

Woodhaven-Brownstown School District



SECTION 00 01 10
TABLE OF CONTENTS

DIVISION 00 – BIDDING & CONTRACT REQUIREMENTS

<u>Section</u>	<u>Description</u>
00 01 01	Cover Page
00 01 10	Table of Contents
00 11 16	Invitation to Bid
00 40 00	Bid Forms
00 21 13	Instructions to Bidders
00 65 00	Contract Close-out

DIVISION 27 – TECHNOLOGY SYSTEMS

<u>Section</u>	<u>Description</u>
27 30 00	Phone System

APPENDICES

<u>Section</u>	<u>Description</u>
A	Phone Schedule

END OF SECTION

SECTION 00 11 16
INVITATION TO BID

PART 1 - GENERAL

1.01 WORK INCLUDED: DISTRICT VOICE SYSTEMS UPGRADES

A. Woodhaven-Brownstown School District (Owner) is seeking bids for a new telecommunications system, associated equipment and installation to replace the existing system. The system is intended to be a single enterprise Ethernet based system installed on the Owner's existing network. Proposed systems shall be configured and installed to service Owner's classrooms across multiple instructional facilities, and as described herein. Qualified Contractors must be prepared to provide full system demolition of the existing system following the new system cut over and acceptance.

B. Project: DISTRICT VOICE SYSTEMS UPGRADES

C. Owner: Woodhaven-Brownstown School District
24821 Hall Road
Woodhaven, Michigan 48183

D. Designer: Communications by Design, Inc.

E. Sites of Work:

1. Administration Building
24821 Hall Road
Woodhaven, Michigan 48183
2. Patrick Henry Middle School
24825 Hall Road
Woodhaven, Michigan 48183
3. Erving Elementary School
24175 Hall Road
Woodhaven, Michigan 48183
4. Woodhaven High School
24787 Van Horn Road
Brownstown, Michigan 48134
5. Support Services & Transportation
24793 Van Horn Road
Brownstown, Michigan 48134

6. Bates Elementary School
22811 Gudith Road
Woodhaven, Michigan 48183
7. Yake Elementary School
16400 Carter Road
Woodhaven, Michigan 48183
8. Gudith Elementary & Special Services
22700 Sibley Road
Brownstown, Michigan 48193
9. Wegienka Elementary School
23925 Arsenal Road
Brownstown, Michigan 48134
10. Brownstown Middle School
20135 Inkster Road
Brownstown, Michigan 48174

1.02 GENERAL DESCRIPTION OF PROJECT SEQUENCE

- A. Sequences and dates specified herein are for information only and indicate the plan and intent of the Owner. Actual dates shall be established based on final award of project.
- B. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner as required to meet schedules.
- C. Schedule:
 1. Request for Bid Distributed: Friday, February 16, 2024
 2. Pre-Bid Meeting: Thursday, February 22 at 11:00am
 3. Intent to Bid Deadline: Friday, February 23 by 5:00pm
 4. Question and Clarification Deadline: Friday, February 23 by 5:00pm
 5. Public Bids Due: Friday, March 8, 2024 at 10:00am

1.03 TYPES OF BIDS

- A. Bids shall be submitted in total and with required detail for each item bid and as is required herein, and include all portions of the work identified for the individual bid package as specified herein. Bids shall be made on unaltered bid forms as included herein. Bidder shall fill in all blank spaces and the bid

shall be signed by a legal officer or agent authorized to bind the bidder to a contract.

1.04 PRE-BID CONFERENCE

- A. A pre-bid conference will be held. A discussion of the project and review of bid documents will be followed by a site review and an opportunity to ask questions. Attendance is highly encouraged for all contractors interested in bidding on any components or portions of this project. Attendance at the pre-bid conference will be a factor considered during evaluation of bids.
- B. Time: Thursday, February 22 at 11:00am
- C. Location: Woodhaven-Brownstown School District
Administration Building
- D. Any drawings identified in the table of contents herein will be distributed and reviewed at this conference.
- E. Physical building inspections of sites of work will be provided for at this time.

1.05 TIME AND PLACE OF BID RECEPTION

- A. Physically sealed bids for the base bid work will be received at the district office and read aloud at a public opening. Bids arriving after the appointed time as determined by the Owner's representative conducting the public opening, shall be returned unopened. Bids will be accepted beginning forty-eight (48) hours prior to the appointed opening time provided they are in sealed packages and addressed as specified herein.
- B. Bid Receipt Deadline: 10:00am on Friday, March 8, 2024
- C. Bid Opening Location: Woodhaven-Brownstown School District
Administration Building
- D. Faxed or electronically delivered bids will not be accepted.

1.06 EXAMINATION AND PROCUREMENT OF DOCUMENTS

- A. Specifications and any relevant Drawings may be obtained from the Technology Designer. Contractors may obtain copies by documented request to Communications by Design, Attn: Rebecca Szilagy. Requests may be made by:
 - 1. Writing – 4101 Sparks Drive, Grand Rapids, Michigan 49546
 - 2. Email – rszilagy@cbdconsulting.com

1.07 BID SECURITY

- A. Bid security equal to five percent (5%) of the total bid amount, must accompany each base bid in accordance with the Instruction to Bidders.
- B. Bid security shall be either a Bid Bond issued by a company licensed in the State of Michigan to furnish bid security or Certified Check made payable to the Owner.

1.08 PERFORMANCE BOND COVERAGE

- A. Selected Contractor(s) will be required to provide a performance bond and payment bond in an amount equal to one hundred percent (100%) of the bid amount including any accepted alternates at the Owner's discretion. Such bonds shall be issued by surety licensed by the State of Michigan and acceptable to the Owner.

1.09 OWNER'S RIGHT TO REJECT BIDS

- A. The Owner reserves the right to reject any and/or all bids. The Owner reserves the right to accept a bid, or portion thereof by issuance of a valid purchase order within ninety (90) calendar days following the bid opening. No bids may be withdrawn during this time without the specific approval of the Owner.
- B. Withdrawal of any Bids after the opening time without specific approval by Owner may result in forfeiture of required bid security by Bidder.

1.10 DEFINITIONS

- A. "Owner" is intended to mean Woodhaven-Brownstown School District, a Michigan general powers school district.
- B. For purposes of this project, the terms "Architect", "Engineer" and "Designer" are used synonymously to refer to Communications by Design, Inc., a Michigan Corporation.
- C. The term "Bidder" refers to any organization properly and accurately submitting a complete "Intent to Bid Form" prior to the required time specified herein and subsequently properly submitting completed set of bid documents as specified herein.
- D. The term "Contractor" herein is a reference to the firm(s) eventually selected by the Owner to provide the intended system(s), or any portion thereof, and fulfill the terms of the contract.

- E. The term Contract is a reference to the collective set of documents, drawings, diagrams, Owner's Purchase Order, Addenda and all other materials as provided for herein defining arrangement between Owner and Contractor.
- F. The term Addenda (or Addendum) are that portion of the Contract consisting of modifications, amendments, deletions or substitutions to the contract documents issued prior to the execution of the Contract.

END OF SECTION

SECTION 00 40 00
BID FORMS

Intent to Bid Form

Complete and submit the following form if you have interest or intend to submit a Bid for this project. Unaltered and completed forms must be received on or before 5:00 PM on Friday, February 23. Only bidders returning a completed "Intent to Bid Form" will be notified of required addenda.

Company Information

Name: _____

Address Line1: _____

Address Line2: _____

City, State and Zip Code _____

Primary Contact Information

Name: _____

Phone No.: _____

Fax. No.: _____

E-Mail Address: _____

Portions of the bid for which you will be responding:

☐

Section 27 30 00 – Phone System

Submit unaltered and completed form to:

Rebecca Szilagy

Communications by Design, Inc.

rszilagy@cbdconsulting.com

SEALED BID LABEL

Separate, or fold over, the label on the line below, and affix to the exterior of sealed container so information is clearly visible for Bid Submission. Insure label is attached in a manner to prevent accidental removal or defacement. Label shall serve as sole identification for sealed bid at submission.

BID TO: Woodhaven-Brownstown School District
Attention: Lyndsay Johnson-Lemieux
Administration Building

BID FROM: _____

PROJECT: DISTRICT VOICE SYSTEMS UPGRADES
BID #3041

INCLUDING Addendum No. _____ Dated _____
ADDENDA: Addendum No. _____ Dated _____

DUE: Friday, March 8, 2024 at 8:00am

BID FORM

BID TO: Woodhaven-Brownstown School District
Attention: Lyndsay Johnson-Lemieux
Administration Building

BID FROM: _____

PROJECT: DISTRICT VOICE SYSTEMS UPGRADES
BID #3041

The undersigned, having familiarized themselves with all local conditions affecting the cost of work, and having examined the site and all applicable Bidding Documents herein, and herein referenced, including, but not limited to, all addenda issued thereto, hereby propose to furnish all labor, material, equipment, applicable taxes and services required for proper completion of each of the following categories of this project for the sum of:

Bid Category _____ Title _____
Dollars (\$ _____).

Said amount written above constituting the Base Bid

TAXES:

Bid sum includes all applicable taxes.

ALLOWANCES:

Base bid includes all applicable allowance cost(s) as set forth herein.

COST OF BONDS:

Bid sum includes cost of furnishing a Performance Bond and Labor and Material Payment Bond, each in the amount of one hundred percent (100%) of the bid.

ACKNOWLEDGEMENT OF ADDENDA:

The following addenda have been received, are hereby acknowledged, and their execution is included in both base bid and alternate bids herein.

Addendum No. _____ Dated _____ Addendum No. _____ Dated _____

Addendum No. _____ Dated _____ Addendum No. _____ Dated _____

ALTERNATES:

Based bid amount may be increased or decreased in accordance with each of the following alternate bids as may be selected, following procedures stated herein. Alternates shown below are identified and described in detail on appropriate attachment(s) as referenced herein.

Five (5) Year Warranty Alternate _____

Voluntary Alternate A _____

Voluntary Alternate B _____

Voluntary Alternate C _____

Voluntary Alternate D _____

Voluntary Alternate E _____

PRINCIPAL SUBCONTRACTORS

As required herein, the following Subcontractors are proposed to be used for this project:

Legal Name: _____ Work Proposed _____

Legal Name: _____ Work Proposed _____

Legal Name: _____ Work Proposed _____

BID SECURITY:

Accompanying this Bid, as required herein, is a bid security in the form of Certified Check/Cashier's Check/Bidder's Bond in the amount of:

_____ Dollars (\$ _____), payable to the Owner, which it is agreed, shall be retained as liquidated damages, not as a penalty, by the Owner, if the undersigned fails to execute the Contract in conformity with the form of Contract incorporated and referenced herein and fails to furnish specified bonds within ten (10) days after date of issuance of a Letter of Intent to the undersigned.

If awarded the Contract, the undersigned agrees to commence work within ten (10) calendar days after date of issuance of a Purchase Order, which shall be considered as the notice to proceed, and agrees to complete the work in accordance with the schedule herein.

FAMILIAL DISCLOSURE:

Accompanying this Bid, as required herein, is a legally executed and notarized Michigan Familial Disclosure Statement.

EXCEPTIONS:

Bidder takes no exception to terms, conditions, specifications and/or any other requirements herein unless expressly noted, and specifically identified as provided for herein on unaltered Contract Exception form accompanying this Bid.

SIGNATORY AUTHORITY:

The undersigned certifies they are an authorized agent of the bidding entity, and legally able to bind the bidding entity to the terms, conditions and responsibilities of this, and all

referenced bid documents. Furthermore, the undersigned acknowledges an understanding that non-compliance of this authority or any other bidding requirements may result in forfeiture of bid security, dismissal of consideration of bid submitted, and/or personal liability against the signatory.

AGREEMENT:

The undersigned agree(s) to provide the post-bid information required within ten (10) days after notification of a Letter of Intent and to execute an agreement for work covered by this Bid on the Owner's standard Purchase Order for which terms and conditions are expanded to include all Bidding Documents and subsequent addenda issued thereto.

In submitting this bid, it is understood that the Owner reserves the right to reject any or all bids. It is further agreed that this bid is binding for a period of Ninety (90) days from the opening thereof.

Respectfully submitted,

Date: _____

Firm Name: _____

By: _____

Signed: _____

Title: _____

Official Address: _____

Telephone Number: _____

Fax Number: _____

Primary Contact Email Address: _____

(If Corporation, affix Seal)

Michigan Familial Relationship Disclosure Statement

In accordance with Section 1267 of Michigan Revised School Code this sworn and notarized statement of an authorized representative, discloses any familial relationship between the owner and/or any employee of the Bidder, and any member of the project Owner's governing Board(s) or Superintendent(s).

If any conflict of interest is discovered subsequent to submission of bid, written disclosure shall be submitted to the project Owner within seven (7) days of discovery. The project Owner reserves the right to immediately terminate any contract with Bidder upon notification of a conflict of interest. Upon such termination, the project Owner shall compensate Bidder only for the value of any goods or services provided to the Owner prior to such termination as determined by Designer.

(Check only one Box Below)

☐ It is hereby acknowledged and certified by Bidder that no familial relationship exists between the owner or any employee of the Bidder and any member of the project Owner's governing Board(s) or Superintendent(s).

☐ A familial relationship exists between the owner or an employee of the Bidder and a member of the project Owner's governing Board(s) or Superintendent(s). The person(s) and the relationship(s) are as follows:

Bidder

Board or Superintendent

_____	_____
_____	_____
_____	_____
_____	_____

Bidder Authorized Representative:

Bidder: _____

Representative's Signature: _____

Print or Type Name: _____

Representative's Title: _____

Subscribed and sworn this _____ day of _____, 2023.

In the County of _____ State of _____

By _____
Notary Public Signature

Seal or Stamp:

My commission expires on: _____

IRAN LINKED BUSINESS AFFIDAVIT

All Bids shall be accompanied by a sworn statement disclosing any Iran Linked Business relationship that exists within the owners, including its officers, directors and employees.

The undersigned, owner or authorized officer of _____ (the bidder), pursuant to Michigan Public Act No. 517 of 2012, the "Iran Linked Business" requirement provided in the Woodhaven-Brownstown School District Proposals hereby represents and warrants that the bidder, including its officers, directors and employees, is not an "Iran Linked Business" within the meaning of the applicable Public Act, and that in the event bidder is awarded a contract as a result of this RFB, the bidder will not become an "Iran Linked Business" at any time during the course of performing under the contract. The bidder further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than \$250,000.00 or 2 times the amount of the contract or proposed contract for which the false certification was made, whichever is greater, the cost of the District investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on future Requests for Bids for three (3) years from the date that it is determined that the person has submitted the false certification.

There is not an "Iran Linked Business" that exists within the bidder and/or owner, officers, directors and employees.

Bidder

[Company Name]

[Signature]

[Title]

This instrument was acknowledged before me, a Notary Public,

in and for _____ County,

_____ on this ____ day of _____,
20__,

[Notary Public Signature]

My Commission expires: _____

Acting in the County of: _____

REFERENCES

Customer name: _____
Address: _____
City/State/Zip: _____
Contact name: _____
Contact title: _____
Phone: _____
E-mail: _____
Scope of project: _____

Date of completion: _____

Customer name: _____
Address: _____
City/State/Zip: _____
Contact name: _____
Contact title: _____
Phone: _____
E-mail: _____
Scope of project: _____

Date of completion: _____

Customer name: _____
Address: _____
City/State/Zip: _____
Contact name: _____
Contact title: _____
Phone: _____
E-mail: _____
Scope of project: _____

Date of completion: _____

CONTRACT EXCEPTIONS

Check one Box

☐ Bidder takes no exception to, and agrees to comply with all sections, terms, conditions and/or requirements of the Contract Documents.

☐ Bidder proposes the following exceptions to the Contract Documents:

<i>Paragraph Number</i>	<i>Explanation</i>
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NOTE:

Exception(s) to any bid sections, terms, conditions and/or requirements deemed excessive for any reason by the Owner and/or Designer may result in disqualification of Bid.

SCHEDULE OF VALUES/BID FORM

(Bidder may submit version of only this form with slight variation. All information in this form is required. Form submitted must materially match below both in content and format. Electronic version of this form is required with bid package as Microsoft Excel compatible spreadsheet on provided USB drive for each project section being bid. Failure to provide appropriate and complete SCHEDULE OF VALUES, as determined by the Owner and/or Designer, may result in disqualification of Bid.)

Bidder:

Bid Division:27 30 00

ID	Qty	Part Number	Mfg and Description	Unit Cost	Unit Labor Cost	Total Proposed Cost
			New Extended Voice Terminal (EVT) Unit Price			
			Administrator Voice Terminal Expansion Module Unit Price			
			Conference Voice Terminal Unit Price			
			DECT Headset Unit Price			
			PROJECT MANAGEMENT			
			TRAINING			
			BONDS AND INSURANCE			
			GRAND TOTAL (Must match base bid)			

END OF SECTION

SECTION 00 21 13
INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 OWNERSHIP

- A. Bidders prepare and provide bids without any cost to the Owner and/or Designer. Once opened, bids become the sole property of the Owner. Bidders have no claim to, or ownership of bids opened. Bids become subject to all legal statutes including, if applicable, United States and Michigan Freedom of Information Acts and related laws.

1.02 COMPLIANCE

- A. This document establishes the primary system(s) design configuration. The Bidder's bid response shall include all services, supplies, components and equipment required to provide a complete turnkey system(s) which meets or exceeds all specifications for each given bid item being proposed.
- B. Owner prefers to enter into a contract with a single bidder for all materials for completion of this project, but shall consider combinations of portions of bids from various bidders. The Owner reserves the right to award portions of the project to multiple bidders who will be required to cooperate with one another in order to complete the work.
- C. By their response, Bidders agree to comply with all sections, terms, conditions and/or requirements of the contract documents except as expressly noted, and specifically identified by paragraph number on the unaltered Contract Exceptions Bid Form. Exceptions to any bid sections, terms, conditions and/or requirements deemed excessive by the Owner and/or Bid Coordinator may disqualify Bid.
- D. In compliance with the Freedom of Information Act (FOIA), the Owner shall make bid documents available for public review after issuance of purchase order to the successful bidder/s.
- E. In connection with the execution of this Contract, Contractor and any Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, or national origin.
- F. Negligence in preparation, improper preparation, errors in, or omissions from Bids shall not relieve Bidder from fulfillment of any and all obligations and requirements of the Contract Documents.
- G. All Bid documents and worksheets must be completed in detail and submitted together on time.

- H. All documents constituting the entire present agreement shall be construed in accordance with and governed by the laws of the State of Michigan.
- I. Designer shall have authority for interpretation of Contract Documents. In the event terms, provisions or any other portion of the Contract Documents is/are in dispute, Designer shall have full and final authority to interpret the Contract Documents, and such interpretation shall be final and binding.
- J. In the event of a conflict between any terms or conditions in any of the documents comprising the entire present Agreement, the terms and conditions set forth in this document shall take precedence.

1.03 NOTICE AND RESPONSE

- A. Upon notification of Bidder being considered as a finalist, the Bidder shall provide to the Owner and Designer, within 48 hours, a current “Dunn and Bradstreet Supplier Evaluation Report” and other documentation as may be required of finalists herein and as requested by Owner and/or Bid Coordinator.
- B. Bidder shall provide timely response to all requests from Designer and/or Owner regarding clarification and/or elaboration concerning, but not limited to its Bid as may be deemed relevant by the Owner and/or Designer.

1.04 PROTECTION AND SAFETY

- A. Contractor shall continuously maintain adequate protection of all Work from damage and shall protect the Owner’s property from injury or loss arising in connection with the execution of the Contract. Contractor shall make good any such damage, injury or loss, except such as may be directly caused by agents or employees of the Owner. The Contractor shall adequately protect adjacent property as required by law, by the Contract Documents, or as otherwise required, to cause no damage to them during the execution of the Contract. This requirement shall also apply to structures above and below ground as conditions of the site require.
- B. Contractor shall be solely responsible for, and have control over means, methods, techniques, sequences and procedures for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the contract. Contractor shall take all necessary precautions for the safety of employees and visitors on the site of the Project and shall comply with applicable provisions of federal, state, and municipal safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the Work is being performed. Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for the protection of workers and the Public.

- C. Contractor shall vigorously defend any and all suits that may be brought against the Owner by any person and/or entity, whether in the employ of the Contractor or not, for damage to property, and/or injury or death to persons alleged or claimed to have been caused by or through the performance of work.

1.05 DRAWINGS DIAGRAMS AND ILLUSTRATIONS

- A. Drawings, Diagrams and Illustrations are diagrammatic in nature and indicate general arrangement and nature of systems and work included.
- B. Floor plan drawings are provided to assist the contractor in preparing documentation and reports as required herein.

PART 2 - MATERIALS

2.01 VOLUNTARY ALTERNATES AND SUBSTITUTION OF SPECIFIED PRODUCTS

- A. This Request for Bid describes a particular implementation. All Bids must provide pricing on the “base bid” as described herein. Voluntary alternatives providing comparable functionality with significant cost reduction and/or performance enhancement may be proposed. Voluntary alternatives are encouraged, but must be identified as “Voluntary Alternates” and detailed on unaltered Bid Forms contained herein. Voluntary Alternates may be further detailed and/or explained in attachments to the unaltered Bid Forms contained herein. Exceptions to the Request for Bid specifications must be clearly noted and explained for each Voluntary Alternate proposed.
- B. No substitutions of specified products may be made without specific prior authorization by Designer and Owner. Individual bid divisions herein contain particular information related to acceptable manufacturer and product requirements.
- C. Trade-in, equipment/license exchanges or other return allowances may be provided as a voluntary alternate. Trade-in, exchange or other return equipment allowances shall not be included in base bid amount.

PART 3 - EXECUTION

3.01 EXAMINATION OF DOCUMENTS AND SITE

- A. Bidders shall carefully examine the Contract Documents and the construction site to obtain first-hand knowledge of existing conditions and requirements. No plea of ignorance of conditions that exist, or any other relevant matter concerning work to be performed in the execution of work will be accepted as justification for failure to fulfill every detail of all requirements as described herein.

3.02 QUESTIONS, INTERPRETATIONS AND ADDENDA

- A. Any bidder finding discrepancies between Drawings, Specifications and/or Bid Documents, or be in doubt as to the exact meaning of any provision or detail shall notify the Designer at once, and before the deadline for Questions and Clarifications. The Designer may then, at their option, issue Addenda clarifying same. The Designer is not responsible for oral instructions, or Bidder's/Contractor's misinterpretations of Drawings, Specifications and/or Bid Documents.
- B. The Designer reserves the right to issue Addenda at any time up to thirty-six (36) hours prior to the scheduled bid opening. All such addenda shall become, upon issuance, an inseparable part of the Specification/Contract Documents. Each bidder shall incorporate within their bid all costs for items listed in any/all Addenda, and shall acknowledge receipt and identifying number of each Addendum on the Bid Form and on the outside of the sealed bid container.
- C. Addenda will be forwarded to each bidder who has received a copy of the Bidding Documents and has submitted "Intent to Bid Form".

3.03 BID SECURITY, BONDS AND INSURANCE

- A. Bid Security, Performance and Payment Bonds are required on this project.
 - 1. Bid security equal to five percent (5%) of the bid amount must accompany each bid in accordance with the Instruction to Bidders.
 - a. Bid security shall be either a Bid Bond issued by a company licensed in the State of Michigan to furnish bid security or Certified Check made payable to the Owner.
- B. The selected Contractor will be required to provide a performance bond and a payment bond each in an amount equal to one hundred percent (100%) of the bid amount including any accepted alternates at the Owner's discretion.
 - 1. The surety of the performance bond shall remain in effect until all acceptances and final contract close-out requirements herein have been executed by the Owner.
- C. Contractor shall provide, prior to beginning any work at the sites, certificate of insurance for delivery to Owner indicating all required insurance coverage is in force.
 - 1. Workers' Compensation and Employer's Liability Insurance
 - a. Coverage A – Statutory

- b. Coverage B - \$1,000,000 Per Accident
 - 2. Broad Form Comprehensive General Liability Insurance (including – Premises, Elevators, Contractor’s Protective Liability, Contractual, Products & Completed Operations – including Broad Form Extensions).
 - a. Each Occurrence - \$1,000,000
 - b. General Aggregate - \$2,000,000
 - c. Products & Completed Operation Aggregate - \$2,000,000
 - d. Personal Injury & Advertising Injury - \$1,000,000
 - e. Fire Legal - \$100,000
 - 3. Sub-contractors Operations, Products – Completed Operations and Contractual Liabilities, plus such excess coverage as may be appropriate for the limits listed.
 - 4. Comprehensive Automobile Liability Insurance (owned, hired, and non-owned automobiles).
 - a. Bodily - \$1,000,000 each Person and \$1,000,000 each Occurrence
 - b. Property Damage - \$1,000,000
 - 5. Furnish Owner with Contingent Liability Insurance Policy with coverage and liability limits the same as for Public Liability Insurance specified herein. Designate on policy as assured, only the Owner.
 - 6. Furnish Owner with Contingent Property Damage Insurance Policy with coverage and liability limits the same as for Property Damage specified herein. Designate on policy as assured, only the Owner.
 - 7. Policies shall include notification clause requiring ninety (90) days written notice to Owner in the event of policy cancellation, expiration, non-renewal, coverage reduction or other material change.
 - 8. Contractor shall not commence work under the Contract until after all insurance required herein as been obtained and certificates for such are approved by Owner.
- D. All such bonds and/or insurance shall be issued by surety licensed by the State of Michigan and acceptable to the Owner.
- 1. Insurance certificate(s) shall be signed by insurance agent licensed in the state of Michigan or a representative of the insurance company.

- E. Contractor agrees to indemnify and hold harmless the Owner and Designer, including their agents and employees, from and against all claims, damages, losses and expenses, including, but not limited to, attorney fees arising out of, or resulting from the performance of the work to the fullest extent allowed by law on a comparison basis of fault.

3.04 MODIFICATION AND WITHDRAWAL

- A. Bids may be withdrawn and/or changed any time prior to the deadline for submission of bids. Bids may not be withdrawn or changed thereafter and shall be deemed a firm offer continuing for ninety (90) calendar days. Bids received after the deadline for submission will be returned unopened at the Owner's discretion.
- B. Withdrawal of any Bid after the opening time without specific approval by Owner may result in forfeiture of required bid security by Bidder.

3.05 CODES, ORDINANCES, REGULATIONS AND RELATED

- A. All labor and materials shall be furnished and installed in strict accordance with the latest applicable codes, ordinances and regulations of any governing body having jurisdiction over this project.
- B. In the event the quality of labor and materials required by the Drawings and Specifications herein exceeds requirements of current applicable codes, ordinances and regulations, the Drawings and Specifications shall take precedence.
- C. In the event the quality of labor and materials required by current applicable codes, ordinances and regulations having jurisdiction over this project exceeds that of the Drawings and Specifications herein, the applicable codes, ordinances and regulations shall take precedence.
- D. The Contractor shall give all notices and comply with all codes, laws, ordinances, rules and regulations of any authority having jurisdiction, which bears on the performance of its work. This compliance includes, but is not limited to, the Michigan School Safety Initiative (PA129, PA130, PA131 and PA138) if applicable to work being performed.
- E. The Contractor shall pay for all licenses, permits, taxes, and fees required for this project; and shall comply with all federal, state, local and Owner's codes, laws, ordinances, regulations and other requirements applicable to the work specified at no additional cost to the Owner. Contractor shall submit copies of all approved certificates and approvals to the Owner upon receipt.

3.06 SUB-CONTRACTOR AND MATERIAL SUPPLIER

- A. The successful Bidder shall submit to the Owner and Designer a complete list of all sub-contractors and all material suppliers proposed to engage on the work. Sub-contracts shall not be awarded until after they have been approved by the Designer and Owner.
- B. Finalist bidders may be required to submit additional details related to sub-contractors and suppliers within forty-eight (48) hours after the bid opening.
- C. Names of any principal sub-contractors must be listed on the Bid Form.
- D. All contracts made by the successful Bidder with Subcontractors shall be covered by the terms and conditions herein. The successful Bidder shall see to it that Subcontractors are fully informed in regard to these terms and conditions, and shall bind all subcontractors to the same terms and conditions. Failure to do so will absolve the Owner from any liability for additional cost due to subcontractor claims for additional cost, time or any claim(s) for additional cost by subcontractor(s).

3.07 BID RESPONSE FORMAT

- A. Bidder shall provide complete Bid copies in two formats as described herein.
 - 1. One (1) Hard copy format responses shall be in a bound tabulated format. Each response shall have tab indicators for each section.
 - 2. One (1) Electronic copy format responses shall be submitted on a USB Drive, readable by a standard Microsoft Windows 10 workstation. Electronic media shall contain separate folders to organize response documentation as described herein. Files submitted electronically shall be *Adobe Acrobat* "PDF" format (SCHEDULE OF VALUES is additionally required to be on the disk in the appropriate folder as a spreadsheet and as described herein).
- B. All Bid Response formats shall be clearly externally marked to include, but not be limited to:
 - 1. Bidder identification.
 - 2. Project Owner identification.
 - 3. DISTRICT VOICE SYSTEMS UPGRADES.
 - 4. Bid submission date.
- C. Bid Responses shall include an index containing copies/PDF of a complete index of documents comprising Bid Response. Responses shall include, but not be limited to the following tabbed/folder sections:

1. Section 1 – Forms, which shall contain copies/PDF files of all required and completed bid forms.
 - a. BID FORM
 - b. Michigan Familial Relationship Disclosure Statement
 - c. Iran Linked Business Affidavit
 - d. REFERENCES
 - e. CONTRACT EXCEPTIONS
 - f. SCHEDULE(s) OF VALUES
 - g. BID BOND
2. Section 2 – Overview, which shall contain copies/PDF files of cover letter and/or executive overview.
3. Section 3 – Submittals, which shall contain copies/PDF files of all required and voluntary submittals.
4. Section 4 – Appendices, which shall contain copies/PDF files of other reference materials Bidder wishes to, or is required to submit.

3.08 AWARD OF CONTRACT

- A. The material proposed to be used for the completion of work, and the competency, solvency and responsibility of bidders will receive due consideration before award of contract. In the reception of bids for this work, the Owner incurs no obligation to accept the lowest, or any bid submitted. The right to accept or reject any and all bids or portion thereof is reserved by the Owner. The Owner reserves the right to require testimonial, accounting or legal documents pertaining to the solvency of a Contractor, or any other decision factor the Owner deems appropriate, prior to award of contract.
- B. Owner reserves the right to select individual components from schedule of values independent of installation as may be determined in Owners best interest. Selected bidder may be required to install selected components provided by others.
- C. Issuance of a Purchase Order by Owner in response to a valid bid shall be a Notice to Proceed, and shall become part of, but not limited to, all terms, conditions and requirements herein. Notice to Proceed shall have the full effect of contract award, and shall make all terms, conditions, requirements and responsibilities of Bidder binding upon issuance. Notice to Proceed, once

issued, shall become an inseparable part of the contract documents herein, and constitute both Bidder and Owner's acceptance of contract.

3.09 TIME, SCHEDULES, PROJECT MANAGEMENT, MEETINGS AND PLANS

- A. Time is of the essence on this project. Award of contracts for this project will be contingent on the bidder's agreement to complete the work on or before the contract completion date stated herein.
- B. All Contractors will commence work in such a manner and at such a time as to expeditiously interface with the work of other Contractors, and will pursue the project diligently to completion. All Contractors will work in a cooperative manner with Owner and other Contractors.
- C. Contractor shall appoint an overall Project Manager acceptable to Owner, with skills and experience deemed appropriate by the Owner for the scope and size of the project. Project Manager shall be responsible for the scheduling of all Contractor resources and attending all project meetings. Upon notification of Bidder being considered a finalist, the Bidder shall submit professional resume of proposed Project Manager within forty-eight (48) hours.
 - 1. Project meetings shall be conducted at Owner's selected and identified location weekly and at Owner's and/or Designer's discretion.
 - 2. Within five (5) days of Notice to Proceed (issuance of a Purchase Order by the Owner), Contractor's Project Manager shall provide to the Owner a critical flow path in the form of a "Gantt Chart" (or equivalent) indicating the proposed sequence of events and approximate beginning and completion dates in accordance with, compliance to, and coordinated with requirements herein.
 - 3. Changes of the Project Manager during the project shall not be acceptable without prior written approval from the Owner.
 - 4. It is the responsibility of the Contractor's Project Manager to schedule work, work out issues, ensure that all required products and services are delivered according to schedule and attend to any other matters required by the Owner in the interest of professional and timely completion of the project.
 - 5. The appointed Project Manager, or a designee acceptable to the Owner, shall be in attendance of all project meetings throughout the term of the project. Failure to do so may be considered a material breach of contract.
 - 6. After a ten (10) business day notice, the Owner reserves the right to request a new Project Manager, when it appears that, in the Owner's sole discretion, the Project Manager is not fulfilling the full responsibilities of

the position. Failure by Contractor to provide adequate Project Manager meeting requirements of the Owner, may result in Contract termination.

3.10 CHANGES IN THE WORK

- A. No changes in work with the effect of either increasing or decreasing in the project value shall be made without specific and prior authorization by the Owner and Designer.
- B. Owner, without invalidating the contract and without notice to any surety, may at any time order extra work or make changes by altering, adding to or deducting from the work, the Contract Sum being adjusted accordingly. All such work shall be authorized by a written Change Order approved by Owner and Contract Designer. Upon receipt of such an order Contractor shall promptly proceed with the work involved. All such work shall be executed under the conditions of the original Contract. Owner authorized change order(s) may be issued at any time prior to Contract close out.
- C. When so directed, Contractor shall promptly submit an itemized estimate and a unit price for performing or deleting such extra or changed work as may be contemplated. Any extensions or reductions of the contract time associated with extra or changed work shall be identified at the time Contractor submits such documentation.
- D. At the Owner's discretion, adjustments in the Contract Sum shall be determined by one or more of the following methods:
 - 1. By mutual acceptance of a lump sum cost, including overhead and profit, itemized and supported by sufficient substantiating data to permit evaluation.
 - 2. By unit prices stated in the Contract Documents including, but not limited to, Schedule of Values.
 - 3. By unit prices mutually agreed upon.

3.11 PAYMENT REQUESTS AND PAYMENTS

- A. Contractor's invoices shall be submitted monthly in correlation with the Project Schedule indicating percentage of work completed.
- B. All contract and change order invoices shall be sent directly to Contract Designer.
- C. A 10% retainage shall be held back on all payment requests, including, but not limited to hardware, software, change orders and services, until final completion and close out of the project or project phase as determined by Owner and Designer.

- D. Contractors are required to submit all invoices on approved AIA Payment Request Forms or other billing format pre-approved by Contract Designer. Each AIA Payment Request Form shall be accompanied by a properly completed, executed and notarized Waiver of Lien which shall be in a format and contain verbiage approved by Owner.
- E. The Contract Designer and Owner shall process payment requests on a monthly schedule and in accordance with their respective established processes and procedures. Payments will be made by the Owner based only on AIA Request Forms having been previously certified, audited and approved by Contract Designer and accompanied by acceptable Waiver of Lien.

END OF SECTION

SECTION 00 65 00
CONTRACT CLOSE OUT

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide an orderly and efficient transfer of the completed work to Owner.
- B. Details affecting work of this Section includes, but is not limited to all other Sections herein and all related Contract Documents.
- C. Activities relative to Contract close-out are described in, but not limited to, this and other Sections of this document.

1.02 SUBSTANTIAL COMPLETION

- A. "Substantial Completion" shall be defined as:
 - 1. All responsibilities of Contractor for all provisions and requirements of all divisions and sections of complete Contract herein, and as amended, are properly and fully completed or properly, accurately and acceptably provisioned for.
 - 2. All systems, equipment, facilities, services, programming and/or components required by all divisions and sections of complete Contract are fully operational, acceptable and useful to the Owner for their intended purposes.
- B. Prior to requesting inspection by Designer to certify Substantial Completion, Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements and is ready for such inspection.

PART 2 - MATERIALS

2.01 NOT USED FOR THIS SECTION

PART 3 - EXECUTION

3.01 PROCEDURES

- A. Contractor shall submit a written request to Designer indicating they have achieved Substantial Completion of Work.
- B. Within a reasonable time after receipt of the request, Designer will inspect Work to determine status of completion.
- C. Should Designer determine the Work is not substantially complete:

1. Designer promptly will so notify Contractor, in writing giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.
 2. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-inspection.
 3. Designer will re-inspect the Work.
 4. Excessive re-inspections of Work may result in fees being assessed Contractor.
- D. Should Designer concur the Work is substantially complete:
1. Designer will prepare a letter of Substantial Completion.
 2. Designer will submit the letter to Owner and Contractor.
 3. Contract shall be deemed "Closed Out" for retainage purposes.
 4. Final Acceptance of the system shall be deemed complete.

END OF SECTION

SECTION 27 30 30
PHONE SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to a Voice Telecommunications System replacement for Woodhaven-Brownstown School District. Work shall include, but not be limited to telephone instruments, gateways and all other components and services required for a full and operational system.
- B. Owner desires to replace telephone systems currently in operation and serving all locations with new and more maintainable technology.
- C. Contractor shall propose a System to be deployed using Ethernet transport foundation. The system shall be installed and connected to the owner's existing Ethernet infrastructure.
 - 1. Existing Wide Area Network (WAN) links are in place to all locations for packet based communication.
- D. Fail-over PSTN gateways shall be installed in the Owner's Main Distribution Frame (MDF) in each building affected.
- E. Access to centralized call processor(s) and centralized PSTN gateways shall be provided.
- F. Contractor shall advise, coordinate and work cooperatively with Owner representatives and others related to any configuration changes required and/or proposed for Owner's existing Ethernet infrastructure (VLAN configuration, QoS mapping, routing, etc.).
- G. Power for all new voice terminals will be provided for, by way of standard IEEE Power over Ethernet (PoE) installed in appropriate distribution frames throughout sites of work and configured by others.
- H. The Contractor shall design, engineer, configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant Voice Communication System, complete and with full functionality as specified herein.
- I. Contractor shall coordinate their installation with other communication systems, contractors, Designer and the Owner as is appropriate.

1.02 WARRANTY

- A. Complete installation shall be fully functional and free from defect and/or failure for a period of three (3) years. Any replacement, upgrade, patch or fix, including labor for any non-conforming or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.
 - 1. REQUIRED ALTERNATE: Five (5) year warranty.
- B. Manufacturer's warranty shall be provided for all components of the system.
 - 1. Any paperwork and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.
 - 2. Contractor shall submit all paperwork, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.
- C. On site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.
- D. Contractor shall provide the following response times for all malfunctioning equipment:
 - 1. Four (4) hours or less for matters that render twenty percent (20%) or more of the system users unable to maintain normal productivity.
 - 2. Two (2) business days for matters not meeting the above criteria.
 - 3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.
- E. Bidder shall provide current annual maintenance/service contract pricing for recommended programs for all equipment following the specified and included period as additional information. This information will be considered by Owner and Designer as part of the bid evaluation process.
- F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, connection of circuits, turn-up of system, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have no effect on Warranty or System Acceptance by Owner and/or Designer.
- G. Bidder shall provide alternate bid that includes three (3) year warranty, in lieu of required and included warranty as defined herein.

1.03 STORAGE OF MATERIALS

- A. All materials shall be secured when not in use by the Contractor.
- B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.
- C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

1.04 SUBMITTALS

- A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid Proposals.
- B. Shop drawings and diagrams shall be submitted by Bidder for approval by Designer with Bid Proposals.
 - 1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.
 - 2. No work constituting final installation shall be commenced until after approval of shop drawings by Designer.
- C. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project with Bid Proposals.
- D. Equipment or material installed for this project that does not have an approved submittal associated with it, will be removed and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.
 - 1. The Owner and/or Designer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.
 - 2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due, or become due Contractor.
- E. The Contractor shall submit within five (5) calendar days after the Notice to Proceed, a schedule that reflects the sequence of activities of the contractor's approach to the execution of and completion of the work. The schedule shall be broken into work areas to provide for a clear identification of the planned progress of the work.

Included in the schedule will be a list of tasks with list of deliverables and the percentage of work completed. This schedule shall coincide with progress payments applications dates and projected amounts. All durations shown will be in working days. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing and executing the work required by the Contract Documents. Owner will rely on such schedules to coordinate and otherwise plan related work of Owner personnel, other separate contractors, or the Owner's routine daily work.

1.05 REFERENCE SPECIFICATIONS

- A. All work, products, and materials shall conform with the following standards as applicable for the intended use:
 - 1. EIA/TIA Commercial and Administration Standards
 - 2. NEC
 - 3. IEEE 802
 - 4. IETF RFCs
 - 5. FCC Emissions Ratings
 - 6. UL
 - 7. MOSHA Safety Standards

1.06 CONTRACTOR

- A. The Contractor shall accept complete responsibility for the installation, certification and support of the system. Contractor shall be an authorized vendor of all major components.
- B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install Voice Communication System and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods.
- C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.
- D. The Contractor shall have a proven track record in Voice Communication System configuration and installation. This must be shown by the inclusion of references of at least three (3) projects involving the installation of similar systems completed by the Contractor in the prior two (2) years on unaltered forms with the sealed Bid Proposal as provided herein.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer of major components of the Voice Communication System shall be a known and leading entity in the communications field, and shall have been designing, manufacturing and installing similar systems for a period of no less than three (3) years.

1. Acceptable Manufacturers (In alphabetical order):

- a. Avaya
- b. CISCO
- c. MITEL

2. System shall be compatible with and support industry SIP VoIP standards.

2.02 Supply most current version of all products provided.

A. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.

B. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.

2.03 Furnish only new, first class quality materials and equipment.

2.04 System shall be comprised of interoperable components including, but not limited to, servers, controllers, speakers, terminals, gateways, power injectors/switches and battery/power conditioning equipment, cabling and management software, integrated into a common working system.

2.05 CENTRAL VOICE PROCESSOR

A. Contractor shall insure building based telephone system provides access to Contractor supplied central voice processor capable of supporting the specified configuration and an additional ten percent (10%) more stations without additional hardware or software investment required (actual station hardware cost excluded) from Owner.

B. System shall provide full functionality of the following feature sets:

- 1. Distinguish internal calls from external calls and route them accordingly.
- 2. Incoming callers must have the option to transfer out of a call path/control to a directed number, central answering position, and/or specific extension.

3. Automatic Call Back (Redial)
4. Call Block
5. Call Forwarding
 - a. Ring no answer
 - b. External
 - c. Internal
6. Call Hold
7. Call Park
8. Busy Override
9. Call Pick-up
 - a. Directed
 - b. Group
10. Call Queuing
11. Camp-on (Call Waiting)
12. Conference Calling
 - a. Dial-up conferencing for 6 connections
 - b. “Meet-me” conferencing for twenty (40) parties
13. Day/Night Class of Service
14. Direct Inward Dial (DID)
15. Direct Outward Dial (DOD)
16. Disconnect Supervision
17. Do not Disturb
18. Flexible Numbering Plan
19. Forced and Verified Authorization Codes
20. Incoming Call Identification (Caller ID)

- a. Name
 - b. Number
- 21. Last Number Redial
- 22. Least Cost Routing
- 23. Multiple Console Operation
- 24. Night Ring Assignments
- 25. Power Fail Transfer (PFT)
- 26. Paging
 - a. Zone
 - b. All Call
- 27. Remote Diagnosis
- 28. Remote moves, adds and changes
- 29. Music/Message on Hold
- 30. Cellular Phone Integration
- 31. Restrictive Station Control
- 32. Hunt Groups (Line Hunting)
 - a. Multi-Line
 - b. Linear
- 33. Speed Dial
 - a. System
 - b. Personal
- 34. Station to Station Dialing (4 digit)
- 35. System Security Codes
- 36. Toll Restriction
 - a. 0 /1 Access

- b. By Area Code
- 37. Trunk Hunting (Inbound and Outbound)
- 38. Call Recording
 - a. Call Recording shall be on demand, when initiated a user by depressing a function key, for up to ten (10) simultaneous calls from any of up to thirty (30) Owner pre-designated telephone instruments.
- C. Local system administration functions shall be capable of being performed from any web browser attached to the local area network (LAN).
 - 1. Administration access shall be protected by unique and secure log on (User ID and Password).
 - 2. System shall be capable of bulk moves, adds and changes.
 - 3. System administrator shall be capable of complete system back-up and full system restoration from a previously saved configuration.
 - 4. System reporting shall include, but not be limited to:
 - a. Real time trunk and gateway status.
 - b. Historical trunk and gateway utilization for administrator defined period.
 - c. Status of all system and call routing components.
 - d. Real time Station status.
 - e. Real time call trace capability.
 - f. Complete historical call detail reporting.
- D. Systems shall connect across Owner's fiber optic network to provide for 4 digit dialing.
- E. System shall provide access to standard, trunked ISDN PRI circuits located at Owner's central facility designated location.
- F. All sites shall have local system survivability that provides basic telephone system functionality to local copper (POTS) Public Switched Telephone Network (PSTN) lines in the event of a Wide Area Network (WAN) outage.
 - 1. Four (4) lines in each building(s) below except as otherwise designated:
 - a. High School – Four (4) lines

- b. Middle Schools – Four (4) lines
- c. Elementary Schools – Four (4) lines
- d. Central Business Office – Four (4) lines
- G. System shall be configured to provide standard acceptable Ethernet Quality of Service (QoS) identification at both layer two (2) and layer three (3) to Owner's network infrastructure so as to insure end-to-end priority delivery of voice traffic across the network.
- H. System shall provide for adequate call admission control with Owner's network infrastructure to guarantee Local Area Network/Wide Area Network (LAN/WAN) links are not oversubscribed.
- I. System shall automatically detect the presence of an Internet Protocol (IP) telephone.
- J. System shall comply with all requirements for telephone access, including, but not limited to the following, and as required by federal, state, local and Owner statutes, guidelines and/or policies:
 - 1. Enhanced 911 services
 - 2. TDD services
- K. In the event of a power failure, system shall automatically re-initialize and "become active" to the last configuration in use with no human intervention.
- L. System shall be configured for two (2) appropriate power fail telephone instruments per site (ground or loop start as required). Power fail jacks and telephones shall be acceptably and clearly labeled as "Power Fail Phones".
- M. All other features currently a part of the manufacturer's latest commercial release.

2.06 FAX SERVER

- A. Contractor shall provide a district wide, premise-based fax server such as OpenText RightFax. This system shall replace approximately twenty (20) facsimile machines currently operating across the district.
- B. Contractor shall through letter of agency be responsible for removal from carrier contract of all associated analog lines for current facsimile devices (60 lines) transition all such numbers to DID appearance on Owner trunk circuits.
- C. Fax Server shall meet or exceed the following operational requirements:
 - 1. Integrate fax with desktop, email and other primary applications.
 - 2. Integrate with Owner's existing MFP printing infrastructure.

3. Provide for fax routing to email and printer based on DID assignment.
4. Verify document transmission and track use history with full audit trail and use reporting based on detailed log files.
5. Provide for 50 independent fax users/numbers and user destinations (email and printer locations).
6. Provide for the ability to expand to 100 independent fax users/numbers/destinations.
7. Provide all hardware, services, cables, connectors and program distribution for a fully compliant and working system.

2.07 MASS NOTIFICATION SYSTEM

- A. Contractor shall provide a district wide, premise-based Mass Notification System complete with all hardware and software required to meet or exceed the following:
 1. System shall provide for event notification through web based and telephony-based password/code protected interfaces.
 2. Event notification shall be capable of being initiated through Owner provided contact closures.
 3. Notification delivery must be able to be provided for the following:
 - a. All telephone stations/instruments in the system via visual display and audio indication.
 - b. Email to a list of user-maintained subscribers.
 - c. SMS text messages to a list of user-maintained subscribers.
 4. System shall provide for notification delivery to limited numbers or recipients based on how and where the notification event is initiated.
 5. The following events and notification scenarios shall be configured in the base system installation and configuration provided by Bidders:
 - a. Pressing an existing “lock-down button” at a building will result in limited distribution of notification to telephone instruments, email and text messages to users at that building and select other administrative stations/personnel in other buildings.
 - b. Any telephone that a user dials 911 from will result in limited distribution of notification to telephone instruments, email and text messages to users at that building and select other administrative stations/personnel in other buildings.

PHONE SYSTEM

- c. Two additional “triggers” shall be configured for limited notification to telephones, email and text messages as directed by Owner. Owner shall remain responsible for any “third party” system configuration to outside devices and/or servers. All equipment, materials, cables, connections and configuration to the Contractor supplied systems and components shall remain the responsibility of the Contractor.
- 6. Complete audit logs of all notifications delivered and system reporting shall be configured for Owner reviews at Owner discretion.
- 7. Integration with Owner’s Active Directory for database maintenance.

2.08 NEW VOICE TERMINALS

- A. All New Voice Terminals (Telephone Instruments/Sets) shall be Ethernet devices, and shall properly and acceptably communicate over, and attach to, Owner’s standard, existing, installed Ethernet communications network provided by others.
 - 1. Work includes supply and installation of new connection/patch cables to all phone instruments which require data network connectivity.
 - a. Contractor shall supply all patch cables for system operation and a connected computer to each telephone instrument. All patch cables shall be Category 6A cable.
 - 1. Cable from wall to telephone shall be fifteen (15) feet in length and white in color.
 - 2. Cable from telephone to computer shall be fifteen (15) feet in length and white in color. This shall be included for contractor provided Administrator Voice Terminals.
 - 3. Patch cable in wire closet from patch panel to switch port shall be installed by contractor and provided by owner.
 - 2. Voice terminals often will be required to be installed “in line” on cable and switch ports, and supply Ethernet connectivity to existing workstations, printers, or other devices from the second port supplied on the voice terminal, as specified herein and/or as provided for during the station review and installation planning process required of Contractor.
 - 3. When attaching existing equipment to phone instruments “in line”, contractor shall install all supplied CAT 6A patch cables between wall outlet and phone and between phone and devices. No existing device cables shall be installed between phone and the device. Contractor shall remove and dispose of all existing and excess cable as part of the installation work.
- B. New Standard Voice Terminal (SVT)

1. See Appendix A for quantities and locations.
2. SVTs shall simultaneously provide, but not be limited to the following:
 - a. Dual (2) line operation.
 - b. Two (2) Ethernet ports (Integrated 2 port 10/100/1000 Ethernet switch).
 - c. Hearing aid compatible handset.
 - d. Message waiting notification lamp or indicator.
 - e. Hold button.
 - f. Transfer button.
 - g. Conference button.
 - h. Dial pad on base.
 - i. Four (4) programmable feature access buttons.
 - j. Multiple line display.
 - k. Speaker and Microphone for hands free communication.
 - l. Session Initiation Protocol (SIP) compliance.
 - m. IEEE Standard Power over Ethernet (PoE) compliance.

C. New Administrator Voice Terminal (AVT)

1. See Appendix A for quantities and locations.
2. AVTs shall simultaneously provide, but not be limited to the following:
 - a. Eight (8) line operation.
 - b. Two (2) Ethernet ports (Integrated 2 port 10/100/1000 Ethernet switch).
 - c. Hearing aid compatible handset.
 - d. Message waiting notification lamp or indicator.
 - e. Hold button.
 - f. Transfer button.
 - g. Conference button.

- h. Dial pad on base.
 - i. Eight (8) programmable feature access buttons.
 - j. Eight (8) line display.
 - k. Full Duplex Speaker and Microphone for hands free communication.
 - l. Session Initiation Protocol (SIP) compliance.
 - m. IEEE Standard Power over Ethernet (PoE) compliance.
- 3. Contractor shall integrate with owner's existing Rauland public address system as detailed in Appendix B
 - 4. Provide unit pricing for owner consideration for DECT wireless headsets compatible with contractor provided Administrator Voice Terminals.
 - 5. Provide unit pricing for owner consideration for expansion module providing additional programable keys compatible with contractor provided Administrator Voice Terminals.

D. New Extended Voice Terminal (EVT)

- 1. Provide unit pricing for owner consideration.
- 2. EVTs shall simultaneously provide, but not be limited to the following:
 - a. Four (4) line operation.
 - b. Two (2) Ethernet ports (Integrated 2 port 10/100/1000 Ethernet switch).
 - c. Hearing aid compatible handset.
 - d. Message waiting notification lamp or indicator.
 - e. Hold button.
 - f. Transfer button.
 - g. Conference button.
 - h. Dial pad on base.
 - i. Twenty four (24) programmable feature access and/or line appearance buttons.
 - j. Four (4) line display.

- k. Speaker and Microphone for hands free communication.
- l. Session Initiation Protocol (SIP) compliance.
- m. IEEE Standard Power over Ethernet (PoE) compliance.

E. New Conference Voice Terminal (CVT)

- 1. Provide unit pricing for owner consideration.
- 2. CVTs shall simultaneously provide, but not be limited to the following:
 - a. Four (4) line operation.
 - b. Two (2) Ethernet ports (Integrated 2 port 10/100/1000 Ethernet switch).
 - c. On-hook/off-hook button.
 - d. Volume up/down keys.
 - e. Menu navigation keys.
 - f. Mute button.
 - g. Hold button.
 - h. Transfer button.
 - i. Conference button.
 - j. Dial pad on base.
 - k. Eight (8) programmable feature access buttons.
 - l. Four (4) line display.
 - m. Microphone technology to support 360 degree sound pickup.
 - n. Up to 10 ft. microphone pick-up range.
 - o. Full duplex audio capability.
 - p. Dynamic Noise Reduction.
 - q. Ability to support extension microphones to increase pickup.
 - r. Frequency response: 300 to 3300 Hz.
 - s. Volume adjustable to 94 dBA SPL (peak) volume at 0.5 meters.

- t. Session Initiation Protocol (SIP) compliance.
 - u. IEEE Standard 802.3at Power over Ethernet (PoE+) compliance.
- F. Contractor shall supply and install twenty (50) wall mount kits compatible with supplied standard voice terminals (SVT), to be installed in locations identified by Owner and Designer. Wall mount kits shall securely and neatly fasten phone instrument to wall. Contractor to supply all necessary parts and installation for a fully functional and compliant system.

2.09 VOICE GATEWAYS (TRUNK CAPACITY)

- A. System shall provide and be provisioned for all equipment and software including gatekeeper(s) and gateway(s) to meet system requirements and be fully functional for intended applications as defined herein.
- B. System gateways shall support, but not be limited to the following circuits and services:
 - 1. Contractor shall integrate with owner's existing Rauland public address system as detailed in Appendix B
 - 2. Analog Station Ports - Currently have 48 analog lines found on billing statements.
 - a. Four (4) ports to support analog station (FXS) connections shall be provisioned at each school unless otherwise designated.
 - 1. Administration - Eight (8) ports
 - 2. High School - Eight (8) ports
 - 3. Patrick Henry and BMS - Eight (6) ports each
 - b. Session Initiation Protocol (SIP) compliance.
 - c. Support for credit card "swipes", facsimile machines and other common analog telecommunications devices.
 - 3. Analog Line Ports
 - a. Two (2) ports to support analog station (FXO) connections shall be provisioned at each school unless otherwise designated.
 - 1. Administration - Four (4) ports
 - 2. High Schools - Four (4) ports
 - 3. Middle Schools - Four (4) ports

- b. Session Initiation Protocol (SIP) compliance.
- 4. All other features currently a part of the manufacturer's latest commercial release.
- 5. Bidder shall include voluntary alternate to provide all necessary hardware, labor and licensing to accommodate cellular backup functionality.
- 6. Bidder shall include voluntary alternate to provide all necessary hardware, labor and licensing to accommodate SIP trucking in initial system configuration as required herein in lieu of base bid required ISDN PRI gateway based termination of telco circuits.

2.10 POWER OVER ETHERNET (PoE)

- A. All new equipment for system bid shall connect to Owner's Ethernet distribution system providing standard IEEE 802.3 PoE. Proprietary power distribution shall not be acceptable.

2.11 CENTRAL VOICE MESSAGE SYSTEM

- A. Central Voice Message System shall be provided. Central Voice Message System shall provide for full proper and acceptable communications over, and attachment to, Owner's standard, existing, installed Ethernet communications network provided by others.
- B. Owner intends to deploy a suite of basic unified messaging features as part of this system deployment.
- C. System shall provide for six hundred fifty (650) mail boxes in the initial deployment.
- D. System shall include capability of answering telephone calls from the Public Switched Telephone Network (PSTN) gateways or internally. System shall provide full functionality of the following feature sets:
 - 1. System wide Auto-Attendant feature providing for menu guided self-service of callers.
 - 2. Record personal greetings
 - 3. Message waiting lamp indication(s)
 - 4. Information mailboxes
 - 5. User modifiable security codes
 - 6. Set calendar days and hours for alternate greetings
 - 7. Guest mailboxes

8. Out calling for message waiting notification
 9. Multiple distribution lists
 10. Message forwarding
 11. Message reply
 12. Users must be able to retrieve messages from both on and off premise
 13. Messages must be time and date stamped.
 14. Pause and replay messages
 15. Record messages, send and mark “urgent”, “private”, etcetera
 16. Transfer messages to other subscribers and append them with comments
 17. Edit and/or modify personal distribution lists
 18. Dial by name / organization directory
 19. If a message is sent from another subscriber, the senders name and mailbox number shall be a part of the message envelope. If the message is sent from an extension on the system, the extension number must be part of the message envelope.
 20. System shall produce reports detailing voice mail and automated attendant usage, system availability, and capacity utilization.
 21. All other features currently a part of the manufacturer’s latest commercial release.
- E. System shall support the following standard protocols for interconnection to other systems or components and to provide for basic form of unified messaging with Owner’s installed and existing email system:
1. VPIM
 2. LDAP
 3. IMAP4
 4. POP3
 5. SIP
 6. Audio voice message transcription to text via email integration using a tool such as Nuance or Dragon.

2.12 ALLOWANCES

A. Contractor shall include allowances for equipment and/or other contract service reimbursements as required below in base bid lump sum amount(s). Equipment and/or contract services shall be provided and sourced at Owner's discretion and convenience with full cooperation by Contractor, and paid for from successful bidder's contract in the amount(s) provided for herein. Any allowance amount proving to be excessive for the intended equipment and/or contract services shall be credited to the Owner against contract payment requests.

1. Allowance shall be made in the amount of \$12,000 for additional owner desired upgrades.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Contractor shall conduct detailed walk-through examination with Designer and Owner verifying equipment and material locations as well as mounting and placement requirements prior to commencement of other installation activities.
- B. Contractor shall insure all submittals and shop drawings have been provided to, and approval has been obtained from Designer prior to commencement of any final installation activities.

3.02 INSTALLATION

- A. Contractor shall conduct complete departmental interviews throughout the Owner's Technology Department Staff and additional District Staff as deemed necessary to review current station and feature usage and provide for station and feature programming standards (Class of Services - CoS).
 1. Interviews and station reviews shall be fully documented by Contractor and submitted to Owner for approval.
 2. Such station reviews shall include, but not be limited to detailed telephone and dial plan reviews for all key user groups and individuals:
 - a. Building Secretaries
 - b. Building Principals
 - c. Teachers
 - d. Central Office Administrators
 - e. Administrative Assistants
 - f. Transportation Administrators

g. Early Child Care Administrators

3. Such station reviews shall be completed, documented and reviewed with the Owner project team prior to any new system configuration work being initiated.
- B. Contractor shall be familiar with the environment where work will be done as specified herein.
- C. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed and disposed of in an approved container for the site. All equipment and tools shall be removed from common areas and stored in approved, secure storage locations. Any work that may impede the general use of the space and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.
- D. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.
- E. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:
 1. Inventory receipt of all components and equipment.
 2. Storage of all equipment and components until such time those items are installed according to the specifications.
 3. Transport equipment to the Owner's installation location(s).
 4. Assemble, install, configure and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
 5. Collect all information necessary to accurately program all station sets and/or system devices to the Owner's intended use and need.
 6. Label all station sets and system devices as may be appropriate and required by Owner and Designer.
 7. Contractor shall provide and install blank cover plates for all locations that wall mounted telephones are removed and not reinstalled.
 8. Complete end user and system administrator training programs as specified herein.
 9. Prepare, execute, confirm and coordinate with the carrier(s) all new trunk/circuit orders, changes of existing circuits, as well as disconnect orders required by Owner. This effort shall include Contractor request(s) and verification of carrier(s) to identify and tag all existing circuits terminating on Owner premises to

industry standards. Owner shall provide a “Letter of Agency” to Contractor to facilitate this activity.

10. Work shall be performed to meet local codes and industry standards, including, but not limited to:
 - a. Adequate gas tube protection for outside plant cable connections.
 - b. Grounding and Bonding.
11. Work includes extending trunks and circuits, as required, to Owner identified equipment installation locations at all locations.
12. Owner will provide contractor with permanent asset tags for each system component that exceeds \$100.00 in value and each telephone instrument. Equipment installed in wiring closets will have district asset tags installed in a prominent location. Assets installed in public areas, such as staff desktop devices, will have asset tags installed in discreet but consistent area of each asset.
 - a. Asset number, device/component description, serial number, make, model, part-number, site, room number/name and any other critical asset information shall be recorded for Owner as part of the documentation described and required herein.

F. Sites of Work:

1. Administration Building
24821 Hall Road
Woodhaven, Michigan 48183
2. Patrick Henry Middle School
24825 Hall Road
Woodhaven, Michigan 48183
3. Erving Elementary School
24175 Hall Road
Woodhaven, Michigan 48183
4. Woodhaven High School
24787 Van Horn Road
Brownstown, Michigan 48134
5. Support Services & Transportation
24793 Van Horn Road
Brownstown, Michigan 48134

6. Bates Elementary School
22811 Gudith Road
Woodhaven, Michigan 48183
 7. Yake Elementary School
16400 Carter Road
Woodhaven, Michigan 48183
 8. Gudith Elementary & Special Services
22700 Sibley Road
Brownstown, Michigan 48193
 9. Wegienka Elementary School
23925 Arsenal Road
Brownstown, Michigan 48134
 10. Brownstown Middle School
20135 Inkster Road
Brownstown, Michigan 48174
- G. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate or panel to the original condition.
1. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.
 2. The building and work area shall be returned to its original condition prior to final sign off of the project.
- H. Following installation and prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.
1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.
- I. Contractor shall collect, consolidate and otherwise prepare for shipping or disposal Owner's existing telecommunications system components, including, but not limited to stations, processors, cards, options, fax machines, batteries and application servers in a manner acceptable to, and consistent with, Owner's intended disposition of the items.

1. Contractor shall remove all existing telephone system components from Owner facilities and provide a certificate of environmentally responsible disposal and/or bill of sale for all such components that will no longer be in the Owner's use.

3.03 TESTING

- A. In an effort to insure a smooth cut-over to the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over. Testing shall include, but not be limited to the following:

1. Telephone routing
2. Voice message interface to email system
3. System fail-over
4. Gateway connectivity
5. Paging and Public-Address integration and programming

- B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements, meets the owner's specific application requirements and is ready for functionality and integrity testing.

C. PROCEDURES

1. Prior to system cut-over, Contractor shall submit a written request to Designer indicating they have completed full and final configuration of the system, and are ready to have system integrity and functionality tested.
2. Within reasonable time after receipt of request, Designer will provide a test schedule and coordinate testing date(s) with Owner and Contractor.
3. Should Designer determine the Work is not acceptably configured or not of adequate integrity:
 - a. Designer promptly will so notify Contractor, giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.
 - b. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-testing.
 - c. Designer will schedule re-test of the Work.
 - d. Excessive re-testing of Work may result in fees being assessed Contractor.
4. Should Designer and Owner concur the Work is configured properly and system integrity is as required:

- a. Designer will review Contractors detailed cut-over plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system cut-over can proceed.

3.04 DOCUMENTATION

- A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment (file drawers, folders, dividers, etc.), to contain all as-built drawings, owners manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or Owner deem necessary.
- B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:
 1. Equipment description.
 2. Equipment make.
 3. Model number.
 4. MAC Address
 5. Asset Tag ID
 6. Software release.
 7. Date installed.
 8. Manufacturer's warranty.
 9. Maintenance contract terms.
 10. Verification of maintenance contract engagement.
 11. Telephone numbers for service and support.
 12. Detailed technical support and service procedure instructions.
 13. All product (hardware and software) manuals and manufacturer supplied documentation, including, but not limited to owner manuals, system administrator manuals and configuration guides. Where number of duplicate copies for particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.
 14. Photocopy of original invoice listing make and model for all components and equipment from individual manufacturer(s), distribution source(s), or authorized

agent(s) to establish manufacturer warranty start date for potential use after end of contract warranty provisions.

15. CAD as built drawings for each building.

16. Dial Plan Report.

17. Complete inventory of installed station hardware and system software. Hardware inventory shall include set type (model number), Ethernet MAC address, station serial number, extension number, station user's name, location, software groups (including call pick-up, intercom, class of service, speed call, etc.).

3.05 TRAINING

A. Contractor shall provide training for the Owner designated system administrator(s). Owner shall designate up to Four (4) administrators to be trained. Training shall be a minimum of Two (2), four (4) hour sessions in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:

1. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.
2. System back-up and restore functions and procedures for all system parameters and configurations.
3. Device additions, moves and changes as well as device reconfiguration.
4. Dial plan manipulation.
5. A basic syllabus shall be supplied to Owner and Designer prior to training.

B. Contractor shall provide training for the Owner's key personnel who use, or may use the telecommunication system, or any of the system features. Owner shall coordinate schedules to provide for reasonable and efficient use of time in scheduling key personnel training. Training shall be a minimum of thirty (30) minutes in duration, conducted in multiple locations, This shall be two (2) sperate session times available. Training is required to reasonably cover the operational training needs of all Owner key personnel to an acceptable degree. Training shall include, but not be limited to:

1. Making or placing telephone calls inside and outside the organization.
2. Receiving telephone calls from inside and outside the organization.
3. Administration of personal telecommunication features.
 - a. Call forwarding
 - b. Conference Calling

- c. Transferring Calls
 - d. Listening to, Saving, Deleting and administering voice messages.
 - e. Administering voice greetings.
 - f. Other features as required by Owner.
- 4. A basic syllabus shall be supplied to Owner and Designer prior to training.
- 5. Training with this same content shall be video recorded for posting on Owner's internal employee training site to be used for recurrent training and new hire training. Video training shall be reasonably professional in quality.
- C. General User System Training shall be video recorded for posting on Owner's internal employee training site to be used for general staff recurrent training and new hire training. Video training shall be reasonably professional in quality and include, but not be limited to:
 - 1. Making or placing telephone calls inside and outside the organization.
 - 2. Receiving telephone calls from inside and outside the organization.
 - 3. Administration of personal telecommunication features.
 - a. Call forwarding
 - b. Conference Calling
 - c. Transferring Calls
 - d. Listening to, Saving, Deleting and administering voice messages.
 - e. Administering voice greetings.
 - f. Other features as required by Owner.

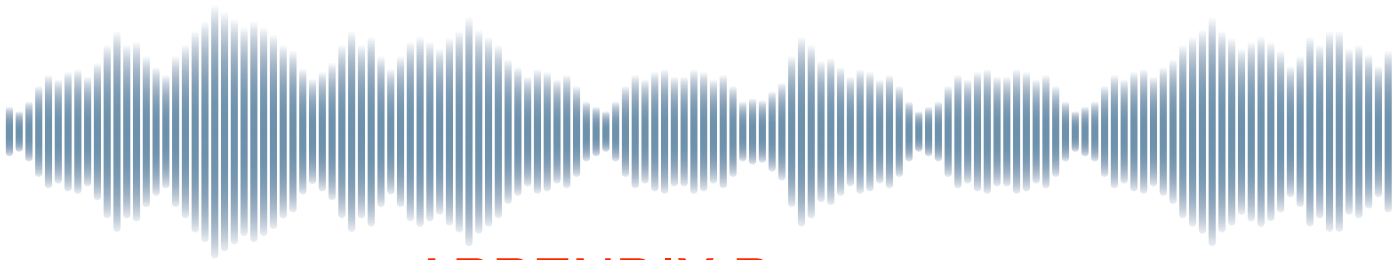
3.06 SCHEDULE, MEETINGS AND PLANS

- A. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner, documented herein, required by Designer, Architect and/or Construction Manager and as required to meet schedules.
- B. Schedule
 - 1. Post bid Interviews: Monday, March 11, 2024
 - 2. Contractor Chosen: Week of March 18, 2024

3. Work Commences: April 2024
 4. Substantial Completion of Project: August 2024
 5. Project Close-out: September 2024
- C. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.
- D. All work shall be coordinated with Owner's construction manager on site.
- E. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.

END OF SECTION

APPENDIX A		
Location	Standard Voice Terminal	Administrator Voice Terminal
Administartion Building	12	28
Bates Elementary	38	4
Brownstown Middle School	47	21
Erving Elementary	39	4
Gudith Elementary	42	3
Patrick Henry Middle School	70	49
Support Services and Transportation	8	10
TOTE	10	18
Wegienka Elementary	34	5
Woodhaven High School	101	28
Yake Elementary	41	4
Shelf Spares	18	16
TOTAL	460	190



APPENDIX B



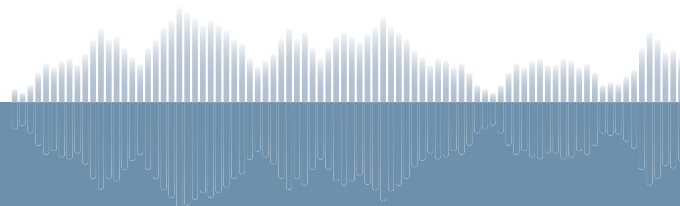
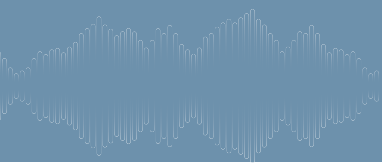
Application Note

EAN 0038

Telecenter U® SIP Integration



Connect **Your** Universe®





Overview

This Application Note outlines the method and equipment necessary to allow access to Telecenter U (TCU) from a Session Initiation Protocol (SIP) trunk and SIP phones. For all Telecenter U applications, review Application Note EAN0028, Telecenter U In Your Data Center, for TCU network requirements.

Features of Telecenter U, SIP phone integration:

- SIP phones can initiate emergency and normal sequences and emergency all pages
- Calling station (call-in) information passed to SIP phone
- Answer classroom call-ins
- Intercom into individual classrooms
- Page into individual, multiple or all TCU zones
- Issue critical communications and lockdowns from a SIP phone
- Escalate call-ins to SIP phones

Note – the features listed above are effective on a per school basis.

When a SIP phone receives a call-in from a TCU room, the SIP phone display shows, in the following order:

- Call-in Priority (Norm, Emer)
- Room Name, where "Room Name" is defined in the Room Name field under *Home → Setup → Schools → school name → Rooms* in the TCU web user interface
- Extension, if the SIP phone display is large enough, otherwise, this info will be truncated

SIP Integration Requirements

TCC2000 Campus Controller

Each TCC2000 Campus Controller requires a SIP trunk connection (Ethernet) from a SIP server to communicate with Telecenter U devices associated with that controller (school).

SIP Server (third party provided)

The TCU SIP integration utilizes standard SIP ports only. These ports are non-configurable. For example, SIP control signaling must use port 5060. All DTMF signaling must be compliant with RFC2833, which specifies dialed digit encoding.

Media Streams

The media streams (audio) of a SIP integration utilize SDP/RTP over UDP thus the SIP server must support this functionality.

Control Signaling

All SIP control signaling use UDP. TCU accepts TCP for inbound signals but generates UDP for outbound signaling.

SIP Re-INVITE support

TCU SIP integration requires that the SIP server supports the re-INVITE method. This is necessary to answer call-ins via the asterisk (*) key on the targeted SIP phone. Although TCU generates a SIP re-INVITE, and requires that the SIP server supports it, TCU does not support inbound SIP re-INVITE methods.

SIP Integration Limitations

TCC2000 Campus Controller

A maximum of ten (10) simultaneous SIP calls can be handled by each TCC2000 Campus Controller. Each SIP call uses one of the ten (10) TCU audio channels available for simultaneous audio events in a TCC2000 Campus Controller.

SIP Security

TCU does not support Secure SIP (SIPS) or Secure RTP (SRTP). However, TCU does provide enhanced security by providing an option that requires inbound SIP calls from programmed SIP trunks only. Using the TCU Web interface, browse to the following page: *Setup* → *Schools* → *Configure (after your chosen school)* → *School Settings*. Place a checkmark in the "Inbound SIP Calls From Trunks Only:" checkbox to enable this feature. Security can more effectively be managed during configuration of the SIP server.

RTP Packets

RTP (audio) packet length is non-configurable on TCU. It is fixed at 20mS. TCU does not support symmetric RTP.

When calling into the TCU from a SIP server, the TCU recognizes three types of dialed inputs:

1. Extensions of Dial Actions
2. Extensions of modules with speakers (i.e., TCC2011 IP Classroom Module)
3. "*" to answer call-ins

A SIP telephone connection to TCU has the power to initiate school-wide TCU page/intercom and emergency functions.

Dial Actions

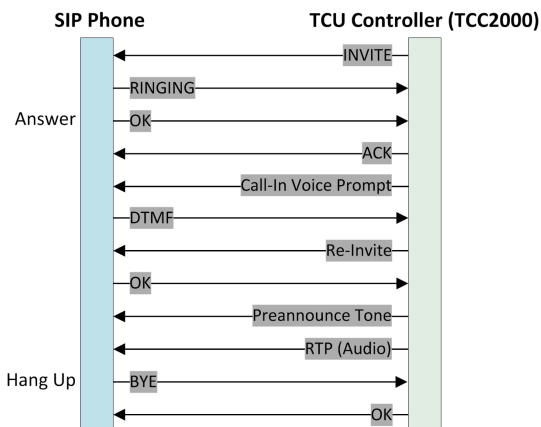
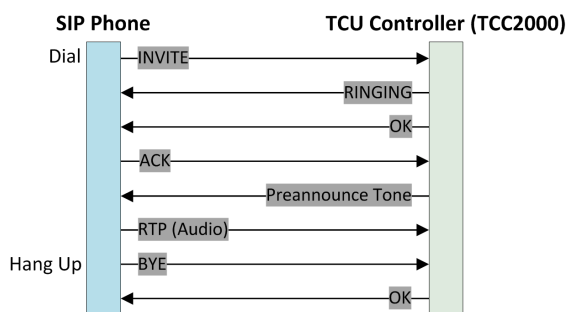
Dial Actions can be initiated from a SIP phone connected to TCU. Dial Actions present the most flexible way to take advantage of the vast capabilities of TCU from a SIP phone. Dial Actions are configurable on a per-school basis, allowing greater flexibility in district applications.

A Dial Action can initiate any of the following actions on TCU:

- live all page
- emergency all page
- zone page
- pre-recorded audio
- initiate a school-wide emergency
- terminate all prerecorded audio
- cancel all call-ins in a school
- initiate a sequence
- all clear
- set/clear/toggle swings

SIP Architecture – SIP Packet Flow by TCU Controller and SIP Phone

SIP Architecture on Telecenter U, Campus Edition is shown in the following two diagrams. Each diagram gives the SIP packet transmission during a SIP phone initiated page into a classroom and for an intercom call-in from the classroom. Note that an integrated SIP phone sends dialed digits directly to the TCU Controller, not the SIP server.





SIP Configuration

In a district-wide SIP application, each school must have a TCC2000 Campus Controller and SIP trunk connection from the SIP server. Each school can use its own set of SIP phone extensions. It is recommended that the SIP phone extension numbers be contiguous and easily distinguishable (i.e. don't attempt to fit them into your dialing plan). If you have other SIP integrations, bear in mind that all TCU SIP phone extensions must be unique across all schools in the district.

TCU Configuration – Programming

TCU announces call-ins via SIP by assigning a call-in coverage to a SIP phone extension. When integrated directly to a SIP server, these SIP extensions correspond to endpoints on the SIP server. Each TCU SIP extension could be configured in the SIP system to ring multiple SIP phones. TCU will only announce a single call-in at a time to any given SIP phone extension. If multiple call-ins are pending in the same coverage, only the highest priority call-in will announce (ring) to the SIP extension. If multiple pending call-ins have the same priority, then the oldest will ring through.

For additional details about SIP Trunk programming, see KI-2277, the TCU System Programming & Administration Manual.

Configure Coverages

Configure a call-in coverage for each SIP extension. Using the TCU Web interface, browse to the following page: *Setup → Schools → Configure (after your chosen school) → Coverages*. For additional details about Coverages, see KI-2277, the TCU System Programming & Administration Manual.

Configure SIP Phones

Using the TCU Web interface, browse to the following page: *Setup → Schools → Configure (after your chosen school) → SIP Phones*. Add a new SIP phone and assign it a SIP extension number and name. The SIP phone extension must be unique across all schools and contain from two to six digits. Select the Coverage for this SIP phone from the drop-down list. Repeat this process for each SIP phone extension.

Configure Dial Actions

To perform actions other than intercom (e.g. Paging or Emergency initiation), Dial Actions must be configured. Dial Actions are configured on the *Setup → Schools → Configure (after your chosen school) → Dial Actions* screen.

The Dial Action configured below initiates a Lockdown Emergency when a SIP phone connected to TCU dials 992. Additional details for Dial Actions are available in KI-2277, the TCU System Programming & Administration Manual.

Everyday Communication | Calendar | Emergencies | Tools | Shortcuts | **Setup**

Home > Setup > Schools > Hudson High School > Dial Actions

Dial Action Extension:

Description:

Action:

<input type="radio"/> All Page	<input type="radio"/> Emergency All Page	<input type="radio"/> Zone Page	<input type="text" value=""/>
<input type="radio"/> Terminate All Prerecorded Audio	<input type="radio"/> Prerecorded Audio	Duration <input type="text" value="0"/> s	
<input type="radio"/> Cancel All Call-Ins In This School	Target <input type="text" value=""/>	Attachment <input type="text" value=""/>	
<input type="radio"/> Terminate All Sequences	<input type="radio"/> Run Sequence	--Select Item--	
<input type="radio"/> All Clear	<input checked="" type="radio"/> Run Emergency	Lockdown	
<input type="radio"/> Set Swing	<input type="radio"/> Clear Swing	<input type="radio"/> Toggle Swing	

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Figure 3 – Dial Action Configuration Example

Once the SIP connections have been configured, users can initiate various TCU actions. The configuration of Dial Actions will determine the number to dial for the desired TCU action. To initiate an action from a SIP phone, configure the Dial Action screen by navigating to *Setup* → *Schools* → *Configure (after your chosen school)* → *Dial Actions*. Additional details for Dial Actions are available in KI-2277, the TCU System Programming & Administration Manual.

Additional Notes

Since each school's TCU Controller communicates directly with the SIP phone system, SIP functionality will continue even if the network connection to the TCU district server is lost or broken.

Rauland recommends that every TCU school has at least one TCU Administrative Console (TCC2044). The Administrative Console displays multiple call-ins on the same screen as well as important status information during emergencies. When timing is critical, the Administrative Console provides the easiest way to effectively communicate throughout the school.

Testing

It is recommended to test each SIP phone extension and each Dial Action to ensure the following scenarios are operational:

- Intercom call to a single room
- Paging dial action initiation (if desired)
- Emergency dial action initiation (if desired)
- Call-in placement and annunciation from a single room
- Call-in placement and annunciation from multiple rooms in different coverages (all call-ins should annunciate)
- Call-in placement and annunciation from multiple rooms in the same coverage (only the highest priority call-in should annunciate)



Advanced Integration Tips Using a Brekeke SIP Server

A few issues that may become evident when implementing more advanced SIP integrations are outlined below. These integrations may require additional hardware and/or software than previously outlined in the Application Note. SIP interoperability is not mature enough for all applications to predictably interface with other SIP applications, even though both are standards-compliant. This means you might need tools such as a Brekeke SIP server to normalize and optimize SIP messages as they flow through the network from the applications across a SIP trunk.

A Brekeke SIP server is REQUIRED for full Shoretel SIP integration as the Shoretel SIP implementation does not support receiving re-INVITE. Support for re-INVITE is required to use a Shoretel phone to answer a call-in from a TCU call switch. Shoretel integrations that do not include call-in answer, such as paging into TCU from a Shoretel SIP phone, do not require a Brekeke SIP server. Currently, a Brekeke SIP server is required for hosted SIP (cloud) integrations with TCU.

Call Routing

- Problem: School district with schools that use the same extension numbers within each school, i.e. extensions 100 to 999 in school A, extensions 100 to 999 in school B
- Solution: On the school district's SIP server, prepend the extension numbers with an additional digit(s) that is unique to each school, i.e. "1" for school A, "2" for school B. The SIP server would dial the full "1100" to reach extension 100 in school A. Conversely, the SIP server would dial "2100" to reach extension 100 in school B.

As a SIP endpoint, TCU cannot provide the dial plan routing for a SIP call. The Brekeke SIP server provides this functionality, effectively stripping off the leading digit when passing the call from the SIP server to the appropriate TCU controller. This assures all SIP extensions are unique, as seen from the SIP server. Using the Brekeke for digit stripping decreases the load on the SIP server and is typically easier to do than using the SIP server for this function. See Brekeke documentation at <http://www.brekeke.com/sip/> for SIP server configuration details.

Security

Although TCU provides partial SIP security by allowing SIP connections only from IP addresses configured in TCU, SIP trunking networks face the same threats as the Internet at large. Providing security must be a top priority for any SIP deployment. Additional security measures include firewalls, NAT devices, SIP registration and Session Border Controllers (SBC) located on all network access points. An SBC offers security, demarcation, session management, and interworking features that protect your network from denial-of-service (DoS) and other SIP-based attacks. Some SIP applications require additional authentication such as when using a hosted SIP provider.

RTP Relay

SIP itself does not carry any voice or video data, but it allows two endpoints to set up connections to transfer that traffic between each other via the Real-time Transport Protocol (RTP). Unlike SIP, which listens on port 5060 (usually UDP, but can be TCP), RTP uses a dynamic port range (and is always UDP), generally between 10000-20000. This range can usually be customized on the client to suit differing firewall configurations.

Summary

Integration of Telecenter U to a SIP trunk provides schools with a wealth of critical communication features. This integration provides a reliable link from TCU to most vendor's SIP server equipment. Be sure to verify that the SIP server solution you select meets the requirements outlined in this Application Note.



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