

CENTRAL CONNECTICUT STATE UNIVERSITY
NEW PUBLIC SAFETY BUILDING
1500 EAST STREET
NEW BRITAIN, CT
PROJECT: BI-RC-311

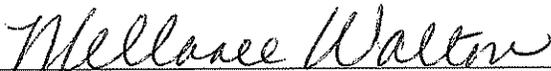
BID OPENING	1:00 P.M.	APRIL 6, 2011
ADDENDUM NUMBER 1	DATE OF ADDENDUM	MARCH 24, 2011

The following clarifications are applicable to drawings and specifications for the project referenced above.

Item 1

Replace section 00 41 00 Bid Proposal Form with the new section 00 41 00 Bid Proposal Form that is in the Addendum with an addition to the named subcontractors.

End of Addendum Number One


Mellanee Walton
Associate Fiscal Administrative Officer
Department of Public Works

FOR PROJECTS ESTIMATED TO COST MORE THAN \$500,000.00

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC WORKS
BID PROPOSAL FORM

DATE: _____

PROPOSAL OF

BIDDER'S LEGAL COMPANY NAME

BIDDER'S ADDRESS

To the Commissioner, Department of Public Works
State Office Building
Hartford, Connecticut

Dear Sir:

- 1.0 In accordance with Chapter 60 Part II of the Connecticut General Statutes, as amended, and pursuant to, and in compliance with your Invitation to Bid, the Notice to Bidders, the Contract, including the conditions thereto, the Bid Security, I (we) propose to furnish the labor and/or materials, installed as required for the project named and numbered on this Bid Proposal Form, submitted herein, furnishing all necessary equipment, machinery, tools, labor and other means of construction, and all materials specified in the manner and at the time prescribed strictly in accordance with the provisions of the Contract including, but not limited to, the specifications and/or drawings together with all addenda issued by your authority and received prior to the scheduled closing time for the receipt of the bids, and in conformity with requirements of the Awarding Authority and any laws or Departmental regulations of the State of Connecticut or of the United States which may affect the same, for and in consideration of the price(s) stated on the said Bid Proposal Form, hereof.
- 2.0 The **Lump Sum Base Bid** by me (us) on the Bid Proposal Form *includes all* work indicated on the drawings and/or described in the specifications, except:
 - 2.1 Work covered by **Supplemental Bids** as may be listed on the Bid Proposal Form and General Requirements.
 - 2.2 Contingent Work covered by the **Unit Prices** included within the **General Requirements**.
 - 2.3 Contingent Work covered by the **Contractor Provided Unit Prices** as may be listed on the **Bid Proposal Form** in Section 00 41 00, Item 7.7.
- 3.0 I (we) *acknowledge and agree* to the following:

- 3.1 To use and accept the **Contractor Provided Unit Prices** on the **Bid Proposal Form**, Section 00 41 00, Item 7.7, as provided by the Contractor in evaluating either additions to or deductions from the Work.
- 3.2 To use and accept the **Unit Prices** in Section 01 20 00 "Contract Considerations" Division 1 as provided by the Owner in evaluating either additions to or deductions from the Work.
- 3.3 To use and accept the **Allowances** in Section 01 20 00 "Contract Considerations" Division 1, as part of the Total Contract Sum as listed in Section 7.3 of this Bid Proposal form.
- 3.4 To use and accept the **Supplemental Bids** in Section 01 23 13, Division 1, as provided by the Contractor, when authorized by the Owner as scheduled in Section 7.6 of this Bid proposal form.
- 3.5 To complete and submit a **Contractor/Consultant Certification** along with a **Resolution/Certificate of Authority** for contracts with a value of \$50,000 or more when requested in the **Letter of Intent**.

DPW Website location <http://www.ct.gov/dpw/cwp/view.asp?a=1983&q=289926>

This certification must be *updated annually* by the *successful* bidder. **Annually**, on or within two (2) weeks of the **anniversary** date of the execution of this contract, the Contractor shall submit a completed **Annual Certification** with authorizing resolution to DPW, 165 Capitol Ave., Room G-35, Hartford, CT 06106. For the purposes of this paragraph, the **execution date** of the contract will be the date the Commissioner of DPW signs the contract.

- 3.6 To hold the bid price for ninety (90) calendar days and any extensions caused by the Contractor's delays in required submissions. The Contractor and the State may mutually agree to extend this period. The agreement to extend the 90-day period may occur after the expiration of the original 90-day period.

The apparent low bidder is required to submit key supporting documents as noted under the caption **Bid Submittal Time Line** at the end of this Section 00 41 00, within ten (10) calendar days of the bid opening, and to submit their Affirmative Action Plan to CHRO within fifteen (15) calendar days of bid opening. If there are any delays in the receipt of these materials then the Bid shall remain valid for the same additional number of days. For example, if the materials are submitted four (4) days later; then the bid shall remain valid for ninety-four (94) days.

- 3.7 With regard to a State contract as defined in **P.A. 07-01** having a value in a calendar year of \$50,000 or more or a combination or series of such **agreements** or **contracts** having a value of \$100,000 or more, the **authorized signatory** to this **submission** in response to the State's solicitation expressly **acknowledges receipt** of the **State Election Enforcement Commission's notice** advising prospective state contractors of the state campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the **notice**. See Attachment **SEEC Form 10 and 11**.

- 3.8 To comply with the Department of Correction's **Security Regulations For Contract Forces**, Section 00 73 63.
- 4.0 This Bid Proposal Form is submitted to and in compliance with the foregoing and following conditions and/or information:
- 4.1 AWARD
- 4.1.1 All proposals shall be subject to provisions of **Article 1 of the Notice to Bidders** and for purpose of award, consideration shall be given only to Bid Proposals submitted by qualified and responsible bidders.
- 4.1.2 The award shall be made on the **lowest Lump Sum Bid** as stated in Section 7.3 of this Bid Proposal Form and any or all **Supplemental Bids** as stated in Section 7.6 of this **Bid Proposal Form**, taken sequentially, as applicable, provided funds are available.
- 4.1.3 In the event of any **discrepancy** between the amount written in words and the amount written in numerical figures, the amount written in words shall be controlling.
- 4.2 COMMENCEMENT AND ACCEPTANCE (ARTICLE 4 GENERAL CONDITIONS)
- 4.2.1 The General Contractor shall commence Work within **fourteen (14) calendar days** *after* receiving "Construction Start Date and Notice To Proceed" by the Commissioner or the authorized representative and continue for Three Hundred Sixty Five (**365**) calendar days for completion of the project.
- 4.3 LIQUIDATED DAMAGES: (ARTICLE 8, GENERAL CONDITIONS)
- 4.3.1 The General Contractor shall be assessed \$1,742.00 per day for each calendar day *beyond* the Date established for Substantial Completion of the Contract according to the **Contract Time** as defined in Article 1.28 of the General Conditions, and not otherwise excused or waived pursuant to the Contract Documents, as defined in Article 1.23 of the General Conditions.
- 4.3.2 The General Contractor shall be assessed \$1,592.00 per day for each calendar day *beyond* ninety (90) days *after* the date of said Substantial Completion that the Contractor fails to achieve **Acceptance**, as defined in Article 1.1 of the General Conditions and not otherwise excused or waived as described above.
- 4.4 CONTRACTOR'S INSURANCE REQUIRED: (ARTICLE 35, GENERAL CONDITIONS)
- 4.4.1 The **limits of liability** for the Insurance required for this project shall be those listed in Article 35 of the General Conditions.

4.4.2 SPECIAL HAZARDS INSURANCE REQUIRED:

Type "X", "C", "U" – Explosion, Collapse, Underground in accordance with Article 35 of the General Conditions.

4.4.3 BUILDERS RISK INSURANCE

The General Contractor shall maintain Builder's Risk insurance providing coverage for the entire Work at the project site, and shall also cover portions of the Work located away from the site but intended for use at the site, and shall also cover portions of the Work in transit. Coverage shall be written on an All-Risk, Replacement Cost, and completed Value Form basis in an amount at least equal to the projected completed value of the Work and the policy shall state that it is for the benefit of and payable to the state of Connecticut.

4.5 NOT USED

4.6 The General Contractor on this project shall be required to award not less than **25%** of the total Contract Sum to contractors who are certified and eligible to participate under The State of Connecticut Set-Aside Program for **small** contractors, including **6.25%** to certified and eligible **Minority Business Enterprises**, in accordance with Connecticut General Statutes Section 4a-60g.

4.6.1 This requirement *must be met even if* the **General Contractor** is *certified and eligible* to participate in the **Small Business Set-Aside Program**. To facilitate compliance with this requirement for set-aside subcontractors, the three (3) **apparent low bidders** will have ten (10) calendar days from the date of bid opening within which to submit a **list of certified set-aside contractors** to be used on this project along with the **dollar amounts** to be paid to each, on the form provided, and a copy of their **current certification** must be attached. This information will be considered as part of your Bid Proposal Form and **failure** to comply with any portion of this requirement within the ten (10) days, including but not limited to **failure** to list or meet the necessary dollar amount or percentage of the bid price will be cause to **reject** your bid.

4.7 BIDDER'S QUALIFICATION STATEMENT AND OBJECTIVE CRITERIA FOR EVALUATING QUALIFICATIONS OF BIDDERS:

4.7.1 Information in regards to the General Contractor's and the Named Subcontractor's Bidder's Qualification is submitted and is made part of this Bid Proposal Form. **Note: Individual Specification Sections may contain General Contractor and/or Subcontractor Qualification requirements that exceed those in Section 00 45 15, "Objective Criteria Established for Evaluating Qualifications of Bidders."**

4.7.1.1 The **General Contractor** is required to complete the **General Contractor Bidder's Qualification Statement** in section 00 45 14.

4.7.1.2 Any **Named Subcontractor** as listed in schedule 7.5.1 of this Bid Proposal Form is required to complete the **Named Subcontractor Bidder's Qualification Statement** in section 00 45 17. To facilitate compliance with this requirement, the three (3) apparent low bidders will have **ten** (10) calendar days, from the bid opening date, to submit the completed **Named Subcontractor Bidder's Qualification Statement** as required in section 00 45 17. This information will be considered as part of your Bid Proposal Form and failure to comply with any portion of this requirement will be **cause to reject** your bid.

4.7.2 The **Objective Criteria for Evaluating Bidders** that are included in Division 0, Section 00 45 15, of this Project Manual, is to assure that the State of Connecticut will secure the "lowest responsible and qualified bidder" who has the ability and capacity to successfully complete the Bid Proposal Form and the Work.

4.8 **NONDISCRIMINATION AND LABOR RECRUITMENT:**

4.8.1 The Contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of the Contract as if they had been fully set forth in it. At the Contractor's request, the Client Agency shall provide a copy of these orders to the Contractor. The Contract may also be subject to Executive Order No. 7C of Governor M. Jodi Rell, promulgated July 13, 2006, concerning contracting reforms and Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services, in accordance with their respective terms and conditions.

4.9 **FEDERAL & STATE WAGE DETERMINATIONS:**

4.9.1 The U. S. Secretary of Labor's latest decision and the State of Connecticut Wage Schedule are all incorporated in the documents. The higher rate (Federal or State) for any given occupation shall prevail. At the time of bidding, the bidder agrees to accept the current prevailing wage scale, as well as the annual adjustment to the prevailing wage scale, as provided by the Connecticut Department of Labor.

4.10 **CERTIFICATION OF BIDDER REGARDING EQUAL EMPLOYMENT OPPORTUNITY & NON-SEGREGATED FACILITIES:**

4.10.1 The General Contractor and Subcontractors are hereby advised that upon acceptance of their bids they are obligated to fill out within seven (7) calendar days the certification required pursuant to Executive Order No. 11246, and agree to certify to the compliance of non-segregated facilities.

4.11 **EQUALS AND SUBSTITUTION REQUESTS PROCEDURES:**

- 4.11.1 All submissions requesting "Equals and/or Substitutions" shall be made by the **Contractor** in accordance with **Article 15** of the **General Conditions** and **Section 01 25 00** of the **General Requirements**. All submissions shall contain all the information necessary for the Department of Public Works to evaluate the submission and the request. Failure to submit sufficient information to make a proper evaluation, including submittal of data for the first manufacturer listed as well as the data for the "Equals and/or Substitutions" proposed, shall result in a **rejection** of the submission and request. Upon receipt of the submission and request the Department of Public Works shall notify the Contractor the request has been received and as soon as possible shall render a decision on such submission and request.
- 4.11.2 **Pre-Bid Opening Substitution of Materials and Equipment:** The Owner will consider requests for equals or substitutions *if* received **fourteen (14) days prior** to the **Bid Opening**. The **Equal or Substitute Product Request Form 701** must be used to submit request. This **form** may be found in the **DPW Website**.
- 4.11.3 Request for Equal or Substitution shall be submitted to the **DPW Project Manager and Architect or Engineer**.
- 4.11.4 Any substitution request not complying with requirements will be denied. Substitution request sent *after* the **deadline** will be denied.
- 4.11.5 An **Addendum** shall be issued to inform all prospective bidder of any accepted substitution in accordance with our addenda procedures.
- 4.11.6 No extension of time will be allowed for the time period required for consideration of any Substitution or Equal.
- 4.11.7 **Post Contract Award Substitution Of Materials And Equipment:** All Requests For "Equals And Substitutions" *after* the Award of the Contract shall be made *only* by the **General Contractor** in accordance with Article 15, Materials: Standards, Section 00 72 00 General Conditions Of The Contract For Construction.

5.0 ACCOMPANYING THIS PROPOSAL IS:

- 5.1 A CERTIFIED CHECK drawn to the order of – Treasurer, State of Connecticut, in the which it is understood shall be cashed and the proceeds thereof used so far as may be necessary to reimburse the State of Connecticut for losses and damages arising by virtue of my (our) failure to file the required Bonds and execute the required contract if this proposal is accepted by the Awarding Authority.
- OR
- 5.2 A BID BOND having as surety thereto a Surety Company or Companies authorized to transact business in the State of Connecticut and made out in the penal sum of 10% of the bid.

5.3 GIFT AND CAMPAIGN CONTRIBUTION CERTIFICATE AT TIME OF CONTRACT EXECUTION

5.4 A DEPARTMENT OF ADMINISTRATIVE SERVICES (DAS) CONTRACTOR PRE-QUALIFICATION CERTIFICATE

The DAS Prequalification Certificate is required for projects estimated to exceed \$500,000.00 (C.G.S. 4b-91 as amended)

5.5 A DEPARTMENT OF ADMINISTRATIVE SERVICES (DAS) UPDATE STATEMENT

The DAS Update Statement is required for projects estimated to exceed \$500,000.00 (C.G.S. 4b-91 as amended)

5.6 CHECKLIST OF INCLUDED ITEMS WITH BID PROPOSAL AT TIME OF BID PROPOSAL SUBMITTAL

IMPORTANT:		
Item		Section
	A. All forms below must be included when you submit your bid package.	
	B. Failure to submit any of items marked below with an asterisk (*) shall cause rejection of the bid and shall not be considered a minor irregularity under CGS 4b-95.	
1 *	Bid Proposal Form*	00 41 00
2 *	Appropriate Resolution or Certificate (of authority*)	00 40 14
3 *	Ethics Affidavit (Regarding State Ethics) (New July 1, 2005)*	00 40 14
4 *	Department of Administrative Services Pre-qualification Certificate*	00 40 15
5 *	Department of Administrative Services Update Statement *	00 40 15
6 *	Standard Bid Bond or Certified Check*	00 43 16
7	General Contractor Bidder's Qualification Statement	00 45 14

6.0 I (we), the undersigned, hereby declare that I am (we are) the only person(s) interested in the Bid Proposal and that it is made without any connection with any other person making any Bid Proposal for the same work. No person acting for, or employed by, the State of Connecticut is directly or indirectly interested in this Bid Proposal, or in any Contract which may be made under it, or in expected profits to arise therefrom. This Bid Proposal is made without directly or indirectly influencing or attempting to influence any other person or corporation to bid or refrain from bidding or to influence the amount of the Bid Proposal of any other person or corporation. This Bid Proposal is made in good faith without collusion or connection with any other person bidding for the same work and this proposal is made with distinct reference and relation to the plans and specifications prepared for this Contract. I (we) further declare that in regard to the conditions affecting the Work to be done and the labor and materials needed, this Bid Proposal is based solely on my (our) own investigation and research and not in reliance upon any representations of any employee, officer or agent of the State.

7.0 Each **class of Work** set forth in a separate section of the specifications pursuant to this Section shall be a **subtrade** designated in Schedule 7.5.1 of this Bid Proposal Form and shall be the matter of a **subcontract** made in accordance with the procedure set forth in this chapter.

7.1 The undersigned proposes to furnish all labor and materials required for

Project Number: BI-RC-311
Project Title: Central Connecticut State University, New Public Safety Building
1500 East Street, New Britain, CT

in accordance with the accompanying Plans and Specifications

Prepared by: Perkins + Will, 655 Winding Brook Drive, Glastonbury, CT 06033

Engineer/Architect

for the Contract Sum specified in Section 7.3 subject to **additions** and **deductions** according to the terms of the specifications.

7.2 This Bid Proposal includes _____ number of **Addenda/Addendum**.

7.2.1 The **Contractor is to fill in item 7.2 above**, acknowledging the number of Addenda that the Contractor is including in the Bid Proposal Form. Failure to acknowledge all **addenda** in the space provided in the Bid Proposal Form shall be cause for **rejection** of the bid.

7.3 **THE PROPOSED CONTRACT PRICE IS AS FOLLOWS:**

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(Place figures in appropriate boxes.)

DOLLARS

(Written Amount)

7.3.1 In Accordance With Section 4.6 Not Less Than **25%** Of This Total Must be Awarded to Certified **Set-Aside** Contractors, including **6.25% Minority Business Enterprises**. **Failure to Meet This Requirement Will Be Cause To Reject Your Bid.**

7.4. **NOT USED**

7.5 **Subcontractors and their price must be listed for the trades identified in Schedule 7.5.1.**

FAILURE TO PROPERLY COMPLETE THIS SECTION ACCORDING TO THE BELOW INSTRUCTIONS SHALL RESULT IN REJECTION OF THE BID.

SCHEDULE 7.5.1 – NAMED SUBCONTRACTORS					
Description	Name of Subcontractor	Amount Dollars	Labor & Material Payment Bond	Performance Bond	State of CT D.C.P. License/Registration No.
					Format: Prefix - No. - Suffix
1. Electrical	_____	\$ _____	_____ %	_____ %	_____
2. Mechanical*	_____	\$ _____	_____ %	_____ %	_____
* Includes (Plumbing, etc ...) <i>except</i> HVAC					
3. HVAC**	_____	\$ _____	_____ %	_____ %	_____
**HVAC (includes all controls)					
4. Masonry	_____	\$ _____	_____ %	_____ %	_____
5. Sprinkler	_____	\$ _____	_____ %	_____ %	_____

On and after October 1, 2007, **no** person whose **subcontract** *exceeds* five hundred thousand dollars in value may perform work as a **subcontractor** on a project estimated to cost more than five hundred thousand dollars, *unless* the person is **prequalified** in accordance with section 4a-100, as amended by **Public Act 06-134**.

- 7.5.2 List the *name* and *price* of each **Named Subcontractor** that will perform the **work** of the trades *listed* in **Schedule 7.5.1**.
- 7.5.3 The **General Contractor** *may* list **itself** together with its **price (failure to provide both will be cause for rejection)**, *if* it customarily performs any of the trades specified. *If* the General Contractor leaves the spaces for a specific "Trade Description" *completely blank*, it will be *assumed* that the General Contractor will perform that Work.
- 7.5.4 *If* the General Contractor requires a **Performance** and/or **Labor and Material Payment Bond**, *then* the General Contractor must indicate in **Schedule 7.5.1** which of the Named Subcontractors are subject to this requirement. The amount (%) shall not exceed the Named Subcontractor's price listed in **Schedule 7.5.1**.
- 7.5.5 The undersigned *agrees* that each of the **Named Subcontractors** listed in **Schedule 7.5.1** of the Bid Proposal Form will be used for the **Work indicated at the amount stated**, *unless* a **substitution** is permitted by the awarding authority as provided for in section 00 21 19 Notice to Bidders.

- 7.6 Any **Supplemental Bids** listed in schedule 7.6.1, *if* accepted by the Owner, will be taken cumulatively and in numerical order as scheduled. No Supplemental Bid will be skipped or taken out of numerical order as scheduled. Supplemental Bids: Division 1, Section 01 23 13 of the **General Requirements** identify and describe the Supplemental Bids as shown in Schedule 7.6.1.

SCHEDULE 7.6.1 – SUPPLEMENTAL BIDS	
Supplemental Bid No.: 1	Provide all labor, material and equipment to complete the Work in accordance with Division 1, Section 01 23 13.
ADD: _____ Dollars \$ _____	(Written Amount)

- 7.7 **Contractor Provided Unit Prices** are not needed for this project.
- 7.8 The **undersigned** agrees that *if* selected as the General Contractor, I (we) shall, within **seven (7)** calendar days (legal State holidays excluded) *after* notification thereof by the awarding authority, *execute* a **Contract** in accordance with the terms of this Bid Proposal Form and Contract.
- 7.9 The undersigned agrees and warrants that they have made **good faith efforts** to employ **minority business enterprises** as **Subcontractors** and **suppliers** of materials under such Contract and shall provide the Commission on Human Rights and Opportunities with such information as is requested by the Commission concerning their **employment practices and procedures** as they relate to the current provisions of the Connecticut General Statutes governing Contract requirements.
- 7.10 This project is not a “Threshold Building.”
- 8.0 **CONFIDENTIALITY OF DOCUMENTS**
- 8.01 The **undersigned** agrees that if not selected as the General Contractor for this project, all plans and specifications in their possession for the project shall be destroyed.
- 8.02 The **undersigned** agrees that if selected as the General Contractor for this project:
- 8.02.1 The **plans and specifications** shall not be disseminated to anyone except for construction of this project.
- 8.02.2 The following **provision** shall be included in all of its contracts with subcontractors and sub-consultants:

Any and all drawings, specifications, maps, reports, records or other documents associated with the contract shall only be utilized to the extent necessary for the performance of the work and duties under this contract. Said drawings, specifications, maps, reports, records and other documents may not be released to any other entity or person except for

the sole purpose of the work described in this contract. No other disclosure shall be permitted without the prior written consent of the Department of Public Works. When any such drawings, specifications, maps, reports, records or other documents are no longer needed, they shall be destroyed.”

8.02.3 Upon completion of the construction and the issuance of a certificate of occupancy, the plans and specifications shall be returned to the Department of Public Works, or destroyed, or retained in a secure location and not released to anyone without first obtaining the permission of the Department of Public Works.

9.0 A duly authorized representative of the Bidder or Bidder’s partnership, firm, corporation or business organization must sign all Bid Proposals Forms.

(NO FACSIMILE SIGNATURE IS PERMITTED).
ALL INFORMATION BELOW IS TO BE FILLED IN BY THE BIDDER.

Project Number BI-RC-311

Firm Name Complete BIDDER'S LEGAL COMPANY NAME

General Contractor’s State of Connecticut, D.C.P. License/ Registration No. _____
(Applicable for Threshold Building projects only. Insert “N/A” if not applicable. Refer to Item 7.10)

Firm Federal Employer Identification Number _____

Firm CT Tax Registration Number _____

Firm Address _____
Street City State Zip Code

Telephone Number _____

FAX Number _____

E-mail Address _____

Type of Business (check one): Corporation Limited Liability Corporation (LLC) Corporate Seal, *if a Corporation*

____ Partnership

____ Sole Proprietor

____ Doing Business As (d/b/a), if yes,
provide complete name **below:**

Provide Exact Wording on Corporate Seal
below:

This Bid Submission is **only** for Contractors who are **Certified** in the **DAS Prequalification Classification** noted in the **Invitation to Bid**.

*** A Resolution/Certificate of Authority must be submitted with your Bid Proposal.***

Signed this _____ day of _____ 20 _____

Bidder's Signature _____
Duly Authorized Title

Print Name Date

The apparent three low bidders are required to submit key supporting documents as noted on the following page within ten (10) calendar days of the bid opening, while the apparent low bidder is required to submit his Affirmative Action Plan to CHRO within fifteen (15) calendar days of bid opening. If there are any delays in the receipt of these materials then the Bids shall remain valid for the same additional number of days. For example, since, the apparent three low bidders are required to hold the bid price for ninety (90) calendar days and any extensions caused by the Contractor's delays in required submissions, if materials are submitted four (4) days later; then the bid shall remain valid for ninety-four (94) days.

Failure to meet the below stated deadlines may result in rejection of the bid at the sole discretion of the Commissioner of Public Works.

Bid Submittal Time Line

SUBMITTALS DUE WITHIN 10 CALENDAR DAYS AFTER BID OPENING
(From the Apparent **Three** Low Bidders):

1. Section 00 73 27 DPW Set-Aside Schedule:
2. Listing of certified set aside contractors Subs with name, address, amount and whether a subcontractor or a supplier or both
3. DAS Set-Aside Subcontractor Certificate of Eligibility (SBE's & MBE's)
4. Section 00 45 17 Named Subcontractor Bidder's Qualification Statements
5. Named Subcontractor's DAS Prequalification Certificate, when applicable

SUBMITTALS DUE WITHIN 15 CALENDAR DAYS AFTER BID OPENING
(From the **Apparent Low Bidder**):

1. Affirmative Action Plan to CHRO
2. Affirmative Action Plan Transmittal Letter Copy to DPW Procurement
3. Section 00 73 53 Affidavit for Certified Subcontractors as MBE's
4. Section 00 73 44 Wage Certification to DOL
5. On your letterhead, list of all named subcontractors, address and contact person
6. Scope Review conducted

SUBMITTALS DUE WITHIN 10 BUSINESS DAYS AFTER BOND COMMISSION FUNDING APPROVAL VIA EXPRESS/OVERNIGHT MAIL (From The **Apparent Low Bidder**):

1. Section 00 52 73 Subcontractor Agreements (Named & Listed)

SUBMITTALS DUE WITHIN 10 BUSINESS DAYS AFTER THE LETTER OF INTENT

1. Section 00 62 16 Insurance Certificate Form
2. Section 00 92 10 Performance Bond
3. Section 00 92 10 Labor & Material Bond
4. Section 00 92 10 Surety Sheet
5. Power of Attorney from the Surety Company
6. Section 00 40 14 Certificate of Authority/Resolution - Certificate
7. Asbestos Abatement Liability Insurance (for asbestos abatement only)
8. Motor Vehicle Pollution Liability for Asbestos Abatement (for asbestos abatement only)
9. Section 00 92 10 Non-Residents Certificate - DRS - Guarantee Bond (form AU-766)
10. Section 00 92 10 Bidder's Certificate: Financial Position & Corporate Structure
11. Section 00 52 03 Contract
12. Section 00 40 14 Affidavit Regarding State Ethics - for each Named Subcontractor

- 13. Section 00 40 14 Gift And Campaign Contribution Certification
- 14. Section 00 40 14 Consulting Agreement Affidavit
- 15. Certificate of Legal Existence from Corporations

END OF SECTION

PMWeb Language for Project BI-RC-311

PMWeb Project Management:

1. The State of Connecticut Department of Public Works (CTDPW) is using **PMWeb** as the project management collaborative software tool for this project.
2. The General Contractor is required to utilize PMWeb for the duration of this project, including project closeout and shall provide all project information via this program. This includes, but is not limited to contracts, applications for payment, change orders, change order proposals, requests for information, etc.
3. The General Contractor is required to purchase **five (5)** full PMWeb licenses to be utilized on the CT DPW PMWeb Hosted System from PSSGroup, Inc. and maintain the licenses, software support, and hosting services through the duration of this project. These licenses will be assigned to members of the project team. At end of the project, these licenses shall be turned over to the CT DPW. The cost for the licenses, support of the licenses, and hosting fees shall be included by the General Contractor in the General Conditions costs for this project.
4. The General Contractor shall provide for two (2) days of formal PMWeb training as directed by the Construction Administrator or DPW Project Manager for the Construction Administrator, Owner, and their representatives. Training will be conducted at the DPW Training Room at the State Office Building, at 165 Capitol Avenue, Hartford, CT 06106. The training shall be coordinated through the DPW Project Manager and DPW **PMWeb** Staff. The cost for the training shall be included by the General Contractor in the General Conditions costs for this project.
5. The General Contractor shall contact PSSGroup, Inc. for the licenses and training at <http://www.pmweb.com> [Phone: (617) 207-7080 [Fax: (978) 246-0248.
6. Connecticut Department of Public Works (CTDPW) will be establishing a project specific email "file" address for this project. The General Contractor shall send an electronic "file" copy of all project documents to this email address, to include but not limited to all project correspondence, project emails, forms, etc.
7. The General Contractor shall electronically scan all documents not created in PMWeb. These scanned document files shall be uploaded and maintained in the PMWeb Document Management System for this project and linked to the corresponding record in PMWeb.

1.1 SCOPE

- A. This Addendum is issued pursuant to Article 1.1.1 of the AIA General Conditions of the Contract for Construction (A201) in connection with revision of Bidding Documents which have been previously issued.
- B. When construction is not under contract, all instructions contained herein shall be reflected in the Contract Sum and this Addendum will be made a part of the Contract Documents, if, as, and when a Contract is awarded.
- C. This Addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated 06-16-10 as noted below. Receipt of this Addendum must be acknowledged in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.
- D. This Addendum consists of 149 pages plus attachments.

1.2 CHANGES TO INTRODUCTORY INFORMATION

- A. Change the contact for Perkins+Will to Kathyann Cowles, 860-659-6815, Kathyann.cowles@perkinswill.com,

1.3 CHANGES TO PROCUREMENT REQUIREMENTS

- A. Replace section 00 41 00 Bid Proposal Form with section 00 41 00 New Bid Proposal Form in the Addendum with Additional Subtrade.

1.4 CHANGES TO CONTRACTING REQUIREMENTS

- A. Delete Section 01 11 00 Paragraph H.
- B. Add PMWeb Language for Project BI-RC-311 attached.

1.5 CHANGES TO THE SPECIFICATIONS

- A. REVISE Section 095123, Acoustical Tile Ceilings: ADD Armstrong Ultima ¾" tile. DELETE reference to 1" tile.
- B. Section 10 51 13 DELETE reference to metal locker bases; bases are to be concrete as shown on plans.
- C. ADD Geotechnical Report dated Jan. 9, 2004
- D. REPLACE Section 28 13 00 Security Systems in its entirety.
- E. REPLACE Section 28 31 00 Fire Alarm System in its entirety.

1.6 CHANGES TO THE DRAWINGS

- A. C100 and C201 ADD the revised Drawings plan. The plans have been revised to show the existing topography.
- B. There are 10 steel bollards shown on the survey within the specified area. The intent is to remove all bollards within this area.

END OF ADDENDUM 1

1.7 BIDDERS QUESTIONS/CLARIFICATIONS

- A. Entry Door #104A is an aluminum door type "4" and aluminum frame type AL4.
- B. Entry door #104c and Toilet #104B are bullet resistant doors.
- C. Detention doors are limited to #108A, 108B, 108C and 108D.
- D. Substitution requests should be addressed as outlined in the specification.
- E. Security conduit, wiring and equipment are to be included in the bidders proposals
- F. Footing Elevations: Bottom of footing elevations are to be as shown on S.1.1 Foundation Plan. Footing steps between elevations are shown as well.
- G. Top of Pier P1 Elevation: Top of elevation of piers P1 shown in the basement are 85.83' of 8" below floor slab. See 4/S2.1 for detail.
- H. Request for Geotechnical report- included in addendum
- I. There is no allowance for dewatering. All dewatering activities shall follow local and state requirements.
- J. The groundwater tables and/or borings should be provided by the geotechnical engineer; see attached Geotech report.
- K. The unit price schedule provided within the specifications is for all rock removal work.
- L. The utility pole 8341 shown on drawing C102 shall be relocated by CL&P.
- M. Substitution requests will be considered after the award of the contract. All Bidders are to bid on plans and specifications. Refer to requirements for substitutions in section 1026 00, Contract Modification Procedures.
- N. Hardware clarifications
 - CB233 provide pivot hinges in at the top and regular hinges in the middle and bottom
 - FBB Ball Bearing Hinges are required at hardware sets DELETE reference to CB concealed bearing hinges.
 - 08 71 00 See page 1/18 of paragraph "D" Spec section this shall dictate who should supply hardware sets.
 - Section 28 13 00; Prox reader is by the "security contractor" NOT CCSU.
 - The Bullet Resistant Doors and Frames are specified as "Basis of Design". Contractor bears the responsibility of providing materials that are equal to or greater than the basis of design.

END OF DOCUMENT

Security Systems Part 1.00- General

1.01 General Instructions

1. These specifications describe the requirements of security and access control equipment and explain how the Security Management System (System) will operate. The technical security representative (Consultant) is Applied Risk Management, LLC.
2. The Integrator's price shall be for a completely installed, programmed and functioning system. The Integrator shall be responsible for installing all cable and wiring for the security system and connecting it to the equipment which they are furnishing. Any additional conduit and power required for the security system not shown on the electrical drawings shall be the responsibility of the Integrator. The Integrator must be a TAC certified partner who has a minimum of 10 years of association with Andover. All Andover programming must be by a TAC certified Continuum Engineer employed full time by the Integrator for at least 1 year.
3. The Integrator must be a Verint certified partner with at least 2 years of association with Verint, All programming must be by a Verint trained and certified programmer who has been employed full time by the Integrator for at least 1 year.
4. The Sole Source Vendor is: Environmental Systems Corp.
18 Jansen Court
West Hartford, Ct 06110
860-953-8800
Contact: Richard Fox
5. Any Sub Contractor used by the Integrator shall be approved by CCSU.
6. In addition, throughout these instructions and specifications references are made to the "Owner", specifically, the Owner is operator of the system. The Owner, along with their designated representatives shall accept the work and ensure that the equipment is installed in accordance with these documents. The warranty period shall not commence until the Owner has accepted the system and is in receipt of as-built drawings and all manuals.
7. If at any time over the next three (3) years or the duration of the service contract, whichever is longer, the Owner wishes to add to this system, these line item prices are to remain valid.

1.02 Description of Work

- A. The System shall consist of three (3) modules or sub-systems:
 - A proximity card access control and intrusion system (ACS)
 - A digitally recorded closed circuit television system (CCTV)
 - A communication system that includes audio and video intercoms (Comm.).
- B. CCSU is constructing a new Public Safety Building on campus. This building will include a dispatch center on the first floor. The access control/ intrusion detection system will be connected to the main campus system via the CCSU network.
- C. The CCTV system will be a stand-alone system consisting of a new Verint Master server, Recorder, Storage, Power Supplies, Encoders, software and all licenses. All of the CCTV cameras in the PS building will be recorded on this system.
- D. The Booking area cameras will have audio capability and will be recorded in the Equipment room within Dispatch.

- E. The second floor interview room camera shall have audio capability and will be recorded in the Equipment room within Dispatch.
- F. There will be intercoms used throughout the facility to allow communications between specified locations including, but not limited to:
 - Stair 1 Entrance
 - Stair 2 Entrance
 - Dispatch Center Entrance
- G. The Integrator shall be responsible for furnishing, mounting, and wiring all equipment and providing any additional needed conduit, wire and cable not shown on the plans.

1.03 Tests, Permits and Fees

- A. All tests of materials and/or systems where required by the specifications shall be paid for by the Contractor. Satisfactory documentary evidence that the materials have passed the required inspection and tests must be furnished to the Owner's Representative.

1.04 Technical Coordination

- A. The Integrator shall appoint a technical coordinator and/or project manager to act as a liaison between the Contractor and the Owner's Representative.

1.05 Warranty and Service Requirements

Warranty and service of all equipment being furnished is of prime importance to the Owner. The Integrator must demonstrate the ability to promptly provide service required by the equipment being installed, such as system software programming, mechanical and electrical technical support, and application support. See Section 3.24 for further details.

- A. Provide a copy of their standard maintenance and service agreement, in addition to the service and maintenance.
- B. All installed systems will be fully warranted for parts, maintenance, and labor on a 24X7 basis.

1.06 Project Scope of Work

- A. The work and equipment that comprise the system shall include all items necessary to make the system operational whether specifically detailed, outlined, or indicated in the specifications or on the drawings along with those elements not specifically indicated but essential to the performance of the project intent and operational purposes. A "Turnkey" installation shall be provided.
- B. The work includes: selecting products; application engineering; installation drawings and instructions; shop drawings and documentation manuals; installation engineering; supervision; installation of equipment wiring and cables; final connection of all equipment and devices; all materials; labor; adjustments; system start-up; testing; training of operating personnel; device documentation; system components; software; spare parts where required; warranties and maintenance; other materials as may be necessary for a complete security alarm, CCTV, and access control system as specified herein and shown on the plans. The successful Bidder shall agree to provide as-built AutoCAD version 2008 compatible drawings showing in detail all wiring and connections.
- C. The system as outlined herein shall include the access control system (ACS); the digital video recording system (CCTV); and the Communication System (Communication). The preference is

to have one integrated system with the ability to perform all functions including; alarm monitoring, access control, and control of the CCTV system through a single computerized user interface. This interface shall be operated by the Owner's personnel and located in the Dispatch Center in the new Public Safety Building. Manufacturers shall integrate their systems in a seamless manner. The Owner shall be the sole judge of acceptable integration and functionality. The equipment must be designed and approved for its intended use.

- D. The Integrator must coordinate the installation with other trades and contractors working in the building and on this project.

1.07 Work by Others and Coordination:

- A. The following items shall be supplied by other contractors but interface to the Integrator's system and operate as intended. This paragraph spells out the various contractor responsibilities.
1. Locking Devices - All locking devices on the various controlled doors shall be the responsibility of the Hardware Contractor. They shall be mounted and installed by the Hardware Contractor. They shall be wired by the Integrator who shall provide and install 24 VDC power supplies with 4-hour standby power. The two contractors shall coordinate their requirements. Where electric hinges or hinge security switches are used they shall be the responsibility of the Hardware Contractor. Any wiring through doors or hinges shall be the responsibility of the Hardware Contractor. All wiring at the doors shall be the responsibility of the Integrator. The installation and supply of any special hardware such as door closers, automatic doors operators and/or the delayed egress controllers shall be the responsibility of the Hardware Contractor and/or the General Contractor.
 2. Electric Power - There are emergency power circuits in the building. The security system shall be powered from these circuits. All security equipment shall be equipped with standby batteries to ensure that false alarms shall not occur in the event of primary power failure. The electrical engineer shall identify the power circuits for the security system. Duplex plugs are to be supplied in the MDF Room. There is a security alarm monitoring workstation at the Dispatch Center for the security system. The project electrical contractor on the job is to supplying rough in boxes at the various security system component locations. These rough in boxes have conduit from them to above the ceiling where required. The Integrator shall coordinate these locations with the electrical contractor. Once above the ceiling the Integrator shall install their wire and cable in accordance with the project electrical specifications. All security cables shall be appropriately identified with a distinctive marking and be plenum rated. All cables shall be neatly bundled and supported to a building member in a neat workmanlike manner. In the event that the Integrator needs additional conduit/EMT or power not shown on the electrical drawings, it shall be his responsibility to install this conduit/EMT as part of the security system. There shall be no exposed wiring.
 3. Telephone - All required telephone communication lines/channels shall be supplied by the Owner. The Integrator shall identify in its bid the number and requirements of the telephone lines and connections.
 4. CCTV - The General Contractor shall work with the Integrator and assist in mounting of the CCTV cameras. The mounting shall be installed to insure vibration-free operation of the CCTV equipment. The General Contractor shall coordinate the installation of this equipment with the various contractors involved such as the ceiling contractor, the electrical contractor and the Owner. Electrical power and coaxial cable shall be supplied to each of these locations as shown on the electrical drawings by the Integrator.
 5. IT Network Connections - The Integrator shall identify all required network connections and specify in their bid, all requirements of these connections including, but not limited to;

data transfer speeds, static IP requirements (if any), and bandwidth estimates. The Owner shall coordinate and provide all IT programming and connections.

6. Cabinets and Enclosures – The Integrator shall supply a full-enclosed EIA 19" rack with front and rear doors to mount various component of the ACS system in MDF room. This enclosure shall have all necessary power strips for the ACS system and be ventilated to meet the requirements of the equipment housed within it.

1.08 Submittal Documentation

The following submittals shall be made prior to commencing work on the project:

- A. Illustration block diagram showing each component of the system, its operation and intersystem dependability. The diagram shall also show how the system can be expanded and where expansion is already built into the system.
- B. A detailed system description of each system module including; the ACS, CCTV/ DVR; Connection to a UL approved central station, remote access, and connections to the building security system.
- C. A paragraph-by-paragraph description of how the equipment being proposed conforms to these specifications. (See 1.11D-K)
- D. A set of technical data sheets defining all system components appropriately marked to show the particular model that shall be used.
- E. A sketch of the proposed components to be mounted in the Integrator supplied equipment cabinet in the MDF Room. The sketch shall illustrate the plan, elevation and frontal views of each component to be mounted in the cabinet. The sketches will be fully dimensioned and show how security equipment shall fit into the space allocated for it. It shall include all redundant and backup equipment
- F. A schedule of work in the form of a Gantt chart detailing the amount of time to complete a particular item in "Days after Receipt of Order to Proceed."
- G. List at least five existing installations that use the proposed equipment types including in particular, the integrated access control system and CCTV combination as proposed in response to this specification. Attachment # 1 of these specifications must be filled out and be a part of your bid. (See "Reference List")
- H. A power requirements chart showing the power requirements of each location where power is required. This power shall be emergency power and will require time to transfer. The Integrator's equipment shall have battery standby in order to transfer without causing alarms and/or trouble signals. All remote detection devices and dispersed intelligent controllers shall have 4-hour standby power. Any other power requirements beyond the emergency power described above shall be the responsibility of the Integrator.
- I. The Integrator shall provide documented heat load and total power requirements for all equipment to be installed in the MDF Room # 0011000 and at the work stations in the Dispatch Center.
- J. Written notification of any contradictions and/or conflicts between parts of the specifications and/or the plans and specifications.
- K. The following questions should be answered and/or clearly explained in your submittals:

1. Does the proposed system satisfy all UL standards, and what approvals does it presently have?
2. What is the maximum guaranteed time (in hours) to respond to a maintenance request?
3. Are installations done by the Bidder's employees or a third party? If by a third party, who?
4. Is the proposed system built upon commercially available operating programs and industry standard components and what licenses are required?
5. All licenses shall be included, please confirm.
6. What Operating System does the proposed system require? The preferred system is Microsoft Windows XP Professional.
7. Do you presently stock all parts and boards required to keep the system operational within a four hour time period of service?

1.10 Maintenance Agreement

1. Please provide pricing for a comprehensive maintenance agreement that covers all parts and labor for all components in the System. This agreement will be for five (5) years and shall be for 24X7 Coverage. List the pricing by year on the Proposal Form. There should be no cost associated with the first year as the system will be under 24X7 Warranty for that period.

1.11 Training

1. Please see the training section (3.23). In addition, supply pricing to provide additional training on an hourly basis, including expenses.

End of Part I

PART 2.00 - PRODUCTS

2.01 General

A. Products

All products not provided by the Owner shall be new and unused, and shall be of manufacturer's current and standard production.

B. Equipment

Where two or more equipment items of the same kind are provided, all shall be identical and provided by the same manufacturer.

C. Components

Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. The Integrator shall provide all components needed for a complete System.

D. Product Availability

1. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

2. Certain products specified may only be available through factory authorized dealers and distributors. Contractor shall verify his ability to procure the products specified prior to submitting a proposal.

E. Wire and Cable

1. General: Provide all wire and cable required to install systems as indicated. Wire and cable shall be sized to provide minimum voltage drop and minimum resistance to the devices being supplied.

2. All cables shall be specifically designed for their intended use.

3. Comply with equipment manufacturers recommendations for wire and cable.

4. Comply with all applicable codes and ordinances.

5. All Cables shall be plenum rated and clearly identified as security cables at each foot marker.

6. All Cable shall be manufactured by West Penn per campus standards.

7. All Cables will be "home runs" with no splices.

F. Conduit and Raceway Systems

1. General: All conduit, raceway, and pull-strings shall be installed by the project Electrical Contractor.

2. Integrator shall be responsible for coordination of work with project Electrical Contractor.

G. Junction and Pull Boxes

1. General: All junction boxes, handholds, and back boxes shall be installed by the project Electrical Contractor.

2. The Integrator shall be responsible for coordination of work with project Electrical Contractor.

H. Lightning Protection

1. The Contractor shall provide suitable lightning protection for all equipment.
2. All lightning protection equipment shall be UL listed.

2.02 Access Control System (Upgraded in 2010 as part of a different project including new workstations, software, and server). There are no approved equivalents to the Andover Controls equipment specified herein.

A. Software

The Access Control System shall be the Andover Controls Continuum. The System shall have the following minimum features/capacities:

1. 12 Simultaneous Users
2. Up to 2048 Card Readers
3. Up to 4096 Inputs
4. Up to 4096 Outputs
5. 2 Ports
6. Up to 100,000 Card Holders
7. Up to 2,000 Clearance Codes
8. Laser Printer

B. Server Hardware

The Server CPU shall be 100% IBM compatible Pentium PC approved for running the Microsoft Windows XP Professional operating system. The PC shall have the following minimum configuration:

1. 1 GB RAM
2. 4.0 GHz processor
3. 200 GB hard drive
4. 3.5" floppy disk drive
5. QIC, DAT tape drive, or CD-RW drive
6. CD-ROM drive
7. Two (2) serial ports
8. Two (2) USB ports.
8. Windows XP Professional OS
9. Ethernet Adapter
10. SVGA Display Adapter (1024 x 768 resolution @ 65,536 colors)
11. 56.6K baud modem

C. Client Hardware

The Operator (Client) workstation(s) a 100% IBM compatible Pentium PC approved for running the Microsoft Windows XP Professional operating system. The PC shall have the following minimum configuration:

1. 256Mb RAM
2. 800 MHz clock

3. 20 GB hard drive
4. 3.5" floppy disk drive
5. CD-ROM drive
6. 17" SVGA flat panel monitor (1024 x 768 resolution)
7. Two (2) serial, one (1) parallel ports
8. PS/2 style mouse
9. Windows 2000, XP or 2003 operating system
10. Ethernet Adapter
11. SVGA Display Adapter (1024 x 768 resolution @ 65,536 colors)

D. System Equipment Racks

1. The CCTV Verint Nextiva server and extended storage module shall be installed in the Integrator supplied 19" EIA standard equipment cabinet enclosure.
2. The client workstation console shall be installed in the owner supplied operator workstation desk, and connected to the access control client CPU located elsewhere on campus via TCP/IP.

E. Printer

1. A laser printer shall be mounted in the ASC console on a pull out draw. At a minimum, the printer shall have a laser printer interface, four (4) page per minute print rate, and 2MB memory.
2. The printer shall be the HP 1160 or approved equal.

F. Data Gathering Panels

The data gathering or field control panels shall be located in the MDF Room # 0110000 and shall have the following features/capacities:

1. Up to 32 Readers per Panel
2. Minimum 64 Mbytes On-Board Memory
3. Dual network failover support/redundant communications
4. Ethernet ready
5. Embedded operating system
6. Seamless integration with Continuum
7. Wide range of alarm monitoring
8. Advanced clustering
9. Intrusion zones & keypad commands
10. Supports up to 16 Wiegand readers
11. Web diagnostics
12. Secure communications
13. Easily upgradeable
14. Worldwide compliance
15. Instant database backup & restore
16. Two PCMCIA slots
17. Batteries on board

18. The data gathering panel shall be the Andover Controls NC-2-R-000000000 (Net Controller 2). There is no approved equal.

G. Field Panel Power Supplies

1. The field panel battery backup units shall be capable of supporting the full power demands of a fully loaded Net Controller 2 panel as specified above for a minimum of 4 hours in the event of normal circuit power loss.
2. The Access Control System field panel battery backup units shall be the Andover Controls PS120/240-AC85U. There is no approved equal.

H. Input Boards

1. The Net Controller 2 input capacities shall be expanded to control a minimum of eight NC or NO supervised inputs with the addition of eight (8) input boards.
2. The input boards shall be the Andover Controls UI-8-10. There is no approved equal.

I. Output Boards

1. The Net Controller 2 panel output capacities shall be expanded to control a minimum of 12 outputs for interfacing the intercom outputs with the access control system to reduce false alarms.
2. The four (4) output expansion board shall be the Andover Controls DO-4-R.

J. Alarm Keypads

1. The motion detector (s) shall be armed and disarmed with an LD-1 keypad

K. Card Readers

1. The Access Control System card readers shall be mounted on single gang electrical back boxes.
2. The door controllers shall be the Andover Controls AC1 or AC1 Plus. There are no approved equals.
3. The proximity card reader with integrated keypad shall be the HID ProxPro KP (5355AGK09).
4. The ACS power supply will be the Altronix AL600ULXPD16 (one for each sixteen readers).

L. Access Cards

1. The Access Control System cards shall be by HID and shall be supplied by the Owner.

M. Locking Hardware Power Supply

1. The lock power supply shall provide sixteen (16) 24 VDC outputs each capable of being independently switched due to fire alarm activation.
2. It shall be the Integrator responsibility to coordinate with the hardware supplier and size the power supply capable of supporting the full power demands of the locking hardware as specified for a minimum of 4 hours in the event of normal circuit power loss.
3. The enclosure for all locking hardware shall be mounted on the plywood backboard in room # 011000.
4. The lock power supply shall be the Altronix AL600ULXPD16. (one for each sixteen locks)

N. Magnetic Contacts

1. Recessed door contacts shall be installed on select doors as indicated on the Contract Drawings.
2. Each door contact (except those on double doors) shall be configured as a separate alarm point.
3. The contacts shall activate when a disturbance in the magnetic field occurs.
4. The magnetic contact shall be rated for a minimum lifetime of one million operations.

5. Recessed door contacts shall be the GE/ Sentrol 1078 series or approved equal.
6. Industrial door contacts for use on swinging gates, rollup doors and concrete filled frame doors shall be the GE/ Sentrol 2200 series or an approved equal.
7. The surface mount contact shall be the Sentrol 1045T
8. The ACS panel tamper switches shall be the GE/ Sentrol 3025T or an approved equal.

O. Door Release Buttons

1. The door release button shall be hardwired, shall be the push button type and provided as shown on the Contract Drawings.
2. Door Release Button shall be the Dynalock 6140 or an approved equal.

P. Duress Buttons

1. Duress buttons shall be hardwired, shall be the push button type, shall be latching, and provided as shown on the Contract Drawings.
2. Duress buttons shall be the Ademco 269 or an approved equal.

Q. Request to Exit Devices (RTE)

1. Request to exit devices shall be installed in selected protected areas of the facility having card access control, as indicated on the Contract Drawings and Schedule. The request to exit device shall shunt the alarm initiated from the door contact upon egress.
2. The request to exit devices shall be the Detection Systems (Bosch) DS-160I.
3. The RTE power supply will be the Altronix AL600ULXPD16 (one for each sixteen motions).

R. Passive Infrared Motion Detector(s)

1. The PIR is to be relocated from Records to Evidence. This move will require the LD-1 keypad to be moved to Evidence also.
2. Passive infrared motion detectors shall be installed and located as shown on the contract drawings.
3. The motion detectors shall be hardwired to the alarm input modules as shown on the contract drawings.
4. The passive infrared motion sensor shall detect changes in the ambient level of infrared emissions caused by the movement of a standard intruder within the sensor's field of view. Upon detecting such changes, the sensor shall transmit an alarm signal to the SMS.
5. The sensor shall detect a change in temperature of no more than 2 degrees F, and shall detect a standard intruder traveling within the sensor's field of view at a speed of 0.3 to 7.5 feet per second across two adjacent segments of the field of view. Emissions monitored by the sensor

shall be in the 8 to 4 micron range. The sensor shall be adjustable to obtain the coverage patterns shown.

6. The sensor shall be equipped with a temperature compensation circuit. The passive infrared motion sensor shall be equipped with an LED walk test indicator. The walk test indicator shall not be visible during normal operations. When visible, the walk test indicator shall light when the sensor detects an intruder.
7. The sensor shall either be equipped with a manual control, located within the sensor's housing, to enable/disable the test indicator or the test indicator shall be located within the sensor such that it can only be seen when the housing is open/removed.
8. The passive infrared motion detectors shall be the Visonic Duo 240.
9. The PIR power supply shall be the Altronix AL600ULXPD16

S. Gate Controllers

1. The gate controllers for the Sally Port gates will be controlled only by a push button in dispatch that goes to Andover as an input, and then back to the controller as an output (from the Andover system) resulting in an alarm free transaction while allowing for an audit trail. There shall be an interlock so that the sally-port building door cannot be opened before the gates are closed.

T. Equipment Racks

The CCTV Video Recording System and associated equipment shall be mounted in an Integrator supplied rack located in the MDF Room, #0110000. The Integrator shall supply a KVM switch with a built in console/monitor for switching between CPUs in this rack.

1. A vertical equipment rack shall be located in MDF Room, #0110000 as shown on the contract drawings.
2. The equipment rack shall house the video head end and recording equipment.
3. The equipment rack shall be 70" AFF.
4. The equipment rack shall have sides and locking front and rear doors.
5. The equipment rack shall also have casters, a fan kit and a 20A power strip provided by the same manufacturer.
6. The equipment rack shall be the Atlas Sound WA202-70B-962 or an approved equal.
7. The equipment rack fan panel shall be the Atlas Sound ES195-121-052 or an approved equal.
8. The equipment rack caster kit shall be the Atlas Sound CT-500K or an approved equal.
9. The equipment rack 20A power strip shall be the Atlas Sound ACS-2A or an approved equal.
10. The KVM switch/console/monitor shall be the ATEN ACS1216AL or an approved equal.

2.03 Video System

The CCTV system shall be autonomous from the campus wide system. However, in order for the images from the campus wide system to be viewed in the new dispatch center additional equipment shall be required as depicted on the Camera schedules and as specified below.

- A. The Video system shall be by Verint and include the following part #s and quantities. Pricing shall include all licenses and fees. There are no approved equivalent products.

1. NEX-6.2-MR-D2.0TB	1
2. NEX-6.2-DPVEXT-14.0TB	1
3. S1816e-A	1
4. S1816e	1
5. PDP10-2	1
6. PS1281	1
7. NEX-6.2-MR-S	1
8. NEX-6.2-1CAM-S	32
9. NEX-6.2-1RV-1	5
10. NEX-6.2-DWRK-P	3

B. Video Cameras

The IP Video cameras at the CCSU public safety building shall be mounted as described on the Camera schedule. The one (1) pole mounted camera shall communicate via MM fiber optic cable. The fiber optic transmitter and receiver, pole mount, pole mount adapter, and NEMA-4 enclosure required to house the transmitter shall be provided by the Integrator.

The CCTV cameras shall have the following features and capabilities:

1. Polycarbonate Dome Housing 5.6" Diameter.
2. Universal Mounting Accessory.
3. Wide Dynamic Range.
4. Clear Dome Insert.
5. 1/3" CCD.
6. Better than 51 dB S/N Ratio.
7. Output Coax 75 ohms.
8. Electronic Iris 1/60-1/100,000 sec.
9. Power 12 VDC, 24 VAC.
10. Backlight Compensation.
11. 480 Lines TV Resolution.
12. Dynamic Range 52 dB.
13. 0.3 Lux @ F1.5 Minimum Illumination.
14. 4.5 W Current Consumption
15. A varifocal lens suited for the application as noted in the CCTV schedule.
16. The fixed wall or ceiling surface mount mini-dome cameras shall be the Speco Intensifier HT-7248FFi.
17. The PTZ camera shall be the GE Kalatel CYB-CE3-D36N.
18. The PTZ power supply shall be the GE Kalatel KTP-24.
19. The Fiber Optic rack shall be the IFS R3.
20. All cameras shall be wired with Siamese Coaxial cables with 18/2 power cables. All Exterior cameras shall have lightning protection supplied by the integrator.

B. CCTV Power Supplies

The CCTV cameras shall be powered from the MDF Room #0110000. The unit shall have the following features/ capabilities:

1. The enclosure shall be mounted in the freestanding enclosed ACS rack supplied by the Integrator.
2. The unit shall supply 12VDC distributed via sixteen (16) fuse protected outputs.
3. 10 amp @ 12VDC.
4. Sixteen (16) circuit breaker protected outputs.
5. Output fuses are rated @ 3.5 amp.
6. 115VAC 50/60Hz, 6-amp input.
7. Surge suppression.
8. AC power LED indicator.
9. Power ON/OFF switch.
10. Unit maintains camera synchronization.
11. 19" Rack mountable
12. The CCTV Power Supply shall be Altronix Model R615DC1016UL rack mount 16 Output Power Supply.

C Security Cable

1. All Cable shall be provided by the integrator and shall be plenum rated.
2. Cable shall be manufactured by West Penn.
3. Cables shall be marked "Security" at each foot marker with an indentifying phone # (coordinate with Bob LeBaron (Facilities)). The following cable part #s shall be used on this project:
 - Camera cable shall be WP-252815B
 - Reader cable shall be WP-253186B
 - Lock cable shall be WP-25294
 - Rex Power cable shall be WP-25293B
 - Rex Circuit cable shall be WP-25292
 - Door Contact cable shall be WP-25292B
 - Camera Data cable shall be WP-25292B
 - Video Intercom cable shall be Belden 1624P-BEL
 - Microphone cables shall be WP-25291

2.04 Communication Equipment

A. Audio Video Intercom

1. There shall be an audio/video intercom system with four door stations (the two side entrances, and the entrance to the dispatch center).
2. There shall also be two master stations as part of this system, one located in the dispatch center, the other located in the Students/Motor Pool Office.
3. All door release functions shall be done through the access control system as system events to avoid false alarms.
4. The intercom A/V door stations shall be the Aiphone AX-DV or an approved equal.
5. The master stations shall be the Aiphone AX-8MV or an approved equal.
6. The intercom switching/ power supply module shall be the Aiphone PS-2420UL.
7. The intercom central exchange unit shall be the Aiphone AX-084C or an approved equal.

B. Microphones

1. There shall be an audio microphone located as indicated on the Security Camera Schedule (SEC-3.3).
2. The cameras and microphones located in Holding Cell 1080200, Interview Room 1080100 and Prisoner Processing Room 108000 shall be wired to the Verint system located in the security equipment rack in MDF 0110000.
3. Louroe model # ASK-4 KIT 700
4. The camera and microphone located in Interview Room 2080000 shall be wired to the Verint system located in the security equipment rack in MDF 0110000.
5. Louroe model # ASK-4 KIT 101
6. The 4th microphone from the 700 kit will be mounted in such a way as to be able to record conversation on both sides of Dispatch service window
7. Each microphone shall have a switch that can turn off the mic for lawyer/client privacy.

2.05 Miscellaneous Equipment

A. Uninterruptible Power Supply

The UPS system shall be an APC model PC Smart-UPS 1500VA USB & Serial RM 2U 120V. The UPS shall be installed in the Integrator supplied 19" EIA equipment cabinet, and shall supply normal and backup power to all devices contained in the equipment cabinet. The Integrator shall be responsible for providing additional receptacles or power strips to distribute UPS power to all devices as needed. The UPS shall have the following features and capabilities:

1. Output Specifications
 - a. Output power capacity - 1440 VA
 - b. Output power capacity - 980 watts
 - c. Max Configurable Power - 1440 VA
 - d. Max Configurable Power - 980 watts
 - e. Nominal output voltage - 120V
 - f. Output Voltage Distortion - less than 5% at full load
 - g. Output Frequency (sync to mains) - 47-53Hz for 50Hz nominal , 57-63Hz for 60Hz nominal
 - h. Crest Factor - up to 5 : 1
 - i. Waveform type - Sinewave
2. Input Specifications
 - a. Nominal input voltage - 120V
 - b. Input frequency - 50/60 Hz +/- 3 Hz (auto sensing)
 - c. Input Connection Type
 - d. Cord Length - 8 feet (2.44 meters)
 - e. Input voltage range for main operations - 82 - 144 V
 - f. Input voltage adjustable range for mains operation - 75 - 154 V
3. Batteries and Run-Time Specifications
 - a. Battery type - Maintenance-free sealed Lead-Acid battery with suspended electrolyte: it shall be rated leak proof
 - b. Replacement battery cartridge - RBC24
 - c. RBC™ Quantity - 1
 - d. Typical backup time at half load - 26.5 minutes (490 Watts)
 - e. Typical backup time at full load - 7.4 minutes (980 Watts)
4. Surge Protection and Filtering
 - a. Surge energy rating - 459 Joules
 - b. Filtering - Full time multi-pole noise filtering : 0.3% IEEE surge let-through : zero clamping response time : meets UL 1449
5. Conformance
 - a. Approvals - CSA , FCC Part 15 Class A , UL 1778
 - b. Standard warranty - 2 years repair or replace , optional on-site warranties available, optional extended warranties available
 - c. Equipment protection policy - Lifetime : \$150000

End of Part II

PART 3.0 INSTALLATION REQUIREMENTS

3.01 General

- A. The intent of these specifications is to describe the Integrator's responsibilities with regard to the installation of the security system. Monitoring and control points are identified in part II of these specifications. The electrical drawings and specifications show where the Electrical Contractor will install conduit and supporting infrastructure. The Integrator shall carefully study these plans and provide a

completely installed and operating system. The Integrator shall be responsible for furnishing, installing, and connecting the cables required for the various security system components. The installation of all security equipment and supporting cable and wiring shall be the responsibility of the Integrator. The complete installation shall be accomplished in accordance with these paragraphs.

- B. There is an existing access control and alarm monitoring installed on the campus at CCSU. It is owned and operated by the Owner. The access control system will act as part of that system, the CCTV system will, however, be autonomous from the CCSU campus CCTV system.
- C. The current Public Safety building has two 54" Samsung LED Monitors that are used for CCTV monitors. The Integrator will move them and the existing workstations to the new building, along with the two 22" monitors and the Andover workstation and monitors as well as any other Card access and CCTV equipment that needs to transfer.
- D. Four new Owner supplied 54" LED TVs will be mounted alongside the two that are brought over to make a bank of six. New workstations will be needed to process the video. The CCSU Facilities department is investigating smaller units to possibly mount behind the monitors. Coordinate this task with Bob Lebaron (Facilities).
- E. The installation of the new access control and alarm system is required to be interfaced with the PS building fire alarm system. The integrator's equipment shall be capable of accepting a normally open or closed signal from the FA system. All maintenance, parts and labor required to perform the interface to this equipment shall be provided by the project Electrical Contractor.

3.02 Materials and Workmanship

- A. All work performed in response to these Construction Documents shall be of new, unused and of good quality.
- B. The Security Systems Integrator guarantees new equipment supplied shall operate satisfactorily and continuously in accordance with the operating conditions specified and the performance data submitted by the equipment supplier. If new equipment fails to meet the guarantee, the Security Systems Integrator agrees, at its own expense, to furnish and install new or redesigned equipment so that the system operation shall be in accordance with operating conditions and performance is satisfactory.
- C. The Security Systems Integrator guarantees installation or re-installation, as the case may be, of equipment to be relocated by the Security Systems Integrator or to be purchased by the Owner and installed by the Security Systems Integrator. The Integrator shall be responsible and liable for any damage made through mishandling of the equipment, once the equipment is received by the Integrator. Likewise, the Integrator shall guarantee the service connections to be free from all defects in workmanship and/or material and if failure of the equipment is due to such defects, within one year of the date of acceptance, the Integrator shall repair such defects at its own expense. The warranty period shall be for one year from the date of acceptance by the Owner or their representatives. This acceptance will be in writing. The warranty will be for twenty-four (24) hour coverage, seven (7) days per week (24X7).
- D. The Integrator shall submit all manufacturers' warranties to the Owner's Representative upon acceptance of the materials or equipment.
- E. All purchased equipment shall require four (4) operational, instructional, and spare parts manuals. These shall be turned over to the Owner's Representative at project completion. The warranty period shall not start prior to these documents being turned over.
- F. Before ordering any material or doing any work, the System Integrator shall verify all measurements and shall be responsible for the accuracy and correctness of it. No extra charge or compensation will be allowed due to differences between the actual dimensions and the measurements indicated on the drawings. Any difference that may be found shall be submitted to the Owner's Representative for

consideration before proceeding with the work, adjustments shall be made as the Owner's Representative may direct.

- G. All materials shall be delivered to the site with the approved manufacturer's label intact in full and/or unopened packages, containers, etc. unless approved in advance by Bob LeBaron (CCSU Facilities).

3.03 Drawings and Specifications at the Site

- A. The Integrator shall maintain at the site for the Owner one copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders and other Modifications, in good order and marked (in red) to record all changes made during construction. These changes shall be made daily and will be reviewed by the Owner or their representatives during construction administration visits.

3.04 Submittals (Shop Drawings, Product Data, and Samples)

- A. Shop Drawings - "Shop Drawings" are drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data that are prepared by the Integrator or any Subcontractor, manufacturer, supplier, or distributor, and which illustrate some portion of the Work.
- B. Product data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Integrator to the Owner's Representative to illustrate a material, product, or system for some portion of the Work.
- C. Samples are physical examples furnished by the Integrator to illustrate materials, equipment, or workmanship, and to establish standards by which the Work will be judged.
- D. The Integrator shall submit to the Owner's Representative one electronic copy in AutoCAD 2008 format and three hard copy prints of each shop drawing, including fabrication, erection, layout and setting drawings and such other drawings as required under various sections of the specifications, until final acceptance by the Owner is obtained. Prepare drawings legibly, drawing plans, elevations sections and details in scales required in individual trades sections and on drawing sheet not larger than 24" x 26". Submit a copy of manufacturer's descriptive data, including catalog sheets for materials, equipment and fixtures, showing dimensions, performance characteristics and capacities, wiring diagrams and controls schedules and other pertinent information as required. Where printed materials describe more than one product or mode, clearly identify which is to be furnished.
- E. The Integrator shall review, approve, and submit with reasonable promptness and in such sequence as to cause no delay in the work or in the work of the Owner or any separate Contractor, all shop drawings, product data and samples required by the Contract Documents.
- F. By approving and submitting shop drawings, product data, and samples, the Integrator represents that it has determined and verified all materials, field measurements, and field construction criteria related thereto, and that it has checked and coordinated the information contained within such submittals, with the requirements of the work and of the Contract Documents. The Integrator shall not be relieved from responsibility for errors or omissions in the shop drawings, product data, or samples by the Owner's acceptance thereof.
- G. Submission of shop drawings and samples shall be accompanied by a copy of a transmittal letter containing project name, Integrator's name, number of drawings, and samples, titles and other pertinent data. Transmittal shall bear signature of the Integrator as evidence the Integrator checked same and found them in conformance with the Contract Documents.
- H. Shop drawings and samples shall be dated including Integrator and Subcontractor dates of submittal and approval, and marked to show the name of the project, Consultant, Integrator, origination Subcontractor, manufacturer, or supplier, and separate detailed if pertinent. After reviewing and correcting each

submittal as required, Integrator shall place its approval stamp and personally initial every sheet of every submittal. Shop drawings shall completely identify specification section and locations at which materials or equipment is to be installed.

- I. The Integrator shall make any correction required by the Owner's Representative and shall resubmit the required number or corrected copies of Shop Drawings or new samples. The Integrator shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections requested by the Owner's Representative on previous submission.
- J. The Integrator is responsible for obtaining and distributing required prints of shop drawings to his Subcontractors and material suppliers after as well before final approval.
- K. No portion of the Work requiring submission of a shop drawing, product data, or samples shall be commenced until the submittal has been reviewed and accepted by the Owner's Representative. All such portions of the work shall be in accordance with reviewed submittals.
- L. Acceptance of submittals does not authorize any changes in the Contract Documents unless covered by a contract Change Order signed by the parties.

3.05 Initial Submittals

- A. The Integrator shall provide a detailed project schedule in MS Project file format showing the sequence of work within two weeks of receiving a written purchase order, and three copies of the following submittals before commencing the work.
 - 1. Initial Floor Plan Submittal:
 - a. The Owner shall supply a set of electronic floor plans for the buildings. The Integrator shall amend drawings and show the wiring of particular devices including the following:
 - 1. Each device, its numerical designation and precise location.
 - 2. Capacity of each device and how the system can be expanded.
 - 3. Zone or address numbers.
 - 4. Reference to symbols, legend, riser diagrams, mounting, and wiring drawings.
 - 5. Notes, site key, and provisions for revision.
 - 6. Catalog cuts on each piece of equipment.
 - 2. Initial Riser Diagram Submittal:
 - a. Provide riser diagrams of all new and the existing equipment including:
 - 1. Each device with its numerical designation.
 - 1. Each zone or point with all devices connected.
 - 3. Indicate the floor and room number where devices are located.

4. Show equipment cabinets, terminal boxes, and junction boxes, noting their particular locations. Each cabinet shall have complete details of each wire terminal strip and device installed in it.
3. Initial Wiring Diagram Submittal:
 - a. Provide terminal strip-to-terminal strip wiring diagrams including:
 1. Every field wiring connection and a drawing of every type of terminal strip used. Typical wiring terminal connections may be used. List each device number that the typical applies to. All existing equipment and new equipment shall be shown. It shall be the Integrators responsibility to update and correct these diagrams. Identify all spare cables and wires. Show how each wire is used.
 2. Where two or more terminal strips are located within housing, illustrate in diagrammatic form the position and number of each strip.
 3. Reference notes, site key, and revisions shall be consistent with those used on the floor plans.
4. Initial Submittal:
 - a. Provide the following information:
 1. Details of the security system and access control equipment to be installed in the MDF Room and the Dispatch Center to include a suggested plan of the area where the components shall be located, the configuration of devices, and how the system shall be installed. Dimensions of each piece of equipment shall be shown.
 2. Wiring diagrams shall be pictorial in form and shall include connectors and terminals. Diagrams shall show point to point wiring of panels and power supplies, terminal blocks, panel mounted switches, controls, jacks, etc. All cables and terminal blocks shall be identified.
5. Initial Schematic Submittal:
 - a. Provide manufacturers circuit schematic of each manufactured device as applied by the manufacturer. Schematic diagram shall be a complete circuit drawing with all components detailed, values indicated, and manufacturer and model number listed. Equipment modifications to standard products shall clearly indicate the changes made and the methods required for normal maintenance and operation.

3.06 As-Built Documentation

A. As Built Drawings:

1. The Owner or Architect shall provide the Integrator with electronic AutoCAD 2008 format files on CD showing the floor plans of the building.
2. Changes shall be recorded daily on "red lined" drawings as the project is completed. These changes shall be made permanently at the conclusion of the project in AutoCAD 2008 and presented along with the red lined drawings to the Owner or the Owner's Representative upon completion of the Work.

3. After completion of the work, the Integrator shall update the initial drawing and furnish three sets of prints showing final location of all new and old devices, wiring diagrams, and schematic diagrams of each device and unit of equipment. One electronic copy shall be provided.
4. Drawings and written material shall be prepared in complete accordance with the bid specification and submitted before the final acceptance test. Final payment shall not be authorized until these drawings and materials are received, approved, and accepted by the Owner and/or the Owner's Representatives.

B. As-Built Manuals:

1. All manuals shall be supplied with vinyl plastic, hardcover, 3-ring, and loose-leaf binders. The binders shall be heavy-duty and sized sufficiently to accommodate all sheets provided by the Integrator.
2. Each manual shall have tab separators for each major section. The tabs shall be printed with the title of each section.
3. Each manual shall contain a table of contents that lists all the sheets in the manual, including all illustrations and tabulations at the time of issue or latest change.
4. Drawings and diagrams included shall be reduced to a convenient size that also retains legibility of data.
5. Each manual shall have apron fold-outs for all sheets larger than 8-1/2 inches by 11 inches.
6. Three types of manuals shall be provided: operator's manuals, maintenance manuals and software manuals. The Owner shall own all copyrights to the manuals.

C. Operator's manuals will be used by console and terminal operators. Terminal Operator's Manual shall include remote terminal operators. Three Operator's Manuals shall be provided. A separate section shall be provided in the manual for the material applicable to each group. Each section shall include, but not be limited to:

1. A brief description of security and basic operating features, including drawings of the operator consoles and terminals, and formats for all displays and print-outs.
2. Complete operating instructions for all consoles/workstations and terminals.
3. A detailed description of the operational characteristics of the system under normal as well as alarm conditions. The information provided shall include all appropriate operator interactions during normal as well as degraded conditions.
4. Procedures for data entry and report generation.
5. Recommended periodic testing procedure for each subsystem component.
6. Procedures for routine and preventive maintenance and servicing (replacing paper, tapes, bulbs, etc.) of console and terminal equipment.
7. Operating materials lists.

D. Three maintenance manuals for file shall be provided. The maintenance manuals shall include, but are not limited to:

1. Principles of operation and a detailed system description to include expansion capabilities.

2. Data sheets for all components utilized in the system to include power requirements and maximum and minimum temperature limits of each as applicable. Include parts lists with each manufacturer's model number.
3. Routine preventive maintenance procedures.
4. Corrective diagnostic troubleshooting and repair procedures to board level.
5. Charts showing normal operating conditions at significant points (waveforms and test voltage).
6. Instructions for using system and peripheral diagnostic programs.
7. List of ordinary and special tools and test equipment recommended for operation and servicing.
8. System physical, block, elementary, logic, interconnection, single-line electrical and raceway drawings, wiring diagrams, and electrical circuit schedules.

3.07 Applicable Codes, Regulations, and Standards

- A. It is not the intention of these General Conditions to provide all details of design and fabrication. The Integrator shall ensure that the equipment has been designed and fabricated in accordance with applicable engineering codes, standards and guidelines. When specific requirements are stated in the Specification that exceed and/or overlap the requirements of the codes, standards and guidelines listed herein, the Specification shall govern.
- B. The Specification is based on the latest applicable codes and standards in force at the time of issue of the Specification. Should the codes or standards listed herein be revised before or after the award of the Contract, the Integrator shall inform the Owner immediately, in writing, upon receipt of such information. Before adoption of any subsequent issue, the Integrator shall identify the changes in writing to the Owner and shall not proceed with engineering, material, and/or fabrication changes without the Owner's written permission. It shall be mandatory that the Integrator supply in writing notification of any such changes.
- C. The equipment supplied under this Contract shall conform to the following publications:
 1. American National Standards Institute
ANSI/IEEE-100-1988, Dictionary of Electrical and Electronic Terms
ANSI/IEEE-242-1986, IEEE Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems (IEEE Buff Book)
ANSI/NFPA-70-1990, National Electrical Code (NEC)
ANSI/NFPA-101-1991, Life Safety Code
 2. National Fire Protection Association
NFPA-110-1988, Emergency & Standby Power Systems
NFPA-100A-1989, Stored Energy Emergency & Standby Power Systems
 3. Underwriters Laboratories
UL 1076
UL 864
UL 294

3.08 Telephone Lines

- A. The Owner shall supply telephone lines and IT network jacks to a VPN at the various locations as defined in these specifications.
- B. The Integrator shall indicate the number and the requirement of each telephone line or communication channel required between locations. The owner shall provide all IT network programming.

3.09 Equipment Availability

- A. The Integrator agrees to maintain a stock or inventory of all equipment and components needed in the System, including software, available to the Owner for a period of not less than five (5) years after final completion of the Work. Such equipment and components shall be provided by the Integrator at cost not in excess of the unit prices included in this proposal plus an annual increase equal to the increase in the U.S. Government's published Consumer Price Index for the preceding year. In lieu of direct replacement, the Integrator shall provide an alternate item at the same cost that is compatible or upgrades the system to their latest model.
- B. Equipment availability as specified herein shall be independent of any and all extended warranty and/or service agreements. All equipment and software shall be available for five years from the date of acceptance of the job.

3.10 Security

- A. The Integrator and Subcontractors are subject to the Owner's security regulations and normal supervision by the property manager or the General Contractor of the building in which the Work is being done.
- B. Any Integrator or Subcontractor personnel who violate the Owner's Regulations may be denied future access to the site.

3.11 Clean Up

- A. The Integrator shall, at all times, keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the work day the Integrator shall remove all its waste materials and rubbish from and about the project as well as all its tools, construction equipment, machinery and surplus materials, and shall clean all glass surfaces and leave the work "vacuum clean" or its equivalent, except as otherwise specified.
- B. The external surface of all equipment installed shall be cleaned at the completion of the work to remove all concrete, dust, and dirt, welding, and cutting splatter, etc.
- C. If the Integrator fails to clean up, the Owner and/or the building owner may do so and the cost thereof shall be charged to the Integrator.

3.12 Installation Technicians and Engineering

- A. The Integrator shall provide on-site installation technicians. These technicians shall be well qualified by factory training and experience in the installation and operation of the equipment as specified herein. Technicians shall be licensed CT L-6 or higher electricians or shall be under the direct onsite supervision of a licensed electrician if apprentices are being used. At all times the Code-required Electrician/Apprentice ratio shall be strictly adhered to. Once the job is started these technicians shall be

assigned to this job and not moved to another job until this job is complete, unless mutually agreed upon. The Integrator shall supply, at the time of bid, resumes of the personnel that will be assigned to this job. The Integrator shall be a TAC dealer. The programmer shall be a TAC certified Continuum Engineer employed full time by the Integrator.

- B. The project manager or lead installation technician shall:
1. Conduct a specification review and obtain detailed site information necessary to prepare the required submittals.
 2. Review the proposed system scope and the installation plan with the responsible representatives from the Owner and the Consultant.
 3. Schedule deliveries of material.
 4. As often as necessary, and as long as is necessary, provide on-site supervision of installation until system acceptance.
 5. Supervise the mounting of all equipment, setting up the Console equipment, make connections, card reader and alarm tests, and adjustments.
 6. Turn on the power to the equipment, test and adjust to obtain normal operation.
 7. Verify conformance with the performance specification.
 8. Conduct complete job tests.

3.13 Electric Power

- A. Electric power shall be 120/208, 60-hertz single phase, three wires. All power connections shall be to a panel furnished by the Electrical Contractor. The Integrator shall verify these locations on the electrical plans. If additional power is required it shall be the responsibility of the Integrator to provide it from the building emergency power sources.
- B. No plug-in units shall be used, except in secure alarmed panels with tamper switches.

3.14 Wiring

- A. The Integrator shall connect all cables to the security equipment and devices. The final mounting locations for security devices shall be approved by the architect and the owner.
- B. Installation of Class 2 and Class 3 power-limited circuits shall comply with the local codes and NEC Article 725. Wire and cable shall be concealed, unless otherwise noted, and shall NOT be spliced. Provide a generous loop of cable within equipment housings and slack cable in secured areas to assure ample cable for several reconnections.
- C. Necessary lightning protection shall be provided by the Integrator. This protection shall be in complete accordance with the manufacturer of the equipment. It shall provide protection of all major components of the system.
- D. All exposed wiring shall be in conduit or EMT. All conduit/EMT shall be installed in a neat, workman-like manner and properly supported.

- E. Plenum rated or approved cable will be permitted in concealed areas above the ceiling. Approval must be secured from the building Owner and be in complete accordance with all national, state, and city building codes.
- F. All security cables shall be distinctly marked at each foot marker. All cables shall be firmly attached to a building member or the decking. Loose draping of cables on the ceiling shall not be acceptable.

3.15 Mounting of Remote Equipment

- A. All major remote power supplies, controllers and various switching components of the system shall be mounted in the basement level MDF Room, room #0110000 or other secure serviceable area, as shown on the plans. Mounting various power supply components randomly around the building and/or above the ceiling is not acceptable.

3.16 Cutting and Patching

- A. All cutting and patching is the responsibility of the Integrator. Where patching is required, the Integrator shall leave the patched area ready for painting. It shall be the Owner's determination whether the patching is in compliance with industry standards.
- B. All painting of patchwork shall be the responsibility of the owner. Since this is a new office area, the Integrator must rough in its equipment prior to final painting of the building by the Painting Contractor.
- C. Install all required sleeves, forms and inserts before wall, partitions, floors, or roofs are built. Cutting and patching of walls, partitions, ceilings and floors necessary for reception of work, caused by failure to provide or properly locate sleeves, forms, and inserts, incorrect location of work, or failure to cooperate with other trades, shall be done at expense of the Integrator and in accordance with all labor agreements.
- D. Cutting of beams, floors or walls for piping and conduit, shall be done as approved by the Owner in a careful manner with core drills, so as not to seriously impair the appearance or strength of the structure.
- E. Where the work pierces waterproofing, installation shall be as approved by the Owner. The Integrator shall furnish all necessary sleeves, caulking and flashing required to make openings absolutely watertight.
- F. Provide all drilling and patching for expansion bolts, hangers and other supports for proper and safe installation of work. Pneumatic fasteners and hammer drills can only be used during specific times as specified by the Owner. The Integrator shall coordinate those times with the Owner or their representatives prior to commencing work.
- G. Fire wall penetrations shall be sealed and patched in a manner that will restore the original fire rating of the wall.
- H. Fire rated door penetrations shall be made in such a manner that the rating is maintained. If the manufacturer of the door must make those penetrations, they will be done at no additional cost to the owner.

3.17 Connections

- A. Terminal blocks or connectors shall be provided for all cables that interconnect equipment or devices. Terminals shall have permanently attached identification strips placed so that connected wires do not obscure the markings.

- B. Connections shall be made on screw-type terminals in terminal cabinets or on terminal strips in equipment housings and/or multi-terminal plugs. Each wire shall be fitted with a spade lug or other suitable connection device. Not more than two lugs shall be placed under one screw. Connections to devices with leads shall be made by solder and tape or compression connection if both wires are solid.
- C. Stranded wires that are tinned may be connected by a compression connector. Use the manufacturer's crimp tool on compression jugs.
- D. No splices shall be made. If the Integrator requests a variance, it shall be accompanied by a statement of technical adequacy by the equipment manufacturer and be subject to approval of the Owner. If a splice is allowed, the splice must be done in a box and will be clearly marked on the as-built drawings by the Integrator. The splice shall be soldered.
- E. Cabling shall be neatly laced, dressed, identified, and adequately supported. Cables shall be formed into cabinets with appropriate radius bends and run parallel or perpendicular to the cabinet.
- F. Cables shall be grouped according to the signals being carried to reduce signal contamination.
- G. Ten (10) percent spare conductors shall be included in any cable run.

3.18 Low Voltage Transformers

- A. All other low voltage transformers shall be mounted within the security panels and shall have the primary side hard wired to the 120 VA emergency supply circuit. The 120 VAC shall be appropriately labeled and shielded in the panel from other voltages and devices. Provide #18 wire or larger, as specified by the hardware manufacturer, so that full voltage is applied to the equipment when it is under full load.

3.19 Back Boxes

- A. Back boxes and devices shall be securely mounted to insure trouble-free operation of the system and prevent tampering with the equipment.

3.20 Site Tests

- A. The cost of providing Integrator personnel, test equipment, expendable materials, replacement parts, and compliance certification shall be included in the contract price. Test equipment shall be of the accuracy necessary to measure the required performance and will remain the property of the Integrator.
- B. The Integrator shall follow a comprehensive test procedure for the system developed by the Consultant. Tests shall cover each device and type of equipment and shall be designed to demonstrate operational and performance compliance.
- C. If tests show that the equipment is in any way defective, of poor workmanship, at variance with the requirements of the Contract Documents, or dangerous, the Integrator shall make all necessary changes and remedy all defects to the satisfaction of the Owner at no additional cost.
- D. Performance, Reliability and Acceptance Tests shall be scheduled and conducted by the Integrator in the presence of the Owner's representative. Written request for tests shall be given to the Owner one (1) week or more in advance.

3.21 Start Up

- A. To assure a satisfactory and on-time completion, the Integrator shall schedule an operational start up period before the performance test. All alarm sensors, devices, signals, and the console shall be in full operation. The console shall be manned by Integrator personnel during this test.
- B. Test and adjustments shall be performed during this period to bring all equipment within the sensitivity and reliability specifications as stated herein and the referenced standards. Sensitivity adjustments of each device shall be recorded on an Integrator-furnished form with additional columns for the operational, performance, and acceptance tests. This record shall be available to the Owner at all times and shall be given to the Owner at the completion of the acceptance test.
- C. As a minimum, conduct the following tests will be performed on the access control and security system:
 - 1. Exercise each panel and each function on the panel.
 - 2. Test each detection device and check the alarm display for correct identification.
 - 3. Test each card reader to ensure that the proper information is displayed at the monitoring station upon a valid card read and upon invalid (no access, wrong time code).
 - 4. Simulation test which represents normal and worst case operational conditions.
 - 5. Test response time between detector initial signal and alarm display at the console with the system at full load.
 - 6. Test output function from each input command.
 - 7. Input improper commands to check rejection and display.
 - 8. Check operational effect of power failure.
 - 9. Check all power failure, tamper, supervisory, and failsafe alarms.
 - 10. Test operation of standby power for the specified time period and record the recharge rate and time.
- D. The Integrator shall include a minimum two (2) working days of on-site programming personnel. The purpose of this programming time is to assist the Owner in developing programs for the new system and procedures and functions. This is addition to any programming time required to make the System fully operational.

3.22 Performance Test

- A. A performance test of each device and of the entire system shall be conducted by the Integrator in the presence of the Owner and/or Consultant. The Integrator shall furnish all test personnel except those required to operate the console and maintain alarm records. The Owner may suspend or discontinue the test when any performance is considered unsatisfactory. Resumption of testing may cover the previously untested elements, and any completed elements, at the discretion of the Owner.
- B. After the performance tests have demonstrated the operation of the complete system, the system shall be accepted by the Owner.
- C. The Consultant will provide written test criteria for testing of each phase of the system within 60 days after the award of the contract. This test procedure shall be mutually agreeable to all involved parties.

- D. Once the performance test has been completed and the Owner has indicated its acceptance of the system a Trial Period Test shall begin. The system shall operate without software or a hardware breakdown for a period of 30 days.
- E. In the event there is a failure of equipment or software, the Trial Period Test shall start again. The one-year warranty shall not commence until this Trial Period Test has been met.
- F. The performance test shall be accomplished by job phase wherever possible.

3.23 Training and Instruction

A. General

- 1. The Integrator shall provide on-site training for operating and supervisory personnel designated by the Owner. This training shall be completed prior to the start of the Performance Test.
 - a. Operating personnel shall receive detailed instruction in operating procedures, routine preventive maintenance and routine servicing of console and remote terminal equipment.
 - b. Supervisory personnel shall receive detailed instructions in the initial setup of the system prior to installation, operating procedures, routine preventive maintenance and routine servicing of all Security equipment.
- 2. Training shall be conducted by experienced, knowledgeable personnel, supported by modern training aids, and shall utilize the actual system being supplied as much as possible. The Owner shall receive, at least 15-days prior to the time the course is to be conducted, individual copies of all pertinent technical manuals and documentation that apply specifically to the Security hardware and software.
- 3. A course outline of each course in the training programs shall be forwarded to the Owner at least two (2) weeks in advance of presentation of each course. This outline shall include the course duration, location, prerequisites, a brief description of the purpose and subject matter, how the course fits into the overall training program, and the instructor's name and qualifications. Presentation of the course as outlined to Owner's personnel shall be subject to the Owner's approval. Owner may make recommendations for additions and/or deletions to the material as appropriate considering the background and needs of the personnel attending.

B. Orientation Classes

- 1. The Integrator shall conduct training classes at the project site for operational and maintenance personnel.
- 2. The Integrator shall be available for questions that the operating and maintenance personnel may have during the warrantee period.
- 3. There shall be particular attention given to the training of the personnel using the equipment. This shall include separate training for personnel operating the workstations.
- 4. Additional training shall be available, if required, at a per diem cost as stated in the bid.

C. Operator Training

- 1. Operating personnel must be familiar with the operational capabilities and limitations of the security consoles and remote terminals. Operator training shall include, as a minimum:

- a. Equipment familiarization.
 - b. Start-up.
 - c. Operating procedures.
 - d. Manual switch over and emergency shutdown procedures.
 - e. Routine preventive maintenance.
 - f. Routine servicing (e.g., changing paper, ribbons, etc.).
 - g. Initial diagnostic procedures.
2. Operator training shall be reinforced with hands-on experience on all equipment. All operator courses shall be conducted at the site.
 3. Operator training shall have duration of at least 2 days. A minimum of 3-sessions shall be provided to assure that operators on all shifts are trained.

D. Supervisor Training

1. Supervisory personnel must be familiar with the operational capabilities and limitations of the entire security system. Supervisor training shall include, as a minimum:
 - a. Equipment familiarization and all of the ways that the system may be programmed.
 - b. Startup.
 - c. Operating procedures.
 - d. Manual switch over and emergency shutdown procedures.
 - e. Routine preventive maintenance.
 - f. Routine servicing.
 - g. Use of system and peripheral diagnostic software.
 - h. Data entry and maintenance.
 - i. Report generation.
 - j. Graphics display preparation.
2. Supervisor training shall be reinforced with hands-on experience on all equipment.
3. Supervisor training shall have duration of at least 2 days.

3.24 Warranty and Maintenance

- A. The Integrator shall warranty the entire system for a period of 1-year following successful completion of a 30 day Trial Period Test. Any deficiencies reported to the Integrator by the Owner during the Trial Period

Test shall be corrected within 24-hours after the time it is reported without cost and to the satisfaction of the Owner. In the event this is not accomplished, the Trial Period Test shall be started again.

- B. The Integrator shall provide local "on-call" hardware and software maintenance for all equipment supplied under this Contract during the warranty period. The maintenance shall consist of all material, labor and travel expenses to:
1. The warranty shall be valid 24X7.
 2. Respond to emergency service requests on site within 4-hours and effect repair within 24-hours.
 3. Replace all defective components as required.
 4. Install without cost, any improvements in the system that improve its reliability and operation as they become available. Before such a change is made, the Owner must accept it.
 5. Submit a yearly maintenance reports to the Owner.
 6. Perform preventive maintenance as required.
 7. Provide software updates as they become available at no cost to the Owner. Before such a change is made, the Owner must accept it.
- C. At the end of the warranty period, the Integrator shall provide detailed documentation of emergency maintenance performed from date of acceptance. Documentation shall include description of symptoms, diagnoses and subsequent actions taken. Recommended changes in routine preventive maintenance procedures shall also be included. A logbook shall be maintained at the job site to record all service and maintenance performed.
- D. All warranty, maintenance, and service periods shall commence on the date that the Trial Period Test is met and the Owner provides a written final acceptance of the system except that, if it is discovered after said date that certain work or materials were not in fact in conformance with the requirements of the Contract Documents, the applicable period for defective components or software shall recommence from the completion of all remedial work required.
- E. The Integrator shall warranty that all materials, programs, and workmanship will be serviceable and will perform dependably for a period of at least one year. Such warranty is in addition to and independent of any guarantee and warranties of Subcontractor, Supplier or Manufacturer. All changes to software or firmware that are necessary to maintain contract performance shall be provided at no cost to the Owner during this warranty period.
- F. During the warranty period, the Integrator shall install replacement parts and make other changes that may be issued by the original equipment manufacturers to improve product performance and reliability of the installed equipment at no cost to the Owner.
- G. During the warranty period, if the system operation is not fully restored within two business days, the Owner reserves the right to require the Integrator to provide on-site manufacturer's service technicians. The Owner reserves the right to expand or add to the system during the warranty period using firms other than the original Integrator for such expansion without affecting the Integrator's responsibility, provided that the expansion is done by a firm that is an authorized dealer or agent for the equipment or system manufacturer.
- H. Should the system or any of its component parts malfunction, or fail to operate properly, the Owner will require the Integrator to repair the affected unit(s), or may require replacement of the affected equipment, or the entire unit(s) at its sole discretion.

- I. The product to be installed shall be of a manufacturer's standard design. However, should the Integrator determine that a more responsible functional operation can be achieved; a specific exception may be proposed. Approval must be obtained from the Owner's Representative and an appropriate paragraph-by-paragraph comparison must be submitted.
- J. The Integrator submit all product warrantee cards and registration certificates on all equipment supplied

3.25 Preventive Maintenance and Service

- A. The Integrator shall conduct Preventive Maintenance on the entire system in accordance with the manufacturers' recommendations during the warranty period. Maintenance shall include all of the manufacturers' suggested service plus testing each detection and supervisory device, exercise each part of the system and control, and test each power supply in accordance with the maintenance specifications. The price shall include all parts and service on the system. The software shall be similarly covered with a software contract. The price for this maintenance shall be indicated on the Proposal Form.
- B. The Integrator shall be responsible for maintaining all systems in good, efficient operating condition and shall supply all labor and parts that are necessary to repair the system. Equipment failure will be reported to the Integrator during the normal workday by the Owner or its authorized representative. The Integrator shall dispatch one or more qualified technicians to arrive at the equipment location before close of the business day, when notification is given before noon. When notification is given in the afternoon before the close of business, the service call shall be made on the next business day. The equipment shall be serviced and returned to full operation on the same day of the service call. In the event the equipment cannot be serviced in this time, the Integrator shall notify the Owner. The Integrator shall provide a security system service and maintenance logbook on the job. Each service call will be recorded and a copy furnished to the Owner filing in the maintenance logbook.
- C. After normal working hours, the Integrator shall have service technicians available to dispatch to the job site. When this emergency service is required, the Integrator shall respond to the call for services within four (4) hours after the call is made. These calls shall be covered under the warranty.
- D. The Integrator shall provide alternate prices for maintenance of the system after the first year. These prices shall include parts and labor both during regular working hours and 24 hour per day and holidays.

End of Part III

Attachment # 1

A. Reference List

Please provide five (5) references where you have installed the same equipment that you are proposing at the same installed capacity.

Attachment # 2

- A. Drawings
 - a. SEC2.0- Site Drawing with Security Countermeasures
 - b. SEC2.1- Basement Drawing with Security Countermeasures
 - c. SEC2.2- First Floor Drawing with Security Countermeasures
 - d. SEC2.0- Second Floor Drawing with Security Countermeasures
 - e. SEC3.0- Security Typical Drawings

- f. SEC3.1- Security Control Device Schedule
- g. SEC3.2- Security Countermeasure Device Schedule
- h. SEC3.1- Security Camera Schedule
- i. SEC3.1- Security Wiring Schedule

-End of Document-

1.6 CHANGES TO THE DRAWINGS

- A. C100 and C201 ADD the revised Drawings plan. The plans have been revised to show the existing topography.
- B. There are 10 steel bollards shown on the survey within the specified area. The intent is to remove all bollards within this area.

END OF ADDENDUM 1

1.7 BIDDERS QUESTIONS/CLARIFICATIONS

- A. Entry Door #104A is an aluminum door type "4" and aluminum frame type AL4.
- B. Entry door #104c and Toilet #104B are bullet resistant doors.
- C. Detention doors are limited to #108A, 108B, 108C and 108D.
- D. Substitution requests should be addressed as outlined in the specification.
- E. Security conduit, wiring and equipment are to be included in the bidders proposals
- F. Footing Elevations: Bottom of footing elevations are to be as shown on S.1.1 Foundation Plan. Footing steps between elevations are shown as well.
- G. Top of Pier P1 Elevation: Top of elevation of piers P1 shown in the basement are 85.83' of 8" below floor slab. See 4/S2.1 for detail.
- H. Request for Geotechnical report- included in addendum
- I. There is no allowance for dewatering. All dewatering activities shall follow local and state requirements.
- J. The groundwater tables and/or borings should be provided by the geotechnical engineer; see attached Geotech report.
- K. The unit price schedule provided within the specifications is for all rock removal work.
- L. The utility pole 8341 shown on drawing C102 shall be relocated by CL&P.
- M. Substitution requests will be considered after the award of the contract. All Bidders are to bid on plans and specifications. Refer to requirements for substitutions in section 1026 00, Contract Modification Procedures.
- N. Hardware clarifications
 - CB233 provide pivot hinges in at the top and regular hinges in the middle and bottom
 - FBB Ball Bearing Hinges are required at hardware sets DELETE reference to CB concealed bearing hinges.
 - 08 71 00 See page 1/18 of paragraph 'D' Spec section this shall dictate who should supply hardware sets.
 - Section 28 13 00; Prox reader is by the "security contractor" NOT CCSU.
 - The Bullet Resistant Doors and Frames are specified as "Basis of Design". Contractor bears the responsibility of providing materials that are equal to or greater than the basis of design.

END OF DOCUMENT

SECTION 28 31 00 – FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 SCOPE & RELATED DOCUMENTS

- A. The work covered by this section of the specifications includes the furnishing of all labor, equipment, materials, and performance of all operations in connection with the installation of the Fire Alarm System as shown on the drawings and as herein specified.
- B. The requirements of the conditions of the Contract, Supplementary Conditions and General Requirements, apply to the work specified in this section.
- C. The scope of this project shall also include work to be performed by the fire alarm vendor that currently services the campus. Electrical contractor shall include costs for this work by TPC as a separate line item. The cost for this allowance shall be \$34,675.00
 - 1. The system described herein is a part of an existing campus-wide fire alarm system.
 - 2. All connections to the CCSU fire alarm system, fire alarm panels and sub-panels, fireworks computer programming, assignment of building device addresses, data loop assignments, system testing and updating of the building .DXF/.DWG files shall be performed by the Agency approved fire alarm contractor.
Approved vendor: TPC Associates, Inc.
261 Pepe's Farm Rd.
Milford, CT. 06460
(203) 878-1321 (Al Sullivan)
 - 3. TPC shall provide the following equipment, project management, supervision of the installing electrical contractor and labor to transfer the existing fire alarm head end equipment from the old Police Station to the new Police Station.
 - a. Provide new cabinets for the fire alarm panels. (CAB 45, 3-CAB21B, 3-CAB21D, battery cabinets. It is the responsibility of the installing electrical contractor to mount the cabinets in the locations shown on the contract drawings and provide power to the cabinets. Battery cabinets installed and wired by the installing electrical contractor as shown on the drawings. TPC to supervise installation of cabinets.
 - b. Install fiber cards, provided under this contract, in the new Police Station fire alarm panel and the Gallaudet Hall fire alarm panel.
 - c. Provide jobsite supervision of the installation of new cable between the new Police Station fire alarm panels and the fire alarm panels in East Hall, Burritt Library, North Hall, and Copernicus Hall. The installing contractor shall provide cable and install (3) Atlas Cable #218-16-1-1TP from the new police station fire alarm panel to each of the above buildings. The cable shall terminate in the building fire alarm control

- panel in each building. Terminations of the cables will be the responsibility of TPC.
- d. Provide jobsite supervision on the installation of new fiber optic cable between the new Police Station fire alarm EST3 panel and the Gallaudet Hall fire alarm control panel. The installing contractor shall provide (1) 12 strand 62.5/125 or 100/140 multi-mode fiber cable and shall terminate with ST type connectors in the fire alarm control panels in the new Police Station and Gallaudet Hall. Connection of the cables within the fire alarm panels will be the responsibility of TPC.
 - e. Move the fireworks computer, monitor, keyboard, mouse, and printer into the new Police Dispatch Center. The installing electrical contractor shall provide and install (5) #16awg twisted shielded pair cables between the fireworks computer location and the fire alarm control panels. Connection of the cables to the fireworks computer and the fire alarm control panels will be the responsibility of TPC.
 - f. Once the new cabinets are installed and powered, TPC shall move the head end fire alarm equipment from the old Police Station to the new Police station. This move will be done in phases, one loop at a time. Following the move of each loop a test of each building on the loop will be done. This will be a random alarm test in each building to insure communications.

1.2 SECTION INCLUDES

- A. This specification provides the requirements for the installation, programming and configuration of a complete Analog Addressable Peer to Peer Token Ring Network for the Central Connecticut State University Safety Building. The system shall include, but not limited to: Fire Alarm Control Panels, Automatic and Manually Activated Voice Evacuation Alarm Subsystem per building, Automatic and Manually activated alarm Initiating and Indicating Peripheral Devices and Appliances, conduit, wire and accessories required to furnish a complete and operational Life Safety System.

1.3 RELATED SECTIONS

- A. Division 23 - Mechanical
- B. Division 26 - Electrical

1.4 ALTERNATES

- A. Equipment specified is EST3 as manufactured by Edwards Systems Technology and constitutes the quality and performance required. Any deviation from the specified equipment , in regards to functionality or survivability , must be clearly stated in the bid package. Failure to adhere to this requirement will be grounds for immediate disqualification without further review. These deviations must be provided to the engineer 10 days before bids are due.

1.5 REFERENCES

- A. The equipment and installation shall comply with the current provisions of the following standards:
- National Electric Code, Article 760.
 - National Fire Protection Association Standards:
 - NFPA72 National Fire Alarm Code
 - NFPA101 Life Safety Code
 - Local and State Building Codes.
 - Local Authorities Having Jurisdiction.
 - Underwriters Laboratories Inc.
- B. The system and all components shall be listed by Underwriters Laboratories Inc. for use in fire protective signaling system under the following standards as applicable:
- UL 864/UOJZ, APOU Control Units for Fire Protective Signaling Systems.
 - UL 268 Smoke Detectors for Fire Protective Signaling Systems.
 - UL 268A Smoke Detectors for Duct Applications.
 - UL 217 Smoke Detectors Single Station.
 - UL 521 Heat Detectors for Fire Protective Signaling Systems.
 - UL 228 Door Holders for Fire Protective Signaling Systems.
 - UL 464 Audible Signaling Appliances.
 - UL 1638 Visual Signaling Appliances.
 - UL 38 Manually Activated Signaling Boxes.
 - UL 346 Waterflow Indicators for Fire Protective Signaling Systems.
 - UL 1971 Standard for Signaling Devices for the Hearing Impaired
 - UL 1481 Power Supplies for Fire Protective Signaling Systems.
 - UL 1711 Amplifiers for Fire Protective Signaling Systems.
Americans with Disabilities Act (ADA)
International Standards Organization (ISO)
- ISO-9000
 - ISO-9001

1.6 SYSTEM DESCRIPTION

- A. The Fire Alarm / Life Safety System supplied under this specification shall be a microprocessor-based Peer to Peer Token Ring Fiber network . All Control Panel Assemblies and connected Field Appliances shall be both designed and manufactured by the same company, and shall be tested and cross-listed as compatible to ensure that a fully functioning Life Safety System is designed and installed.
- B. Provide a Fiber Optic Token Ring for the fire alarm network loop to the EST3 system that is currently on campus. This will require multi-mode fiber optic cable from the new Police Station to Gallaudet Hall. Provide multimode fiber optic communication interface cards at the police station and Gallaudet Hall. Each panel to incorporate (1) 3-FIBMB and (2) MMXVR cards. Contractor shall allow for 100 feet of fiber optic cable and conduit within Gallaudet Hall.
- C. The existing IRC3 loops (4) total, will require copper to be run from the new Police station to each of the buildings where the copper network loops begin. IRC Loop #1 begins at East Hall, Loop #2 begins at Burritt Library, Loop #3 begins at North Hall, Loop #4 begins at Copernicus Hall. Provide (3) Atlas cable #218-1-1TP from

the police station to each of these buildings and terminate in the existing IRC3 fire alarm control panel. Contractor shall allow for 100 feet of conduit and wiring within each building.

- D. Provide an Audio Paging and Emergency Evacuation system using the EST 3-ASU Audio source unit.

1.7 SUBMITTALS

A. Product Data

1. The contractor shall submit three (3) complete sets of documentation within 30 calendar days after award of purchase order. Indicated in the documentation will be the type, size, rating, style, catalog number, manufacturers names, photos, and/or catalog data sheets for all items proposed to meet these specifications. The proposed equipment shall be subject to the approval of the Architect/Engineer and no equipment shall be ordered or installed on the premises without that approval.
2. The Contractor shall provide hourly Service Rates and Semi-Annual inspection prices, performed by a factory trained and authorized personal, for this installed Life Safety System with the submittal. Proof of that training and authorization of the servicing ESD shall be included in the submittal. These hourly service rates shall be guaranteed for a one year period unless otherwise specified.

B. Shop Drawings

1. A complete set of Shop Drawings, one for each unit sub-assembly which requires that a field wire be connected to it, shall be supplied. The Shop Drawings shall be reproduced electronically from a Master Copy supplied by the manufacturer in digital format.
 - a. Samples
2. Two samples of each field connected device (smoke detectors, intelligent modules , strobes, and/or speakers) shall be provided to the contractor for their familiarization.
 - a. Close-out Submittals
3. Four (4) copies of the following Manual shall be delivered to the Building Owner's representative at the time of system acceptance. The close out submittals shall include:
 - a. Operating manuals covering the installed Life Safety System.
 - b. Point to Point diagrams of the entire Life Safety System as installed. This shall include all connected Smoke Detectors and addressable field modules. All drawings shall be provided in CAD and supplied in standard .DXF format. Vellum plots of each sheet shall also be provided. A system generated point to point diagram is required to insure accuracy.

- c. The application program listing for the system as installed at the time of acceptance by the building owner and/or Local AHJ (Disk and Hard copy printout).
- d. Name, address and telephone of the authorized factory representative.
- e. All drawings must reflect device address and programmed characteristics as verified in the presence of the engineer and/or the end user unless device addressing is electronically generated, and graphically printed.

1.8 QUALITY ASSURANCE

- A. **Qualifications:** The installing ESD shall provide proof of their qualifications as Factory Authorization and Factory Training for the product(s) specified herein. These qualification credentials shall not be more than two years old, to ensure up-to-date product and application knowledge on the part of the installing ESD.
- B. **Warranty**
 - 1. Warranty all materials, installation and workmanship for three (3) years from date of acceptance, unless otherwise specified. This shall include all new and relocated equipment including all work performed by TPC.
 - 2. A copy of the manufacturers' warranty shall be provided with close-out documentation and included with the operation and installation manuals.

1.9 SYSTEM STARTUP, OWNERS' INSTRUCTIONS, COMMISSIONING

- A. System startup shall be performed by a Factory Trained and Authorized Engineered Systems Distributor. Certain functions of the Systems Startup Procedure may be performed by a contractor under the direction of the Factory Trained and Authorized Engineered Systems Distributor.
- B. Owners' Instructions and Operation Manuals, specific for this project, shall be supplied to the Building Operations Staff by the Factory Trained and Authorized Engineered Systems Distributor. A "Generic" or "Typical" Owners' Instruction and Operation Manual shall not be acceptable to fulfill this requirement.
- C. Commissioning of the installed system shall be performed by the Factory Trained and Authorized Engineered Systems Distributor in the presence of the Local AHJ, the Building Owners' Representative, and a Representative of the General Contractor, if deemed appropriate.
- D. A System Generated device map, which will serve as an "as-built" drawing shall be provided to the Local AHJ and the Building Owners' Representative.

1.10 MAINTENANCE

- A. The Factory Trained and Authorized Engineered Systems Distributor who Designed and Installed this system shall provide a separate maintenance contract for a period of 2 Years from the date of system commissioning.

PART 2 - PRODUCTS

2.1 GENERAL

- A. This Life Safety System Specification must be conformed to in its entirety to ensure that the installed and programmed Life Safety System will accommodate all of the future requirements and operations required by the building owner. Any specified item or operational feature not specifically addressed prior to bid date will be required to be met without exception.
- B. Submission of product purported to be equal to those specified herein will be considered as possible substitutes only when all of the following requirements have been met:
 - 1. Any deviation from the equipment, operations, methods, design or other criteria specified herein must be submitted in detail to the Specifying Architect or Engineer a minimum of 10 working days prior to the scheduled submission of bids. Each deviation from the operation detailed in these specifications must be documented in detail, including Page Number and Section Number which lists the system function for which the substitution is being proposed.
 - 2. A complete list of such substituted products, with three (3) copies of working drawings for each, shall be submitted to and be approved by the architect and/or consulting engineer, not less than ten (10) calendar days prior to the scheduled date for opening bids.
 - 3. The contractor or substitute bidder shall functionally demonstrate that the proposed substituted products are, in fact, equal in quality and performance to those specified herein. Because the decision to specify the Life Safety System(s) and Equipment detailed herein was made by an Architect and/or Consulting Engineer on behalf of their client(s) (the Building Owners), such evidence of the applicability of any substitute materials must be submitted to, and accepted by, the Architect and/or Consulting Engineer, not less than ten (10) calendar days prior to the scheduled date for opening bids for this project. Substitute equipment will be accepted only on the discretion of the Architect and/or Consulting Engineer on behalf of the Building Owner.
- C. General Equipment and Material Requirements
- D. All equipment furnished for this project shall be new and unused. All components and systems shall be designed for uninterrupted duty. All equipment, materials, accessories, devices, and other facilities covered by this specification or noted on contract drawings and installation specifications shall be the best suited for the intended use and shall be provided by a single manufacturer. If any of the equipment provided under this Specification is provided by different manufacturers, then that equipment shall be recognized as compatible by both manufacturers, and "Listed" as such by Underwriters' Laboratories.
- E. System installation and operations shall be verified by the manufacturer's representative and a verification certificate presented upon completion. The manufacturer's representative shall be responsible for an on-site demonstration of the operation of the system and initial staff training. Provide a minimum of four hours of training for owner's staff, to be scheduled by the owner.

- F. The system shall be capable of detecting the electrical location of each Signature intelligent device including new and existing devices. It shall be possible to display the intelligent device map on the laptop PC.
- G. If a device map cannot be generated by the Control Panel, the contractor must include a minimum of (3) days to verify location of all wire runs while in the presence of the Architect/Engineer or Building Owners Representative to verify all conduit and wire runs.
- H. In addition, "As-Built" riser and wiring diagrams reflecting all T-Taps, each programmed device characteristic including detector type, base type, serial number, sensitivity setting and wire configurations will be provided to the Architect/Engineer, based on the information gathered during the verification process described above.
- I. It shall be possible for authorized service personnel using a Program/Service Tool or laptop PC to change the personality/function of a Signature Series Device to meet changes in building layout or environment. System changes shall be verified by the manufacturer's representative and a verification certificate presented upon completion.

2.2 MANUFACTURERS

- A. Equipment and materials shall be provided by an Authorized Engineered Systems Distributor to ensure proper Specification Adherence, final connection, test, turnover, warranty compliance, and service.
- B. Service availability: The supplier shall have sufficient stock on hand and have a fully equipped service organization capable of guaranteeing response time within 8 hours of service calls, 24 hours a day, 7 days a week to service completed systems.
- C. The Engineered Systems Distributor of the Fire Alarm / Life Safety Equipment specified herein shall provide a copy of their certificate of successful completion of an authorized Training Course given by the Manufacturer of the Fire Alarm / Life Safety Equipment.

2.3 EQUIPMENT

- A. The Life Safety System shall be a Multi-Processor Based Network System designed specifically for Fire, Audio Evacuation and Security applications. The Life Safety System shall be a Model EST3, and shall be UL listed under Standards 864 (Control Units for Fire-Protective Signaling Systems) under categories UOJZ and APOU, and ULC listed under standard CAN/ULC-S527. The specified modules shall also be listed under UL 1076 (Proprietary Burglar Alarm Units and Systems) under category APOU.
- B. The Life Safety System shall include all required hardware and system programming to provide a complete and operational system, capable of providing the protected premises with the following functions and operations:

1. Modular systems design, with a layered application design concept, including an "Operational Layer" and a "Human Interface Layer", to allow maximum flexibility of the system with a minimum physical size requirement.
 2. Audio Paging and Emergency Evacuation system shall be the EST-3 3-ASU series. The audio evacuation system will contain amplifier modules, integral microphone with push to talk switch for all call paging within the building, and speaker zone modules for a total of 4 speaker zones. Panel will include tone generator, and digitized message repeater. Digital voice message to be approved by the Campus Fire Marshal.
 3. All System operational software is to be stored in FLASH memory. Control Panel disassembly, and replacement of electronic components of any kind shall not be required in order to upgrade the operations of the installed system to conform to future application code and operating system changes.
 4. Up to 128 Service Groups must be definable within the system program to allow the testing of the installed system based on the physical layout of the system, not on the wiring of the field circuits connected to the Fire Alarm Control Panel.
 5. Advanced Windows™-based System Definition Utility with Program Version Reporting to document any and all changes made during system start-up or system commissioning. Time and Date Stamps of all modifications made to the program must be included to allow full retention of all previous program version data.
 6. System response to any alarm condition must occur within 3 seconds, regardless of the size and the complexity of the installed system.
 7. Each speaker circuit shall be individually supervised by the audio evacuation panel.
 8. HVAC Status LED Illumination shall be controlled by the activation of the output device. A "Flash", followed by a "Steady" illumination will verify operation without the need for a "sail" switch in each air handling unit.
 9. System Common Control Functions shall be automatically routed to any node of the system as a function of the time of day and date.
- C. The Life Safety System
1. Life Safety System Mechanical and Overall Feature Summary
- D. The Life Safety System shall include the following features and shall support the following operations in each installed cabinet or node of the system:
1. Up to 10 Signature Series Intelligent Device loops.
 2. Up to 125 Intelligent Smoke Detectors and 125 Intelligent Modules per SDC.
 3. Up to 120 Hardwired input/output Circuits.
 4. Up to 342 Manual Control (Input) Switches
 5. Up to 456 LED Annunciation Points
 6. Up to 63 Remote Display Units.
 7. Multi-Priority, token passing, peer-to-peer network connection of up to 64 system nodes wired as Class B (Style 4).
 8. Ground fault detection by panel, by Signature Data Circuit, and by device module.
 9. Ability to download all system applications programs and "firmware" from a computer through a single point in the system.

10. True Distributed Intelligence, including microprocessor-based Detectors and Modules.
 11. A.C. Power Trouble Delay adjustable from 4 Hours to 10 Hours.
 12. Removable, Interlocked terminal blocks for the connection of the field wiring to the Fire Alarm Control Panel.
 13. Electronic Addressing of Field Devices.
 14. Advanced Power Management
 15. Dead Front Construction.
- E. Life Safety System Human Interface
- F. System Common Controls and Emergency User Interface
- G. The Fire Alarm / Life Safety System shall include a Emergency Operators' Interface Panel which shall include the following system annunciation and control functions:
- H. System Annunciation and Control Functions:
1. Hands free Emergency Operation. The first and last highest priority event on the system shall be displayed automatically and simultaneously.
 2. Control Panel Internal Audible Signal shall have four programmable signal patterns, to allow for the easy differentiation between Alarm, Supervisory, Trouble and Monitor conditions within the installed system.
- I. Discreet "System Status" LEDs:
1. Power Status LED - Green LED shall illuminate when AC power is present.
 2. Test Status LED - Yellow LED shall illuminate when any portion of the system is in the test mode. A programmable timer shall cause the system to automatically exit the test mode after a period of system inactivity. This Test LED shall function in a local or in a group mode.
 3. CPU Fail Status LED - Yellow LED shall illuminate when the panel controller has an internal failure.
 4. Ground Fault Status LED - Yellow LED shall illuminate when un-grounded wiring connected to the cabinets' power supply has continuity to ground. This feature shall function in either a local or group mode.
 5. Disable Status LED - Yellow LED shall illuminate whenever any point or zone in the installed system is manually disabled.
- J. Discreet Common Control Switches with associated Status LEDs:
1. Reset: Depression of the Reset Switch starts the system reset operation. The associated Yellow LED shall have three flash rates during this operation to inform the user of the progress status of the reset cycle. The LED shall flash fast during the smoke detector power down sequence, then it shall flash slowly during the restart phase, and shall illuminate steadily for the restoral phase. The LED shall go out completely when the system is back to normal mode. Each phase, as well the overall reset cycle shall be programmable to perform other functions.
 2. Alarm Silence: Depression of the Alarm Silence Switch shall turn off all (audible and/or visible) Notification Appliance Circuits. The associated yellow LED illuminates when the Alarm Silence function is active, whether by the

Alarm Silence Switch, or by an integral software timer. Subsequent activation of the Alarm Silence Switch shall resound the signals. Activation of the Alarm Silence switch shall be programmable to perform other functions.

3. Panel Silence: Depression of the Panel Silence Switch shall turn off the systems' internal audible signal when configured as a 'local' system. The associated yellow LED illuminates when the panel silence feature is activated.
 4. Drill Switch / LED: Depressing the DRILL switch activates the fire drill function. Yellow LED indicates that the fire drill function is active. The Drill Switch shall also be programmable to perform system functions other than the Drill Function.
- K. Other Operator Control Switches:
1. Previous Message Switch: Pressing the Previous Message Switch shall scroll the display to show the preceding message in the selected queue. Holding the Previous Message Switch and pressing any queue select switch moves to the top of the respective queue event list. Scrolling through event messages may be done by the operator at any time.
 2. Next Message Switch: Pressing the Next Message Switch shall scroll the display to show the following message in the selected queue. Holding the Previous Message Switch and pressing any queue select switch moves to the bottom of the respective queue event list. Scrolling through event messages may be done by the operator at any time.
 3. More Details Switch: Pressing the More Details Switch shall show the address and 42 character location message of the active device on display. If a zone is active, pressing the switch displays the address and message of active devices within the zone. When multiple devices are active, the "Previous/Next" message switch may be used to scroll through the messages.
- L. The System Main Liquid Crystal Display:
1. The Liquid Crystal display shall provide the means to inform the System Operator with detailed information about the off-normal status of the installed Fire Alarm / Life Safety System. The Main Display shall automatically respond to the status of the system, and shall display that status on a 8 line by 21 character backlit alpha-numeric Graphical Liquid Crystal Display.
- M. Automatic Functions:
1. The following status functions shall be annunciated by the Main Liquid Crystal Display:
 2. When the Fire Alarm / Life Safety System is in the "Normal" Mode, the LCD displays:
 - a. The current Date and Time.
 - b. A Custom System Title (2 lines X 21 characters).
 - c. A summary total of the Alarm History of the system.
 3. With the Fire Alarm Life Safety System in the Alarm Mode, the LCD shall automatically reconfigure into four logical windows.
 4. Systems Status Window

- a. The LCD shall show the system time, and the number of active points and disabled points in the system in this section of the LCD Display.
5. Current Event Window
 - a. The LCD shall show the first active event of the highest priority in reverse text to highlight the condition to the Emergency Operator. The top line of the reversed text shall show the sequence number in which the displayed event was received, as well as its event type. The second and third lines of reversed text shall display an identification message related to the displayed event.
 6. Last Event Window
 - a. The LCD shall show the most recent, highest priority event received by the system.
 7. Type Status Window
 - a. The LCD shall show the total number of active events in the system, by event type. b. There shall be four different System Event Types which shall be displayed, "Alarm Events", "Supervisory Events", "Active Trouble Events", and "Active Monitor vents".
- N. System Message Processing:
1. In order to simplify, and to clarify the System Status information which is given to the Emergency Operator, the Main LCD shall include queues for each of the System Event Types. The Main LCD shall allow the Emergency operator access to the System Status information contained within those queues by pressing an associated queue select switch. Whenever there is an unacknowledged event in any of the System Event queues, the associated Status LED shall flash. Viewing each event listed in a queue shall acknowledge all events in that queue, and shall cause the associated LED to illuminate steady.
 2. All messages contained in any of the System Event queues shall be accessible for review by the Emergency Operator using the "Previous/Next" message switch. It shall be possible to route additional event information to a printer.
- O. Maintenance Menu:
1. The Main LCD shall also allow the System Operator to access system maintenance functions through a four level password system. The authorized System Operator shall be able to access the following functions:
 2. System Status: The system shall allow the operator to determine the status of individual system components, including active points, disabled points, and active points by panel. ****list additional****
 3. Enable: The system shall allow the operator to restore a disabled point (device) in the system, allowing that point (device) to operate as originally intended by the application program of the system.

- P. Additionally, the system shall allow the operator to restore any group function, guard patrol function, Panel, system module, "software - defined zone", operator control, or time control function.
- Q. Disable: The system shall allow the operator to disable any point (device) in the system, inhibiting that point (device) from operating as originally intended by the application program of the system.
- R. Additionally, the system shall allow the operator to disable any group function, guard patrol function, Panel, system module, "software - defined zone", operator control, or time control function within the system.
- S. Activate: The system shall allow the operator to manually turn on any system output point, or system function. Alternate Smoke Detector sensitivity, message routing within the system, guard patrol timing, and check-in group timings shall be modifiable with this simple command from the control panel.
- T. Restore: The system shall allow the operator to restore the primary (application program defined) operation to the Smoke Detector sensitivity and the message routing functions with this simple command from the control panel.
- U. Control Output: The system shall allow the operator to manually command and control relays and LEDs. Relays shall be able to be commanded to "Latch", to energize as a "High Priority", or as a "Low Priority", to "Energize", or to "De-Energize".
- V. LEDs shall be able to be commanded to "Latch", to energize as a "High Priority", or as a "Low Priority", to turn "On", to turn "Off", to "Slow Blink", or to "Fast Blink".
- W. Reports: The system shall provide the operator with system reports which give detailed description of the status of certain system parameters for corrective action, or for preventative maintenance programs. The system shall provide these reports via the Main LCD, and shall be capable of being printed on any of the connected system printers.
 - 1. The system shall provide a report which gives a sensitivity listing of all detectors which have less than 75% environmental compensation remaining.
 - 2. The system shall provide a report which provides a sensitivity listing of any particular detector.
 - 3. The system shall provide a report which gives a listing of the sensitivity of all of the detectors on any given panel in the system, or any given SDC loop within any given panel.
 - 4. The system shall provide a report which gives a chronological listing of up to the last 1740 system events.
 - 5. The system shall provide a listing of all of the firmware revision listings for all of the installed network components in the system.
- X. Program: The system shall allow the authorized operator to perform all of the following system functions:
 - 1. Set the System Time
 - 2. Set the System Date

3. Set (Change) the System Passwords.
 4. Restart the System.
 5. Set the Dates for the System Holiday Schedule.
 6. Clear the Chronological System History File.
- Y. Test: The system shall allow the authorized operator to perform test functions within the installed system. Test functions shall be defined by the authorized operator to be performed on a per cabinet, circuit, or service group basis.
- Z. Local Control and Display Annunciators: Each panel in the installed system shall include local Control and Display Annunciators. These annunciators shall have integral membrane style, tactile push-button control switches, for the control of system functions, and LEDs with programmable (software-controlled) flash rates and slide-in labels for annunciation of system events.
1. The Local Control Display Annunciators shall provide the system with individual zone and / or device annunciation.
 2. The Local Control Display Annunciators shall provide the system with individual zone and / or device annunciation with zone and / or device disable.
 3. The Remote Control Display Annunciators shall provide the system with individual alarm and trouble annunciation per zone and / or device with zone and / or device disable.
 4. The Local Control and Display Annunciators shall provide the system with groups of three switches which have a software controlled interlock to allow only one of the switches to be active at any time. The switch triads shall be used for all of the fan and damper controls in the protected premises.
- AA. Remote System Point Annunciators: Each remote panel in the installed system shall include remote Control and Display Annunciators. These annunciators shall have integral membrane style, tactile push-button control switches for the control of system functions, and LEDs with programmable (software-controlled) flash rates and slide-in labels for annunciation of system events.
1. The Remote Control Display Annunciators shall provide the system with individual zone and / or device annunciation.
 2. The Remote Control Display Annunciators shall provide the system with individual zone and / or device annunciation with zone and / or device disable.
 3. The Remote Control Display Annunciators shall provide the system with individual alarm and trouble annunciation per zone and / or device with zone and / or device disable.
 4. The Remote Control Display Annunciators shall provide the system with groups of three switches which have a software controlled interlock to allow only one of the switches to be active at any time. The switch triads shall be used for all of the manual zone/floor paging operations in the protected premises.
 5. The Remote Control and Display Annunciators shall be provided to provide the system with groups of three switches which have a software controlled interlock to allow only one of the switches to be active at any time. The switch triads shall be used for all of the fan and damper controls in the protected premises.

BB. System Printers

1. The event and status printer shall be a 9 pin, impact, dot-matrix printer with a minimum print speed of 200 characters per second at 10 characters per inch. Printer parameters shall be set up with a menu drive program in the printer. The serial cable connecting the Fire Alarm Control Panel to the Printer shall be supervised. The serial printer shall support short haul modems or Fiber-Optics modules. The printers shall list the time, date, type, and user defined message for each event printed. It shall be possible to support multiple printers per CPU. It shall be possible to define which event types are sent to the printer(s) including alarm, supervisory, trouble, monitor, and service groups.
2. The printer shall be powered from 115 VAC, and shall use standard 91/2" x 11" fan fold paper. Battery backup if required shall use an emergency power unit or uninterrupted power supply.

CC. Life Safety System Operations Interface: SDC Card

1. The Signature Device Card (SDC) shall be the interface between the Fire Alarm Control Panel and the Signature Series Detectors and Modules.
2. The communications format between the SDC and the Signature Series Devices shall be 100% digital. Communications to devices must incorporate BROADCAST POLLING and DIRECT ADDRESS SEARCH to ensure the fastest reporting of off-normal conditions to the system human interface layer.
3. It shall be possible to wire the SDC as Class A (Style 6 or Style 7) or Class B (Style 4) without twisted or shielded wire. It must be possible to wire branch circuits (T-Taps) from Class B Circuits.
4. The associated controller (3-SSDC), through the SDC, shall provide the ability to set the sensitivity and alarm verification of each of the individual intelligent detectors on the circuit. It shall be possible to automatically set the sensitivity of individual intelligent detectors during day and night periods.
5. It shall be possible for the SDC to address all intelligent devices connected to it without having to set switches at the individual devices.
6. It shall be possible to obtain a mapping report of all devices connected to the circuit for confirmation of "as-built" wiring. The map shall show physical wiring of T-Taps, device types, and the panel addresses of devices connected to the circuit. The SDC shall be capable of reporting unexpected additional device addresses and changes to the wiring in the data circuit. A specific trouble shall be reported for any off-normal non-alarm condition.
7. The SDC shall be able to report the following information on a per intelligent device basis:
 - a. Device Serial Number
 - b. Device Address
 - c. Device Type
 - d. Current Detector Sensitivity Values and the Extent of Environmental Compensation.
 - e. Any of 32 possible trouble codes to specifically diagnose faults.
8. Should a Signature Driver Controller CPU fail to communicate, the Signature circuit shall go into the stand alone mode. The circuit shall be capable of

- producing a loop alarm if an alarm type device becomes active during stand alone mode.
9. Hard Wired NAC Circuits Provide where indicated on the plans supervised hard wired Notification Appliance Circuits (NAC) for the control of 24Vdc EST Integrity Series Signaling Appliances. The NAC shall be Class B (Style 4), and shall control up to 3.5 amps of power to the circuit.
 10. Provide where indicated on the plans supervised hard wired Notification Appliance Circuits (NAC) for the control of 70.7Vrms EST Integrity Series Audio Signaling Appliances. The NAC shall be Class B (Style 4), and shall control up to 35 Watts of power to the circuit.
 11. Provide where indicated on the plans supervised hard wired Notification Appliance Circuits (NAC) for the control of 25Vrms EST Integrity Series Audio Signaling Appliances. The NAC shall be Class B (Style 4), and shall control up to 50 Watts of power to the circuit.
 12. Panel NACs shall be power limited to 3.5A at 24Vdc and 4.1A at 20.4Vdc to support higher current demand by visible appliances at lower battery voltages.
 13. Hard Wired (2-Wire) Smoke Detector Circuits
 14. Provide where indicated on the plans supervised hard wired two wire initiating device circuits capable of supporting up to 50 (6250 series) ionization or 30 (6270 series) photoelectric smoke detectors. It shall be possible to configure IDCs for alarm verification with programmable verification times within UL guidelines.
 15. Hard Wired Initiating Device Circuits
 16. Provide where indicated on the plans supervised hard wired initiating device circuits. It shall be possible to configure IDCs for alarm, supervisory, or monitor operation.
 17. Life Safety System Programmable Operations:
 18. System Message Processing and Display Operations:
 19. The Fire Alarm / Life Safety System shall allow Network Routing to be configured to any or all nodes (cabinets) in the network.
 20. All of the system Printer ports can be configured to display any or all of the following functions:
 - a. Alarm
 - b. Supervisory
 - c. Trouble
 - d. Monitor
 - e. Service Group
 21. Each LCD Display on each node (cabinet) in the system shall be configurable to show the status of any or all of the following functions anywhere in the system:
 - a. Alarm
 - b. Supervisory
 - c. Trouble
 - d. Monitor
 22. The system shall provide the capability to label each of the system points with up to 256 characters of location message. The first 42 characters shall be directed to the LCD while the entire message shall be sent to the printer.

23. The system shall have the capability to provide up to 128 logical Counting AND Groups. Each group shall have a programmable 'activation' number. Whenever the number of active devices in an AND Group reaches the activation number, the AND Groups' rules will execute. It shall be possible to 'overlap' AND groups by having devices appear in more than one group.
24. The system shall provide a means to monitor the well being of any or all of the occupants of the protected premises by means of a Check-In Group feature. The Check-In Group shall display an emergency alarm whenever any member of a check-in group fails to check-in during the programmable check-in period. Subsequent check-in activations during the check-in period, or activations outside of the check-in period shall also activate an emergency response. It shall be possible to have a minimum of 128 check-in groups. All event messages for the Check-In feature shall be directable to any system monitor or printer.
25. The system shall have the ability to define a minimum of 64 Guard Patrols with up to 10 different tours each. For each tour it shall be possible to program a minimum-maximum time period between patrol stations. Each guard patrol can have up to 50 stations. Guard patrol can be started from the control panel or by operation of the first station in a tour. Guard patrol delinquencies occur when a guard is early to a station, late to a station and out of sequence. Delinquencies shall display at the control panel, perform programmable system responses, and may be directed to any printer.
26. The system shall have the ability to define a minimum of 128 Matrix Groups with up to 250 points each. For each matrix, it shall be possible to define a 'radius' and an 'activation' number. The radius number defines the proximity between detector locations. When two detectors activate at or within the value of the 'radius' or whenever the number of active devices reaches the activation number the Matrix Group activates. It shall be possible to 'overlap' Matrix groups by having devices appear in more than one group.
27. The system shall include the ability to define an alternate set of device commands which may be used in combination with the system test command for the testing of the connected Signature Series Smoke Detectors. This function shall disable the normal alarm command for each of the members of the group, so that the testing process will not result in an activation of the building evacuation signals, auxiliary relays or central station connections.
28. The system shall include Time Control functions which will have the ability to control any system output or function, or initiate any system operational sequence as a function of the Month, Day of Week, Date, Hour, Minute, or Holiday.
29. The system shall include up to 600 software defined Logical Zone Groups which may group any input from any Signature Data Circuit, or other Initiating Device Circuit, in order to control a system 30.output or function, or initiate any system operational sequence. A device or IDC may be a member of one Logical Zone Group. Each of these zones shall have an associated message.
30. The system shall provide the ability to download data from the Signature Series Detectors to a P.C. while the system is on-line and operational in the protected premises. The downloaded data may then be analyzed in a diagnostic program supplied by the system manufacturer.
31. The Fire Alarm/ Life Safety System shall incorporate a microprocessor based audio system. The main audio system shall include (2) 40 watt amplifiers, integral microphone, tone generator, digital message repeater, and 4 speaker

zone modules,. In alarm condition the system will automatically deliver a slow-whoop tone for (3) seconds to the entire building, followed by a digitized voice evacuation message (message to be approved by the Campus Fire Marshal). The digitized message will be repeated (4) times and then be followed by the slow-whoop tone. At any time during the evacuation sequence the push to talk microphone switch may be operated for a live voice message to be broadcast to the building. The audio evacuation system shall be fully supervised by the fire alarm system. The audio evacuation system zone modules shall automatically detect and annunciate zone active or zone fault conditions on the speaker circuits. The audio evacuation system shall be the EST 3-ASU series.

DD. COMPONENTS

1. Intelligent Detectors - General Operation
2. The System Intelligent Detectors shall be capable of full digital communications using both broadcast and polling protocol. Each detector shall be capable of performing independent fire detection algorithms. The fire detection algorithm shall measure sensor signal dimensions, time patterns and combine different fire parameters to increase reliability and distinguish real fire conditions from unwanted deceptive nuisance alarms. Signal patterns that are not typical of fires shall be eliminated by digital filters. Devices not capable of combining different fire parameters or employing digital filters shall not be acceptable.
3. Each detector shall have an integral microprocessor capable of making alarm decisions based on fire parameter information stored in the detector head. Distributed intelligence shall improve response time by decreasing the data flow between detector and Analog loop controller. Detectors not capable of making independent alarm decisions shall not be acceptable. Maximum total Analog loop response time for detectors changing state shall be 0.5 seconds.
4. Each detector shall have a separate means of displaying communication and alarm status. A green LED shall flash to confirm communication with the Analog loop controller. A red LED shall flash to display alarm status. Both LEDs on steady shall indicate alarm-standalone mode status. Both LEDs shall be visible through a full 360 degree viewing angle.
5. The detector shall be capable of identifying up to 32 diagnostic codes. This information shall be available for system maintenance. The diagnostic code shall be stored at the detector.
6. Each smoke detector shall be capable of transmitting pre-alarm and alarm signals in addition to the normal, trouble and need cleaning information. It shall be possible to program control panel activity to each level. Each smoke detector may be individually programmed to operate at any one of five (5) sensitivity settings.
7. Each detector microprocessor shall contain an environmental compensation algorithm which identifies and sets ambient "Environmental Thresholds" approximately six times an hour. The microprocessor shall continually monitor the environmental impact of temperature, humidity, other contaminants as well as detector aging. The process shall employ digital compensation to adapt the detector to both 24 hour long term and 4 hour short term environmental changes. The microprocessor shall monitor the environmental compensation value and alert the system operator when the detector approaches 80% and 100% of the allowable environmental

- compensation value. Differential sensing algorithms shall maintain a constant differential between selected detector sensitivity and the "learned" base line sensitivity. The base line sensitivity information shall be updated and permanently stored at the detector approximately once every hour.
8. The intelligent Analog device and the Analog loop controller shall provide increased reliability and inherent survivability through intelligent Analog standalone operation. The device shall automatically change to standalone conventional device operation in the event of a loop controller polling communications failure. In the Analog standalone detector mode, the Analog detector shall continue to operate using sensitivity and environmental compensation information stored in its microprocessor at the time of communications failure. The Analog loop controller shall monitor the loop and activate a loop alarm if any detector reaches its alarm sensitivity threshold.
 9. Each Signature Series device shall be capable of automatic electronic addressing and/or custom addressing without the use of DIP or rotary switches. Devices using DIP or rotary switches for addressing, either in the base or on the detector shall not be acceptable.
 10. The intelligent Analog detectors shall be suitable for mounting on any Signature Series detector mounting base.
 - a. Fixed Temperature Heat Detector, SIGA-HFS
 11. Provide intelligent fixed temperature heat detectors <SIGA-HFS>. The heat detector shall have a low mass thermistor heat sensor and operate at a fixed temperature. It shall continually monitor the temperature of the air in its surroundings to minimize thermal lag to the time required to process an alarm. The integral microprocessor shall determine if an alarm condition exists and initiate an alarm based on the analysis of the data. Systems using central intelligence for alarm decisions shall not be acceptable. The heat detector shall have a nominal alarm point rating of 135°F (57°C). The heat detector shall be rated for ceiling installation at a minimum of 70 ft (21.3m) centers and be suitable for wall mount applications.
 - a. Fixed Temperature/Rate of Rise Heat Detector, SIGA-HRS
 12. Provide intelligent combination fixed temperature/rate-of-rise heat detectors <SIGA-HRS>. The heat detector shall have a low mass thermistor heat sensor and operate at a fixed temperature and at a temperature rate-of-rise. It shall continually monitor the temperature of the air in its surroundings to minimize thermal lag to the time required to process an alarm. The integral microprocessor shall determine if an alarm condition exists and initiate an alarm based on the analysis of the data. Systems using central intelligence for alarm decisions shall not be acceptable. The intelligent heat detector shall have a nominal fixed temperature alarm point rating of 135°F (57°C) and a rate-of-rise alarm point of 15°F (9°C) per minute. The heat detector shall be rated for ceiling installation at a minimum of 70 ft (21.3m) centers and be suitable for wall mount applications.
 - a. Ionization Smoke Detector, SIGA-IS
 13. Provide intelligent ionization smoke detectors <SIGA-IS>. The analog ionization detector shall utilize a unipolar ionization smoke sensor to sense

- changes in air samples from its surroundings. The integral microprocessor shall dynamically examine values from the sensor and initiate an alarm based on the analysis of data. Systems using central intelligence for alarm decisions shall not be acceptable. The detector shall continually monitor any changes in sensitivity due to the environmental affects of dirt, smoke, temperature, aging and humidity. The information shall be stored in the integral processor and transferred to the analog loop controller for retrieval using a laptop PC or the SIGA-PRO Signature Program/Service Tool. The ion detector shall be rated for ceiling installation at a minimum of 30 ft (9.1m) centers and be suitable for wall mount applications. The ion smoke detector shall be rated for operation in constant air velocities from 0 to 75 ft/min. (0-0.38 m/sec) and with intermittent air gusts up to 300 ft/min. (1.52m/sec) for up to 1 hour.
14. The percent smoke obscuration per foot alarm set point shall be field selectable to any of five sensitivity settings ranging from 0.7% to 1.6%. The ion detector shall be suitable for operation in the following environment:
 - a. Temperature: 32°F to 120°F (0°C to 49°C)
 - b. Humidity: 0-93% RH, non-condensing
 - c. Elevation: Up to 6,000 ft. (1828 m)
 - d. Photoelectric Smoke Detector, SIGA-PS
 15. Provide intelligent photoelectric smoke detectors <SIGA-PS>. The analog photoelectric detector shall utilize a light scattering type photoelectric smoke sensor to sense changes in air samples from its surroundings. The integral microprocessor shall dynamically examine values from the sensor and initiate an alarm based on the analysis of data. Systems using central intelligence for alarm decisions shall not be acceptable. The detector shall continually monitor any changes in sensitivity due to the environmental affects of dirt, smoke, temperature, aging and humidity. The information shall be stored in the integral processor and transferred to the analog loop controller for retrieval using a laptop PC <or the SIGA-PRO Signature Program/Service Tool>. The photo detector shall be rated for ceiling installation at a minimum of 30 ft (9.1m) centers and be suitable for wall mount applications. The photoelectric smoke detector shall be suitable for direct insertion into air ducts up to 3 ft (0.91m) high and 3 ft (0.91m) wide with air velocities up to 5,000 ft/min. (0-25.39 m/sec) without requiring specific duct detector housings or supply tubes.
 16. The percent smoke obscuration per foot alarm set point shall be field selectable to any of five sensitivity settings ranging from 1.0% to 3.5%. The photo detector shall be suitable for operation in the following environment:
 - a. Temperature: 32°F to 120°F (0°C to 49°C)
 - b. Humidity: 0-93% RH, non-condensing
 - c. Elevation: no limit
 17. 3D Multisensor Detector, SIGA-PHS
 18. Provide intelligent 3D multisensor smoke detectors <SIGA-PHS>. The multisensor analog detector shall use a light scattering type photoelectric smoke sensor and a fixed temperature type heat sensor to sense changes in air samples from its surroundings. The integral microprocessor shall employ time based algorithms to dynamically examine values from both sensors simultaneously and initiate an alarm based on that data. Systems using

central intelligence for alarm decisions shall not be acceptable. The detector shall continually monitor any changes in sensitivity due to the environmental affects of dirt, smoke, temperature, aging and humidity. The information shall be stored in the integral processor and transferred to the analog loop controller for retrieval using a laptop PC or the SIGA-PRO Signature Program/Service Tool. Separately mounted photoelectric detectors and heat detectors in the same location are not acceptable alternatives. The 3D Multisensor detector shall be rated for ceiling installation at a minimum of 30 ft (9.1m) centers and be suitable for wall mount applications. The 3D Multisensor smoke detector shall be suitable for direct insertion into air ducts up to 3 ft (0.91m) high and 3 ft (0.91m) wide and with air velocities up to 5,000 ft/min. (0-25.39 m/sec) without requiring specific duct detector housings or supply tubes.

19. The percent smoke obscuration per foot alarm set point shall be field selectable to any of five sensitivity settings ranging from 1.0% to 3.5%. The fixed temperature alarm set point shall be 135°F (57°C) nominal. The 3D Multisensor detector shall be suitable for operation in the following environment:
 - a. Temperature: 32°F to 100°F (0°C to 38°C)
 - b. Humidity: 0-93% RH, non-condensing.
 - c. Elevation: no limit.
20. 4D Multisensor Detector, SIGA-IPHS
21. Provide intelligent 4D multisensor smoke detectors <SIGA-IPHS>. The multisensor analog detector shall use a light scattering type photoelectric smoke sensor, a unipolar ionization smoke sensor and an ambient temperature sensor to sense changes in air samples from its surroundings. The integral microprocessor shall employ time based algorithms to dynamically examine values from the three sensors simultaneously and initiate an alarm based on that data. The 4D Multisensor shall be capable of adapting to ambient environmental conditions. The temperature sensor shall self-adjust to the ambient temperature of the surrounding air and input an alarm when there is a change of 65°F (35°C) in ambient temperature. Systems using central intelligence for alarm decisions shall not be acceptable. The detector shall continually monitor any changes in sensitivity due to the environmental affects of dirt, smoke, temperature, age and humidity. The information shall be stored in the integral processor and transferred to the analog loop controller for retrieval using a laptop PC or the SIGA-PRO Signature Program/Service Tool. Separately mounted photoelectric detectors, ionization detectors and heat detectors in the same location are not acceptable alternatives. The 4D Multisensor smoke detector shall be rated for ceiling installation at a minimum of 30 ft (9.1m) centers and suitable for wall mount applications. The 4D Multisensor shall be suitable for direct insertion into air ducts up to 3 ft (0.91m) high and 3 ft (0.91m) wide and air velocities up to 500 ft/min. (0-2.54 m/sec) without requiring specific duct detector housings or supply tubes.
22. The percent smoke obscuration per foot alarm set point shall be field selectable to any of five sensitivity settings ranging from 1.0% to 3.5%. The integral heat sensor shall cause an alarm when it senses a change in ambient temperature of 65°F (35°C) or reaches it fixed temperature alarm set point of

135°F (57°C) nominal. The 4D Multisensor detector shall be suitable for operation in the following environment:

- a. Temperature: 32°F to 100°F (0°C to 38°C)
- b. Humidity: 0-93% RH, non condensing
- c. Elevation : Up to 6,000 ft (1828 m)

23. Standard Detector Mounting Bases, SIGA-SB / SIGA-SB4

24. Provide standard detector mounting bases <SIGA-SB> <SIGA-SB4> suitable for mounting on <North American 1-gang, 3½" or 4" octagon box and 4" square box> <European BESA or 1-gang>. The base shall, contain no electronics, support all Signature Series detector types and have the following minimum requirements:

- a. Removal of the respective detector shall not affect communications with other detectors.
- b. Terminal connections shall be made on the room side of the base. Bases which must be removed to gain access to the terminals shall not be acceptable.
- c. The base shall be capable of supporting one (1) Signature Series <SIGA-LED> Remote Alarm LED Indicator. Provide remote LED alarm indicators where shown on the plans.

25. Relay Detector Mounting Bases, SIGA-RB / SIGA-RB4

26. Provide relay detector mounting bases <SIGA-RB> <SIGA-RB4> suitable for mounting on <North American 1-gang, 3 ½ " or 4" octagon box and 4" square box> <European BESA or 1-gang>. The relay base shall support all Signature Series detector types and have the following minimum requirements:

- a. The relay shall be a bi-stable type and selectable for normally open or normally closed operation.
- b. The position of the contact shall be supervised.
- c. The relay operation shall be exercised by the detector processor upon power up.
- d. The relay shall automatically de-energize when a detector is removed.
- e. The operation of the relay base shall be controlled by its respective detector processor. Detectors operating standalone mode shall operate the relay upon changing to alarm state. Relay bases not controlled by the detector microprocessor shall not be acceptable.
- f. Form "C" Relay contacts shall have a minimum rating of 1 amp @ 30 Vdc and be listed for "pilot duty".
- g. Removal of the respective detector shall not affect communications with other detectors.
- h. Terminal connections shall be made on the room side of the base. Bases which must be removed to gain access to the terminals shall not be acceptable.

27. Isolator Detector Mounting Bases, SIGA-IB / SIGA-IB4

28. Provide isolator detector mounting bases <SIGA-IB> <SIGA-IB4> suitable for mounting on <North American 1-gang, 3 ½ " or 4" octagon box and 4" square box> <European BESA or 1-gang>. The operation of the isolator base shall

be controlled by its respective detector processor. Isolators which are not controlled by a detector processor shall not be accepted. Following a short circuit condition, each isolator/detector shall be capable of performing an internal self-test procedure to re-establish normal operation. Isolator/detectors not capable of performing independent self tests shall not be acceptable. The isolator base shall support all Signature Series Detector types and have the following minimum requirements:

- a. The isolator shall operate within a minimum of 23 msec. of a short circuit condition on the communication line.
 - b. When connected in Class A configuration the Signature Loop Controller shall identify an isolated circuit condition and provide communications to all non isolated analog devices.
 - c. Terminal connections shall be made on the room side of the base. Bases which must be removed to gain access to the terminals shall not be acceptable.
29. Detector Mounting Plate, SIGA-DMP
30. Provide detector mounting plate assemblies <SIGA-DMP> to facilitate mounting a Signature Series detector for direct insertion into a low velocity duct 3 ft (0.91m) high and 3 ft (0.91m) wide, ceiling plenum, or raised floor. Mounting plate shall be code gauge steel with corrosion resistant red enamel finish. The detector mounting plate shall support an intelligent analog photoelectric detector <SIGA-PS>, or 3D Multisensor detector <SIGA-PHS>, or 4D Multisensor detector <SIGA-IPHS> along with a standard, relay or isolator detector mounting base.
31. Duct Detector Housing, SIGA-DH
32. Provide smoke detector duct housing assemblies <SIGA-DH> to facilitate mounting an intelligent analog photoelectric detector <SIGA-PS>, or 3D multisensor detector <SIGA-PHS>, or 4D multisensor detector <SIGA-IPHS> along with a standard, relay or isolator detector mounting base. Provide for variations in duct air velocity between 300 and 4000 feet per minute (300 to 1000 feet per minute for ion-photo-heat detector). Protect the measuring chamber from damage and insects. Provide an air exhaust tube and an air sampling inlet tube which extends into the duct air stream up to ten feet. Provide drilling templates and gaskets to facilitate locating and mounting the housing. Provide five one gang knockouts for mounting optional Signature Series modules. Finish the housing in baked red enamel. Provide remote alarm LEDs <SIGA-LED> and Remote Test Stations <SIGA-DTS> as shown on the plans.
- a. Intelligent Modules - General Operation
33. It shall be possible to address each Intelligent Signature Series module without the use of DIP or rotary switches. Devices using DIP switches for addressing shall not be acceptable. The personality of multifunction modules shall be programmable at site to suit conditions and may be changed at any time using a personality code downloaded from the Analog Loop Controller. Modules requiring EPROM, PROM, ROM changes or DIP switch and/or jumper changes shall not be acceptable. The modules shall have a minimum of 2 diagnostic LEDs mounted behind a finished cover plate. A green LED shall flash to confirm communication with the loop controller. A red LED shall flash

to display alarm status. The module shall be capable of storing up to 24 diagnostic codes which can be retrieved for troubleshooting assistance. Input and output circuit wiring shall be supervised for open and ground faults. The module shall be suitable for operation in the following environment:

- a. Temperature: 32°F to 120°F (0°C to 49°C)
 - b. Humidity: 0-93% RH, non-condensing
34. Single Input Module, SIGA-CT1
35. Provide intelligent single input modules <SIGA-CT1>. The Single Input Module shall provide one (1) supervised Class B input circuit capable of a minimum of 4 personalities, each with a distinct operation. The module shall be suitable for mounting on North American 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square boxes with 1-gang covers. The single input module shall support the following circuit types:
- a. Normally-Open Alarm Latching (Manual Stations, Heat Detectors, etc.)
 - b. Normally-Open Alarm Delayed Latching (Waterflow Switches)
 - c. Normally-Open Active Non-Latching (Monitor, Fans, Dampers, Doors, etc.)
 - d. Normally-Open Active Latching (Supervisory, Tamper Switches)
36. Dual Input Module, SIGA-CT2 Provide intelligent dual input modules <SIGA-CT2>. The Dual Input Module shall provide two (2) supervised Class B input circuits each capable of a minimum of 4 personalities, each with a distinct operation. The module shall be suitable for mounting on North American 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square boxes with 1-gang covers. The dual input module shall support the following circuit types:
- a. Normally-Open Alarm Latching (Manual Stations, Heat Detectors, etc.)
 - b. Normally-Open Alarm Delayed Latching (Waterflow Switches)
 - c. Normally-Open Active Non-Latching (Monitor, Fans, Dampers, Doors, etc.)
 - d. Normally-Open Active Latching (Supervisory, Tamper Switches)
37. Monitor Module, SIGA-MM1 Provide intelligent monitor modules <SIGA-MM1>. The Monitor Module shall be factory set to support one (1) supervised Class B Normally-Open Active Non-Latching Monitor circuit. The monitor module shall be suitable for mounting on North American 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square boxes with 1-gang covers.
38. Waterflow/Tamper Module, SIGA-WTM Provide intelligent waterflow/tamper modules <SIGA-WTM>. The Waterflow/Tamper Module shall be factory set to support two (2) supervised Class B input circuits. Channel A shall support a Normally-Open Alarm Delayed Latching Waterflow Switch circuit. Channel B shall support a Normally-Open Active Latching Tamper Switch. The waterflow/tamper module shall be suitable for mounting on North American 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square boxes with 1-gang covers.
39. Single Input Signal Module, SIGA-CC1 Provide intelligent single input signal modules <SIGA-CC1>. The Single Input (Single Riser Select) Signal Module shall provide one (1) supervised Class B output circuit capable of a minimum

of 2 personalities, each with a distinct operation. When selected as a telephone power selector, the module shall be capable of generating its own "ring tone". The module shall be suitable for mounting on North American 2 ½" (64mm) deep 2-gang boxes and 1 ½" (38mm) deep 4" square boxes with 2-gang covers, or European 100mm square boxes. The single input signal module shall support the following operations:

- a. Audible/Visible Signal Power Selector (Polarized 24 Vdc @ 2A, 25Vrms @50w or 70 Vrms @ 35 Watts of Audio)
40. Dual Input Signal Module, SIGA-CC2 Provide intelligent dual input signal modules <SIGA-CC2>. The Dual Input (Dual Riser Select) Signal Module shall provide a means to selectively connect one of two (2) signaling circuit power risers to one (1) supervised output circuit. The module shall be suitable for mounting on North American 2 ½" (64mm) deep 2-gang boxes and 1 ½" (38mm) deep 4" square boxes with 2-gang covers, or European 100mm square boxes. The dual input signal module shall support the following operation:
- a. Audible/Visible Signal Power Selector (Polarized 24 Vdc @ 2A, 25 Vrms @ 50w or 70 Vrms @ 35w of Audio)
41. Control Relay Module, SIGA-CR Provide intelligent control relay modules <SIGA-CR>. The Control Relay Module shall provide one form "C" dry relay contact rated at 2 amps @ 24 Vdc to control external appliances or equipment shutdown. The control relay shall be rated for pilot duty and releasing systems. The position of the relay contact shall be confirmed by the system firmware. The control relay module shall be suitable for mounting on North American 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square boxes with 1-gang covers.
42. Universal Class A/B Module, SIGA-UM Provide intelligent class A/B modules <SIGA-UM>. The Universal Class A/B Module shall be capable of a minimum of fifteen (15) distinct operations. The module shall be suitable for mounting on North American 2 ½" (64mm) deep 2-gang boxes and 1 ½" (38mm) deep 4" square boxes with 2-gang covers, or European 100mm square boxes. The universal class A/B module shall support the following circuit types:
- a. Two (2) supervised Class B Normally-Open Alarm Latching.
 - b. Two (2) supervised Class B Normally-Open Alarm Delayed Latching.
 - c. Two (2) supervised Class B Normally-Open Active Non-Latching.
 - d. Two (2) supervised Class B Normally-Open Active Latching.
 - e. One (1) form "C" dry relay contact rated at 2 amps @ 24 Vdc.
 - f. One (1) supervised Class A Normally-Open Alarm Latching.
 - g. One (1) supervised Class A Normally-Open Alarm Delayed Latching.
 - h. One (1) supervised Class A Normally-Open Active Non-Latching.
 - i. One (1) supervised Class A Normally-Open Active Latching.
 - j. One (1) supervised Class A 2-wire Smoke Alarm Non-Verified.
 - k. One (1) supervised Class B 2-wire Smoke Alarm Non-Verified.
 - l. One (1) supervised Class A 2-wire Smoke Alarm Verified
 - m. One (1) supervised Class B 2-wire Smoke Alarm Verified
 - n. One (1) supervised Class A Signal Circuit, 24Vdc @ 2A.
 - o. One (1) supervised Class B Signal Circuit, 24Vdc @ 2A.

43. Intelligent Manual Pull Stations - General Operation It shall be possible to address each Signature Series fire alarm pull station without the use of DIP or rotary switches. Devices using DIP switches for addressing shall not be acceptable. The manual stations shall have a minimum of 2 diagnostic LEDs mounted on their integral, factory assembled single or two stage input module. A green LED shall flash to confirm communication with the loop controller. A red LED shall flash to display alarm status. The station shall be capable of storing up to 24 diagnostic codes which can be retrieved for troubleshooting assistance. Input circuit wiring shall be supervised for open and ground faults. The fire alarm pull station shall be suitable for operation in the following environment:
 - a. Temperature: 32°F to 120°F (0°C to 49°C)
 - b. Humidity: 0-93% RH, non-condensing
44. Manual Pull Station, SIGA-270, SIGC-270F, SIGC-270B Provide intelligent single action, single stage fire alarm stations <SIGA-270> <SIGC-270F> <SIGC-270B>. The fire alarm station shall be of metal construction with an internal toggle switch. Provide a locked test feature. Finish the station in red with silver "PULL IN CASE OF FIRE" <English> <French> <English/French Bilingual> lettering. <The station shall be marked "LOCAL ALARM".> The manual station shall be suitable for mounting on North American 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square boxes with 1-gang covers.
45. Double Action Manual Pull Station, SIGA-278 Provide intelligent double action, single stage fire alarm stations <SIGA-278>. The fire alarm station shall be of lexan construction with an internal toggle switch. Provide a key locked test feature. Finish the station in red with white "PULL IN CASE OF FIRE" lettering. The manual station shall be suitable for mounting on North American 2½" (64mm) deep 1-gang boxes and 1½" (38mm) deep 4" square boxes with 1-gang covers.
46. 2-Stage (Presignal) Manual Pull Station, SIGA-270P, SIGC-270PB Provide intelligent single action, two stage fire alarm stations <SIGA-270P> <SIGC-270PB>. The fire alarm station shall be of metal construction with an internal toggle switch for first stage alarm and key switch for second stage alarm. Provide a locked test feature. Finish the station in red with silver "PULL IN CASE OF FIRE" <English> <English/French Bilingual> lettering. The manual station shall be suitable for mounting on a North American 1½" (38mm) deep, 4" square box with ½" (13mm) raised cover.

EE. Conventional Fire Alarm Initiating Devices

1. Manual Pull Stations Manual Pull Station, 270 Series Provide single action, <single> <two> stage fire alarm stations. The fire alarm station shall be of metal construction with an internal toggle switch. Provide a locked test feature to permit transmission of an alarm for fire drills or tests. Finish the station in red with silver "PULL IN CASE OF FIRE" lettering. <Provide a key operated switch for general alarm activation. Key all stations alike.> The manual station shall be suitable for mounting on North American 4" square boxes with 1-gang 1/2" raised covers.
2. Manual Pull Stations, 276/277 Series Provide single action, fire alarm stations with <screw terminals (276B series)> <6" wire leads (277B series)> for

- connection of installation wiring. All stations shall be break glass type. The station shall be constructed of red lexan with white raised letters.
3. The alarm handle shall be marked "PULL FOR FIRE", to provide simple, concise instructions for activation of the station by the general public. Pulling the alarm handle shall break a glass rod and activate a toggle switch which shall cause the handle to latch in the alarm position. Momentary push button type switches shall not be acceptable. To reset the station it shall be necessary to open the station using <a key> <a special tool>, restore the toggle switch to its normal position and replace the glass rod. <Provide a general alarm key switch for second stage operation. All stations shall be keyed alike.>
 4. Double-Action Manual Pull Stations Provide double action, single stage fire alarm stations with <screw terminals (278B series)> <6" wire leads (279B series)> for connection of installation wiring. All stations shall be break glass type. The station shall be constructed of red lexan with white raised letters.
 5. The alarm handle shall be marked "PULL FOR FIRE", to provide simple, concise instructions for activation of the station by the general public. It shall be necessary to first lift an upper door marked "LIFT THEN PULL HANDLE" to gain access the alarm handle. Pulling the alarm handle shall break a glass rod and activate a toggle switch which shall cause the handle to latch in the alarm position. Momentary push button type switches shall not be acceptable. To reset the station it shall be necessary to open the station using <a key> <a special tool>, restore the toggle switch to its normal position and replace the glass rod. <Provide a general alarm key switch for second stage operation. All stations shall be keyed alike.>
 6. Heat Detectors
 - a. Combination Fixed Temperature/Rate-of-Rise Heat Detectors, 281B, 282B
 - 1) Provide low profile heat detectors rated for a maximum smooth ceiling rating of <2500 sq. ft.> <232 m2>. The detector shall be finished pure white and have a positive identification for the operation of the fixed temperature element. The detectors shall be rated at <15°F (9°C) per minute rate-of-rise and 135°F (57°C) fixed temperature.> <15°F (9°C) per minute rate-of-rise and 194°F (88°C) fixed temperature.>
 - b. Fixed Temperature Heat Detectors, 283B, 284B
 - 1) Provide low profile heat detectors rated for a maximum smooth ceiling rating of <2500 sq. ft.> <232 m2>. The detector shall be finished pure white and have a positive identification for the operation of the fixed temperature element. The detectors shall be rated at <135°F (57°C) fixed temperature.> <194°F (88°C) fixed temperature.>
 7. Smoke Detectors
 - a. Ionization Smoke Detectors, 6250 Series

- 1) Provide stable, solid state, unipolar ionization detectors capable of detecting visible and invisible products of combustion. Provide the detectors with a measuring chamber and a protected reference chamber sensitive to changes in temperature and humidity only. Protect the measuring chamber from damage and insects. Provide a built-in five second delay to minimize alarms due to transient smoke. Safeguard radioactive parts and protect circuitry against electrical transients, electromagnetic interference, and polarity reversal.
 - 2) Factory set the detector sensitivity and provide for field adjustment within the range of ULI defined sensitivity. <Connect remote LED alarm indicators where shown on the plans.> The detector shall be tamper resistant plug mounted to a separate base. A built-in shorting device shall permit checking of the installation wiring before detector installation. Provide a concealed test switch to allow full logical testing without the use of smoke or aerosol spays.
- b. Photoelectric Smoke Detectors, 6270 Series
- 1) Provide stable, solid state, photoelectric detectors capable of detecting visible products of combustion. Provide the detectors with self-compensating circuitry to protect its stability against the effects of aging, dust and film accumulation. Protect the measuring chamber from damage and insects. Provide a built-in five second delay to minimize alarms due to transient smoke. Safeguard and protect circuitry against electrical transients, electromagnetic interference, and polarity reversal.
 - 2) Factory set the detector sensitivity. <Connect a remote LED alarm indicator where shown on the plans.> The detector shall be tamper resistant plug mounted to a separate base. A built-in shorting device shall permit checking of the installation wiring before detector installation. Provide a concealed test switch to allow full logical testing without the use of smoke or aerosol spays. <Provide an auxiliary 135oF (57oC) fixed temperature heat detector.>
- c. Air Duct Smoke Detectors, 6260A-100
- 1) Provide stable, solid state, <unipolar ionization (6264B-001)> <photoelectric (6266B-001)> air duct smoke detector heads capable of detecting visible and invisible products of combustion. Provide the detectors with a measuring chamber and a protected reference chamber sensitive to changes in temperature and humidity only. Protect the measuring chamber from damage and insects. Provide a built-in five second delay to minimize alarms due to transient smoke.
 - 2) Variations in duct air velocity between 400 and 4,000 FPM (2 and 20.3 m/sec.) shall not cause any false alarms. Safeguard radioactive parts and protect circuitry against electrical transients, electromagnetic interference, and polarity reversal. Factory set the detector sensitivity. Mount the detectors head in an enclosure

suitable for mounting to a air duct. Provide an air sampling tube that extends into the duct air stream. <Provide a LED alarm indicator on the enclosure> <and a key operated alarm indicator/test switch.>

8. Notification Appliances

a. General

- 1) All appliances shall be U.L. Listed for Fire Protective Service.
- 2) All strobe appliances or combination appliances with strobes shall be capable of providing the "Equivalent Facilitation" which is allowed under the Americans with Disabilities Act Accessibilities Guidelines (ADA(AG)), and shall be UL 1971, and ULC S526 Listed.
- 3) All appliances shall be of the same manufacturer as the Fire Alarm Control Panel specified to insure absolute compatibility between the appliances and the control panels, and to insure that the application of the appliances are done in accordance with the single manufacturers' instructions.
- 4) Any appliances which do not meet the above requirements, and are submitted for use must show written proof of their compatibility for the purposes intended. Such proof shall be in the form of documentation from all manufacturers which clearly states that their equipment (as submitted) are 100% compatible with each other for the purposes intended.

9. Self-Synchronized Strobes

a. 1-Gang Strobes, Genesis Series

- 1) Provide strobes manufactured by EST, Cat No. G1RF-VM. In - Out screw terminals shall be provided for wiring. The strobes shall have a <red> plastic face plate. They shall provide <15 cd> <30 cd> <60 cd> <110 cd> synchronized flash outputs. Strobes shall mount in a North American 1-gang box.

10. Cone Speaker/Strobes

a. Wall Mount, Genesis G4 Series

- 1) Provide speaker/strobes with a 4" mylar cone as manufactured by EST, Cat. No. G4RF-S2VM. Paper type cones are not acceptable. The rear of the speaker shall be completely sealed protecting the cone during and after installation. In - Out screw terminals shall be provided for wiring. Speaker/strobe housings shall be <red>. Speakers shall be provided for use with <25V> systems. Speakers shall provide power taps at 1/4w, 1/2w, 1w, and 2w. Speaker/strobes shall provide UL confirmed 87 dBA sound output at 2w.

- 2) Strobes shall provide <15 cd> <15/75 cd> <30 cd> <110 cd> synchronized flash output.
- 3) Speaker/strobes shall mount in a North American 4" electrical box.

11. Ancillary Devices

- a. Remote Relays
- b. Multi Voltage Control Relays, MR-100 Series
 - 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings shall be SPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 24 Vdc, 24 Vac, 115 Vac, or 230 Vac. A red LED shall indicate the relay is energized. <A metal enclosure shall be provided.>
- c. Multi Voltage Control Relays, MR-200 Series
 - 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings shall be DPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 24 Vdc, 24 Vac, 115 Vac, or 230 Vac. A red LED shall indicate the relay is energized. <A metal enclosure shall be provided.>
- d. Multi Voltage Control Relays, MR-700 Series
 - 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings shall be SPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 12 Vdc, 12 Vac, 24 Vdc, or 24 Vac. A red LED shall indicate the relay is energized.
- e. Multi Voltage Control Relays, MR-800 Series
 - 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings shall be SPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 24 Vdc, or 24 Vac, or 115 Vac. A red LED shall indicate the relay is energized.
- f. Manual Override Control Relays, MR-600 Series
 - 1) Provide remote control relays each with manual override feature connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings shall be SPDT and rated for 10 amperes at 115 Vac or 24 Vdc. A single relay may be energized from a voltage source of 24 Vdc or 24 Vac. A red LED shall indicate the relay is energized.

- g. Heavy Duty Power Relays, MR-199 Series
 - 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings shall be DPDT and rated for 30 amperes at 300 Vac or 2 HP motor load. A single relay may be energized from a voltage source of <24 Vac> <115 Vac>. <A metal enclosure shall be provided.>

- 12. Electromagnetic Doorholders, 1500 Series
 - a. Floor Mounted, 1501/1502 Series
 - 1) Provide <single door> <double door> floor mounted electromagnetic doorholder/releases rated at <12 Vdc> <24 Vac/dc> <120 Vac> input. Finish shall be brushed zinc.

 - b. Wall Mounted, 1504/1505/1508/1509 Series
 - 1) Provide <flush> <semi-flush> <surface> wall mounted electromagnetic doorholder/releases rated at <12 Vdc> <24 Vac/dc> <120 Vac>. Finish shall be brushed zinc.

PART 3 - EXECUTION

3.1 GENERAL

- A. The entire system shall be installed in a workmanlike manner in accordance with approved manufacturers manuals and wiring diagrams. The contractor shall furnish all conduit, wiring, outlet boxes, junction boxes, cabinets and similar devices necessary for the complete installation. All wiring shall be of the type recommended by the NEC, approved by local authorities having jurisdiction for the purpose, and shall be installed in dedicated conduit throughout.

- B. All penetration of floor slabs and fire walls shall be fire stopped in accordance with all local fire codes.

- C. End of Line Resistors shall be furnished as required for mounting as directed by the manufacturer.

- D. All wiring shall be installed according to NEC standards per the drawings submitted by the authorized Engineered Systems Distributor, unless otherwise noted.

- E. Field Quality Control
 - 1. The system shall be installed and fully tested under the supervision of trained manufacturer's representative and in accordance with NFPA 1996 72H. The system shall be demonstrated to perform all the functions as specified.
 - 2. General Testing

- a. Intelligent analog devices shall be tested for correct address and sensitivity using test equipment specifically designed for that purpose. These devices and their bases shall be tagged with adhesive tags located in an area not visible when installed, showing the system address, initials of the installing technician and date.
- b. Wiring runs shall be tested for continuity, short circuits and grounds before system is energized. Resistance, current and voltage readings shall be made as work progresses.
 - 1) A systematic record shall be maintained of readings using schedules or charts of tests and measurements. Areas shall be provided on the logging form for readings, dates and witnesses.
 - 2) The acceptance inspector shall be notified before the start of the required tests. Items found at variance with the drawings or this specification during testing or inspection by the acceptance inspector, shall be corrected.
 - 3) Test reports shall be delivered to the acceptance inspector as completed.
- c. Test equipment, instruments, tools and labor required to conduct the system tests shall be made available by the contractor. The following equipment shall be a minimum for conducting the tests:
 - 1) Ladders and scaffolds as required to access installed equipment.
 - 2) Multi-meter for reading voltage (current and resistance).
 - 3) Intelligent device programmer/tester.
 - 4) Laptop computer with programming software for any required program revisions.
 - 5) Two way radios, flashlights, smoke generation devices and supplies.
 - 6) Spare printer paper.
 - 7) A manufacturer recommended device for measuring air flow through air duct smoke detector sampling assemblies.
 - 8) Decibel meter.
- d. In addition to the testing specified to be performed by the contractor, the installation shall be subject to test by the acceptance inspector.
- e. System wiring: Fire alarm circuits shall be tested for continuity, grounds, and short circuits.

3.2 ACCEPTABLE INSTALLERS

- A. The Fire Alarm / Life Safety System specified herein shall be installed by a Factory Trained and Authorized Engineered Systems Distributor.
- B. Field Connected Devices may be installed and wired, and primary power may be wired by licensed contractors under the direct supervision of a Factory Trained and Authorized Engineered Systems Distributor.

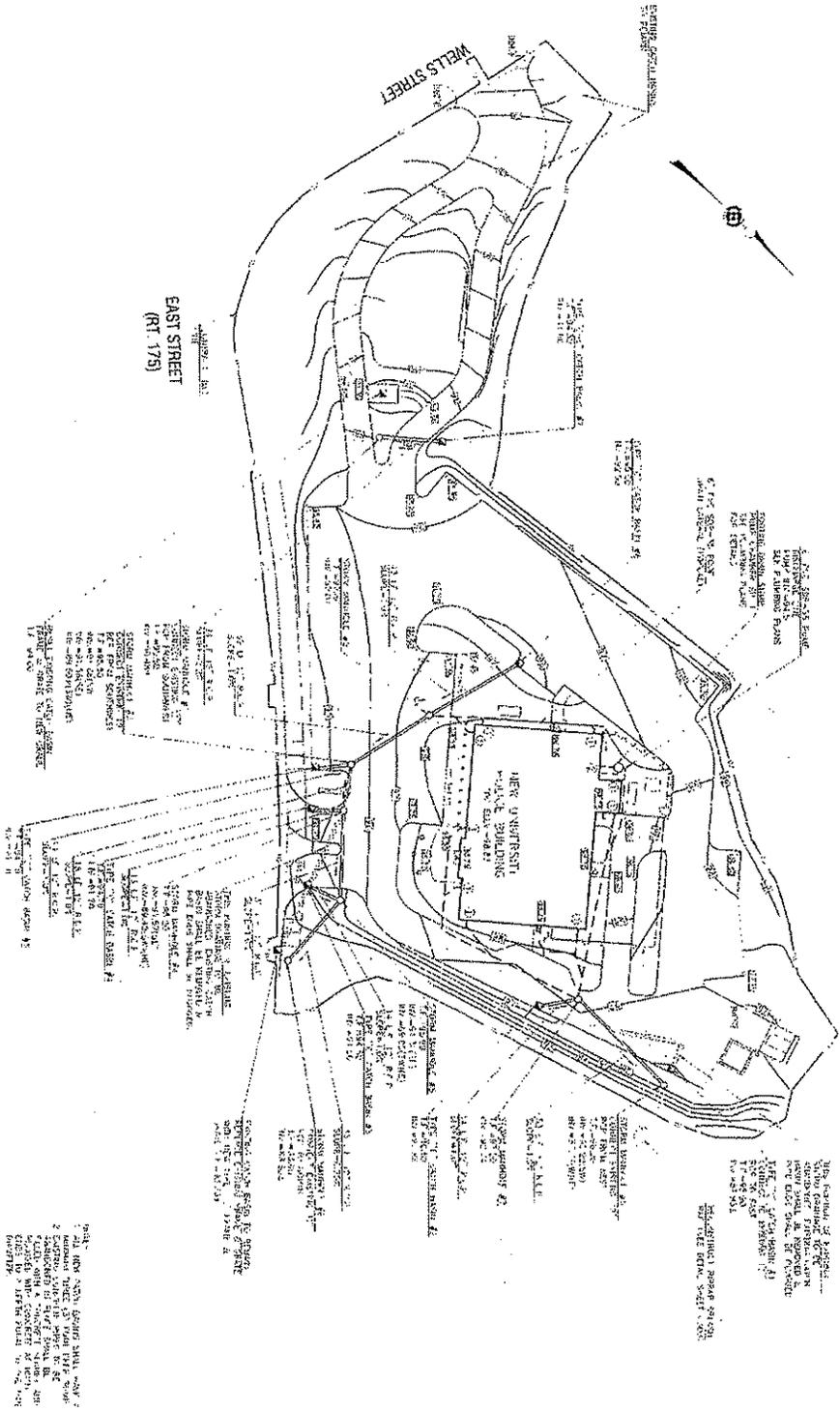
3.3 EXAMINATION

- A. Prior to the commencement of any of the work detailed herein, an examination and analysis of the area(s) where the Fire Alarm / Life Safety System and all associated components are to be installed shall be made.
- B. Any of these area(s) which are found to be outside the manufacturers' recommended environments for the particular specified products shall be noted on a Site Examination Report which shall be given to the Building Owners' Representative, and the local AHJ.
- C. Any shorts, opens, or grounds found on existing wiring shall be corrected prior to the connection of these wires to any panel component or field device.

3.4 DEMONSTRATION

- A. Each of the intended operations of the installed Fire Alarm / Life Safety System shall be demonstrated to the Building Owners' Representative and the Local Authority Having Jurisdiction by the Installing ESD. Training shall consist of (2) 4 hour sessions by the fire alarm manufacturer for owner personnel on the operation and maintenance of all provided equipment. Session shall be digitally recorded by contractor and turned over to owner upon completion.

END OF SECTION



- 1. NORTH - PLANNED - 9.48' SEE CONTIGUOUS
- 2. NORTH - PLANNED - 9.48' SEE CONTIGUOUS
- 3. SOUTH - PLANNED - 9.48' SEE CONTIGUOUS
- 4. SOUTH - PLANNED - 9.48' SEE CONTIGUOUS



STATE OF CONNECTICUT DEPARTMENT OF CONSTRUCTION DIVISION OF PLANNING AND ZONING	
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New Public Safety Building at Central Conn. State University
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ARCHITECTS

PERKINS + WILL

600 N. LAUREL STREET
 CHICAGO, ILL. 60610

**New University Police Building
Central Connecticut State University
New Britain, Connecticut**

**Report on
Geotechnical Engineering Investigation**

January 9, 2004

**Prepared By:
Gibble Norden Champion Brown
Consulting Engineers, Inc.
Old Saybrook, Connecticut**

**Prepared For:
Ai
Essex, Connecticut**

January 9, 2004

Ms. Katherine Faulkner
Ai
8 Railroad Avenue, Suite 8
Essex, Connecticut 06426-1515

Re: New University Police Building
Central Connecticut State University
East and Wells Streets
New Britain, Connecticut

Dear Katie:

This report summarizes the results of recent test borings and foundation design studies for the New University Police Building to be constructed at Central Connecticut State University (CCSU) in New Britain, Connecticut. Our work was undertaken in accordance with our contract agreement dated September 5, 2003.

In summary, the results of six test borings indicate that subsurface conditions typically consist of a 5.5 to 8 ft. thick surface layer of man-placed fill, that is underlain by alluvium deposits consisting of medium to fine sand, fine sand, and silt; within the south and east portions of the building, the upper portion of the alluvium contains trace amounts of roots. Groundwater was recently measured at a depth of 12 ft., corresponding to El. 82.5. We recommend that the proposed building be supported on reinforced concrete spread footings bearing on the naturally-deposited alluvium or on compacted structural fill placed on the suitable bearing soils. In view of the proximity of groundwater, we recommend that perimeter and underslab drains be provided below the basement slab, provided the drains can be carried to a suitable gravity outlet; alternatively the slab may need to be designed for a hydrostatic condition and waterproofed.

Ai
January 9, 2004
Page 2

We expect that the approximately 11 to 15 ft. deep excavations required for the basement and to remove man-placed fill within the non-basement areas, can be made by open cut slope. Some dewatering, particularly at the elevator area, will be needed to permit the work to proceed in-the-dry.

Please call if you have any questions or need additional information.

Sincerely yours,

David L. Freed, PE
Geotechnical Associate

c. Purcell Associates (Attn: Paul Bellagamba)
GNCB (Attn: Charles Brown)

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V. Subsurface and Groundwater Conditions	4
VI. Foundation Design and Construction	5
VII. Construction Considerations	10
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I - Summary of Test Borings

Drawings:

1 - Project Locus

2 - Test Boring Plan

3 - Limits of Compacted Structural Fill Below Footings

Appendix A:

Test Boring Logs (B-1 to B-6)

Appendix B:

Technical Provisions of Specifications for Compacted Structural Fill

I. PURPOSE AND SCOPE:

The purpose of this study was to investigate soil and groundwater conditions at the site and to develop foundation design recommendations for the proposed structure. Comments on geotechnical engineering aspects of project construction are also provided.

To achieve these objectives, Gibble Norden Champion Brown Consulting Engineers, Inc. (GNCB) completed the following scope of work:

- Developed and monitored a program of six test borings (B-1 to B-6) and one groundwater observation well (at B-4).
- Conducted engineering analyses on soil bearing capacity, settlement, lateral earth pressures, seismic requirements, and other aspects of project design.
- Prepared an engineering report that summarizes the work completed.

II. SITE LOCATION AND SURFACE CONDITIONS:

The project site is located on the north side of East Street (Route 175) just east of its intersection with Wells Street, in New Britain, Connecticut. The approximate location of the site, which is at the east end of the CCSU campus and just south of the athletic complex, is shown on Drawing 1, "Project Locus."

The site currently serves as a contractor staging area for several local university projects. The area is paved and construction trailers border the west side of the site. Ground surface slopes upward from east to west, ranging from about El. 93

to El. 97 within the new building limits. (Note that elevations are in feet and refer to NAVD 88).

Bass Brook, which flows to the south, borders the east side of the property. This water body passes below East Street within a concrete box culvert. Water level within the brook, at the street crossing, is at about El. 80; we understand that the 100-yr flood level of the brook is at El. 88.1. A significant concentration of utilities, which consist of below grade manhole and junction box structures, exist at the west end of the site, near the intersection of East and Wells Streets. However, active utilities east of this area pass around the site perimeter. An abandoned fire protection line exists just south of the proposed building.

III. PROPOSED CONSTRUCTION:

The project consists of a rectangular shaped, two-story, main structure with a basement, and a connecting rectangular one-story extension, with carport, north of the main structure. The total building footprint is about 6,400 sq. ft. We understand that the building finish first floor and basement slab levels, will be at El. 96.9 and El. 83.6, respectively. An elevator in the basement will have a slab grade at El. 79.6. The approximate location of the proposed building, as well as the locations of existing utilities and ground surface elevations, is shown on Drawing 2, "Test Boring Plan."

Structural framing for the new building consists of perimeter load-bearing masonry walls, above ground, with reinforced concrete basement walls below grade. Some individual internal column footings will be needed. Our structural engineers indicate that perimeter load bearing walls will have a dead plus live load of approximately 4 kips per linear ft.; the individual column loads will be less than 40 kips.

IV. SUBSURFACE INVESTIGATIONS:

For foundation design, GNGB recommended a program of six test borings (B-1 to B-6). These explorations were drilled on December 1, 2003 at the approximate locations shown on Drawing 2. GNGB monitored the field work, located the borings in the field by taping from existing site features, and estimated ground surface elevations by interpolating the contours shown on the base plan reference on Drawing 2. Table I summarizes the subsurface conditions at each test boring; detailed soil descriptions are contained in the following report section. Logs of the test borings, prepared by the contractor and reviewed by GNGB, are included as Appendix A.

General Borings, Inc. of Prospect, Connecticut, under contract to GNGB, drilled the test borings using a truck rig to advance 3-1/4 in. inside diameter hollow stem augers. Soil samples (ASTM D 1556) were obtained generally at 5 ft. intervals; some continuous sampling was completed within the upper 16 ft. at some locations. The test borings ranged in depth from 12 to 26 ft. All the test borings terminated within naturally-deposited inorganic granular soil.

At the completion of test boring B-4, a 2 in. diameter groundwater observation well was installed. The well point tip is set at El. 74.0; the bottom 10 ft. of the well is slotted. The slotted portion of the well is backfilled with fine filter sand; a bentonite seal was placed above the screened portion and the remaining well riser pipe backfilled with borehole cuttings. A surface roadway box permits access to the well. GNGB measured the following water levels within the well:

<u>Date</u>	<u>Elevation of Water (ft.)</u>
17 Dec 03	81.7
31 Dec 03	82.5

V. SUBSURFACE AND GROUNDWATER CONDITIONS:

A. Subsurface Conditions:

The test borings indicated at least three subsurface units; the main soil unit, an alluvium, is separated into an upper and lower strata. Conditions are summarized below, progressing downward from ground surface:

<u>Range in Thickness (ft.)</u>	<u>Description</u>
5.5 – 8.5	Medium dense-brown to dark brown silty fine SAND, little gravel to silty coarse to fine SAND, trace gravel (MAN-PLACED FILL)
0.0 –9.0 (B-4, B-5, and B-6 only)	Medium Dense brown to dark brown silty fine SAND to fine sandy SILT, trace gravel and trace roots, slight organic odor (UPPER ALLUVIUM)
At least 3.5 to up to 9.0 (at B-5)	Dense brown silty medium to fine SAND, trace gravel to stratified fine sandy SILT and coarse to fine SAND (LOWER ALLUVIUM)
5.5 ft. (at B-4 only)	Very dense brown coarse to fine sandy SILT to red-brown medium to fine SAND with decomposed gravel (GLACIAL TILL)

The thickness of man-placed fill appears to decrease from west to east. The asphalt within paved areas is 3 in. thick. The upper alluvium material, which contains trace roots and has a slight organic odor in a few locations, was only encountered within the center and south end of the proposed building, at B-4, B-5, and B-6. The elevation of the top of alluvium, as shown by contours on Drawing 2, is at about El. 88, within the west end of the proposed building and slopes down to about El. 85.5, within the east corner of the building, towards the brook.

B. Groundwater Conditions:

Groundwater within the observation well has ranged from El. 81.7 to El. 82.5. Water levels observed at the completion of the test borings are noted on the logs and are summarized on Table 1. However, the water levels within the test borings may not be representative of the actual static groundwater level since they were made over a short period of time and may not have stabilized. It appears, though, that groundwater flows from west to east, towards the brook. In springtime, we anticipate that groundwater may be slightly above the current levels; we plan to continue monitoring the water level within the observation well.

In any event, water levels vary with precipitation, season, and other factors. As a result, water levels encountered during and after construction may differ from those observed in the observation well and explorations.

VI. FOUNDATION DESIGN AND CONSTRUCTION:

A. Building Foundations and Lowest Slab:

The man-placed fill is not suitable to support the building frame or ground floor slab. We recommend that building columns be supported on reinforced

concrete spread footings bearing on the naturally-deposited alluvial soil. The recommended general design criteria follow:

1. Design in accordance with the applicable provisions of the current edition of the State of Connecticut Building Code.
2. Locate bottoms of footings at least 3.5 ft. below exterior ground surface exposed to freezing.
3. Proportion footings for an allowable soil bearing pressure of 4 kips per sq. ft. (ksf), provided they are at least 3 ft. wide. Footings that bear directly on the upper alluvium soil (see comments below) should be placed on a minimum 12 in. thick layer of compacted structural fill.
4. Where compacted structural fill is used to support footings (see comments below), carry the foundation preparation and fill to lateral limits extending a distance beyond the edge of the footing equal to the depth of fill below footing plus two feet. This criteria is shown on Drawing 3.
5. We anticipate that footings will settle about 3/4 in. due to the static load with a differential settlement between individual footings of 0.5 in. or less. Settlement is expected to occur as the load is applied.
6. Provide a minimum 9 in. thick layer of compacted structural fill below the ground floor slab; special stone fill is needed below the basement slab as discussed below for underslab drains. Prior to placing this layer, recompact the existing subgrade with at least 6 passes of a vibratory roller that weighs at least 10 tons. Replace any soils that are visually unstable with compacted structural fill.

Based on the test boring information, we anticipate that the existing fill and most of the upper alluvium material will be removed from the portion of the building that has a basement. However, footings within the south end of the building, in the vicinity of B-5, will bear on the upper alluvium, where it is recommended that footings bear on a minimum 12 in. thickness of compacted structural fill. The top of the alluvium material within the one-story building, where basement is planned, ranges from 8 to up to 11 ft. below the first floor grade. Accordingly, footings within this area will be supported on compacted structural fill after removing the man-placed fill.

B. Perimeter and Underslab Drains:

Within the portion of the structure having a basement, groundwater is within a few feet of the finish basement slab. In order to keep the basement walls dry and to minimize build-up of hydrostatic pressure, we recommend that a perimeter and underslab drain system be installed adjacent to any below grade foundation walls, and the walls should be damp proofed. The perimeter and underslab drains should be separately connected to a suitable gravity outlet.

The perimeter drain should consist of a perforated 6 in. diameter pipe, surrounded by successive 6 in. thick layers of 3/4 in. size crushed stone and compacted structural fill. In addition, a minimum 3 ft. wide zone of compacted structural fill is required adjacent to the foundation wall. At ground surface, a 6 in. thick layer of impervious soil should be placed over the drainage zone to minimize surface water flow into the foundation drain.

Below the basement slab, drainage should consist of a 12 in. thick layer of 3/4 in. size crushed stone that is underlain by a filter fabric material. Within the center of the crushed stone layer, a series of 4 in. diameter perforated drains, spaced about 30 ft. apart, should be placed.

In the event that a suitable gravity outlet cannot be provided, it will be necessary to design the basement floor slab for a maximum groundwater level. Without additional groundwater levels, we suggest at this time a design groundwater level at El. 85. For this alternate, the basement slab would need to be waterproofed below El. 85 and the slab designed to resist a hydrostatic uplift force equivalent to about 3 or 4 ft. of water.

Regardless of the alternate that is selected, the basement elevator slab should be designed for full hydrostatic uplift pressure, and the walls and slab should be waterproofed.

C. Lateral Earth Pressures:

Basement foundation walls will be backfilled on one side and will require design for lateral soil pressure. In view of the perimeter and underslab drainage, design for hydrostatic pressure is not needed. However, if the alternate is selected, than basement walls below El. 85 would need to be designed for hydrostatic pressure. The design values for non-yielding basement walls, based on an at-rest earth pressure condition, follow:

- retained soil: use an equivalent fluid unit weight of 55 pcf (above water) and 90 psf (below water), plus
- surcharge: use 0.5 times the vertical surcharge load, distributed uniformly over the height of wall, plus
- seismic: use $9.9H$ psf, distributed as a uniform pressure, where H is the height of the wall in feet.

The following additional criteria apply:

- coefficient of friction: use 0.45 for concrete on the natural sand, or on compacted structural fill.
- factors of safety: use 2.0 for overturning and 1.5 for sliding.

D. Seismic Criteria:

We recommend a soil site coefficient (S) equal to 1.0 for seismic design. The natural inorganic soil or compacted structural fill to be placed are not susceptible to liquefaction.

E. Compacted Structural Fill:

Fill for use as compacted structural fill below footings, if needed to replace unsuitable bearing soils, or as fill below the ground floor slabs or adjacent to foundation walls, should consist of sandy gravel or gravelly sand, free of organic material, snow, ice or other unsuitable materials, and should be well graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer By Weight</u>
4 in.	100
No. 4	20 - 80
No. 40	5 - 50
No. 200	0 - 8

Compacted structural fill should be placed in horizontal layers having a maximum loose lift thickness of 10 in. (open areas) or 6 in. (confined areas). Each layer should be compacted to a dry density at least 95 percent of the maximum dry density as determined in accordance with ASTM Test Designation D1557. Structural fill will need to be obtained from off site. We do not anticipate that the existing fill or outwash sands will satisfy the gradation requirements for structural fill.

Appendix B includes recommended technical provisions of specifications for compacted structural fill.

VII. CONSTRUCTION CONSIDERATIONS:

A. General:

This section provides comments related to foundation construction, earthwork, and other geotechnical aspects of the project. It will aid those responsible for preparation of contract plans and specifications and those involved with construction monitoring. The contractor must evaluate potential construction problems on the basis of their own knowledge and experience in the area and on the basis of similar projects in other localities, taking into account their own proposed construction equipment and procedures.

B. Excavation:

Excavation for the basement foundations, or to remove unsuitable man-placed fill within the one-story building, will be made to depths up to 15 ft. The material will consist of sand, silt, and gravel, with some root material. We expect that normal construction equipment will be adequate for excavation.

Excavation geometry should conform to OSHA excavation regulations contained in 29 CFR Part 1926 dated October 31, 1989. Temporary excavation slopes at 1.5 hor: 1 ver should be stable. We anticipate that sufficient room exists for open sloped excavations.

C. Dewatering:

Groundwater is expected to be at or slightly above the level for excavation for basement foundations. Accordingly, the contractor will be expected to install a systematic dewatering system to permit the work to proceed in the dry. We expect that a system of properly filtered wellpoints or deep sumps will be adequate to maintain the dry excavations.

D. Preparation of Bearing Surfaces:

Following footing excavation, we recommend that the bearing surface be recompacted with hand-guided vibratory equipment prior to forming and concreting. However, the recompaction should be waived, if groundwater is near the bearing surface.

E. Construction Monitoring:

The recommendations contained in this report are based on the known and predictable behavior of properly engineered and constructed foundations and other facilities. As part of our agreement for services, GNCB plans to observe on a part-time basis, the preparation of footing bearing surfaces and backfilling activities. Monitoring of this work is intended to observe compliance with the design concepts and specifications and to allow design changes in the event that subsurface conditions differ from those anticipated prior to construction.

IX. LIMITATIONS OF RECOMMENDATIONS:

This report has been prepared for specific application to the New University Police Building project at CCSU in New Britain, Connecticut, in accordance with generally accepted geotechnical engineering practice. No other warranty, express or implied, is made. In the event that any changes in the nature, design, or location of the construction is planned, the conclusions and recommendations contained in the report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyses and recommendations in this report are based in part upon data obtained from the referenced test borings. The nature and extent of variations between the explorations may not become evident until construction. If

variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

GNCB plans to perform a general review of the final design, contract drawings and specifications in order to confirm that our earthwork and foundation recommendations have been properly interpreted and implemented as they were intended.

Tables

I - Summary of Test Borings

TABLE I

SUMMARY OF TEST BORINGS

NEW UNIVERSITY POLICE BUILDING
 AT CENTRAL CONNECTICUT STATE UNIVERSITY
 NEW BRITAIN, CONNECTICUT

TEST BORING NO.	TOTAL DEPTH (FT.)	ELEV. GROUND SURFACE (FT.)	ELEV. OF WATER (FT.)	THICKNESS OF SOIL (FT.)				ELEV. TOP ALLUVIUM
				FILL	UPPER ALLUVIUM	LOWER ALLUVIUM	GLACIAL TILL	
B-1	13.0	96.0	84.0	8.0	0.0	5.0+	-	88.0
B-2	15.0	93.5	81.5	8.0	0.0	7.0+	-	85.5
B-3	12.0	96.5	86.5	8.5	0.0	3.5+	-	88.0
B-4/OW	26.0	94.5	82.5	5.5	9.0	6.0	5.5+	89.0
B-5	26.0	95.0	82.5	7.5	9.5	9.0+	-	87.5
B-6	21.0	93.5	85.5	6.0	6.5	8.5+	-	87.5

NOTES

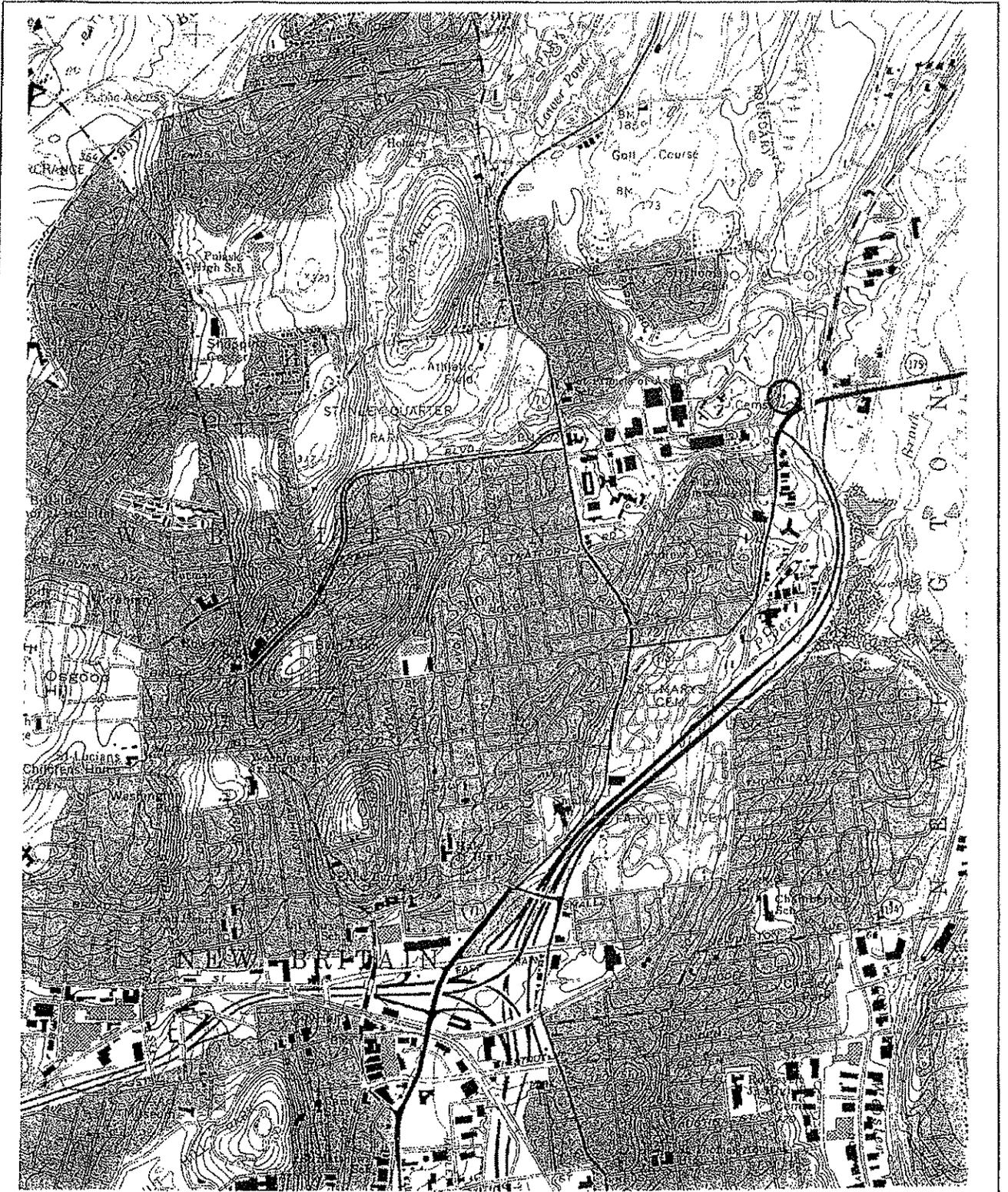
1. Refer to Drawing 2 for location of test borings.
2. Elevations are in feet and refer to NAVD 1988.
3. GNCB monitored the field work.

Drawings

1 – Project Locus

2 – Test Boring Plan

3 – Limits of Compacted Structural Fill Below Footings



PROJECT NO. 03091

SITE COORDINATES: 41° 41' 36" N 72° 45' 37" W



U.S.G.S QUADRANGLE: NEW BRITAIN, CT

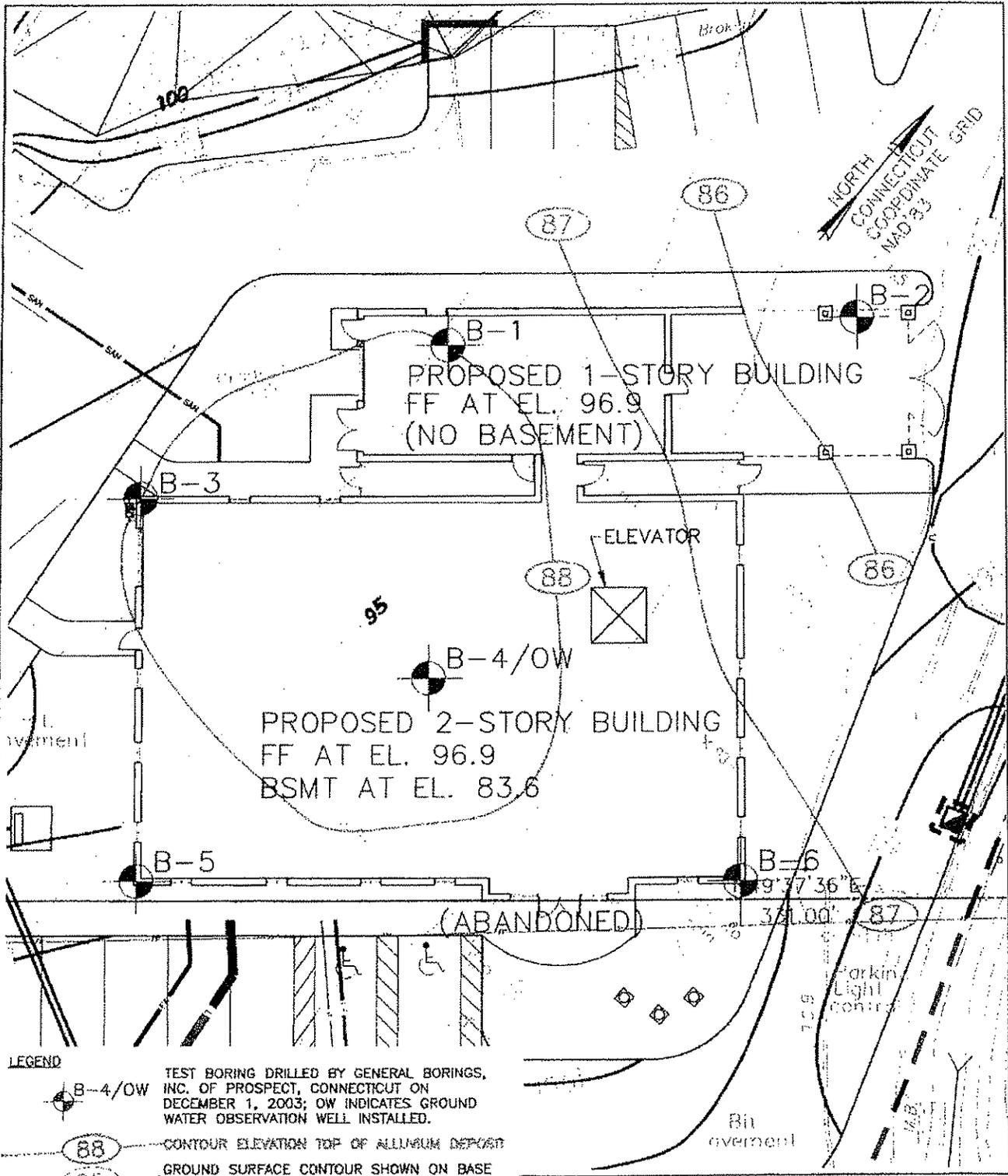
GNCB
 Gable Norden Champion Brown
 Consulting Engineers, Inc.

130 ELM STREET
 POST OFFICE BOX 802
 OLD SAYBROOK
 CONNECTICUT 06475
 PHONE: 860 388 1224
 FAX: 860 388 4613
 GNCBENGINEERS.COM

NEW UNIVERSITY POLICE BUILDING
 AT CCSU
 NEW BRITAIN, CONNECTICUT
 PROJECT LOCUS

APPROX SCALE 1"=2000'

JANUARY 2004



- LEGEND**
- TEST BORING DRILLED BY GENERAL BORINGS, INC. OF PROSPECT, CONNECTICUT ON DECEMBER 1, 2003; OW INDICATES GROUND WATER OBSERVATION WELL INSTALLED.
 - CONTOUR ELEVATION TOP OF ALLUVIUM DEPOSIT
 - GROUND SURFACE CONTOUR SHOWN ON BASE PLAN
 - FINISH GROUND SURFACE SHOWN ON BASE PLAN

- NOTES:**
1. BASE PLAN IS A COPY OF "SITE GRADING AND DRAINAGE PLAN", SHEET C201, DATED 20 OCTOBER 2003 BY AI.
 2. ELEVATIONS ARE IN FEET AND REFER TO NAVD 1988
 3. GIBBLE NORDEN CHAMPION BROWN MONITORED THE TEST BORINGS AND LOCATED THEM IN THE FIELD BY TAPING FROM EXISTING SITE FEATURES.
 4. CONTOUR ELEVATIONS WERE INTERPOLATED FROM TEST BORINGS. ACTUAL TOP OF ALLUVIUM WILL VARY.

GNCB

Gibble Norden Champion Brown
Consulting Engineers, Inc.

130 ELM STREET
POST OFFICE BOX 802
OLD SAYBROOK
CONNECTICUT 06475
PHONE: 860 388 1224
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GNCBENGINEERS.COM

**NEW UNIVERSITY POLICE BUILDING
AT CCSU
NEW BRITAIN, CONNECTICUT
TEST BORING PLAN**

SCALE: 1 IN = 20 FT

JANUARY 2004

Appendix A

**Test Boring Logs
(B-1 to B-6)**

CLIENT:
Gibble Norden Champion Brown
FOREMAN/DRILLER:
John Muccino

General Borings, Inc.
P. O. BOX 7135 PROSPECT, CT 06712

SOIL ENGINEER

INSPECTOR: Garry Jacobsen

PROJECT NAME: New University Police Building

DESIGN ENGINEER

Surface Elevation: 96.0 (approx.)

LOCATION: at CCSU, New Britain, CT

Date Started: 12/1/03

GBI JOB NO. 311-03

Date Finished: 12/1/03

TYPE S Auger H Auger Casing HA Sampler S. S. Core Bar

Hole No. B-1

Groundwater Observations

Size I. D. 3-1/4" 1-3/8"

Line & Station

AT 12.0 AFTER 0.0 HRS

Hammer 140 LBS. Bit

Offset L R

AT AFTER HRS

Fall 30'

N Coordinate

DEPTH

Casing blows per foot

DEPTH IN FEET FROM - TO

SAMPLE NO

PEN IN

REC IN

TYPE

BLOWS PER 6 INCHES ON SAMPLER

STRATA CHANGE: DEPTH, ELEV.

FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)

DEPTH	Casing blows per foot	DEPTH IN FEET FROM - TO	SAMPLE NO	PEN IN	REC IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER				STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
							0-6	6-12	12-18	18-24		
5		1.0-2.7	1	20	12	SS	21	27	23	50/2	7	6" Blacktop and 2" Road Stone
		5.0-5.0	2	0	0	SS	50/0				8.0	1) Very dense-Red-brown silty fine SAND, little fine-medium gravel. 2) No penetration or recovery 3) No penetration or recovery (fil)
10		7.0-7.0	3	0	0	SS	50/0					
		9.0-11.0	4	24	18	SS	9	12	14	15	13.0'	4) Medium-Red-brown silty fine SAND. 5) Very stiff-Red-brown fine sandy SILT.
15		11.0-13.0	5	24	13	SS	11	11	12	13	EOB	END OF BORING 13.0'
20												
25												
30												
35												
40												

From Ground Surface to Feet in Earth 13 Feet Used in Casing Then 0 in. Casing For 3 No. of Samples 3 Hole No. 8-1
 SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON
 PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

CLIENT:		General Borings, Inc.										SHEET 1 OF 1	
Gibble Norden Champion Brown		P. O. BOX 7135 PROSPECT, CT 06712											
FOREMAN/DRILLER:		PROJECT NAME:										SOIL ENGINEER	
John Muccino		New University Police Building											
INSPECTOR:		LOCATION:										DESIGN ENGINEER	
Garry Jacobsen		at CCSU, New Britain, CT											
Surface Elevation:		GBI JOB NO.											
93.5 (approx.)		311-03											
Date Started:		TYPE		S Auger		Casing		Sampler		Core Bar		Hole No.	
12/1/03						HA		S. S.				B-2	
Date Finished:		Size I. D.		H Auger								Line & Station	
12/1/03						3-1/4"		1-3/8"					
Groundwater Observations												Offset L R	
AT 12.0 AFTER 0.0 HRS		Hammer						140 LBS.		Bit		N Coordinate	
		Fall <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td>											
AT								30"				E. Coordinate	
D E P T H	Casing blows per foot	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER				STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)	
		DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	C-6	6-12	12-18	18-24			
5		1.0-3.0	1	24	13	SS	19	31	25	44	7'	8" Blacktop and Road Stone	
		5.0-5.9	2	11	10	SS	23	60/5				1) Very Dense-Red-brown silty coarse-fine SAND, little fine-coarse gravel.	
10		8.0-10.0	3	24	8	SS	2	2	3	14	8.0'	2) Very dense-Same as S-1, little wood. (fill)	
		13.0-15.0	4	24	12	SS	8	14	11	13	15.0'	3) Loose-Red-brown coarse-fine SILT.	
15											15.0'	4) Very stiff-Red-brown sandy SILT. (stratified)	
											EOB	END OF BORING 15.0'	
20													
25													
30													
35													
40													

From Ground Surface to	Feet Used	in. Casing Then	in. Casing For	Feet
Feet In Earth	Feet In Rock			
15	0			
SAMPLE TYPE CODING:		No. of Samples		Hole No.
PROPORTIONS USED:		A = AUGER		B-2
SS = DRIVEN		SOME = 20-35%		4
TRACE = 1-10%		AND = 35-50%		
LITTLE = 10-20%				

CLIENT		General Borings, Inc.										SHEET 1 OF 1	
Gibble Norden Champion Brown		P. O. BOX 7135 PROSPECT, CT 06712											
FOREMAN/DRILLER:		PROJECT NAME:										SOIL ENGINEER	
John Muccino		New University Police Building											
INSPECTOR:		LOCATION:										DESIGN ENGINEER	
Garry Jacobsen		at CCSU, New Britain, CT											
Surface Elevation:		GBI JOB NO.											
96.5 (approx.)		311-03											
Date Started:		TYPE		S Auger		Casing		Sampler		Core Bar		Hole No.	
12/1/03						HA		S. S.				B-3	
Date Finished:		Size I. D.		H Auger								Line & Station	
12/1/03						3-1/4"		1-3/8"					
Groundwater Observations												Offset L R	
AT None		AFTER 0.0 HRS		Hammer				140 LBS.		Bit		N Coordinate	
AT AFTER		AFTER HRS		Fall				30"				E. Coordinate	
D E P T H	Casing blows per foot	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER				STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)	
		DEPTH IN FEET FROM - TO	NO	PEN. IN	REC. IN	TYPE	0-6	6-12	12-18	18-24			
5		1.0-2.4	1	17	14	SS	15	19	50/5	.8'	9" Blacktop and Road Stone		
		5.0-7.0	2	24	18	SS	27	22	25 26	8.5'	1) Very dense-Red-gray-brown coarse- fine sandy SILT and coarse-fine GRAVEL. 2) Dense-Red-brown silty medium-fine SAND, trace wood, trace fine gravel. (fill)		
10		10.0-12.0	3	24	18	SS	11	12	13 15	12.0'	3) Medium-Red-brown fine sandy SILT. (stratified)		
15										EOB	END OF BORING 12.0'		
20													
25													
30													
35													
40													

From Ground Surface to	Feet Used	In. Casing Then	in. Casing For	Feet
Feet in Earth 12	Feet in Rock 0			
SAMPLE TYPE CODING:	SS = DRIVEN	C = CORE	No. of Samples 3	Hole No. B-3
PROPORTIONS USED:	TRACE = 1-10%	LITTLE = 10-20%	A = AUGER	U = UNDISTURBED PISTON
			SOME = 20-35%	AND = 35-50%

CLIENT:
Gibble Norden Champion Brown

General Borings, Inc.
P O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
John Muccino

SOIL ENGINEER

INSPECTOR: Garry Jacobsen

PROJECT NAME: New University Police Building
LOCATION: at CCSU, New Britain, CT

DESIGN ENGINEER

Surface Elevation: 95.0 (approx.)

GBI JOB NO: 311-03

Date Started: 12/1/03

TYPE: S Auger, Casing, Sampler, Core Bar

Hole No. B-5

Date Finished: 12/1/03

H Auger, HA, S. S.

Line & Station

Groundwater Observations

Size I. D.: 3-1/4", 1-3/8"

Offset L R

AT 12.5 AFTER 0.0 HRS

Hammer, 140 LBS., Bit

N Coordinate

AT AFTER HRS

Fall, 30"

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER				STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)	
		DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC IN	TYPE	0-6	6-12	12-18	18-24			
											5'	6" Blacktop and Road Stone	
5		1.0-1.3	1	4	4	SS	50/4					7.5'	1) Very Dense-Red-brown silty fine SAND, little fine-medium gravel. 2) No penetration or recovery 3) Very dense-Red-brown silty fine SAND, trace fine-medium gravel, black silty fine sand in tip. (fill) 4) Medium-Red-brown silty fine SAND, trace roots. 5) Stiff-Dark brown SILT, trace fine sandy silt. 6) Stiff-Same as S-5 7) Stiff-Same as S-5, layers of fine-coarse sandy silt.
		3.0-3.0	2	0	0	SS	50/0						
		4.0-6.0	3	24	18	SS	30	35	17	15			
		6.0-8.0	4	24	19	SS	11	13	15	9			
10		9.0-11.0	5	24	24	SS	6	6	5	6			
		11.0-13.0	6	24	24	SS	5	6	5	6			
15		14.0-16.0	7	24	24	SS	5	7	7	8			
											17.0'		
20		19.0-21.0	8	24	24	SS	5	6	7	6			
25		24.0-26.0	9	24	20	SS	7	7	21	19			
											26.0'		
											EOB		
30													
35													
40													

From Ground Surface to Feet in Earth: 26
 Feet Used in Casing Then in Casing For: 0
 Feet in Rock: 0
 No. of Samples: 9
 Hole No.: B-5
 SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON
 PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

		General Borings, Inc. P. O. BOX 7135 PROSPECT, CT 06712										SHEET 1 OF 1	
CLIENT: Gibble Norden Champion Brown													
FOREMAN/DRILLER: John Muccino		PROJECT NAME: New University Police Building										SOIL ENGINEER	
INSPECTOR: Garry Jacobsen		LOCATION: at CCSU, New Britain, CT										DESIGN ENGINEER	
Surface Elevation: 93.5 (approx.)		GBI JOB NO. 311-03											
Date Started: 12/1/03		TYPE		S Auger		Casing		Sampler		Core Bar		Hole No. B-6	
Date Finished: 12/1/03				H Auger		HA		S. S.				Line & Station	
Groundwater Observations		Size I. D.				3-1/4"		1-3/8"				Offset L R	
AT 12.0 AFTER 0.5 HRS		Hammer						140 LBS.		Bit		N Coordinate	
AT		Fall						30"				E. Coordinate	
DEPTH	Casing blows per foot	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER				STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)	
		DEPTH IN FEET FROM - TO	NO.	PEN IN	REC. IN	TYPE	0-6	6-12	12-18	18-24			
5		1.0-1.8	1	9	8	SS	20	50/3			8'	9" Blacktop and Road Stone	
		4.0-6.0	2	24	20	SS	21	19	11	10	6.0'	1) Very dense-Red-brown silty fine SAND, little fine-medium gravel. 2) Very stiff-Red-brown coarse-fine sandy SILT.	
		6.0-8.0	3	24	24	SS	9	8	7	7		Bottom 6" Black coarse-fine SAND. 3) Stiff-Dark brown sandy SILT, trace roots. 4) Stiff-Dark brown SILT, trace roots.	
10		9.0-11.0	4	24	12	SS	6	4	5	6	12.5'		
		14.0-16.0	5	24	20	SS	6	7	7	9		5) Medium-Red-brown medium-fine SAND, little silt, trace fine gravel.	
20		19.0-21.0	6	24	18	SS	7	9	16	22	21.0'	6) Medium-Red-brown silty coarse-fine SAND.	
											EOB	END OF BORING 21.0'	
25													
30													
35													
40													

From Ground Surface to Feet Used in Casing Then in Casing For Feet
 Feet in Earth 21 Feet in Rock 0 No. of Samples 6 Hole No. B-6
 SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON
 PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

Appendix B

Technical Provisions of Specifications for Compacted Structural Fill

TECHNICAL PROVISIONS OF SPECIFICATIONS
FOR COMPACTED STRUCTURAL FILL

PART 1 – GENERAL:

1.01 DESCRIPTION OF WORK

The work covered by this specification consists of furnishing all plant, labor, equipment and materials and performing all operations in connection with excavation, preparation of subgrade, and providing, placing and compacting Structural Fill within the building.

1.02 QUALITY ASSURANCE

Monitoring of earthwork operations will be provided by the Owner.

The Contractor shall not place a layer of fill until the Owner has observed the underlying materials.

PART 2 – PRODUCTS:

2.01 STRUCTURAL FILL

Structural fill shall be suitable gravel, sandy gravel, or gravelly sand, free of organic material, loam, trash, snow, ice, frozen soil and other objectionable material and shall be well-graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
4 inches	100
No. 4	20 – 80
No. 40	5 – 50
No. 200	0 – 8

Excavated material is not suitable for use as Structural Fill. The inorganic excavated materials may be used as common fill outside the building limits or may be disposed of in accordance with arrangements previously made with the Owner. Organic soil and surplus excavated soil shall be legally disposed of.

All material is subject to approval by the Owner's representative.

PART 3 – EXECUTION:

3.01 SUBGRADE PREPARATION

Remove all pavement, man-placed fill, and other unsuitable materials from the building area and to lateral limits extended beyond the footings a distance equal to the depth of fill required below the footing plus two feet. Upon completion of the excavation, the soil subgrade shall be compacted by at least six coverages with the treads of a crawler type tractor weighing at least 30,000 pounds, with the rear wheels of a fully loaded ten-wheel dump truck, or by a suitable 10-ton vibratory roller as approved by the Owner. Where, in the opinion of the Owner, compaction of the subgrade is not desirable, the above compaction requirements will be waived.

3.02 PLACEMENT OF COMPACTED STRUCTURAL FILL

Structural fill shall be placed in layers not to exceed ten inches in thickness as measured before compaction. Each layer shall be compacted by a minimum of four coverages with the equipment described below to at least 95 percent of maximum dry density as determined by ASTM Test D1557. Incidental compaction due to traffic by construction equipment will not be credited toward the required minimum four coverages.

Compaction equipment in open areas shall consist of vibratory rollers, fully loaded ten-wheel dump trucks, or other compaction equipment approved by the Owner.

Compaction equipment in confined areas (in trenches and adjacent to walls, piers and footings) shall consist of hand-guided vibratory equipment or mechanical tampers as approved by the Owner. Layer thickness prior to compaction shall not exceed six inches.

All fill material shall be placed and compacted "in-the-dry". The Contractor shall dewater excavated areas as required to perform the work and in such a manner as to preserve the undisturbed state of the existing soil subgrade.

The Contractor shall not place a layer of compacted structural fill on snow, ice or soil that was permitted to freeze prior to compaction. Removal of these unsatisfactory materials will be required as directed by the Owner.

In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operations. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.

Compacted fill shall not be placed when temperatures are below freezing.

INVITATION TO BID

FOR PROJECTS ESTIMATED TO COST MORE THAN \$500,000.00

ADV. NO.: 11-13

ADV. DATE: February 18, 2011

SEALED BIDS FROM CONTRACTORS WHO HAVE BEEN PREQUALIFIED IN THE DAS CLASSIFICATION NOTED BELOW SHALL BE ADDRESSED TO THE DEPARTMENT OF PUBLIC WORKS - STATE OF CONNECTICUT FOR:

Project Title:	Central Connecticut State University New Public Safety Building 1500 East Street New Britain, CT
Project Number:	BI-RC-311
DAS Classification:	Group C – General Building Construction
Special Requirement:	N/A
Cost Estimate Range:	\$3,996,653. - \$4,417,350.
Plans & Specs Ready For Sale Date:	February 23, 2011
A NON-REFUNDABLE FEE OF PER SET IS REQUIRED	\$185.00 Checks should be made payable to “Treasurer, State Of Connecticut” and should <i>include</i> the prospective bidder’s correct mailing address, email address, telephone and fax numbers. USE A SEPARATE CHECK FOR EACH PROJECT.
Examination or Purchase of Plans & Specs	at the State Of Connecticut, Department Of Public Works, Plans And Specifications Section, Room No. G-36, 165 Capitol Avenue, Hartford, CT 06106, during the hours of 7:30 A.M. to 3:00 P.M. (Monday-Friday) or by addressing a request to the above address with your Fedex number.
Pre-Bid Conference:	All prospective bidders are encouraged to attend a pre-bid conference
Pre-Bid Conference Time	to be held AT 10:00 A.M.
Pre-Bid Conference Date	ON March 16, 2011
Pre-Bid Conference Location	AT Central Connecticut State University, 40 Wells Street, New Britain, CT., East Hall Conference Room 2
BID OPENING DATE:	April 6, 2011
Receipt of Bid Package	Bids will be received at the State Office Building, 165 Capitol Avenue, Hartford, CT, 06106 in Room No. G-36 UNTIL 1:00 P.M. on the date shown above and thereafter publicly opened and read aloud in Room No. G-32.
Bid Results:	Bid results are posted on the DPW Website in approximately

	two (2) days after the bid opening date.
Set-Aside Participation	25%
Including MBE	6.25%
Gift And Campaign Contribution Certification	If awarded the subject contract and the contract has a value of \$50,000 or more the contractor will be required to sign and submit, at the time of contract execution, a Gift And Campaign Contribution Certification. See the DPW home page, http://www.ct.gov/dpw , click on Affidavits. For the purposes of signing the Certification, the "date DPW began planning" the subject project or services is such date noted below.
Date DPW Began Planning the Subject Project:	5/6/2002
Summary and Affidavit Regarding State Ethics	Any one seeking a contract with a value of more than \$500,000 shall provide with their bid an Ethics Affidavit <i>located</i> at CT DPW Website (www.ct.gov/dpw). Failure to provide this affidavit with the bid proposal shall result in rejection of the bid.
Bid Security	As security, <i>each</i> bid must be accompanied by a CERTIFIED CHECK made payable to "Treasurer, State of Connecticut," or the bid must be accompanied by a BID BOND, in the form required by the awarding authority and having surety thereto such Surety Company or Companies as are authorized to do business in this State and/or accepted by the Commissioner of the Department of Public Works for an amount not less than 10% of the bid.
Bidders are advised that <i>both</i> the DEPARTMENT OF ADMINISTRATIVE SERVICES PREQUALIFICATION CERTIFICATE and UPDATE STATEMENT <u>must</u> accompany the bid proposal for projects <i>estimated to exceed</i> Five Hundred Thousand Dollars (\$500,000.00) (C.G.S. 4b-91 as amended). <i>Failure to supply them with the bid will result in rejection of the bid</i>	
Department of Administrative Services (DAS) Contractor Prequalification Program: http://www.das.state.ct.us/Purchase/New_PurchHome/Busopp.asp	
To access Executive Orders: http://www.ct.gov/governorrell/cwp/browse.asp?a=1719&bc=0&c=18433	
To access the Department of Public Works Web Site: http://www.ct.gov/dpw	

Performance and Labor and Material Bonds to be furnished by the bidder awarded the contract shall be an amount not less than 100% of the contract price.

The Commissioner reserves the right to do any of the following without liability, including but not limited to: (a) waive technical defects in the bid proposal as he or she deems best for the interest of the State; (b) negotiate with a contractor in accordance with Connecticut General Statutes Section 4b-91; (c) reject any or all bids; (d) cancel the award or execution of any contract prior to the issuance of the "Notice To Proceed;" and, (e) advertise for new bids.

Nonresident contractors: At the time of contract signing a certificate from the Commissioner of Revenue Services must be provided which evidences that C.G.S. 12-430 for non-resident contractors has been met. For details call the Department of Revenue Services at (860) 541-3280, ext. 7.

EXECUTIVE ORDERS:

The Contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of the Contract as if they had been fully set forth in it. At the Contractor's request, the Client Agency shall provide a copy of these orders to the Contractor. The Contract may also be subject to Executive Order No. 7C of Governor M. Jodi Rell, promulgated July 13, 2006, concerning contracting reforms and Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services, in accordance with their respective terms and conditions.

This contract is subject to the provisions of the Department of Public Works Sexual Harassment Policy ("Policy") and, as such, the contract may be canceled, terminated, or suspended by DPW for violation of or noncompliance with said Policy. Said document is hereby incorporated herein by reference and made a part hereof as though fully set forth herein. This policy may be found at the Department of Public Works Website at <http://www.ct.gov/dpw>, under Publications.

All technical questions must be in writing (not phoned or emailed) and faxed to the Architect/Engineer with a copy to the DPW Project Manager listed below.

Architect/Engineer/ Consultant:	Perkins + Will, Jennifer Rodriguez, Architect	Fax No:	860-657-0757
Construction Administrator	Arcadis U.S., Inc. Norman Benjamin, CA Representative	Fax No:	860-704-6120
DPW Project Manager:	Scott Dunnack	Fax No:	860-713-7261

All bid questions should be addressed to the Officer listed below.

Associates Fiscal Administrative Officer:	Mellanee Walton	Fax No:	(860) 713-7395
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Contract Time Allowed: 365 Calendar Days

