

- 1. TECHNOLOGY GENERAL NOTES:**
- ALL STRUCTURED CABLING SYSTEM (SCS) & LOW VOLTAGE (LV) CABLING USED THROUGHOUT THIS PROJECT SHALL COMPLY WITH THE LOCAL REGULATIONS AS OUTLINED IN THE FOLLOWING CODES & LOCAL REGULATIONS FOR THE FOLLOWING: ANSIIA-568-C, ANSIIA-569-D, ANSIIA-606-B, ANSIIA-607-B, BICSI TDDM (CURRENT VERSION), NEC ARTICLE 90, ARTICLE 300, NEC ARTICLE 645, NEC ARTICLE 646, NEC ARTICLE 725, NEC ARTICLE 780, NEC ARTICLE 770, NEC ARTICLE 800, NEC ARTICLE 830. THE SCS & TECHNOLOGY SYSTEM(S) MUST MEET ALL LOCAL AND OTHER PREVAILING CODES.
 - ALL SCS & LV CABLING SHALL BEAR UL LISTED TYPE CMP (PLENUM RATED) AND/OR CMG (GENERAL PURPOSE) AND/OR CMR (RISER RATED), AND/OR OPTIC CABLING SHALL BEAR OFR (PLENUM RATED) AND/OR OFR (RISER RATED) AND/OR OFRG (GENERAL PURPOSE). THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING APPROPRIATELY RATED CABLE FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED.
 - ALL INSTALLATION SHALL BE DONE IN CONFORMANCE WITH ANSIIA-568-C STANDARDS AND MANUFACTURERS INSTALLATION GUIDELINES. THE CONTRACTOR SHALL ENSURE THAT THE CABLE'S MINIMUM BEND RADIUS AND, MAXIMUM PULLING TENSIONS OF THE SPECIFIED DISTRIBUTION CABLES ARE NOT EXCEEDED. THE CABLE BENDS MUST MAINTAIN THE PROPER RADIUS DURING THE PLACEMENT OF THE FACILITIES. FAILURE TO FOLLOW THE APPROPRIATE GUIDELINES WILL REQUIRE THE CONTRACTOR TO PROVIDE, IN A TIMELY FASHION, ANY ADDITIONAL MATERIAL AND LABOR NECESSARY TO PROPERLY RECTIFY THE SITUATION TO THE SATISFACTION OF THE ARCHITECT. THIS SHALL ALSO APPLY TO ANY AND ALL DAMAGES SUSTAINED TO THE CABLES BY THE CONTRACTOR DURING THE IMPLEMENTATION.
 - ALL SCS AND/OR LV INSTALLATIONS SHALL BE PERFORMED BY QUALIFIED TECHNICIANS FOR THAT SYSTEM. THE LABOR EMPLOYED BY THE CONTRACTOR SHALL BE REGULARLY EMPLOYED IN THE INSTALLATION AND REPAIR OF SCS AND/OR LV SYSTEMS AND SHALL BE ACCEPTABLE TO THE OWNERS REPRESENTATIVE TO ENGAGE IN THE INSTALLATION AND SERVICE OF THIS SYSTEM.
 - THE MDF AND IDF SPACES ARE DESCRIBED BELOW, AND ENCOMPASS THE AREAS THE COMMUNICATIONS CABLING EXISTS IN. THESE AREAS INCLUDE (BUT NOT LIMITED TO) THE BACKBOARDS, CABINETS, RACKS, FRAMES, LADDER RACKS, TERMINATION FIELDS, AND PATCH CORBONS (WALL AND RACK TYPES FOR COPPER AND FIBER). THE SCS CONTRACTOR IS RESPONSIBLE FOR FOLLOWING THE STANDARDS, CODES AND LOCAL REGULATIONS FOR THESE SPACES. (E.G. ANSIIA-568-C, ANSIIA-569-D, ANSIIA-606-B, ANSIIA-607-B, BICSI TDDM (CURRENT VERSION), NEC ARTICLE 90, ARTICLE 300, NEC ARTICLE 645, NEC ARTICLE 646, NEC ARTICLE 725, NEC ARTICLE 770, NEC ARTICLE 800, NEC ARTICLE 830)
 - THE WRING OF THE SYSTEM SHALL BE EXECUTED IN ACCORDANCE WITH THE DRAWINGS AND THE EQUIPMENT MANUFACTURER'S WRING DIAGRAMS. SHOULD ANY VARIATIONS IN THESE REQUIREMENTS OCCUR, THE CONTRACTOR SHALL NOTIFY THE OWNERS REPRESENTATIVE BEFORE MAKING ANY CHANGES. IT SHALL BE THE RESPONSIBILITY OF THE MANUFACTURER - AUTHORIZED INSTALLER OF THE APPROVED EQUIPMENT TO INSTALL THE EQUIPMENT AND GUARANTEE THE SYSTEM TO OPERATE AS PER PLANS AND SPECIFICATIONS.
 - ALL MATERIALS SHALL BE NEW, NO USED OR RE-MANUFACTURED PARTS OR COMPONENTS SHALL BE ACCEPTED.
 - CABLE STORAGE:
 - THE CONTRACTOR SHALL NOT ROLL OR STORE CABLE REELS WITHOUT AN APPROPRIATE UNDERLAY AND THE PRIOR WRITTEN APPROVAL OF OWNERS REPRESENTATIVE.
 - SPECIAL EQUIPMENT AND TOOLS:
 - IN ORDER TO ENSURE THE LEAST AMOUNT OF CABLE UNTWISTING, IT IS REQUIRED THAT ALL CABLES SHALL BE STRIPPED USING A CABLE MANUFACTURER'S RECOGNIZED SPECIAL TOOL. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FURNISH ANY SPECIAL INSTALLATION EQUIPMENT OR TOOLS NECESSARY TO PROPERLY COMPLETE THE SYSTEM. THIS MAY INCLUDE, BUT IS NOT LIMITED TO, TOOLS FOR TERMINATING CABLES, TESTING AND SPLICING EQUIPMENT, EQUIPMENT FOR COPPER/FIBER CABLES, COMMUNICATION DEVICES, JACK STANDS FOR CABLE REELS, OR CABLE WINCHES.
 - UNDER NO CIRCUMSTANCE ARE "CHANNEL LOCKS" OR OTHER PULLERS NOT DESIGNED BY THE SCS MANUFACTURE TO BE USED TO TERMINATE WAQ JACKS.

- 2. TECHNOLOGY PATHWAY NOTES:**
- PATHWAYS CAN BE DIVIDED UP INTO TWO SEPARATE CATEGORIES, OUTSIDE PLANT (OSP) AND INSIDE PLANT (ISP). IT IS THE SCS AND/OR LV CONTRACTOR'S RESPONSIBILITY TO IDENTIFY ALL EXISTING PATHWAYS (CONDUIT, CABLE TRAY, ETC.) THAT WILL BE UTILIZED ON THE PROJECT, AND COORDINATE WITH THE ON-SITE ELECTRICAL OR GENERAL CONTRACTOR TO PROVE ALL PATHS SUBJECT TO BE USED ON THIS PROJECT, BEFORE INSTALLATION. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION ALL UNDERGROUND (UG) PATHWAYS, NON-ACCESSIBLE AND OPEN CEILING SPACE PATHWAYS AS DESCRIBED IN SECTION G, CONTRACTOR GUIDELINES OF THESE TECHNOLOGY GENERAL NOTES.
 - ALL PULLBOXES SHALL BE SIZED AND INSTALLED PER ANSIIA-569-D. PULLBOXES FOR INJUNER SLAB CONDUIT RUNS ARE NOT PERMITTED UNLESS OTHERWISE NOTED. PULLBOXES FOR OVERHEAD CONDUIT RUNS SHALL BE LOCATED ABOVE ACCESSIBLE CEILING WITHIN THE ACCESSIBLE CEILING SPACE AND SUPPORTED INDEPENDENTLY FROM THE STRUCTURE AND CONDUIT EQUIPPMENTS. PULLBOXES FOR ROOF MOUNTED OR EXTERIOR ABOVE GRADE APPLICATIONS SHALL BE NEMA 3R RATED. PULLBOXES SHALL BE SIZED ACCORDING TO THE FOLLOWING.

PULLBOX SIZING PER ANSIIA-569-D

Conduit Size	WIDTH	LENGTH	DEPTH	WIDTH INCREASE PER ADDITIONAL...
1"	4"	15"	3"	2"
2"	8"	36"	4"	5"
3"	61	46"	5"	6"
4"	101	60"	8"	8"

FOR FILL RATIO BASED CONDUIT SIZING REFER TO THE FILL RATIO TABLE 1A - 2B BELOW AND REFERENCE TO ANSIIA-569-D.

FILL RATIO TABLE 1A - Conduit

Conduit Size	.13	.18	.19	.20	.21	.22	.23	.24	.25	.26	.27	.28	.29	.30	.31	.32	.33	.34	.35	.37	.39
3/4"	16	8	7	6	6	5	5	4	4	4	3	3	3	2	2	2	2	2	2	1	1
1"	26	13	12	11	9	9	8	7	7	6	6	5	5	4	4	4	4	3	3	3	2
1 1/4"	45	23	21	19	17	15	14	13	12	11	10	9	8	7	7	6	6	6	6	5	5
1 1/2"	61	32	28	25	23	21	19	18	16	15	14	13	12	11	10	10	9	8	8	7	6
2"	101	52	47	42	38	35	32	29	27	25	23	21	20	18	17	16	15	14	13	12	11
2 1/2"	176	92	82	74	67	61	56	51	47	44	40	38	35	31	29	27	25	24	21	19	19
3"	266	139	124	112	102	93	85	78	72	66	61	57	53	50	46	43	41	38	30	32	29
3 1/2"	347	181	162	146	133	121	111	102	94	86	80	74	69	65	61	57	53	50	47	42	38
4"	444	231	208	187	170	155	142	130	120	111	103	95	89	83	78	73	68	64	61	54	49

FILL RATIO TABLE 1B - Conduit

Conduit Size	.41	.45	.49	.51	.55	.59	.61	.65	.69	.71	.75	.79	.85	.98	1.00	1.32	1.58	1.79	2.18	2.63	3.00 (47%)
3/4"	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1"	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-
1 1/4"	4	3	3	2	2	2	2	1	1	1	1	1	1	1	1	-	-	-	-	-	-
1 1/2"	6	5	4	3	3	2	2	2	2	2	1	1	1	1	1	-	-	-	-	-	-
2"	10	8	7	6	5	4	4	4	3	3	3	2	2	2	1	1	-	-	-	-	-
2 1/2"	17	14	12	11	9	8	8	7	6	5	5	4	4	3	2	2	1	1	-	-	-
3"	26	22	18	17	14	12	12	10	9	8	8	7	6	4	4	2	1	-	-	-	-
3 1/2"	34	29	24	21	19	16	15	13	12	11	10	9	8	6	5	3	2	1	1	-	-
4"	44	37	31	28	24	21	20	17	15	14	13	12	10	7	7	4	3	2	1	1	1

FILL RATIO TABLE 2A - Cable Tray / Wiro Basket / Raceway per NEC 2017 Article 725

Tray Size (WxD)	.13	.18	.19	.20	.21	.22	.23	.24	.25	.26	.27	.28	.29	.30	.31	.32	.33	.34	.35	.37	.39
4x4	482	251	225	203	184	168	154	141	130	120	111	103	96	90	84	79	74	70	66	59	53
6x4	723	377	338	305	277	252	231	212	195	180	167	155	145	135	127	119	112	105	99	89	80
12x4	1447	754	677	661	554	505	462	424	391	361	335	311	290	271	254	238	224	211	199	178	160
18x4	2170	1132	1016	917	831	758	693	636	587	542	503	467	407	381	358	336	317	299	267	241	214
24x4	2894	1509	1355	1222	1109	1010	924	849	782	732	671	623	561	543	509	477	449	423	399	357	321
6x6	1085	566	508	458	415	379	346	318	293	271	251	233	218	203	190	179	168	158	149	133	120
12x6	2170	1132	1016	917	831	758	693	636	587	542	503	467	407	381	358	336	317	299	267	241	214
18x6	3256	1698	1524	1375	1247	1137	1040	955	880	814	754	701	654	611	572	537	505	476	449	401	361
24x6	4341	2264	2032	1834	1663	1516	1387	1273	1174	1085	1006	935	872	815	763	716	673	634	598	535	482

FILL RATIO TABLE 2B - Cable Tray / Wiro Basket / Raceway

Tray Size (WxD)	.41	.45	.49	.51	.55	.59	.61	.65	.69	.71	.75	.79	.85	.98	1.00	1.32	1.58	1.79	2.18	2.63	3.00 (47%)
4x4	48	40	33	31	28	23	21	19	17	16	14	13	11	8	4	3	2	-	-	-	-
6x4	72	60	50	47	40	35	32	28	25	24	21	19	16	12	7	4	3	2	-	-	-
12x4	145	120	101	94	80	70	65	57	51	48	43	39	33	25	14	9	7	5	3	2	-
18x4	218	181	152	141	121	105	98	86	77	72	65	59	50	38	24	14	11	7	5	4	-
24x4	291	241	203	188	161	140	131	115	102	97	86	78	67	50	48	28	19	15	10	7	5
6x6	109	90	76	70	60	52	49	43	38	36	32	29	25	19	18	10	7	5	-	-	-
12x6	218	181	152	141	130	105	106	86	77	72	65	58	50	38	26	14	11	7	5	4	-
18x6	327	271	229	211	181	158	147	130	115	109	97	88	76	57	55	31	22	17	11	7	6
24x6	436	362	305	282	242	210	197	173	154	145	130	117	101	76	73	42	29	22	15	10	8

FOR FILL RATIO BASED CONDUIT SIZING REFER TO THE FILL RATIO TABLE 1A - 2B BELOW AND REFERENCE TO ANSIIA-569-D.

PATHWAY SEPARATION FROM SOURCE OF ELECTROMAGNETIC ENERGY:

CONDITION	<2KVA	2-5 KVA	>5KVA
Unshielded Power Lines in Proximity to open PVC Pathways	5" (In.)	12" (In.)	24" (In.)
Unshielded Power Lines in Proximity to Grounded Metallic Pathways	2.5" (In.)	6" (In.)	12" (In.)
Power Lines enclosed in Metal Grounded Pathways in proximity to Grounded Metallic...	<1" (In.)	3" (In.)	6" (In.)

- WHERE ADDITIONAL CONDUIT(S)/SLEEVE(S) ARE REQUIRED, BUT NOT PROVIDED BY THE ELECTRICAL CONTRACTOR, THE SCS AND/OR LV CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE SUCH CONDUIT(S)/SLEEVE(S). CONDUIT(S) AND SLEEVE(S) SHALL BE OF SUIITABLE MATERIAL, SIZED, INSTALLED, FIRE STOPPED, AND GROUNDING AS REQUIRED BY THE NEC 2017, ANSIIA-569-D STANDARD AND ALL OTHER APPLICABLE CODES AND STANDARDS. SLEEVES SHALL CONSIST OF METALLIC CONDUIT DE-BURRED AND GROMMETTED ON BOTH ENDS WITH FLANGES OR OTHER MEANS TO PREVENT THE SLEEVE FROM SLIPPING OR FALLING OUT OF THE PARTITION. SLEEVES SHALL EXTEND A MINIMUM OF 4" ON BOTH SIDES OF THE PARTITION. OUTSIDE PERIMETER OF SLEEVES SHALL BE SEALED AGAINST SOUND, AIR, WATER, HEAT, OR AS REQUIRED BY PARTITION DESIGN. INSIDE OF SLEEVE SHALL BE SEALED SIMILARLY AFTER INSTALLATION OF ALL CABLES WITHIN THE SLEEVE. SLEEVES SHALL NOT BE USED AS CABLE SUPPORTS. ANY CONDUIT(S) AND SLEEVE(S) ADDED BY THE SCS CONTRACTOR SHALL BE APPROVED BY THE OWNERS REPRESENTATIVE PRIOR TO ROUGH-IN.
- IN THE EVENT CONTRACTOR IS REQUIRED TO REMOVE CEILING TIES, SUCH WORK SHALL NOT BREAK OR DISTURB GRID. REMOVAL OF THE CEILING GRID MUST BE COORDINATED WITH THE OWNERS REPRESENTATIVE. ALL INSULATION SHALL BE REPLACED IN ITS ORIGINAL LOCATION.
- CONDUITS:
 - ALL BACKBONE CABLING WILL RUN THROUGH DEDICATED CONDUITS.
 - ALL NEW CONDUITS WILL BE SUPPLIED WITH A PULL STRING BY THE ELECTRICAL CONTRACTOR.
 - EXISTING CONDUITS SHALL BE PROVEN TO BE CLEAR BY THE SCS AND/OR LV CONTRACTOR PRIOR TO PULLING OF CABLES.
 - SCS AND/OR LV CONTRACTOR SHALL SUPPLY PULL STRING AND PULL ROPE FOR THE INSTALLATION OF ALL CABLES IN EXISTING CONDUITS.
 - FOR ALL CONDUITS LEFT WITH AVAILABLE CAPACITY, SCS AND/OR LV CONTRACTOR SHALL REPLACE PULL STRINGS DURING THE COURSE OF HIS WORK.
 - SCS AND/OR LV CONTRACTOR MUST SEAL ALL CONDUITS WITH AN APPROVED SEALING COMPOUND.

2. TECHNOLOGY PATHWAY NOTES: (CONT.)

- FOR ALL FIRESTOPPING OF SCS AND LV SYSTEMS PATHWAY RESPONSIBILITIES REFERENCE SECTION G, PENETRATION OF WALLS, FLOOR AND CEILINGS OF THESE TECHNOLOGY GENERAL NOTES.
- FOR ALL OTHER SCS AND/OR LV SYSTEMS PATHWAY RESPONSIBILITIES REFERENCE SECTION F, CONTRACTOR GUIDELINES OF THESE TECHNOLOGY GENERAL NOTES.
- OUTSIDE PLANT (OSP) PATHWAYS CAN BE BROKEN DOWN INTO THE FOLLOWING ITEMS, MAINTENANCE HOLES, HAND HOLES, PULLBOXES AND PRACTICES:
 - WHILE ENTERING MAINTENANCE HOLES, HAND HOLES, PULLBOXES, FOLLOW ALL CODES AND SAFETY PRACTICES OF A "CONFINED SPACE". UTILIZE NECESSARY EQUIPMENT TO MAINTAIN ALL SAFE PULLING TENSIONS FOR THE CABLES TO BE USED. THIS INFORMATION CAN BE FOUND ON THE CABLE MANUFACTURER'S SPECIFICATIONS SHEETS.
 - BEFORE EXITING THE MAINTENANCE HOLE, HAND HOLE, PULLBOX, NOTE ON PAPER OR DIGITAL MEANS THE EXISTING AND NEW CABLE(S) LOCATION(S) AND ROUTE(S), AND PROVIDE A "BUTTERFLY" PRINT TO AHJ AND OWNERS REPRESENTATIVE. LABEL THE INSTALLED MEDIA PER SPECIFICATION A.
 - WITH DIRECTION OF OWNER OR OWNER'S REPRESENTATIVE, CHOOSE AND PROVE ALL CONDUITS BEFORE THE INSTALLATION OF THE MEDIA. MEASURE ALL PATHWAYS WITH MULE-TAPE PRIOR TO ORDERING MATERIAL. ALL LABOR AND MATERIALS MUST BE MATCHED WITH DISCREPANCIES BETWEEN DRAWINGS AND VERIFIABLE SITE CONDITIONS SHALL BE BORNE BY CONTRACTOR. COORDINATE WITH THE ELECTRICAL OR GENERAL CONTRACTOR (EC OR GC, IF) CONDUITS ARE PLUGGED OR MISSING PULL ROPE.
 - TRAIL ALL BACKBONE MEDIA (IE COPPER, FIBER OR INNERDUCT) WITH A 3/8" YELLOW POLY-NYLON ROPE. LABEL THE ROPE, AND THE OFF EITER END, FOR FUTURE INSTALLATIONS.
 - PROVIDE AND INSTALL ALL HARDWARE NECESSARY TO SUPPORT THE CABLING TO THE WALLS OF THE MAINTENANCE HOLE. HAND HOLES, PULLBOX (IF IT DOES NOT ALREADY EXIST) THIS HARDWARE IS TO BE CONSTRUCTED FOR THE AREA IT IS TO BE INSTALLED AND DESIGNED FOR THE PURPOSE INTENDING FOR ITS USE.
 - SCS AND/OR LV CONTRACTOR TO PROVIDE EXPANSION PLUGS IN ALL DUCTS/CONDUITS ENTERING THE BUILDING. SEAL ALL UNUSED DUCTS/CONDUITS WITH PLUGS THAT ALLOW THE PULL-STRING TO BE TIED OFF ON THE INSIDE.
- INSIDE PLANT (ISP) PATHWAYS CAN BE BROKEN DOWN INTO THE FOLLOWING ITEMS, HOLLOW WALL PENETRATION, MEMBRANE PENETRATION, ACCESSIBLE CEILING (IE "J" HOOKS), AND CONDUIT.

3. CABLE RACEWAYS AND CONDUITS SHALL NOT BE FILLED GREATER THAN THE NEC 2017, ARTICLE 725 AND BICSI RECOMMENDED FILL FOR THE PARTICULAR RACEWAY OR CONDUIT SIZE FOR CLASS 2/3 WIRE/CABLE.

- CONDUIT AND PATHWAY ROUTING SHOW FOR THE SCS AND LV SYSTEMS ARE STRICTLY DIAGRAMMATICAL FOR THE PURPOSE OF THE BID TO ILLUSTRATE GENERAL METHODOLOGY. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO DETERMINE THE BEST MEANS & METHODS FOR SCS & TECHNOLOGY CONDUIT AND PATHWAY INSTALLATION. ADDITIONALLY IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO COORDINATE THE INSTALLATION PLAN WITH THE OWNERS REPRESENTATIVE AND ALL TRADES PRIOR TO INSTALLATION OF CONDUITS AND GENERAL ELECTRICAL SPECIFICATION FOR ADDITIONAL REQUIREMENTS.
- CONDUIT PATHWAYS SHALL BE SUPPLIED BY THE ELECTRICAL OR GENERAL CONTRACTOR AS PER THE DRAWINGS. OTHER CONDUITS (IF ANY) MAY NEED TO BE COORDINATED WITH THE EC AND/OR GC OF THE PROJECT.
- NO CABLE IS TO BE PULLED THROUGH A CONDUIT L-BEND "LB" (CONDULETS).
- ALL EXPOSED CONDUIT AND HARDWARE SHALL BE PAINTED TO MATCH SURROUNDING SURFACES. CONTRACT DISTRICT CATEGORIES APPLY FOR PAINT COLORS.
- CONDUITS SHALL CONTAIN PLASTIC OR NYLON PULL TAPE RATED AT 200 LBS. WITH A MINIMUM OF 5 FEET OF EXTRA PULL TAPE COILED AT EACH END.
- TERMINATE CONDUIT STUBS AND SLEEVES THAT PROTRUDE THROUGH STRUCTURAL FLOORS 2"-3" ABOVE THE FLOOR SURFACE.
- INSTALL BUSHINGS AND BELL ENDS AS REQUIRED ON ALL CONDUITS.
- FLEX CONDUIT IS UNACCEPTABLE FOR USE AS A COMMUNICATIONS CONDUIT EXCEPT AT SEISMIC JOINTS AND/OR IF APPROVED IN WRITING BY THE ENGINEER.
- ALL UNDER SLAB OR IN-SLAB CONDUITS SHALL BE INSTALLED IN A MANNER THAT PREVENTS WATER INFILTRATION OF THE CONDUIT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROUND WATER, RAIN WATER OR CONSTRUCTION WATER IS PREVENTED FROM ENTERING AND/OR REMOVED FROM THE CONDUITS PRIOR TO PLACEMENT OF COMMUNICATIONS CABLES. SEE ELECTRICAL SPECIFICATIONS, DETAILS AND PLANS FOR ADDITIONAL CONDUIT SEALING REQUIREMENTS.
- PROVIDE LABELING OF EACH CONDUIT PER GENERAL ELECTRICAL SPECIFICATIONS.
- REINSTALL PULL-STRINGS IN ALL SCS AND LV ISP PATHWAYS AFTER USE TO FACILITATE FUTURE ADDITION OF CABLES.
- IT IS THE SCS AND/OR LV CONTRACTOR'S RESPONSIBILITY TO REPORT ANY UNUSABLE OR INADEQUATE CONDUIT RUNS TO THE OWNER PRIOR TO PULLING ANY CABLE.
- PULL BOXES ARE NOT TO BE USED IN LIEU OF A BEND, AND THE CONDUIT SHALL EXIT A PULLBOX ON THE WALL OPPOSITE THE WALL ENTERED.
- CONDUITS SHALL:
 - CONTAIN NO CONTINUOUS SECTIONS LONGER THAN 30M (98 FT.).
 - CONTAIN NO MORE THAN (2) 90° BENDS OR (1) REVERSE BEND WITHOUT INSTALLING A PULLBOX SIZED PER STANDARDS & CODE.
 - SPLIT CONDUITS IN PLACE OF PULLBOXES ARE UNACCEPTABLE.
- CONDUIT BEND RADIUS SHALL BE:
 - A MINIMUM OF 6 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS 2" IN DIAMETER OR LESS.
 - A MINIMUM OF 10 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS MORE THAN 2" IN DIAMETER.
- POWER SEPARATION:
 - THE CONTRACTOR SHALL NOT PLACE ANY DISTRIBUTION CABLING ALONGSIDE POWER LINES, OR SHARE THE SAME CONDUIT, CHANNEL OR SLEEVE WITH ELECTRICAL APPARATUS. AT NO POINT SHALL THE COMMUNICATIONS CABLES BE TIED TO POWER CABLES OR OTHER BUILDING SERVICES. STATION CABLES AND THE CABLES INSTALLED WITHIN CEILING SPACES SHALL BE ROUTED THROUGH THESE SPACES AT RIGHT ANGLES TO ELECTRICAL POWER CIRCUITS.
 - AVOID ELECTROMAGNETIC INTERFERENCE (EMI) BY MAINTAINING ADEQUATE PHYSICAL SEPARATION BETWEEN TECHNOLOGY CABLING AND POSSIBLE SOURCES SUCH AS, BUT NOT LIMITED TO, ELECTRIC MOTORS, ELECTRIC PENCIL SHARPENERS, TRANSFORMERS, FLUORESCENT LIGHTS THAT SHARE DISTRIBUTION SPACINGS WITH TECHNOLOGY CABLING, COPIERS THAT SHARE WORK AREA SPACE WITH LINE CORDS AND TERMINALS, LARGE FAX MACHINES AND POWER CORDS THAT SUPPORTS SUCH EQUIPMENT.

4. TECHNOLOGY CABLING NOTES:

- THE USE OF LUBRICANTS SUCH AS CLEAR GLIDE, TO FACILITATE THE INSTALLATION OF CABLES IN CONDUITS IS ENCOURAGED FOR FRICTION REDUCTION AND TO MAINTAIN THE REQUIRED PULL TENSION. YELLOW 77 AND POLYWATER IS NOT PERMISSIBLE FOR USE AS A LUBRICANT FOR ISP TECHNOLOGY CABLING. THE USE OF OSP, LOW TEMPERATURE CABLE LUBRICANTS SHALL NOT BE ACCEPTABLE IN AN INDOOR PLENUM ENVIRONMENT. UNDER NO CIRCUMSTANCES SHALL CABLE PULLING LUBRICANT BE ALLOWED ON WALLS, FLOORS, BACKBOARDS, OR OTHER SURFACES OUTSIDE THE CONDUIT.
- ANY CABLE DAMAGED OR EXCEEDING RECOMMENDED INSTALLATION PARAMETERS DURING INSTALLATION SHALL BE REPLACED BY THE CONTRACTOR BEFORE FINAL ACCEPTANCE AT NO COST TO THE OWNER.
- EACH RUN OF CABLE BETWEEN THE TERMINATION BLOCK OR PATCH PANEL AND THE STATION CONNECTOR SHALL BE CONTINUOUS WITHOUT ANY JOINTS OR SPLICES.
- ALL STATION CABLE SHALL BE PLACED IN THE INTERIOR OF WALLS UNLESS OTHERWISE NOTED OR OBSTRUCTED.
- PROVIDE BUSHINGS, GROMMETS AND STRAIN-RELIEF FOR CABLES TERMINATING AT WALL-MOUNTED OUTLETS AND PATCH PANELS TO ENSURE DURABLE AND ROBUST CONNECTIONS. THE BUSHINGS AND GROMMETS ARE INTENDED TO PROTECT THE CABLES FROM ANY SHARP EDGES THAT PRESENT A RISK TO THE CABLES. ENSURE THAT ALL SHARP EDGES ARE COVERED TO PROTECT THE CABLES FROM DAMAGE.
- ALL CABLE BUNDLES EXITING FLOOR OR WALL PENETRATIONS AND RUNNING INTO FURNITURE OR CASEWORK SHALL BE WRAPPED IN SPIRAL WRAP OR SPLIT-LOOM TUBING TO PROTECT THE CABLING AND PROVIDE A NEAT INSTALLATION.
- ALL CABLE OR INNERDUCT SHALL RUN PARALLEL OR AT RIGHT ANGLES TO BUILDING WALL STRUCTURES.
- IN SUSPENDED CEILING AND RAISED FLOOR AREAS WHERE DUCT, CABLE TRAYS OR CONDUIT ARE NOT AVAILABLE, CABLE BUNDLES SHALL BE SUPPORTED VIA "J" HOOKS ATTACHED TO THE BUILDING STRUCTURE AND FRAMEWORK AT A MAXIMUM OF FIVE (5) FOOT INTERVALS. MINIMUM 1" WIDE J-HOOKS SHALL BE APPROPRIATELY SIZED TO ALLOW A MINIMUM OF 60% SPARE CAPACITY FOR FUTURE CABLE INSTALLATION. THE CONTRACTOR SHALL INCLUDE ALL COSTS IN BASE BID FOR