HISTORIC AND DESIGN REVIEW COMMISSION
April 02, 2025

HDRC CASE NO:	**2025-061**
ADDRESS:	1103 CINCINNATI AVE
LEGAL DESCRIPTION:	NCB 2003 BLK LOT ALL OF BLK WOODLAWN LAKE PARK
ZONING:	R-6, H
CITY COUNCIL DIST.:	7
DISTRICT:	Woodlawn Lake and Park Historic District
APPLICANT:	Laura Hall/Ford Powell and Carson, Inc.
OWNER:	Desiree Salmon/CITY OF SAN ANTONIO
TYPE OF WORK:	Splash pad construction and site modifications
APPLICATION RECEIVED:	March 10, 2025
60-DAY REVIEW:	May 9, 2025
CASE MANAGER:	Edward Hall

REQUEST:

The applicant is requesting a Certificate of Appropriateness for approval to construct a splash pad to the east of Woodlawn Lake adjacent to the existing swimming pool.

APPLICABLE CITATIONS:

UDC Sec. 35-641. - Design Considerations for Historic and Design Review Commission Recommendations.
In reviewing an application, the historic and design review commission shall be aware of the importance of attempting to find a way to meet the current needs of the City of San Antonio, lessee, or licensee of public property. The historic and design review commission shall also recognize the importance of recommending approval of plans that will be reasonable to implement. The best urban design standards possible can and should be employed with public property including buildings and facilities, parks and open spaces, and the public right-of-way. Design and construction on public property should employ such standards because the use of public monies for design and construction is a public trust. Public commitment to quality design should encourage better design by the private sector. Finally, using such design standards for public property improves the identity and the quality of life of the surrounding neighborhoods.

UDC Sec 35-642. – New Construction of Buildings and Facilities:
In considering whether to recommend approval or disapproval of a certificate, the historic and design review commission shall be guided by the following design considerations. These are not intended to restrict imagination, innovation or variety, but rather to assist in focusing on design principles, which can result in creative solutions that will enhance the city and its neighborhoods. Good and original design solutions that meet the individual requirements of a specific site or neighborhood are encouraged and welcomed.

(a) Site and Setting.
(1) Building sites should be planned to take into consideration existing natural climatic and topographical features. The intrusive leveling of the site should be avoided. Climatic factors such as sun, wind, and temperature should become an integral part of the design to encourage design of site-specific facilities which reinforces the individual identity of a neighborhood and promotes energy efficient facilities.
(2) Special consideration should be given to maintain existing urban design characteristics, such as setbacks, building heights, streetscapes, pedestrian movement, and traffic flow. Building placement should enhance or create focal points and views. Continuity of scale and orientation shall be emphasized.
(3) Accessibility from streets should be designed to accommodate safe pedestrian movement as well as vehicular traffic. Where possible, parking areas should be screened from view from the public right-of-way by attractive fences, berms, plantings or other means.
(4) Historically significant aspects of the site shall be identified and if possible incorporated into the site design. Historic relationships between buildings, such as plazas or open spaces, boulevards or axial relationships should be maintained.
(b) Building Design.
(1) Buildings for the public should maintain the highest quality standards of design integrity. They should elicit a pride of ownership for all citizens. Public buildings should reflect the unique and diverse character of San Antonio and should be responsive to the time and place in which they were constructed.

(2) Buildings shall be in scale with their adjoining surroundings and shall be in harmonious conformance to the identifying quality and characteristics of the neighborhood. They shall be compatible in design, style and materials. Reproductions of styles and designs from a different time period are not encouraged, consistent with the secretary of the interior's standards. Major horizontal and vertical elements in adjoining sites should be respected.
(3) Materials shall be suitable to the type of building and design in which they are used. They shall be durable and easily maintained. Materials and designs at pedestrian level shall be at human scale, that is they shall be designed to be understood and appreciated by someone on foot. Materials should be selected that respect the historic character of the surrounding area in texture, size and color.
(4) Building components such as doors, windows, overhangs, awnings, roof shapes and decorative elements shall all be designed to contribute to the proportions and scale of their surrounding context. Established mass/void relationships shall be maintained. Patterns and rhythms in the streetscape shall be continued.
(5) Colors shall be harmonious with the surrounding environment, but should not be dull. Choice of color should reflect the local and regional character. Nearby historic colors shall be respected.
(6) Mechanical equipment or other utility hardware should be screened from public view with materials compatible with the building design. Where possible, rooftop mechanical equipment should be screened, even from above. Where feasible, overhead utilities should also be underground or attractively screened. Exterior lighting shall be an integral part of the design. Interior lighting shall be controlled so that the spillover lighting onto public walkways is not annoying to pedestrians.
(7) Signs which are out of keeping with the character of the environment in question should not be used. Excessive size and inappropriate placement on buildings results in visual clutter. Signs should be designed to relate harmoniously to exterior building materials and colors. Signs should express a simple clear message with wording kept to a minimum.
(8) Auxiliary design. The site should take into account the compatibility of landscaping, parking facilities, utility and service areas, walkways and appurtenances. These should be designed with the overall environment in mind and should be in visual keeping with related buildings, structures and places.

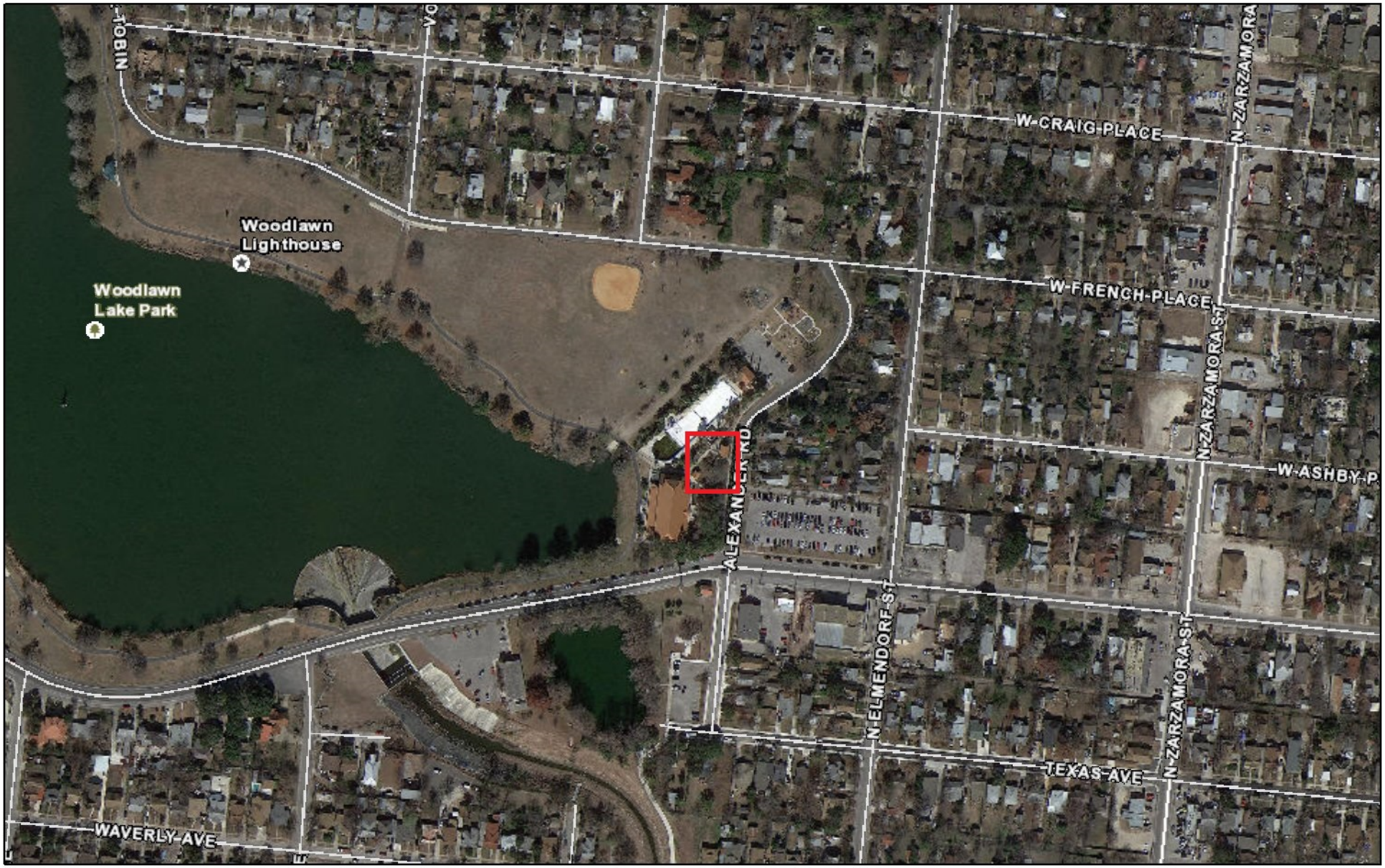
FINDINGS:

a. The property located at 1103 Cincinnati Ave is commonly known as Woodlawn Lake Park. Woodlawn Lake is bordered by W Woodlawn Ave and W French Pl to the north, Alexander Ave to the east, S Josephine Tobin Dr to the south, and Bancroft Ave to the west. The lake features a prominent walking trail, a fitness station, the Woodlawn Lake Lighthouse, a tennis center, and other similar amenities. The property is owned by the City of San Antonio. This property contributes to the Woodlawn Lake and Park Historic District.
b. SPLASH PAD CONSTRUCTION – The applicant is requesting approval to construct a splash pad to the east of Woodlawn Lake adjacent to the existing swimming pool. As a result, an existing sidewalk will be relocated, and an equipment storage enclosure will have its southwestern wall removed and reconstructed with a larger footprint. In keeping with UDC Section 35-641, the request for splash pad construction is reasonable and staff finds the request appropriate

RECOMMENDATION:

Staff recommends approval of the request, based on findings a and b, as submitted.

City of San Antonio One Stop



March 27, 2025

1:4,000

0 0.0325 0.065 0.13 mi

0 0.05 0.1 0.2 km


LOOKING NORTHEAST


LOOKING NORTHEAST


LOOKING NORTH


LOOKING EAST


LOOKING SOUTHWEST


LOOKING WEST


LOOKING NORTHWEST


LOOKING NORTH

FORD POWELL CARSON

EXISTING SITE PHOTOS

WOODLAWN LAKE PARK SPLASHPAD
MARCH 6, 2025
FPC #102401

Woodlawn Park SplashPark by Kraftsman

Option 3

Picture may not depict actual proposed equipment

PRELIMINARY DESIGN – NOT FOR CONSTRUCTION

Graphic Representation.
Refer to drawings/quotes for items included and not included.

Woodlawn Park SplashPark
San Antonio, TX

Project 30495 Option 3	Sheet K.1.1A	Designer MZB	Date 08.14.2024
Drawing Name KPS-30495-3	View 3D Site Plan		Sales Rep. Jeff Goodman

PRELIMINARY DESIGN – NOT FOR CONSTRUCTION

Graphic Representation.
Refer to drawings/quotes for items included and not included.

Woodlawn Park SplashPark
San Antonio, TX

Project 30495 Option 2	Sheet K.6.1A	Designer MZB	Date 08.14.2024
Drawing Name KPS-30495-3	View 3D View		Sales Rep. Jeff Goodman

PRELIMINARY DESIGN – NOT FOR CONSTRUCTION

Graphic Representation.
Refer to drawings/quotes for items included and not included.

Woodlawn Park SplashPark
San Antonio, TX

Project 30495 Option 2	Sheet K.6.1B	Designer MZB	Date 08.14.2024
Drawing Name KPS-30495-3	View 3D View		Sales Rep. Jeff Goodman

PRELIMINARY DESIGN – NOT FOR CONSTRUCTION

Graphic Representation.
Refer to drawings/quotes for items included and not included.

Woodlawn Park SplashPark
San Antonio, TX

Project	Sheet	Designer	Date
30495 Option 2	K.6.1C	MZB	08.14.2024
Drawing Name	**View**		**Sales Rep.**
KPS-30495-3	3D View		Jeff Goodman

PRELIMINARY DESIGN – NOT FOR CONSTRUCTION

Graphic Representation.
Refer to drawings/quotes for items included and not included.

Woodlawn Park SplashPark
San Antonio, TX

Project 30495 Option 2	Sheet K.6.1E	Designer MZB	Date 08.14.2024
Drawing Name KPS-30495-3	View 3D View		Sales Rep. Jeff Goodman

PRELIMINARY DESIGN – NOT FOR CONSTRUCTION

Graphic Representation.
Refer to drawings/quotes for items included and not included.

Woodlawn Park SplashPark
San Antonio, TX

Project 30495 Option 2	Sheet K.6.1D	Designer MZB	Date 08.14.2024
Drawing Name KPS-30495-3	View 3D View		Sales Rep. Jeff Goodman

City of San Antonio
Woodlawn Lake Park
Splashpad

Bond 2020

1103 Cincinnati Ave., San Antonio, TX 78201

07/17/2024 REV

Design Development

FORD POWELL CARSON
420 BROADWAY, SUITE 100 210.226.1246
SAN ANTONIO TX 78205 www.fpcarch.com

Landscape
Rialto Studio
2425 Broadway St, San Antonio, TX 78215
210.828.1155/www.railtostudio.com

Electrical
CNG Engineering
8302 Broadway St, San Antonio, TX 78209
210.224.8841/www.cngengineering.com

1 OVERALL SITE PLAN
SCALE: 1:1,500

N

10' 50' 100' 200' 300' 500'

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City of San Antonio
Woodlawn Lake Park
Bond 2020

1103 Cincinnati Ave., San Antonio, TX 78201

Architect: Nathan Perez

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Revisions

Mark	Date	Description

Drawn By:	Approved By:
LEH	NP
Project Number:	Project Issue Date:
102401	07/17/2024 *REV*

SITE PLAN

DESIGN DEVELOPMENT

SHEET

A001

GENERAL NOTES:

A. PROTECT EXISTING BUILDINGS AND FENCE ALONG THE POOL DURING CONSTRUCTION.

1 SPLASHPAD DEMOLITION SITE PLAN
SCALE: 1/8" = 1'-0"

N

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City of San Antonio
Woodlawn Lake Park
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Architect: Nathan Perez

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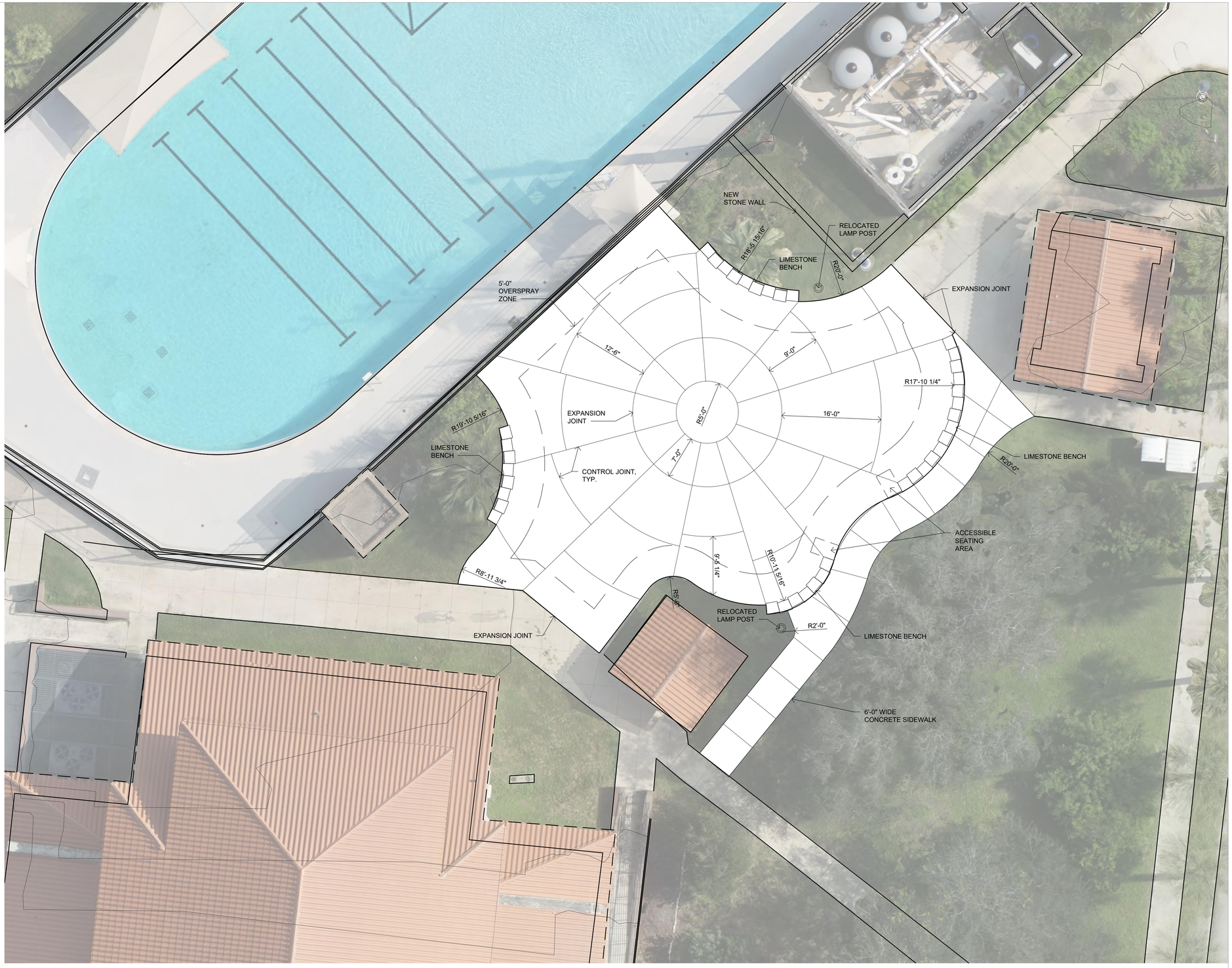
102401	07/17/2024

ENLARGED DEMOLITION SITE PLAN

DESIGN DEVELOPMENT

SHEET

D002



1 SPLASHPAD SITE PLAN
SCALE: 1/8" = 1'-0"

N

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Woodlawn Lake Park
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Architect: Nathan Perez

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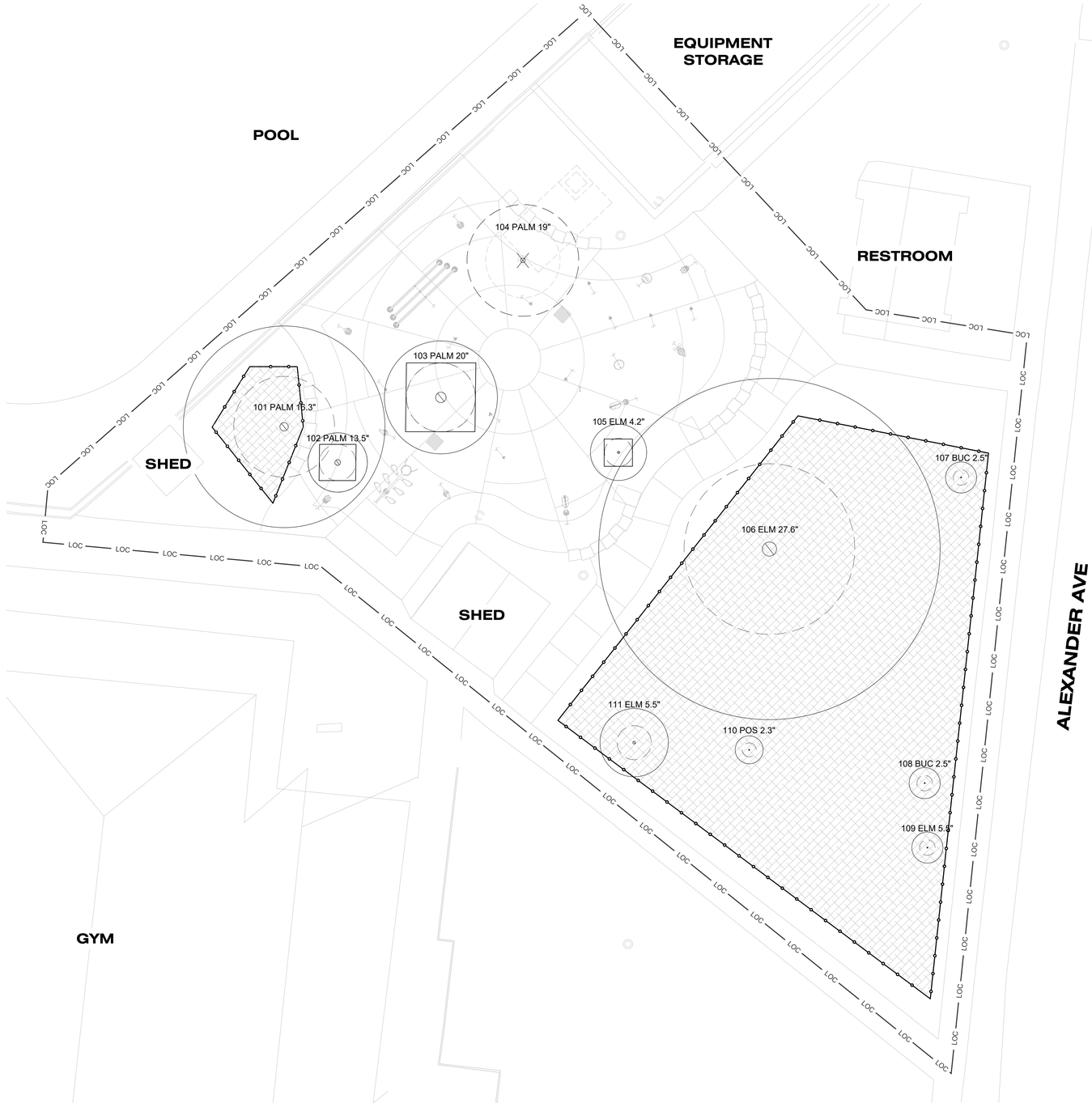
Drawn By:	Approved By:
LEH	NP
Project Number:	Project Issue Date:
102401	07/17/2024 *REV*

ENLARGED SITE PLAN

DESIGN DEVELOPMENT

SHEET

A002



NORTH

0 4 8 16FT

SCALE: 1/8"=1'-0"

TREE INVENTORY

Tag #	Species	Caliper	Understory Species* to 11.5" Removed	Understory Species* to 11.5" Preserved	Significant Tree to 23.5" Removed	Significant Tree to 23.5" Preserved	Significant Tree** 10.0" - 23.5" Removed	Significant Tree** 10.0" - 23.5" Preserved	Heritage 3:1 Removed	Heritage 3:1 Preserved	Heritage 1:1 Removed	Heritage 1:1 Preserved	Additional Inches Preserved for Mitigation ***
101	SABAL PALM	16.3"											
102	SABAL PALM	13.5"				13.5							
103	SABAL PALM	20"				20							
104	SABAL PALM (REMOVE)	19"											
105	CEDAR ELM	4.2"				4.2							
106	CEDAR ELM	27.6"								27.6			
107	MEXICAN BUCKEYE	2.5"											2.5
108	MEXICAN BUCKEYE	2.5"											2.5
109	CEDAR ELM	5.5"				5.5							
110	POSSUM HAW	2.3"											2.3
111	CEDAR ELM	5.5"^				5.5							
Sub. Tot. Inches=			0	0	0	48.7	0	0	0	27.6	0	0	7.3
Total inches by category=				0		48.7		0		27.6		0	
Preservation percentage=				100%				100%				100%	
Mitigation required (Commercial) =				0				-29.22				0	
Total Mitigation (inches)				-32.02	Palm Mitigation: 1.5" Trees to plant			4.5					

No category to fall below 20% preservation;
Preserved - Tree to remain that meets root protection zone requirements described in section 35-523 of the UDC.
Mitigation 1:1 for significant trees below minimum preservation requirements; 3:1 for heritage trees below 100% preservation
** Small species: Condalia, Redbud, Tx. Mountain Laurel, Tx. Persimmon, Hawthorn, Possumhaw - these are mitigated at 1:1 for Heritage Trees*
*** Ashe Juniper, Huisache, Mesquite, Arizona Ash, Hackberry protected at 10" dbh and mitigated at 1:1 for heritage trees*
**** Mitigation Trees: Unprotected-sized trees to be used for mitigation calculations; subtract inches from mitigation owed*
^ Multi-trunk tree, where smallest trunk is below Significant level in size
^^ Tree in decline
^^^ Tree to remain that does not meet minimum root protection zone requirements, therefore counted as removed

TREE CANOPY COVERAGE

Lot Size (SF)	**12760 SF**		
Canopy Required (SF: 15%)	**1914 SF**		
EXISTING TREES @ 100%	VALUE (SF)	QTY	SUBTOTAL
Cedar Elm	875	4	3500
Mexican Buckeye	275	2	550
Possum Haw	275	1	275
Canopy Provided (SF)			4325

TREE PRESERVATION LEGEND:

TREE TO BE REMOVED
TREE TAG NUMBER
ROOT PROTECTION ZONE
1/2 ROOT PROTECTION ZONE

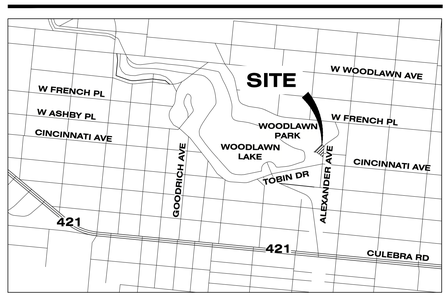
TREE TO BE PROTECTED
TREE TAG NUMBER
ROOT PROTECTION ZONE
1/2 ROOT PROTECTION ZONE

TREE TO BE RELOCATED
TREE TAG NUMBER
ROOT PROTECTION ZONE
1/2 ROOT PROTECTION ZONE

TREE PROTECTION FENCE:
MAY CONSIST OF SNOW FENCING, VINYL CONSTRUCTION FENCING, OR CHAIN LINK

6" LAYER OF MULCH TO BE PLACED AND MAINTAINED OVER THE ROOT PROTECTION ZONE WHERE THERE IS NO EXISTING UNDERSTORY PLANTING OR TURF

LOCATION MAP



N.T.S. NORTH

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RIALTO STUDIO
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Landscape Architecture
2425 Broadway
San Antonio, Texas 78215
210.828.1155

CITY OF SAN ANTONIO
WOODLAWN LAKE PARK
BOND 2020
1103 Cincinnati Ave., San Antonio, TX 78201

Architect: Principal in Charge

This document dated 07.17.2024 is incomplete. Do not use for regulatory approval, permit, or construction

Revisions

Mark	Date	Description

Drawn By: JC
Approved By:

Project Number: 22120
Project Issue Date:

TREE PRESERVATION PLAN

DESIGN DEVELOPMENT

SHEET
L101.1

TREE PRESERVATION NOTES

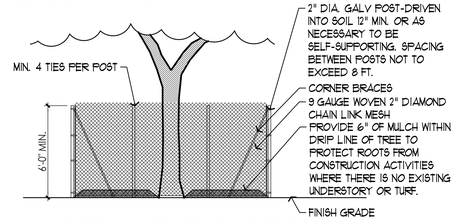
1. ALL TREES SHALL REMAIN UNLESS NOTED ON THE PLANS.
2. NO SITE PREPARATION WORK SHALL BEGIN IN AREAS WHERE TREE PRESERVATION AND TREATMENT MEASURES HAVE NOT BEEN COMPLETED.
3. ALL EXISTING TREES DENOTED TO REMAIN SHALL BE PROTECTED AT THE ROOT PROTECTION ZONE(RPZ). THE RPZ SHALL BE DETERMINED BY TREE SIZE (RECOMMENDED 12" RADIUS FROM TRUNK FOR EVERY 1" IN DIAMETER OF TRUNK AT 4.5' FROM GROUND) WITH A MINIMUM 5' DIAMETER FROM THE TRUNK.
4. A CHAIN LINK FENCE BARRIER DELINEATING THE RPZ SHALL BE ERECTED AND MAINTAINED BY THE CONTRACTOR UNTIL CONSTRUCTION IS COMPLETED.
5. RPZ SHALL BE SUSTAINED IN A NATURAL STATE AND SHALL BE FREE FROM VEHICULAR OR MECHANICAL TRAFFIC.
6. THE RPZ SHALL BE COVERED WITH MULCH AND BE MAINTAINED BY GENERAL CONTRACTOR DURING CONSTRUCTION PHASE TO REDUCE MOISTURE STRESS.
7. DURING CONSTRUCTION, NO EXCESS SOIL, ADDITIONAL FILL MATERIAL, EQUIPMENT, LIQUIDS, OR CONSTRUCTION DEBRIS SHALL BE PLACED INSIDE THE PROTECTION BARRIER, NOR SHALL ANY SOIL BE REMOVED FROM WITHIN THE BARRIER.
8. ANY DAMAGE DONE TO EXISTING TREE CROWNS OR ROOT SYSTEMS SHALL BE CUT CLEANLY IMMEDIATELY AFTER INJURY. ALL WOUNDS TO LIVE OAKS SHALL BE PAINTED WITH PRUNING PAINT WITHIN 30 MINUTES AFTER DAMAGE. ROOTS EXPOSED DURING CONSTRUCTION OPERATIONS WILL BE CUT CLEANLY.
9. THE PROPOSED FINISH GRADE AND ELEVATION OF LAND WITHIN THE RPZ OF ANY TREE TO BE PRESERVED SHALL NOT BE RAISED OR LOWERED MORE THAN THREE INCHES. WELLING AND RETAINING METHODS ARE ALLOWED OUTSIDE THE RPZ.
10. THE RPZ SHALL REMAIN PERVIOUS, I.E. GROUNDCOVER OR TURF AT COMPLETION OF LANDSCAPE INSTALLATION.
11. THE ASSOCIATED TREE PROTECTION DETAIL COMPLIES WITH THE MINIMUM TREE PROTECTION GUIDELINES FROM THE CITY OF SAN ANTONIO. WHERE POSSIBLE, PROVIDE FENCE TO TREE DRIP LINE OR GROUP TREES IN FENCE PERIMETER TO PROVIDE INCREASED PROTECTION.
12. WHERE TREES HAVE BEEN REMOVED FROM IRRIGATION, GENERAL CONTRACTOR SHALL SUPPLY SUPPLEMENTAL WATER ONCE A WEEK DURING THE DURATION OF CONSTRUCTION. COORDINATE W/ L.A. FOR AMOUNT OF WATER TO BE APPLIED.
13. NO WORK SHALL BEGIN IN AREAS WHERE TREE PRESERVATION AND TREATMENT MEASURES HAVE NOT BEEN COMPLETED AND APPROVED.
14. TREES WHICH ARE DAMAGED OR LOST DUE TO THE CONTRACTOR'S NEGLIGENCE DURING CONSTRUCTION SHALL BE MITIGATED PER UDC 35-523 (f) MITIGATION.
15. TREES MUST BE MAINTAINED IN GOOD HEALTH THROUGHOUT THE CONSTRUCTION PROCESS. MAINTENANCE MAY INCLUDE BUT IS NOT LIMITED TO: WATERING THE ROOT PROTECTION ZONE, WASHING FOLIAGE, FERTILIZATION, PRUNING, ADDITIONAL MULCH APPLICATIONS AND OTHER MAINTENANCE ON THE PROJECT.
16. ROOTS SHALL BE CUT WITH A ROCK SAW OR BY HAND, NOT BY AN EXCAVATOR OR OTHER ROAD CONSTRUCTION EQUIPMENT.

TREE RELOCATION NOTES

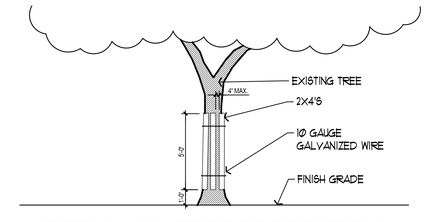
1. PRIOR TO DIGGING TREES, EXCAVATE NEW PLANTING PITS WITH VERTICAL SIDES AND SLIGHTLY RAISED CENTERS. LOOSEN SUBSOIL IN BOTTOM. REFER TO TREE PLANTING NOTES IN SPECIFICATIONS.
2. USE SOIL EXCAVATED FROM NEW TREE LOCATIONS TO REFILL HOLES CREATED BY TREES BEING LOCATED. FILL HOLE WITH SOIL AND COMPACT TO MATCH SURROUNDING GRADE. COORDINATE BACKFILL MATERIAL WITH GEOTECH ENGINEER PRIOR TO PLACEMENT.
3. PRIOR TO DIGGING, TRIM TREES SELECTIVELY, ON ADVICE OF ARBORIST. MOISTEN BALL AREA THOROUGHLY AT LEAST TWO DAYS BEFORE DIGGING, WITH APPROXIMATELY 20 GALLONS OF ROOT STIMULATOR MIXTURE AT SPECIFIED RATIO IN POTABLE WATER. SPRAY TREE WITH ANTI-TRANSPIRANT.
4. CUT BALL TO A DEPTH SUFFICIENT TO CONTAIN MAJOR ROOT STRUCTURE. THE DIAMETER OF THE ROOT BALL SHALL BE 1 FOOT DIAMETER PER CALIPER INCH. CUT EXPOSED ROOTS WITH CLIPPERS. BURLAP AND WIRE BALLS TIGHTLY. SECURE BALLS WITH A STRAPPING SYSTEM THAT SUPPORTS THE BALL AND UTILIZES A MINIMUM OF FOUR STRAPS. CONNECT CRANE CABLE LOCK TO STRAP LIFT ON BALL (NOT TREE TRUNK). PAD VULNERABLE UNPROTECTED TRUNK AREAS. PROTECT BALL FROM CRACKING OR BREAKING APART.
5. LIFT TREE, MAINTAINING IT IN A VERTICAL POSITION, AND SET IT ONTO FLAT BED TRAILER. KEEP ROOT BALL MOIST. DO NOT LIFT TREE BY STRAPS WRAPPED AROUND THE TREE TRUNK.
6. IF PLANTING IS DELAYED MORE THAN SIX HOURS FROM TIME OF DIGGING, SET BALLED AND BURLAP STOCK ON THE GROUND, HEEL THEM IN, AND BACKFILL AND COVER THE ROOT BALLS WITH MULCH; WATER AS NECESSARY TO PREVENT ROOT BALL FROM DRYING OUT.
7. TO PLANT TREES, SET THE ROOT BALL ON LAYER OF COMPACTED PLANTING SOIL MIX, PLUMB AND IN CENTER OF PIT WITH TOP OF BALL AT ELEVATION SPECIFIED IN THE PLANS. LOOSEN BURLAP AT BASE OF TRUNK. WHEN SET, PLACE PLANTING SOIL MIX AROUND BASE AND SIDES OF BALL, WORKING EACH LAYER TO SETTLE BACKFILL AND ELIMINATE VOIDS AND AIR POCKETS. WHEN EXCAVATION IS APPROXIMATELY 2/3 FILLED, WATER THOROUGHLY UNTIL NO MORE WATER IS ABSORBED. COMPLETE PLACEMENT OF BACKFILL.
8. DISH TOP OF BACKFILL WITH 4-INCH TALL RING, 6 FEET IN DIAMETER. MULCH TO DEPTH OF 3 INCHES INSIDE RING. INJECT ROOT STIMULATOR INTO THE BALL AND APPLY TO TRANSITION ZONE AT BALL'S EDGE. REMOVE BROKEN LIMBS AND PAINT SCARS. GUY AND STAKE ONLY IF REQUIRED TO MAINTAIN TREE IN PROPER ALIGNMENT.
9. DO NOT LEAVE OPEN EXCAVATED TREE HOLES OVERNIGHT WITHOUT COVER OR APPROPRIATE BARRICADES.

TREE PROTECTION DETAILS

NOTE:
THE DRAWING BELOW DETAILS COMPLIANCE W/ THE MINIMUM TREE PROTECTION GUIDELINES FROM THE CITY OF SAN ANTONIO.

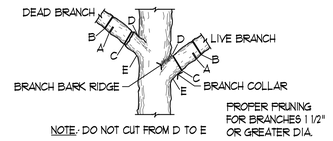


1 DETAIL: TREE PROTECTION
SCALE: 1/4"= 1'-0"



2 DETAIL: 2X4 TREE PROTECTION
SCALE: 1/4"= 1'-0"

NOTES:
1. PROTECTIVE LUMBER SHALL NOT BE DIRECTLY NAILED TO THE TREE
2. 2X4'S SHALL BE HELD SECURELY IN PLACE WITH 10 GAUGE WIRE WRAPPED OVER THE LUMBER AND AROUND THE TREE AT MIN. OF 2 LOCATIONS.
3. THE GAP BETWEEN THE BOARDS IS TO BE 4 INCHES OR LESS.
4. PROVIDE 6" OF MULCH WITHIN DRIP LINE OF TREE TO PROTECT ROOTS FROM CONSTRUCTION ACTIVITIES WHEN THERE IS NO EXISTING UNDERSTORY OR TURF.



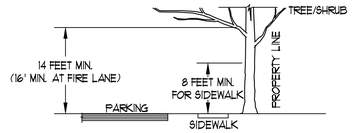
PROPER PRUNING FOR BRANCHES 1 1/2" OR GREATER DIA.

NOTE: DO NOT CUT FROM D TO E

A. FIRST CUT- TO PREVENT THE BARK FROM BEING PEELED WHEN THE BRANCH FALLS.
B. SECOND CUT- TO REDUCE THE WEIGHT OF BRANCH.
C. FINAL CUT- ALLOW FOR HEALING COLLAR BUT NO STUBS.
D. BRANCH RIDGES- INDENT PROPERLY BRANCH RIDGES WHICH ARE SITE FOR DECAY.

FOR OAKS ONLY: PAINT ALL WOUNDS OR CUTS WITH PRUNING SPRAY WITHIN 20 MINUTES TO PREVENT SPREAD OF OAK WILT

3 DETAIL: BRANCH PRUNING
SCALE: N.T.S.



A MINIMUM BRANCH CLEARANCE OF 14 FEET ABOVE PARKING LOT/DRIVE LANES (16 FEET ABOVE FIRE LANES) MUST BE MAINTAINED.

4 DETAIL: TREE BRANCH CLEARANCE
SCALE: N.T.S.

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CITY OF SAN ANTONIO
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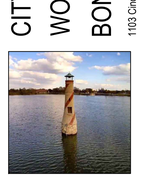
BOND 2020
1103 Cincinnati Ave., San Antonio, TX 78201



Architect: Principal in Charge

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Revisions

Mark	Date	Description

Drawn By: JC Approved By:

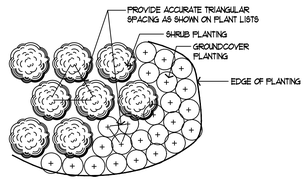
Project Number: 22120 Project Issue Date:

TREE PRESERVATION NOTES & DETAILS

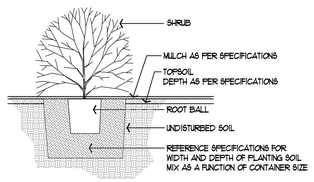
DESIGN DEVELOPMENT

SHEET
L101.2

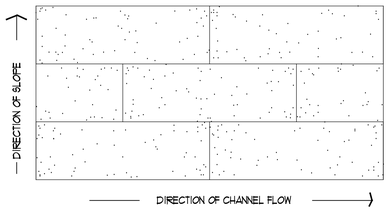
LANDSCAPE DETAILS



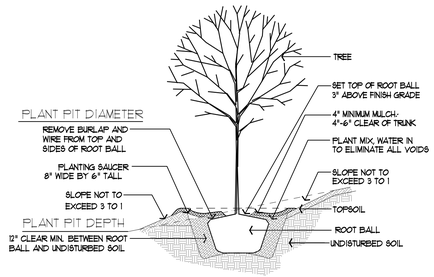
6 PLAN: SHRUB SPACING
N.T.S.



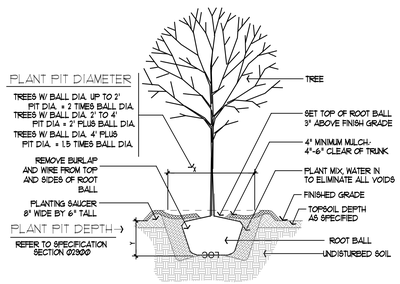
1 SHRUB/GROUNDCOVER PLANTING
N.T.S.



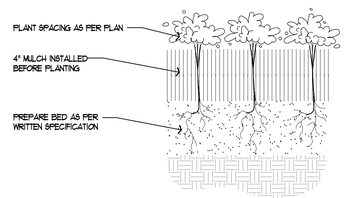
7 DETAIL: SOD INSTALLATION
N.T.S.



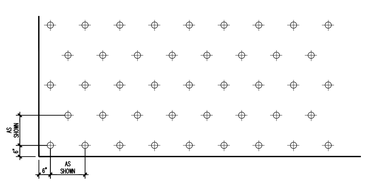
2 SECTION: TREE PLANTING ON SLOPE
N.T.S.



3 SECTION: TREE PLANTING
N.T.S.



4 DETAIL: GROUNDCOVER PLANTING
N.T.S.



5 DETAIL: GROUNDCOVER PLANTING
N.T.S.

PLANTING NOTES

1. MAINTAIN A 1' CLEAR AREA AT THE BASE OF EACH TREE TO ALLOW OXYGEN EXCHANGE. INSTALL NATIVE BARK MULCH WHERE NOTED. IT SHALL BE DOUBLE SHREDDED HARDWOOD AND INSTALLED TO A DEPTH OF 4" AS COMPLIANT WITH COSA STANDARDS. MULCH INSTALLED ON SLOPES GREATER THAN 5% SHALL BE THOROUGHLY WETTED UPON INSTALLATION.

2. PLANTING AREA SOILS IN PREVIOUSLY VEGETATED AREAS ARE TO RECEIVE 2 INCHES OF FINISHED COMPOST, RAKED INTO THE SOIL SURFACE.

3. PLANTING AREA SOILS IN PREVIOUSLY HARDSCAPED AREAS ARE TO RECEIVE 8 INCHES OF SOIL MIX WITH THE FOLLOWING PROPORTIONS AND COMPONENTS: 1/3 CUBIC YARD TOPSOIL, 1/3 CUBIC YARD COMPOSTED MANURE, 1/3 CUBIC YARD SAND, 1 1/2 POUNDS SULFUR, 1/2 POUND GENERAL ALL-PURPOSE FERTILIZER. ("FOUR-WAY MIX" AVAILABLE FROM NEW EARTH IS AN ACCEPTABLE SUBSTITUTION FOR THE MIX LISTED ABOVE. FERTILIZER IS STILL REQUIRED.) SUBMIT SAMPLE FOR REVIEW.

4. ALL SHRUB AND GROUNDCOVER PLANTING AREAS SHALL RECEIVE A MINIMUM OF 4 INCHES OF NATIVE BARK MULCH (DOUBLE SHREDDED HARDWOOD); PROVIDE SAMPLE FOR APPROVAL BY LANDSCAPE ARCHITECT.

5. ALL QUANTITIES SHOWN ON PLANS TO BE VERIFIED BY LANDSCAPE CONTRACTOR. LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ALL LABELED PLANT MATERIAL ON PLANS (NOT TABULATION).

6. ALL PLANTS MUST COMPLY WITH THE AMERICAN STANDARDS FOR NURSERY STOCK, BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC. AND MEET OR EXCEED HEIGHT AND SPREAD REQUIREMENTS LISTED ON THE PLANT SCHEDULE.

7. LANDSCAPE CONTRACTOR SHALL MAINTAIN ALL TREES, SHRUBS, AND GROUNDCOVER IN A HEALTHY STATE UNDER THE CONTRACT UNTIL FINAL ACCEPTANCE BY THE OWNER.

8. LANDSCAPE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OF ANY QUESTIONS REGARDING APPLICATION OF PROPOSED PLANT MATERIAL PRIOR TO INSTALLATION.

9. AUTOMATIC IRRIGATION TO BE PROVIDED:
   DRIP IRRIGATION FOR ALL AREAS SHOWN AS PLANTING (SHRUB AND GROUNDCOVER) AREAS
   ROTOR IRRIGATION FOR ALL AREAS SHOWN AS SOD
   BUBBLER IRRIGATION FOR ALL NEW TREES SHOWN

10. ALL GROUND AREAS DAMAGED BY CONSTRUCTION ACTIVITY ARE TO BE SODDED WITH TURF, UNLESS ANOTHER GROUND TREATMENT IS SHOWN ON PLANTING PLANS.

11. HOSE BIBBS TO BE PROVIDED NEAR FOUR (4) CORNERS OF MAIN BUILDING.

12. DEVELOP CODE-COMPLIANT IRRIGATION PLANS TO EXTEND THE EXISTING IRRIGATION SYSTEM. THIS MAY INCLUDE REPAIR OR UPGRADE OF THE EXISTING IRRIGATION SYSTEM TO CONFORM TO CODE STANDARDS.

COSA PLANTING NOTE

ALL TREE PLANTING SUBJECT TO SECTION 35-523(m) SHALL BE REQUIRED TO BE PLANTED IN SOIL THAT IS SUITABLE FOR ESTABLISHING AND SUSTAINING THE PLANTINGS. IN ADDITION TO CONTAINING SUITABLE SOIL PARTICLE SIZE AND DEPTH OF SOIL ZONE, THE SOIL MUST CONTAIN SUFFICIENT ORGANIC MATTER AND NUTRIENTS. TESTING AND CONFIRMATION BY A LANDSCAPE ARCHITECT, OR A TEXAS LICENSED SOIL TESTING FIRM SHALL BE COMPLETED TO ENSURE THE SOILS ARE SUITABLE. IN LIEU OF CONFIRMATION BY A LANDSCAPE ARCHITECT, OR A TEXAS LICENSED SOIL TESTING FIRM, SOIL MAY BE AMENDED WITH COMPOST BY ADDING THREE (3) INCHES OF COMPOST BLENDED INTO EVERY ONE (1) FOOT OF SOIL. FOR COMPLETE SOIL REPLACEMENT, SUCH AS TREE PLANTINGS, AN AMOUNT OF TWENTY-FIVE (25) PERCENT COMPOST MAY BE ADDED TO SEVENTY-FIVE (75) PERCENT NATIVE SOIL. REF. SEC 35-523. TREE PRESERVATION. (M) GENERAL PLANTING STANDARDS. (7)

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CITY OF SAN ANTONIO
WOODLAWN LAKE PARK
BOND 2020
1103 Cincinnati Ave., San Antonio, TX 78201

Architect: Principal in Charge

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Revisions

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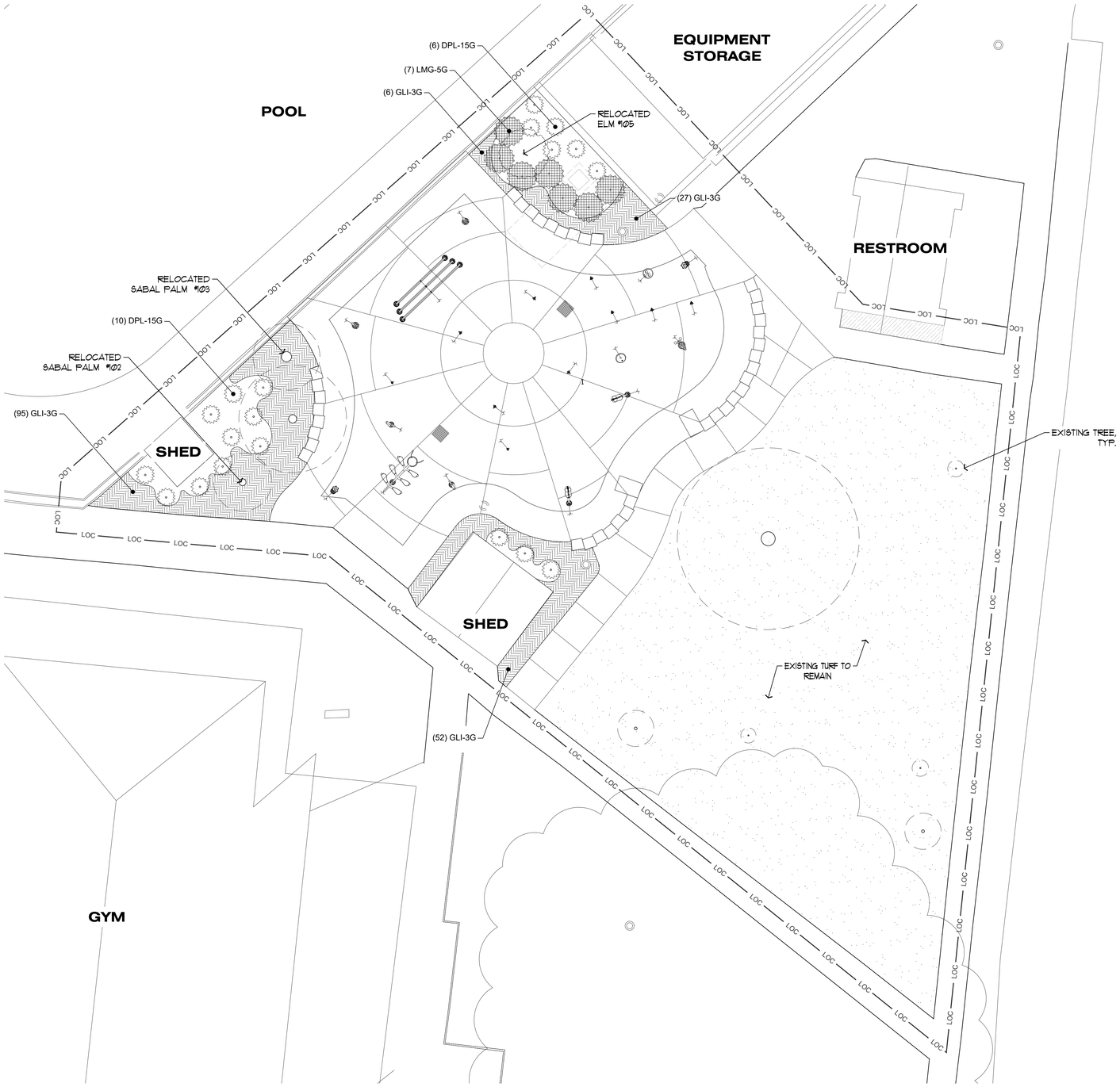
PLANTING SCHEDULE, DETAILS & NOTES

DESIGN DEVELOPMENT

SHEET
L4.01



PLANTING SCHEDULE

PLANT SCHEDULE								
CODE	**QTY**	**COMMON NAME**	**BOTANICAL NAME**	**SIZE**	**HEIGHT**	**SPREAD**	**SPACING**	**REMARKS**
SHRUBS								
DPL-15G	19	Dwarf Palmetto	Sabal minor	15 gal.	24"-28"	16"-20"	48"	Full and symmetrical
LMG-5G	7	Lindheimer's Muhly Grass	Muhlenbergia lindheimeri	5 gal.	28"-32"	16"-20"	36"	Full and symmetrical, well rooted
SHRUB AREAS								
GLI-3G	685 sf	Giant Liriope	Liriope gigantea	3 gal.	16"-20"	8"-10"	24"	Full and symmetrical, well rooted

LEGEND

- PROPERTY LINE
- LOC — LIMIT OF CONTRACT
- MULCH
- EXISTING TURF TO REMAIN
- GIANT LIRIOPE

NORTH

0 4 8 16FT
SCALE: 1/8"=1'-0"

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PLANTING PLAN

DESIGN DEVELOPMENT

SHEET

L4.02

ELECTRICAL SYMBOLS & ABBREVIATIONS

[SOME SYMBOLS MAY NOT BE USED ON THIS PROJECT]

GENERAL

SYMBOL	DESCRIPTION
	MOTOR, HP AS INDICATED
	DISCONNECT SWITCH
	MOTOR CONTROLLER
	COMBINATION MOTOR CONTROLLER/DISCONNECT UNIT
VFD	VARIABLE FREQUENCY DRIVE
C	CONTACTOR
J	JUNCTION BOX, CEILING MOUNTED
J	JUNCTION BOX, WALL MOUNTED
	PUSHBUTTON
	EQUIPMENT CONNECTION, HARD WIRED
TB	PLYWOOD TELEPHONE BACKBOARD

LOW VOLTAGE TRANSFORMERS (26 22 00)

	LOW VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMER, FLOOR MOUNTED (SEE E7 SERIES TRANSFORMER SCHEDULE)

PANELBOARDS (26 24 16)

	480Y/277V PANELBOARD, SURFACE MOUNTED (SEE E7 SERIES FOR PANEL SCHEDULES)
	208Y/120V PANELBOARD, SURFACE MOUNTED (SEE E7 SERIES FOR PANEL SCHEDULES)

INTERIOR & EXTERIOR LIGHTING (26 51 00 & 26 56 00)

	LED DOWNLIGHT, ON NORMAL POWER / EMERGENCY
a/01 a/01 a/01 a/01	2' x 2' OR 2' x 4' LED DIRECT/INDIRECT FIXTURE, ON NORMAL POWER / EMERGENCY (WITH SWITCHLEG "a" AND DAYLIGHT ZONE "01" INDICATED)
	LED PENDANT OR RECESSED LINEAR STRIP LIGHTING FIXTURES ON NORMAL POWER / EMERGENCY
	OUTDOOR IN-GRADE MONUMENT SIGN UPLIGHT
	FLAGPOLE UPLIGHT
	BOLLARD
	BOLLARD WITH WP, RECEPTACLE
	CIRCULAR POST TOP POLE LIGHT
	OUTDOOR SINGLE / MULTIPLE HEAD POLE-MOUNTED LED
	EXIT SIGN, SINGLE/DOUBLE FACE, CEILING MOUNTED WITH ARROWS AS INDICATED IN DRAWINGS
	EXIT SIGN, WALL MOUNTED, SINGLE/DOUBLE FACE WITH ARROWS AS INDICATED IN DRAWINGS
	BUG-EYE EMERGENCY FIXTURE
	BUG-EYE EXIT SIGN COMBO FIXTURE
	FLOODLIGHT FIXTURE

RACEWAYS (26 05 33)

OHE	OVERHEAD UTILITY LINE
UGE	UNDERGROUND UTILITY LINE
OHE	EXISTING OVERHEAD UTILITY LINE
UGE	EXISTING UNDERGROUND UTILITY LINE
	CONDUIT CONCEALED IN WALL OR CEILING WITH ONE PHASE, NEUTRAL AND GROUND CONDUCTOR U.N.O.
	UNDERGROUND CIRCUIT POWER LINES
	CABLE TRAY
PANEL-2,4,6 #2 CU	BRANCH CIRCUIT HOMERUN, WITH PANEL AND BREAKER POSITION INDICATED, SMALL TICK(S) = PHASE CONDUCTORS, LARGE TICK = NEUTRAL CONDUCTOR AND LARGE TICK WITH CIRCLE = GROUND CONDUCTOR.

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
A	AMPERE(S)
ABV	ABOVE
AC	ABOVE COUNTER
A/C	AIR CONDITIONING
AIC	AMPERE INTERRUPTING CAPACITY
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
ATS	AUTOMATIC TRANSFER SWITCH
BC	BELOW COUNTER
BFF	BELOW FINISHED FLOOR
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
COND	CONDUCTOR
CPU	CENTRAL PROCESSING UNIT
CU	COPPER
DIA	DIAMETER
DIST	DISTRIBUTION
DN	DOWN
DWGS	DRAWINGS
EC	ELECTRICAL CONTRACTOR
EDF	ELECTRIC DRINKING FOUNTAIN
EF	EXHAUST FAN
EGC	EQUIPMENT GROUNDING CONDUCTOR
EMT	ELEC. METALLIC TUBING
EOR	ENGINEER OF RECORD
EQPT	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EXH	EXHAUST
EXIST	EXISTING
EWH	ELECTRIC WATER HEATER
FAS	FIRE ALARM SYSTEM
FC	FOOT CANDLES
FCU	FAN COIL UNIT
FMC	FLEXIBLE METAL CONDUIT
FT	FEET, FOOT
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
HP	HORSE POWER
HOA	HAND OFF AUTOMATIC
HVAC	HEATING/VENTILATING/AIR CONDITIONING
HZ	HERTZ

ABBREVIATION	DESCRIPTION
IC	INTERCOM
ID	INSIDE DIAMETER
IMC	INTERMEDIATE STEEL CONDUIT
IN	INCHES
IG	ISOLATED GROUND
JB	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAC	KILOVOLT AMPERE CAPACITIVE
KVAR	KILOVOLT AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
LED	LIGHT EMITTING DIODE
LB	POUND
LGT	LIGHTING
M	MANHOLE
MCB	MAIN CIRCUIT BREAKER
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL & PLUMBING
MH	MOUNTING HEIGHT
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MTG	MOUNTING
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NF	NON FUSED
N.O.	NORMALLY OPEN
N.T.S.	NOT-TO-SCALE
N. NEMA	NEMA=NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
OC	ON CENTER
OCP	OVER CURRENT PROTECTIVE DEVICE
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OH	OVERHEAD
P	POLE
PB	PUSH BUTTON
PNL	PANELBOARD
PSI	POUNDS PER SQUARE INCH
PVC	POLY VINYL CHLORIDE CONDUIT
PWR	POWER
RGS	RIGID GALVANIZED STEEL CONDUIT
RMC	RIGID METAL CONDUIT
SC	SPLIT CIRCUIT
SN	SOLID NEUTRAL
SF	SQUARE FEET,FOOT
SPD	SURGE PROTECTIVE DEVICE
SQ	SQUARE
SW	SWITCH
SWBD	SWITCHBOARD
TELE	TELEPHONE
TSTAT	THERMOSTAT
TV	TELEVISION
TYP.	TYPICAL
UH	UNIT HEATER
UEP	UNDERGROUND ELECTRIC PRIMARY
UES	UNDERGROUND ELECTRIC SECONDARY
UEB	UNDERGROUND ELECTRIC BRANCH CIRCUIT
U.N.O.	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTED POWER SYSTEM
V	VOLT(S)
W	WIRE
WP	WEATHERPROOF
XFMR	TRANSFORMER
XPD	TRANSPONDER
Z	IMPEDANCE
1P	ONE POLE
2P	TWO POLE
3P	THREE POLE
ϕ	PHASE

REFERENCE SYMBOLS

	CIRCUIT END EXTENSION
2	KEYED NOTE TAG, HEXAGON
2	DEMOLITION KEYED NOTE TAG, ROUND
1	ADDENDUM, ASI, ASR, PR TAG
XXX-XX	EQUIPMENT TAG
E1.0 / 1	ENLARGED PLAN, DETAIL TAG
E5.0 / 2	ELEVATION TAG
E5.0 / 3	SECTION TAG

POWER GENERAL NOTES

A. REFERENCE EQUIPMENT CONNECTION SCHEDULE FOR REQUIREMENTS AND ADDITIONAL INFORMATION OF TAGGED EQUIPMENT SHOWN ON PLAN.

B. COORDINATE ALL RECEPTACLE LOCATIONS AND HEIGHTS WITH ARCHITECTURAL INTERIOR ELEVATIONS.

C. RECEPTACLES LOCATED WITHIN 6' OF ANY PLUMBING FIXTURE, AT BREAK ROOM COUNTERTOPS, WITHIN 6' OF EXTERIOR DOORS, AT THE EXTERIOR, OR OTHERWISE EXPOSED TO WATER SHALL BE TYPE GFCI. PROVIDE "WHILE IN-USE", NEMA 3R, NON METALLIC COVERS FOR EXTERIOR RECEPTACLES EQUAL TO HUBBELL TAYMAC #ML450.

D. ALL RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE UNLESS NOTED OTHERWISE.

E. PROVIDE 120V CIRCUIT TO ALL FIRE/SMOKE DAMPERS. CONNECT NO MORE THAN FOUR(4) DAMPERS TO NEAREST 120V PANEL. DAMPERS ON DIFFERENT FLOORS SHALL NOT BE CONNECTED TOGETHER. DAMPER CONTROL SHALL BE COORDINATED WITH MECHANICAL CONTRACTOR. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS AND QUANTITIES OF ALL FIRE/SMOKE DAMPERS.

F. PROVIDE 120V POWER FOR DOOR OPERATORS, MAG LOCKS, ELECTRIC STRIKES AND EMERGENCY PANIC DOORS WHERE REQUIRED. COORDINATE REQUIREMENTS, EXACT LOCATIONS, QUANTITIES AND ROUGH-IN REQUIREMENTS WITH ARCHITECTURAL AND SECURITY DRAWINGS.

G. PROVIDE 120V POWER TO EACH HVAC DDC CONTROL PANEL. COORDINATE EXACT LOCATIONS AND QUANTITIES WITH MECHANICAL DRAWINGS.

H. COORDINATE DISCONNECT SWITCHES, VFDS AND MOTOR STARTER LOCATIONS WITH EQUIPMENT INSTALLERS TO MAINTAIN PROPER MAINTENANCE AND CODE CLEARANCES.

I. POWER CONNECTION FOR THE MOTORIZED PROJECTOR SCREEN AND THE CEILING MOUNTED PROJECTOR RECEPTACLE SHALL USE THE SAME CIRCUIT.

J. LOCATIONS OF ELECTRICAL EQUIPMENT AND DEVICES ARE DIAGRAMMATIC. EXACT LOCATIONS SHALL BE COORDINATED WITH OTHER DISCIPLINES AND DETERMINED IN THE FIELD. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY CONFLICTS PRIOR TO ROUGH-IN.

K. RECEPTACLES ARE INTENDED AND SHALL BE INSTALLED ADJACENT TO EACH WALL MOUNTED DATA OUTLET, WITH THE RESPECTIVE BOXES SPACES 10-12" ON CENTER TO BE CONSIDERED AS ADJACENT. CONTRACTOR SHALL REVIEW IT AND ELECTRICAL DRAWINGS TO CONFIRM THAT THE DIAGRAMMATIC SYMBOLS INDICATE AN ELECTRICAL OUTLET ADJACENT TO EACH DATA OUTLET AS INTENDED. IF UPON SUCH REVIEW, THE CONTRACTOR NOTES ANY DISCREPANCIES BETWEEN THE IT AND ELECTRICAL DRAWINGS, THEN THEY SHALL PREPARE A SINGLE RFI LISTING FOR EACH INSTANCE, THE ASSOCIATED ROOM NUMBER FOR RESOLUTION BY THE DESIGN TEAM. FAILURE OF THE CONTRACTOR TO REQUEST CLARIFICATION OF SUCH DISCREPANCIES WILL RESULT IN THE CONTRACTOR BEING REQUIRED TO MOVE RECEPTACLE OR DATA OUTLET LOCATIONS TO MEET THE STATED CRITERIA AT THEIR EXPENSE, REGARDLESS OF THE PHASE OF CONSTRUCTION.

L. CONTRACTOR SHALL SUBMIT FULLY COORDINATED SHOP DRAWINGS SHOWING ALL ELECTRICAL EQUIPMENT AND DEVICES FOR REVIEW BY THE DESIGN TEAM PRIOR TO ROUGH-IN. CONTRACTOR SHALL INCLUDE ALL PROPOSED EQUIPMENT LOCATIONS IN DRAWINGS. THIS INCLUDES ALL MAJOR EQUIPMENT ROOMS.

M. MC CABLE MAY BE USED IN BRANCH CIRCUITS FROM LAST JUNCTION BOX TO LOAD SERVED, EXCEPT IN LABS AND KITCHENS, WHERE ALL CIRCUITING SHALL BE IN CONDUITS. MC CABLE IS NOT ALLOWABLE FOR HORIZONTAL FEEDERS OF BRANCH CIRCUITING AHEAD OF THE LAST JUNCTION BOX. MC CABLE SHALL BE UL-LISTED FOR 600-VOLTS.

N. PROVIDE 120V POWER TO RESTROOMS WITH PLUMBING SENSORS FOR AUTOMATIC LAVATORY, WATER CLOSET, URINALS AND SINK CONTROLS AS NEEDED. COORDINATE EXACT LOCATIONS, QUANTITIES AND ROUGH-IN REQUIREMENTS WITH ARCHITECTURAL AND PLUMBING DRAWINGS.

O. PROVIDE 120V POWER TO MOTORIZED DAMPERS, AND MOTORIZED VALVES, INCLUDING OTHER HVAC ACCESSORIES NEEDING POWER SUPPLY. CONNECT TO A 120V RECEPTACLE CIRCUIT NEAREST TO THE HVAC DAMPERS, VALVE OR ACCESSORY. THE CONTRACTOR SHALL NOT EXCEED THE BRANCH CIRCUIT RATING OF 1200 VA PER CIRCUIT WHEN CONNECTING TO THE NEAREST 20A BRANCH CIRCUIT. THE CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL DRAWINGS AND FIELD VERIFY THE LOCATIONS WITH THE INSTALLER BEFORE BEGINNING ANY INSTALLATION.

P. PROVIDE POWER TO EXTERNAL CONDENSATE PUMPS FOR MINI-SPLIT AND F/C UNITS. COORDINATE WITH MECHANICAL INSTALLER.

Q. PROVIDE POWER FOR ROLLER SHADES AS REQUIRED BY MANUFACTURER. COORDINATE EXACT LOCATIONS, QUANTITIES AND ROUGH-IN REQUIREMENTS WITH ARCHITECTURAL DRAWINGS.

R. PROVIDE 120V POWER SUPPLY TO LINE VOLTAGE THERMOSTATS AS REQUIRED. COORDINATE EXACT LOCATIONS, QUANTITIES AND ROUGH-IN REQUIREMENTS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.

S. PROVIDE HEAT TRACE CIRCUIT WITH GFP PROTECTION AND SUPERVISION FOR FIRE PROTECTION SYSTEM PER NFPA 13.

T. GENERATOR AUXILIARY BRANCH CIRCUITS - IF THE GENERATOR IS NOT PROVIDED WITH A GENERATOR PANEL PRE-WIRED FOR THE CIRCUITS NEEDING POWER SUPPLY, IF EXTERNAL CIRCUITS, VERIFY AND CHECK WITH SPEC WRITER. ADD COORDINATION NOTE FOR CONTRACTOR TO VERIFY CIRCUITS REQUIRED PER GEN SET MANUFACTURER.

LIGHTING GENERAL NOTES

A. PROVIDE UNSWITCHED CONDUCTORS IN CIRCUITS SERVING BATTERY POWERED EGRESS LIGHTS AND EXIT SIGNS.

B. ELECTRICAL DRAWINGS INDICATE GENERAL LOCATIONS OF LIGHTING FIXTURES REFER TO ARCHITECTURAL DRAWINGS FOR COORDINATION, LOCATIONS, AND HEIGHT. IF THERE IS A DIFFERENCE IN QUANTITY OF FIXTURES SHOWN ON THE ARCHITECTURAL AND ELECTRICAL DRAWINGS, HE SHALL USE THE GREATER QUANTITY FOR BIDDING AND CONTACT THE DESIGN TEAM FOR FINAL RESOLUTION.

C. COORDINATE LIGHTING FIXTURE LOCATIONS IN MECHANICAL AND TELECOMMUNICATION EQUIPMENT ROOMS BASED ON ACTUAL EQUIPMENT LAYOUT. REVIEW LAYOUT WITH MECHANICAL AND LOW VOLTAGE CABLING CONTRACTORS PRIOR TO ROUGH-IN.

D. PROVIDE LIGHTING CONTROL SYSTEM WITH ALL NECESSARY ACCESSORIES FOR A COMPLETE INSTALLATION.

E. POWER SUPPLY FOR CEILING MOTION SENSORS SHOULD BE INSTALLED ADJACENT TO ENTRANCE DOOR.

F. REFERENCE LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL FIXTURE INFORMATION.

G. PROVIDE A RELAY FOR STANDBY POWER CONNECTION OF LOCALLY CONTROLLED EGRESS LIGHTS WITHIN DOORS.

GENERAL NOTES

A. CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS AND REVIEW ALL RELATED DRAWINGS AND SPECIFICATIONS PRIOR TO BID.

B. THE DRAWINGS ARE DIAGRAMMATIC. CONTRACTOR SHALL VERIFY FIELD CONDITIONS AND DETERMINE CONDUIT ROUTING AND EXACT LOCATIONS OF EQUIPMENT AND DEVICES. NOTIFY THE ARCHITECT/ENGINEER IF THE APPROXIMATE CONDUIT ROUTING SHOWN ON PLANS IS NOT FEASIBLE. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY CONFLICTS PRIOR TO ROUGH-IN.

C. LOCATIONS OF DEVICES ARE DIAGRAMMATIC. EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY CONFLICTS PRIOR TO ROUGH-IN.

D. PROVIDE LISTED FIRE-STOP AND CAULKING TO MAINTAIN INTEGRITY OF RATED WALLS AT ALL RACEWAY AND CABLE TRAY PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF RATED WALLS.

E. CONTRACTOR SHALL GROUND CABLE TRAY TO BUILDING GROUNDING SYSTEM. EACH SECTION OF THE CABLE TRAY SHALL BE BONDED TOGETHER WITH A GROUNDING JUMPER. CONDUIT TERMINATING AT THE CABLE TRAY SHALL BE BONDED AT THAT LOCATION. REFER TO SPECIAL SYSTEMS DRAWINGS FOR CABLE TRAY LOCATIONS.

F. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE CURRENT ISSUE OF THE NATIONAL ELECTRIC CODE AND ALL APPLICABLE LOCAL CODES. ALL WORK SHALL MATCH THE EXISTING BUILDING'S ELECTRICAL INSTALLATION. ALL SYSTEMS SHALL BE INSTALLED IN A WORKMANLIKE MANNER IN ACCORDANCE WITH APPLICABLE STANDARDS AND SPECIFICATIONS APPROVED BY ALL AUTHORITIES HAVING JURISDICTION.

G. PROVIDE A TYPED PANEL DIRECTORY FOR EACH NEW OR MODIFIED ELECTRICAL PANEL. DIRECTORY SHALL IDENTIFY THE CIRCUIT NUMBER, DEVICES SERVED, AND LOCATION OF DEVICES BY ROOM NUMBER. FILE COPY OF DIRECTORIES WITH THE OWNER'S REPRESENTATIVE WHEN WORK IS COMPLETED, AND PROVIDE COPIES WITH THE OWNER'S MANUALS.

H. INDICATED SPARE AND/OR SPACES IN ALL EQUIPMENT ON THE ELECTRICAL ONE-LINE DIAGRAM AND IN THE PANEL SCHEDULES ARE THE MINIMUM NUMBER REQUIRED FOR THIS PROJECT.

I. PROVIDE 3-1/2" HIGH CONCRETE HOUSEKEEPING PADS, EXTENDING 3" MIN. BEYOND ENCLOSURE DIMENSIONS FOR SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS AND FLOOR-MOUNTED PANELS/PANELBOARDS.

J. ALL CONNECTIONS TO MOTORS, OR OTHER DEVICES SUBJECT TO VIBRATION SHALL BE MADE USING A MINIMUM OF 12" LENGTH OF LIQUID TIGHT FLEXIBLE METALLIC CONDUIT. PROVIDE CONTINUOUS SEPARATE GROUND WIRE THROUGH ALL FLEXIBLE METALLIC CONDUIT CONNECTIONS.

K. IDENTIFY PANEL AND CIRCUIT NUMBER FOR ALL INSTALLED ELECTRICAL DEVICES ON THE OUTSIDE OF THE JUNCTION BOX.

L. ALL FUSES/CIRCUIT BREAKERS IN PANELS, DISCONNECT SWITCHES, MOTOR STARTERS, ETC., SERVING MOTORS AND EQUIPMENT SHALL BE SIZED AS RECOMMENDED BY THE MANUFACTURER OF THE PARTICULAR LOAD DEVICE SERVED. COORDINATE WITH OTHER TRADES AS REQUIRED.

DEMOLITION GENERAL NOTES

A. CONDUCT ALL DEMOLITION WORK IN SUCH MANNER TO MAINTAIN A SAFE WORK ENVIRONMENT AND IN ACCORDANCE WITH APPLICABLE SAFETY RULES AND PROCEDURES WITHIN NEC, NESC, NECA, AND OSHA REQUIREMENTS.

B. CONTRACTOR SHALL REQUEST AND REVIEW ANY HAZARDOUS MATERIALS SURVEYS FROM THE OWNER'S REPRESENTATIVE. OBSERVE RECOMMENDED PRECAUTIONS AND VERIFY THE STATUS OF ANY REMEDIAL WORK RECOMMENDED OR NOTED WITHIN THE HAZARDOUS MATERIAL SURVEY. NOTIFY THE OWNER'S REPRESENTATIVE IF ANY HAZARDOUS MATERIALS ARE SUSPECTED OR OBSERVED DURING THE COURSE OF EXECUTING THIS CONTRACT.

C. SURVEY AREAS OF THE FACILITY SCHEDULED FOR RENOVATION OR PARTIAL DEMOLITION PRIOR TO ANY WORK BEING PROFORMED. SUBMIT A REPORT OF THIS PRE-WORK SURVEY DETAILING ANY UTILIZATION EQUIPMENT OR SYSTEMS THAT ARE NOT IN GOOD WORKING ORDER IN ADVANCE OF ANY DEMOLITION WORK AND REVIEW WITH THE OWNER'S REPRESENTATIVE.

D. RESTORE CIRCUITS, UTILIZATION EQUIPMENT, AND SYSTEMS AFFECTED BY SELECTIVE DEMOLITION TO THE CONDITION NOTED IN THE PRE-WORK SURVEY REPORT. ELECTRICAL CIRCUITS WITH A PORTION OF THE LOAD REMOVED SHALL HAVE THE REMOVED LOADS ASSOCIATED CIRCUITRY TERMINATED IN SUCH A MANNER THAT THE REMAINING LOAD REMAINS FULLY OPERATIONAL.

E. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL FOR SALVAGED MATERIAL. REQUEST THAT THE OWNER PROVIDE DIRECTION ON DISPOSITION OF SALVAGED MATERIAL FIVE (5) WORKING DAYS PRIOR TO REMOVAL. IF SO DIRECTED BY THE OWNER, SALVAGED MATERIAL SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE DELIVERED BY THE CONTRACTOR TO A LOCATION AS DIRECTED. REMOVE AND DISPOSE ANY SALVAGED MATERIAL NOT RETAINED BY THE OWNER.

F. UNLESS OTHERWISE NOTED, DEMOLISH ELECTRICAL DEVICES, INCLUDING BUT NOT LIMITED TO: POWER OUTLETS, WIRING, RACEWAYS, PANELBOARDS, LIGHTING DEVICES, EQUIPMENT CONTROL DEVICES, AND POWER CONNECTIONS TO HVAC AND PLUMBING EQUIPMENT SCHEDULED FOR DEMOLITION.

G. VERIFY LOCATION AND QUANTITY OF ITEMS TO BE REMOVED. NO ALLOWANCE WILL BE MADE BECAUSE OF CONTRACTOR'S UNFAMILIARITY WITH THESE DETAILS.

H. EQUIPMENT, RECEPTACLES, AND LIGHTS, SCHEDULED FOR DEMOLITION SHALL HAVE THEIR ASSOCIATED CIRCUITRY REMOVED. ASSOCIATED CIRCUITRY IS DEFINED AS ALL WIRE, CONDUIT, J- BOXES, DEVICE BOXES, WIRING DEVICES, COVER PLATES, PROTECTIVE DEVICE, AND PANEL ETC. ASSOCIATED WITH THE ITEM SCHEDULED FOR REMOVAL. CONDUIT FOR ITEMS SCHEDULED FOR REMOVAL AND IN INACCESSIBLE AREAS SHALL BE EMPTIED AND SEALED OR OTHERWISE TERMINATED IN A SAFE MANNER ACCEPTABLE TO THE OWNER.

I. DAMAGED AREAS CAUSED DURING DEMOLITION THAT IS NOT CONCEALED BY NEW CONSTRUCTION SHALL BE REPAIRED TO MATCH ADJACENT SURFACES. OPENINGS CREATED BY THE REMOVAL OF THESE ITEMS THROUGH FIRE RATED WALLS SHALL BE FIRE STOPPED.

J. REMOVE ABANDONED CONDUIT TO POINT OF CONCEALMENT BEHIND INACCESSIBLE SURFACES. ENTIRELY REMOVE ABANDONED WIRING.

K. PROVIDE BLANK COVERS AND PLATES AT UNUSED OPENINGS IN BOXES, RACEWAYS, AUXILIARY GUTTERS, CABINETS, EQUIPMENT CASES AND HOUSINGS SHALL BE CLOSED TO AFFORD PROTECTION SUBSTANTIALLY EQUIVALENT TO THE EQUIPMENT ENCLOSURE.

L. IF A CONDUIT RUN IS EXPOSED OR A SURFACE RACEWAY LEFT WITHOUT A MOUNTING SURFACE DUE TO REMOVAL OF A PARTITION, THE RACEWAY SHALL BE RE-ROUTED OR RE-SUPPORTED AS ACCEPTABLE TO THE OWNER/ARCHITECT.

M. PROTECT ELECTRICAL EQUIPMENT, OUTLETS, AND DEVICES THAT ARE SCHEDULED TO BE RELOCATED, REPAIR, RESTORE, OR REPLACE ITEMS DAMAGED WHEN REMOVED TO THE APPROVAL OF THE OWNER. NOTIFY THE OWNER/ARCHITECT/ENGINEER OF ANY ELECTRICAL EQUIPMENT, OUTLETS AND/OR DEVICES WHICH ARE SCHEDULED TO BE RE-USED THAT ARE FOUND TO BE UNUSABLE.

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City of San Antonio
Woodlawn Lake Park
Bond 2020
1103 Cincinnati Ave., San Antonio, TX 78201

INTERIM REVIEW ONLY
Document Incomplete: Not Intended for permit, bidding or construction.
Engineer: TRAVIS E. WILTSHIRE
P.E. Reg. No.: 85219
Company Name: CNG ENGINEERING, PLLC.
Company Reg. No.: F-7964
Date: 07-17-2024

Revisions

Mark	Date	Description

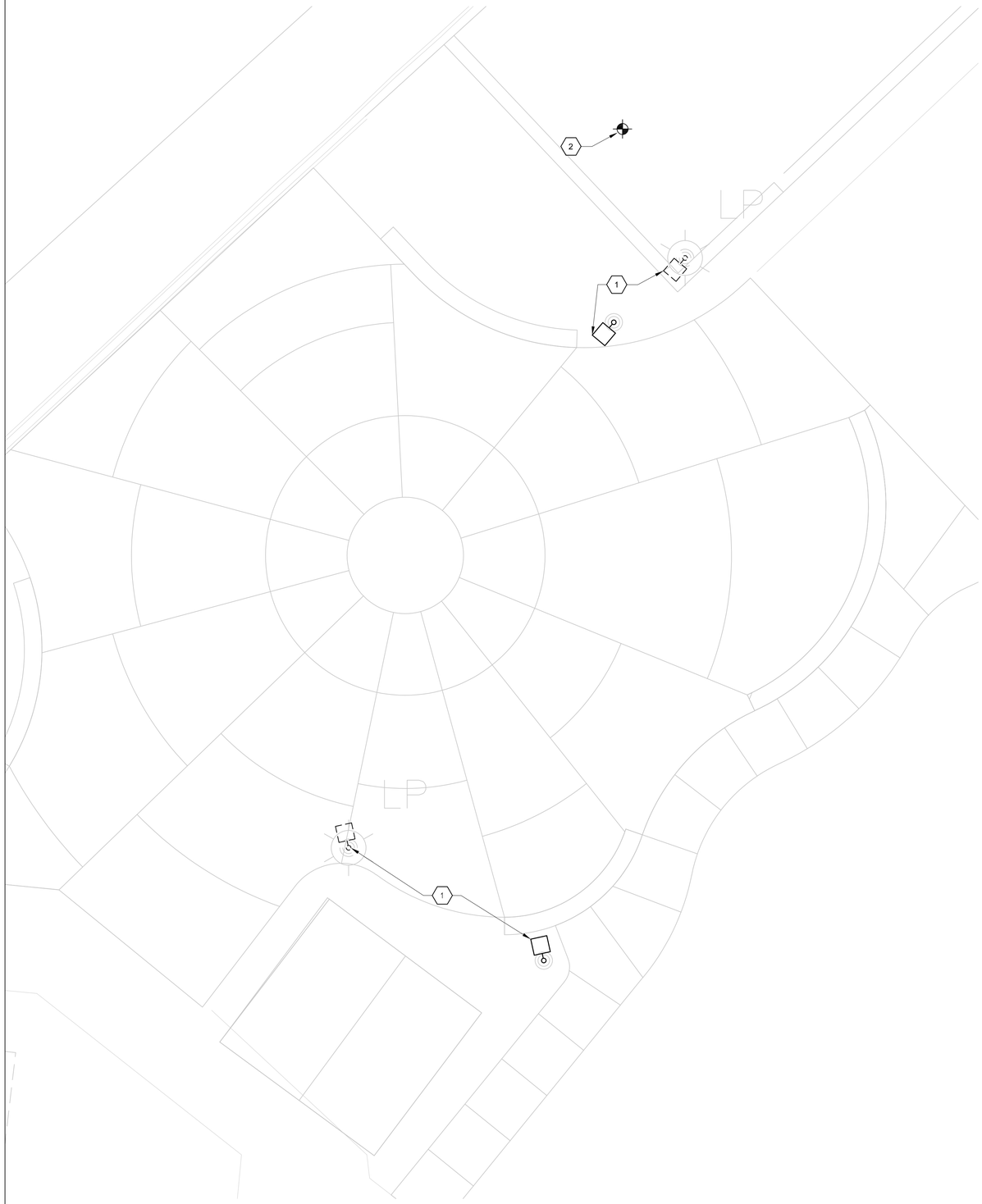
Drawn By:	Approved By:
GP	JG
Project Number:	Project Issue Date:
102401	07/17/2024

ELECTRICAL SYMBOLS AND ABBREVIATIONS

Design Development

SHEET

E000



1 ELETRICAL SITE PLAN
NEW CONSTRUCTION
SCALE:3/16"=1'-0"

N

GENERAL NOTES: (THIS SHEET ONLY)

A. REFER TO E000 FOR ALL SYMBOLS, ABBREVIATIONS, AND NOTES.

(#) KEYED NOTES: (THIS SHEET ONLY)

1. RELOCATE THE EXISTING LIGHT POLE FROM CURRENT POSITION TO THE DESIGNATED LOCATION. EXTEND EXISTING CONDUIT AND WIRE TO NEW LOCATION.
2. PROVIDE POWER CONNECTION TO NEW WATER FEATURE PANEL. REFER TO WATER FEATURE DRAWINGS FOR ADDITIONAL INFORMATION AND LOCATION.

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Drawn By:	Approved By:
GP	JG
Project Number:	**Project Issue Date:**
102401	07/17/2024

ELECTRICAL SITE PLAN

Design Development

SHEET

E001

Design Development SUBMITTAL
July 17, 2024

WOODLAWN LAKE PARK SPLASHPAD

1103 Cincinnati Ave.
San Antonio, Texas

FPC #102401

Owner:

CITY OF SAN ANTONIO
100 West Houston Street
City Tower
San Antonio, Texas

Architects:

FORD POWELL & CARSON ARCHITECTS and PLANNERS, INC.
420 Broadway, Suite 100
San Antonio, Texas 78205

FORD POWELL CARSON

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00 0107 - DESIGN TEAM IDENTIFICATION
Architect: Ford, Powell & Carson Architects & Planners, Inc.
Electrical Engineering: CNG Engineering, PLLC
Landscape Architecture / Irrigation Design: Rialto Studio, Inc.
Construction Cost Estimating: AG|CM, Inc.

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END OF SECTION

SECTION 07 9200
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-sag, gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015.

B. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2015a.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).

G. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2014.

H. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2002 (Reapproved 2013).

I. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2013.

J. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015.

K. SCAQMD 1168 - Adhesive and Sealant Applications; 1989 (Amended 2017).

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.
   5. Substrates for which use of primer is required.
   6. Sample product warranty.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

E. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

F. Installation Plan: Submit at least four weeks prior to start of installation.

G. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.

H. Field Quality Control Plan: Submit at least two weeks prior to start of installation.

I. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.

J. Installation Log: Submit filled out log for each length or instance of sealant installed.

K. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

L. Mockups: Provide joint sealant application within mockups required in other sections identical to specified joint sealants and installation methods.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

D. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
   1. Adhesion Testing: In accordance with ASTM C794.
   2. Compatibility Testing: In accordance with ASTM C1087.
   3. Allow sufficient time for testing to avoid delaying the work.
   4. Deliver to manufacturer sufficient samples for testing.
   5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
   6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

E. Installation Plan: Include schedule of sealed joints, including the following.
   1. Method to be used to protect adjacent surfaces from sealant droppings and smears, with acknowledgement that some surfaces cannot be cleaned to like-new condition and therefore prevention is imperative.
   2. Installation Log Form: Include the following data fields, with known information filled out.
      a. Location on project.
      b. Substrates.
      c. Sealant used.
      d. Stated movement capability of sealant.
      e. Primer to be used or indicate as "No primer" used.
      f. Size and actual backing material used.

g. Date of installation.
h. Name of installer.
i. Actual joint width; provide space to indicate maximum and minimum width.
j. Actual joint depth to face of backing material at centerline of joint.
k. Air temperature.

F. Preinstallation Field Adhesion Test Plan: Include destructive field adhesion testing of one sample of each combination of sealant type and substrate, except interior acrylic latex sealants, and include the following for each tested sample.
1. Identification of testing agency.
2. Name(s) of sealant manufacturers' field representatives who will be observing
3. Preinstallation Field Adhesion Test Log Form: Include the following data fields, with known information filled out.
a. Test date.
b. Copy of test method documents.
c. Age of sealant upon date of testing.
d. Test results, modeled after the sample form in the test method document.
e. Indicate use of photographic record of test.

G. Field Quality Control Plan:
1. Visual inspection of entire length of sealant joints.
2. Non-destructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
3. Field testing agency's qualifications.
4. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

H. Field Adhesion Test Procedures:
1. Allow sealants to fully cure as recommended by manufacturer before testing.
2. Prior to installing joint sealants, field test adhesion to joint substrates using ASTM C 1193 Method A. Verify adhesion is adequate. Modify joint preparation recommendations for failed joints and re-test. Submit written test report.

1.05 DELIVERY, STORAGE AND HANDLING

A. Accept materials on site in manufacturer's unopened original packaging.

B. Store primers and sealants in dry location with ambient temperature range of 60 to 80 deg. F (15 to 27deg. C).

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not install primers or sealants when atmospheric temperatures or joint surface temperatures are less than 40 deg. F (4 deg. C).

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five-year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
   1. Dow Corning Corporation: www.dowcorning.com/construction/#sle.
   2. Pecora Corporation: www.pecora.com.
   3. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Self-Leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.
   1. Dow Chemical Company: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
   2. Pecora Corporation: www.pecora.com.
   3. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.
      b. Joints between different exposed materials.
      c. Openings below ledge angles in masonry.
   2. Do not seal the following types of joints.
      a. Intentional weepholes in masonry.
      b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
      c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
      d. Joints where installation of sealant is specified in another section.

B. Type S - Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.

2.03 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

2.04 NONSAG JOINT SEALANTS

A. Type M - Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.
   2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
   3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
   5. Color: To be selected by Architect from manufacturer's standard range.
   6. Manufacturers:
      a. Pecora Corporation; 898NST: www.pecora.com.

b. Tremco Commercial Sealants & Waterproofing; Spectrem 3: www.tremcosealants.com/#sle.
c. Tremco; Tremsil 200: www.tremco.com
d. Substitutions: See Section 01 6000 - Product Requirements.

B. Type S or M - Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.
1. Movement Capability: Plus and minus 35 percent, minimum.

2.05 SELF-LEVELING SEALANTS

A. Type M - Self-Leveling Polyurethane Sealant for Horizontal Expansion Joints: ASTM C920, Grade P, Uses T, M and O; multi-component; explicitly approved by manufacturer for horizontal expansion joints.
1. Movement Capability: Plus and minus 25 percent, minimum.
2. Hardness Range: 30 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.
4. Tensile Strength: 200 to 250 psi (1.38 to 1.72 MPa) in accordance with ASTM D412.
5. Manufacturers:
a. Tremco Commercial Sealants & Waterproofing; THC-901: www.tremcosealants.com/#sle.
b. Substitutions: See Section 01 6000 - Product Requirements.

B. Type S - Semi-Self-Leveling Polyurethane Sealant: Intended for expansion joints in sidewalks, swimming pool decks, plazas, floors and other horizontal surfaces with up to 6 percent slope.
1. Composition: Single or multi-component.
2. Hardness: 35 to 45, Shore A, minimum, when tested in accordance with ASTM D2240.
3. Color: To be selected by Architect from manufacturer's standard colors.
4. Tensile Strength: 250 to 300 psi (1.72 to 2.07 MPa) in accordance with ASTM D412.
5. Manufacturers:
a. Tremco Commercial Sealants & Waterproofing; Vulkem 445 SSL: www.tremcosealants.com/#sle.
b. Substitutions: See Section 01 6000 - Product Requirements.

2.06 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
3. Open Cell: 40 to 50 percent larger in diameter than joint width.
4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
5. Manufacturers:
a. Nomaco, Inc; HBR: www.nomaco.com/#sle.
b. Substitutions: See Section 01 6000 - Product Requirements.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

D. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.
   1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.
   2. Notify Architect of date and time that tests will be performed, at least 7 days in advance.
   3. Arrange for sealant manufacturer's technical representative to be present during tests.
   4. Record each test on Preinstallation Adhesion Test Log as indicated.
   5. If any sample fails, review products and installation procedures, consult manufacturer, or take whatever other measures are necessary to ensure adhesion; re-test in a different location; if unable to obtain satisfactory adhesion, report to Architect.
   6. After completion of tests, remove remaining sample material and prepare joint for new sealant installation.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
   1. Width/depth ratio of 2:1.

2. Neck dimension no greater than 1/2 of the joint width.
3. Surface bond area on each side not less than 75 percent of joint width.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

H. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 FIELD QUALITY CONTROL

A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

B. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet (30 linear m), notify Architect immediately.

C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION

SECTION 26 0001
BASIC REQUIREMENTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Drawings and Specifications
1. Division 26 specifications are written in imperative and streamlined format. This imperative language is directed to the Contractor. The word “shall be” shall be included by inference where a colon (:) is used within sentences and phrases.

C. Codes, Permits and Standards
1. Comply with the most recently revised versions of applicable laws, rules, regulations, and ordinances of federal, state, and local utilities and authorities.
2. Obtain all applicable permits, licenses and inspections and pay all fees charged by above authorities.
3. Work shall comply with the local city codes and ordinances, the regulations of state authorities having lawful jurisdiction and the codes, statues and reference standards identified within these Specifications. None of the terms or provisions of the Drawings or specification shall be construed as waiving any of the rules, regulations, or requirements of these authorities. In the event of conflict between the Contract Documents and the local enforcing authority, the latter shall rule.
4. Where alterations to and deviations from the Contract Documents are required to comply with interpretations of a Code Authority Having Jurisdiction (AHJ), report the requirements and secure approval before starting work. Contractor shall review any requested modifications with the Engineer and secure his approval before proceeding.
5. Where Contract Document requirements are in excess of Code requirements and are permitted under the Code, the Contract Documents shall govern.

1.2 DEFINITIONS & ABBREVIATIONS

A. Definitions
1. Contract Documents - Drawings and the project manual, including Specifications.
2. Install: to set in place in position for service.
3. Furnish: to supply.
4. Provide: to install and furnish.
5. City - When used in an otherwise non-specific reference anywhere in the Contract documents, City is defined to refer to the local municipal authority governing the project address or the City who’s ETJ includes the project address.

B. Abbreviations
1. ANSI American National Standards Institute.
2. ASHRAE American Society of Heating, Refrigerating & Air-Conditioning Engineers
3. EIA Electronic Industry Association.
4. ETL Electrical Testing Laboratory.
5. ETJExtra-Territorial Jurisdiction
6. FM Factory Mutual
7. IEEE Institute of Electrical and Electronics Engineers

8. IES Illuminating Engineering Society of North America
9. LPI Lightning Protection Institute.
10. NFPA National Fire Protection Association
11. NEC National Electric Code (NFPA-70)
12. NESC National Electric Safety Code
13. NECA National Electrical Contractor's Association
14. NEMA National Electrical Manufacturers Association
15. NETA InterNational Electrical Testing Association
16. NRTL Nationally Recognized Testing Laboratory
17. OSHA Occupational Safety Health Administration (US Department of Labor)
18. UL Underwriters Laboratories

1.3 SUMMARY ORGANIZATION

A. PART 1 of This Section Includes:
   1. Electrical Utilities and Service
   2. Electrical equipment coordination and installation.
   3. Submittal requirements.

B. PART 2 of This Section Includes:
   1. Substitution requirements.

C. PART 3 of This Section Includes:
   1. Common Requirements for Electrical Installation
   2. Electric wiring of motors and equipment
   3. Vibration Isolation
   4. Quality Assurance requirements.

1.4 ELECTRIC UTILITIES AND SERVICE

A. Utilities: The Contract Documents reflect the general location and routing of existing and new utilities required for this project. Visit the site, and coordinate and confirm the exact requirements for new electrical services. Refer to Division 01. Electrical utilities and service entrance equipment exist at the site and are being demolished except as indicated on the drawings.
   1. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
      a. Notify the Owner's representative no fewer than (fourteen) (14) days in advance of proposed interruption of electric service.
      b. Indicate method of providing temporary electric service.
      c. Do not proceed with interruption of electric service without the Owner's representative's written permission.
   2. Temporary Services:
      a. Provide temporary electrical service and electric power distribution and temporary lighting throughout the construction site. Install and maintain in accordance with National Electrical Code and OSHA requirements. Make arrangements with the serving utility for point of service for temporary electric service and pay costs for delivery to and use at the site.
      b. Existing electrical distributions systems at the site may be utilized for temporary construction power. Submit to the Owner in writing, documents identifying the locations and anticipated maximum demand at

which power will be utilized, and obtain the Owner's approval, in writing, prior to connection and utilization.

1.5 ELECTRICAL EQUIPMENT COORDINATION AND INSTALLATION

A. General: Refer to Division 1 for general coordination requirements applicable to the entire work. It is recognized that the Contract Documents are diagrammatic in showing certain physical relationships which must be established within the electrical work, and in its interface with other work including utilities and mechanical work and that such establishment is the exclusive responsibility of the Contractor. The Drawings show diagrammatically the sizes and locations of the various conduit and raceway systems and equipment items and the sizes of the major interconnecting distribution, without showing exact details as to elevations, offsets, control lines, and installation details. All major feeders 1-1/2” diameter and over shall be shown on site and floor plans.
   1. Arrange electrical work in a neat, plumb and straight well organized and workmanlike manner with services running parallel with primary lines of the building construction and with a minimum of 7’ overhead clearance where possible. Maintain 4” clearance of other systems and 12” above ceiling.
   2. The Contractor shall carefully lay out his work at the site to conform to the architectural and structural conditions, to avoid obstructions and to provide proper grading of lines. Exact locations of outlets, apparatus and connections thereto shall be determined by reference to detail Drawings, equipment Drawings, roughing-in Drawings, etc., by measurements at the building and in cooperation with other Contractors and in all cases shall be subject to the approval of the Engineer. Relocations necessitated by the conditions at the site or directed by the Engineer shall be made without any additional cost to the Owner or Engineer.
   3. All conduit and boxes except those in the electrical service enclosure or where specifically designated herein, or on the Drawings, shall be installed concealed. Wherever conditions exist which would cause any of these items to be exposed in finished spaces, the Contractor whose work is involved shall immediately call the situation to the attention of the Engineer and shall stop work in those areas until the Owner's Representative or General Contractor directs the resumption of the work. Submit for approval a Shop Drawing for any change in equipment placement, etc.
   4. Equipment has been chosen to fit within the available space with all required Code and maintenance clearances and shall be installed as shown. Every effort has been made to also accommodate equipment of other approved manufacturers, however since equipment and access space requirements vary, the final responsibility for installation access and proper fit of substituted equipment rests with the Contractor with approval from Author by having jurisdiction.

B. Pre-installation planning: Coordinate arrangement, mounting, and support of electrical equipment as follows:
   1. Allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
   2. Provide access for disconnecting means and working space for equipment with minimum interference to adjacent equipment.
   3. The equipment shall be arranged to facilitate service, maintenance, and repair or replacement of components and equipment.
   4. Coordination submittal requirements
      a. Provide an electrical service and plan view layout, scaled to 1/4" = 1' - 0" or larger to depict correctly all new equipment that must be fit into the electrical enclosure containing electrical distribution equipment. These

shall be provided with the associated electrical distribution equipment submittals.

b. Electrical layout drawings shall show dimensioned layout, required working clearances. Show support locations, type of support, and weight on each support. Indicate field measurements.

1.6 DRAWINGS AND SPECIFICATIONS

A. General: The Drawings are schematic in nature and indicate approximate locations of the electrical systems, equipment, fixtures and devices, except where specific locations are noted and dimensioned on the Drawings. All items are shown to approximate scale with intent to depict how these items shall be integrated into the building. Locate all items by field measurements and in accordance with the Contract Documents. Cooperate with other trades to ensure project completion as indicated.

B. Location: Prior to locating electrical replacement equipment obtain the Architect/ Engineer's approval as to exact location. Locations shall not be determined by scaling Drawings. Mount lighting controls and electrical devices at the heights directed by the Architect/Engineer. Where there is a question concerning the required location for items of electrical work, the Contractor shall submit a request for information to the Architect/Engineer requesting specific directions for locating the item. The contractor shall be responsible for costs of redoing work of trades necessitated by failure to comply with this requirement.

1. The Drawings show diagrammatic locations of the various outlets and apparatus. Exact locations of these outlets and apparatus shall be determined by reference to the Architectural Drawings and to all detail Drawings, equipment Drawings, rough-in Drawings, etc., by measurements at the existing equipment, and in cooperation with the other trades. The Owner and Architect/Engineer reserve the right to make any reasonable change in the location of any outlet or apparatus before installation, without additional cost to the Owner.

C. Specifications: The specifications are intended to supplement the Drawings and it is not in the scope of the specifications to mention any part of the work which the Drawings are competent to fully explain. Conversely, any part of the work which the specifications are competent to fully explain, may not be mentioned on the Drawings.

D. Disagreement: Disagreement between the Drawings or specifications or within the Drawings or specifications shall be estimated using the better quality or greater quantity of material or installation, and a request for information shall be made to the Engineer.

1.7 Discrepancies

A. Clarification: Clarification shall be obtained before submitting a proposal for the Work under this Division as to discrepancies or omissions from the Contract Documents or questions as to the intent thereof.

B. Detailed Instructions: Should it appear that the work hereby intended to be done or any of the materials relative thereto, is not sufficiently detailed or explained in the Drawings or Specifications, then the Contractor shall submit a request for information to the Engineer for such further Drawings or explanations as may be necessary before proceeding, allowing a reasonable time for the Engineer to respond. The Contractor shall conform to this additional information as a part of the Contract without additional cost to the Owner or Engineer.

C. Interpretations: Should any doubt or question arise respecting the true meaning of Drawings or Specifications, reference shall be made to the Engineer, whose written decision shall be final and conclusive. No alleged statement by the Engineer will be accepted as an excuse for inferior work.

D. Contractor Agreement: Consideration will not be granted for misunderstanding of the amount of work to be performed. Submission of a bid conveys full Contractor agreement of the items and conditions specified, shown, scheduled, or required for completion of the project.

1.8 Submittal REQUIREMENTS

A. Provide all electrical shop drawing submittals at the same time.

B. Submittals shall be provided in binders and arranged in sequence by Specification section number. Provide submittals only for specification sections that list this requirement.
   1. Provide tabs for each section, labeled to match the associated specification. The page after each tab section shall contain a typed list of any exceptions that the Contractor is proposing.
   2. Each page of the submittal shall be a clear copy or scan, indicating items and options proposed for use in the project with a graphical arrow. Items included on a submittal page that are not proposed for use shall be deleted with strike-through or other acceptable method that clearly distinguishes the proposed from non-relevant information.
   3. Subject to the requirements in Division 1, at the Contractor's option, submittals may be provided in PDF form.
   4. All format and informational requirements for submittals in binders apply to PDF submittals.
   5. Multiple files may be submitted; however, these must be organized into a consistent format.
   6. PDF submittal shall include a table of contents with page numbers listed for the beginning of each section.
   7. Additionally, the PDF shall be formatted to include tab or chapter shortcuts, labeled with the associated specification section. These shortcuts shall allow the reader to jump to a tab or chapter associated with beginning of each specification section with a single action.
   8. At the engineer’s request, the contractor shall submit hard copy version in accordance with requirements outlined above.

C. Provide closeout submittals for all products used. Refer to the related specification section for additional requirements.
   1. Provide maintenance and warranty information with contact information for parts and service of equipment.

PART 2 - PRODUCTS

2.1 GENERAL MATERIALS AND EQUIPMENT REQUIREMENTS

A. Materials and equipment shall be new, of best grade and quality, and meet all requirements of the Contract Documents. Materials and equipment shall conform to National Electrical Code requirements and shall be listed by Underwriters Laboratories, Inc. (UL). UL listing will be accepted as evidence that the material or equipment conforms to the standards of that agency. In lieu of this listing, submit a statement from a nationally recognized testing agency, indicating that products have been tested in

accordance with UL criteria and that the materials and equipment comply with Contract requirements.

B. Materials and equipment shall be standard catalog products of manufacturers regularly engaged in the manufacture of products conforming to these Specifications. Custom fabricated items shall be fully described using Drawings and technical data sufficient to demonstrate compliance with the Contract Documents.

2.2 SUBSTITUTIONS

A. Basis of Design - For products specified in part 2.1 of the associated specification section, as "Basis of Design", that term is herein defined as the standard level of product that is required for the project.
   1. The use of term Basis of Design in these specifications is intended to allow the Contractor to propose use of non-specified manufacturer's products, provided that the proposed substitute is of equal or greater construction material, workmanship, quality, performance, and manufacturer support. If the product's proposed location is not concealed, aesthetic considerations are also considered as a significant factor.
   2. During the bid process, the Engineer will not evaluate products and provide approval prior to the bid date on proposed substitute products. If the Contractor wishes to propose substitutions, the Engineer will evaluate the successful Contractor's proposed alternates during the submittal review process. The Engineer will take no exception to the use of individual products determined to be equal. That decision may be the result of consultation and input from other members of the design team. If a product is not determined to be equal, it will be rejected and another product that is equal to the basis of design shall be re-submitted by the Contractor. The Engineer will not evaluate more than two substitution attempts before the Contractor is required to submit the specified product.
   3. If the Contractor proposes product substitutions that may not be equal to the specified product, and cost savings are associated with the use of the proposed substitute, then the Contractor should propose these as part of a VE (Value Engineering) process, with line item cost savings identified for each product substitution proposed. With information on line item costs, the design team may determine if the proposed substitutes, though not equal, represent a better value and these *may* be recommended for use.

B. Substitutions are generally not allowed for products specified in the associated specification section when listed as "Provide products by one of the following". If there is a concern about delivery schedules from the manufacturers listed or other factors, these special case substitutions will be considered individually during the submittal phase.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Workmanship: Work shall be executed, and materials installed in accordance with the best practice of the trades in a thorough, substantial, workmanlike manner by competent, state licensed workmen, presenting a neat appearance when completed, straight and plumb.

B. Manufacturer's Recommendations: With exceptions as specified or indicated on the Drawings or in the Specifications, apply, install, connect, erect, use, clean, and condition manufactured articles, materials, and equipment per manufacturer's current printed

recommendations. Copies of such printed recommendations shall be kept at the job site and made available as required.

3.2 SPACE REQUIREMENTS

A. General: Determine in advance of purchase that the equipment and materials proposed for installation will fit into the confines indicated, leaving adequate code clearances for adjustments, repair, or replacement and comply with code.

B. Clearance: Allow adequate space for clearance in accordance with requirements of the Code and local inspection department.

C. Scheduled Equipment: The design shown on the Drawings is based on the equipment scheduled.

D. Responsibility: Space requirements and equipment arrangement may vary for each manufacturer, the responsibility for ensuring initial access and suitability rests with the Contractor.

E. Review: Final arrangements of equipment to be installed shall be subject to the Architect's review.

3.3 SAFETY REGULATIONS

A. All electrical work, including work associated with temporary power, shall be performed in compliance with all applicable and governing safety regulations. All safety lights, guards, signs, and other safety materials and provisions required for the performance of the electrical work shall be provided by and operated by the Electrical contractor.

3.4 DELIVERY, STORAGE AND HANDLING OF MATERIALS

A. General: Protect all materials and equipment to be installed under this Division from physical and weather damage.

B. Scope: Work under this Division shall include, but not limited to:
   1. Shipping from point of manufacture to job site.
   2. Unloading, moving, and storage on site with proper safeguards as required to properly protect equipment from corrosion, drip, humidity, dust, and physical damage.
   3. Hoisting and scaffolding of materials and equipment included in this Division.
   4. Ensuring safety of employees, materials, and equipment using such hoisting equipment and scaffolding.

C. Coordination: All large pieces of equipment which are to be installed in the building and which are too large to permit access through doorways, stairways or shafts shall be brought to the job by the Contractor and shall be placed in the spaces before enclosing partitions and structure are completed. Contractor shall support equipment above floor slab and provide suitable, protective covering.

D. Install in accordance with approved equipment submittal layouts.

E. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

F. Coordinate sleeve selection and application with selection and application of firestopping.

3.5 VIBRATION ISOLATION

A. General: Warrant the electrical systems, and their component parts to operate without objectionable noise or vibration. Noise from systems or equipment which results in noise within occupied spaces above the recommended NC curves (refer to ASHRAE Standard) shall be considered objectionable. Objectionable noise, vibration, or transmission thereof shall be corrected.

B. Provide vibration isolation means for equipment and materials to prevent the transmission of perceptible vibration, structure borne, or air borne noise. Items requiring vibration isolation include:
   1. Transformers and rotating and reciprocating equipment shall be mounted on cork, rubber or steel spring isolator units properly sized, spaced and loaded as recommended by the manufacturer.
   2. Electrical Conduit: Isolate from dry type transformers, rotating and reciprocating machinery using flexible conduit, 18" minimum length or 12" of flexible conduit per 1" of conduit diameter with maximum of 36”.

3.6 QUALITY ASSURANCE TESTING

A. Description of Work
   1. General: Provide testing of electrical work installed under Divisions 26, 27 and 28, as specified herein and in other Division 26, 27 and 28 sections. Feeders and equipment shall not be placed in service until they have been checked out and tested, as applicable.

B. Personnel
   1. Personnel: Submit evidence to show that the personnel who will actually test the systems are qualified and state certified.
   2. The Engineer/Owner reserves the right to request that the originally approved personnel be replaced with other qualified personnel if, in his opinion, the original personnel are not qualified or are not properly conducting the system testing.

C. Submittals
   1. Testing Procedures: Submit four copies of all proposed testing procedures to the Engineer for review at least 30 days prior to conducting any testing.
   2. Reporting Forms: Submit four copies of proposed forms to be used in recording testing data and results to the Engineer for review at least 30 days prior to conducting any testing on the project.
   3. Test Data and Results: Submit four copies of complete data and certified test results for each test performed, including, but not limited to:
      a. Test performed.
      b. Test procedure.
      c. System and area tested.
      d. Date(s) and time(s) of test.
      e. Weather conditions.
      f. Test criteria.
      g. Test results.
      h. Additional pertinent information.
   4. Operational Certification: Submit four certified copies of an operational certification which documents that all equipment and systems have been fully tested to verify proper operation in accordance with the design shown in the Construction Documents and manufacturer's recommendations.

5. Certification: Certifications stating that submitted test data and results are true and correct shall be provided for all submittals under this Section. Certification shall be executed by an authorized officer if the Contractor is a corporation, by a partner if the Contractor is a partnership, by the Owner if the Contractor is a sole proprietorship or by the authorized representative if the Contractor is a joint venture.
6. Calibration List: Submit four copies of a listing of testing devices to be used for the project to the Engineer for approval. Listing shall include documentation that devices are properly and currently calibrated.
7. Prepare test and inspection reports, including a certified report that identifies electrical distribution equipment included and that describes scan results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
8. Test Log: The Contractor shall maintain a test log at the site to document the results of all successful and unsuccessful testing as it is performed. This log shall be available for review by the Engineer and a copy of the log shall be submitted to the Engineer and Owner's Representative prior to the Substantial Completion inspection. A space shall be provided on the test log for signoff by the Owner's Representative.

D. Notice
1. General: Notify the Engineer and the Owner's Representative in writing two weeks prior all scheduled testing to allow time for scheduling witness of testing, where elected by the Engineer and Owner's Representative.

E. Materials
1. General: Provide all materials and test equipment required for testing specified electrical systems, including retesting until acceptable test results are obtained.

F. Manufacturer's Field Service
1. Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections, and to assist in testing.

G. Preparation
1. Perform visual mechanical inspection and electrical tests for field connections Test insulation resistance for each electrical distribution equipment bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

H. Testing
1. General: Tests shall be made during the course of construction as specified and as required by authorities having jurisdiction. Such tests shall be conducted by this Division as a part of the Work and shall include all personnel, material, and equipment required to perform tests until satisfactory results are obtained. Any defects detected during testing shall be satisfactorily repaired or the equipment involved shall be replaced and the tests re-executed.
2. Tests: Refer to the Table below for inspection and testing requirements associated with listed product specification sections:

Spec Section #	Title							Notes
260519	**LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**	○		○	○			
260526	**GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**	○	○	○			○	

NOTES:

a. Refer to individual specification section for additional testing requirements.

I. RESULTS AND DEFICIENCY CORRECTIONS:
1. Correct malfunctions on-site, where possible, and retest to demonstrate compliance; otherwise, replace them with new units and retest.
2. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
3. Any resultant delay because of such necessary retest, does not relieve the Contractor of his responsibility under this contract.
4. Equipment will be considered defective if it does not pass tests and inspections. Tested products which fail to provide acceptable test results shall be repaired or replaced with suitable materials required to obtain acceptable test results.

3.7 CONTRACTOR WARRANTIES AND GUARANTEES

A. General: Contractor shall guarantee all material and equipment installed by him against defects in workmanship and material for a period of 24 months after final acceptance of the work by the Owner and he shall repair or replace any materials or equipment developing such defects within that time, promptly on due notice given him by the Owner and at Contractor's sole cost and expense.

B. Equipment: All equipment bearing a manufacturer's guarantee in excess of the time requirement above, such as electrical equipment, devices, components, and similar items, shall be considered to have that guarantee extended directly to the Owner by the manufacturer. Any such equipment that proves defective in materials or workmanship within the guarantee period is to be corrected by the Contractor in accordance with the manufacturer's guarantee.

C. Start-up: The Electrical Contractor shall provide instructions and equipment starting service on new equipment for two complete years after the date of final acceptance of the work by the Owner, at Contractor's sole cost and expense.

END OF SECTION

SECTION 26 0519
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Building wires and cables rated 600 V or less.
   2. Connectors, splices, and terminations rated 600 V or less.

1.3 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

A. Shop Drawing submittals shall include, but not be limited to, the following:
   1. The Contractor shall submit to the Engineer for review a list of the proposed manufacturers of wire and cable, cable lugs, cable connectors and termination fittings listed herein. The Contractor may install wire and cable, cable lugs, cable connectors and termination fittings furnished by any manufacturer listed on the approved submittal.
   2. Cut sheets on all 300 and 600 volt conductors with manufacturers name, ratings and capacities, insulation characteristics, and available colors, clearly listed.
   3. Cut sheets indicating all cable lugs, termination fittings and cable connectors.

B. Closeout Submittal
   1. Include final version of approved shop drawing submittals within the Operation and Maintenance manual.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Alcan Products Corporation; Alcan Cable Division.
   2. American Insulated Wire Corp.; a Leviton Company.
   3. General Cable Corporation.
   4. Senator Wire & Cable Company.
   5. Southwire Company.

B. Copper Conductors: Comply with NEMA WC 70.

C. Conductor Insulation: Comply with NEMA WC 70 for Types THW, THHN-THWN and XHHW.

D. Low-voltage cabling per lighting manufacturer shall comply with NEC 225.6(B) for Festoon lighting.

2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. TE Connectivity
6. NSI Industries

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

C. Provide UL Listed 486D Watertight connectors equal to Polaris Blue Type ISW for the size range required.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Exposed Feeders: Type THHN-THWN, single conductors in raceway.

B. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW, THHN-THWN, single conductors in raceway.

C. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in conduit underground or in the service enclosures, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

E. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

F. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings.

C. Provide connections using UL listed watertight connectors submersible for direct burial and installation in pullboxes.

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:
1. After installing conductors and cables and before electrical circuitry has been energized, test branch circuit conductors for compliance with requirements.

END OF SECTION

SECTION 26 0533
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Metal conduits, tubing, and fittings.
2. Nonmetal conduits, tubing, and fittings.
3. Metal wireways and auxiliary gutters.
4. Boxes, enclosures, and cabinets.
5. Handholes and boxes for exterior underground cabling.

1.3 DEFINITIONS

A. GRC, RGS: Galvanized rigid steel conduit.

B. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360

C. RNC: Type EPC-40-PVC or EPC-80-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

1.4 SUBMITTALS

A. Shop Drawing submittals shall include, but not be limited to, the following:
1. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
2. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

B. Closeout Submittal
1. Include final version of approved shop drawing submittals within the Operation and Maintenance manual.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. AFC Cable Systems, Inc.
2. Allied Tube & Conduit; a Tyco International Ltd. Co.
3. Anamet Electrical, Inc.
4. Electri-Flex Company. O-Z/Gedney; a brand of EGS Electrical Group.Picoma Industries, a subsidiary of Mueller Water Products, Inc.

5. Republic Conduit.
6. Robroy Industries.
7. Southwire Company.
8. Thomas & Betts Corporation.
9. Western Tube and Conduit Corporation.
10. Wheatland Tube Company; a division of John Maneely Company.

B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. GRC, GRS: Comply with ANSI C80.1 and UL 6.

D. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
1. Comply with NEMA RN 1.
2. Coating Thickness: 0.040 inch (1 mm), minimum.

E. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

F. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
2. Fittings for EMT:
   a. Material: Steel.
   b. Type: Compression.
3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
4. Cable Support Fittings: Provide hot dipped galvanized cable support body fitting of malleable or ductile iron with wedging plugs as required for long vertical cable installations in accordance with NEC 300.19.
5. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.

G. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. AFC Cable Systems, Inc.
2. Anamet Electrical, Inc.
3. Arnco Corporation.
4. CANTEX Inc.
5. CertainTeed Corp.
6. Condux International, Inc.
7. Electri-Flex Company.
8. Kraloy.

9. Lamson & Sessions; Carlon Electrical Products.
10. Niedax-Kleinhuis USA, Inc.
11. RACO; a Hubbell company.
12. Thomas & Betts Corporation.

B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. LFNC: Comply with UL 1660.

D. Fittings for LFNC: Comply with UL 514B.

E. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by the following manufacturers:
1. Adalet.
2. Cooper Technologies Company; Cooper Crouse-Hinds.
3. EGS/Appleton Electric.
4. Erickson Electrical Equipment Company.
5. FSR Inc.
6. Hoffman; a Pentair company.
7. Hubbell Incorporated; Killark Division.
8. Kraloy.
9. Milbank Manufacturing Co.
10. Mono-Systems, Inc.
11. O-Z/Gedney; a brand of EGS Electrical Group.
12. RACO; a Hubbell Company.
13. Robroy Industries.
14. Spring City Electrical Manufacturing Company.
15. Stahlin Non-Metallic Enclosures; a division of Robroy Industries.
16. Thomas & Betts Corporation.
17. Wiremold / Legrand.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

D. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.

E. Device Box Dimensions: 4 inches square by 2-1/8 inches deep (100 mm square by 60 mm deep)

F. Gangable boxes are prohibited.

G. Hinged-Cover Enclosures: Provide NEMA enclosure rating as indicated on drawings. If not indicated provide enclosure rating as required by environmental and Code requirements. Provide continuous-hinge cover with flush latch unless otherwise indicated.
   1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

2.4 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. General Requirements for Handholes and Boxes:

   1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
   2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following manufacturers:
      a. Armorcast Products Company.
      b. Carson Industries LLC.
      c. CDR Systems Corporation; Hubbell Power Systems.
      d. NewBasis.
      e. Oldcastle Precast, Inc.; Christy Concrete Products.
      f. Synertech Moulded Products; a division of Oldcastle Precast, Inc.
   2. Standard: Comply with SCTE 77.
   3. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
   4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
   5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
   6. Cover Legend: Molded lettering, "ELECTRIC." or similar wording to indicate service.
   7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
   8. Handholes 12 Inches Wide by 24 Inches Long (300 mm Wide by 600 mm Long) and larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.5 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
   1. Tests of materials shall be performed by an independent testing agency.

2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012 and traceable to NIST standards.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
   1. Exposed Conduit: GRC (GRS) or IMC or RNC, Type EPC-80-PVC.
   2. Underground Conduit (Branch Circuits): Type EPC-80-PVC, direct buried.
   3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
   4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Minimum Raceway Size: 3/4-inch (21-mm) trade size.

C. Raceway Fittings: Compatible with raceways and suitable for use and location.
   1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
   2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.

D. Install surface raceways only where indicated on Drawings.

3.2 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Complete raceway installation before starting conductor installation.

C. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

D. Arrange stub-ups so curved portions of bends are not visible above finished slab.

E. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.

F. Conceal conduit unless otherwise indicated.

G. Install above grade conduits parallel or perpendicular to adjacent structures.

H. Support conduit within 12 inches (300 mm) of enclosures to which attached.

I. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

J. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

K. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

L. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

M. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

N. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

O. Cut conduit perpendicular to the length. For conduits 2-inch (53-mm) trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

P. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

Q. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

R. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
   1. Where otherwise required by NFPA 70.

S. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

T. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches (1830 mm) of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers.
   1. Use LFMC in damp or wet locations subject to severe physical damage.
   2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

U. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

V. Fasten junction and pull boxes. Do not support boxes by conduits.

3.3 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
   2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 26 0553
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels.
8. Miscellaneous identification products.

1.3 SUBMITTALS

A. Shop Drawing submittals shall include, but not be limited to, the following:
1. Product Data: For each electrical identification product indicated.
2. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE

A. Comply with ANSI A13.1.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Write-On Tags: Polyester tag, 0.010 inch (0.25 mm) thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
   1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

C. Snap-Around Labels: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.2 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.

2.3 DETECTABLE UNDERGROUND-LINE WARNING TAPE

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. Brady
      b. Scotch
      c. Presco
      d. Trumbull MFG.

B. Tape:
   1. Minimum 5.0 mil overall thickness with .35 mil, solid aluminum foil core.
   2. Printing on tape shall be permanent and shall not be damaged by burial operations.
   3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

C. Color and Printing:
   1. Comply with ANSI Z535.1 through ANSI Z535.5.
   2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE, .
   3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.

D. Tape Width:
   1. Minimum tape width shall correspond to burial depth below final, finished grade as follows:
      a. 2" wide for 6"-12" installed depth, below finished grade.

b. 3" wide for 12"-24" installed depth, below finished grade.
c. 6" wide for 22"-30" installed depth, below finished grade.

2.4 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Warning label and sign shall include, but are not limited to, the following legends:
1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."
3. ARC FLASH.

2.5 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. inches (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.
1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.
3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.6 EQUIPMENT IDENTIFICATION LABELS

A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. The minimum letter height shall be 3/8 inch (10 mm).

B. Stenciled Legend: In non-fading, waterproof, black ink or paint. Minimum letter height shall be 1 inch (25 mm).

2.7 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon.
1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi (82.7 MPa).
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black except where used for color-coding.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one-piece, self-locking, Type 6/6 nylon.
1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi (82.7 MPa).
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black.

2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify the identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

G. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.

H. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
1. Outdoors: UV-stabilized nylon.

I. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line. Depth below final finished grade shall not exceed amount indicated per these specifications or as published in the tape manufacturer's installation instructions. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches (400 mm) overall.

J. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

A. Accessible Raceways and Cables: Identify the covers of each junction and pull box of the electrical power system with self-adhesive vinyl labels with the wiring system legend and system voltage. Provide identification products after completion of all finish painting.

B. Power-Circuit Conductor Identification, 600 V or Less: For conductors pull and junction boxes and handholes, use color-coding conductor tape to identify the phase.
   1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder, and branch-circuit conductors.
      a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.

      b. Colors for 240/120-V, single phase Circuits:
         1) Phase A: Black.
         2) Phase B: Red.

      c. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

C. Power-Circuit Conductor Identification, More than 600 V: For conductors in vaults, pull and junction boxes and handholes, use write-on tags and a separate tag with the circuit designation.

D. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.

E. Conductors to be extended in the future: Attach write-on tags to conductors and list source.

F. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
   1. Install underground-line detectable warning tape for both direct-buried cables and cables in raceway.

G. Warning Labels for Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
   1. Comply with 29 CFR 1910.145.
   2. Identify system voltage with black letters on an orange background.
   3. Apply to exterior of door, cover, or other access.
   4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
      a. Controls with external control power connections.

H. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

I. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, control panels, control stations, terminal cabinets. Systems include power, lighting, control, and signal systems unless equipment is provided with its own identification.
   1. Labeling Instructions:
      a. Outdoor Equipment: Engraved, laminated acrylic or melamine label.

b. Elevated Components: Increase the sizes of labels and letters to those appropriate for viewing from the floor.
c. Fasten labels with appropriate stainless-steel mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to be Labeled:
   a. Panelboard identification shall be engraved, laminated acrylic or melamine label.
   b. Enclosures and electrical cabinets.
   c. Access doors and panels for concealed electrical items.
   d. Enclosed switches.
   e. Enclosed circuit breakers.
   f. Enclosed controllers.
   g. Push-button stations.
   h. Remote-controlled switches, and control devices.
   i. Monitoring and control equipment.
3. Equipment Requiring Directory and/or branch device labels:
   a. Panelboards: Typewritten directory of circuits corresponding to "as-installed" device and load locations.
   b. Lighting Control panels and Lighting Contractors.
   c. Monitoring and control equipment.

END OF SECTION

SECTION 26 0923
LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Time switches.
2. Photoelectric switches.
3. Lighting contactors.

1.3 DEFINITIONS

A. LED: Light-emitting diode

1.4 SUBMITTALS

A. Shop Drawing submittals shall include, but not be limited to, the following:
1. Product Data: For each type of lighting control device proposed for use on the project.
2. Shop Drawings: Showing installation details for occupancy and light-level sensors. Provide interconnection diagrams showing field installed wiring. Include diagrams for power, signal, and control wiring.

B. Closeout Submittal
1. Include final version of approved shop drawing submittals within the Operation and Maintenance manual.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 TIME SWITCHES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. NSi Industries LLC; TORK Products.
2. Cooper Industries, Inc.
3. Intermatic, Inc.
4. Lutron Electronics Co., Inc
5. Square D; Schneider Electric.
6. Leviton Mfg. Company Inc.
7. Watt Stopper (The).

8. Tyco Electronics; ALR Brand.
9. Lithonia Lighting; Acuity Lighting Group, Inc.

B. Electromechanical-Dial Time Switches: Comply with UL 917.
1. Contact Configuration: SPST.
2. Contact Rating: 30-A inductive or resistive, 240-V ac load, 120-/240-V ac
3. Circuitry: Allows connection of a photoelectric relay as a substitute for the on-off function of a program.
4. Astronomic time dial.
5. Eight-Day Program: Uniquely programmable for each weekday and holidays.
6. Skip-a-day mode.
7. Wound-spring reserve carryover mechanism to keep time during power failures, minimum of 10 hours.

2.2 OUTDOOR PHOTOELECTRIC SWITCHES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Cooper Industries, Inc.
2. Intermatic, Inc.
3. NSi Industries LLC; TORK Products.
4. Watt Stopper (The).

B. Description: Solid state, with DPST dry contacts rated for 1800-VA tungsten or 1000-VA inductive, to operate connected relay, contactor coils, or microprocessor input; complying with UL 773A.
1. Light-Level Monitoring Range: 1.5 to 10 fc (16.14 to 108 lux), with an adjustment for turn-on and turn-off levels within that range, and a directional lens in front of the photocell to prevent fixed light sources from causing turn-off.
2. Time Delay: Fifteen second minimum, to prevent false operation.
3. Surge Protection: Metal-oxide varistor, complying with IEEE C62.41.1, IEEE C62.41.2, and IEEE 62.45 for Category A1 locations.
4. Mounting: Twist lock complies with NEMA C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the north sky exposure.

2.3 CONDUCTORS AND CABLES

A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 CONTACTOR INSTALLATION

A. Mount electrically held lighting contactors with elastomeric isolator pads to eliminate structure-borne vibration, unless contactors are installed in an enclosure with factory-installed vibration isolators.

3.2 WIRING INSTALLATION

A. Wiring Method: Comply with Section 260519 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 1/2 inch (13 mm).

B. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.

C. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.

D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.3 IDENTIFICATION

A. Identify components and power and control wiring according to Section 260553 "Identification for Electrical Systems."
   1. Identify controlled circuits in lighting contactors.

B. Label time switches and contactors with a unique designation.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
   1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
   2. Test and adjust controls and safety. Replace damaged and malfunctioning controls and equipment.

C. Lighting control devices will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices. Refer to Division 01 Section "Project Closeout."

END OF SECTION

SECTION 26 2726
WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Receptacles, receptacles with integral GFCI, and associated device plates.
2. Weather-resistant receptacles.
3. Snap switches.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

D. RFI: Radio-frequency interference.

E. UTP: Unshielded twisted pair.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

C. Samples: One for each type of device and cover plate specified, in each color specified if required.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
1. Cooper Wiring Devices; Division of Cooper Industries, Inc. (Cooper).
2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
3. Leviton Mfg. Company Inc. (Leviton).
4. Pass & Seymour/Legrand (Pass & Seymour).

B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
2. Devices shall comply with the requirements in this Section.

2.3 GFCI RECEPTACLES

A. GFCI, Weather-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, UL 498, and UL 943 Class A.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Cooper; TWRVGF15.
b. Hubbell; GFTR15.
c. Pass & Seymour; 1594TRWR.
2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, .

2.4 WALL PLATES

A. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with a while in use cover equal to Hubbell Taymac Cat No. ML-450G or approved equivalent for single gang installations. Color shall be selected by the Architect.

2.5 FINISHES

A. Device Color:

1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:
   1. Keep outlet boxes free of mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
   2. Install wiring devices after any required painting, is complete.

C. Conductors:
   1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
   2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
   3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
   4. Existing Conductors:
      a. Cut back and pigtail, or replace all damaged conductors.
      b. Straighten conductors that remain and remove corrosion and foreign matter.
      c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:
   1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
   2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
   3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
   4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
   5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
   6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
   7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
   8. Tighten unused terminal screws on the device.
   9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:
   1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top.

3.2 GFCI RECEPTACLES

A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

A. Comply with Section 26 05 53 "Identification for Electrical Systems."

B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
   1. Test Instruments: Use instruments that comply with UL 1436.
   2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

B. Tests for Convenience Receptacles:
   1. Line Voltage: Acceptable range is 105 to 132 V.
   2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
   3. Ground Impedance: Values of up to 2 ohms are acceptable.
   4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
   5. Using the test plug, verify that the device and its outlet box are securely mounted.
   6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions remove malfunctioning units and replace them with new ones, and retest as specified above.

C. Wiring device will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION