SECTION 27 50 00

PUBLIC ADDRESS GENERAL REQUIREMENTS

PART 1 GENERAL

1.01   SUMMARY

A.   This Section includes requirements for the Public Address System.

1.02   RELATED SECTIONS

A.   Related Sections include, but are not limited to, the following:

1.   This Section provides supplemental information to the Division 27 Specification Section *Basic Communications Requirements*.

1.03   SUBMITTALS

A.   In addition to the criteria set forth for Submittals in Division 27 Specification Section *Basic Communications Requirements*, provide the following: (Upon request from D.o.T.S. Project Manager)

1.   Shop Drawings: In addition to that called for in the Specification Section above, provide the following:

a.   Floor / reflected ceiling plans indicating equipment locations.

b.   One-line diagrams detailing the interconnections of the Public Address system components. Identify all devices, cabling, terminations, and termination techniques as required to provide a fully functional system.

c.   Detail drawings, including dimensional identification and intended installation methods. Drawings shall include, but are not limited to:

1)   Wall/ceiling mounted devices.

2)   Equipment racks.

3)   Equipment mounted within furniture.

4)   Speaker assemblies.

5)   Non-standard manufactured equipment.

6)   Panels and plates, including details relating to engraving, finish and color.

7)   Custom designed consoles, tables, carts, support bases, shelves, etc.

8)   Schematics drawings for custom circuitry, components, wall and floor plates, etc.

9)   Unusual equipment modifications.

10) Identification of cable routing within equipment racks and housings.

1.04   RECORD DOCUMENTS

A.   In addition to the criteria set forth for Record Documents in Division 27 Specification Section *Basic Communications Requirements*, provide the following: (Upon request from D.o.T.S. Project Manager)

1.   System component labels and identifiers for all major components, including engraved, lamacoid, silk screen and paper labels.

2.   Applicable software block diagrams representing the internal operation of programmable devices integral to the operation of the Public Address System.

1.05   OPERATION AND MAINTENANCE MANUALS

A.   In addition to the criteria set forth for Operation and Maintenance Manuals in Division 27 Specification Section *Basic Communications Requirements*, provide the following: (Upon request from D.o.T.S. Project Manager)

1. Software: Include all source code, executable code, configuration files and data files required for the Public Address system.

    a. Software shall include, but shall not be limited to:

        1) All source code for custom programs. Source code shall be provided on CD-ROM.

        2) Public Address system software.

        3) Control system software.

        4) Computer operating systems software.

        5) Application software.

        6) Version Documentation: Provide a spreadsheet in MS Excel format documenting all software and firmware versions for all programmable devices. Provide in both printed format and on CD-ROM.

1.06 SYSTEM DESCRIPTION

A. The Public Address System shall broadcast messages throughout the facility utilizing any standard telephone connected to the facility telephone system. Messaging shall also broadcast throughout the facility utilizing an administration telephone set integral to the paging system. One-way communication (paging) to all other areas within the facility. A general all zone and an emergency all zone paging feature shall be provided. The Public Address System Head-end equipment shall be wall mounted within the Main Telecommunication Room. The Contractor shall be responsible for providing all necessary wall mounted equipment, power distribution and cabling management to install the Public Address System within this area. The Contractor shall coordinate with the Telecommunications Contractor to ensure the Public Address System and all other building system remain separate and unaffected from possible interference. Contractor shall coordinate with Owner for all specific programming requirements such as room name identification, zone identification, emergency functionality and tone schedules.

1. Clock system: The Public Address System shall interface with the Clock System for the purpose of synchronization of facility clocks and bell tones.

PART 2 MATERIALS

2.01 GENERAL

A. Manufacturer: Unless otherwise indicated, equipment in this Section shall be the standard products of a manufacturer regularly engaged in the manufacture of such products. All components used in the system shall be commercial designs that comply with the Specifications. Each major component of equipment shall identify the manufacturer's name, model and serial number. Items of the same classification shall be identical. This includes equipment, modules, parts, and components. The Engineer retains the right to reject products which reflect, in the Engineer's opinion, sub-standard design practices, manufacturing procedures, support services, or warranty policies.

1. Unless otherwise indicated, the equipment by the following manufacturers shall not be substituted. The Contractor shall provide the most current model and/or version of product available by listed manufacturer at time of procurement:

    a. Bogen

B. Plenum Rating:

1. Cable shall be plenum rated. Cable shall bear plenum markings.

2. Supports, incidental materials, cable ties and cable retainers shall be plenum rated to match that of associated cable.

C. Part Numbers: Refer to the equipment schedule on Drawings for specific part numbers. Part numbers listed in the equipment schedule define the performance specifications for the parts and shall be per the most recent manufacturer's cut/data specification sheets available at the time of bid.Provide materials in quantities as required to provide a fully functional and operational Public Address System.

2.02   **EQUIPMENT SPECIFICATIONS**

A.   This equipment shall as a minimum conform to the following specifications:

1.   Ceiling Loudspeaker

a.   The Contractor shall reuse the existing public address loudspeakers whenever possible. All defective units shall be replaced with a like in kind product matching the existing unit's characteristics as close as possible.

b.   The loudspeakers shall be passive transducers with 25/70 volt transformers with variable tap selections.

2.   Loudspeakers Horn

a.   Loudspeaker horn shall be passive transducer with 25/70 volt transformer with an impact resistant, weather proof housing.

3.   Public Address System Head-end

a.   The public address head-end shall provide 1 telephone interface ports for connection to the facility phone system. This shall enable any standard phone on the facility phone system to access the Public Address System and distribute a message or indicate an intercom call.

PART 3 EXECUTION

3.01   **GENERAL**

A.   Work shall comply with the Governing Requirements as defined in Division 27 Specification Section *Basic Communications Requirements*. Governing Requirements of particular relevance to this Section include, but are not limited to:

1.   IEEE C62.41: Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits

2.   UL 1449: Transient Voltage Surge Suppressors

B.   Speakers

1.   All speaker cables will need to be home runs to the closest MDF or IDF following DPS structured cabling standards.

2.   There will need to be two18/4 Shielded Plenum rated cables with a drain wire ran between MDF and all IDF's to be used as feeder cables. These cables will need to be punched down on a dedicated S66M 1-50 + 89 D mounting brackets.

3.   All speaker cables will need to be labeled with a Panduit PanTher handheld labeler. Handwritten labels will not be accepted. Example B-25 B= IDF and 25 = cable number.

4.   Speaker cable will need to be 18/4 Shielded Plenum rated two pair with a drain wire.

5.   Both pairs will need to be punched down using the correct color code. (Green, Red, Black, White). First pair is being Green/Red and second pair being Black/White.

6.   All drain do need to be terminated on a grounding block in each IDF/MDF. Causes feedback.

7.   All cables will need to be punched down on S66M1-50 blocks with an 89D mounting brackets.

8.   All blocks will need to be labeled with correct cable number.

9.   All speaker locations will need to be identified on the Record Drawing.

10. All Horns installed in the Gym will need to have protective wire cages and installed at 10'-12' above AFF. Unless other wised approved.

11. All speakers/horns need to be labeled at the speaker/horn location. Speakers in grid ceiling need label affixed to the grid. Horns need labeled on bottom of horn. Labels need to be visible from floor.

12. All external horns are mounted between 10' -12' with single gang weather proof box. OSP cable is installed between horn and single gang box.

C. Speaker terminations

1. All classroom speakers will need to be set at 2 watts using the 70V taps. Speaker cable green conductor terminates to the 2 watt 70v lead on the speaker. Speaker cable red conductor terminates common (black) lead of the speaker.

2. All hallway speakers will need to be set at 4 watts using the 70V taps. Speaker cable green conductor terminates to the 4 watt 70v lead on the speaker. Speaker cable red conductor terminates common (black) lead of the speaker.

3. All gym and cafeteria paging installations will use horns. Horns will need to be set at 4 watts using the 70V taps. Speaker cable green conductor terminates to the 4 watt 70v lead on the speaker. Speaker cable red conductor terminates common (black) lead of the speaker.

4. Wire nuts will need to be used in making all speaker terminations.

5. All classroom and hallway volume controls will need to be set at ½.

6. All gym and cafeteria volumes will need to be set at ¾.

D. Zone Paging Specifications

1. The Bogen PCM 2000 and Bogen Amps will need to be located close to the paging station blocks.

2. The output jumpers of the PCM2000 will need to be run to the Amps neatly as possible by using white spools or D-Rings. DoTS tech will made final termination to equipment.

3. The PCM2000 power cord will need to be labeled at the plug end. Paging Unit.

4. If a power strip is needed it will be securely fastened to the backboard as close as possible the paging equipment.

5. Each Amp will be labeled with 2 labels. Amp number on one label and the zone number on the second label. Example: Amp1 Zone 1, Amp2 Zone 2, and Amp3 Zone 3.

6. Each amp's power cord will need to be labeled at the plug end with the correct amp's number. Amp1, Amp2, Amp3.

7. Each Amp's output will go to a distribution block (S66M 1-50 + 89 D mounting brackets) and will be looped to 12 pairs of that block. Amp1's output will be terminated on distribution block 1 pairs 1-12. Amp2's output will be terminated on distribution block 1 pairs 13-24 amp3's will be terminated on distribution block 2 pairs 1-12. The distribution block will be labeled with the correct zone number pairs 1-12 = Zone1, 13-24 = Zone2, 1- 12 (2nd Block) = Zone3.

8. There can only be a maximum of 3 speakers looped to 1 pair off of the distribution block.

9. The looped speakers can only be on one side of the speaker station block field.

10. IDF feeds from the distribution block cannot be on a loop. They need to be a dedicated jumper from the distribution block.

11. IDFs will need to have a distribution block installed and labeled just like the MDF's distribution block. Punched down across from feeder pairs and use bridging clips.

12. All jumpers will need to be ran using white spools and or D-rings for longer runs.

13. The contact closer on the Amps will need to be terminated on the master clock feed for bell operation. The best way to accomplish connecting the amps to this feed is to run a 4 pair station cable from the amps to the Master Clock port then crimp on an 8 conductor modular plug made for solid wire. Zone 1 =White/Blue pair to Master Clock, Zone2 = White/Orange pair to Master Clock and so forth. The Master Clock feed is located on a patch panel in the wiring frame.

14. DPS will provide the most current As-builds that we have.

15. The As-builds provided will need to be marked up with the speaker cable number associated to the room that has been assigned a zone and returned to DoTS. That cable number will also need to be on the speaker station block. Also label the speakers.

16. Each zone and speaker will need to be tested for volume levels and zone accuracy. Classrooms need to be tapped at 2 watts and volume set at ½. Hallways need to be tapped at 4 watts and volume set at ½.

17. All gym and cafeteria speakers/horns need to be tapped at 4 watts and volume set at ¾.

18. All call will always be 0

19. DPS will always be Zone 1.

20. Refer to the Zone paging drawings on how to run jumpers. Jumpers are NOT to be run over the top of the blocks.

E. PCM 2000 Programming (DoTS will program PCM 200)

1. PCM 2000 programming shall be as follows:

a. Default Timer 050 = 00

b. VOX Timer 051 = 00

c. For Dip switch settings refer to the PCM2000 Configuration Guide page13, Configuration 5: Station Level/Centrex-3-Zone, One-Way Paging, Single Amplifier, 25/70V AC Speakers.

d. TIM Module Dip switch settings S1-S5, S7 = Off, S6 = on. Turn Tone Volume to ½.

e. CPU Dip switch settings S1-S4 = Off

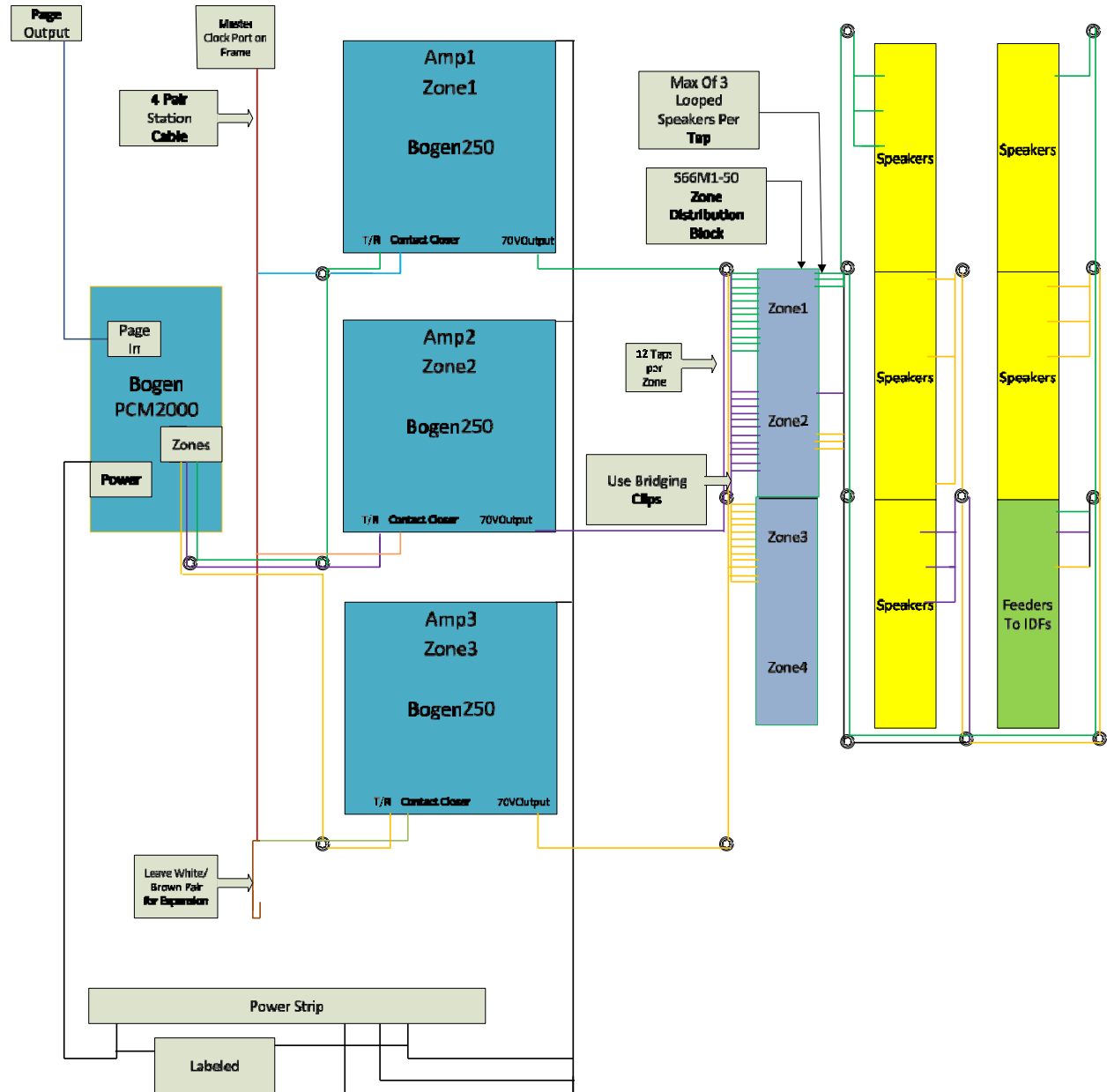f. ZPM Module Zone A, B, C, = Off. Output = Lo PWR

3.02   INSTALLATION

A. Pathways: Prior to installation of Public Address cabling, Contractor shall verify conduit sizing and quantity for correctness. Deviations from design documents shall be documented and Contractor shall contact Engineer with notification of deviation.
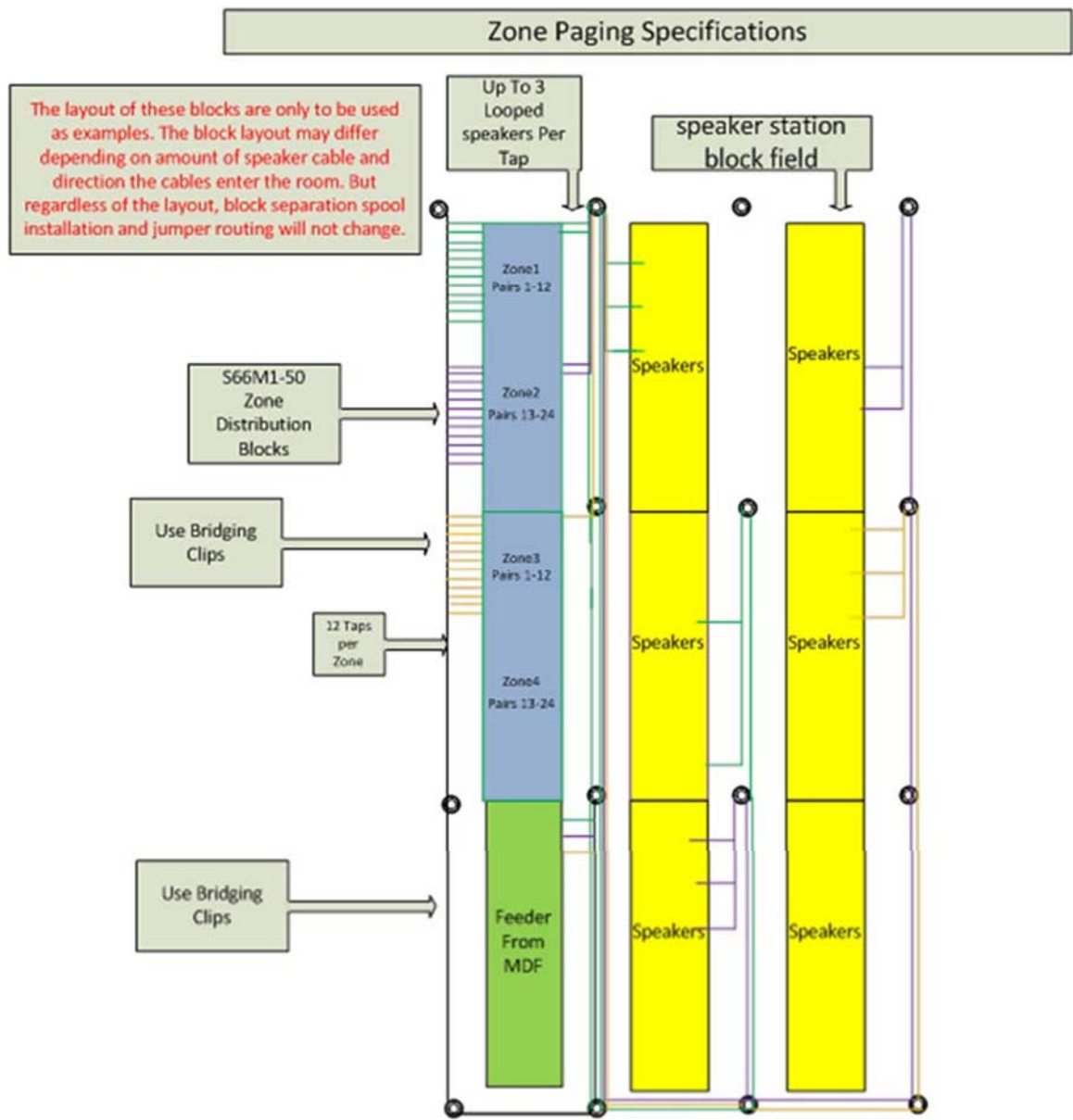
PART 4 – EQUIPMENT SCHEDULES

27 50 00 - Public Address (PA)		
Manufacturer/Part Number (newest on file)		
DESCRIPTION	**BOGEN**	**Special Rqmt/Notes**
CLASSROOM/HALLWAY SPEAKERS, WALL MOUNT, WOOD	WBS8T725V	
CLASSROOM/HALLWAY SPEAKERS, WALL MOUNT, METAL	MB8TSQVR	
CLASSROOM/HALLWAY SPEAKERS, CEILING GRID	CSD1X2VR	
BATHROOM, WALL MOUNT	MB8TSQVR	
BATHROOM, CUT IN	S86T725PG8WBRVR	
HORNS	SPT15A	
WATTAGE OF 70 OR HIGHER	TPU250	
WATTAGE OF 70 OR LOWER	TPU100	
PAGING SYSTEM	PCM2000	

PART 5 – ATTACHMENTS

5.01 – MDF

5.02 – IDF

Zone Paging Specifications

The layout of these blocks are only to be used as examples. The block layout may differ depending on amount of speaker cable and direction the cables enter the room. But regardless of the layout, block separation spool installation and jumper routing will not change.

Up To 3 Looped speakers Per Tap

speaker station block field

S66M1-50 Zone Distribution Blocks

Use Bridging Clips

12 Taps per Zone

Use Bridging Clips

Zone1 Pairs 1-12

Zone2 Pairs 13-24

Zone3 Pairs 1-12

Zone4 Pairs 13-24

Feeder From MDF

Speakers

Speakers

Speakers

Speakers

Speakers

Speakers

END OF SECTION 27 50 00