PART 1 - GENERAL

1.1 SUMMARY
A. Section includes complete pathway system and requirements for building control systems including but not limited to:
   1. Conduit and fittings
   2. Termination panels
   3. J-hooks and Bridal Rings
B. Related Sections:
   1. 25 05 13 Conductors and Cables
   2. Division 16 (Future 26)

1.2 REFERENCES
A. Refer to 25 0000 Integrated Automation

1.3 DEFINITIONS
A. Refer to 25 06 11 Integrated Automation Definitions
B. Continuous Pathway Enclosed pathway system such as conduit, cable tray, flexible conduit, etc.
C. Non-Continuous Pathway Open air pathway systems such as J-hooks, bridal rings, etc.
D. Pathways Support and protection system for conductors and cabling.
E. Sleeves Protection for wall and other penetrations.

1.4 SYSTEM DESCRIPTION
A. Communication and instrument wiring must be in approved pathways as defined herein.
B. Approved pathways include:
   1. Conduit as specified in Division 16 (future 26).
   2. Wall penetrations for wiring not in conduit, must be sleeved.
C. Directions for cable installation are:
   1. When there are four or more cables, down the hallway for lon/power install on j-hooks.
   2. When it is a few single pair, it could be wire tied, but needs to accessible and protected from mechanical cuts or abrasion. (Prefer wires run on side, not on top of ductwork. Will need to visually trace wires for troubleshooting.)
   3. Cables may not be supported on raceways. (conduit).
   4. Cables may be supported on HVAC ducts or supports.
D. Where specifically allowed or specified, pathway system includes hangers, bridle rings, j-hooks and other supports for cabling not required to be in conduit.
E. Floor level DDC power, communication, & instrument wiring can be installed above ceiling & within walls without conduit, but wall penetrations sleeves are required
F. Run wiring in conduit in mechanical spaces, non-accessible spaces, and other spaces where exposed wiring could be damaged.
G. Wiring above removable ceiling tiles must be run at least 12 inches above the tiles.

H. Communication wire runs within buildings may make use of communications cable trays and sleeves if acceptable to communications contractor.

I. Where trays are not available and wiring is not subject to mechanical abrasion and where conduit is not required:
   1. Space J-hook cable supports every 4 ft or in accordance with cable manufacturer's specifications, whichever distance is shorter. Use of tie wraps on structure, ductwork, wire, etc. for support is prohibited.
   2. Cable shall be free of tension at both ends. In cases where cable must bear stress, provide Kellems grips to spread stress over longer length of cable.

J. For indoor applications, Electrical Metallic Tubing (EMT) can be used. Where conduit is required to instruments, install a minimum 24 inch length of flexible conduit at the instrument to allow removal of the instrument.

1.5 SUBMITTALS

A. Refer to Division 16 (future 26) for submittal requirements

Note: Section specific submittal requirements should be defined here but not repeated from other sections. Stanford preference is for submittals to include only deviations from Division 16 (future 26) specifications. It is assumed that controls contractor will be following the specifications and industry best practices.

1.6 QUALITY ASSURANCE

A. All work shall meet the requirements of the National Electrical Code.

B. Install pathways parallel and perpendicular to building structure. Coordinate space requirements with other trades. Avoid horizontal runs inside walls.

C. Provide conduit sleeve for all free wire penetrations.

D. For fire-rated construction, seal penetrations to maintain fire rating of construction penetrated.

E. Do not install pathways on floor or in any way that may obstruct access to equipment, spaces, walkways, etc.

F. Support pathways appropriately to avoid movement and vibration.

G. Refer to Division 16 (future 26) for additional requirements.

Note: Section specific quality requirements should be defined here but not repeated from other sections.

PART 2 - PRODUCTS

2.1 Refer to Division 16 (future 26) for pathway product requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify routing and termination locations of pathways prior to rough-in.

B. Coordinate equipment, floor, wall and roof penetrations with appropriate trades.
   1. Provide penetrations for pathways.
   2. Provide appropriate sleeves for penetrations.
   3. Provide fire-stopping as required.
C. Provide pathways for all work within this division.
   1. Provide conduit stub from wall sensor to associated controller.
   2. Provide continuous enclosed conduit pathway systems in mechanical spaces, electrical spaces, and in any areas not specifically allowed to be non-continuous pathways.

D. Size conduit and boxes by circular mil size of cable in conduit or box.

E. Minimum conduit size from panel to J-box is 3/4". From J-box to single instrument is 1/2" unless otherwise noted.

F. Maximum length of flexible conduit is 3 feet.

G. Conduit Sizing: Conduit run between Field Terminal panels and field instrumentation J-boxes shall be sized to provide an additional twenty-five percent (25%) of wiring capacity for future control modifications.

3.2 PROTECTION

A. Conduit and raceway penetrations through fire rated walls and floors require firestopping.

B. Provide sleeves for penetrations of non-continuous pathways. Coordinate sleeve selection and application with Division 16 (future 26).

C. Do not cut, remove, or pierce general or mechanical insulation, fire rated walls, ceilings, or steelwork without prior permission and instruction.

D. Provide appropriate protection for all work within this division.

END OF SECTION