Co. Bitumastic No. 50. A precoat of Kopper No. 30 "Metal Coat" shall be applied prior to the application of the bituminous coatings.

B. Conduit shall be protected, during installation, by installing flat metallic discs and steel bushings on each conduit end. Prior to pulling cable, metallic discs shall be removed and steel bushing replaced by grounding bushings. Conduit nicks and field cuts shall be repaired with red lead or approved equal.

C. All conduit stub-ups shall be rigid steel conduit, shall be terminated three (3) inches above finished floor or concrete and shall be capped until used.

D. Where ductwork cross under roadways or railbeds, galvanized rigid steel conduits shall be used in all cases, extending five feet beyond the edge of the road bed. Minimum depth for ductbank shall be three (3) feet below grade and reinforced with rebar.

3.04 REINFORCING STEEL

A. Ductbanks shall be reinforced with reinforcing steel installed parallel to the conduits in the area between the edge of the conduit and ductbank. Minimum distance between the reinforcing steel and edge of the ductbank shall be 1-1/2". Unless otherwise indicated on the contract drawings, the total area of the reinforcing steel

shall not be less than 0.005 times the gross area of the ductbank. The minimum size reinforcement bar shall be #4 and the maximum size reinforcement bar shall be #8. The minimum number of reinforcement bars shall be 6. The minimum total area of the reinforcement bars located above and below the conduits shall be (0.25 x .0005) times the gross area of the ductbank.

B. All ductbanks shall be installed with a #3 (minimum) tie reinforcement around the conduit and reinforcement steel at 24" on center.

3.05 MISCELLANEOUS

A. A 3/32" diameter poly rope equal to Jetline Products No. 332 or steel wire shall be installed and left in all spare conduits not containing wire and cable. Spare conduit will be capped.

B. All conduits shall be swabbed clean before cable installation.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16032 - RACEWAY SUPPORTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 1, and Division 16 of the Specification Sections, apply to work of this Section.

B. All supports to meet Section 16071 Seismic Restraints.

1.02 DESCRIPTION OF WORK:

A. Provide raceway supports with all fittings, accessories and supports for a complete system as specified herein and indicated on the drawings.

1.03 SUBMITTALS:

A. Load Calculations - Submit all load calculations to Construction Manager for review.

PART 2 - PRODUCTS

2.01 BEAM CLAMPS:

A. They shall be suitable for structural members and conditions; claps shall be Appleton, Kindorf or Steel City, and shall be submitted for approval.

2.02 CHANNELS:

A. They are used for trapeze hangers or other supporting means shall be Kindorf No. B-905 or equivalent by Steel City or Unistrut.

2.03 CLAMPS FOR CLAMPING RIGID CONDUIT TO HANGERS:

A. They shall be Kindorf Series No. C-105, or equivalent by Steel City or unistrut. Clamps for electrical metallic tubing shall be Kindorf Series No. C-106 or equivalent by Steel City or Unistrut. Clamps used for clamping conduit to walls or other similar surfaces shall be one-hole malleable iron type.

2.04 FINISH:

A. All channels, beam clamps and conduit clamps shall be galvanize.

B. All steel bolts, nuts, washers and screws shall be cadmium plated.

C. All weld joints shall be cleaned, prime painted, and two coats of red lead or approved equal shall be applied to these areas.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. The required strength of the raceway supports and the size and type of anchors shall be based on the combined weight of raceway, hangers, conductors and any equipment supported from the raceway with a minimum safety factor of four times the total supported weight. Submit load calculations for review and approval prior to installation.

B. All raceway systems shall be installed in such a way that no portion of the raceway system is dependent upon panels, boxes, motor control centers, etc. to support the raceway.

C. No part of the raceway system shall be supported from anything other than structural members or masonry surfaces without the prior written approval of Construction Manager.

D. Single Runs:

1. Where conduits are run individually along walls or masonry surfaces, they shall be supported by approved conduit clamps secured by means of toggle bolts on hollow masonry, expansion shields and machine screws or standard preset inserts on concrete or solid masonry, and machine screws or bolts on metal surfaces. The use of perforated strap shall not be permitted.

Expansion shields shall be installed using a Greenlee No. 866, No. 867, No. 868 or No. 870 expansion anchor tool. No expansion anchors of any other type shall be installed in mortar joints.

2. Conduits installed along the surface of damp locations or in refrigerated areas shall be provided with clamp backs under each conduit to prevent accumulation of moisture around the conduits.

3. Where individual conduits are suspended from a structural member, they shall be supported by hangers, Steel City No. 149 or an approved equal. All threaded rods shall not exceed 24 inches in length when used to make hangers for individual conduit runs. Conduit run directly along or across structural members shall be supported with Appleton right angle, parallel or edge Type "KClamps".

E. Multiple Conduit Runs:

1. Where two or more conduits are to be run exposed and parallel one with another, they shall be grouped evenly and consistently spaced out allow for conduit installation and arranged to minimize crossing. They shall be supported in channel mounted to structural members or in trapeze hangers. All channel cut edges shall be filed smooth and free of burrs and cut square. All threaded rods shall not exceed 24 inches in length when used for trapeze hangers without prior written approval of Construction Manager.

F. Additional supports for proper spacing or support of outlets, cabinets, pull boxes, lighting fixtures or starters shall be as detailed on the drawings. Where no detail is given, the supports shall be channel mounted to structural members or masonry surfaces in an approved manner. Supports shall have a minimum safety factor of four times the total supported weight.

G. All threaded rod, bolts, etc. used for raceway support shall be double nutted and wrench tightened to appropriate torque values.

H. All raceway supports shall be installed in a quality workmanlike manner, shall be neat in appearance, shall be cut square and filed to remove any sharp edges, and shall be capable of supporting the total required load with the required safety factor.

I. Any raceway supports and associated hardware located in corrosive environments shall be stainless steel or PVC-
coated and must be approved prior to installation by Construction Manager.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16033 - NAMEPLATES AND IDENTIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 16 of the Specification Sections, apply to work of this Section.

1.02 WORK INCLUDED:

A. This Section specifies:

1. Nameplates
2. Directories
3. Conduit Identification
4. Panel Identification
5. Safety Disconnect Switch Identification
6. Wire Markers
7. Outlets and light switches.
8. Motor control centers.

1.03 GENERAL:

A. Provide nameplates, schedules, directories, markers and tags for all electrical equipment furnished and/or installed under this division.

PART 2 - PRODUCTS

2.01 NAMEPLATES:

A. Identify equipment and key equipment components with nameplates of black laminated phenolic material.

1. Coordinate nameplates with actual equipment installed.

2. Secure nameplates onto or near each item.

3. Submit cut sheet of nameplates for approval prior to fabrication and installation.

4. Minimum nameplate size shall be three inches long with 1/4 inch lettering.

B. Secure nameplates with screws or bolts and nuts. Glued or pasted-on laminated nameplates are not acceptable.

C. See attached list for tagging of process equipment.

2.02 PANELBOARD IDENTIFICATION:

A. Provide screw-on nameplates on the panel trim outside indicating the panelboard designation and the source of power origin of feeders serving each panel or switch.

2.03 SWITCH IDENTIFICATION:

A. Provide screw-on nameplates on outside of covers or doors indicating the load served and the source of power and the service. (See schedule at back of specification).

2.04 PANELBOARD DIRECTORIES:

A. All panelboards shall be furnished with a directory frame. Provide a neatly typed directory listing the circuit number, equipment served and location for each circuit in all lighting panels, power panels and distribution panels. Directories shall identify all spare circuit devices.

2.05 CONDUIT IDENTIFICATION:

A. Provide adhesive-type labels indicating voltage and circuit information.

1. Install markers, after finish painting, every 50 feet and at every change of direction.

2. Labels shall be W. H. Brady Company, Newark, NJ, B-500 vinyl cloth or equal.

2.06 OUTLETS:

1. Provide bakelite with epoxy adhesive on emergency outlet indicating panelboard designation and circuit number.

2.06 WIRE MARKERS:

A. Wire markers shall be provided to identify devices served, conductors and cables at terminals, and in pull boxes. Numbering shall be specific to the device and per loop drawings.

B. Wire markers shall be adhesive type manufactured by:

1. Thomas & Betts

2. W.H. Brady Company

C. All wires shall be permanently marked with suitable wire markers in motor control centers, pull boxes, junction boxes, hand holes, terminal boxes and other accessible locations. All markings shall be unique and clearly shown on submittal data.

2.07 MOTOR CONTROL CENTERS:

1. Provide adhesive type or plastic laminated labels including Tag No., equipment and service, (see table at end of specification for descriptions).

PART 3 - EXECUTION **Not Applicable**

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16040 - LIGHTING FIXTURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 16 of the Specification Sections, apply to work of this Section.

1.02 WORK INCLUDED

A. This section specifies:

1. Lighting fixtures

2. Lamps

1.03 GENERAL

A. Furnish and install all lighting fixtures complete with lamps as indicated on the drawings, as herein specified and specified in the Lighting Floor Plan Notes.

B. It is the intent to provide and install a complete fixture, and multiples thereof, on each and every outlet shown on the drawings. Therefore, in the event a type designation is omitted from any fixture outlet indicated, furnish and install units typical to those in similar locations, at no additional cost to the Owner.

C. Include the cost of purchasing all fixtures specified in the Lighting Fixture Schedule, including plaster frames pendant hangers and miscellaneous accessories, as well as the cost involved in receiving, checking, cleaning, safeguarding, distributing, necessary wiring, disposal of cartons and crates from the site, etc., assembling, installing and connecting of lighting fixtures.

D. All lighting fixtures shall be protected from damage during the installation. Any damaged fixtures, diffusers, glassware, sockets, stems and the like, shall be replaced with new parts, without additional cost to the Owner.

E. All spare glassware shall be protected from damage and shall be delivered to the Owner.

1.04 UTILITY COMPANY REBATES

A. All lamps and ballasts furnished for this installation shall be of the types required by the local electric utility company to qualify for any applicable rebate programs.

B. The Contractor shall assist in the preparation of utility company rebate applications.

C. Rebates, if applicable, shall be paid to the Owner.

PART 2 - PRODUCTS

2.01 FIXTURES AND APPURTENANCES

A. Lighting fixtures shall be furnished complete with all necessary devices and appurtenances to completely install fixtures in operating condition, including plaster rings, studs, hickeys, canopies, stems, clamps, leveling devices, glassware, diffusers, etc., and lamps.

2.02 QUALITY ASSURANCE

A. Each lighting fixture shall have an UL label, and shall comply with the requirements of all authorities having jurisdiction.

B. Ballasts for fluorescent fixtures shall be solid state electronic energy-saving CBM certified, Class P ballasts, sound rated 'A', high power factor type.

C. Lighting fixtures shall be wired with approved fixture wire. Each fixture shall be wired to a single point with adequate slack for proper connection.

D. Lighting fixtures shall be suitable for the location in which they are installed.

1. Fixtures in damp or wet locations shall be listed for those locations.

2. Fixtures in corrosive locations shall have non-metallic housings.

3. Fixtures in hazardous locations shall be listed for those locations. Recessed fixtures to be Kurtzon-Haz-Lock Series.

4. Fixtures installed outdoors shall be listed for those locations.

5. Fixtures in process areas are to be Kurtzon-Klean-Lock Series, 4 lamp acrylic lens with stainless steel door.

2.03 MATERIALS

A. All "plastic" diffusers furnished under this division shall be "acrylic" material, regardless of whether or not so indicated in the Fixture Schedule.

1. When directed, remove diffusers, selected at random by the Owner, for verification by test.

B. Fluorescent fixtures in dry locations shall be fabricated from heavy gauge formed sheet steel.

1. Metal parts shall be joined together to form rigid housings with wireway covers and frames.

C. Exposed metal trim on lighting fixtures in process areas shall be stainless steel with welded joints and polished finish.

D. The finish of all metal parts shall be baked white enamel, unless otherwise indicated in the Fixture Schedule.

2.04 BALLASTS

A. Fluorescent lighting fixtures shall be furnished with solid state electronic ballasts rated for 120/277 volt service as noted in the Lighting Fixture Schedule.

B. Ballasts for fixtures located in indoor unheated areas and open outdoor areas shall be low temperature type.

C. Fluorescent ballasts shall carry the CBM and UL labels.

D. Hid ballasts shall carry the UL label.

E. Ballasts shall be energy-saving type.

F. Fluorescent ballasts shall be sound rated 'A'.

G. If ballast hum is noticeable, or lamp flicker persists, change ballast or take other effective action to remedy hum or flicker. If changing ballast or lamp, and detailed inspection and correction of faulty electrical connections fails to stop hum or flicker, replace the entire fixture with one of like kind, and re-test.

H. Ballasts for fluorescent fixtures shall be solid state electronic, Class P, equipped with thermally actuated automatic reclosing protective device, sensitive to current and winding temperatures which shall prevent ballast case temperatures from exceeding 110°C.

I. Ballasts shall be suitable for the quantity and types on lamps specified in the Lighting Fixture Schedule.

J. Ballasts shall be high power factor, 60 Hz, 120/277 Volt, or other circuit voltages as listed in the Lighting Fixture Schedule on the drawings.

2.05 GLASSWARE LENSES AND DIFFUSERS

A. Provide to the Owner, one percent of spare glassware, lenses or diffusers, but in no case less than one for each type of lighting fixture indicated in the Fixture Schedule, which requires glassware, lenses or diffusers.

2.06 LAMPS

A. Provide a full complement of lamps, of all types required in the fixtures installed throughout the project area.

B. Fluorescent lamps shall be 32 watt, 48 inch, T-8 rapid start medium bi-pin, 4000°K, unless otherwise noted.

C. Metal halide lamps shall be clear, mogul base standard output lamps, wattage rating as indicated on the Drawings.

D. Unless otherwise indicated, all lamps including led shall be as manufactured by:

1. General Electric Co.

2. Philips

3. Sylvania

PART 3 - EXECUTION

3.01 INSTALLATION

A. Provide a junction box at each recessed lighting fixture whether specifically indicated or not.

B. All recessed lighting fixtures shall be secured to the ceiling frame members with approved clips, or other approved mechanical methods.

C. All light fixtures to have two (2) sets of aircraft cable to structure above to meet seismic restraint for seismic zone 3.

3.02 COORDINATION

A. Coordinate construction and design of trim and supports for all recessed lighting fixtures for conformity with suspended ceilings in which the lighting fixtures are installed.

1. Submit sub-types of fixtures designations specified as necessary to indicate such conformity of design.

2. Any work that may be required to overcome difficulties in fitting designs to particular locations, or to clear obstacles, etc., shall be done without additional cost to the Owner.

B. Install pendant mounted and wall mounted lighting fixtures at the elevations indicated on the drawings.

C. Pendant-mounted fixtures shall be hung from 3/8-inch stems with a minimum wall thickness of 0.091 inch. Swivel joints shall be used at the top of each stem.

1. Arrange stems to avoid pipes and other interferences above fixtures.

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3.03 TESTS

A. After the fixtures are completely installed, the wiring system, and fixtures must test free from grounds and short circuits.

- End of Section -

PRIDCO
STRUCTURAL ASSESSMENT AND DESIGN PROJECT
BUILDING ID #: T-0953-0-70-00
GURABO, PR

DIVISION 16 - ELECTRICAL

SECTION 16060 - DISTRIBUTION EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, Division 1, and all other Division 16 Specification Sections, apply to work of this Section.

1.02 WORK INCLUDED

A. Distribution boards.

B. Power Panels.

C. Lighting Panels.

D. Appliance Panels.

1.03 GENERAL

A. Furnish and install all distribution equipment as herein specified and as indicated on the drawings.

PART 2 - PRODUCTS

2.01 QUALITY ASSURANCE

A. All equipment ratings shall be in accordance with the applicable standards of ANSI, IEEE, NEMA and UL.

B. All assemblies shall bear the UL label.

C. Materials shall be of the type and size indicated on the drawings, specified herein and indicated in the Schedules. Manufacturer shall furnish certified test reports for actual

equipment provided for this project, or units of identical design, indicating compliance with applicable ANSI, IEEE and NEMA standards.

2.02 DISTRIBUTION BOARD

A. Short Circuit Current Ratings:

1. Distribution Boards shall be rated with a minimum short circuit current rating of 65,000 rms symmetrical amperes at 480 VAC maximum.

B. Future Provisions:

1. All unused spaces provided, unless otherwise specified, shall be fully equipped for future devices, including all appropriate connectors and mounting hardware.

C. Enclosure: Type 1 - General Purpose:

1. Sections shall be aligned front and rear.

2. Distribution Board height shall be a maximum 91.5 inches including 1.5 inch floor sills and excluding lifting members and pull boxes.

3. The Distribution Board(s) shall be of dead front construction.

4. The Distribution Board frame shall be of formed steel rigidly bolted together to support all cover plates, bussing and component devices during shipment and installation.

5. Steel base channels shall be bolted to the frame to rigidly support the entire shipping section for moving on rollers and floor mounting.

6. Each Distribution Board section shall have a barriered bottom and an individually removable top plate for installation and termination of conduit.

7. The Distribution Board enclosure shall be painted on all exterior surfaces. The paint finish shall be a medium gray, ANSI #49, applied by the electro-deposition process over an iron phosphate pre-treatment.

8. All front covers shall be screw removable with a single tool and all doors shall be hinged with removable hung pins.

9. Top and bottom conduit areas shall be clearly indicated on shop drawings.

D. Nameplates:

1. Provide 1 in. H x 3 in. W engraved laminated Gravoply nameplates for each device. Furnish black letters on white background for all voltages.

E. Bus Composition:

1. Shall be plated copper. Plating shall be applied continuously to all bus work. The Distribution Board bussing shall be of sufficient cross-sectional area to meet UL Standard 891 temperature rise requirements. The Phase and neutral through-bus shall have an ampacity as shown in the plans. For 4-wire systems, the neutral shall be of equivalent ampacity as the phase bus bar. Tapered bus is not acceptable. Full provisions for the addition of future sections shall be provided. Bussing shall include all necessary hardware to accommodate splicing for future additions.

F. Bus Connection:

1. Shall be bolted with Grade 5 bolts and conical spring washers.

G. Ground Bus:

1. Sized per NFPA70 and UL 891 Tables 25.1 and 25.2 and shall extend the entire length of the Distribution Board. Provisions for the addition of future sections shall be provided.

H. Accessibility:

1. Accessible from the front of the switchboard.

2. Circuit breaker(s) shall have power terminals to accommodate either cable or bolted bus connections.

2.03 MAIN CIRCUIT BREAKER

Thermal magnetic molded case circuit breaker(s).

A. Group mounted through 1200 A

1. Circuit protective devices shall be Square D molded case circuit breaker(s). Circuit breaker(s) shall be standard interrupting Ampere ratings shall be as shown on the drawings.

   Manufacturer shall submit one set of published Ip and It let-through curves as required by UL to the Owner.

2. Branch circuit breaker(s) shall be group mounted bolt-on type with mechanical restraint on a common pan or rail assembly.

3. The interior shall have three flat bus bars stacked and aligned vertically with glass reinforced polyester insulators laminated between phases. The molded polyester insulators shall support and provide phase isolation to the entire length of bus.

4. Circuit breaker(s) equipped with the line terminal jaws shall not require additional external mounting hardware. Circuit breaker(s) shall be held in mounted position by a self-contained bracket secured to the mounting pan by fasteners. Circuit breaker(s) of different frame size shall be capable of being mounted across from each other.

5. Line side circuit breaker connections are to be jaw type.

2.04 POWER PANELS

A. Power panels shall consist of an assembly of molded case circuit breakers installed in code gauge galvanized sheet steel cabinets, surface or flush mounted as indicated on the drawings.

B. The panel sections shall be mounted away from the back of the cabinet trim and frames.

   1. The gutter space on sides, top and bottom shall be of sufficient size to prevent overcrowding of wires and cables, and overheating of the circuit breakers.

   2. Cabinets shall be complete with hinged doors with cylinder lock, directory frame and neatly typed directory charts.

   3. All panels shall be keyed alike.

4. Provide an angle piece on the inside of the bottom of each trim for ease of installation.

5. All panels shall contain a main circuit breaker.

C. Main buswork shall be copper rated 1000 amperes per square inch, and shall, as a minimum, be designed to carry the full rating of the feeder breaker or switch supplying the panel without perceptible heating.

1. Branch circuit breakers shall be arranged so that each breaker is readily removable from the panel without disturbing adjacent breakers.

2. Phase legs shall be alternately bussed to each circuit breaker in a manner to effect balancing the branch circuit connections as nearly as possible over each phase.

D. The branch circuit breakers, in general, shall be molded case, thermal magnetic trip, 3 pole as scheduled on the drawings.

1. All multiple pole breakers shall be single handle, common trip.
2. Circuit breaker frame and trip ratings shall be as shown on the drawings.

E. Power panels shall be Square D I-Line.

1. Power panels as manufactured by General Electric will be acceptable.

2.05 LIGHTING PANELS

A. Lighting panels shall consist of an assembly of molded case circuit breakers installed in code gauge galvanized sheet steel cabinets, surface or flush mounted as indicated on the drawings and shall automatically control lighting. System to be a Square 'D' Powerlink G3 system.

B. The panel interior shall be mounted away from the back of the cabinet trim and frames.

1. The gutter space on sides, top and bottom shall be of sufficient size to prevent overcrowding of wires and cables, and overheating of the circuit breakers.

2. Cabinets shall be complete with hinged doors with cylinder lock, directory frame and neatly typed directory charts.

3. All panels shall be keyed alike.

4. Provide an angle piece on the inside of the bottom of each trim for ease of installation.

5. All panels shall contain a main circuit breaker.

C. Main buswork shall be copper rated 1,000 amperes per square inch, and shall, as a minimum, be designed to carry the full rating of the feeder breaker or switch supplying the panel without perceptible heating.

1. Branch circuit breakers shall be arranged so that each breaker is readily removable from the panel without disturbing adjacent breakers.

2. Phase legs shall be alternately bussed to each circuit breaker in a manner to effect balancing the branch circuit connections as neatly as possible over each phase.

D. The system shall be used as a networked system for controlling loads via external low voltage inputs.

E. The system shall include branch circuit overcurrent protection and remote lighting control, low voltage switch inputs, control logic functionality and shall all fit within a standard lighting panelboard enclosure.

F. To assure seamless integration, all major system components shall have a common manufacturer.

G. Start-up: After the system has been installed, and the documentation delivered to the Owner, the Contractor shall secure the services of a factory trained manufacturer's representative to verify correct operation of all system components.

H. The panelboard lighting control system shall be POWERLINK G3 as manufactured by Square 'D' Company. The lighting control system shall consist of a microprocessor-based control electronics with remotely operated circuit breakers.

I. The circuit breakers shall provide overcurrent protection meeting or exceeding the fault current of the system to which the panelboard is applied.

J. The lighting control system shall meet or exceed the following capabilities:

1. Individual remote control for 42 branch circuits.

2. Up to sixteen 2-wire maintained dry-contact inputs for connection to external low voltage (24 VDC or below) switch contacts.

3. Zone creation of multiple branch circuits and control of individual branch circuits or zones.

4. Individual branch circuit and zone override.

5. True closed loop control by monitoring branch circuit breaker status based on actual system voltage at load side terminal.

6. Downloadable firmware that will permit field installation of newest features in existing systems.

K. All lighting control components shall be installed in a conventional panelboard enclosure. Suitable barriers between Class 1 and Class 2 wiring shall be provided.

L. To minimize installation labor and space requirements, the remote operated circuit breakers, power interface module, and control module shall be integral to the lighting panelboard.

M. Remotely operated circuit breakers: All remotely operated branch circuit breakers shall provide overload and short circuit protection suitable for that location in the electrical system, as defined in the panelboard schedules. Remotely operated lighting control devices shall provide:

1. Load switching endurance rating of 200,000 open/close operations at full load and 0.8 lagging power factor.

2. Switching devices with lower endurance ratings may be judged to be acceptable, but must be provided with 100% spare switching devices for each circuit to ensure an equivalent total number of operations.

3. 15A, 20A, and 30A current ratings.

4. Integral branch circuit overcurrent protection as required by the National Electrical Code (NEC), and shall be either fully rated or shall have published series connected ratings for providing adequate protection at that point in the system.

5. Available in single, 2 or 3 pole configurations.

6. UL listing SWD rating on 15A and 20A 1-, 2- and 3- pole branches; UL listed HACR rating and UL listed HID rating on all remotely operated lighting control devices.
7. Handle that mechanically opens lighting control device contacts when moved to the OFF position and disables remote control capabilities of the device.

8. Operating mode selector button on each lighting control device shall be provided to enable or disable remote operated function of the device independent of the handle.

9. Visible flag to clearly indicate the status of the circuit breaker contacts.

    a. Status condition shall include: ON, OFF, TRIPPED.

    b. The visible flag shall be mechanical in nature, directly tied to the breaker mechanism, and shall be provided in addition to any status indicator supplied by the system electronics.

10. All individual lighting control devices rated for 277 or 480Y/277 VAC shall have a short circuit interrupting rating 65,000 RMS symmetrical amperes.

11. Lighting control devices shall meet all NEC requirements for circuit breakers; shall be UL listed as circuit breakers.

N. All electronic modules and circuit breakers in the panelboard shall be mounted in positions and control the loads as indicated on the panelboard drawings.

O. Panelboards shall accept standard circuit breakers for loads not controlled by the system.

P. Interconnections: All interconnections between circuit breakers, control buses and power interface modules shall meet NEC and UL requirements for Class 1 control circuits.

Q. Modular control buses shall be used to provide control power and communications to the remote operated branch breakers.

R. A power interface module shall be provided to supply control power for the operation of the remotely operated circuit breakers, for low voltage inputs, and for the electronics and communications. The module shall provide screw type terminals for up to sixteen 2-wire maintained or two-wire momentary inputs, or eight 3-wire momentary inputs for connection to external low voltage (24 VDC or below) switch contacts.

S. Control Module: A control module shall be provided where indicated.

1. The control module shall provide time clock, communications, and programming functionality.

2. Display control module shall have high-resolution graphics LCD display and keypad that will permit programming of the system, control override of the breaker status, and display diagnostic information at the front panel. Provide a display control module for each lighting control panelboard.

T. RS-485 network option shall enable the panelboard lighting control system to connect with other control systems.

U. User may set up, monitor, and control any panelboard connected to the network form a remote workstation.

V. Network shall be configured to support all panelboards and personal computer workstations as required.

W. LonWorks compliant network shall be required to provide interoperability between the lighting control panelboards such that inputs or switching events in one panel may be used to control the switching of breakers in another panel. This interoperability shall not be limited to panelboards, but shall extend to any LonWorks compliant device such as occupancy sensors or network switches.

X. Furnish, install and connect remote control system components as required to interface the new remote control circuit breaker with the existing Square D Powerlink System presently in use in the building. Components shall include, but shall not be limited to:
1. Square-D power interface modules for NEHB panelboards.

2. P.C. workstation complete with software shall be provided and tested.

2.06 APPLIANCE PANELS

A. Appliance panels shall consist of an assembly of molded case circuit breakers installed in code gauge galvanized sheet steel cabinets, surface or flush mounted as indicated on the drawings.

B. The panel sections shall be mounted away from the back of the cabinet trim and frames.

1. The gutter space on sides, top and bottom shall be of sufficient size to prevent overcrowding of wires and cables, and overheating of the circuit breakers.

2. Cabinets shall be complete with hinged doors with cylinder lock, directory frame and neatly typed directory charts.

3. All panels shall be keyed alike.

4. Provide an angle piece on the inside of the bottom of each trim for ease of installation.

5. All panel shall contain a main circuit breaker.

C. Main buswork shall be copper rated 1000 amperes per square inch, and shall, as a minimum, be designed to carry the full rating of the feeder breaker or switch supplying the panel without perceptible heating.

1. Branch circuit breakers shall be arranged so that each breaker is readily removable from the panel without disturbing adjacent breakers.

2. Phase legs shall be alternately bussed to each circuit breaker in a manner to effect balancing the branch circuit connections as nearly as possible over each phase.

D. Branch circuit breakers shall be molded case, bolt-on type, thermal magnetic trip, single, 2 or 3 pole as scheduled on the drawings.

1. Circuit breakers shall contain a visual trip indicator.

2. Multiple pole breakers shall be single handle, common trip.

3. Where breakers of larger capacity are required, they shall have circuit characteristics as shown on the drawings.

4. Breakers for 120/208 volt service shall be rated 10,000 A.I.C. unless otherwise indicated.

E. Appliance panels shall be Square D Type NQOD with type QOB circuit breakers.

PART 3 - EXECUTION Not Applicable

- End of Section -