

FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

1

July 20, 2023

Mr. Paul Goldstein
Moderator, Representative Town Meeting
15 Rope Ferry Road
Waterford, CT 06385

Moderator Goldstein:

At the Board of Finance meeting held Wednesday, July 19, 2023, the Board approved a request for an appropriation in the amount of \$300,000 for a new Capital Non-Recurring Project (account to be determined), for Community Center Building Management System (BMS) Upgrades. Appropriated funds for this project will be made available by transferring the approved \$300,000 from the Unassigned Fund Balance of the General Fund to ~~line~~ a new account. This letter forwards the BOF-approved appropriation request for RTM approval.

I respectfully request you place this item on the agenda of the next meeting of the Representative Town Meeting. Copies of justification documentation are attached hereto.

Respectfully Submitted,

Glenn Patterson

Glenn Patterson
Chairman, Board of Finance

Attachment

RECEIVED FOR RECORD
WATERFORD, CT
2023 JUL 24 P 2:16
ATTEST: *David H. Langston*
TOWN CLERK

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Mr. Paul Goldstein
Moderator, Representative Town Meeting
15 Rope Ferry Road
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Moderator Goldstein:

At the Board of Finance meeting held Wednesday, July 19, 2023, the Board approved a request for an appropriation in the amount of \$300,000 for a new Capital Non-Recurring Project (account to be determine), Community Center Building Management System (BMS). Appropriated funds for this project will be made available by transferring the approved \$300,000 from the Unassigned Fund Balance of the General Fund to line a new account number to be determined (Community Center BMS). This letter forwards the BOF-approved appropriation request for RTM approval.

I respectfully request you place this item on the agenda of the next meeting of the Representative Town Meeting. Copies of justification documentation are attached hereto.

Respectfully Submitted,

Glenn Patterson

Glenn Patterson
Chairman, Board of Finance

Attachment

RECEIVED FOR RECORD
WATERFORD, CT
2023 JUL 21 A 10:55
ATTEST: *David H. Lange*
TOWN CLERK

INTER-OFFICE MEMORANDUMTOWN OF WATERFORD

To: Rob Brule, First Selectman
From: Gary J. Schneider, Director of Public Works
Date: June 12, 2023
Re: HVAC Community Center



This request is to

- Seek funding in the amount of \$300,000 for the installation of a new Building Management System (BMS) and associated work at the Community Center and;
- Waive the bidding of the BMS and associated work and contract with Automated Building Systems (ABS) to complete the work.

With the Director of Recreation and Parks and the Human Services Administrator, offering new and expanded programming at the Community Center, the failures of the exiting HVAC System are no longer just an inconvenience, they are becoming intolerable. The calls for repairs are taxing not only the Board of Education (BOE) maintenance staff, but also our residents, budget and our outside service vendor.

The facility needs to be inviting. It has community orientation. Our residents must feel comfortable attending the services at the facility. The space also needs to function well so staff can focus on their current and future missions and not be concerned about the limitations of the HVAC system.

Overall the facility, the shell, is in good condition. However the building does not function well with a mal-functioning HVAC system. We can't go on with the issues we have been having with a HVAC failure fixed by a service call. The years of service calls and band aide fixes are not providing a facility that meet the expectations of those who use the facility.

The first HVAC report was a broad overview, first to confirm that the ventilation systems and their controls were separate from the Friendship School (they were) and provide a general overview of the system. Facilities now had an understanding of the system and worked with the BOE and our vendor in the attempt to get the HVAC system meeting the demands of the building use. All of the attempts provided results that were nothing more than band aids, causing an increase in frustration and costly expenditures for repairs.

That report was used by our On-Call MEP to conduct a deep dive, pulling together service and BOE reports of the system's performance to determine what was required to accomplish the goal of providing reliable, cost effective heating, ventilation and air conditioning to the Community Center. Simple repairs and service calls will not correct what is wrong with the HVAC.

6/20/23, BOS - approved

The renovation requires the replacement of the Building Management System. The BMS system controls the fans, heating and cooling cycles and can be expanded to cover other systems such as lighting, kitchen equipment and more. It is programmable and can be monitored remotely. The project must also replace components that have failed and by-passed, units that sporadically operate and add equipment to the system to address humidity issues.

The Department consulted with the BOE on what they use for their BMS. Having all Town Buildings on the same page, using the same vendor would allow the BOE, from their desk, to assist in diagnosing an issue and if warranted, make the correction without waiting for a technician travel to the building. The use of the same vendor, Alerton, which the BOE is currently using and will continue to use is major. From day one, we have the wealth of knowledge that Facilities can tap into.

The BMS will allow us at a future date to add other buildings into the system such as the Library, Public Safety and Police Station. All of these buildings have been identified for major HVAC renovations and replacements.

We are proposing to replace the existing proprietary control system (Trane) with a non-proprietary system that uses the industry standard, BACnet. It is a protocol developed by the American Heating Refrigeration and Air Conditioning Engineers. It is an open architecture where different manufactures can have their components and control systems used in various systems as long as they follow the BACnet protocol. This keeps the market competitive.

What we are proposing is a new open architecture building automation and control network or BMS that controls the exchange of information between the headworks and the devices and controls throughout the HVAC system. The BMS system proposed can be expanded with additional control points for refrigeration and freezers and lighting.

What we have:

- 18 year old software that was never updated. Our version is not supported by Trane.
- It is a proprietary, meaning, everything must be Trane.
- The computer that is the headworks operates on Windows Vista, which is not supported anymore. Upgrade the computer, the old software will not work on the current platforms.
- The cables from the headworks to the HVAC units is suspect (reliability). Sometime it works, sometime it doesn't.

If we remain with Trane:

- The Trane cost to update the software and hardware is over \$43,000. That doesn't include the hardware, cabling, malfunctioning or broken controls at the HVAC units, all unknown additional costs.
- Doesn't include the components to address the humidity issues. Estimated at \$45,000.

- Eliminates the BOE support. Understanding the programming of the system (headworks) is just as important as the replacement of a controller that is out in the system.
- Causes the Town to have two BMS systems. Library, Police and Public Safety will have the Allerton systems installed as part of their upgrades when these projects are funded or completed. Any new construction should also have the capability to be added to the BMS.

If we transition to Allerton BMS

- Transition the automation of the management of the facilities HVAC to an industry standard, non-proprietary Building Manage System.
- Consolidation of systems with the Board of Education allowing for expanded coverage and knowledge transfer at no additional cost,
- Ability to add facilities to the system as their HVAC systems are renovated or replaced.
- Ability to monitor other critical equipment in each facility such as freezers and refrigerators.
- Ability to have remote access to all the systems (facilities) and accessed by Smartphone or central desktop.

My long range CIP had identified this need as a future project. Not knowing the extent of the project, funding was not requested in the last budget round. We are having a difficult and expensive time keeping this system functioning. It is limping along on borrowed time. If it crashes, many programs in the building will need to be relocated to other facilities (unknown if there are other locations that could be used).

I am requesting an additional funding to the Consultant's estimate. The market is still volatile and although there have been reports that supply chain issues have been resolved, pricing issues have not. We have a prime example with the bids for the renovations to Town Hall Toilets. The architect advised to increase his cost estimate by 15%. Bids came in 28% higher and I had to request additional funding twice. This is lengthy process that this project can't afford, as the HVAC system are functioning on borrowed time.

**TOWN OF WATERFORD
CAPITAL PROJECT REQUEST FORM
2023-2024 FISCAL YEAR REQUEST**

DEPARTMENT/AGENCY <u>Building Maintenance</u>	CONTACT PERSON <u>Gary J. Schneider</u>
PROJECT NAME <u>Building Management System, Community Ctr</u>	DEPARTMENT PRIORITY <u>1</u>

1	DESCRIPTION AND JUSTIFICATION (describe the type, purpose & anticipated accomplishments of the project) The renovation requires the replacement of the Building Management System. The BMS system controls the fans, heating and cooling cycles and can be expanded to cover other systems such as lighting, kitchen equipment and more. It is programmable and can be monitored remotely. The project must also replace components that have failed and by-passed, units that sporadically operate and add equipment to the system to address humidity issues.																																																																													
2	PROJECT STATUS IF IN PROGRESS Study and analysis has been completed. See attached memo.																																																																													
3	LIST OTHER PROJECTS WITHIN YOUR DEPARTMENT OR ANOTHER DEPARTMENT THAT WILL BE IMPACTED BY THIS REQUEST None																																																																													
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6	ATTACH PLAN ESTIMATE, SERVICE AREA MAP AND/OR OTHER SUPPORTING DOCUMENTATION (if none, simply state that in the area below) See attached memo.																																																																													
7	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">COST/FUNDING SOURCE</th> </tr> <tr> <th style="width: 35%;">FUNDING SOURCE</th> <th style="width: 10%;">APPROVED FUNDING TO DATE</th> <th style="width: 10%;">FY2024</th> <th style="width: 10%;">FY2025</th> <th style="width: 10%;">FY2026</th> <th style="width: 10%;">FY2027</th> <th style="width: 10%;">FY2028</th> </tr> </thead> <tbody> <tr> <td>1 Current Year Capital</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 Utility Budget/Sewer Cap Maint Fund</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 Transfer to CNR</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4 Short/Long-term Bonds</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5 LoCIP (detail in section 5 above)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6 CNR Undesignated Fund Balance</td> <td></td> <td style="text-align: center;">300,000</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>7 Federal/State Grants (detail in section 5)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8 Other Funding (detail in section 5 above)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TOTALS</td> <td style="text-align: center;">0</td> <td style="text-align: center;">300,000</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> </tbody> </table>	COST/FUNDING SOURCE							FUNDING SOURCE	APPROVED FUNDING TO DATE	FY2024	FY2025	FY2026	FY2027	FY2028	1 Current Year Capital							2 Utility Budget/Sewer Cap Maint Fund							3 Transfer to CNR							4 Short/Long-term Bonds							5 LoCIP (detail in section 5 above)							6 CNR Undesignated Fund Balance		300,000					7 Federal/State Grants (detail in section 5)							8 Other Funding (detail in section 5 above)							TOTALS	0	300,000	0	0	0	0
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750 Old Main Street, Rocky Hill, CT 06067
Phone: (860) 436-4336 • Fax: (860) 436-4450
www.rzdesignassociates.com

May 16, 2023

Paul Koelle
Facilities Manager
Public Works Department
Town of Waterford
15 Rope Ferry Road
Waterford, CT 06385

Re: Community Center HVAC Control System

Dear Paul:

The following letter serves to supplement the Waterford Community Center HVAC Study dated February 21, 2022, as performed by AI Engineers. Recent issues with the existing Trane Summit control system identified by your service contractor necessitate a revision to the recommendations contained in the study which also significantly impacts the opinion of probable cost outlined in the report.

DISCUSSION

The 2022 HVAC study contained a recommendation to upgrade the existing Trane Tracer Summit control system to the current Trane SC+ control system as the Trane Tracer Summit is obsolete and no longer supported by Trane. This upgrade would include replacement of the head end controller and field controllers at the equipment, and would provide modern graphics, improve remote access and alarm capabilities, and introduce BACnet capabilities to the site. There was also a line item for re-commissioning the system once the upgrade was complete which included a point-by-point verification of the digital and analog signals and proper calibration and operation of the sensors. The opinion of probable costs contained in the study appears to have come from a proposal dated June 28, 2021, that Trane provided to the Town. The HVAC study and Trane proposal included a cost of \$33,135.00 to upgrade to the Tracer SC+ system plus another \$9,040.00 for recommissioning the system. Both the HVAC study and Trane proposal did not include any costs for repairs to the existing system that may be identified during the recommissioning process.

Fast forward a year to February of 2023 when your HVAC service contractor identified numerous problems with the control system after being able to gain access to the control system to address a "no heat" call in the building, including:

- Several VAV boxes with failed or missing actuators,
- Inability to maintain proper minimum and maximum airflows to the zones due to limited VAV control available,
- Several reheat valves have failed and were not functional,
- Static pressure control sequences are not working properly on three of the Air Handling Units; manual adjustments were made to compensate,
- Discharge air temperature sequences are not functioning on all the Air Handling Units,

- Boiler and Chiller control sequences such as Outside Air Temperature Lockouts and Temperature resets are not functioning properly and will not take permanent adjustments,
- Frequent communication failures occur with controllers going on and offline due to communication bus failure and control failures.

Your HVAC service contractor went further to state that:

- The control system is old proprietary technology that cannot be easily updated,
- Parts such as field and network controllers are difficult and very expensive to maintain,
- Any major programming changes or repairs must be done by proprietary vendors at very high cost,
- Adjustments and minor repairs have been made throughout to bring the system to a level of maintaining comfort, but that these measures are not a permanent solution, and that the system does not operate the building in a consistent or efficient manner.

RECOMMENDATIONS

The HVAC study provided a reasonable low-cost recommendation to simply upgrade the Trane control system to the current system offered by Trane, based on the limited information that was available about the existing system at the time. While the "no heat" call created an emergency, in a way, it was fortunate that it happened as your HVAC service contractor was able to identify problems with the system that were not known before. It was also fortunate that these problems were identified prior to any decision to upgrade the Trane controls as the Town would have been at Trane's mercy to correct these problems, which would have likely surfaced during the recommissioning process, as Trane's proposal did not include any repairs or replacements of system components.

Not only have numerous control device problems been identified (i.e., actuators, control valves, sensors), the most concerning of the problems identified by your HVAC service contractor is the communication bus failures. The communications bus essentially acts like the system's spinal cord; damage to the bus inhibits effective communication of the controllers and devices which in turn does not permit the system to operate in a consistent or efficient manner.

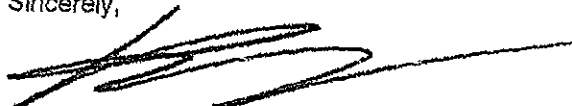
The ASHRAE life expectancy of a controls system is 15-years. While this does not mean the system cannot last longer than 15 years, it means that the system becomes more and more expensive to maintain after its service life when compared to replacement. The existing system has been operating for over 18 years and based on the problems identified with the controllers, communications bus, and devices, as well as the proprietary nature of the existing system, we recommend full replacement of the control system with a fully BACnet compliant system. BACnet is an open non-proprietary protocol that has become the industry standard. Alerton, which I understand is the control system utilized by Waterford Public Schools, is a fully BACnet compliant system that we recommend be the basis of design for the Community Center.

OPINION OF PROBABLE COST

Removal of existing Trane control system and installation of a new fully BACnet (Alerton) control system.....	\$ 180,000.00
Addition of Electric reheat coils (from AI study).....	\$ 20,000.00
Dehumidification / Dynamic Ventilation Reset (AI study).....	<u>\$ 25,000.00</u>
Construction Cost:	\$ 225,000.00
Contingency:	\$ 22,500.00
Engineering:	<u>\$ 22,500.00</u>
Total Budget:	\$ 270,000.00

Please let me know if you have any questions or need additional information.

Sincerely,



Kenneth A. Hipsky, P.E., LEED AP
Vice President



Main Office
126 Kreiger Lane
Glastonbury, Connecticut 06033
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Marlborough, Massachusetts
Licenses: CT E1-125715, CT S1-389041, MA 20987A

April 24, 2023

Prepared by: Drew Appleton

Number of pages: 5

Project: Direct Digital Control System for: Waterford Community Center

Automated Building Systems, Inc. is pleased to present the following quotation and scope for the above referenced project.

- Operator's workstation consisting of:
 - Personal Computer with operating system software
 - Un-Interruptible power supply
 - Alerton ACM BACnet Global controller
 - Alerton COMPASS System software
 - Customized System graphics
 - **ISP provided by Customer
- Global Control Points including:
 - Outdoor air temperature
 - Outdoor air relative humidity
- Direct Digital Control (DDC) of Hot Water System consisting of:
 - Remove existing TRANE controls and replace with:
 - Boiler Enable / Disable
 - Boiler run status
 - Hot water supply temperature
 - Hot water return temperature
 - Hot water pump speed control a through variable speed drive – VFDs by others
 - Pump lead / lag control
 - Pump rotation control.
 - Hot water supply pressure
 - Hot water return pressure
 - Common hot water supply temperature.
 - Common hot water return temperature.
 - Fuel select switch status
 - Relief damper status
- DDC control of Chilled Water System consisting of:
 - (2) chilled water pump start / stop
 - (2) Chilled water pump run status
 - (1) Chiller enable / disable

- Chiller run status
 - Chiller alarm status
 - Chiller supply water set-point
 - Chiller supply water temperature
 - Chiller return water temperature
 - Chilled water supply pressure
 - Chilled water return pressure
 - Chilled Water Flow – Meter existing to remain
 - Minimum Chilled water flow valve - New valve included for installation by others.
 - Glycol level alarm – Level switch existing to remain
- DDC control of AHU- 1 consisting of:
 - Outdoor air damper control – dampers and actuators existing to remain
 - Return air damper control - dampers and actuators existing to remain
 - Exhaust air damper control - dampers and actuators existing to remain
 - Supply fan on / off
 - Supply fan run status
 - Supply fan speed control through a variable frequency drive – VFDs existing to remain
 - Return fan on / off
 - Return fan run status
 - Return fan speed control through a variable frequency drive – VFDs existing to remain
 - Duct static pressure transmitter
 - Filter status switch
 - Hot water coil control – New Valve included for installation by others
 - Low limit thermostat
 - Discharge air temperature sensor
 - Return air temperature
 - Mixed air temperature
 - Return air CO2 transmitter
 - Space temperature sensor with digital display, local programmable setpoint, programmed timed override button.
 - Smoke detector status – Smoke Detector existing to remain.
- DDC control of (1) Kitchen Exhaust Fan consisting of:
 - Fan Enable /Disable
 - Fan Run Status
- DDC control of (1) Dishwasher Exhaust Fan consisting of:
 - Fan Enable /Disable
 - Fan Run Status
- DDC control of AHU- 2 consisting of:
 - Outdoor air damper control – dampers and actuators existing to remain
 - Face & By-pass damper control - dampers and actuators existing to remain
 - Supply fan on / off
 - Supply fan run status

- Supply fan speed control through a variable frequency drive – VFDs existing to remain
 - Filter status switches
 - Hot water coil control – New Valve included for installation by others
 - Low limit thermostat
 - Space temperature sensor with digital display, local programmable setpoint, programmed timed override button.
- DDC control of AHU- 3 consisting of:
 - Outdoor air damper control – dampers and actuators existing to remain
 - Return air damper control - dampers and actuators existing to remain
 - Exhaust air damper control - dampers and actuators existing to remain
 - Supply fan on / off
 - Supply fan run status
 - Supply fan speed control through a variable frequency drive – VFDs existing to remain
 - Return fan on / off
 - Return fan run status
 - Return fan speed control through a variable frequency drive – VFDs existing to remain
 - Filter status switch
 - Chilled water coil control – Valves included for installation by others
 - Hot water coil control - Valves included for installation by others
 - Low limit thermostat
 - Return air temperature sensor
 - Mixed air temperature sensor
 - Discharge air temperature sensor
 - Duct static pressure transmitters
 - Return air humidity transmitter
 - Return air CO2 transmitter
 - Space temperature sensor with digital display, local programmable setpoint, programmed timed override button.
 - Perimeter radiation valve open /close – New valve included for installation by others.
- DDC control of AHU- 4 consisting of:
 - Outdoor air damper control – dampers and actuators existing to remain
 - Return air damper control - dampers and actuators existing to remain
 - Exhaust air damper control - dampers and actuators existing to remain
 - Supply fan on / off
 - Supply fan run status
 - Supply fan speed control through a variable frequency drive – VFDs existing to remain
 - Return fan on / off
 - Return fan run status
 - Return fan speed control through a variable frequency drive – VFDs existing to remain
 - Filter status switch
 - Chilled water coil control – Valves included for installation by others
 - Hot water coil control - Valves included for installation by others
 - Low limit thermostat
 - Return air temperature sensor

- Mixed air temperature sensor
 - Discharge air temperature sensor
 - Duct static pressure transmitters
 - Return air humidity transmitter
 - Return air CO2 transmitter
 - Space temperature sensor with digital display, local programmable setpoint, programmed timed override button.
- DDC control of AHU- 5 consisting of:
 - Outdoor air damper control – dampers and actuators existing to remain
 - Return air damper control - dampers and actuators existing to remain
 - Exhaust air damper control - dampers and actuators existing to remain
 - Supply fan on / off
 - Supply fan run status
 - Supply fan speed control through a variable frequency drive – VFDs existing to remain
 - Return fan on / off
 - Return fan run status
 - Return fan speed control through a variable frequency drive – VFDs existing to remain
 - Filter status switch
 - Chilled water coil control – Valves included for installation by others
 - Hot water coil control - Valves included for installation by others
 - Low limit thermostat
 - Return air temperature sensor
 - Mixed air temperature sensor
 - Discharge air temperature sensor
 - Duct static pressure transmitters
 - Return air humidity transmitter
 - Return air CO2 transmitter
 - Space temperature sensor with digital display, local programmable setpoint, programmed timed override button.
- DDC control of AHU-A (Data) consisting of:
 - Unit on / off
 - Unit run status
 - Space temperature sensor
- DDC monitoring of (1) Freezer and (1) Refrigerator temperature.
- DDC control of (3) zones of lighting consisting of:
 - Light circuit on/off
 - Light circuit status
 - Zone Occupancy override switch.
- Direct Digital Controls for (21) variable air volume boxes with duct mounted reheat coils consisting of:

- Space temperature sensor with local digital display, programmable setpoint, and programmable timed override.
 - New Damper Actuator
 - Hot water re-heat coil control – Valve included for installation by others
 - Discharge air temperature sensor
 - Air flow transmitter – probes by box manufacturer
 - Transformer
 - Interlock control to associated zone perimeter radiation – (8) New Zone valves included.
 - Control panel by box manufacturer.
- DDC control of exhaust fans 1,2,3 4,5,6,7,8 & 9 consisting of:
 - Fan start / stop
 - Fan run status
 - Fan space temperature
- Includes controls installation
 - Includes control wiring
 - Includes control programming
 - Includes (1) year Warranty
 - Includes Controls Start-Up
 - Includes Commissioning.
 - Includes Customer Training
- DOES NOT INCLUDE:
 - Variable Frequency Drives
 - Smoke / Fire Dampers
 - Smoke detection
 - Motor Starters
 - *Sales Tax*

Our quotation for the above is\$ 179,800.00

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2

July 20, 2023

Mr. Paul Goldstein
Moderator, Representative Town Meeting
15 Rope Ferry Road
Waterford, CT 06385

Moderator Goldstein:

At the Board of Finance meeting held Wednesday, July 19, 2023, the Board approved a request for an additional appropriation in the amount of \$581,700 for Capital Non-Recurring Project 20547-57860 (Telephone System Upgrade). Appropriated funds for this project will be made available by transferring the approved \$581,700 from the CNR Undesignated Fund Balance Line #205-31520 to line #20547-57860 (Telephone System Upgrade). This letter forwards the BOF-approved appropriation request for RTM approval.

I respectfully request you place this item on the agenda of the next meeting of the Representative Town Meeting. Copies of justification documentation are attached hereto.

Respectfully Submitted,

Glenn Patterson

Glenn Patterson
Chairman, Board of Finance

Attachment

RECEIVED FOR RECORD
WATERFORD, CT
2023 JUL 24 P 2:17
ATTEST: *David J. Grogan*
TOWN CLERK

FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

TO: Board of Selectmen

FROM: Kim Allen, Director of Finance
Jeff Robillard, IT Manager

RE: Additional Appropriation Request

DATE: June 26, 2023

The Town and Board of Education phone system is at end of life. The software can no longer be maintained and issues are now becoming frequent that put the safety of both school and town employees at risk. The school telephone system is the only concrete way for staff to be able to call outside the school during any type of emergency as the buildings materials make cellular phones inconsistent. The upgraded software will also include an added security layer by programming "panic buttons" that will be wired directly to Waterford dispatch in case of an emergency.

We respectfully request an additional appropriation of \$581,700 for capital project 20547-57860 (Telephone System Upgrade)

Regards,

Kim Allen
Jeff Robillard

7/11/23 BOS, approved

**TOWN OF WATERFORD
CAPITAL PROJECT REQUEST FORM
2023-2024 FISCAL YEAR REQUEST**

DEPARTMENT/AGENCY INFORMATION TECHNOLOGY	CONTACT PERSON JEFFREY ROBILLARD
PROJECT NAME PHONE SYSTEM UPGRADE REPLACEMENT	DEPARTMENT PRIORITY 2

1	DESCRIPTION AND JUSTIFICATION (describe the type, purpose & anticipated accomplishments of the project)						
	The purpose of the project is to update the Cisco VOIP phone system that provides voice communications and voicemail from town residents, to/from all Town Buildings/Departments, to/from all Board of Education buildings/Departments, and to/from all the Fire Houses to a current supportable secure platform. Most of the current backend equipment and all of the software that makes the phone system function is end of life or past end of life and considered unsupportable. The replacement project will allow the School system, Town, and Fire Houses to run a phone system that is current, reliable, supportable, and secure.						
2	PROJECT STATUS IF IN PROGRESS						
3	LIST OTHER PROJECTS WITHIN YOUR DEPARTMENT OR ANOTHER DEPARTMENT THAT WILL BE IMPACTED BY THIS REQUEST						
4	DESCRIBE THE IMPACT ON DEPARTMENT OPERATING BUDGET (include cost estimate if applicable)						
5	GRANT FUNDING/OTHER FUNDING, if applicable (detailed explanation of grant/other funding, including the amount, source of funding, status, town match, if any. Attach award letter if available)						
6	ATTACH PLAN ESTIMATE, SERVICE AREA MAP AND/OR OTHER SUPPORTING DOCUMENTATION (if none, simply state that in the area below)						
7	COST/FUNDING SOURCE						
	FUNDING SOURCE	APPROVED FUNDING TO DATE	FY2024	FY2025	FY2026	FY2027	FY2028
1	Current Year Capital						
2	Utility Budget/Sewer Cap Maint Fund						
3	Transfer to CNR		581,700				
4	Short/Long-term Bonds						
5	LoCIP (detail in section 5 above)						
6	CNR Undesignated Fund Balance						
7	Federal/State Grants (detail in section 5)						
8	Other Funding (detail in section 5 above)						
	TOTALS	0	581,700				

TOTAL COMMUNICATIONS

Itemized Pricing

Quote Prepared for: Waterford Board of Education

Quote Expires: 1/4/2023

CPE MATERIAL				UNIT PRICE	TOTAL PRICE
QTY	PART NUMBER	DESCRIPTION			
Alternate 1					
	Collab Flex (School portion of 520 KW, 5yrs)				
1	A-FLEX-3	Collaboration Flex Plan 3.0		-	-
1	SVS-FLEX-SUPT-BAS	Basic Support for Flex Plan		-	-
347	A-FLEX-EAPL	EntW On-Premises Calling	427.16		148,224.52
50	A-FLEX-STD-CUBE	CUBE Standard Trunk Session License	159.40		7,970.00
694	A-FLEX-SRST-E	SRST Endpoints (1)	-	-	-
347	A-FLEX-P-EA	On-Premises Smart License - EA (1)	-	-	-
70	A-FLEX-P-ACC	Access Smart License (1)	-	-	-
174	A-FLEX-P-CA	Common Area Smart License (1)	-	-	-
416	A-FLEX-P-UCXN	Unity Connection Smart License (1)	-	-	-
1040	A-FLEX-P-ER	Emergency Responder Smart License (1)	-	-	-
1	A-FLEX-SW-12.5-K9	On-Premises SW Bundle v12.5 (1)	-	-	-
1	A-FLEX-SW-14-K9	On-Premises SW Bundle v14 (1)	-	-	-
	Cisco UC Virtual Servers (HA Pair on each side, 5yrs)				
2	BE6M-M5-K9	Cisco Business Edition 6000M (M5) Appliance, Export Restr SW	9,489.94		18,979.88
2	CON-SNT-BE6MM5K9	5yrs SNTC-8X5XNBD Cisco BE 6000M (M5) (Smartnet)	2,512.46		5,024.92
2	BE6K-PSU	Cisco UCS 770W AC Power Supply for Rack Server	-	-	-
2	BE6K-RAIDCTRLR	Cisco 12G Modular RAID controller with 2GB cache	-	-	-

12	BE6K-DISK	300GB 12G SAS 10K RPM SFF HDD	-	-
2	R2XX-RAID5	Enable RAID 5 Setting	-	-
2	BE6K-CPU	2.2 GHz 4114/85W 10C/13.75MB Cache/DDR4 2400MHz	-	-
2	CAB-9K12A-NA	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America	-	-
2	BE6K-VIRTBAS-7X	Cisco BE Embedded Virt. Basic 7x, BE6K only	-	-
2	CON-ECMU-BE6KVIRX	SWSS UPGRADES Cisco BE Embedded Virt. Basic 7x, BE6K o	487.69	975.38
3	BE6K-RAM-M6-M5	16GB RDIMM SRx4 3200 (8Gb)	-	-
2	UCSC-PSU1-770W=	Cisco UCS 770W AC Power Supply for Rack Server	558.24	1,116.48
2	CAB-9K12A-NA=	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America	25.97	51.94
1	UCSC-PCIE-IRJ45=	Intel i350 Quad Port 1Gb Adapter	1,418.60	1,418.60
Head End C8300 SIP Router (DNA Adv, 4FXO, 2FXS, 5yr)				
1	C8300-1N1S-6T	Cisco Catalyst C8300-1N1S-6T Router	9,232.51	9,232.51
1	CON-SNTE-C830IN6T	5yrs SNTC-8X5X4 Cisco Catalyst C8300 (Smartnet)	10,615.15	10,615.15
1	MEM-C8300-8GB	Cisco Catalyst 8300 Edge 8GB memory	-	-
1	M2USB-16G	Cisco Catalyst 8000 Edge M.2 USB 16GB	-	-
1	C-RFID-1R	Cisco Catalyst 8000 Edge RFID - 1RU	-	-
1	C8300-RM-19-1R	Cisco Catalyst 8300 Rack mount kit - 19" 1R	-	-
1	C8300-PIM-BLANK	Cisco Catalyst 8300 Edge PIM Blank	-	-
1	NETWORK-PNP-LIC	Network Plug-n-Play Connect for zero-touch device deployment	-	-
1	TE-R-SW	TE agent for IOSXE on Enterprise Routing	-	-
1	IOSXE-AUTO-MODE	IOS XE Autonomous boot up mode for Unified image	-	-
1	SC8KBEUK9-176	UNIVERSAL	-	-
2	PWR-CC1-400WAC	Cisco C8300 1RU AC Power supply	-	-
2	CAB-AC	AC Power Cord (North America), C13, NEMA 5-15P, 2.1m	-	-
1	NIM-PVDM-64	NIM with 64-channel DSP	2,853.69	2,853.69
1	NIM-2FXS/4FXOP	2-Port FXS/FXS-E/DID and 4-Port FXO Network Interface Module	1,246.87	1,246.87
1	C-SM-NIM-ADPT	Cisco Catalyst SM to NIM Module Adaptor	1,258.99	1,258.99
1	DNA-P-T0-A-3Y	Cisco DNA Advantage On-Prem Lic 3Y - upto 25M (Aggr, 50M)	2,968.52	2,968.52
1	SVS-PDNA-ADV	Embedded Support for SW - Tiered DNA Advantage On-Prem	-	-
1	DSTACK-T0-A	Cisco DNA Advantage Stack - upto 25M (Aggr, 50M)	-	-

1	NWSTACK-T0-A	Cisco Network Advantage Stack - upto 25M (Aggr, 50M)	-	-	-
1	SDWAN-UMB-ADV	Cisco Umbrella for DNA Advantage	-	-	-
1	DNAC-ONPREM-PF	Cisco DNA Center On Prem Deployment Option for WAN	-	-	-
	C8200 (DNA Adv, 2FXO, 5yr)				
3	C8200-1N-4T	Cisco Catalyst C8200-1N-4T Router	3,776.93	11,330.79	
3	CON-SNT-C82001N4	5yrs SNTC-8X5XNBD Cisco Catalyst C8200 (Smartnet)	3,029.03	9,087.09	
3	MEM-C8200-8GB	Cisco Catalyst 8200 Edge 8GB memory	-	-	-
3	M2USB-16G	Cisco Catalyst 8000 Edge M.2 USB 16GB	-	-	-
3	CAB-AC	AC Power Cord (North America), C13, NEMA 5-15P, 2.1m	-	-	-
3	C-RFID-1R	Cisco Catalyst 8000 Edge RFID - 1RU	-	-	-
3	C8200-RM-19-1R	Cisco Catalyst 8200 Rack mount kit - 19" 1R	-	-	-
3	NETWORK-PNP-LIC	Network Plug-n-Play Connect for zero-touch device deployment	-	-	-
3	C8200-PIM-BLANK	Cisco Catalyst 8200 Edge PIM Blank	-	-	-
3	TE-R-SW	TE agent for IOSXE on Enterprise Routing	-	-	-
3	IOSXE-AUTO-MODE	IOS XE Autonomous boot up mode for Unified image	-	-	-
3	SC8KBEUK9-176	UNIVERSAL	-	-	-
3	SVS-PDNA-ADV	Embedded Support for SW - Tiered DNA Advantage On-Prem	-	-	-
3	SDWAN-UMB-ADV	Cisco Umbrella for DNA Advantage	-	-	-
3	DNAC-ONPREM-PF	Cisco DNA Center On Prem Deployment Option for WAN	-	-	-
3	DNA-P-T0-A-3Y	Cisco DNA Advantage On-Prem Lic 3Y - upto 25M (Aggr, 50M)	2,968.52	8,905.56	
3	NWSTACK-T0-A	Cisco Network Advantage Stack - upto 25M (Aggr, 50M)	-	-	-
3	DSTACK-T0-A	Cisco DNA Advantage Stack - upto 25M (Aggr, 50M)	-	-	-
3	NIM-2FXO	2-port Network Interface Module - FXO (Universal)	419.66	1,258.98	
	Analog GWs (5yrs)				
4	VG400-4FXS/4FXO	Cisco VG400 Analog Voice Gateway	3,440.01	13,760.04	
4	CON-SNT-VG4004FO	5yrs SNTC-8X5XNBD Cisco VG400 Analog Voice G/w (Smartnet)	2,197.10	8,788.40	
4	SL-VG400-UC-K9	Unified Communication License for VG400 Series	-	-	-
4	CAB-AC	AC Power Cord (North America), C13, NEMA 5-15P, 2.1m	-	-	-
4	PWR-VG400-AC	AC Power Supply for Cisco VG400	-	-	-
4	SVG400UK9-175	Cisco VG400 Series IOS XE Universal Image	-	-	-
1		Cisco Smartnet years 1-5	35,078.71	35,078.71	

1	S&H	Freight	1,277.24	1,277.24
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*note wall mounts and labor not included in phone pricing

PROJECT SUMMARY

Material Summary	\$	301,424.26
Labor Summary	\$	22,799.98
Total Customer Price	\$	324,224.24
Annual Payment	\$	64,844.85

* All work to be performed during normal business hours Monday through Friday between 8:00am and 5:00pm unless otherwise specified.

* Additional taxes may apply to both upfront and monthly charges and vary by location.

TOTAL COMMUNICATIONS

Itemized Pricing

Quote Prepared For: Town of Waterford Quote Expires: 1/4/2023

CPE MATERIAL

QTY	PART NUMBER	DESCRIPTION	UNIT PRICE	TOTAL PRICE
Base Quote				
Collab Flex (Town portion of 520 KW, 5yrs)				
1	A-FLEX-3	Collaboration Flex Plan 3.0	-	-
1	SVS-FLEX-SUPT-BAS	Basic Support for Flex Plan	-	-
173	A-FLEX-EAPL	EntW On-Premises Calling	427.16	73,898.68
50	A-FLEX-STD-CUBE	CUBE Standard Trunk Session License	159.40	7,970.00
346	A-FLEX-SRST-E	SRST Endpoints (1)	-	-
173	A-FLEX-P-EA	On-Premises Smart License - EA (1)	-	-
34	A-FLEX-P-ACC	Access Smart License (1)	-	-
86	A-FLEX-P-CA	Common Area Smart License (1)	-	-
208	A-FLEX-P-UCCXN	Unity Connection Smart License (1)	-	-
520	A-FLEX-P-ER	Emergency Responder Smart License (1)	-	-
1	A-FLEX-SW-12.5-K9	On-Premises SW Bundle v12.5 (1)	-	-
1	A-FLEX-SW-14-K9	On-Premises SW Bundle v14 (1)	-	-
Cisco UC Virtual Servers (HA Pair on each side, 5yrs)				
2	BE6M-M5-K9	Cisco Business Edition 6000M (M5) Appliance, Export Restr SW	9,489.94	18,979.88
2	CON-SNT-BE6MM5K9	5yrs SNTC-8X5XNBD Cisco BE 6000M (M5) (Smartnet)	2,512.46	5,024.92
2	BE6K-PSU	Cisco UCS 770W AC Power Supply for Rack Server	-	-
2	BE6K-RAIDCTRLR	Cisco 12G Modular RAID controller with 2GB cache	-	-

12	BE6K-DISK	300GB 12G SAS 10K RPM SFF HDD	-	-	-
2	R2XX-RAID5	Enable RAID 5 Setting	-	-	-
2	BE6K-CPU	2.2 GHz 4114/85W 10C/13.75MB Cache/DDR4 2400MHz	-	-	-
2	CAB-9K12A-NA	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America	-	-	-
2	BE6K-VIRTBAS-7X	Cisco BE Embedded Virt. Basic 7x, BE6K only	-	-	-
2	CON-ECMU-BE6K/VIRX	SWSS UPGRADES Cisco BE Embedded Virt. Basic 7x, BE6K o	487.69	975.38	-
3	BE6K-RAM-M6-M5	16GB RDIMM SRx4 3200 (8Gb)	-	-	-
2	UCSC-PSU1-770W=	Cisco UCS 770W AC Power Supply for Rack Server	558.24	1,116.48	-
2	CAB-9K12A-NA=	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America	25.97	51.94	-
1	UCSC-PCIE-IRJ45=	Intel i350 Quad Port 1Gb Adapter	1,418.60	1,418.60	-
Head End C8300 SIP Router (DNA Adv, 4FXO, 2FXS, 5yr)					
3	C8300-1N1S-6T	Cisco Catalyst C8300-1N1S-6T Router	9,232.51	27,697.53	-
3	CON-SNTE-C830IN6T	5yrs SNTE-8X5X4 Cisco Catalyst C8300 (Smartnet)	10,615.15	31,845.45	-
3	MEM-C8300-8GB	Cisco Catalyst 8300 Edge 8GB memory	-	-	-
3	M2USB-16G	Cisco Catalyst 8000 Edge M.2 USB 16GB	-	-	-
3	C-RFID-1R	Cisco Catalyst 8000 Edge RFID - 1RU	-	-	-
3	C8300-RM-19-1R	Cisco Catalyst 8300 Rack mount kit - 19" 1R	-	-	-
3	C8300-PIM-BLANK	Cisco Catalyst 8300 Edge PIM Blank	-	-	-
3	NETWORK-PNP-LIC	Network Plug-n-Play Connect for zero-touch device deployment	-	-	-
3	TE-R-SW	TE agent for IOSXE on Enterprise Routing	-	-	-
3	IOSXE-AUTO-MODE	IOS XE Autonomous boot up mode for Unified image	-	-	-
3	SC8KBEUK9-176	UNIVERSAL	-	-	-
6	PWR-CC1-400WAC	Cisco C8300 1RU AC Power supply	-	-	-
6	CAB-AC	AC Power Cord (North America), C13, NEMA 5-15P, 2.1m	-	-	-
3	NIM-PVDM-64	NIM with 64-channel DSP	2,853.69	8,561.07	-
3	NIM-2FXS/4FXOP	2-Port FXS/FXS-E/DID and 4-Port FXO Network Interface Module	1,246.87	3,740.61	-
3	C-SM-NIM-ADPT	Cisco Catalyst SM to NIM Module Adaptor	1,258.99	3,776.97	-
3	DNA-P-T0-A-3Y	Cisco DNA Advantage On-Prem Lic 3Y - upto 25M (Aggr, 50M)	2,968.52	8,905.56	-
3	SVS-PDNA-ADV	Embedded Support for SW - Tiered DNA Advantage On-Prem	-	-	-
3	DSTACK-T0-A	Cisco DNA Advantage Stack - upto 25M (Aggr, 50M)	-	-	-

3	NWSTACK-T0-A	Cisco Network Advantage Stack - upto 25M (Aggr, 50M)	-	-	-
3	SDWAN-UMB-ADV	Cisco Umbrella for DNA Advantage	-	-	-
3	DNAC-ONPREM-PF	Cisco DNA Center On Prem Deployment Option for WAN	-	-	-
1	Addl Port Cards (2FXO for EoC1 and 4FXO for EoC2)		-	-	-
1	NIM-2FXO=	2-port Network Interface Module - FXO (Universal)	525.20	525.20	525.20
1	NIM-4FXO=	4-port Network Interface Module - FXO (Universal)	1,027.02	1,027.02	1,027.02
	Analog GWs (EoC1 and EoC2, 5yrs)				
2	VG400-4FXS/4FXO	Cisco VG400 Analog Voice Gateway	3,440.01	3,440.01	6,880.02
2	CON-SNT-VG4004FO	5yrs SNTC-8X5XNBD Cisco VG400 Analog Voice G/w (Smartnet)	2,197.10	2,197.10	4,394.20
2	SL-VG400-UC-K9	Unified Communication License for VG400 Series	-	-	-
2	CAB-AC	AC Power Cord (North America), C13, NEMA 5-15P, 2.1m	-	-	-
2	PWR-VG400-AC	AC Power Supply for Cisco VG400	-	-	-
2	SVG400UK9-175	Cisco VG400 Series IOS XE Universal Image	-	-	-
	Analog GWs (Both for EoC1, 5yrs)				
2	VG400-8FXS	Cisco VG400 Analog Voice Gateway	3,354.05	3,354.05	6,708.10
2	CON-SNT-VG4008X	5yrs SNTC-8X5XNBD Cisco VG400 Analog Voice G/w (Smartnet)	2,140.43	2,140.43	4,280.86
2	SL-VG400-UC-K9	Unified Communication License for VG400 Series	-	-	-
2	CAB-AC	AC Power Cord (North America), C13, NEMA 5-15P, 2.1m	-	-	-
2	PWR-VG400-AC	AC Power Supply for Cisco VG400	-	-	-
2	SVG400UK9-175	Cisco VG400 Series IOS XE Universal Image	-	-	-
	C8200 - Comm Ctr (DNA Adv, 4FXO, 2FXS, 5yr)				
1	C8200-1N-4T	Cisco Catalyst C8200-1N-4T Router	3,776.93	3,776.93	3,776.93
1	CON-SNT-C82001N4	5yrs SNTC-8X5XNBD Cisco Catalyst C8200 (Smartnet)	3,029.03	3,029.03	3,029.03
1	MEM-C8200-8GB	Cisco Catalyst 8200 Edge 8GB memory	-	-	-

1	M2USB-16G	Cisco Catalyst 8000 Edge M.2 USB 16GB	-	-
1	CAB-AC	AC Power Cord (North America), C13, NEMA 5-15P, 2.1m	-	-
1	C-RFID-1R	Cisco Catalyst 8000 Edge RFID - 1RU	-	-
1	C8200-RM-19-1R	Cisco Catalyst 8200 Rack mount kit - 19" 1R	-	-
1	NETWORK-PNP-LIC	Network Plug-n-Play Connect for zero-touch device deployment	-	-
1	C8200-PIM-BLANK	Cisco Catalyst 8200 Edge PIM Blank	-	-
1	TE-R-SW	TE agent for IOSXE on Enterprise Routing	-	-
1	IOSXE-AUTO-MODE	IOS XE Autonomous boot up mode for Unified Image	-	-
1	SC8KBEUK9-176	UNIVERSAL	-	-
1	SVS-PDNA-ADV	Embedded Support for SW - Tiered DNA Advantage On-Prem	-	-
1	SDWAN-UMB-ADV	Cisco Umbrella for DNA Advantage	-	-
1	DNAC-ONPREM-PF	Cisco DNA Center On Prem Deployment Option for WAN	-	-
1	DNA-P-T0-A-3Y	Cisco DNA Advantage On-Prem Lic 3Y - upto 25M (Aggr, 50M)	2,968.52	2,968.52
1	NWSTACK-T0-A	Cisco Network Advantage Stack - upto 25M (Aggr, 50M)	-	-
1	DSTACK-T0-A	Cisco DNA Advantage Stack - upto 25M (Aggr, 50M)	-	-
1	NIM-2FXS/4FXOP	2-Port FXS/FXS-E/DID and 4-Port FXO Network Interface Module	1,246.87	1,246.87
1		Cisco Smartnet years 2-5	17,333.66	17,333.66
1	S&H	Freight	638.61	638.61

PROJECT SUMMARY

Material Summary	\$ 246,772.09
Labor Summary	\$ 10,699.99
Total Customer Price	\$ 257,472.08
Annual Payment	\$ 51,494.42

* All work to be performed during normal business hours Monday through Friday between 8:00am and 5:00pm unless otherwise specified.

* Additional taxes may apply to both upfront and monthly charges and vary by location.

Cisco Business Edition 6000 Solutions

Contents

Platform model options	3
Applications	4
Solution specifications: System capacity	6
Licensing	7
Ordering Information	7
Cisco Unified Communications Services	7
Cisco Capital	8
For more information	8

Cisco Business Edition 6000 14 (Collaboration System Release Version 14)

The Cisco® Business Edition 6000 (BE6000) gives employees a full range of collaboration tools: premium voice, video, messaging, *instant messaging and presence*, conferencing, *video conferencing*, *contact center services*, mobility capabilities, and more. With these tools your small or midsize business can boost productivity among employees and strengthen relationships with customers and business partners. And they can help you speed decision making and reduce time to market.

Cisco BE6000 is purpose-built for companies with 25 to 1000 employees. The solutions consist of one or more modular, stackable servers so you can easily add more capacity to support additional users. And because they use virtualization technology, they pack a lot of collaboration tools into a small form factor.

Cisco BE6000 is delivered with a suite of preloaded, ready-to-activate unified communications and collaboration applications. And as your business needs grow, you can easily “turn on” the additional application options supported, including emergency services, contact center, video conferencing, edge connectivity, and more. Cisco BE6000 and Cisco Webex can be purchased together with a subscription using the [Cisco Collaboration Flex Plan](#), which enables customers to simplify purchasing with meetings, messaging, and calling capabilities in one offer.

With these choices in size and functionality, you can select a collaboration engine that meets your business’s specific needs.

Platform model options

Cisco BE6000 platforms are built on virtualized Cisco Unified Computing System™ (Cisco UCS®) products, which are designed for performance and density over a wide range of company sizes and business workloads. There are three models:

- BE6000H: Supports multiple applications (typically 8 to 10) in a single virtualized server platform; maximum capacity of 1000 users, 2500 devices, and 100 contact center agents. Ideal for medium- to large-scale end-to-end collaboration deployments (see Figure 1).
- BE6000M: Supports multiple applications (typically 5 to 7) in a single virtualized server platform; maximum capacity of 1000 users, 1200 devices, and 100 contact center agents. Ideal for medium-scale end-to-end collaboration deployments.

The servers are delivered ready for use, with a preinstalled virtualization hypervisor and preloaded software, ready to install. *Specific details of BE6000 platform components are available at the links provided in following section.*

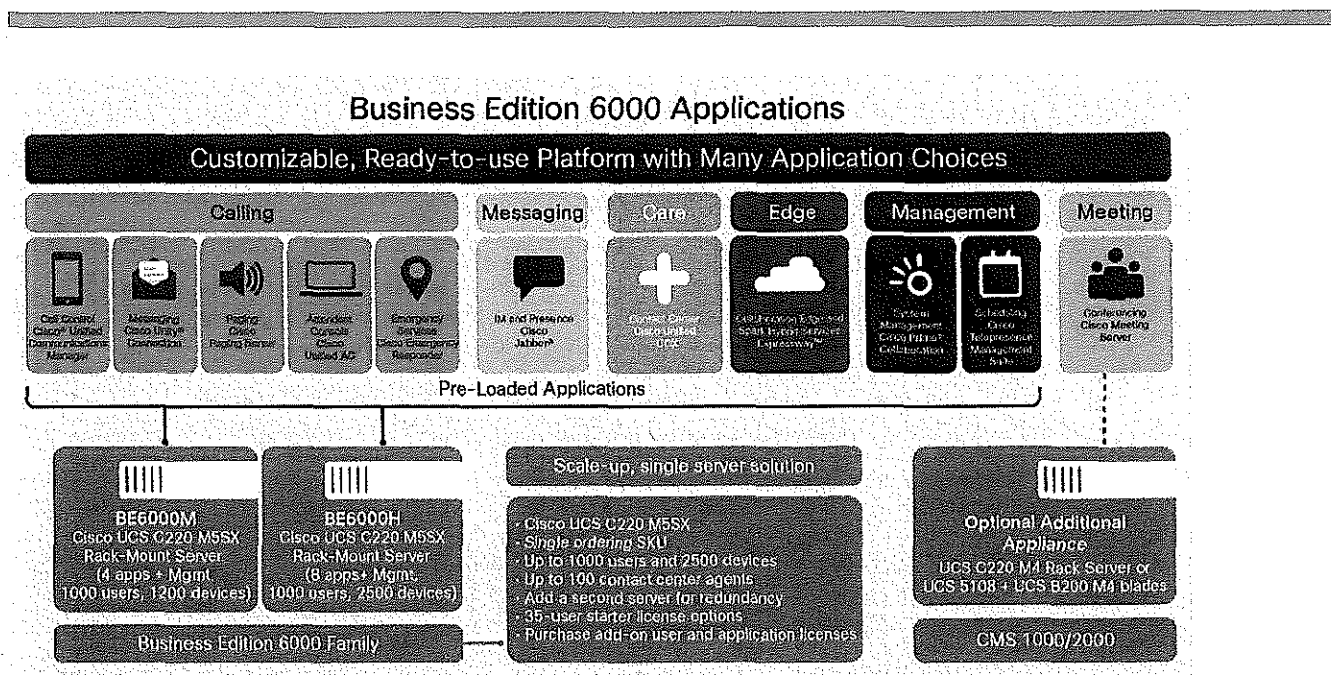


Figure 1.
Cisco BE6000H/M: Built for Medium-Scale Collaboration Deployments

The Cisco BE6000 is a packaged solution that comes preloaded with virtualization and applications software. Simply turn on additional collaboration applications as your business needs grow.

Applications

The following applications are typically used together to deliver the core unified communications features of each BE6000 solution:

Calling

- Cisco Unified Communications Manager (Cisco Unified CM) is the call-processing engine of Cisco's Collaboration Architecture. It extends voice and video features to network devices such as IP phones, telepresence endpoints, media-processing devices, gateways, and multimedia applications. Cisco Unified CM is equipped for use with the Instant Messaging (IM) and Presence Service. In addition, multimedia conferencing, collaborative contact centers, and interactive multimedia response systems are made possible through its open telephony APIs.
- Cisco Unity® Connection integrates voice-messaging and voice-recognition functions to provide continuous global access to calls and messages. Its advanced convergence-based communication services allow you to use natural-language voice commands to place calls or listen to messages in hands-free mode and to check voice messages from your desktop, either from your email inbox or using a web browser. It also provides robust auto-attendant functions, including intelligent routing for incoming calls and easily customizable call-screening and message-notification options.
- Cisco Unified Attendant Consoles provide the human attendant console operator with the tools to quickly accept and effectively dispatch incoming calls to individuals across the organization.

-
- Cisco Emergency Responder helps assure that Cisco Unified Communications Manager sends emergency calls to the appropriate United States Public Safety Answering Point (PSAP) for the caller's location, and that the PSAP can identify the caller's location and return the call if necessary. The system automatically tracks and updates equipment moves and changes, helping ensure better compliance with legal or regulatory obligations and reducing the risk of liability related to emergency calls as a result.
 - Cisco Paging Server provides paging capabilities for all users. It supports basic and advanced paging features. Basic paging features require no license and allow point-to-point or group audio paging between groups of up to 50 Cisco IP phones. An advanced paging license allows unlimited paging groups. It also makes possible other advanced functions, including paging to overhead analog and IP speakers, bell scheduling, prioritizing emergency notifications with the call-barge option, prerecorded and text-only pages, integration with social media sites for notification, email and Short Message Service (SMS) mass notification and all-number monitoring, Emergency Services alerting, and integration with Cisco Jabber clients.

Messaging

- Cisco Unified Communications Manager IM and Presence Service provides embedded standards-based enterprise instant messaging and network-based presence. The service is secure, scalable, easy to manage, and rich in features. It's tightly integrated with Cisco Jabber® desktop and mobile instant messaging and presence clients and the Cisco Jabber Software Development Kit (SDK). Collaboration clients such as Cisco Jabber use products from the Cisco collaboration portfolio to perform many functions, such as instant messaging, presence, click-to-call, phone control, voice, video, visual voicemail, and web collaboration.

Contact Center

- Cisco Unified Contact Center Express product line helps businesses and organizations deliver a connected digital experience, enabling you to provide contextual, continuous, and capability-rich journeys for your customers, across time and channels. This easy-to-deploy and easy-to-use solution is designed for midmarket companies or enterprise branch offices. Secure and highly available, it supports powerful agent-based services and fully integrated self-service applications, including Automatic Call Distributor (ACD), Interactive Voice Response (IVR), Computer Telephony Integration (CTI), and digital channels, including email and chat.

Edge

- Cisco Expressway™ is an advanced gateway that helps make collaboration as simple, secure, and effective outside the organization as it is inside. Expressway provides remote access to mobile users and teleworkers, without the need for a separate VPN client. It supports business-to-business and business-to-consumer collaboration, and video interoperability with third-party standards-based systems. Expressway also enables seamless hybrid collaboration experiences, connecting on-premises unified communications assets to Cisco Webex® cloud services.

Management

- [Cisco Prime® Collaboration Provisioning](#) provides an automated process for initial deployments and for ongoing moves, adds, changes, and deletions. An intuitive user interface provides a single view of a subscriber and the subscriber's services. Cisco Prime Collaboration Provisioning significantly accelerates site rollouts and dramatically reduces the time required for ongoing changes. The result? Exceptional productivity gains and lower operating expenses. In addition, Cisco Prime Collaboration Provisioning simplifies the tasks, allowing organizations to optimize IT resources and further reduce total cost of ownership.
- [Cisco Prime Collaboration Deployment](#) is an application that is designed to assist in the management of unified communications applications. It allows you to perform tasks such as migration of older software versions to new virtual machines, fresh installs, and upgrades of existing applications.
- [Cisco TelePresence® Management Suite](#) offers flexible scheduling capabilities for video meetings, including the ability to integrate with Microsoft Exchange and Microsoft Office 365. At the core of the Cisco collaboration infrastructure portfolio, the suite facilitates on-premises video collaboration. It works with Cisco Meeting Server and Cisco TelePresence Server deployments.

Meetings

- **(Not preloaded)** [Cisco Meeting Server](#) brings premises-based video, audio, and web communication together to meet the collaboration needs of the modern workplace. It works with third-party devices and provides an enjoyable and intuitive user experience. It also scales easily and can be purchased using our all-in-one, user-based multiparty licensing offer.

In addition, when used with a Cisco Business Edition Embedded Virtualization Basic license, BE6000M and BE6000H platform models support co-residency of approved third-party collaboration applications as described in the [Co-Residency Policy](#). Cisco Business Edition Embedded Virtualization Basic licenses may be replaced with a higher-tier feature edition to host any application if required.

Solution specifications: System capacity

Tables 1 and 2 list the system capacities supported by the BE6000 platform models. For solution design guidance and deployment models, please refer to the [Preferred Architecture for Midmarket Collaboration](#) and [Cisco Validated Designs](#) guides. The [Cisco Solutions Reference Network Design \(SRND\)](#) guides and the [Cisco Collaboration Virtualization](#) document are also available for more advanced implementations, as required.

Table 1. Cisco BE6000M and BE6000H Models System Capacity

Attribute	Capacity
Maximum number of users	1000
Maximum number of mailboxes and voicemail ports	1000 mailboxes and 24 voicemail ports
Number of contact center agents	100
Number of presence users	1000
Number of devices supported	BE6000H: 2500 devices BE6000M: 1200 devices

Attribute	Capacity
Maximum number of co-resident applications	BE6000H: varies by deployment, typically 8 to 10 per appliance BE6000M: varies by deployment, typically 5 to 7 per appliance

Table 2. Ordering Cisco Business Edition 6000 Platform Models

Part Number	Description
BE6H-M5-K9	Cisco Business Edition 6000H Svr (M5), Export Restricted SW
BE6H-M5-XU	Cisco Business Edition 6000H Svr (M5), Export Unrestrict. SW
BE6M-M5-K9	Cisco Business Edition 6000M Svr (M5), Export Restricted SW
BE6M-M5-XU	Cisco Business Edition 6000M Svr (M5), Export Unrestrict. SW

Licensing

The collaboration applications in the BE6000 platform models are licensed on a per-user basis. Each BE6000 customer may purchase a Cisco Collaboration Flex Plan subscription at various feature levels for each of their users and common area devices. Cisco Collaboration Flex Plan provides simplified purchasing with flexible payment options, easily extensible functionality from calling and messaging to meetings and contact center, flexible migration to the cloud and enhanced visibility into collaboration usage. For more information, see <https://www.cisco.com/c/en/us/products/unified-communications/collaboration-flex-plan/index.html>.

Ordering information

To order any BE6000 platform model, simply purchase the required number of appliances and add application subscriptions to enable the required mix of features and number of users. Cisco channel partners and resellers can refer to the [Cisco Business Edition 6000 Ordering Guide](#) for further information.

To place an order, contact your local Cisco representative or visit [Cisco.com Locate a Partner](#) and search on “Advanced Collaboration Architecture Specialization (ACAS),” or “Cisco Express Collaboration Specialization” to find a certified unified communications partner in your local area.

Cisco Unified Communications Services

Cisco Unified Communications Services help you accelerate cost savings and productivity gains associated with deploying Cisco Unified Communications in your network. Delivered by Cisco and our certified partners, our portfolio of deployment and technical support services is based on proven methodologies for unifying voice, video, data, and mobile applications on fixed and mobile networks. Our unique lifecycle approach to these services can help you provide your users with powerful new ways to collaborate with co-workers, partners, and customers across any workspace to accelerate business advantage.

To learn more, please visit <https://www.cisco.com/go/ucservices>.

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For more information

To learn more about Cisco Business Edition 6000 solutions, visit: <https://www.cisco.com/go/be6000>.

To learn more about Cisco's complete portfolio offering for midmarket, visit: <https://www.cisco.com/go/midmarket>.

To learn more about resources for Cisco channel partners, visit: <https://www.cisco.com/go/bepartner>.

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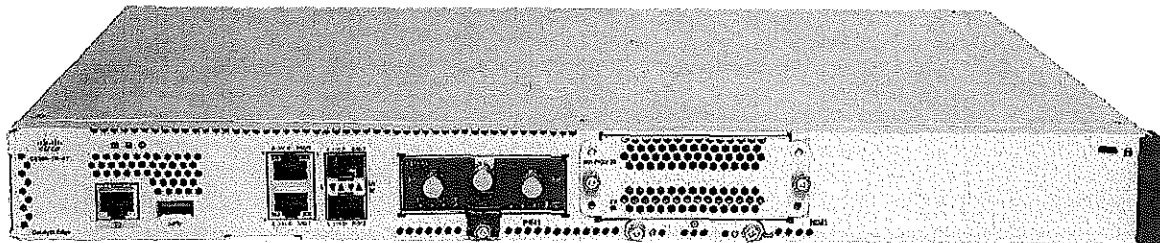
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Cisco Catalyst 8200 Series Edge Platforms

Contents

Product overview	4
Platform details	5
Platform performance	5
Overall platform benefits	6
Supported modules	8
Memory, storage, and accessory options	10
Optics and transceivers modules	10
Power supplies	11
Software requirements	11
Licensing	13
Product sustainability	14
Specifications	14
Services	16
Cisco Capital	17
Ordering information	18
For more information	18
Document history	19

The Cisco Catalyst 8200 Series Edge Platforms are 5G-ready cloud edge platforms designed for Secure Access Service Edge (SASE), multilayer security, and cloud-native agility to accelerate your journey to cloud.



The Cisco® Catalyst® 8200 Series Edge Platforms with Cisco IOS® XE SD-WAN software deliver Cisco's secure, cloud-scale SD-WAN solution for the small branch. The platforms are purpose-built for performance and integrated SD-WAN services along with flexibility to deliver security and networking services together from the cloud or on premises. They have a wide variety of interface options to choose from, with backward compatibility to existing WAN, LAN, and voice modules. Powered by Cisco IOS XE, a fully programmable software architecture, and API support, the Catalyst 8200 Series can facilitate automation at scale to achieve zero-touch IT capability while migrating workloads to the cloud. The platforms also come with a trustworthy solutions 2.0 infrastructure that secures them against threats and vulnerabilities through advanced integrity verification and remediation of threats.

The 8200 Series is well suited for small and medium-sized enterprise branch offices at optimal price/performance with integrated SD-WAN services.

The Catalyst 8200 Series Edge Platforms are offered in two models: C8200L-1N-4T for the small branch with SASE-compliant, cloud-based security requirements, and C8200-1N-4T for the small to medium-sized branch with requirements for higher throughput, scale, and service flexibility. In addition to supporting SASE-compliant cloud-based security services, the C8200-1N-4T also delivers a flexible system of best-in-class, on-premises security services through container-based apps, using Cisco's third-party ecosystem.

Product overview

Product highlights

Table 1. Product highlights

Product feature	Benefits and description
Multicore processors	• C8200-1N-4T uses an Intel® x86 CPU with 8 GB DRAM memory default • C8200L-1N-4T uses an Intel x86 CPU with 4 GB DRAM memory default • High-performance multicore processors support high-speed WAN connections • Dynamic core allocation architecture will repurpose unused cores into forwarding entities as per the user's configuration
Embedded IPsec VPN hardware acceleration	• C8200-1N-4T enables up to 1 Gbps IPsec traffic • C8200L-1N-4T enables up to 500 Mbps IPsec traffic • Increases scalability for IPsec throughput requirements • SSL and crypto hardware acceleration
Integrated Gigabit Ethernet ports	• Provides four built-in Ethernet WAN ports • Two Ethernet ports are Small Form-Factor Pluggable (SFP) and two are RJ45 ports, enabling fiber as well as copper connectivity
DRAM	• C8200-1N-4T ships with 8 GB DRAM • C8200L-1N-4T ships with 4 GB DRAM • C8200-1N-4T can be upgraded to 16 GB and 32 GB DRAM for higher scale and performance • C8200L-1N-4T can be upgraded to 8GB, 16 GB and 32 GB DRAM for higher scale and performance
Flash memory support	• Both models have an integrated onboard 8-GB flash which is not upgradable. M.2 storage provides flash upgrade options
M.2 storage	• The C8200-1N-4T is shipped with default 16G M.2 storage and can be upgraded to 32G M.2 USB and 600G M.2 Non-Volatile Memory Express (NVMe) Storage • The C8200L-1N-4T does not ship with a default M.2 storage but can be upgraded to 16G, 32G USB and 600G M.2 Non-Volatile Memory Express (NVMe) Storage
Power supply	• Both models use an internal, fixed AC power supply • Power over Ethernet (PoE) is available as an option • PoE ports added in the Network Interface Module (NIM) slot will require an additional external PoE power supply
Modularity and form factor	• 1-Rack Unit (1RU) form factor • Supports NIM and Pluggable Interface Module (PIM) slots
Integrated security	• Hardware-anchored Secure Boot and Secure Unique Device Identification (SUDI) support for Plug and Play to verify the identity of the hardware and software

Platform details

Models and configurations

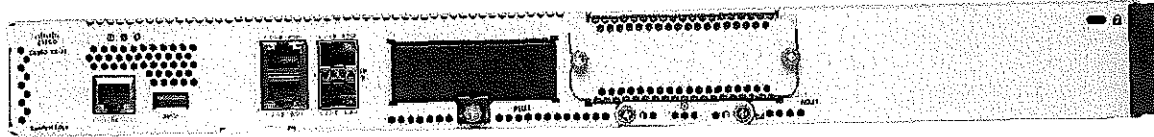


Figure 1.
Catalyst 8200 Series with 1 NIM slot and 4x 1 Gigabit Ethernet WAN ports

Tables 2 and 3 detail platform specifications and performance, respectively.

Table 2. Platform specifications

Model	Description	1G port density	Slots	Memory (DRAM) default	Storage (M.2 SSD) default
C8200-1N-4T	C8200 1RU w/ 1 NIM slot and 4x 1 Gigabit Ethernet WAN ports	4	1 NIM 1 PIM	8 GB	16 GB
C8200L-1N-4T	C8200L 1RU w/ 1 NIM slot and 4x 1 Gigabit Ethernet WAN ports	4	1 NIM 1 PIM	4 GB	No

*16GB eUSB M.2 can only be ordered as a spare.

Platform performance

Table 3a Cisco controller mode (SD-WAN) performance specifications

Feature	C8200-1N-4T	C8200L-1N-4T
SD-WAN IPsec throughput (1400 bytes)	Up to 1 Gbps	Up to 500 Mbps
SD-WAN IPsec throughput (IMIX*)	900 Mbps	400 Mbps
SD-WAN overlay tunnels scale	2500	1500

*IMIX is average packet size of 352 bytes.

Table 3b Cisco autonomous mode (non SD-WAN) performance specifications

Feature	C8200-1N-4T	C8200L-1N-4T
IPv4 forwarding throughput (1400 bytes)	Up to 3.8 Gbps	Up to 3.8 Gbps
IPsec throughput (1400 bytes)	Up to 1 Gbps	Up to 500 Mbps
Number of IPsec Static Virtual Tunnel Interface (SVTI) tunnels	2500	1500

Table 3c Cisco autonomous mode (non SD-WAN) system scalability

Feature	C8200-1N-4T	C8200L-1N-4T
Number of Access Control Lists (ACLs) per system	4000	4000
Number of IPv4 Access Control Entries (ACEs) per system	72,000	72,000
Number of IPv4 routes	1.6M with default 8 GB, up to 4M with 32 GB	800,000 with default 4 GB, up to 4M with 32 GB
Number of IPv6 routes	1.5M with default 8 GB, up to 4M with 32 GB	800,000 with default 4 GB, up to 4M with 32 GB
Number of queues	16,000	16,000
Number of Network Address Translation (NAT) sessions	1.2M with default 8 GB, up to 2M with 32 GB	600,000 with default 4 GB, up to 2M with 32 GB
Number of firewall sessions	512,000	512,000
Number of Virtual Route Forwarding (VRF) instances	4000	2000

Overall platform benefits

Accelerated services with Cisco Software-Defined WAN

Cisco SD-WAN is a set of intelligent software services that allow you to connect users, devices, and branch office locations reliably and securely across a diverse set of WAN transport links. The Cisco Catalyst 8000 Edge Platforms Family can dynamically route traffic across the “best” link based on up-to-the-minute application and network conditions for great application experiences. With Cisco SD-WAN you get tight control over application performance, bandwidth usage, data privacy, and availability of your WAN links. This control is critical as branches conduct greater volumes of mission-critical business using both on-premises and cloud controllers.

Application performance optimization

Ensure that SD-WAN networks meet Service-Level Agreements (SLAs) and maintain strong performance, even if network problems occur. With branch multicloud access, you can accelerate your Software-as-a-Service (SaaS) applications with a simple template push from the SD-WAN controller. Features such as TCP optimization, Forward Error Correction (FEC), and packet duplication enhance application performance for a better user experience.

Multilayer security

You can now move your traditional and complex WAN networks into an agile, software-defined WAN with integrated security. The Catalyst 8200 Series Edge Platforms connect branch offices to the internet and cloud with industry-leading protection against major web attacks. Secure Direct Internet Access (DIA) from the branches helps optimize branch workloads for improved performance, specifically for cloud-hosted applications. At the same time, secure DIA helps ensure that your branch is protected from external threats.

Application visibility

Applications and users are more distributed than ever, and the internet has effectively become the new enterprise WAN. As organizations continue to embrace internet, cloud, and SaaS, network and IT teams are challenged to deliver consistent and reliable connectivity and application performance over networks and services they don't own or directly control.

The Catalyst 8200 Series Edge Platforms are integrated with Cisco ThousandEyes internet and cloud intelligence. IT managers now have expanded visibility, including hop-by-hop analytics, into network underlay, proactive monitoring of SD-WAN overlay, and performance measurement of SaaS applications. This granular visibility ultimately lowers the Mean Time to Identification of Issues (MTTI) and accelerates resolution time.

Unified communications

The Catalyst 8200 Series Edge Platforms offer rich voice services in both SD-WAN and traditional Cisco IOS XE software feature stacks. Cisco is the only SD-WAN vendor to natively integrate analog and digital IP directly into single Customer Premises Equipment (CPE), reducing CapEx and OpEx. In SD-WAN mode, the Catalyst 8200 Series also helps prevent internal and external outages with Survivable Remote Site Telephony (SRST), enabling *branch routers to assume the role of call control PBX for telephony survivability. They also continue to support a* long list of traditional Cisco IOS XE voice use cases such as Cisco Unified Border Element (CUBE) Session Border Controller (SBC), Cisco Unified Communications Manager Express (CUCME), Survivable Remote Site Telephony (SRST), ISDN, and voice over IP.

Cloud-native agility with a programmable software architecture

Cisco continues to offer a feature-rich traditional Cisco IOS XE routing stack on the Catalyst 8200 Series. IP routing, IPsec, QoS, firewall, NAT, Network-Based Application Recognition (NBAR), Flexible NetFlow (FNF), and many other features are part of Cisco IOS XE, a fully programmable software architecture with API support and a wide variety of protocols and configurations. With an integrated software image and a single binary file, you can now choose between Cisco IOS XE SD-WAN and Cisco IOS XE. And you can easily move from one to the other when you choose to do so.

5G-ready

The Catalyst 8200 Series Edge Platforms are built for high-speed Cat18 LTE and 5G networks. With the higher throughputs from Cat18 LTE and 5G, *wireless WAN solutions are becoming feasible options for primary* transport use cases. These platforms supports both integrated pluggable modules as well as external Cellular Gateways with Cat18 LTE and 5G capability for improved throughput that addresses those use cases. An integrated PIM module or external Cellular Gateway can be chosen based on a specific branch's cellular coverage, or work in tandem forming a high-availability Active-Active cellular WAN solution

Interface flexibility

Layer 2 (Switched) and Layer 3 (Routed) ports

The Catalyst 8200 Series continues Cisco's support for a flexible single-box solution with both switching and routing for a small branch. Layer 2 NIM modules provides 4- and 8-port switching with PoE capability and NIM based Layer 3 port modules provides extended Layer 3 port density in addition to the four embedded Layer 3 ports

Voice modules

The Catalyst 8200 Series continues Cisco's support for a variety of voice modules for the different voice needs at the branch. Voice module examples include Foreign Exchange Station (FXS), Foreign Exchange Office (FXO), Digital Signal Processor (DSP), etc.

Supported modules

Table 4. Modules supported

Product number	Description
Ethernet Layer 3 Interface	
C-NIM-1M	1-port 2.5/1Gbps RJ-45 WAN, 90W Poe 802.3 af/at/bt NIM
C-NIM-2T	2-port 100Mbps/1Gbps dual-mode RJ45/SFP NIM with WAN MACSec
LAN modules	
NIM-ES2-4	Cisco 4-port Gigabit Ethernet switch NIM
NIM-ES2-8	Cisco 8-port Gigabit Ethernet switch NIM
NIM-ES2-8-P	Cisco 8-port Gigabit Ethernet switch NIM with PoE 802.3 af/at support
Voice modules	
NIM-2FXO	2-port FXO NIM
NIM-4FXO	4-port FXO NIM
NIM-2FXSP	2-port FXS NIM
NIM-4FXSP	4-port FXS NIM
NIM-2FXSP/4FXOP	2-port FXS and 4-port FXO NIM
NIM-4E/M	4-port E/M NIM
NIM-2BRI-NT/TE	2-port BRI (NT and TE) NIM
NIM-4BRI-NT/TE	4-port BRI (NT and TE) NIM
NIM-PVDM-32	32-channel voice DSP NIM

Product number	Description
NIM-PVDM-64	64-channel voice DSP NIM
NIM-PVDM-128	128-channel voice DSP NIM
NIM-PVDM-256	256-channel voice DSP NIM
NIM-1MFT-T1/E1	1-port multiflex trunk voice/clear-channel data T1/E1 module
NIM-2MFT-T1/E1	2-port multiflex trunk voice/clear-channel data T1/E1 module
NIM-4MFT-T1/E1	4-port multiflex trunk voice/clear-channel data T1/E1 module
NIM-8MFT-T1/E1	8-port multiflex trunk voice/clear-channel data T1/E1 module
DSL/broadband	
NIM-VAB-A	Multi-mode VDSL2/ADSL/2/2+ NIM Annex A
NIM-VA-B	Multi-mode VDSL2/ADSL/2/2+ NIM Annex B
NIM-VAB-M	Multi-mode VDSL2/ADSL/2/2+ NIM Annex M
NIM-4SHDSL-EA	Multi-mode G.SHDSL NIM
Channelized T1/E1 and ISDN PRI	
NIM-1CE1T1-PRI	1-port Multiflex trunk voice/channelized data T1/E1 module
NIM-2CE1T1-PRI	2-port Multiflex trunk voice/channelized data T1/E1 module
NIM-8CE1T1-PRI	8-port Multiflex trunk voice/channelized data T1/E1 module
ISDN BRI WAN interface	
NIM-2BRI-S/T	2-port ISDN BRI WAN interface card for data
NIM-4BRI-S/T	4-port ISDN BRI WAN interface card for data
Serial WAN interface	
NIM-1T	1-port serial high-speed WAN interface card
NIM-2T	2-port serial high-speed WAN interface card
NIM-4T	4-port serial high-speed WAN interface card
Async WAN interface	
NIM-16A	16-port Asynchronous Module
NIM-24A	24-port Asynchronous Module

Product number	Description
Wireless WAN (LTE)	
P-5GS6-GL	5G Sub-6 GHz Pluggable – Global
P-LTEAP18-GL	4G/CAT18 LTE Advanced Pro Pluggable – Global
P-LTEA-EA	4G/CAT6 LTE Advanced Pluggable for North American and Europe
P-LTEA-LA	4G/ CAT6 LTE Advanced Pluggable for APAC, ANZ, and LATAM
NIM-LTEA-EA	LTE Advanced for Europe and North America
NIM-LTEA-LA	LTE Advanced for Asia Pacific, Australia and LATAM

Memory, storage, and accessory options

Table 5. Memory, storage, and accessory options

Product number	Description
MEM-C8200-8GB	Cisco C8200 Edge Platform – 8 GB DRAM Memory
MEM-C8200-16GB	Cisco C8200 Edge Platform – 16 GB DRAM Memory
MEM-C8200-32GB	Cisco C8200 Edge Platform – 32 GB DRAM Memory
M2USB-16G	Cisco C8000 Edge Platform – 16 GB M.2 USB SSD Storage
M2USB-32G	Cisco C8000 Edge Platform – 32 GB M.2 USB SSD Storage
SSD-M2NVME-600G	Cisco C8000 Edge Platform – 600 GB M.2 NVMe SSD Storage
C8200-RM-19	Cisco C8200 1RU Edge Platform – Rack Mount kit – 19"
C8200-RM-23	Cisco C8200 1RU Edge Platform – Rack Mount kit – 23"
C8200-WM-1R	Cisco C8200 1RU Edge Platform – Wall Mount Kit
C8200-RFID-1R	Cisco C8200 1RU Edge Platform – RFID
C8200-NIM-BLANK	Cisco C8200 NIM Blank
C8200-PIM-BLANK	Cisco C8200 PIM Blank

Optics and transceivers modules

Find a full list of optics and transceivers [here](#).

Power supplies

Table 6. Power supply specifications

Power supply feature	Default	PWR-CC1-150WAC optional external PSU for PoE
Power maximum rating	100W	150W For PoE only PoE budget: 150W
Input-voltage range and frequency	90 to 264 VAC 47 to 63 Hz	90 to 264 VAC 47 to 63 Hz
Power supply efficiency	85%	Avg 89%
Input current	1.5A max	2A max
Output ratings	12V 8.4A	54V 2.78A
Output holdup time	20 ms	10 ms
Power supply input receptacles	IEC 320 C14	IEC 320 C14
Power cord rating	10A	10A

Asset management: The Catalyst 8200 Series Edge Platforms have an embedded RFID tag that holds the serial number and product ID for easy asset and inventory management using commercial RFID readers. The RFID tag is external and can be easily removed if needed or can be unselected at the time of ordering. It also features an extendable label tag providing the same information. A QR code on this tag makes asset management easy by simply scanning the label using a smartphone QR reader.

Software requirements

Cisco DNA Software for the Catalyst 8200 Series offers comprehensive solutions for enterprise branch networks.

Table 7. Minimum software requirements

Platform product ID (PID)	Description	Minimum software requirement
C8200-1N-4T	Cisco Catalyst 8200 Series Edge Platform	Cisco IOS XE Software Release 17.4.1
C8200L-1N-4T	Cisco Catalyst 8200 Series Edge Platform	Cisco IOS XE Software Release 17.5.1

Table 8. ThousandEyes requirements

Feature	Requirements
Cisco ThousandEyes	ThousandEyes is supported with a minimum 8 GB DRAM and 8 GB bootflash/storage. Additional memory and storage will be necessary for concurrently running the ThousandEyes agent with containerized SD-WAN security services.

Table 9a. Software features and protocols for autonomous mode

Feature	Description
Protocols	IPv4, IPv6, static routes, Routing Information Protocol Versions 1 and 2 (RIP and RIPv2), Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), Border Gateway Protocol (BGP), BGP Route Reflector, Intermediate System-to-Intermediate System (IS-IS), Multicast Internet Group Management Protocol Version 3 (IGMPv3), Protocol Independent Multicast Sparse Mode (PIM SM), PIM Source-Specific Multicast (SSM), Resource Reservation Protocol (RSVP), Cisco Discovery Protocol, Encapsulated Remote Switched Port Analyzer (ERSPAN), Cisco IOS IP Service-Level Agreements (IPSLA), Call Home, Cisco IOS Embedded Event Manager (EEM), Internet Key Exchange (IKE), ACLs, Ethernet Virtual Connections (EVC), Dynamic Host Configuration Protocol (DHCP), Frame Relay, DNS, Locator ID Separation Protocol (LISP), Hot Standby Router Protocol (HSRP), RADIUS, Authentication, Authorization, and Accounting (AAA), Application Visibility and Control (AVC), Distance Vector Multicast Routing Protocol (DVMRP), IPv4-to-IPv6 Multicast, Multiprotocol Label Switching (MPLS), Layer 2 and Layer 3 VPN, IPsec, Layer 2 Tunneling Protocol Version 3 (L2TPv3), Bidirectional Forwarding Detection (BFD), IEEE 802.1ag, and IEEE 802.3ah
Encapsulations	Generic Routing Encapsulation (GRE), Ethernet, 802.1q VLAN, Point-to-Point Protocol (PPP), Multilink Point-to-Point Protocol (MLPPP), Frame Relay, Multilink Frame Relay (MLFR) (FR.15 and FR.16), High-Level Data Link Control (HDLC), serial (RS-232, RS-449, X.21, V.35, and EIA-530), and PPP over Ethernet (PPPoE)
Traffic management	QoS, Class-Based Weighted Fair Queuing (CBWFQ), Weighted Random Early Detection (WRED), Hierarchical QoS, Policy-Based Routing (PBR), Performance Routing (PfR), and NBAR
Cryptographic algorithms	Encryption: Data Encryption Standard (DES), 3DES, Advanced Encryption Standard (AES)-128 or AES-256 (in Cipher Block Chaining [CBC] and Galois/Counter Mode [GCM]) Authentication: RSA (768/1024/2048 bit), ECDSA (256/384 bit) Integrity: MD5, SHA, SHA-256, SHA-384, SHA-512
Unified communications	Call Admission Control (CAC), Cisco Unified Border Element (CUBE) Session Border Controller (SBC), Cisco Unified Communications Manager Express (CUCME) , (ISDN), RADIUS , RFC 4040-based clear channel codec signaling with Session Initiation Protocol (SIP), Resource Reservation Protocol (RSVP), RTP Control Protocol (RTCP), SIP for voice over IP (VoIP), Survivable Remote Site Telephony (SRST), Secure Real-Time Transport Protocol (SRTP), and voice modules

Table 9b. Software features and protocols for controller mode

Feature	Description
Core features	IPv4, IPv6, static routes, OSPF, EIGRP, BGP, Overlay Management Protocol (OMP), Application Aware Routing (AAR), Traffic Engineering, service insertion, zero trust, whitelisting, tamper-proof module, DTLS/TLS, IPsec, classification, prioritization, low latency queuing, remarking, shaping, scheduling, policing, mirroring, Multicast IPv4 support, service advertisement and insertion policy, Simple Network Management Protocol (SNMP), Network Time Protocol (NTP), DNS client, DHCP, DHCP client, DHCP server, DHCP relay archival, syslog, Secure Shell (SSH), Secure Copy (SCP), Cflowd v10 IPFIX export, IPv6 for transport side, Virtual Router Redundancy Protocol (VRRP), MPLS, NAT (DIA, service-side, overload/PAT, NAT64, etc.), NAT pools, split DNS, ACLs, BFD, NETCONF over SSH, CLI, NTP server support, BFD with service-side BGP, BGP community propagation to OMP, 6 SLA for AAR, Cisco TrustSec®/SD-Access (inline scalable group tag [SGT] propagation), custom app with Software-Defined AVC (SD-AVC), multicast AAR, dynamic on-demand tunnels, OSM, OSPFv3, route policies, multi-VRF support
Encapsulations	Generic Routing Encapsulation (GRE), Ethernet, 802.1q VLAN

Feature	Description
Application experience	QoS, FEC, Class of Service (CoS) marking, Weighted Random Early Detection (WRED), Hierarchical QoS, PBR, NBAR, SD-AVC, per-tunnel QoS, Cloud OnRamp for SaaS, Enhanced Office 365 traffic steering, direct access, FNF
Cryptographic algorithms	Encryption: AES-256 (in CBC and GCM modes), Internet Key Exchange (IKE), Cisco Public Key Infrastructure (PKI) Authentication: AAA, RSA (2048 bit), ESP-256-CBC, HMAC-SHA1, ECDSA (256/384 bit) Integrity: SHA-1, SHA-2
Security: C8200-1N-4T	Built-in end-to-end segmentation (VPNs), zone-based firewall (ZBFW), PKI, Cisco DNA Layer Security, Snort® IPS/IDS, URL filtering, Secure Malware Defense, Secure Malware Analytics, Application-Level Gateway (ALG) for ZBFW, Secure Internet Gateway (SIG)
Security: C8200L-1N-4T	Built-in end-to-end segmentation (VPNs), ZBFW, PKI, Cisco DNA Layer Security, SIG
Unified communications	Cisco Unified Border Element (CUBE), Survivable Remote Site Telephony (SRST), Cisco Unified Communications Manager Express (CUCME) & voice modules

Licensing

The Catalyst 8200 Series Edge Platforms are offered only with a Cisco DNA Software subscription, Enterprise Agreement, and Managed Service Licensing Agreement (MSLA). For more details, refer to this [licensing guide](#).

Cisco DNA stack:

- Cisco DNA Essentials
- Cisco DNA Advantage
- Cisco DNA Premier

Network stack:

- Network Essentials
- Network Advantage

For a more detailed overview on Cisco Licensing, go to cisco.com/go/licensingguide

Cisco ThousandEyes

A valid ThousandEyes agent license is required to activate the ThousandEyes agent. Existing ThousandEyes subscriptions can be leveraged on eligible Catalyst 8200 Series platforms. Additional ThousandEyes subscription information can be found [here](#).

Product sustainability

Information about Cisco's environmental, Social and Governance (ESG) initiatives and performance is provided in Cisco's CSR and sustainability [reporting](#).

Sustainability Topic		Reference
General	Information on product-material-content laws and regulations	Materials
	Information on electronic waste laws and regulations, including our products, batteries and packaging	WEEE Compliance
	Sustainability Inquiries	Contact: csr_inquiries@cisco.com
	Information on product takeback and reuse program	Cisco Takeback and Reuse Program
	Operating and nonoperating conditions	Table 10. Mechanical specifications
	Mean Time Between Failures (MTBF)	Table 10. Mechanical specifications
Power	Safety and EMC (emissions, immunity and ETSI/EN)	Table 11. Mechanical specifications
	Power Supply	Table 1. Product highlights Table 6. Power supply specifications
Material	Product packaging weight and materials	Contact: environment@cisco.com
	Dimensions and weight	Table 10. Mechanical specifications

Specifications

Table 10. Mechanical specifications

Description	Specification
Part number	C8200-1N-4T & C8200L-1N-4T
Dimensions (H x W x D)	1.73 x 17.25 x 11.8 in. (4.39 x 43.81 x 29.97 cm)
Rack Units (RU)	1RU
Chassis weight	10 lb (4.54 kg)
Input voltage	AC: 90 to 264 VAC
Operating temperature	32° to 104°F (0° to 40°C)
Storage temperature	-40° to 150°F (-40° to 70°C)

Description	Specification
Acoustics, both models:	54 dBA/69 dBA
Sound pressure (Typical/maximum)	
Acoustics, both models:	68 dBA/80 dBA
Sound power (Typical/maximum)	
Relative humidity operating and nonoperating noncondensing	Ambient (noncondensing) operating: 5% to 85% Ambient (noncondensing) nonoperating and storage: 5% to 95%
Altitude	0 to 10,000 feet (0 to 3050 meters)
Mean Time Between Failures (MTBF)	692,577 hours

Table 11. Safety and compliance

Description	Specification
Safety certifications	UL 60950-1 CAN/CSA-C22.2 No. 60950-1 EN 60950-1 IEC 60950-1 AS/NZS 60950-1 IEC/EN 60825 Laser Safety FDA: Code of Federal Regulations Laser Safety
EMC (emissions)	47 CFR Part 15 Class A ICES 003 Class A AS/NZS CISPR 32 Class A CISPR 32 Class A EN55032 Class A VCCI-CISPR 32 Class A CNS-13438 Class A KN32 Class A IEC/EN 61000-3-2: Power Line Harmonics IEC/EN 61000-3-3: Voltage Fluctuations and Flicker

Description	Specification
EMC (Immunity)	IEC/EN-61000-4-2: Electrostatic Discharge Immunity IEC/EN-61000-4-3: Radiated Immunity IEC/EN-61000-4-4: Electrical Fast Transient Immunity IEC/EN-61000-4-5: Surge AC, DC, and Signal Ports IEC/EN-61000-4-6: Immunity to Conducted Disturbances IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity IEC/EN-61000-4-11: Voltage DIPS, Short Interruptions, and Voltage Variations KN35
EMC (ETSI/EN)	EN300 386: Telecommunications Network Equipment (EMC) EN55032: Multimedia Equipment (Emissions) EN55024: Information Technology Equipment (Immunity) EN55035: Multimedia Equipment (Immunity) EN61000-6-1: Generic Immunity Standard

Services

Cisco Customer Experience support services for Catalyst 8000 platforms and Cisco DNA Software for SD-WAN and Routing

This section discusses the Cisco support services available for the Catalyst 8000 platforms and associated Cisco DNA Software for SD-WAN and Routing, as well as optional support service offers.

- **Catalyst 8000 platforms:** Cisco Solution Support is the default and recommended Cisco support service. However, Cisco Solution Support is not mandatory; it can be removed or replaced with another Cisco support service or partner service per the customer's preference.
- **Cisco DNA Software for SD-WAN and Routing:** Cisco Solution Support is the default Cisco support service. However, Cisco Solution Support is not mandatory; the customer may choose to use the Cisco Subscription Embedded Software Support included with the purchase of this software.

Note:

- When Solution Support is selected, it must be ordered on both the Catalyst 8000 platform and Cisco DNA Software for SD-WAN and Routing for complete customer entitlement to this premium support service.
- SD-WAN and Routing customers with Solution Support or Cisco Subscription Embedded Software Support are entitled to maintenance releases and software updates for **Cisco DNA SD-WAN and Routing software only**. Support for the Catalyst 8000 platform's OS and network stack, along with OS updates, is covered by the support contract on the Catalyst 8000 platform.
- For ThousandEyes support, C8200L-1N-4T must be upgraded to a minimum of 8GB DRAM

Cisco Solution Support is a premium support purpose-built for today's multiproduct, multivendor network environments and provides:

- A primary point of contact, centralizing support across a solution deployment
- Solution, product, and interoperability expertise
- No requirement for customers to isolate their issue to a product to open a case
- 30-minute service response objective for Severity 1 and 2 cases
- Prioritized case handling over product support cases
- Product support team coordination (Cisco and Solution Support Alliance Partners)
- Accountability for multiproduct, multivendor issue management from first call to resolution, no matter where the issue resides

Learn more about Cisco Solution Support at www.cisco.com/go/solutionsupport

Cisco Subscription Embedded Software Support includes:

- Access to support and troubleshooting via online tools and web case submission. Case severity or escalation guidelines are not applicable.
- Cisco Technical Assistance Center (TAC) access 24 hours per day, 7 days per week to assist by telephone, or web case submission and online tools with application software use and troubleshooting issues.
- Access to www.cisco.com, providing helpful technical and general information on Cisco products, as well as access to Cisco's online Software Center library.

Note: No additional products or fees are required to receive embedded support for Cisco DNA Software for SD-WAN and Routing. However, if using embedded support for this software, hardware support for the Catalyst 8000 platforms must be purchased separately, as Cisco Subscription Embedded Software Support does not cover hardware. In this case, Cisco Smart Net Total Care® Service is recommended for the Catalyst 8000 platforms.

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Flexible payment solutions to help you achieve your objectives

Cisco Capital® makes it easier to get the right technology to achieve your objectives, enable business transformation, and stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. [Learn more.](#)

Ordering information

To place an order, visit the [Cisco Ordering Home Page](#). To download software, visit the [Cisco Software Center](#).

For more information

For more information about the Cisco Catalyst 8200 Series Edge Platforms, visit <https://www.cisco.com/go/C8200> or contact your local Cisco account representative.

Document history

New or Revised Topic	Described In	Date
Updated licensing information	Licensing	Jun 25, 2021

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Cisco VG400 Analog Voice Gateway

Contents

Features and Benefits	4
Analog Phone Connectivity	5
Fax and Modem Connectivity	6
VG400 Models	8
Software Compatibility	9
Technical Specifications	9
Homologation	12
Ordering Information	13
Services and Support	13
Cisco Capital	13

The Cisco® VG400 Analog Voice Gateway enables an IP telephony solution to continue using traditional analog devices while taking advantage of the productivity afforded by IP infrastructure (Figure 1).

The Cisco Unified Communications portfolio of voice and IP communications products and applications enables organizations to communicate more effectively, helping them to streamline business processes, reach the right resource the first time, and improve revenue sales and profitability.

This portfolio is a critical part of the Cisco Business Communications Solution, an integrated solution for organizations of all sizes that also includes network infrastructure, security and network management products, wireless connectivity, and a lifecycle services approach, along with flexible deployment and outsourced management options, end-user and partner financing packages, and third-party communications applications.

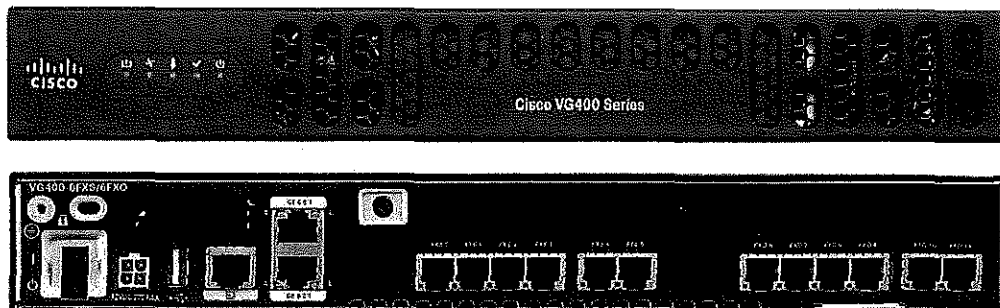


Figure 1.
Cisco VG400 Analog Voice Gateway

The Cisco VG400 is a Cisco IOS® XE Software-based analog phone voice gateway. It connects analog phones, fax machines, modems, and speakerphones to an enterprise voice system based on Cisco Unified Communications Manager. The tight integration with the IP-based phone system is advantageous for increased manageability, scalability, and cost-effectiveness. Businesses can also use the VG400 with Cisco Unified Communications Manager Express to effectively augment an Integrated Services Router (ISR) environment. Either topology environment will support business needs for a high concentration of analog voice ports for modem calls, fax calls, and analog supplementary services (Figures 2 and 3).

The Cisco VG400 offers Cisco IOS XE Software manageability on analog phone lines to enable them to be used as extensions of the Cisco Unified Communications Manager or Cisco Unified Communications Manager Express system.

Features and Benefits

- Cisco IOS XE Software-based hardware: The hardware supports a uniform Cisco Command-Line Interface (CLI) and Simple Network Management Protocol Version 3 (SNMPv3) for ease of gateway configuration and operation.
- Robust voice quality: Cisco experience in providing toll-quality packet-voice service helps ensure that the VG400 provides the clear, robust voice quality end users have come to expect from telephony services.
- Investment protection: Customers can continue to use existing analog phones, fax machines, and modems while taking advantage of IP telephony. Basic analog phone connectivity is needed when the infrastructure (wiring) or application does not support or require IP phones. The Cisco VG400 is the ideal platform to support distributed and low- to medium-density analog phone line deployments, allowing organizations to deploy IP telephony without having to purchase IP phones for all users and to continue using existing devices. The VG400 can also be used in a Cisco Unified Communications Manager Express environment and migrated to a Cisco Unified Communications Manager deployment with 100 percent investment protection.
- Reduced barrier to entry: The Cisco VG400 provides a low-cost alternative for low-end analog phones and allows organizations to take advantage of IP telephony with a lower overall IP telephony investment.

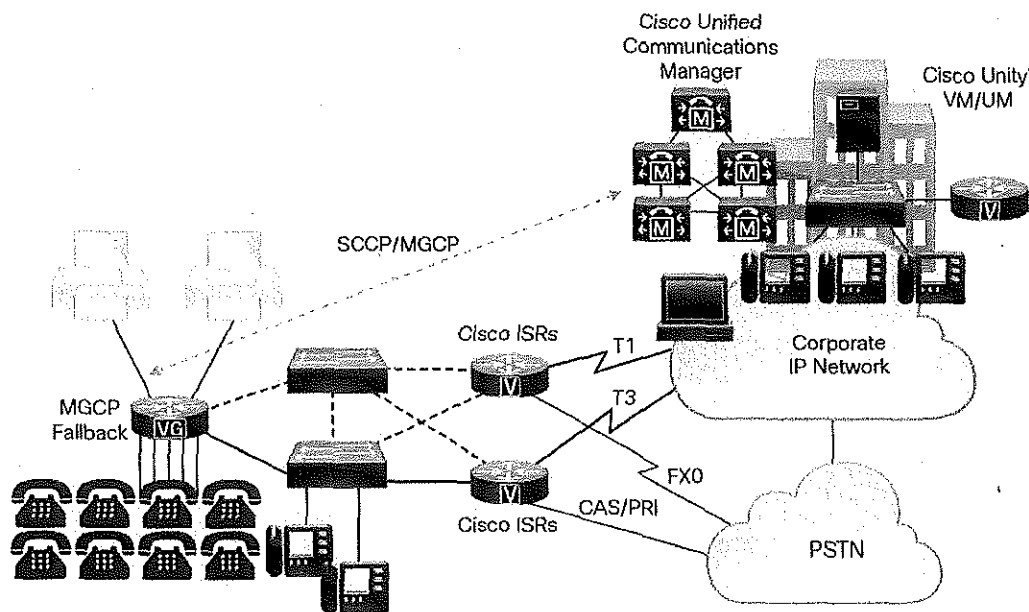


Figure 2.
VG400 Integration with Cisco Unified Communications Manager

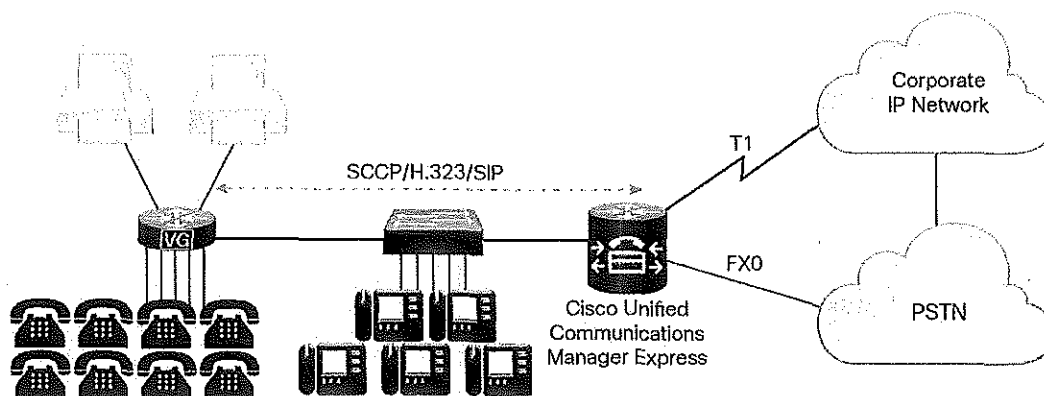


Figure 3.
VG400 Integration with Cisco Unified Communications Manager Express

Analog Phone Connectivity

The Cisco VG400 is ideal for analog phone deployments ranging from centralized to sparsely concentrated or distributed topologies. It provides high availability at locations with Media Gateway Control Protocol (MGCP) fallback, with ease of manageability using Cisco IOS XE Software monitoring features. It offers many supplementary analog calling features depending on the call control and signaling type used. Table 1 lists the supplementary analog calling features available.

Table 1. Supplementary Analog Features

	Skinny Client Control Protocol (SCCP) features with Cisco Unified Communications Manager	SCCP features with Cisco Unified Communications Manager Express	Session Initiation Protocol (SIP) features with Cisco Unified Communications Manager
Basic call	X	X	X
Call forward all	X	X	
Call forward busy	X	X	
Call forward cancel	X	X	
Call forward no answer	X	X	
Call hold or resume	X	X	X
Call pickup group	X	X	
Call pickup local	X	X	
Call transfer blind	X	X	
Call transfer consultative	X	X	X
Call waiting	X	X	X
Caller ID	X	X	X

	Skiny Client Control Protocol (SCCP) features with Cisco Unified Communications Manager	SCCP features with Cisco Unified Communications Manager Express	Session Initiation Protocol (SIP) features with Cisco Unified Communications Manager
Caller ID on call waiting	X	X	X
Malicious caller ID	X		
Conference call	Up to 3 parties	Up to 3 parties	
Impromptu conference call	Up to 3 parties	Up to 3 parties	
Meet-me conference call	X	X	
Directed call park		X	
Directed call pickup		X	
Directed call pickup of ringing extension		X	
Redial	X	X	
Speed dial	X	X	
Call toggle	X	X	X
Music on hold (MoH)	X		
Shared-line support*	X		
Shared-line privacy	X		
Precedence and preemption	X		
Call back on busy	X		
DC voltage Visible Message Waiting Indication (VMWI)	X		

*Simultaneous ringing, hold, and resume across analog and IP phones.

The Cisco VG400 supports SCCP Feature Access Codes (FACs) in conjunction with Cisco Unified Communications Manager and Cisco Unified Communications Manager Express. Refer to Cisco Unified Communications Manager and Cisco Unified Communications Manager Express documentation for details.

Fax and Modem Connectivity

The Cisco VG400 supports fax machines and modems. When connected to fax machines, the VG400 supports T.38 Fax Relay and Fax Pass-Through. T.38 Fax Relay technologies allow transfer of faxes across the network with high reliability using less bandwidth than a voice call. All modems can be connected to the VG400 and will be transferred over the network using modem pass-through.

Protocols supported

- SCCP
- H.323v4
- MGCP
- SIP
- Real-Time Transport Protocol (RTP)
- Secure Real-Time Transport Protocol (SRTP)
- Trivial File Transfer Protocol (TFTP)
- HTTP server
- SNMP
- Telnet
- Dynamic Host Configuration Protocol (DHCP)
- DNS
- Call survivability – MGCP failover to an H.323 connection to the SRST router
- T.38 Fax Relay and Fax Pass-Through
- V.150.1 MER Modem Relay, GW Controlled Modem Relay, and Modem Pass-Through
- Support G.711 and G.729a
- RADIUS and TACACS+ for Telnet and authorization

VG400 Models

The Cisco VG400 has a fixed port configuration with flexibility to configure FXS and FXO ports inside the same chassis.

The VG400 is available in the form factors depicted in Table 2.

Table 2. Form Factors

Model	Picture
VG400-6FXS/6FXO 6 FXS and 6 FXO	
VG400-8FXS 8 FXS	
VG400-4FXS/4FXO 4 FXS and 4 FXO	
VG400-2FXS/2FXO 2 FXS and 2 FXO	

The VG400 improves upon the previous generation of Cisco VG202XM and VG204XM Analog Voice Gateways. These improvements include:

- On-board Digital Signal Processor (DSP):** The FXO and FXS in VG400 contain an onboard DSP and don't require the VG400 to have a dedicated Packet Voice DSP Module (PVDM) on the motherboard. The DSP on the voice module is necessary for the voice features. It also provides for echo cancellation of up to 128-ms echo-tail length for demanding network conditions.
- FXS-E (extended loops) support:** FXS ports on the VG400 support FXS-E with the following details:
 - Higher loop current (35 mA) to accommodate specialty phones
 - Longer loop length for loops with 26 AWG wire, up to 11,000 feet (3400 meters)
 - Higher ringing voltage (65 Vrms, no load)
- FXO failover bypass ports:** A failover bypass port, also called a failover trunk bypass, provides a way to use designated analog phone ports to make phone calls through the PSTN during a power outage.

Table 3 summarizes the supported FXO failover bypass and FXS-E-enabled ports in the VG400 models.

Table 3. Feature and Port Comparison

Part number	Number of FXS ports	Number of FXO ports	FXO failover bypass ports	FXS-E enabled ports
VG400-2FXS/2FXO	2	2	2	2
VG400-4FXS/4FXO	4	4	4	4
VG400-6FXS/6FXO	6	6	6	6
VG400-8FXS	8	—	—	8

Software Compatibility

The Cisco VG400 does not natively support Cisco Unified Border Element (CUBE), Cisco Unified Communications Manager Express, or Cisco Unified Survivable Remote Site Telephony (SRST). Additionally, it does not support DSP farm capability. These functions are available only in the Cisco 4000 Series Integrated Services Routers. Table 4 lists the software versions compatible with the VG400.

Table 4. Software Compatibility

Product category	Compatible versions
Cisco IOS XE compatibility	16.10.1 or later
Cisco Unified Communications Manager	12.0.1SU2 or later
Cisco Unified Communications Manager Express	All versions compatible with Cisco IOS XE 16.10.1 or later
Third-party call control	IP-based trunk: SIP and H.323

Technical Specifications

Table 5 lists the technical specifications for the Cisco VG400's FXS and FXO ports. Table 6 gives the environmental specifications for the VG400. Table 7 lists the regulatory standards compliance.

Table 5. Technical Specifications for FXS and FXO Ports

Feature	VG400-2FXS/2FXO	VG400-4FXS/4FXO	VG400-6FXS/6FXO	VG400-8FXS
Tip and ring interfaces for each FXS port (SLIC)				
Interface	FXS/FXO (RJ-11)	FXS/FXO (RJ-11)	FXS/FXO (RJ-11)	FXS/FXO (RJ-11)
	RJ-11 ports 0 to 1: FXS	RJ-11 ports 0 to 3: FXS	RJ-11 ports 0 to 5: FXS	RJ-11 ports 0 to 7: FXS
	RJ-11 ports 2 to 3: FXO	RJ-11 ports 4 to 7: FXO	RJ-11 ports 6 to 11: FXO	

Feature	VG400-2FXS/2FXO	VG400-4FXS/4FXO	VG400-6FXS/6FXO	VG400-8FXS
Address signaling formats	In-band dual-tone multifrequency (DTMF) Out-of-band pulse (8 to 12 pps)	In-band DTMF Out-of-band pulse (8 to 12 pps)	In-band DTMF Out-of-band pulse (8- to 2 pps)	In-band DTMF Out-of-band pulse (8 to 12 pps)
FXS signaling formats	FXS loop-start, ground-start, and direct inward dial (DID) signaling	FXS loop-start, ground-start, and DID signaling	FXS loop-start, ground-start, and DID signaling	FXS loop-start, ground-start, and DID signaling
FXO signaling formats	FXO loop start, ground start	FXO loop start, ground start	FXO loop start, ground start	N/A
FXS loop resistance	- Up to 600 ohms (including phone or terminal equipment) for short-loop-length port - Up to 1400 ohms (including phone and terminal equipment) for long-loop-length port			
DID loop resistance	Up to 1800 ohms (including terminal equipment)			
On-hook voltage	-44V			
Off-hook loop current	25 mA (maximum) for short-loop-length port 35 mA (maximum) for long-loop-length port			
Ring tone	Configurable for different country requirements			
Ring voltage	54 Vrms into 5 Ringer Equivalence Numbers (RENs) at zero-loop-length port (balanced) (short-loop-length port) 65 Vrms into 2 RENs at zero-loop-length port (balanced) (long-loop-length port)			
Ring frequency	20, 25, 30, and 50 Hz			
REN loading	5 RENs per port (short-loop-length port) 2 RENs per port (long-loop-length port)			
RJ-11 FXS port terminating impedance option	600c, 600r, 900c, 900r, complex1, complex2, complex3, complex4, complex5, and complex6			
Disconnect supervision	Power denial (calling party control and far-end disconnect)			
Caller ID	- On-hook transmission of Frequency-Shift-Keying (FSK) data - Support for DTMF caller ID			
FXS loop length	- Short-loop-length port: 3000 ft (900 m) with 26 AWG, 5500 ft (1700 m) with 24 AWG - Long-loop-length port: 11,000 ft (3400 m) with 26 AWG, 18,000 ft (5500 m) with 24 AWG			
Ring waveform	Sine wave if no DC offset			
VMWI	- FXS ports support FSK VMWI - FXS ports on the VG400 support both FSK and DC voltage VMWI. They default to FSK. (DC voltage VMWI is supported only with the STCAPP protocol.)			
Cables	Category 3 and Category 5			

Table 6. Environmental Specifications

Environment	VG400-2FXS/2FXO	VG400-4FXS/4FXO	VG400-6FXS/6FXO	VG400-8FXS
-------------	-----------------	-----------------	-----------------	------------

Environment

Operating temperature	• 32° to 104°F (0° to 40°C)			
Nonoperating temperature	• -40° to 158°F (-40° to 70°C)			
AC Voltage	• 100 to 240 VAC auto ranging			
AC Current	• 1.5 to 0.6A			
AC input frequency	• 50-60 Hz			
Power	63W	67W	72W	55W
Weight	6.75 lb (3.06 kg)			
Dimensions (H x W x D)	1.72 x 12.7 x 10 in. (43.7 x 322.6 x 254 mm)			

Table 7. Regulatory Standards Compliance

Specification	Description
Safety	• UL 60950-1 • CAN/CSA C22.2 No. 60950-1 • EN 60950-1 • AS/NZS 60950-1 • IEC 60950-1
Telecom	• TIA/EIA/IS-968 • CS-03 • TBR21 (FXO) • ES 201 970 (FXS) • S002, S003 • Homologation requirements vary by country and interface type. For specific country information, refer to the online approvals database at: https://www.ciscofax.com/.
EMC	• 47 CFR, Part 15 • CES-003 Issue 4 • EN55022 Class A/B • CISPR22 Class A/B • AS/NZS 3548 Class A • VCCI V-3 • CNS 13438 • EN 300-386
Immunity	• EN 55024, CISPR 24 • EN50082-1 • EN 61000-6-1 • EN300-386

Table 8 gives the Cisco VG400 technical specifications.

Table 8. Technical Specifications

Category	
System	VG400
Processor	High-performance multicore processors
Memory DRAM	4 GB DDR3 SDRAM. Fixed on board
External USB 2.0 slots (type A)	1
Ethernet	Up to two 10/100/1000 Ethernet LAN ports
Power	
AC input current (max)	Need Data
External power supply dimensions	37 × 73 × 152 mm

Homologation

The VG400 is approved for the countries listed in Table 9 for off-premises (FXO) and on-premises (FXS) connections. Approval for other countries is in progress. Refer to the Cisco Telecom Approvals Website for approval progress for other countries: https://tools.cisco.com/cse/prdapp/jsp/externalsearch.do?action=externalsearch&page=EXTERNAL_SEARCH.

Table 9. Telecom Approvals

VG400-2FXS/2FXO	VG400-4FXS/4FXO	VG400-6FXS/6FXO	VG400-8FXS
United States	United States	United States	United States
Canada	Canada	Canada	Canada
CE countries¹	Canada	Canada	Canada
Australia	Australia	Australia	Australia
Japan	Japan	Japan	Japan

¹ The CE mark is recognized in the following countries: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Gibraltar, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, and United Kingdom.

Ordering Information

To order this product, use the information provided in Table 10.

Table 10. Ordering Information

Product number	Description
VG400-2FXS/2FXO	Cisco VG400 Analog Voice Gateway with 2 FXS and 2 FXO
VG400-4FXS/4FXO	Cisco VG400 Analog Voice Gateway with 4 FXS and 4 FXO
VG400-6FXS/6FXO	Cisco VG400 Analog Voice Gateway with 6 FXS and 6 FXO
VG400-8FXS	Cisco VG400 Analog Voice Gateway with 8 FXS

Services and Support

Using the Cisco Lifecycle Services approach, Cisco and our partners offer a broad portfolio of end-to-end services. These services are based on proven methodologies for deploying, operating, and optimizing IP communications solutions. Initial planning and design services, for example, can help you meet aggressive deployment schedules and minimize network disruption during implementation. Operate services reduce the risk of communications downtime with expert technical support. Optimize services enhance solution performance for operational excellence. Cisco and our partners offer a system-level service and support approach that can help you create and maintain a resilient, converged network that meets your business needs.

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FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

3

July 20, 2023

Mr. Paul Goldstein
Moderator, Representative Town Meeting
15 Rope Ferry Road
Waterford, CT 06385

Moderator Goldstein:

At the Board of Finance meeting held Wednesday, July 19, 2023, the Board approved a request for an appropriation in the amount of \$84,914 from Capital and Non-Recurring project Project line 20547-57847 (Town-Wide Camera System). This letter forwards the BOF-approved appropriation request for RTM approval.

I respectfully request you place this item on the agenda of the next meeting of the Representative Town Meeting. Copies of justification documentation are attached hereto.

Respectfully Submitted,

Glenn Patterson

Glenn Patterson
Chairman, Board of Finance

Attachment

RECEIVED FOR RECORD
WATERFORD, CT
2023 JUL 24 P 2:16
ATTEST: *David J. Langley*
TOWN CLERK

FIFTEEN ROPE FERRY ROAD



WATERFORD, CT 06385-2886

June 6, 2023

To: First Selectman Robert Brule
From: IT Manager Jeffrey Robillard
Date: 06/06/2023
Re: **Appropriation Request – 20547-57847**

The IT Department would like to request an appropriation in amount of \$84,913.56 from Capital and Non-recurring designated line 20547-57847 – TOWN-WIDE CAMERA SYSTEM. This would allow for the purchase of security equipment including a Milestone Recording server that will integrate into the current Town Milestone environment, Axis Cameras, and S2 door access control hardware for locations within the Town Hall that will integrate with current Town S2 equipment.

Thank you

Jeffrey M. Robillard,
IT Manager
Town of Waterford

6/20/23 BOS - approved



Quote by Stephanie Seymour
O: 203-287-1306 C: 203-974-9070

To: Jeff Robillard
IT Manager
Town of Waterford
jrobillard@waterfordct.org

Quote #: 2007-30

Rev 9

Date: 6/5/2023

Expires: 7/5/2023

Town Hall Security Systems
Town of Waterford

Qty.	Description	Each	Extended
I. DOOR ACCESS CONTROL:			
1	S2-SL2 Expansion 16 Portal to 32 Portal for existing system @ PW	\$1,877.20	\$1,877.20
1	S2-NN-E2R-WM S2 Network Node wall mount with 1 ACM Blade	\$2,256.80	\$2,256.80
1	S2-MNP-MP Micro Node plus mounting plate - rear doors	\$1,105.00	\$1,105.00
1	S2-ACM Access Control Blade	\$672.10	\$672.10
	1. 3 doors in basement IT, Corridor 1 & Corridor 2 Add Card Access		
	2. Intercom Rear Door single door.		
	3. Rear Double calendar work off existing automatic opener.		
1	02026-001 Axis A8207-VE Mk II Network Intercom	\$1,579.81	\$1,579.81
1	AX-6000ULPD8 Power Supply	\$313.73	\$313.73
3	NP1 2.6 Lead Batteries	\$10.79	\$32.37
3	RP15 HID Access Reader Proximity Multiclass	\$258.70	\$776.10
3	HES 9500-630 ASSA Abloy electric Strike IT Door	\$405.60	\$1,216.80
5	DS160 Request to Exit	\$83.92	\$419.58
4	SM-35 Standard Surface Mount Contacts	\$10.92	\$43.68
100	849231 General Cable CAT6 Network Cable	\$0.39	\$39.00
250	4342T Control Cable	\$1.08	\$269.75
4	100010C EX-RJ45 Cat6 Connectors	\$1.04	\$4.16
32	Installation: Install S2 Equipment and program doors.	\$125.00	\$4,000.00
II. MILESTONE SOFTWARE:			
37	XPPPLUSDL XProtect Pro+ Device Licenses	\$117.60	\$4,351.20
37	YXPPPLUSDL One Year Care Plus Support SUP Device Licenses	\$21.88	\$809.41
III. CAMERAS:			
A. Exterior -			
3	02373-001 Axis P3727-PLE Network Camera 15MP IR 4 x Quad IP Camera.	\$1,420.60	\$4,261.80
3	5017-641 Axis T91A64 Corner Bracket	\$78.69	\$236.07
3	5504-821 Axis T91D61 Camera Wall Mount Bracket	\$87.46	\$262.39
3	01513-001 Axis T94N01D Pendant Kit w/	\$85.33	\$256.00
4	01178-001 Axis M3058-PLVE Fixed Dome Camera 2992x2992 (12MP)	\$819.00	\$3,276.00
3	02342-001 Axis P1468-LE IP 4K Bullet Camera 1080P D/N P-iris	\$834.70	\$2,804.10
B. Interior Camera:			
11	01178-001 Axis M3058-PLVE Fixed Dome Camera 2992x2992 (12MP)	\$819.00	\$9,009.00
15	02374-001 Axis M3086-V Fixed Dome 2.4mm 130	\$347.10	\$5,206.50
6850	849231 General Cable CAT6 Network Cable	\$0.39	\$2,671.50
36	Hubbell Surface Mount Box w/ Modular Jack Cat6	\$25.03	\$900.90
36	3' Standard patch cables	\$2.30	\$82.84
108	100010C EX-RJ45 Cat6 Connectors	\$1.04	\$112.27
IV. SERVER:			
1	D75M100T82RL-3216 Dell 12 Bay - WS 2022 STD, XEON 16C CPU, 32GB ECC RAM, 2x 480GB M2 R1 OS, 2x 3.84TB SSD R1 LIVE, 100TB (RAW) SATA R5 ARCHIVE, HW RAID, 4x1GbE NIC, 2x 800W PS, KB/M 2U Rack with Rails - 3YR Dell NBD Basic hardware Warranty, 3 YR Seagate HDD Warranty.	\$14,117.52	\$14,117.52
V. INSTALLATIONS COSTS:			
1	YR Warranty	\$1,200.00	\$1,200.00
1	Misc. Parts	\$500.00	\$500.00
1	Project Management and Engineering	\$750.00	\$750.00
36	Cable pulls for cameras	\$14,500.00	\$14,500.00
1	Installation of cameras and set-up of camera view	\$5,000.00	\$5,000.00
Cost of Equipment and Labor:			\$84,913.56

Customer to provide:

1. Network Connectivity to PW
2. Routing done by IT Department
3. IT Hardware Equipment
4. Main Front door not included.
5. Existing door hardware in working order.
6. Surface box must be mounted prior if mounting cameras ONLY
7. Cables not pulled by Utility must be certified.

THANK YOU.

FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

4

July 20, 2023

Mr. Paul Goldstein
Moderator, Representative Town Meeting
15 Rope Ferry Road
Waterford, CT 06385

Moderator Goldstein:

At the Board of Finance meeting held Wednesday, July 19, 2023, the Board approved a request for an appropriation in the amount of \$1,126 from Capital and Non-Recurring Project line 20547-57846 (Fiber Upgrade). This letter forwards the BOF-approved appropriation request for RTM approval.

I respectfully request you place this item on the agenda of the next meeting of the Representative Town Meeting. Copies of justification documentation are attached hereto.

Respectfully Submitted,

Glenn Patterson

Glenn Patterson
Chairman, Board of Finance

Attachment

RECEIVED FOR RECORD
WATERFORD, CT
2023 JUL 24 P 2:16
ATTEST: *[Signature]*
TOWN CLERK



FIFTEEN ROPE FERRY ROAD

WATERFORD, CT 06385-2886

June 7, 2023

To: First Selectman Robert Brule
From: IT Manager Jeffrey Robillard
Date: 06/07/2023
Re: **Appropriation Request – 20547-57846**

The IT Department would like to request an appropriation in amount of \$1,126.00 from Capital and Non-recurring designated line 20547-57846 – FIBER UPGRADE. This would allow the purchase 30" interior diameter concrete risers and cast iron covers to fix access to manholes found below grade that contain aspects of the fiber infrastructure within the civic triangle area.

The Public Library needs a 12" increase in height to bring it above grade. The location near the Recreation and Parks garage gravel driveway needs a 18" increase in height to bring it above grade. The cast iron frame and cover provide 6" of height and the risers provide the remainder.

The Public Works department will pick up the risers from the vendor and perform the actual installation.

Thank you

Jeffrey M. Robillard,
IT Manager
Town of Waterford

6/20/23 BOS - approved



christina@jolleyprecast.com

TO Jeff Robillard
Town of Waterford
Waterford, CT

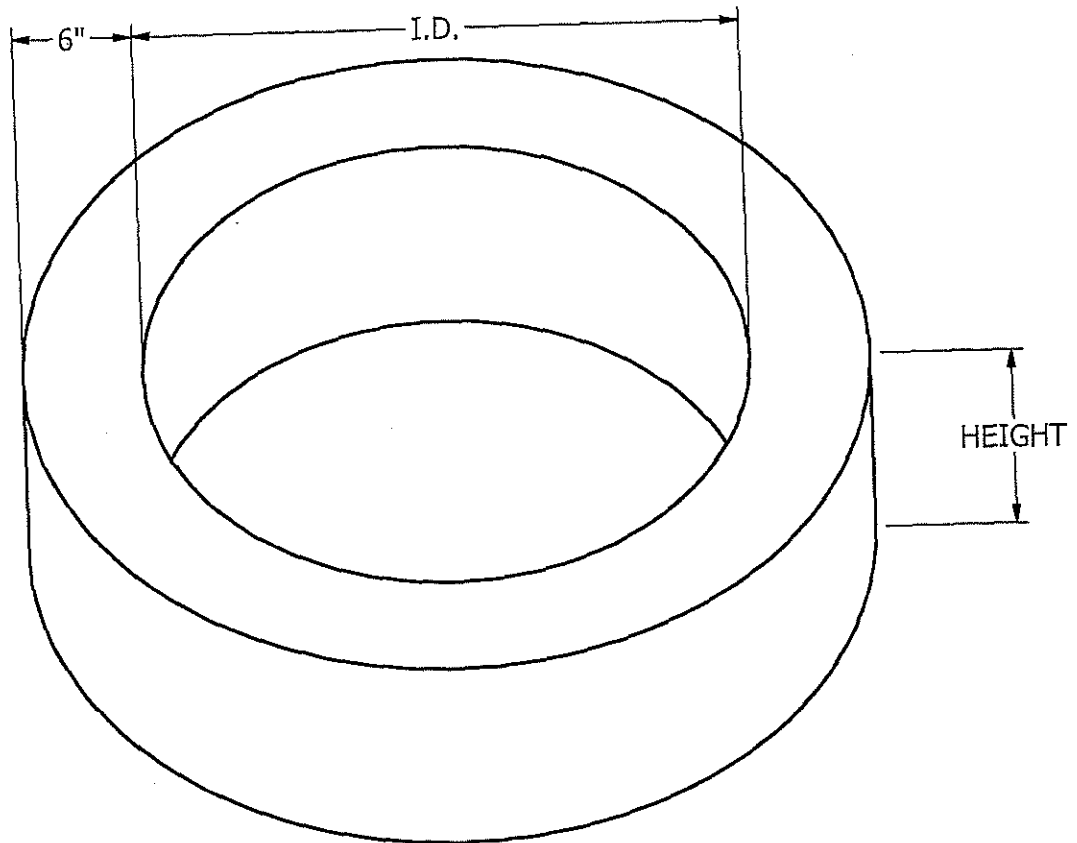
JOB NAME	JOB ADDRESS	SHIPPING METHOD	PAYMENT TERMS
	PICK UP		CHARGE

[illegible]

SUBTOTAL	\$ 1,126.00
TAX	0.00%
SALES TAX	\$ -
TOTAL	\$ 1,126.00

To accept this quotation, sign here and return: _____

THANK YOU FOR YOUR BUSINESS!



WEIGHT OF PRODUCT		
HEIGHT	24" I.D.	30" I.D.
6"	285 LBS	340 LBS
12"	570 LBS	680 LBS
18"	855 LBS	1020 LBS
24"	1140 LBS	1360 LBS

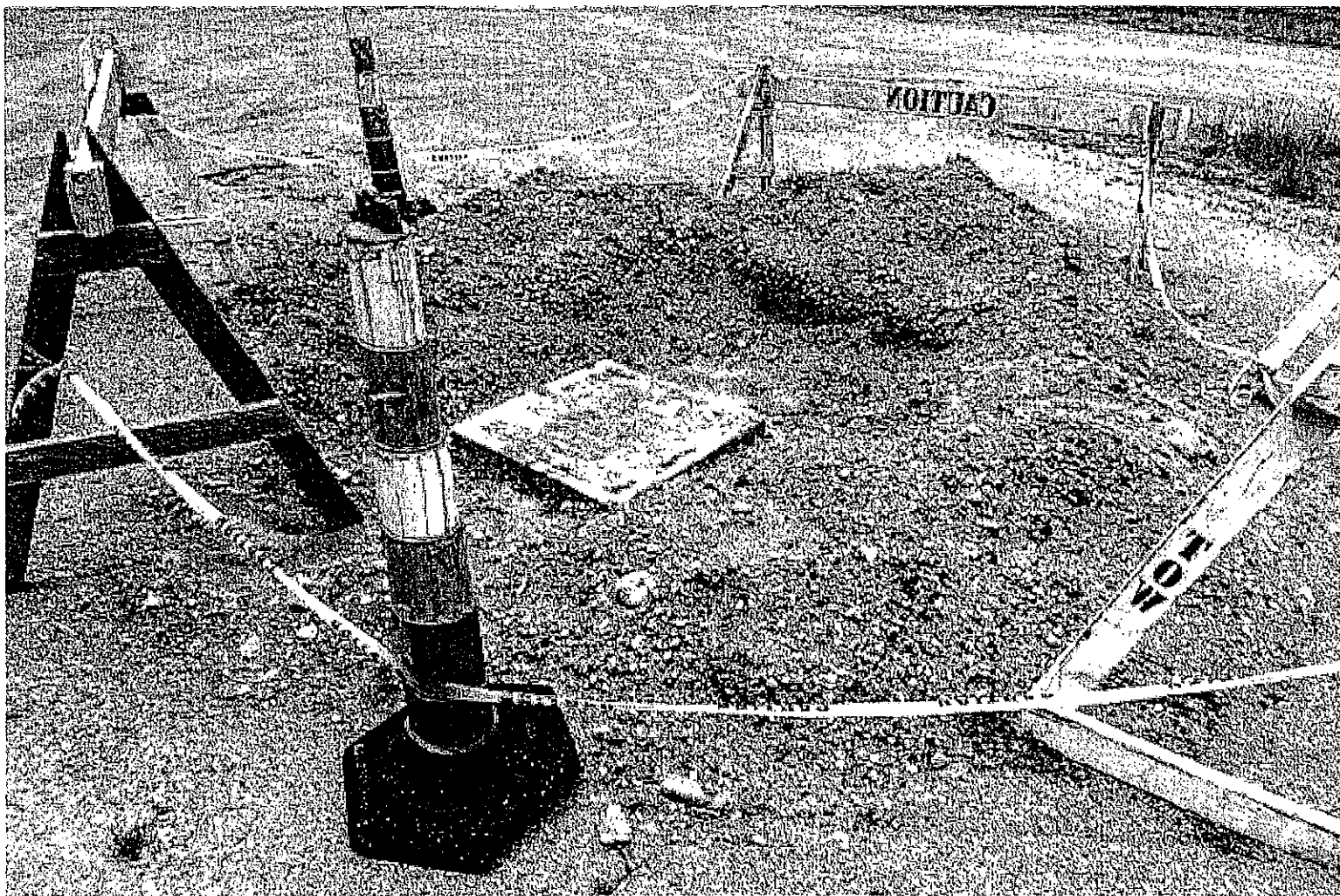
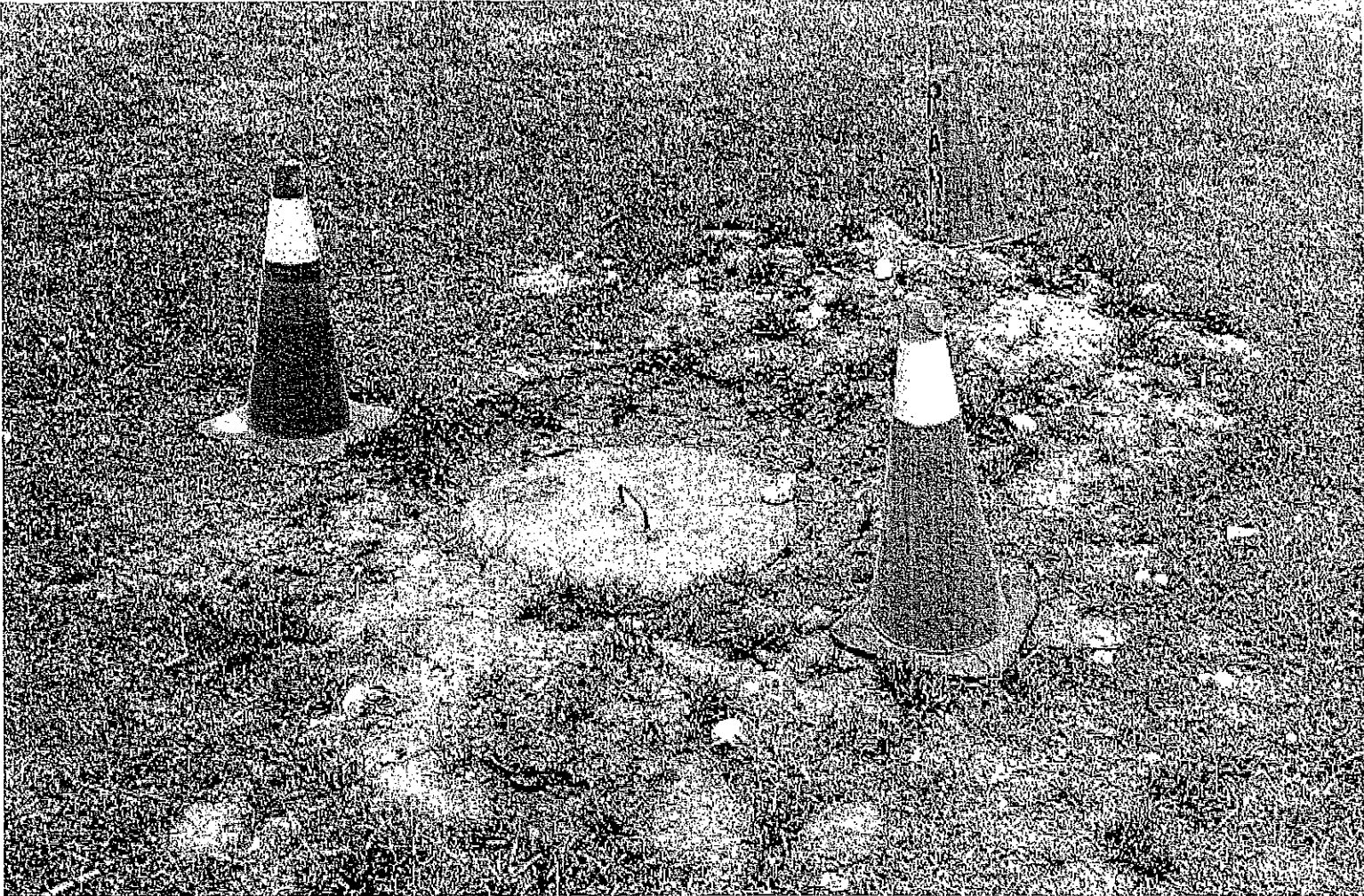
1-800-582-4638



www.jolleyprecast.com

JOLLEY PRECAST INC.

H-20 RISERS



FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

5

July 20, 2023

Mr. Paul Goldstein
Moderator, Representative Town Meeting
15 Rope Ferry Road
Waterford, CT 06385

Moderator Goldstein:

At the Board of Finance meeting held Wednesday, July 19, 2023, the Board approved a request for an additional appropriation in the amount of \$100,000 for Capital Improvement Project 33023-55901 (Curb Replacement/Sandy Hollow Road). Appropriated funds for this project will be made available by transferring the approved \$100,000 from the Unassigned Fund Balance of the General Fund to line #33023-55901. This letter forwards the BOF-approved appropriation request for RTM approval.

I respectfully request you place this item on the agenda of the next meeting of the Representative Town Meeting. Copies of justification documentation are attached hereto.

Respectfully Submitted,

Glenn Patterson

Glenn Patterson
Chairman, Board of Finance

Attachment

RECEIVED FOR RECORD
WATERFORD, CT
2023 JUL 25 P 2:00
ATTEST: *David H. Langley*
TOWN CLERK

INTER-OFFICE MEMORANDUMTOWN OF WATERFORD

To: Rob Brule, First Selectman
From: Gary J. Schneider, Director of Public Works
Date: June 13, 2023
Re: Concrete Curbing

Request: Additional Funding in the amount of \$100,000 for the project to replace the deteriorated concrete curbing on Sandy Hollow Drive.

Discussion: One bid was received on May 24th for the replacement of deteriorated concrete curbing on Sandy Hollow Drive. Although there was just one bid, the bid is reflective of the current market pricing as the bid was very close to the Engineers estimate. (Bid \$305,700 vs \$300,000) The bidder must hold the bid prices for 90 days.

Funding for Sandy Hollow Road was authorized as a Capital Improvement Project (33023-55901) in the FY 23 Budget.

The funding request was estimated in May of 2021 at \$43/lf, based on the Rope Ferry Road Sidewalk replacement project. The current price places the cost at \$103/lf.

During the 1980's and 1990's, many roads had concrete curbing installed. Most are nearing the end of their service life. Years of salt applications to the road has caused the concrete to spall, leaving an uneven surface, a safety issue. There are also sections of the curbing missing and areas have sunken due to settling of the base.

Deteriorated curbing must be replaced before resurfacing any road. The new concrete curbing will be precast sections and use a mix designed to combat the chlorides found in salt from entering the concrete, increasing the life span. Sandy Hollow Drive curbing must be replaced before the road is resurfaced.

This project also included replacement concrete curbing for a portion of Shore Road. That section has not be placed out to bid as we were awaiting the bid results of Sandy Hollow Road. Shore Road curbing replacement will be placed in the CIP request for FY 25.

6/20/23, BOS - approved





FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

6

July 20, 2023

Mr. Paul Goldstein
Moderator, Representative Town Meeting
15 Rope Ferry Road
Waterford, CT 06385

Moderator Goldstein:

At the Board of Finance meeting held Wednesday, July 19, 2023 , the Board approved a request for an additional appropriation in the amount of \$180,000 to Capital Non-Recurring Project 20511-57879 (Town Hall Bathroom Renovations). Appropriated funds for this project will be made available by transferring the approved \$180,000 from the CNR Undesignated Fund Balance Line **#205-31520 to line #20511-57879**. This letter forwards the BOF-approved appropriation request for RTM approval.

I respectfully request you place this item on the agenda of the next meeting of the Representative Town Meeting. Copies of justification documentation are attached hereto.

Respectfully Submitted,

Glenn Patterson

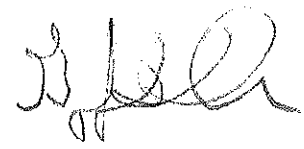
Glenn Patterson
Chairman, Board of Finance

Attachment

RECEIVED FOR RECORD
WATERFORD, CT
2023 JUL 24 P 2:16
ATTEST: *David H. Langley*
TOWN CLERK

INTER-OFFICE MEMORANDUMTOWN OF WATERFORD

To: Robert Brule, First Selectman
From: Gary J. Schneider, Director of Public Works
Date: June 30, 2023
Re: Additional Funding – Town Hall Bathrooms



The first round of bids were rejected based upon the opinion of the Town Attorney. There was an inconsistency in the bidding documents.

The project was then rebid with 5 bidders submitting a bid. Bids ranged from \$472,000 to \$645,000 (see attachment 1). The previously round of bids also had 5 bidders and the bids ranged from \$347,000 to \$1,425,000.

The Department is requesting additional funding in the amount of \$180,000 to award the construction contract. This includes an amount of \$18,000 that will be used for unforeseen conditions that may occur during construction. It is advantageous to have the funds available to handle the issues without having the contractor stop work. Issuing a stop work order costs the owner money due to contractor claims for stopping and starting work.

Funding available for the project is \$310,000 in line items 20511-57879 and 31120-55852. The additional funds should go into 20511-57879.

The project to renovate the toilets is not only renovating the entire toilet rooms but also includes installing new waste piping throughout the entire building. Walls and ceilings must be opened to chase the waste piping to its exit from the building. Twenty eight fixtures will be installed, with the proper ADA code compliant number and location. When complete, it will bring the building into compliance.

The bidders must hold their bids for 60 days. If the additional funding is approved, we ask that the RTM also approve this as an Emergency Legislation and waive the 15 day waiting period so we can meet the timeline.

If funding is rejected, the bids will be rejected and we will continue addressing issues with the plumbing as they arise.

Cc: Kimberly Allen, Finance Director

*Attachments

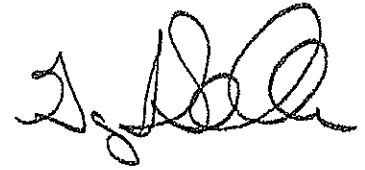
7/11/23, BOS - approved

Tabulation Sheet Bid#23-113R Town Hall Toilet Room Upgrades June 15, 2023 @ 10:00 a.m.			
Entity	Bid Pricing	Notes	
A. Secondino & Son, Inc.	Total Bid -\$472,000.00	Alternate #1- \$24,322 Alternate #2- N/A	
Adform Interiors	Total Bid -\$494,000.00	Alternate #1- \$22,000 Alternate #2- \$24,000	
Sarazin General Contractors, Inc.	Total Bid -\$562,500.00	Alternate #1- \$80,500 Alternate #2- N/A	
Zeiss Construction Group	Total Bid -\$593,688.11	Alternate #1 \$12,293.75 Alternate #2- N/A	
Diversity Construction Group	Total Bid -\$645,000.00	Alternate #1- \$9,000 Alternate #2- Subtract \$50,000	

INTER-OFFICE MEMORANDUM

TOWN OF WATERFORD

To: Robert Brule, First Selectman
From: Gary J. Schneider, Director of Public Works
Date: February 15, 2023
Re: Additional Funding – Town Hall Bathrooms



The Department is requesting additional funding in the amount of \$37,000 to award the construction contract plus an additional amount of \$20,000 for unforeseen conditions bringing the request to \$57,000 for the project to renovate the toilet facilities at Town Hall.

We received 7 bids which ranged from \$347,000 to \$1,425,000 (see attachment 1). Of the 7, there was tight bidding around the low bidder's bid at \$347,000, so we are comfortable with the price. The contractor references were checked and they are acceptable. Funding available for the project is \$310,000.

I am asking for the contingency funds to address unforeseen conditions once work starts. It is advantageous to have the funds available to handle the issues without having the contractor stop work. Issuing a stop work order costs the owner money due to contractor claims.

I had already requested additional funding for this project based on the Architect's recommendation that his estimate of probable construction cost of \$270,000 be increased by 10-15% due to market conditions (See attachment 2). I used the higher percentage for that request. The actual low bidder was over 28% greater than the architect's estimate.

The project to renovate the toilets is not only renovating the entire toilet rooms but also includes installing new waste piping throughout the entire building. Walls and ceilings must be opened to chase the waste piping to its exit from the building. Twenty eight fixtures will be installed, some code compliant, that will bring the building into compliance.

The bidders must hold their bids for 90 days.

If funding is rejected, bids will be rejected and we will continue with addressing issues with the plumbing as they arise.

Cc: Kimberly Allen, Finance Director

*Attachments

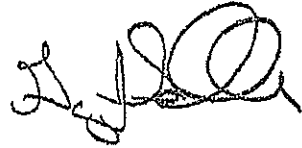
Tabulation Sheet
Bid#23-113 Town Hall Toilet Room Upgrades
DUE: 02/1/2023 @ 10:00a.m.

COMPANY	Alternate NO. 1 (Stainless Steel Toilet Compartment)	Add/Subtract Voluntary Alternate NO. 2 (Contractor to list)	Entire project for the total cost of	This quotation is to remain firm for 90 days
Mattem Construction Inc.	\$24,323.00	NA	\$681,173.00	90 days
Pelletier Construction Mgt.	\$9,700.00	NA	\$374,290.00	90 days
Zeiss Construction Group LLC.	\$4,750.00	NA	\$397,975.00	90 days
Kafa Group LLC	\$40,000.00	NA	\$1,425,000.00	90 days
Adform Interiors	\$22,000.00	NA	\$347,000.00	90 days
Diversify Construction Group	\$15,000.00	NA	\$517,000.00	90 days
SARAZIN General Contractors, Inc.	\$9,000.00	NA	\$497,000.00	90 days

INTER-OFFICE MEMORANDUM

TOWN OF WATERFORD

To: Robert Brule, First Selectman
From: Gary J. Schneider, Director of Public Works
Date: October 24, 2022
Re: Town Hall Bathrooms



Issues with the condition of the surfaces and fixtures in the toilet rooms at Town Hall had been identified as far back as 2018. The plumbing fixtures are original to the building and over the years, the cast iron drain piping has narrowed causing fixtures to overflow, damaging the floors and ceilings below the second floor toilet rooms. Rooms on the first floor have poorly draining fixtures and were placed out of order.

There was an opinion of construction cost prepared in 2018. That work was only for renovations, did not address the ADA requirements nor the need to replace the drainage piping within the building to the current PVC sewer service lateral. That cost was \$175,000.

With the existing approved funding, the design has been completed and the new estimate (\$270,000) was prepared in December 2021. The project will address all the toilet rooms by using the existing footprint to provide ADA fixtures (toilets, sinks, mirrors, and urinals), new partitions, floors and walls. Energy efficient lighting will be added. The ventilation and ceilings in general will remain.

Today, the Architect recommends that opinion of construction cost be increased 10 – 15% due to volatile market forces. (Hurricane Ian may also put a strain on the supply chain but that is unknown). The opinion of construction cost now stands at \$310,000.

Currently funds were appropriated (CIP) in July 2019 and July 2020. Unencumbered is a total of \$97,910.

The Department is requesting that:

- Request that account 31121-55852 along with the designated funds of \$25,000 be moved to a new CNR project.
- Request to approve an additional appropriation of \$217,000 to be added to the existing designated \$25,000 for the new CNR project.
- Request funds be moved from designated to appropriated in the new CNR project number (total \$242,000 to be appropriated)

The request is being made outside the budget for the following reasons

- The plans and specifications are ready to place out to bid.
- Placing this request in the normal cycle would place this project in with schools lining up their summer work. This may put us at a disadvantage in securing multiple bids or reasonable pricing.
- The issues with the plumbing have been known since 2018 and the condition is not getting any better.

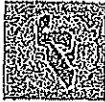
We ask to please be included on the next Board of Selectman meeting scheduled for November 1, 2022.

Attachments:

Email

Memo from Silver-Petrucci dated 12/16/21

Munis sheets



SILVER / PETRUCELLI + ASSOCIATES

Architects / Engineers / Interior Designers

3190 Whitney Avenue, Hamden, CT 06518-2340

Tel: 203 230 9007 Fax: 203 230 8247

silverpetrucci.com

As Requested ☐

For Review ☐

Please Comment ☐

For Your File ☐

Memorandum

To: Paul Koselle, Facilities Manager

From: Paul Jorgensen, AIA

Email:

Date: 12/16/2021

Phone:

Re: Waterford Town Hall, Toilet Rooms Renovation Summary

The Town of Waterford retained Silver Petrucci and Associates to review the existing Town Hall toilet room layouts & conditions. Schematic plans were developed based on the existing floor plans and field observations, culminating in an estimate prepared on 11/9/2021 for proposed toilet renovations, as well as main entry door upgrade and egress stair enclosure.

The team of architects and engineers recommends replacement of the hundred-year-old piping systems serving the toilet rooms. The original piping is near the end of its useful life. The average lifespan of plumbing piping is considered to be 50-70 years, after which replacement is typically undertaken. Replacement includes pipe connections in the toilet rooms, shut off valves, vertical stack piping within the chase walls and piping runs / hangers within the existing tunnel network.

To access concealed piping the existing chase walls will be removed and rebuilt. New chase walls are proposed as galvanized steel stud framing with moisture and impact resistant drywall, finished in a ceramic tile wall wainscot. Access panels will be added to accommodate future maintenance needs. Plumbing fixtures should be replaced with durable commercial grade models which also meet all accessibility standards.

The existing toilet rooms do not meet current code accessibility standards. Doors, hardware and existing clearances at the entrances of the multi-fixture rooms are deficient. There are no accessible toilet stalls or grab bars. Floor recessed urinals are no longer code compliant. Toilet room lavatories are generally not at the correct height, lack accessible knee space clearances and piping is not insulated. New schematic toilet room layouts will meet all accessibility requirements with minimal changes to the overall room sizes. The building currently meets the code required plumbing fixture count for toilets and lavatories, and will in the proposed schematic toilet room layouts which create accessible stalls in each room.

Rounding out the proposed toilet renovations would be new energy efficient lighting and outlets for cleaning and maintenance convenience. Ventilation has recently been upgraded and is not proposed to change during renovations. Existing heater operation will be confirmed and reconnected following updates to the surrounding finishes, flooring and walls. The floors proposed are new ceramic tile and the walls as partial height wainscot tile.

Durable epoxy paint and new toilet accessories, such as soap and paper towel dispensers, will refresh the look of the renovated toilet rooms.

Construction pricing has been volatile in the second half of 2021. Material supplies and availability have been inconsistent causing price spikes and schedule delays, adding to typical construction inflation. The current estimates for the toilet room renovations as noted is approximately \$270,000.

FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

7,8

July 20, 2023

Mr. Paul Goldstein
Moderator, Representative Town Meeting
15 Rope Ferry Road
Waterford, CT 06385

Moderator Goldstein:

At the Board of Finance meeting held Wednesday, July 19, 2023, the Board approved a request for an additional appropriation in the amount of \$181,300 for Capital Non-Recurring Project 20531-57881 (Plastic Water Service Connections). Appropriated funds for this project will be made available by transferring the approved \$181,300 from the CNR Undesignated Fund Balance Line #205-31520 to line #20531-57881 (Plastic Water Service Connections). This letter forwards the BOF-approved appropriation request for RTM approval.

I respectfully request you place this item on the agenda of the next meeting of the Representative Town Meeting. Copies of justification documentation are attached hereto.

Respectfully Submitted,

Glenn Patterson

Glenn Patterson
Chairman, Board of Finance

Attachment

RECEIVED FOR RECORD
WATERFORD, CT
2023 JUL 24 P 2:17
ATTEST: *David J. Gagne*
TOWN CLERK

FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

July 20, 2023

Mr. Paul Goldstein
Moderator, Representative Town Meeting
15 Rope Ferry Road
Waterford, CT 06385

RECEIVED FOR RECORD
WATERFORD, CT
2023 JUL 25 P 2:26
ATTEST: *David J. Long*
TOWN CLERK

Moderator Goldstein:

At the Board of Finance meeting held Wednesday, July 19, 2023, the Board approved a request for an appropriation in the amount of \$1,053,000 for a new Capital Non-Recurring Project (number to be determined), Old Norwich Road Paving. Appropriated funds for this project will be made available by transferring the approved \$1,053,000 from the Unassigned Fund Balance of the General Fund to a new account. This letter forwards the BOF-approved appropriation request for RTM approval.

I respectfully request you place this item on the agenda of the next meeting of the Representative Town Meeting. Copies of justification documentation are attached hereto.

Respectfully Submitted,

Glenn Patterson

Glenn Patterson
Chairman, Board of Finance

Attachment

FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

To: Rob Brule, First Selectman

From: Gary J Schneider, Director of Public Works
James A Bartelli, Director of Waterford Utility Commission

[Handwritten signatures]

Date: June 13, 2023

Re: Request Funds for Additional Paving and Plastic Water Service Line

The Town has made excellent progress in addressing years of delayed work on our road network. To date, using Additional Funds for paving, we completed Daniels Avenue, the northern portion of Niantic River Road, Gardiners Wood Road, Lake Pond Road and Butlertown Road. We are commencing the resurfacing of Oil Mill Road and are awaiting the completion of the utility work so that we can proceed with the remainder of Niantic River Road and Shore Road (portion of).

We continue to use the pavement management update completed in 2020 for the entire network to guide us. This formal evaluation provided a systematic, consistent approach to the evaluation of the present condition of the road surface. It is used to prioritize the work. It was not intended to replace sound engineering judgment, which should dictate specific needs for an individual project.

If additional funds are available, we have identified Old Norwich Road as the next road to be addressed. This continues our effort to address our collector roads, those local roads that carry a good volume of traffic. It is important to address the surface now before the road deteriorates further and the base must then be addressed at a significant additional cost.

Approving the funding of this road in the first part of the calendar year allows us to engage our contractors when they are first setting their schedules of work for the construction season. Approving funds for large projects in the normal funding schedule (July) puts the Town at a disadvantage in getting any work completed before the end of the construction season.

This project is a continuation of a cooperative effort between the Utility Commission and Public Works. Old Norwich Road will be milled by removing the top two inches of old asphalt from the surface and replacing with new asphalt. Traffic markings will be reestablished. But first, the aging plastic water services must be addressed. The Utility Commission has identified 24 locations that the services must be replaced and 25 that must be investigated to determine material type. We are requesting funding for the worse case that all 49 water services will need to be replaced.

6/20/23 - BOS DPW \$1,053,000 approved
WUC, \$181,300 approved

Funding request is broken down as follows:

Public Works Additional Appropriation Request for new Capital Project:

1. Request an Additional Appropriation in the amount of \$1,053,000 to resurface Old Norwich Road. *Old Norwich road is approximate 2.5 miles long and will be resurfaced from the New London City Line to the RT 32 entrance.* The estimate includes funds to adjust manhole and re-establish the traffic markings. It assumes the cost of asphalt will remain stable.

Utility Commission Additional Appropriation Request for Capital Project 20531-57881 (Plastic Water Service Connectors):

2. Request an Additional Appropriation in the amount of \$181,300 for water service replacements on Old Norwich Road. Each service replacement cost is estimated at \$3,700 per unit. The account for this portion of the request is for approved Capital Non-Recurring Project 20531-57881 (Plastic Water Service).

We respectfully request to be on the next Board of Selectman agenda for consideration of this request.

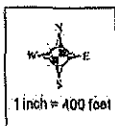
**TOWN OF WATERFORD
CAPITAL PROJECT REQUEST FORM
2023-2024 FISCAL YEAR REQUEST**

DEPARTMENT/AGENCY <u>Public Works</u>	CONTACT PERSON <u>Gary J. Schneider</u>
PROJECT NAME <u>Old Norwich Road Resurfacing/Water Connectors</u>	DEPARTMENT PRIORITY <u>1</u>

1	DESCRIPTION AND JUSTIFICATION (describe the type, purpose & anticipated accomplishments of the project)						
	This project is another cooperative effort between the Utility Commission and Public Works. Old Norwich Road will be milled by removing the top two inches of old asphalt from the surface and replacing with new asphalt. Traffic markings will be reestablished. But first, the plastic water services must be addressed. Utilities has identified 24 locations that the services must be replaced and 25 that must be investigated.						
2	PROJECT STATUS IF IN PROGRESS						
	None						
3	LIST OTHER PROJECTS WITHIN YOUR DEPARTMENT OR ANOTHER DEPARTMENT THAT WILL BE IMPACTED BY THIS REQUEST						
	None						
4	DESCRIBE THE IMPACT ON DEPARTMENT OPERATING BUDGET (include cost estimate if applicable)						
	None						
5	GRANT FUNDING/OTHER FUNDING, if applicable (detailed explanation of grant/other funding, including the amount, source of funding, status, town match, if any. Attach award letter if available)						
	None						
6	ATTACH PLAN ESTIMATE, SERVICE AREA MAP AND/OR OTHER SUPPORTING DOCUMENTATION (if none, simply state that in the area below)						
	See attached memo						
7	COST/FUNDING SOURCE						
	FUNDING SOURCE	APPROVED FUNDING TO DATE	FY2024	FY2025	FY2026	FY2027	FY2028
1	Current Year Capital						
2	Utility Budget/Sewer Cap Maint Fund						
3	Transfer to CNR						
4	Short/Long-term Bonds						
5	LoCIP (detail in section 5 above)						
6	CNR Undesignated Fund Balance		1,234,300				
7	Federal/State Grants (detail in section 5)						
8	Other Funding (detail in section 5 above)						
	TOTALS	0	1,234,300	0	0	0	0



WUC Plastic Water Service Replacement and DPW Paving Cooperative Project Old Norwich Road



Any wetland data depicted on this map was taken from the
New London County and Connecticut Statewide Soil Survey
and are not to be construed as field verified.

Planned or existing work shown on this map was taken from the
Official Record of the Town of Waterford, Connecticut.
The official survey is the only authoritative source of information
regarding the location and extent of wetlands and other
resources shown on this map.

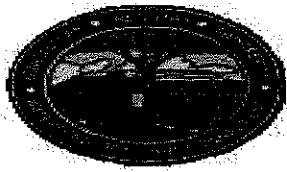


2024 Cooperative Water Service Replacement & Paving Project Funding
Requests

Road	Total Number of Residences / Services	Copper Services	Plastic Services	Unknown Services	Total Numbers of Potential Services to be Replaced
Old Norwich Road	134	85	24	25	49

Please use \$3,700 per service, so this would be \$181,300 for the 49 services we identified as either unknown or plastic.

[illegible]



Town of Waterford

Board Book Report



Ethics Commission

Basic Information

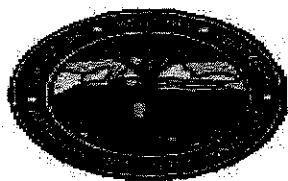
Type	Commission
Status	Enabled
Visibility	Public

9

Board Seats

Board Name	Position	Appointed By	First Name	Last Name	Email	Political Party	Calculated Start Date	Calculated End Date	Status
Ethics Commission	Alternate	Representative Town Meeting	Naomi	Mendelovicz	naomimartadoc@aol.com	Republican	2/7/2022	2/5/2024	Active
Ethics Commission	Alternate	Representative Town Meeting	Paul	Helvig	plhelvig@sbcglobal.net	Democrat	2/6/2023	2/3/2025	Active
Ethics Commission	Member	Representative Town Meeting	Christopher	Nailon	substewy@outlook.com	Republican	2/7/2022	2/5/2024	Active
Ethics Commission	Member	Representative Town Meeting	Alexa	Massad	amassad1119@gmail.com	Republican	2/7/2022	2/5/2024	Active
Ethics Commission	Member	Representative Town Meeting	Adam	Stone	astone@breezeline.net	Republican	2/6/2023	2/3/2025	Active
Ethics Commission	Member	Representative Town Meeting	Laurie	Wolfley	laurie.wolfley@uconn.edu	Democrat	2/7/2022	2/5/2024	Active
Ethics Commission	Member	Representative Town Meeting	Elizabeth	Ritter	betsyritter24@gmail.com	Democrat	2/6/2023	2/3/2025	Active
Board Name	Position	Appointed By	First Name	Last Name	Email	Political Party	Calculated Start Date	Calculated End Date	Status

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Town of Waterford

Board Book Report



Board of Police Commissioners

Basic Information

Type Board
Status Enabled
Visibility Public

10

Board Seats

Board Name	Position	First Name	Last Name	Email	Phone	Cell Phone	Calculated Start Date	Calculated End Date	Status
Board of Police Commissioners	Member	James	Dimmock	jamesdimmock@ymail.com	(860) 625-8042		8/5/2019	8/7/2023	Active
Board of Police Commissioners	Member	Christopher	Gamble	gamblec@me.com		(860) 235-9506	8/5/2019	8/7/2023	Active
Board of Police Commissioners	Member	Mark	Gelinas	markrgelinas@yahoo.com	(860) 442-5162		8/2/2021	8/4/2025	Active
Board of Police Commissioners	Member	Robert	Brule	rbrule@waterfordct.org	(860) 444-5834		11/19/2019	11/21/2023	Active
Board of Police Commissioners	Member	Thomas	Sheridan	tsheridan@chamberect.com	(860) 447-2076		8/2/2021	8/4/2025	Active
Board Name	Position	First Name	Last Name	Email	Phone	Cell Phone	Calculated Start Date	Calculated End Date	Status

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