



GENERAL NOTE:

1. Update **all footers** to include Division Title.
2. Update **all dates in footers** to read:
06/01/2017

DIVISION 01

1. Page 15, after **Section 107, 2, c**, add the following:
 3. MANUFACTURE SOURCING
 - a. All piping shall be domestic manufactured piping.
2. Page 14, **Section 106, C, 3**, revise as follows:
 3. The decision to use a slab-on-grade on an improved sub-grade or a structural floor slab constructed over a crawl space or void space shall take place at the project initiation and shall be based on the need for accessibility for future changes to the occupancy above, costs and the magnitude of potential slab vertical movements acceptable to TCCD. Discussion should include and consider fire protection requirements, exterior wall construction, and project schedule.
3. Page 23, **Section 110, A, 2, e**, revise as follows:
 - e. HVAC & Lighting Controls Diagrams including
 - 1) Lighting Controls as-built
4. Page 22, after **Section 110, A, 2, f**, add the following:
 - g. Design Professional Field Observations Reports.
 - h. Design Professionals to coordinate with TCCD Technical Teams for key observations, deficiency lists, and punch lists.
 - i. TCCD Project Manager shall maintain and coordinate deficiency reports with TCCD Technical Team.
5. Page 23, after **Section 110, D, 2, h**, add the following:
 - i. Lighting Control Diagram
 - j. Emergency Lighting Layout and Control Modes
 - k. Operation and Maintenance Manual
6. Page 10, **Section 102**, add the following:

ODMC
5450 N. Riverside Drive
Fort Worth, Tx 76137

OWTL
2301 Horizon Drive
Fort Worth, Tx 76177

DIVISION 21

1. Page 117, **Section 101, C**, revise as follows:

C. A fire hydrant flow test shall be required anytime a new fire suppression system is part of a project. The design professional shall request the fire hydrant flow test information from the local municipality and if the information is not less than five years old, a formal request shall be submitted to TCCD to have a fire suppression contractor perform the test and provide the information. The water test should be conducted at a maximum flow from a hydrant as close to the facility as possible. A minimum of two-2.5 outlets should be flowed, then static & residual reading recorded. If possible standard play pipes should be at-tached to the 2.5 inch outlets with the brass nozzle tip removed so readings are taken from the 1.75 inch nozzle outlet. It is possible a pumper outlet (~4") is the only outlet to be flowed. The sprinkler contractor shall be accountable to verify the water test is accurate so their designs and provide a minimum safety factor in all calculations. Minimum required data for each fire flow test shall include the following:

2. Page 117, after **Section 101, C**, add the following:

D. No mechanical joints will be concealed or inaccessible. Where piping is concealed or inaccessible, it shall be welded by Certified and Licensed welders or factory pre-fabricated.

3. Page 118, delete **Section 102, A**, and replace with the following:

A. STEEL PIPE AND FITTINGS

1. Fire sprinkler piping NPS 2 or smaller shall be Schedule 40 and may be joined by either threaded fittings, welding or grooved coupling fittings. Fire sprinkler piping larger than NPS 2 shall be Schedule 10 (minimum) and may be joined by threaded fittings, welding or grooved coupling fittings. All grooved coupling fittings shall be Victalulic brand, domestically-manufactured 73-009N FireLock EZ type fittings. Grooves for piping NPS 2 or smaller shall be machine-rolled, not cut. Grooves for piping larger than NPS 2 shall be machine-cut, not rolled. Where piping is welded, all welds shall be primer coated. All pipe and fittings shall be domestically manufactured.
2. Fire sprinkler pipe and fittings used in dry pipe or pre-action sprinkler systems shall be domestically manufactured galvanized pipe.

4. Page 118, **Section 102, C, 1**, revise as follows:

1. Water service to each building shall occur within 6-feet of the building perimeter in accordance with NFPA 24 and be located in an equipment or mechanical room. Water service into each building shall utilize a one piece stainless steel riser fitting capable of extending from below the foundation of each building. No connections are permitted under the slab. Thrust blocking shall be included to meet or exceed requirements in NFPA 24.

5. Page 118, after **Section 102, C, 1**, add the following:

1. Zoning of fire suppressions sytems shall be coordinated with TCCD.

6. Page 119, after **Section 102, D, 2**, add the following:

2. Where possible, use dry sidewall sprinkler heads in lieu of antifreeze or dry-pipe systems in areas prone to freezing.

7. Page 5, **Table of Contents, Chapter 21 Title**, revise as follows:

FIRE SUPPRESSION

8. Page 119, **Section 102, D, 1**, revise as follows:

1. Sprinkler heads utilized for wet pipe sprinkler systems in spaces with ceilings, recessed type pendent sprinkler heads shall be the standard type utilized in TCCD buildings. Concealed type pendent sprinkler heads are acceptable in areas where enhanced appearances are required or where a specific room function or hazard condition exists (athletics spaces, computer labs). Concealed head cover plates shall have custom colors based upon the architects color scheme.

9. Page 119, **Section 102, E**, revise as follows:

- E. SPECIAL FIRE SUPPRESSION SYSTEMS, INCLUDING DRY-PIPE, PRE-ACTION, CLEAN AGENT, FOAM, KITCHEN HOOD, AIR ASPIRATION PIPING, ETC.

10. Page 119, **Section 102, E, 1**, revise as follows:

1. Special fire suppression systems are project specific. Consult with TCCD.

11. Page 121, after **Section 102, H**, add the following:

I. RISERS

1. Backflow preventers installed horizontally, to provide ease of maintenance.
2. Multiple vertical risers:
 - a. Valves operable/accessible from standing position (less than 4.5' AFF).
 - b. No crowding: Valve handles spaced to operate easily when wearing heavy gloves.
 - c. Devices installed at same heights, with straight-out orientation (not rotated/oblique).
 - d. Consistent orientation of valve indicators (OPEN/CLOSED, etc.) and gauge dials with lettering upright; properly spaced to provide unobstructed views.
3. All FDC check valves shall be installed at fire riser manifold.

DIVISION 22

1. Page 124, **Section 102, A, 9, b**, revise as follows:
 - b. A.O. Smith - Cyclone
2. Page 126, Delete **Section 1.02, A, 23, b**, and insert the following:
 - a. Domestic Water Meter
 - 1) [Sensus Omni C²](#)
 - 2) [Mastermeter Octave](#)
3. Page 126, after **Section 1.02, A, 23, b**, add the following:
 24. Shut-Off Valves
 - b. Solenoid Controlled Shut-Off Valve
 - 1) [Bermad Waterworks, Model 710](#)
4. Page 127, delete **Section 103, C, 1, b**, and replace with the following:
 - b. Four (4) inch diameter and larger: AWWA C900 Polyvinyl Chloride (PVC) pressure pipe and fabricated fittings (PR165) installed per the manufacturer's instructions. Follow the manufacturer's guidelines for expansion loops and offsets associated with pipe thermal expansion.
5. Page 128, after **Section 103, K, 1**, add the following:
 2. Fuel oil piping shall be schedule 40 black steel with threaded fittings inside buildings. Where the piping is routed outside and above ground the pipe shall be schedule 40 stainless steel with stainless steel threaded fittings. Where piping is run below ground the pipe and fittings shall be a double walled containment system made of fiberglass, similar to Amaron – Bonstrand II.
6. Page 128, **Section 1.04, A, 1, b**, revise as follows:
 - b. Provided solenoid controlled shut-off valve at domestic water service entrance to all buildings. This valve will allow for remote shut-off of the domestic water supply to the building. The valve shall be normally open and actuated by a 24 volt solenoid (coordinate electrical and control interface for the valve). The installation of the valve shall be downstream from the domestic water meter but prior to any tees, taps, etc. in the piping system.
7. Page 130, Delete **Section 1.04 B**, insert the following information:
 - B. Water Meter
 1. Provide turbine type cold water meter. Meter register shall be digital, indicating gallons. Specify with a digital output BAS interface, remote readout register and necessary wiring and accessories. Connect pulse readout point to campus WAGES, the Utility Monitoring System.
 2. The domestic water meter is intended to capture all domestic water use for a building (restrooms fixtures, water fountains, sinks, hose bibs, etc.). The meter shall be installed up stream of the building main domestic water shut off solenoid valve. The meter shall be installed in an easily

accessible mechanical space. The water meter shall be a turbine type with a digital register calibrated for gallons of water. The meter shall have a pulse readout point that will connect to the campus WAGES (utility monitoring system) and a digital output that will connect to the district BAS interface.

3. Provide domestic water pressure regulator if required. Units need to be approved by TCCD.

8. Page 132, after **Section 104, G, 7**, add the following:

8. For air compressors 3 HP and smaller provide a desiccant air dryer system similar to Speedaire, model 2YNL6. For air compressor 5 HP and larger coordinate with TCCD to select the appropriate air dryer system.

9. Page 133, after **Section 104, L**, add the following:

M. HYDRAULIC ELEVATORS

4. For hydraulic elevator installations the design professional shall comply with Texas Elevator code requirements and the requirements of the local authority having jurisdiction. Provide an integrated, oil/water separator, pumping and alarming system equal to the Park EleVader System.

10. Page 139, **Section 106, N**, revise as follows:

N. Contractor to furnish and install (TCCD standard) water meter and solenoid controlled shut-off valve on all building. Meter/valve locations and control/monitoring interfaces to be coordinated through TCCD. The contractor shall furnish and install (TCCD standard) natural gas meters and coordinate the control/monitoring interfaces with TCCD. Provide isolation valves to accommodate meter and valve servicing.

1. Irrigation Water Meter: Master Meter Octave

a. The irrigation water meter is intended to capture all irrigation water use for a building site. The meter shall be ordered with pulse output capabilities and installed up stream of the irrigation solenoid shut off valve. The meter shall be installed upstream of any branch tees on the irrigation water system.

2. Irrigation Water Solenoid Controlled Shut-Off Valve: Bermad IR-410-X

a. The irrigation water solenoid controlled shut-off valve is intended to provide the ability to remotely shut off the irrigation water supply. The valve is to be normally closed and actuated by a 24v solenoid. The installation is to be installed downstream of the irrigation water meter prior to any tees etc. in the irrigation plumbing system.

DIVISION 23

1. Page 141, **Section 102, A, 2**, revise as follows:
 2. Building Automation System – All campuses, except as noted, Reliable Controls, RC Studio. Trinity River (TR) Campus, Andover Continuum. Trinity River East Campus (TREC), Trane Summit.
2. Page 143, **Section 103, A, 5, c**, revise as follows:
 - c. Duct wrap shall be fibrous glass blanket thermal insulation complying with ASTM C 553-92, Type II, without facing and with all-service jacket manufactured from reinforcing scrim, aluminum foil, and vinyl film. At 1-1/2" thickness the liner shall have an installed R-value of 4.5, at 2" the R-value shall be 6.0. Duct wrap shall be similar to Johns-Manville, Microlite. Duct wrap insulation joints shall be sealed with fiber mesh and mastic to provide a continuous vapor barrier.
3. Page 143, after **Section 103, A, 6, d**, add the following:
 - e. All fire, smoke and combination fire/smoke dampers shall have adequately sized duct access doors.
4. Page 144, **Section 103, B, 3, a**, revise as follows:
 - a. Shall be either schedule 40 black steel or type K copper. Support and mounting of all piping shall comply with MSS SP-58 and MSS SP-69. Provide pipe hangers within 12 inches of each change in direction and provide hangers on both sides of line valves or unions.
5. Page 145, delete **Section 103, B, 4, b**.
6. Page 146, **Section 103, B, 6, h**, revise as follows:
 - h. Air vents shall be provided at all high points in the hydronic system. Where easily accessible manual operated general service type air venting valves shall be used. Where access is difficult or regular air entrainment is possible automatic type air vents shall be used and piped to a floor drain. Combination manual / automatic air vent manifold air vents shall be ball-float type design with brass/bronze or brass bodies, 300 series corrosion-resistant steel float, linkage and removable seat.
7. Page 148, **Section 103, C, 4, b**, revise as follows:
 - b. Piping shall be domestically produced copper tubing ASTM B 280, type ACR, hard drawn with joints soldered with ASTM B 32, grade Sb5 tin-antimony alloy (lead free) with ASTM B 813 solder flux or brazed with AWS A5.8, type Bag-5 with AWS A5.31 flux, except type BCuP-5 or BCuP-6 may be used for brazing copper-to-copper joints. Provide with wrought copper fittings conforming to ASME B16.22.
8. Page 148, **Section 103, C, 4, d**, revise as follows:
 - d. Refrigerant filter driers shall conform to ARI 710 and shall be one direction flow with molded porous core to remove moisture and foreign matter from the refrigerant stream and will be provided on all systems. For heat pump systems provide filter dryer as recommended by the equipment manufacturer, if no recommendations are present provide a filter dryer suitable for the system reversal associated with a heat pump.

9. Page 149, **Section 103, C, 6, a**, revise as follows:

- a. Shall be provided for all pipe penetrations through wall, roof or floors. Provide sleeves one size larger than the pipe it serves (accounting for insulation). Provide sleeves in non-load bearing surfaces fabricated of galvanized sheet metal, and sleeves in load bearing surfaces constructed of uncoated carbon steel pipe, Schedule 40. Sleeves shall not be installed in structural members. Seal all sleeves water and airtight. Provide UL listed sealant between pipe and sleeve as required by code. Provide escutcheon around penetrations in finished areas.

10. Page 149, **Section 103, C, 6, c**, revise as follows:

- c. When penetration is through a fire rated floor or wall, provide fire rated system so that the assembly, when complete, is UL listed and equals the fire rating of construction penetrated by the sleeve.

11. Page 150, **Section 103, D, 4**, revise as follows:

4. Specify equipment identification tags fabricated of laminated three-layer plastic with engraved white letters on a black background; minimum size 3 inches long by 1 inch high. Minimum lettering height for numbers and names is 3/8-inch; other data is 1/4-inch. Mechanically fasten tags to equipment using screws or rivets. Exterior equipment labeling shall be a brass tag riveted to the equipment casing.

12. Page 152, **Section 104, B**, delete line 4, and adjust numbers below.

13. Page 152, **Section 104, B, 1**, revise as follows:

1. Provide factory assembled and tested, packaged water cooled, liquid chiller consisting of (VFD with adaptive internal controls if applicable to specific design), centrifugal compressor, compressor motor, condenser, evaporator, purge unit, refrigeration accessories, instrument and control panel including gauges and human interactive control screen (control screen shall be full color with touch screen control), auxiliary components and accessories, and motor starters. Provide units meeting the requirements of ARI Standard 550/590. JCI to Trane or approved equal.

14. Page 153, **Section 104, E, 1**, revise as follows:

1. Packaged cooling towers, provide complete factory assembled unit or units for outdoor installation, cross-flow induced draft type vertical discharge tower with gear-drive ultra-quiet fan, water distribution basins, and VFD compatible premium efficiency motor. Cooling tower shall be constructed entirely of type 304 stainless steel with 14 mil thick PVC fill. Sump basin shall have an electronic/digital water level controller that is BacNet compatible. No belt driven fans shall be used.

15. Page 154, after **Section 104, E, 14**, add the following:

15. As part of the cooling tower selection process the design professional shall coordinate with TCCD to determine which of the following evaluations should be included as part of the tower selection.
 - a. Perform a life cycle cost analysis that includes the tower size, tower fan, tower pumps and the temperature differential to optimize energy usage.
 - b. Evaluate the need for debris or bird screen on the tower.
 - c. Evaluate how required architectural screening of the tower might impact tower performance.
 - d. Evaluate cooling tower sound attenuation.

16. Page 155, after **Section 104, F, 8**, add the following:

9. Where pumps will be controlled by a variable frequency drive the pump motor shall be rated for use with the VFD. Pumps with integral VFDs are not permitted.

17. Page 156, **Section 104, G, 12**, revise as follows:

12. Provide counterflow water coils, up to six (6) rows deep to accommodate the calculated load. Base coil selections on 45°F chilled water for cooling coils and 140°F heating water for heating coils, with the design delta T across the coils being 20°F and 40°F respectively.

18. Page 156, **Section 104, H, 1**, revise as follows:

1. The rooftop unit shall be factory assembled and tested to ARI standards. A fully Bacnet compatible controller shall be provided with each unit. The controller shall control all aspects of the unit operation and shall have terminals for thermostat/temperature sensor inputs and general alarm outputs. Where indicated on the construction documents the unit shall include an economizer section, including dampers, motor actuators, controls and relief. The preference on all TCCD projects is to utilize natural gas heating with the unit heat exchanger being stainless steel. Electric heating can only be used with prior approval from TCCD. All units shall be high efficiency models with ECM evaporator fan motor. Indicate the following options for all units – insulated roof curb, hail guards, integral disconnect switch, through the roof curb electrical connections, unit mounted GFCI receptacle and 2" filter rack.

19. Page 157, **Section 104, I, 1**, revise as follows:

1. The air-handling unit shall have a total energy wheel capable of both latent and sensible heat energy exchange, as an integral part of the air-handling unit. Only rotary wheels that are ARI 1060 listed shall be considered. Wheel performance shall meet or exceed scheduled performance, but shall be no less than 70% effective when the specified flow rate and exhaust rate are equal. On mixed air units, the return air damper shall be an integral part of the energy wheel section. Access sections with service doors shall be provided both upstream and downstream of energy wheel. Access shall be of sufficient length in direction of airflow to provide physical access to both airstreams paths for periodic wheel maintenance or cleaning. Energy recovery system shall have both certified performances of the air-handling unit (ARI 430 and ARI 410) and of the enthalpy wheel. (ARI 1060). Coordinate BAS interface/integration with energy recovery unit internal controls.

20. Page 158, **Section 104, J, 3**, revise as follows:

3. The preferred fan configuration for TCCD projects is a direct drive fan with a variable frequency drive, with motors ¾ HP and above being selected at 3 phase, if motor is only available in single phase the preferred voltage shall be 277 volts. If a direct drive fan is not available for the intended design application then a V-belt drive shall be used. Use V-belt drives designed for not less than 120 % of the connected driving capacity. Provide variable frequency drives on belt driven fans for balancing. Provide removable metal guards for exposed V-belt drives, and provide speed-test openings at the center of rotating shafts. Provide fans with personnel screens or guards on both suction and supply ends, except that screens are not required, unless otherwise indicated, when ducts are connected to the fan. Specify fans with L50 bearing life rated at not less than 200,000 hours as defined by ABMA 9 and ABMA 11.

21. Page 158, **Section, K, 1**, revise as follows:

1. Provide ETI variable volume, single duct terminal units with a calibrated air volume sensing device, air valve or damper, actuator, foil faced scrim backed insulations and accessories. Provide 25% spare flow capacity in VAV terminal units for potential changes in space use. Fan powered units shall be equipped with high efficiency ECM motors.

22. Page 158, **Section 104, L, 3**, revise as follows:

3. Multiple fume hood installations shall be connected by a duct manifold and exhausted by a single vortex type roof mounted fan. Each fume hood shall have an air flow monitoring station and a precision venturi air valve. The campus control system shall directly control the air valves and other system components, the use of a sub-control system for the fume hood system is not acceptable.

23. Page 164, delete **Section 105, K, 4**

24. Page 165, **Section 105, M, 1**, revise as follows:

1. When the campus site layout, topography, subsurface geology or other conditions prohibit the construction of utility tunnels, use direct-bury pre-insulated piping, as manufactured by Thermacor, for campus chilled water and heating hot water piping distribution. Provide a minimum of six (6) inches clearance between outside of insulation of individual pipes for future maintenance.

25. Page 165, **Section 105, M, 2**, revise as follows:

2. Provide concrete vaults for piping valves and taps. Vault designs shall be similar to utility tunnel design, each vault shall have a sump and sump pump.

26. Page 167, after **Section 105, N, 5, k, 8**, add the following:

- 9) Applicability of plate-and-frame heat exchanger free-cooling.

27. Page 168, **Section 105, O, 1**, revise the table information as follows:

SUMMER OUTDOOR DESIGN:	100°F dry bulb / 78°F wet bulb
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28. Page 170, **Section 105, P, 3**, revise as follows:

3. Provide mechanical rooms with a minimum of one (1) floor sink and hose bibb.

29. Page 170, **Section 105, P, 4**, revise as follows:

4. Pipe equipment drains, condensate, blow-down lines, etc. to a floor sink with a code-approved air gap fitting.

30. Page 170, delete **Section 105, P, 2** and renumber remaining section.

31. Page 163, after **Section 105, F, 6**, add the following:

7. Duct Smoke Detectors: Contractor shall coordinate all air handler duct detector installations with TCCD prior to installation.

32. Page 163, **Section 105, G, 5**, revise as follows:

5. Provide vibration isolation curbs (Mason Industries model RSC or approved equal) sized to match the air handling unit base rail for air handler installations on floors above grade if air handlers are not internally isolated, with exception for fanwall.

DIVISION 24

1. Page 171, **Section 101, C**, revise as follows:

C. The design professional and TCCD shall meet by the first project design submittal to determine if commissioning by a third party CX firm will be part of the project. If commissioning is to be provided the construction documents (drawings and specifications) shall clearly indicate that the contractor and the contractor's sub-contractors need to include the needed time to coordinate and provide support for the commissioning agent.

2. Page 171, after **Section 101, C**, add the following:

D. Cx firm shall be contracted in two phases - design review and implementation. This will better help the Cx agent accurately scope the implementation phase based on the actual design.

3. Page 177, **Section 109, A, 13**, revise as follows:

13. Fire Alarm

4. Page 177, delete **Section 109, A, 17, a**

DIVISION 25

1. Page 183, **Section 101, B, 3**, revise as follows:
 3. The digital Building Automation System (BAS) shall be 100% compatible with all Tarrant County College District (TCCD) facilities utilizing server based control and server based graphical user interface software manufactured by Reliable Controls Corporation except for the Trinity River Campus (TR) that uses a legacy Andover Continuum system and the Trinity River East Campus (TREC) that uses a Trane Summit ES system.
2. Page 185, after **Section 101, G, 2, j**, add the following:
 - k. Proposed graphics for the components and systems controlled shall be submitted along with the component or system architecture submittal for approval.
3. Page 185, **Section 102, A, 1**, revise as follows:
 1. Subject to compliance with terms and conditions each authorized installation contractor agrees to provide the following from BAS manufacturers and suppliers except for the campuses as noted in section 1.01,B,3 above where the systems noted will be used:
4. Page 195, **Section 102, E, 1, a, 15, i, second bullet**, revise as follows:
 - System layout
5. Page 198, delete **Section 102, F, 4, e**
6. Page 198, delete **Section 102, F, 4, f**
7. Page 198, delete **Section 102, F, 4, g**
8. Page 190, **Section 102, E, 1**, revise as follows:
 1. The graphic software shall be based on Microsoft Windows 7 or newer.
9. Page 191, delete **Section 102, E, 1, a, 4, iii**
10. Page 195, **Section 102, E, 1, a, 15, ii**, revise as follows:
 - ii. The operator interface shall allow users to access the various system schematics and floor plans via a graphical penetration scheme, menu selection or text-based commands. Graphics software shall permit the importing of *.BMP, *.PNG, or *.TIF drawings for use in the system.
11. Page 197, **Section 102, F, 1, a**, revise as follows:
 - a. Damper actuators shall be supplied and installed by the controls contractor. The motors shall be of the proper size required to operate the damper with uniform and gradual movement and shall return the damper to the same position for a given signal during an opening or closing movement of the damper. Damper operators shall be of the proportional type capable of accepting 0-10 volts control signal and 2-10 VDC feedback signal.

12. Page 202, **Section 103, C, 2**, revise as follows:

2. On-site Training: Provide (24) hours of training. This training shall be completed in groups of no more than 6 persons per group at one time in one 4hour session for each group. Also include four (2) hours of training for the Test and Balance Representative. The training shall focus on the specific installation and shall address both hardware and software. Specific as-built documentation for this project shall be used for reference as a part of this training.

13. Page 196, **Section 102, E, 3, a, i**, add the following as the third bullet:

- TCCD preferred method of user management is connection to Active Directory

14. Page 187, delete **Section 102, D** and adjust letters below.

DIVISION 26

1. Page 217, after **Section 101, A, 5**, add the following:
 6. NFPA 780, Lightning Protection Standard
2. Page 219, after **Section 103, B**, add the following:
 - C. Low Voltage Cable
 1. All Low Voltage Cables shall be blue in color. The standard Cat6a Cables to be used for TCCD projects shall be:
 - a. [Panduit Mini-Com TX6a 10 Gig UTP Jack Module - CJ6X88TG](#)
 - b. [Panduit TX6a 10 Gig Copper Cable with Advanced MaTriX Technology - PUP6AM04-UG](#)
 - c. [GenSpeed 10,000 - 7131819](#)
3. Page 221, **Section 104, B, 4**, revise as follows:
 4. Manufacturers: ABB or owner-approved equal.
4. Page 221, after **Section 104, B, 4**, add the following:
 5. Medium Voltage Transformers to be amorphous core type only.
5. Page 221, **Section 104, D, 5**, revise as follows:
 5. Manufacturer(s): Square D or owner-approved equal.
6. Page 222, **Section 104, F**, revise as follows:
 - F. Surge Protection Device and Connection Cable
7. Page 222, **Section 104, F, 1**, revise as follows:
 2. Surge Protection Device (SPD) and electrical high frequency noise filtering shall be provided at each service panelboard or switchboard, and at each panel board supplying sensitive electronic equipment. Where a service disconnect is provided ahead of an automatic transfer switch, provide a TVSS at the disconnecting means.
8. Page 223, **Section 104, F, 6**, revise as follows:
 6. Fire stop/seal conduit at SPD end to prevent ingress of smoke and/or particulate matter, via conduit, to panel board or switchboard. This situation would occur if SPD is hit with large surge that permanently damages it.
9. Page 223, **Section 104, F, 7**, revise as follows:
 7. Manufacturer(s): Current Technology, Model SL3-200
10. Page 223, after **Section 104, G, 6**, add the following:
 7. Provide an integral shaft-to-casing ground device/kit on all motors.

11. Page 223, **Section 104, H, 2**, revise as follows:

2. For building services having ground fault protection on the main device, provide coordinated ground fault protection on each main feeder device.

12. Page 225, **Section 105, B, 1**, revise as follows:

1. A complete Underwriter's Laboratories, Inc. certified "Master Label" lightning protection system shall be provided, as directed by TCCD, for structures.

13. Page 226, **Section 105, E, 1**, revise as follows:

1. Pole mounted fixtures of a rounded shape similar to the "Acuity DSX series" model series manufactured by LSI Lighting or other TCCD approved equal shall be provided for area and roadway lighting. Do not use cobra head type fixtures. Building mounted area lights will be selected to match or coordinate with adjacent pole mounted fixtures.

14. Page 226, **Section 105, E, 2**, revise as follows:

2. Bollard type fixtures shall be approved by TCCD.

15. Page 226, **Section 105, E, 3**, revise as follows:

3. The preferred method of floodlighting for building facades is by building mounted or pole mounted fixtures in lieu of ground-mounted fixtures. If ground-mounted fixtures are installed, recognize that the fixture is a high-temperature hazard and place it where it is not readily accessible by the public, minimize glare to pedestrians and minimize additional effort by grounds maintenance personnel.

16. Page 227, delete **Section 105, F**, and replace with the following:

F. Lamps and Ballasts

1. Reference TCCD Lighting Playbook for standard exterior fixture schedules.
2. Sodium vapor, mercury vapor and incandescent lamps shall not be used.

17. Page 228, **Section 105, J, 10**, revise as follows:

10. Type MC cable may be used only for lighting whips and in existing walls. Type AC or BX cable is not allowed.

18. Page 229, **Section 105, J, 16**, revise as follows:

16. Minimum size for raceways: 3/4" minimum for panel homeruns and minimum 1/2" within walls.

19. Page 229, **Section 105, L, 1**, revise as follows:

1. Reference the current version of the TCCD Lighting Playbook and its standard fixture schedule. Illumination foot candle levels shall be based on the recommended values given in the IESNA Handbook and allowances prescribed by the energy codes.

20. Page 231, **Section 105, L, 8, f**, revise as follows:

- f. TCCD has standardized on equipment manufactured by NLight for standalone and system occupancy sensors. If the room is equipped with NLight controls then the occupancy sensor will be an NLight unit attached to the NLight network and programmed into the campus NLight system along with touch stations for controlling the lights.

21. Page 231, **Section 105, L, 10, a**, revise as follows:

- a. The design professional shall study, when available, record, as-built, and/or renovation drawings to verify existing conditions. Every attempt should be made, short of destructive demolition, to verify existing conditions. Reuse lighting/mechanical circuits, for new lighting fixtures/mechanical equipment, when existing lighting fixtures/mechanical equipment has been removed. Update panel schedules after renovation work is complete, schedules shall be type written.

22. Page 231, **Section 105, L, 11, a**, revise as follows:

- a. Provide circuit identification for electrical equipment, receptacles and circuits for new and retrofit work.

23. Page 231, after **Section 105, L, 8, f**, add the following:

- g. Because of the ability for one circuit to power lighting in multiple classrooms, the design shall incorporate key switches located above the entrance to the classroom that can remove power from that classrooms lighting circuit. This will avoid repairs in one classroom from taking a whole bank of classrooms out of service.

24. Page 231, **Section 105, L, 9, a**, revise as follows:

- a. The preferred method to power egress lighting is to provide fixtures supplied from a circuit in an emergency panel fed by the emergency power source, centralized inverter system or generator as directed by TCCD.

DIVISION 28

1. Page 241, **Division Heading**, revise as follows:



28

Electronic Safety & Security / Fire Alarm Systems

2. Page 5, **Table of Contents, Division 28 title**, revise as follows:
28 ELECTRONIC SAFETY AND SECURITY/ FIRE SYSTEMS
3. Page 249, **Section 111, C, 2**, revise as follows:
 2. Fire Alarm System – SimplexGrinnell 4100ES connected to Simplex TrueAlarm network and UL TrueSite Workstation.
4. Page 249, after **Section 111, D, 1, b**, add the following:
 - c. Design exceeding minimum Life-Safety and Fire code requirements: Fire alarm systems installed in TCCD typically surpass minimum Life-Safety and Fire code requirements. TCCD's intent is to utilize fire alarm systems to provide early warning to building occupants and emergency responders, allowing them to take action before more serious fire conditions activate fire sprinklers. Additionally, TCCD's fire systems provide the backbone for a district-wide, central Emergency Communications Systems, for all types of urgent public notification. Both of these criteria require additional alarm sensing and public-notification equipment.
5. Page 250, after **Section 111, E, 1, d**, add the following:
 - e. Fire alarm wiring in conduit shall have a minimum 3/4" conduit size.
6. Page 251, **Section 111, E, 5, a**, revise as follows:
 - a. Heat detectors shall be provided in staff breakrooms, central utility plant machine rooms, wood shops, metal shops, laboratories and in other areas in which smoke or visible vapors are generated during normal operations.
7. Page 252, after **Section 111, E, 8, a, 4)**, add the following:
 - 5) Where a single FACP serves multiple buildings, satellite buildings shall have an annunciator panel.
 - 6) All work in new and existing (renovation/demolition) facilities shall include updating TCC fire alarm graphics to show new, relocated and/or removed fire alarm devices. Graphics features shall match (or exceed) performance of Simplex UL - Certified TrueSite(R) Workstation.