HOUSE of REPRESENTATIVES

STATE OF MICHIGAN

Appropriations Requests for Legislatively Directed Spending Items

1. The sponsoring representative's first name:
   Mike

2. The sponsoring representative's last name:
   McFall

3. The cosponsoring representatives' names. All cosponsors must be listed. If none, please type 'n/a.' A signed letter from the sponsor approving the co-sponsorship and a signed letter from the member wishing to co-sponsor are required. Attach letters at question #9 below.
   n/a

4. Name of the entity that the spending item is intended for:
   Warren Police Department

5. Physical address of the entity that the spending item is intended for:
   29900 N Civic Center DrWarren, MI 48093

6. If there is not a specific recipient, the intended location of the project or activity:
   29900 N Civic Center DrWarren, MI 48093

7. Name of the representative and the district number where the legislatively directed spending item is located:
   McFall 14, McKinney 11, Robinson 58, Xiong 13

8. Purpose of the legislatively directed spending item. Please include how it provides a public benefit and why it is an appropriate use of taxpayer funding. Please also demonstrate that the item does not violate Article IV, S 30 of the Michigan Constitution.
   This funding will help provide necessary updates to the Warren Police Crime Labs. This grant will enhance the Warren Police Department to fight crime and promote safety for its forensics team.

   The room is used by our Evidence Tech Officers to package & photograph evidence along with processing evidence for DNA , latent fingerprints, and/or other forensic evidence. Forensic evidence as you would expect plays a vital role in our efforts to solve

crime and get justice for crime victims. Our current problem is that what once a cutting edge crime lab is now outdated and in need of some expensive updates.

Here is a short list of some of the items we are in need of;

• New countertops, flooring, cabinets & electrical updates
• Upgraded computer work station
• A new forensic camera stand to assist in photographing evidence
• Superglue Fuming Station
• Multiuse fuming station
• Eye wash station for officer safety in the event of an accident
• Ruvis fingerprint camera- allows us to detect fingerprints in some instances w/o chemical enhancement & possible DNA destruction

The 2 major issues we have at this time are the ventilation system and asbestos.

1. Several of the chemicals used to locate latent prints are highly toxic. The rooms current fuming station is connected to the buildings ventilation so the toxins are being circulated throughout the building.
a. The above listed fuming stations are self-contained and avoid the need for redoing the entire ventilation system while still maintaining the buildings air quality.
2. The countertops and current fuming station tested positive for asbestos and there may be more based on the age of the building.

9. Attach documents here if needed:
   Attachments added to the end of this file.

10. The amount of state funding requested for the legislatively directed spending item.
    500000

11. Has the legislatively directed spending item previously received any of the following types of funding? Check all that apply.
    ["None"]

12. Please select one of the following groups that describes the entity requesting the legislatively directed spending item:
    Local unit government

13. For a non-profit organization, has the organization been operating within Michigan for the preceding 36 months?
    Not applicable

14. For a non-profit organization, has the entity had a physical office within Michigan for the preceding 12 months?

Not applicable

15. For a non-profit organization, does the organization have a board of directors?
    Not applicable

16. For a non-profit organization, list all the active members on the organization's board of directors and any other officers. If this question is not applicable, please type 'n/a.'
    n/a

17. "I certify that neither the sponsoring representative nor the sponsoring representative's staff or immediate family has a direct or indirect pecuniary interest in the legislatively directed spending item."
    Yes, this is correct

18. Anticipated start and end dates for the legislatively directed spending item:
    ASAP

19. "I hereby certify that all information provided in this request is true and accurate."
    Yes

SPECIFICATIONS

FOR

WARREN POLICE DEPARTMENT
EVIDENCE LAB RENOVATION
ITB-W-0996

CITY OF WARREN
MACOMB COUNTY
WARREN, MICHIGAN

August 22, 2023

HRC JOB NO. 20210092

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

555 Hulet Drive • P.O. Box 824
Bloomfield Hills, Michigan 48303-0824

TABLE OF CONTENTS

DIVISION 9 - FINISHES

DIVISION 10 -SPECIALTIES

DIVISION 11 - EQUIPMENT

DIVISION 12 - FURNISHINGS

DIVISION 16 - ELECTRICAL

APPENDIX A- LABOR HARMONY THROUGH PRVAILING WAGE ORDINANCE

APPENDIX B- GENERAL WAGE DECISION

APPENDIX C- SELECTED COMPONENT ASBESTOS BUILDING MATERIAL INSPECTION REPORT, MJ ENVIRONMENTAL

END OF SECTION

POLICE DEPARTMENT

ADVERTISEMENT

CITY OF WARREN, MACOMB COUNTY, MICHIGAN will receive sealed proposals for **City Project 20210092, Police Department Evidence Lab Renovation, ITB-W-0996.**

The scope of the project is to furnish all materials, supplies, and labor to complete the remodeling of the Police Evidence Lab at the address listed in the construction documents, in accordance with the contract documents within the time frame specified in the documents and according to the prices listed the bid form.

The City of Warren requires that all contractors and subcontractors employed on this project, pay prevailing wages as listed in this bid package.

Bids will be received at the City of Warren Purchasing Department, located in City Hall, One City Square, Suite 425, Warren, Michigan, **until 12:30 p.m., local time, Wednesday, September 27, 2023.**

Copies of plans and specifications may be downloaded from the BidNet (MITN) Michigan Inter-governmental Trade Network website at www.MITN.info. Each bid must be accompanied by a scanned copy of the contractor's five percent (5%) Bid Bond, Cashier's Check, or Certified Check as security for acceptance of the Contract.

The successful bidder will be required to furnish the required bonds, public liability and property damage insurance, and Workmen's Compensation Insurance.

The City reserves the right to reject any or all bids and to waive any irregularities in bidding. The City also reserves the right to select multiple bids to fulfill the requirements of this project. No bid may be withdrawn after the scheduled closing time for receiving bids for at least sixty (60) days.

No proposal will be received unless made on blanks furnished by and delivered to the Purchasing Department **on or before 12:30 p.m**., local time, **Wednesday, September 27, 2023.** Blank Proposal forms are available for download from the Michigan Inter-Governmental Trade Network website. Bids will be publicly opened and read aloud at 1:00 p.m., local time, via Zoom Meeting.

There will be a pre-bid meeting followed by a site visit held on **Thursday, August 31, 2023 beginning at 9:00 a.m. local time**. This is a **mandatory pre-bid meeting and site visit**; prospective bidders must attend. Bids will not be received or considered from parties that were not represented at the pre-bid meeting. The mandatory pre-bid meeting will be held at The Warren Police Department Headquarters, located at 29900 S. Civic Center Blvd., Warren, MI 48093.

James R. Fouts, Mayor

POLICE DEPARTMENT

INSTRUCTIONS TO BIDDERS

INDEX

Revised 06-10-22

1. RECEIPT AND OPENING OF BIDS

The City of Warren, Macomb County, Michigan invites bids on the form attached hereto. All blanks must be appropriately filled in. The City shall only accept bids submitted electronically, via the BidNet (MITN) system, by **12:30 p.m.** local time on **Wednesday, September 27, 2023.**

In order to have your bid considered for award, vendors are required to attend a Mandatory Pre-Bid Meeting, which will be held on August 31, 2023 at 9:00 am EST, in the Lobby of the Police Headquarters Building, located at 29900 Civic Center Boulevard, Warren, MI 48093.12

The Mandatory Pre-Bid Meeting will be followed immediately by a site visit of the work area.

Only vendors who have attended the mandatory pre-bid meeting will be eligible to attend the scheduled site visit.

Due to security considerations, original drawings will not be available to bidders during the bid phase. The awarded contractor will receive a set of original drawings. A set of relevant sheets will be available for reference during the meeting, but shall not leave the premises or be photographed.

A PUBLIC BID OPENING WILL TAKE PLACE AT 1:00 PM EST ON SEPTEMBER 27, 2023 VIA THE "ZOOM APP" WHICH WILL BE HOSTED BY THE CITY COUNCIL OFFICE. PLEASE JOIN THE ZOOM MEETING BETWEEN 12:50 AND 1:00 PM EST, ON THE DAY OF THE BID OPENING IN ORDER TO VIEW OR LISTEN TO THE BID OPENING VIA THE ZOOM APP.

1. The bid opening shall be made available to the public via a "Zoom Meeting". Interested parties will need to access the Zoom app and enter the Meeting ID # and the Password in order to obtain access to the public bid opening. Interested members of the public may view or listen to the results at that time.

2. The public shall have the ability to join the Zoom Meeting any time after 12:50 pm EST on the bid due date.

3. The public bid opening via "Zoom" shall occur at 1:00 pm EST on the bid due date.

LINK TO ZOOM MEETING:
https://cityofwarren.zoom.us/j/83537144965?pwd=ay9Fc2dYbmhvZVh5OTNLcHppei9PZz09

ZOOM CALL-IN #: **1 929 205 6099**

ZOOM MEETING ID: **835 3714 4965**

ZOOM MEETING PASS CODE: **429600**

2. PREPARATION OF THE BID

All bids must be prepared and signed by the bidder in the form attached hereto and without removal from the bound pamphlet. Additional copies of the Bid Form may be obtained from the website www.MITN.info. All blank spaces for the bid prices must be filled in, in ink or typewritten. Illegibility of any figure in the Bid may be sufficient cause for rejection of the Bid by the City.

If a unit price or a lump sum bid already entered by the Bidder on the Bid Form is to be altered, it shall be crossed out with ink and the new unit price or lump sum bid entered above or below it, and initialed by the bidder with ink.

The Bids received will be compared on the basis of the summation of the lump sum amounts bid and the products of the quantities of items listed at the unit prices bid. In the case of discrepancy between the total shown in the Bid and that obtained by adding the products of the quantities of items at the unit prices, the unit prices in the Bid shall govern and any errors found in products, and in the addition, will be corrected.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form.

The City may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. No unsolicited alternates will be considered.'

Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered.

No bidder may withdraw a bid within **30** days after the actual date of the opening thereof.

3. BID SECURITY REQUIREMENTS FOR CITY OF WARREN BIDS

Each bid must be accompanied by a scanned pdf version of a bid bond, a certified, cashiers, or bank check, or a money order, made in favor of the Treasurer of the City of Warren (**a company or personal check is not acceptable)** duly executed by the bidder as principal and having as surety thereon a surety company approved by the City, in the amount **of 5% of the bid amount as a guarantee** on the part of the bidder that he will, if called upon to do so, enter into a contract to perform the work as per the attached specifications**.**

The original bid bond/check/money order must be submitted to the City prior to the City issuing a recommendation for award to Warren City Council.

BIDDERS WHO DO NOT HAVE A BID SECURITY ATTACHED TO THEIR BIDS, WILL HAVE THEIR BIDS REJECTED.

4. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO THE CONTRACT

The award of Contract must be approved by the City Council. The Contract shall be deemed as having been awarded when formal notice of award shall have been duly served by the City, subsequent to approval of City Council, upon the bidder.

The bidder to whom the Contract shall have been awarded will be required to execute six copies of the Contract in the form attached hereto and to furnish surety and insurance certificates, all as required. In case of the bidder's refusal or failure to do so within ten (10) days after award, the bidder will be considered to have abandoned all rights and interests in the award, and the bid deposit may be declared forfeited to the City as liquidated damages and the award may then be made to the next best qualified bidder or the work re-advertised as the City may elect.

5. SCOPE OF WORK

The work under this Contract shall consist of the items contained in the Bid, including all incidentals necessary to fully complete the project in accordance with all Contract Documents.

6. CONSTRUCTION CONDITIONS

Each bidder shall visit the site of the work and fully acquaint himself with conditions relating to construction and restrictions attending the execution of the work under the Contract. Bidders shall thoroughly examine and be familiar with the drawings and specifications.

It is also expected that the bidder will obtain information concerning the available facilities for receiving, transporting, handling and storing construction equipment and materials and concerning other local conditions that may affect this work.

The failure or omission of any bidder to receive or examine any form, instrument, addendum or other document, or to visit the site and acquaint himself with conditions there existing, shall in no way relieve himself from any obligation with respect to his bid or to the Contract.

The Contractor, as such and as bidder, shall make his own determination as to soil conditions and shall assume all risk and responsibility and shall complete the work in whatever material and under whatever conditions he may encounter or create, without extra cost to the City.

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.

7. ADDENDUMS AND EXPLANATIONS

No verbal answers to inquiries regarding the meaning of the drawings or specifications or verbal instructions previous to the award of the Contract will be given. Any verbal statements regarding same by any person, previous to the award, shall be unauthoritative.

Explanations desired by bidders shall be requested of the City in writing, and if explanations are necessary, a reply will be made in the form of an Addendum. Every request for such explanation shall be in writing by contacting the Purchasing Agent, Craig Treppa of the City of Warren, Purchasing Division preferably by e-mail, ctreppa@cityofwarren.org , subject: ITB-W-0996. It is requested that all inquiries also be sent to Steven Sack, representing Hubbell, Roth, & Clark, preferably by e-mail, ssack@hrcengr.com

Addendums issued to bidders prior to the date of receipt of Bids shall become a part of the specification, and all Bids shall include the work described in the Addendums.

Any inquiry received after **5:00 p.m.** local time on **September 8, 2023** will not be given consideration. Responses to inquiries will be issued no later than **September 14, 2023** by **5:00pm**.

Any and all such interpretations and any supplemental instructions will be in the form of written addenda, clarifications and changes which, if issued, must be obtained on line via the MITN system. Failure of any bidder to receive any such Addendum shall not relieve such bidder from any obligation under his bid as submitted.

8. NAME, ADDRESS AND LEGAL STATUS OF BIDDER

The bid shall be signed in ink and the address of the bidder given. The legal status of the bidder, whether corporation, limited liability company, partnership, or individual, shall also be stated in the bid.

A corporation shall execute the bid by its duly authorized officers in accordance with its corporate bylaws and shall also list the state in which it is incorporated. A partnership bidder shall give all the names of the partners. Partnership and individual bidders will be required to state in the Bid the names of all persons interested therein.

The place of residence of each bidder, or the office address in the case of the firm or company, with county and state, must be given after his signature.

If the bidder is a joint venture consisting of a combination of any or all of the above entities, each joint venturer shall execute the bid.

Anyone signing a bid as an agent of another or others shall submit with his bid legal evidence of his authority to do so.

9. COMPETENCY OF THE BIDDER

The opening and reading of the bid shall not be construed as an acceptance of the bidder as a responsible bidder. The City reserves the right to determine the responsibility of a bidder from its knowledge of the bidder's qualifications or from other sources.
In the event that the City shall require certified supporting data regarding the qualifications of the bidder in order to determine whether the bidder is a responsible bidder, the bidder will be required to furnish the following information sworn to under oath by him.

a. The bidder's performance record with listing of work of a similar character and proportions which he has constructed, giving the name of the Owner, date built, and construction cost.

b. A tabulation of other work now under contract, giving the location, type, size, required date of completion and the percentage of completion to date of each job.

c. An itemized list of the bidder's equipment available for use on the proposed contract.

d. A listing of the major parts of the work which are proposed to be sublet.

e. The bidder's certified financial statement, dated within sixty days prior to the opening of bids. The City may require that any items of such statements be further verified.

f. Evidence that the bidder is licensed to do business in the State of Michigan, in case of a corporation organized under the laws of any other State, the name and address of the resident agent.

g. A construction schedule for that portion of the contract for which he is under consideration for award based on starting construction within ten (10) days after receiving "Notification to Proceed."

h. Such additional information as will satisfy the City that the bidder is adequately prepared to fulfill the contract.

i. Contractor shall have at least 5 years experience on a minimum of 3 projects where renovation work was performed on a building of this construction type (post-tensioned slab). Submit letter, documenting qualifications, prior project names, and descriptions for review and approval as part of the "non-destructive detection scan" bid item.

10. DISQUALIFICATION OF BIDDERS

Any one or more of the following causes may be considered sufficient for the disqualification of a bidder and the rejection of a bid or bids:

a. Evidence of collusion among bidders.

b. Lack of competency as revealed by either financial experience or plant equipment statements as submitted.

c. Lack of responsibility as shown by past work judged from the standpoint of workmanship and progress.

d. Uncompleted work under other contracts, which, in the judgment of the City might hinder or prevent the prompt completion of additional work if awarded.

e. Being in arrears on existing contracts, in litigation with the City, or having defaulted on a previous contract.

f. The authorized company representative does not sign page P-3.

g. The vendor does not submit a 5% bid security with their bid submission.

11. SUBCONTRACT PROVISIONS

The Contractor shall not assign or transfer this Contract without the written consent of the City.

Subcontracting any portion of the Contract shall comply with Section 218 of the General Conditions and the following:

1. Notice. Notice of all subcontracting of services covered by this contract shall be provided to the City prior to subcontracting.
2. Contractor's responsibility. It is the responsibility of the Contractor to ensure that all subcontractors abide by all terms of this contract.
3. Proof of Payment. The Contractor agrees to submit proof of payment of all subcontractors within thirty (30) days of payment.
4. Hold Harmless. The Contractor agrees to indemnify and hold the City harmless from any loss, cost, or expense arising out of the performance of any subcontractor or affiliation entered into by the Contractor, but only to the extent that such loss, cost, or expense is attributable to the negligence of the Contractor, its subcontractor or affiliate.
5. Objection to subcontractor by City. If the City has an objection to any subcontract proposed, the City shall provide notice of such objection within fourteen (14) days of receiving notice of subcontracting. The parties shall then meet, if the objection is not resolved, the Contractor shall not subcontract the serviced as proposed.

12. BASIS OF THE BID

Bids are solicited on the basis of unit prices for each type of work and lump sums for special structures and unit prices for contingent items of additional work all as set forth in the form of Bid. Bids will be compared on the basis of the quantities stated therein and the prices offered for each item.

Alternates may have been included in the Bid for the offering of prices for certain combinations of the various sections of the work.

Prices may be offered for any or all alternates included as specified in the Special Conditions.

13. INCREASE OR DECREASE OF QUANTITIES

The quantities as shown in the bid may be approximate and are given only as a basis of calculation for comparing bids and awarding contracts. The City does not guarantee that the actual quantities involved will correspond with the estimate. Payment to the Contractor will be made only for the actual quantities of work performed in accordance with the plans and specifications.

The Engineer reserves and shall have the right under the Contract to make such changes, from time to time, in the plans and in the quantities of work, as may be necessary or desirable to insure the completion of the work in the most satisfactory manner in accordance with the specifications.

In case a satisfactory adjustment in price cannot be reached for any such item, the City reserves the right to terminate the Contract as it applies to the item in question and make such arrangements as it may deem necessary to complete the work.

14. METHOD OF AWARD

If at the time this Contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the City as available to finance the Contract, the Contract will be awarded on the base bid only. If the bid exceeds such amount, the City may reject all bids or may award the Contract on the base bid combined with such deductible alternates applied in numerical order in which they are listed to produce a net amount which is within available funds. The City also has the right to award the Contract on an individual line item basis as required to meet the funds available for the project.

The City reserves the right to accept any Bids, to reject any or all Bids, and to waive defects or irregularities in any Bid. In particular, any alteration, erasure or interlineation of the Contract documents and of the Form of Bid shall render the accompanying Bid irregular and subject to rejection by the City.

The contract shall not be considered executed unless approved by the City Council and certification as to the availability of funds by the City Controller.

15. TIME OF COMPLETION AND LIQUIDATED DAMAGES

The bidder agrees to fully complete the entire project, including proper clean up, to the satisfaction of the City, by April 1, 2024. Failure of the bidder to complete the project as specified shall result in the following penalties:

1st calendar day after April 1, 2024, and each calendar day thereafter:
$500 per day.

16. LIQUIDATED DAMAGES FOR PERFORMANCE CLAUSE:

The City requires the awarded vendor to place their order of materials within fifteen (15) calendar days of receiving a City-issued purchase order. The awarded vendor shall then notify the City of the date that the materials have arrived.

The project, including clean up, shall be completed to the satisfaction of the City within sixty (60) calendar days of receiving materials for the job. Failure of the bidder to complete the project as specified shall result in the following penalties:

On the sixty-first (61st) calendar day after receiving a City-issued Purchase Order and each calendar day thereafter, liquidated damages of $1,000 per calendar day will be assessed.

The vendor shall be required to furnish proof of order date and receipt of goods date if requested from the City.

Authorized signature for

_____

Liquidated Damages Clause

17. PROSPECTIVE BIDDER MANDATORY PRE-BID MEETING AND SITE VISIT

In order to have your bid considered for award, vendors are required to attend a Mandatory Pre-Bid Meeting, which will be held on August 31, 2023 at 9:00 am EST, in the Lobby of the Police Headquarters Building, located at 29900 Civic Center Boulevard, Warren, MI 48093.

The Mandatory Pre-Bid Meeting will be followed immediately by a site visit of the work area. The scheduled site visit shall be the only time available for vendors to inspect the work area.

Only vendors who have attended the mandatory pre-bid meeting will be eligible to attend the scheduled site visit.

The Bidders will have the opportunity to ask questions and receive clarifications regarding the Project and to visit the project area at the Site during this meeting. If clarifications are necessary following the site visit, an Addendum will be issued by the City via the MITN system.

18. INSPECTION CLAUSE:

All bidders will be held liable to have visited the work site(s) and familiarize themselves with the nature of the work and conditions under which the work will be performed. No extras will be allowed for failure to properly measure, inspect, or account for working conditions.

The last day to ask questions is Friday, September 8, 2023 at 2:00 pm local time. The City shall respond to all questions no later than Thursday, September 14, 2023.

19. WORK PERFORMED FOR THE POLICE DEPARTMENT:

Any awarded vendor's employees that will be performing work for the Police Department must first be fingerprinted and be subject to a criminal background check before work can be done for the Police Department. This is required of any subcontractor's doing work for the awarded vendor, as well. The vendor shall not be compensated for the time spent during the background check.

20. SECURITY:

The City requires that the Contractor, sub-contractors and all employees check in at the front desk of the Warren Police Station and obtain a Visitor Badge for all employees. Each employee shall have a valid driver's license and give it to the Officer at the front desk and they will receive the Visitor Badge and must wear on them at all times while in the building.
In addition, the City requires that the Contractor check in each day with the Building and Grounds Maintenance Superintendent or a designated representative before commencing work each day.

The City does not assume any responsibility, at any time, for the protection of or for loss of materials, from the time that the project starts until the final acceptance of the work by the Building and Grounds Maintenance Superintendent or a designated representative.

POLICE DEPARTMENT

Invitation To Bid (ITB)

Place: **City of Warren**
Date: **August 22, 2023**
Project: **ITB-W-0996**

The Bid of_____(hereinafter called "Bidder" to the City of Warren, Macomb County, Michigan. (Hereinafter called "City").

The Bidder, in compliance with the invitation for bids for the construction of Contract **City Project #20210092, City Bid # ITB-W-0996, Warren Police Department Evidence Lab Renovation,** hereby proposes to furnish all materials, supplies and labor to construct the proposed project in accordance with the contract documents within the time frame specified in these documents and according to the prices listed below. The prices shall cover all expenses incurred in performing the work required by the contract documents. This bid shall be included as part of the contract documents.

The Bidder certifies that the Bidder has examined the plans, specifications and all related documents for the project, has examined the site of the proposed project and is familiar with all of the conditions surrounding construction of the proposed project including the availability of materials, supplies and labor.

The Bidder affirms that in making this bid neither the Bidder, the Bidder's company, any company the Bidder any represent nor anyone on behalf of the Bidder has entered into any combination, collusion or agreement with anyone to maintain the prices of the work or any compact to prevent any other bidder from bidding on the contract or the proposed project. The Bidder further affirms that the bid is made without regard or reference to any other bidder or bid and without any agreement, understanding or combination, either directly or indirectly, with any other person with reference to the bidding in any way or manner whatsoever.

The Bidder agrees that this bid shall be good and shall not be withdrawn for a period of **30** calendar days after the scheduled closing time for bids received.

The Bidder agrees to commence work under this contract on or before the date and time to be specified in the written "Notice to Proceed for Painting Improvements" issued by the City and to fully complete the entire project in the timeframe specified by the awarded Contractor, and agreed to by the City.

The Bidder agrees to perform all the work required in accordance with the contract documents, for the preceding unit prices.

The Owner reserves the right to schedule the exact start date of each item within the tasks in order to accommodate site activities taking place during this time period.

The preceding unit prices shall include labor, materials, bailing, shoring, removal, overhead, profit, insurance, or other expenses required to cover the finished work of the contract documents. The Owner, at his sole discretion, reserves the right to award to the Bidder who, in the sole determination of the Owner, will best serve the interest of the Owner. The Owner may use any combination of the base bid and Alternates in determining the successful low bidder. Bidder understands that the City reserves the right to reject any and all bids and to waive any informalities in the bidding. All line items MUST be filled in, including Contingency Allowance.

Each bid must be accompanied by c a s h i e r ' s c h e c k , certified check of the bidder, or a bid bond duly executed by the bidder as principal and having as surety thereon a surety company approved by the City, in the amount of 5% of the bid as a guarantee on the part of the bidder that he will, if called upon to do so, enter into a contract in the attached form to do the work covered by the Bid and at the prices stated therein and to furnish acceptable surety for its faithful and entire fulfillment. Such cash, checks or bid bonds will be returned to all except the three lowest bidders within seven days after the opening of bids.

The remaining checks, or bid bonds will be returned promptly after the City and the accepted bidder have executed the Contract. If no award has been made within seven days after the opening of bids, the remaining cash, checks, or bid bonds will be returned promptly after the

City and the accepted bidder have executed the Contract, or, if no award has been made within 90 days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

In the interest of expediting the award of this contract, the Bidder may be required to show that he has performed work similar to that which is required under the proposed contract.

The Bidder acknowledges receipt of the following addendums:

No._____Dated:_____No._____Dated:_____

No._____Dated:_____No._____Dated:_____

IT IS REQUIRED OF ALL BIDDERS TO RETURN THIS SHEET FULLY COMPLETED AND SIGNED BY AN AUTHORIZED REPRESENTATIVE WITH THEIR SEALED BID. FAILURE TO PROPERLY SIGN IN THE AREA PROVIDED BELOW WILL RESULT IN YOUR BID NOT BEING ACCEPTED.

FAILURE TO COMPLY WITH THE REQUIREMENTS, PROCEDURES, AND PROVIDE INFORMATION AS REQUESTED BY THIS DOCUMENT MAY RESULT IN DISQUALIFICATION.

Dated and signed this_____day of_____2023

Name of Bidder: _____

Signature: _____

Title of Signer: _____

Business: _____

Address: _____

of Bidder: _____

Telephone: _____

Warren Police Department Evidence Lab Renovation
ITB-W-0996 PRICING DETAIL

	Item	Quantity		Unit Price	Total Cost
1.	General Demolition	1	@	Lump Sum	=$_____
2.	New Doors, Frames & Hardware	1	@	Lump Sum	=$_____
3.	New Flooring, Finishes, Ceiling, Wall Mods	1	@	Lump Sum	=$_____
4.	Appliances	1	@	Lump Sum	=$_____
5.	New North Wall Casework (Elev 2/Q2-00)	1	@	Lump Sum	=$_____
6.	New East and South Corner Base Cabinets (Elevs 3,4/Q2-00 not including dishwasher)	1	@	Lump Sum	=$_____
7.	New South Base Cabinets, west of Door 2040B (Elev 4/Q2-00)	1	@	Lump Sum	=$_____
8.	Casework (Elev 5/Q2-00)	1	@	Lump Sum	=$_____
9.	New Island and wheeled cabinets (Room 2040)	1	@	Lump Sum	=$_____
10.	Office Furniture (Room 2040B)	1	@	Lump Sum	=$_____
11.	New East and South Upper Cabinets (Elevs 3,4/Q2-00)	1	@	Lump Sum	=$_____
12.	New countertops (all locations)	1	@	Lump Sum	=$_____
13.	Mechanical	1	@	Lump Sum	=$_____
14.	Plumbing	1	@	Lump Sum	=$_____
15.	Electrical	1	@	Lump Sum	=$_____
16.	Non-Destructive Detection Scan	1	@	Lump Sum	=$_____
17.	Crack Injection Repair	40	@	LF	=$_____
18.	Exercise Room Beam Repaint	350	@	SF	=$_____
19.	Misc. Items	1	@	Lump Sum	=$_____
20.	Asbestos Remediation	1	@	Lump Sum	=$_____
21.	Project Contingency Allowance (Mandatory)	1	@	Lump Sum	=$ 30,000

Total Amount of Bid $_____

Bid Alternate #1

Distilled Water Station CFCI	1	@	Lump Sum	=$_____

Bid Alternate #2

Flooring Add RT-1	1	@	Lump Sum	=$ _____

Bid Alternate #3

Eliminate new upper cabinets from lines 5 and 10 above. Leave existing upper cabinets in place at those locations.	1	@	Reduction	=$ _____

LEGAL STATUS OF BIDDER:

☐ A Corporation duly organized and doing business under the laws of _____ (State) for whom _____ (Name) bearing the official title of _____ (Office Title) signed this bid and is duly authorized to execute contracts on behalf of the Corporation.

☐ A Limited Liability Company duly organized and doing business under the laws of _____ (State) for whom _____ (Name), bearing the official title of _____ (Office Title) signed this bid and is duly authorized to execute contracts on behalf of the Company.

☐ A Partnership, all of the members of which with addresses are:

_____ _____

_____ _____

_____ _____

_____ _____

☐ A Limited Liability Partnership, all members listed above. An

☐ Individual, whose signature is affixed to this Bid.

SUBCONTRACT PROVISIONS

The Contractor shall list the name and address of the proposed Subcontractors in the space provided below. Approval of any Subcontractor will not be given unless and until it is determined by the City that he is qualified to bid on the type and magnitude of work proposed and shall have executed a subcontract in a form acceptable to the City.

The Contractor shall abide by the provisions set forth herein. Any item of work performed by other than the Contractor or approved Subcontractors will be considered as unauthorized and shall not be paid for under the provisions of the Contract.

NAME OF SUBCONTRACTOR AND ADDRESS	ITEM OF WORK

CONTINGENCY ALLOWANCE:

The contingency allowance included within the bid document is to be utilized at the discretion of the City to cover unforeseen work that was not included in the project scope. The successful bidder shall obtain prior approval from the Project Manager, or its designee, prior to completing work using contingency allowance funds.

LABOR HARMONY:

CITY ORDINANCE FOR LABOR HARMONY THROUGH PREVAILING WAGE AND BENEFITS FOR CITY PROJECTS:

The Warren City Council has adopted an ordinance entitled Labor Harmony through Prevailing Wage and Benefits for City Projects. The ordinance applies to projects that are **anticipated** to be over **$50,000.00 in value**, and **that involve City Projects as defined in section 2-334.1. A copy of the ordinance is contained in *Appendix A*.** The undersigned has read and agrees to comply with the ordinance including to adherence to wage guidelines, in the event that the undersigned is the successful contractor.

All laborers and mechanics employed or working on this project shall be paid wages and bona fide fringe benefits (or cash equivalent therefore) at rates not less than those attached as ***Appendix B***.

The Labor Harmony through Prevailing Wage requirement applies only to those projects that exceed $50,000.00.

Authorized signature for_____

Labor Harmony Clause Compliance

WARRANTY:

The City of Warren requires a minimum One (1) year warranty on any and all defects in materials and workmanship.

All bidders shall state below type and duration of warranty for both the materials and workmanship. Please explicitly indicate warranty exclusions if any exist.

_____

_____

_____

GENERAL CONDITIONS (Effective November 15, 2022)

SIGNATURE

Bids and all information requested of the vendor shall be entered in the appropriate space on the bid form and Signature Page. Failure to do so may disqualify your offer.

An authorized officer or employee of the vendor shall sign all bids.

BID SUBMISSION

Bids shall be submitted by the date specified and at or prior to the time specified to be considered. Late bids, e-mail, telegraphic, or telephone bids will NOT be accepted.

Submit **ORIGINAL AND ONE (1) COPY** to the address shown on the NOTICE INVITATION TO BID, which can usually be found on the first page of the bid document, with a label on the **outside of the ENVELOPE STATING VENDORS NAME, COMMODITY OR SERVICE AND BID NUMBER AND DUE DATE**

Bids received after 12:30 pm of the date they are due will not be accepted or will be marked late and retained unopened.

RELATIONSHIP DISCLOSURE

It is required that any relationship (business or personal) to a City employee or official be disclosed. This includes employment or other professional engagements.

ALTERATION OF BID DOCUMENTS

Vendor **changes or alterations to the bid documents, including the specification, may result in the bid being considered non-responsive** and/or the Bidder being debarred. The only authorized vendor changes to the bid documents will be in the areas provided for the Bidder's response including the "Exceptions" section of the bid and on separate attached sheets submitted by the vendor. Vendor shall clearly identify product offered and deviations from the specification. If a change or alteration to the bid document is undetected, and the bid is awarded the contract, the original terms, conditions, and specification in the authorized version of the bid document will be applicable during the terms of the contract. Bidders are responsible for ensuring they have obtained all relevant documents including amendments, clarifications, changes, drawings, etc. as made available by the City.

PRICES

Prices quoted shall be for new products in current production unless otherwise specified. Where refurbished or discontinued items are offered they shall be clearly identified as such.

Prices quoted shall be exclusive of any rebates due the City. Any rebates the City may be entitled to should be shown as a separate line item and include expiration date.

Corrections and/or modifications received after the bid closing time specified will not be accepted.

Unit prices prevail.

All information shall be entered in ink or typewritten. Mistakes may be crossed out and corrections inserted before submission of your bid. The person signing the bid shall initial corrections in ink.

All prices will be proposed F.O.B. DESTINATION, INCLUDE ALL DELIVERY AND ANY ADDITIONAL CHARGES and remain in effect as specified in the bid.

AWARD

Unless otherwise stated in the bid documents, the City cannot guarantee exclusivity of the contract for the proposed products or services.

Award of the bids shall be based upon a combination of factors, including but not limited to, adherence to bid requirements, references and any other factors that may be in the City's best interest.

The City reserves the right to reject any and all bids, and to waive any defect or irregularity in bids. The City reserves the right to accept and separate items in the bid and to accept the bid that, in the opinion of the City, is to the best advantage and interest of the public we serve. The City also has the right to re-solicit bids if it is deemed to be in the best interest of the City .

The City reserves the right to reject low bids which have major deviations from our specifications; to accept a higher bid which has only minor deviations. By signing the bid, Bidders agree to accept a split award unless the Bidder clearly indicates that it takes Exception. The bid will be awarded to that responsible, responsive firm whose bid, conforms to this solicitation and will be most advantageous to the City, with regard not only to price but also to availability of product, location and quality of product considered.

The City reserves the right to award all line items, to make no award or to award on an individual line item basis, whichever is deemed to be in the best interest of the City.

Time of delivery may be a consideration in the award.

The City reserves the right to consider as unqualified to perform the contract any bidder who does not habitually perform with its own forces seventy-five (75%) of the work involved.

TERMINATION

1. Failure to Perform. The City may terminate a bid award for the failure to perform a term of the bid specifications to the satisfaction of the City. The City shall provide ten (10) days advance written notice to the Awarded Vendor for the failure to perform services or for the violation of any other term of the bid specifications. Unless futile or the violation is recurring, the City shall provide notice and the opportunity to cure the violation prior to termination. Such notice to cure shall be given in writing by first-class mail. In the event of a dispute, or in order to avoid interruption of service, the City may engage another to perform the work and the Awarded Vendor shall be responsible for any costs the City incurs as a result of the Awarded Vendor's violation. The City may withhold payment to offset any damages the City incurs as a result of the Awarded Vendor's violation.

2. At Will. A bid award may be terminated at will by the City upon a minimum of thirty (30) days prior written notice to the Awarded Vendor. In the event of termination as provided in this subsection, the Awarded Vendor will be compensated for all services performed and approvable reimbursable expenses from the inception date to the termination date provided the services performed and the expenses were provided in accordance with the bid specifications. Payment shall be made upon the Awarded Vendor delivering to the City all information and materials retained by the Awarded Vendor, affiliates, or subcontractors in performing the services described in the bid specifications, whether completed or in progress.

3. MISREPRESENTATION. In addition, the City may reject this Bid, or cancel a contract with an Awarded Vendor, if there is evidence of any misleading or intentionally fraudulent information or documents provided in connection with this Bid.

SPECIFICATION

Brand names and numbers, when used, are for reference to indicate the character or quality desired, unless specifically stated "No Substitutes".

Alternate items of the same quality will be considered, provided your offer clearly describes the article. Offers for alternate items shall state the brand and number, or level or quality.

When the bidder does not state brand, or level of quality, it is understood the offer is exactly as specified.

All products and services shall be in accordance with all applicable federal, state and local statutes, rules, ordinances, etc.

All personnel shall have the appropriate licenses with endorsements for the work performed.

In addition, any personnel driving a vehicle on City property shall have the appropriate valid driver's license and have or exceed minimum statutory insurance requirements.

E-VERIFY

Any bidder, attesting to his bid by signature, is affirming that the Bidder has registered with, participates in and utilizes the E-Verify Program (or any successor program implemented by federal Department of Homeland Security and Social Security Administration) to verify the work status of all newly hired employees employed by the Bidder.

NON-IRAN LINKED BUSINESSES

By signing below, Bidder certifies and agrees on behalf of Bidder and the company submitting this bid the following: (1) that the Bidder is duly authorized to legally bind the company submitting this bid; (2) that the company submitting this bid is not an "Iran linked business," as defined in Section 2(e) of the Iran Economic Sanctions Act, being Michigan Public Act No. 517 of 2012; and (3) that Bidder and the company submitting this bid will immediately comply with any further certifications or information submissions requested by the City in this regard.

ASSIGNMENT OF AGREEMENT – OTHER CONTRACTORS.

The Awarded Vendor shall not assign the contract or any part thereof without the written consent of the City.

PERIOD AGREEMENTS

No Exclusive Contract/Additional Services. The Awarded Vendor agrees and understands that the contract shall not be construed as an exclusive agreement and that the City may, at any time, secure similar or identical services at its sole option.

Any contract executed pursuant to this Bid, which is for a specific term shall include for an extension of the contract term, at the option of the City, as follows:

The City shall have the sole option to extend the contract herein for a period of two months by written notice to the Awarded Vendor exercising the option served at least ten days prior to the expiration date of the contract. In the event such option is exercised by City, all of the provisions of the contract shall remain in full force and effect other than the date of expiration of the contract.

The quantities have been estimated for bid award purposes and may be estimated based on past usage. The quantities may increase or decrease and the City makes no representation as to guarantee of usage. The quantities are estimated on an annual basis.

PAYMENT TERMS

The City's normal payment terms are 45 days in connection with cash discounts specified with this bid. Time will be computed from the date of complete delivery of services, supplies, or equipment, as specified, or from the date correct invoices are received in the Office of the City Controller, if the latter is later than the date of delivery. Prices will be considered as net if no cash discount is shown.

Progress payments will be made on the basis of hours of work completed during the course of the engagement in accordance with the firm's fee bid. Interim billings shall cover a period of not less than a calendar month.

MICHIGAN FREEDOM OF INFORMATION ACT (FOIA)

All costs incurred in the preparation and presentation of this bid, in any way whatsoever, shall be wholly absorbed by the Bidder. All supporting documentation shall become the property of the City unless requested otherwise at the time of submission. Michigan FOIA requires the disclosure, upon request, of all public records that are not exempt from disclosure under Section 13 of the Act, which are subject to disclosure under the Act. Therefore, confidentially of information submitted in response to this RFP is not assured.

EQUAL OPPORTUNITY CLAUSE

This contract requires adherence to the equal opportunity clause, 41 CFR § 60-1.4.

EXCEPTIONS TO THE BID SOLICITATION

Each individual/group shall provide a list of Exceptions taken to this bid. Any Exceptions taken shall be identified and explained in writing. An Exception is defined as the individual/group's inability to meet a mandatory requirement or exceed a requirement in the manner specified in the bid solicitation. If the Bidder provides an alternative solution when taking an Exception to a requirement, the benefits of this alternative solution shall be explained. The City reserves the right to accept or reject any Exception whichever is deemed to be in the best interest of the City.

WITHDRAWAL OF BID

Bidders may withdraw their bids by submitting a written request over the signature of an authorized individual to the Purchasing Department any time prior to the submission deadline. Bidders may thereafter submit a new bid prior to the deadline. Modification or withdrawal of the bid in any manner, oral or written, will not be considered if submitted after the deadline.

DEFAULT TO CITY

It is understood that any Bidder who is in default to the City at the time of opening its bid shall have its bid declared null and void.

BIDDER DISCLOSURE

The Bidder declares that it has not, nor will it, provide gifts, gift certificates, entertainment, favors, or other gratuities to a City official, employee, agent, or volunteer, or to their families.

The Bidder acknowledges that if it violates this policy then the City may terminate the contract with the Bidder.

INDEMNITY CLAUSE

To the fullest extent permitted by law, the Bidder expressly agrees to indemnify and hold City and its Affiliates harmless against all losses and liabilities arising out of or related to bodily injury or property damages based upon any act or omission, negligent or otherwise, of Bidder or

anyone acting on Bidder's behalf in connection with or incident to the work to be performed hereunder, except that Bidder shall not be responsible to indemnify the City for losses or damages caused by or resulting from the City's sole negligence.

For the purposes of this indemnity clause, "City" shall mean the City, its Affiliates, and their elected and appointed officials, employees, authorities, boards and commissions and volunteers working on behalf of the City and its Affiliates; "losses and liabilities" shall mean loss, cost, expense, damage, liability or claims, whether groundless or not; "breach, misappropriation or unauthorized use of data" shall mean copyright, patent, trademark or other intellectual property infringement or unauthorized use of license, software, programs, product, manuals or instructions; "personal injury" shall mean false arrest, erroneous service of civil papers, false imprisonment, malicious prosecution, assault and battery, libel, slander, defamation of character, discrimination, mental anguish, wrongful entry or eviction, violation of property or deprivation of rights, privileges or immunities secured by the constitution and laws of the United States of America or the State of Michigan, for which Vendor may be held liable to the injured party in any action at law, suit in equity or other proceedings for redress; "bodily injury: shall mean bodily injury, sickness or disease (including death resulting at any time there from) mental anguish and mental injury which may be sustained or claimed by any person or persons; and "property damage" shall mean the damage or destruction of any property, including the loss of use thereof.

The Bidder's obligation to indemnify and hold the City and its Affiliates harmless shall include, but not be limited to (1) the obligation to defend the City and its Affiliates from any such suit, action or proceeding, and (2) the obligation to pay any and all judgments which may be recovered in any such suit, action or proceeding, and/or any and all expenses, including but not limited to costs, attorney fees and settlement expenses which may be incurred.

APPENDIX A OF TITLE VI PLAN

During the performance of this contract, the contractor, for itself, its assignees, and successors, in interest (hereinafter referred to as the "contractor") agrees, as follows:

1. COMPLIANCE WITH REGULATIONS. The contractor shall comply with Regulations relative to nondiscrimination in Federally-assisted programs of the Department of Transportation, Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

2. NONDISCRIMINATION. The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, sex, or national origin in the selection, retention, and treatment of subcontractors, including procurements of materials in the discrimination prohibited by Section 21.5 of the Regulation, including employment practices when the contractor covers a program set for in Appendix B of the Regulations.

3. SOLICITATION FOR SUBCONTRACTS, INCLUDING PROCUREMENTS OF MATERIALS AND EQUIPMENT. In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under the contract and the Regulations relative to nondiscrimination on the grounds of race, color, sex, or national origin.

4. INFORMATION AND REPORTS. The contractor shall provide all information and reports required by the Regulations, or directives issues pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the State Highway Department or the Federal Highway Administration to be pertinent to ascertain compliance with such Regulations or

directives. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the State Highway Department or the Federal Highway Administration, as appropriate, and shall set forth what efforts it has made to obtain the information.

5. SANCTIONS FOR NONCOMPLIANCE. In the event the contractor's noncompliance with the nondiscrimination provisions of this contract, the State Highway Department shall impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:

a. Withholding payments to the contractor under the contract until the contractor complies and/or

b. Cancellation, termination or suspension of the contract, in whole or in part.

6. INCORPORATION OF PROVISIONS. The contractor shall include provisions of paragraphs (1) through (6) in every subcontract, including procurement of material and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the State Highway Department or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance: provided, however, that, in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the State Highway Department to enter into such litigation to protect the interests of the State, and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

EXTENSION OF AWARD TO THE MITN PURCHASING COOPERATIVE

By signing below, all vendors awarded contracts from this Bid may, upon mutual agreement, extend pricing, terms, and conditions of this bid to local entities, which are part of the Michigan Intergovernmental Trade Network (MITN) Purchasing Cooperative. Each entity is responsible for its own payments and is to be considered individually for billing and collection purposes. Each entity will provide their own purchase order and delivery location(s), and must be invoiced separately to the address indicated on their purchase order.

If an award is made to your company, it is agreed that the pricing, terms, and conditions of this bid maybe extended to any local entity in the Michigan Intergovernmental Trade Network (MITN) Purchasing Cooperative.

_____

(Company Name) (Authorized Representative)

SAFETY DATA SHEETS

IMPORTANT: All City purchases require **SAFETY DATA SHEETS** where applicable, in compliance with the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard.

THE ABOVE GENERAL CONDITIONS ARE CONSIDERED IN FORCE UNLESS SPECIFICALLY ADDRESSED IN ANOTHER SECTION OF THE BID DOCUMENT

We have read and acknowledge the above GENERAL CONDITIONS

_____

(Signature)

INSURANCE REQUIREMENTS:

INSURANCE CERTIFICATE MUST BE SUBMITTED BY THE INSURANCE AGENCY, NOT THE PROPOSER.

The awarded vendor shall be required to provide the City with certificates of insurance naming the City of Warren, City of Warren Municipal Building Authority, Downtown Development Authority, Tax Increment Finance Authority, the 37th District Court, all elected appointed officials, employees and volunteers as individuals acting within the scope of their authority, AS AN ADDITIONAL INSURED.

It is understood and agreed by naming the City of Warren as additional insured, coverage afforded is considered to be primary, and any other insurance the City of Warren may have in effect shall be considered secondary and/or excess.

Additionally, the awarded vendor shall provide language, within the "Description of Operations" section, that "AGREES TO WAIVE THEIR INSURER'S RIGHT OF SUBROGATION UNDER ITS POLICIES".

The awarded vendor shall provide the following coverage and limits (Sub-contractors utilized by the awarded bidder shall be subject to these same conditions).

COMMERCIAL GENERAL LIABILITY:

The following coverage is part of the General Liability policy:
Policy should be on an OCCURRENCE BASIS WITH COMBINED SINGLE LIMITS.

General Aggregate	$2,000,000
Products/Completed Operations Aggregate	$1,000,000
Personal & Advertising Injury	$1,000,000
Each Occurrence	$1,000,000
Fire Damage-Any one fire	$50,000
Medical Expense-Any one person	$5,000

Per project aggregate limit, Independent contractor's coverage, Broad form property damage Blanket contractual liability coverage

AUTOMOBILE LIABILITY:

Automobile liability insurance coverage shall be $1,000,000 combined single limit for any auto and include hired autos and non-owned autos.

WORKERS'COMPENSATION INSURANCE:

Workers' compensation insurance shall be statutory under the State of Michigan Workers' Compensation Act.

UMBRELLA LIABILITY POLICY:

UMBRELLA LIABILITY SHALL BE $2,000,000 AND BE "FOLLOWING FORM"

The umbrella policy shall be written on an occurrence basis and at a minimum provide excess to the Bidder's General Liability, Automobile Liability and Employer's Liability policies.

Coverage shall be provided by a carrier(s) rated A- or better by A.M. Bests.

Insurance certificates shall contain a provision to the effect that the insurance company SHALL NOTIFY the City at least thirty (30) days prior to CANCELLATION OR MATERIAL CHANGE of the insurance.

( ) Can meet insurance as indicated.

( ) Cannot meet but offer the following:

SECTION 01 30 00

SUBMITTALS

PART 1 GENERAL

1.1 SCHEDULE FOR SUBMISSION

A. Submittal procedures

B. Submittal Review

C. Proposed Products list

D. Shop Drawings, Product Data, and Samples

E. Manufacture's installation instructions

F. Manufacture's certificates

1.2 RELATED SECTIONS

A. General Conditions

B. Section 01 40 00 - Quality Control

C. Section 01 70 00 - Contract Closeout

1.3 SCHEDULE FOR SUBMISSION

A. Prior to submitting any shop drawings, product data, portfolios, samples, etc. the Contractor shall prepare a summary, listing all items in the project which he will submit for review by the Engineer.

B. The summary shall be submitted within twenty (20) calendar days after receipt of Notice to Proceed and shall be updated once per month thereafter.

C. The summary shall include the proposed dates for submittal for each item for control purposes. The summary shall be prepared in coordination with the Project Schedule for Construction and adequate time shall be allowed therein for review and possible resubmittal.

D. The summary and schedule for submittals shall not relieve the Contractor of his obligation to comply with specification requirements for items not listed on the schedule.

E. Nothing herein shall be construed as allowing additional time for completion of the project in the event resubmittal is required for shop drawings or the other items to be submitted.

1.4 SUBMITTAL PROCEDURES

A. Transmit each submittal with Engineer approved transmittal form.

B. Sequentially number the transmittal form. Re-submittals shall have original number and a sequential alphabetic suffix.

C. Identify Project, Contractor, Subcontractor and supplier; pertinent drawing and detail number, and specification section number, as appropriate.

D. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.

E. Schedule submittals to expedite the Project, and deliver to the Engineer in a manner to allow sufficient time for review and processing by the Engineer so as to not cause delays in the Work. Coordinate submission of related items.

F. All drawings, information and documentation shall be prepared and submitted with all words in the English language and dimensions in American units. No foreign language or metric units will be permitted.

G. Identify variations from Contract Documents and Products and system limitations which may be detrimental to successful performance of the completed work.

H. Provide space for Contractor and Engineer review stamps.

I. Revise and resubmit submittals as required and identify all changes made since previous submission.

J. Distribute copies of reviewed submittals to all concerned and related parties. Instruct parties to promptly report any inability to comply with provisions.

K. The Engineer reserves the right to refuse to check or review any submittal of a subcontractor or manufacturer which is not presented in compliance with the foregoing requirements.

L. Electronic Submittals:
1. All electronic submittals shall follow the procedures outlined above.
2. Electronic submittal procedures are only applicable to Shop Drawings and product data submittals.
3. Electronic submittals shall be made in a standard format the Engineer has agreed in advance to accept, JPEG, TIF, DGN, DXF, DWG, or PDF.
4. Reviewed submittals shall be returned in JPEG, TIF, or PDF electronic format for the Contractor's printing and distribution.

1.5 SUBMITTAL REVIEW

A. All subcontractors and manufacturers' drawings shall first be sent directly to the Contractor, who shall keep a record of the drawing numbers and the dates of receipt. The Contractor shall check thoroughly all such drawings, as regards measurements, sizes of members, materials, and all other details to assure himself that they conform to the intent of the drawings and the specification, and shall promptly return to the subcontractors and/or manufacturers for correction such drawings as are found inaccurate or otherwise in error.

B. The Engineer will review the Contractor's, subcontractors' and manufacturers' drawings within a reasonable time after receipt thereof and will return one copy endeavoring to indicate, by notation thereon or written instructions, any correction which may be necessary to meet the Contract requirements. The Contractor shall then review such notations and/or instructions and if he concurs therein, shall make or have made such required corrections, and shall, when so noted on the drawings or requested by the Engineer, resubmit corrected drawings to the Engineer as soon as possible, for final review. Such further review by the Engineer will be limited to the corrections only, and the Contractor, by such re-submission shall be held to have represented that such drawings contain no other alterations, additions or deletions, unless the Contractor (in writing) directs the Engineer's specific attention to same. Should the Contractor question, or dissent from, such notations and/or instructions, he shall so inform the Engineer and request further clarification before resubmitting the drawings.

C. The review of Contractor's, subcontractors', and manufacturers' drawings by the Engineer is for coordination and assistance, and the Engineer does not thereby assume responsibility for errors or omissions. Such errors or omissions must be made good by the Contractor, irrespective of the receipt, review of the drawings by the Engineer, and even though the work is done in accordance with such drawings.

1.6 PROPOSED PRODUCTS LIST

A. Within 15 days after date of Owner-Contractor Agreement submit list of all major products proposed for use, including those previously called for to be submitted in the Proposal, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

C. Substitutions: Whenever a particular brand or make or type of material, equipment, or other item is specified or is indicated on the Contract Drawings, it is for the purpose of establishing a standard of quality, design, and type desired and to supplement the detailed specifications. Any other brand or make or type which in the opinion of the Engineer is equivalent to that specified or indicated may be offered as a substitute, subject to the following provisions:
   1. Contractor shall submit for each proposed substitution sufficient details, complete descriptive literature and performance data together with samples of the materials where feasible to enable the Engineer to determine if the proposed substitution is equal to that specified.
   2. Contractor shall submit certified tests where applicable by an independent laboratory, acceptable to the Owner, attesting that the proposed substitution is equal.
   3. A list of installations where the proposed substitution is used.
   4. Requests for substitutions shall include full information concerning differences in cost, and any savings in cost resulting from such substitutions shall be passed on to the Owner.
   5. Where the review of a substitution requires revision or redesign of any part of the work, all such revision and redesign and all new drawings and details required, therefore, shall be provided by the Contractor at his own cost and expense and shall be subject to the review of the Engineer.

6. In all cases, the Engineer shall be sole judge as to whether a proposed substitution is to be incorporated into the project. The Contractor shall abide by the Engineer's decision when proposed substitute items are judged to be unacceptable and shall in such instances furnish the item specified or indicated. No substitute items shall be used in the work without review of the Engineer.

1.7 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

A. The intent of the Contract Documents is to include in the contract price the cost of all labor and materials, water, fuel, tools, plant, equipment, light, transportation, and all other expenses as may be necessary for the proper execution and completion of the work.

B. While the contract drawings and specifications propose to be complete in all respects as to layout, type of equipment and materials, they are not intended to serve as detailed sleeve or insert drawings, and the preparation of such drawings required or necessary for this purpose, or to set equipment accurately, shall be the responsibility of the Contractor.

C. These Contract Documents shall be supplemented by other drawings, product data, samples and portfolios of all equipment, apparatus, materials, etc. furnished by the Contractor and reviewed by the Engineer. All such supplementary drawings or instructions are intended to be consistent with the Contract Documents, true developments thereof and reasonably inferable therefrom. Therefore, no extra charge will be allowed on a claim that particular supplemental drawings or instructions differed from the Contract documents, incurring extra work, unless the Contractor has first brought the matter, in writing, to the Engineer's attention for proper adjustment before starting on the work covered by such and has received from the Engineer an order in writing to so proceed.

D. These original and supplementary drawings constitute the drawings according to which the work is to be done. The Contractor shall keep at the site of the work, copies of all drawings and specifications and shall at all times give the Engineer or Owner access thereto.

E. Shop Drawings are drawings, diagrams, schedules other data specifically prepared for the Work by the Contractor or a subcontractor, Subcontractor manufacturer, supplier or distributor to illustrate some portion of the Work.

F. Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of these submittals is to demonstrate for those portions of the Work for which submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

G. Product Data are illustrations, standard schedules, performance charts, instructions, catalog cuts, brochures, diagrams, materials lists and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

H. Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

I. The Contractor shall review, approve, and submit to the Engineer, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents requested by the Engineer or Owner or otherwise necessary for the proper execution of the work, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals made by the Contractor which are not required by the Contract Documents may be returned without action.

J. The Contractor shall perform no portion of the Work requiring submittal, resubmittal, and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been reviewed by the Engineer. Such Work shall be in accordance with reviewed submittals.

K. By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or contained within such submittals with the requirements of the Work and of the Contract Documents.

L. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Engineer's review of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Engineer in writing of such deviation at the time of submittal and the Engineer has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or

omissions in the Shop Drawings, Product Data, Samples or similar submittals by the Engineer's review thereof, as the Engineer's review in intended to cover compliance with the Contract Document and not to enter into every detail of the shop work.

M. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those required by the Engineer on previous submittals.

N. When professional certification of performance criteria of materials systems or equipment is required by the Contract Documents, the Engineer shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

O. Shop Drawings
1. Submit in the form of two legible opaque copies.
2. One reviewed copy will be returned to the Contractor for his duplication and distribution.
3. After review, produce copies and distribute in accordance with the SUBMITTAL PROCEDURES article herein and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.

P. Product Data
1. Submit two copies of the documents which the Engineer requires. One reviewed copy will be returned to the Contractor for his duplication and distribution.
2. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
3. Product data shall be bound with an index sheet containing a space at least 5" x 8" for review stamps and notes.
4. After review distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01700 - CONTRACT CLOSEOUT.

Q. Samples
1. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
2. Submit samples of sufficient size and representative of finishes indicating textures, and patterns for Owner selection.

3. Include identification on each sample, with full Project information.
4. Submit the number of samples specified in individual specification sections; two of which will be retained by the Engineer.
5. Reviewed samples which may be used in the work are indicated in individual specification sections.

1.8 MANUFACTURER INSTALLATION INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, operating, maintaining and finishing to the Engineer in quantities specified for Product Data.

B. Identify conflicts between manufacturer's instructions and contract documents.

1.9 MANUFACTURER CERTIFICATES

A. When specified in individual sections, submit certification by manufacturer to Engineer, in quantities specified for Product Data.

B. Indicate material or Product meets or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to the Engineer.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 40 00

QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality assurance - control of installation.

B. Tolerances

C. References.

D. Mockup.

E. Inspecting and testing laboratory services.

F. Manufacturers' field services and reports.

1.2 RELATED SECTIONS

A. Section 01300 - Submittals: Submission of manufacturers' instructions and certificates.

B. Section 01600 - Material and Equipment: Requirements for material and product quality.

1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.4 TOLERANCES

A. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.5 REFERENCES

A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date specified in the individual specification sections, except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Architect/Engineer shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.6 MOCK-UP

A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups are representative of the quality required for the Work.

D. Where mock-up has been accepted by Architect/Engineer and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so.

1.7 INSPECTING AND TESTING LABORATORY SERVICES

A. Owner will appoint, employ, and pay for specified services of an independent firm to perform inspecting and testing, as required.

B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Engineer or the Owner.

C. Inspecting, testing, and source quality control may occur on or off the project site. Perform off-site inspecting or testing as required by the Engineer or the Owner.

D. Reports will be submitted by the independent firm to the Engineer, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify Engineer and independent firm 48 hours prior to expected time for operations requiring services.
   2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

F. Testing or inspecting does not relieve Contractor of performing Work to contract requirements.

G. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for retesting will be charged to the Contractor by deducting inspecting or testing charges from the Contract Sum.

1.8 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment and as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

C. Submit report in duplicate within 30 days of observation to Engineer for information.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 50 00

CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone and fax service, water supply, and sanitary facilities.

B. Temporary Controls: Fire Protection, Barriers, enclosures and fencing, protection of the Work, and ground and surface water control.

C. Construction Facilities: First Aid Facilities Access roads, parking, progress cleaning, project signage, existing utilities, structures and temporary buildings.

D. Temporary River Crossing: Construction and removal of temporary river crossing and temporary approach roads.

1.2 RELATED SECTIONS

A. Section 00700 - General Conditions

B. Section 01005 - Administrative Provisions

C. Section 01580 - Project Signs.

D. Section 01590 - Field Offices and Sheds.

E. Section 01700 - Contract Closeout: Final cleaning.

1.3 TEMPORARY ELECTRICITY AND LIGHTING

A. Cost: By Contractor; provide and pay for power service required from utility source.

B. The Contractor shall provide all necessary materials and equipment required for temporary service. All circuits shall be insulated, weatherproof, equipped with an equipment grounding conductor. All enclosures and devices shall be weatherproof.

C. When permanent electrical power and lighting systems are in operating condition, they may be used for temporary power and lighting for construction purposes provided that the Contractor:
1. Obtains the approval of the Engineer.

2. Assumes full responsibility for power and lighting system.
3. Pays all costs for operation and restoration of the systems and for all electrical power consumed.

D. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

E. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

F. Maintain lighting and provide routine repairs.

1.4 TEMPORARY HEAT AND VENTILATION

A. The Contractor shall provide heat and ventilation as required to maintain specified conditions for construction operations and to protect materials and finishes from damage due to temperature or humidity.

B. The Contractor shall provide ventilation of enclosed areas to cure materials; to disperse humidity; and to prevent accumulations of dust, fumes, vapors, or gases.

C. Permanent heating and ventilation systems may be used for temporary heating and ventilation during construction provided the Contractor:
1. Obtains approval from the Engineer.
2. Assumes full responsibility for the entire system.
3. Pays for all costs for operation, maintenance, and restoration of the system and for energy consumed.

D. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.5 TELEPHONE AND FACSIMILE SERVICE

A. Provide, maintain and pay for telephone service to field office and Engineer's field office at time of project mobilization, and during the entire duration of the project.

B. Provide, maintain and pay for facsimile service and a dedicated telephone line to field office at time of project mobilization, and for the entire duration of the project.

C. Provide for removal of these services at the culmination of the project.

1.6 TEMPORARY WATER SERVICE

A. Municipal water shall be made available for the Contractor's use provided such service is readily accessible. Any temporary extension of the facilities shall be installed by the Contractor and removed at the completion of his work. The construction of the temporary facilities shall meet all state and local codes and shall include a meter with totalizer. The discriminate use of the Municipal water for normal purposes of construction shall be at no cost to the Contractor. Excessive or indiscriminant use of water will be cause for the Municipality to require the Contractor to pay for the water used.

B. If connections are made to the hydrants, the Contractor shall obtain authorization from the appropriate Fire Department. The Fire Department standard wrench shall be used for opening and closing the fire hydrants. Fire hydrants shall be pumped out and left dry after each use regardless of the season of the year.

1.7 TEMPORARY SANITARY FACILITIES

A. Provide and maintain adequate and required facilities and enclosures during the entire duration of the project.

1.8 TEMPORARY FIRE PROTECTION

A. The Contractor shall follow the standards of the National Fire Protection Association during torch cutting or welding on the job site.

B. The Contractor shall provide a suitable number of portable fire extinguishers (non-freeze type in cold weather) distributed about the job site.

C. The Contractor shall store gasoline and other flammable liquids in U.L. listed safety containers in a location away from the building and distribute the liquids directly from the containers. Storage of flammable liquids shall not be allowed inside of any municipal or county building or structure.

1.9 BARRIERS

A. The Contractor shall provide barricades, and adequate warning flags, signs, and lights in accordance with governing laws and ordinances to protect construction areas, existing facilities, and adjacent properties.

B. Provide barricades and covered walkways required by governing authorities for public right-of-way and for public access to existing building.

C. Provide protection for plant life designated to remain. Replace damaged plant life.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.10 FENCING

A. Provide fencing around construction sites and equip as needed with vehicular and pedestrian gates with locks as shown on the Contract Drawings.

1.11 GROUND AND SURFACE WATER CONTROL

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment. All water from whatever sources entering the work during any stage of construction shall be promptly removed and disposed. All pumping and drainage shall be done without damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians or vehicular traffic, or the work of other contractors. Dewatering shall be done in such a manner that soil under or adjacent to existing structures shall not be disturbed, removed, or displaced.

1.12 ENCLOSURES

A. The Contractor shall provide a construction plan layout showing the arrangement of temporary buildings, construction equipment, and storage and work areas. The plan must be approved by the Engineer prior to erection.

B. The Contractor shall provide temporary insulated weather tight closure of all exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks. All access openings shall be approved by the Engineer.

C. Provide temporary partitions and ceilings as indicated to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.

D. The construction of partitions shall be 2 x 4 framing and sheet materials with closed joints and sealed edges at intersections with existing surfaces.

1.13 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

G. Prohibit construction traffic from utilizing permanent site access bridge.

1.14 SECURITY

A. Provide security and facilities to protect Work, from unauthorized entry, vandalism, or theft.

1.15 FIRST AID FACILITIES

A. A completely equipped, readily accessible first-aid kit shall be provided and maintained at the job site at all times.

B. The telephone numbers for summoning aid from outside sources (e.g., Police, Fire, EMS, physicians) shall be conspicuously posted near each phone on the job site.

1.16 ACCESS ROADS

A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.

B. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

1.17 PARKING

A. Provide temporary gravel surface parking areas to accommodate construction personnel.

B. When site space is not adequate, provide additional off-site parking.

C. Do not allow vehicle parking on existing pavement.

D. Designate two parking spaces for the Owner and Engineer.

1.18 TRAFFIC REGULATION

A. The Contractor's trucks and equipment operations shall be governed by all applicable ordinances; the rules and regulations of the Fire, Police, Transportation Departments; and the requirements of any other authority having jurisdiction. Flagman, warning lights, traffic signs, cones, and barricades shall be provided by the Contractor as necessary to direct and protect vehicular and pedestrian traffic at all locations of construction operations.

B. The Contractor shall be responsible for obtaining approvals and securing permits from all authorities having jurisdiction over work in rights-of-way.

C. The Contractor shall notify the Engineer, the local police and fire departments, all other interested local authorities, and the residents of all affected streets five days prior to any street closures.

D. The Contractor shall provide and maintain all temporary facilities required. These shall include but not be limited to facilities necessary to maintain pedestrian and vehicular traffic access through the area or to adjacent properties and to provide unobstructed access to fire hydrants and water and gas valves. The Contractor shall provide all barriers, lights, warning flags and signals, and the like that the Engineer or other authorities may require to accommodate and protect the public.

E. Should the Contractor fail to promptly provide or neglect to maintain the required temporary facilities or be dilatory in carrying out specific instruction to the Engineer, the Owner may with or without notice to the Contractor take such remedial measures deemed necessary and charge the Contractor with any costs incurred therefor. Any such action, however, shall in no way serve to release the Contractor from his general or particular liability for the safety of the traveling public or the protection of property.

1.19 PROTECTION OF PROPERTY AND SURVEY MONUMENTS

A. Before any monuments or stakes marking the boundaries of property along or near the work are removed or disturbed, notify the Engineer in sufficient time so that they can be properly located and reset. Contractor shall pay all costs incurred in connection therewith.

B. All precautions shall be taken to avoid disturbance of permanent survey monuments of any city, county, state, or federal authority; and when any of these are disturbed or destroyed, the Contractor shall restore them to

the satisfaction of such authority and shall pay all costs incurred by such authority in connection therewith.

1.20 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.

1.21 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 60 00

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General Provisions.

B. Transportation and handling.

C. Storage and protection.

D. "Or Equal" Clause

E. Product options.

F. Substitutions.

G. Installation of Equipment.

H. Damage during tests and instruction period.

I. Services of manufacturer's engineers.

J. Equipment manufacturer certification.

1.2 RELATED SECTIONS

A. Section 01 40 00 - Quality Control: Product quality monitoring.

1.3 GENERAL PROVISIONS

A. Products (including all materials, machinery, equipment, and systems) shall be carefully designed and installed to insure that all required functions are adequately performed within specified degrees of precision and that each unit shall operate with every other part, furnished or existing, to provide a complete integrated system which shall operate to the satisfaction of the Engineer. Any changes or revisions of existing work made necessary by the type and dimensions of furnished products shall be made at the expense of the Contractor, and he shall furnish detail drawings showing such changes or revisions for the approval of the Engineer.

B. Submit to the Engineer ample proof that each and every part of the products to be furnished is of a reliable make and of a type which has been in successful operation within the continental United States.

Installation of any experimental or untried type of apparatus, material, or machinery will not be allowed.

C. Each major item of equipment shall have the manufacturer's nameplate securely affixed in a conspicuous place. The nameplate shall show the manufacturer's name, address, model number, rating, and any other pertinent data such as speed, horsepower, etc.

D. All materials, equipment, and accessories shall be new and unused and shall be essentially the products of a manufacturer regularly engaged in the production of such material or equipment and shall essentially duplicate material or equipment that has been in satisfactory operation at least 5 years.

E. The owner reserves the right to reject any material or equipment manufacturer who, although he meets the above requirements, does not provide satisfactory evidence indicating adequate and prompt post-installation repair and maintenance service as required to suit the operational requirements of Owner. Items of any one type of materials or equipment shall be the product of a single manufacturer.

F. All piping and equipment furnished under this contract shall be fabricated of such materials that under normal operating conditions harmful substances are not imparted to the water supply system.

G. Except as otherwise specified or required, equipment shall be primed and finish painted at the factory in accordance with the recommendations or the approved manufacturer. All equipment supplied under this contract shall include at least one quart of finish paint used for touch-up at the completion of construction.

H. Necessary field painting shall be in accordance with the requirements of Section 09900 - Painting. Any damage to shop coating shall be corrected to the satisfaction of the Engineer.

I. Certification shall be provided that all materials which may come into contact with potable water meets the National Sanitation Foundation Standard 61 and all MDPH regulations in force at the time of submittals.

1.4 TRANSPORTATION AND HANDLING

A. Transport and handle Products in accordance with manufacturer's instructions.

B. Transport and handle all materials in such a manner to avoid breakage, inclusion of foreign materials, and/or damage by water or other causes.

C. Deliver packaged materials in original unopened containers. Packages or materials showing evidence of damage or contamination regardless of cause will be rejected.

D. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

E. Repair or replace all items damaged or broken as a result of the Contractor's operation at no cost to the Owner.

F. When specified in the individual Section, equipment shall be made available for conditional acceptance by the Engineer at the factory prior to shipment.

G. Equipment shall not be delivered unless it can be immediately incorporated into the work or proper storage facilities are available.

H. Crate all parts of equipment carefully to facilitate shipping and handling. Crates shall completely protect the equipment and be sufficiently strong to permit lifting and skidding without additional bracing or reinforcement.

I. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

J. Notify the Engineer at least two days in advance of the delivery of equipment.

1.5 STORAGE AND PROTECTION

A. Store and protect Products in accordance with manufacturers' instructions, with seals and labels intact and legible.

B. Store sensitive Products in weather tight, climate controlled enclosures.

C. For exterior storage of fabricated Products, place on sloped supports, above ground.

D. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

E. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.

F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

H. Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.6 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers with the provision "No Substitutions": Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for "or Equal" or Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article and Section 01300.

1.7 "OR EQUAL" CLAUSE

A. Specifying an article, material, or piece of equipment by reference to a proprietary product or by using the name of a manufacturer or vendor followed by the clause "or equal" shall be understood to indicate the type, function, minimum standard of design, efficiency, and quality desired and shall not be construed in such a manner as to exclude products of comparable quality, design, and efficiency.

B. Comparable products shall be capable of performing equal function and shall be compatible with other equipment, materials, or systems to which they connect or will become an integral part of.

C. The clause "or approved equal" which may appear elsewhere in the documents shall mean the same as "or equal".

D. Wherever in the documents an article, material, or piece of equipment is defined by specifying a proprietary product or using the name of a manufacturer or vendor the term "or equal" if not included shall be implied.

E. Substitutions of "or equal" products are subject to approval of the Engineer.

1.8 SUBSTITUTIONS

A. Refer also to Section 01300.

B. Engineer will consider requests for Substitutions after the date established in Notice to Proceed.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that the Contractor:
1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.

2. Will provide the same warranty for the Substitution as for the specified Product.
3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension which may subsequently become apparent.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:
1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
2. Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Also provide information required by Section 01300 for substitutions. Burden of proof is on proposer.
3. The Engineer will notify Contractor in writing of decision to accept or reject request.

1.9 INSTALLATION OF EQUIPMENT

A. General
1. Contractor shall have on hand sufficient personnel, proper equipment, and machinery of ample capacity to facilitate the work.
2. Contractor shall be responsible for locating, aligning, and leveling all equipment.
3. Complete manufacturer's installation instructions including permissible tolerances shall be furnished with each unit of equipment.
4. All equipment shall be installed in accordance with the approved manufacturer's specifications, drawings, and tolerances under the direct supervision of the required manufacturer's engineer.
5. Equipment shall be erected in a neat and workman-like manner on the foundations at the locations and elevations shown on the drawings unless directed otherwise by the Engineer during installation.

B. Installation
1. Special care shall be used in locating, aligning and, leveling all equipment and parts thereof to insure that each item is in the proper position relative to other equipment and that all parts are aligned within allowable tolerances. The Contractor shall be responsible for this accuracy and shall notify the Engineer of any conditions in prior work which would prevent this alignment before proceeding with the work. The Contractor shall employ a

competent surveyor to set all lines and levels of equipment to the accuracy required.

2. All blocking and wedging required for the proper support and leveling of equipment during installation shall be furnished by the Contractor. All temporary supports shall be removed except steel wedges and bronze shims which may be left in place with the approval of the Engineer.
3. Each piece of equipment or supporting base bearing on concrete foundations shall be bedded in grout. The Contractor shall provide a minimum of 1-1/2" thick grouting or as indicated on Contract Drawings.

1.10 DAMAGE DURING TESTS AND INSTRUCTION PERIODS

A. Contractor shall be fully responsible for the proper operation of equipment during tests and instruction periods and he shall neither have nor make any claim for damage which may occur to equipment prior to the time when the Owner formally takes over the operation thereof.

1.11 SERVICES OF MANUFACTURER'S ENGINEERS

A. The contract price shall include the cost of furnishing competent engineers or superintendents from each company manufacturing equipment for the Project to:
   1. Assist the Contractor to install, adjust, and test the equipment in conformity with the Contract Documents.
   2. Supervise start-up operations and adequately instruct designated employees of the Owner in the proper operation and maintenance procedures when requested by the Owner throughout the guarantee period of the equipment. A report on each visit shall be filed by the manufacturer's representative with the Engineer.

1.12 EQUIPMENT MANUFACTURER CERTIFICATION

A. The Contractor will provide Engineer with written certification obtained from each company manufacturing equipment for the Project that the equipment is installed and does operate in accordance with the manufacturer's recommendations.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 70 00

CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Adjusting.

D. Project record documents.

E. Lubrication survey.

F. Spare parts and special tools.

G. Equipment startup services.

H. Substantial completion.

I. Warranties.

1.2 RELATED SECTIONS

A. Section 013000 - Submittals.

B. Section 015000 - Construction Facilities.

1.3 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's review.

B. Provide submittals to Engineer that are required by governing or other authorities.

C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.4 FINAL CLEANING

A. Complete final cleaning and restoration prior to final project inspection.

B. Remove all temporary labels, stains and foreign substances. Wash or clean by approved methods all surfaces on which dust and dirt has collected.

C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

D. Clean debris from drainage systems.

E. Clean site; sweep paved areas, rake clean landscaped surfaces.

F. Remove waste and surplus materials, rubbish, and construction facilities from the site.

G. Restore disturbed area. Lawn area may be seeded unless otherwise noted. Paved area shall be restored to their original condition, compatible with the surrounding area, using like materials and workmanship.

H. Touchup painted surface. Clean and repaint with matching color all scratched, marred or otherwise damaged painted surfaces of all equipment and enclosures.

1.5 ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.6 PROJECT RECORD DOCUMENTS

A. Maintain on site, one set of the following record documents:
1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed Shop Drawings, Product Data, and Samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. As the work progresses, keep a complete and accurate record of all changes in the Contract Documents (including Drawings, Shop Drawings, Product Data, and Specifications) indicating the work as actually installed. All changes shall be neatly shown on blueline prints of the drawings effected or in the specifications which shall be kept at the job site for inspection by the Owner and the Engineer.

C. Ensure entries are complete and accurate, enabling future reference by Owner.

D. Store record documents separate from documents used for construction.

E. Record information concurrent with construction progress.

F. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda, Field Modifications and Change Orders.

G. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish main floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

H. On completion of the work, prior to the Contractor's application for final payment and as a condition to its approval by the Engineer and Owner, the Contractor shall arrange such site records in order in accordance with the various sections of the specifications bind them together and index them and deliver them to the Engineer. In addition the Contractor shall request a complete set of reproducible contract Drawings, and transfer all as-built revisions and changes to them and deliver them to the Engineer. These drawings shall be dated and marked "As-Built".

I. All reproducible tracings made by the Contractor, equipment manufacturers, and/or material suppliers shall be corrected to show the work as actually completed or installed and a reproducible copy of these drawings shall then be turned over to the Engineer.

J. Prints in triplicate of all corrected opaque drawings shall be furnished to the Engineer prior to the issuance of the final estimate.

K. Written approval or other evidence satisfactory to the Engineer of the final conditions of the work shall be obtained from:
   1. Macomb County
   2. Detroit Edison Company
   3. All public authorities or agencies having jurisdiction over any portion of the work
   4. Others as requested by the Engineer in writing.

L. All public authorities or agencies having jurisdiction over any part of the work shall be determined, and all the requirements of these authorities or agencies with respect to but not limited to inspection, permits, fees, approval, and the like regardless of whether they are listed above or not shall be met.

M. Submit all documents to Engineer for approval prior to submittal of final Application for Payment.

1.7 LUBRICATION SURVEY

A. A lubrication survey, made by a lubricant supply firm, shall be provided and paid for by the General Contractor, subject to the approval of the Engineer.

B. The lubrication survey shall list all equipment, the equipment manufacturer's lubrication recommendations, and an interchangeable lubricants tabulation standardizing and consolidating lubricants whenever possible.

C. The General Contractor shall supply all lubricants, applicators and labor for lubricating the equipment in accordance with manufacturers' recommendations, for field testing and prior to final acceptance. A supply of required lubricants sufficient for start-up and initial operation shall also be supplied by the General Contractor.

D. Five copies of the approved lubrication survey shall be furnished prior to final acceptance and shall be included within O & M Manuals furnished under Section 01730.

1.8 SPARE PARTS AND SPECIAL TOOLS

A. Spare Parts
1. As soon as practicable after approval of the list of equipment, the Contractor shall furnish spare parts data for each different item of equipment listed. The data shall include a complete list of parts and supplies with current unit prices and source of supply.
2. Contractor shall also furnish a list of parts and supplies that are either normally furnished at no extra cost with the purchase of the equipment or specified to be furnished a part of the Contract and a list of additional items recommended by the manufacturer to assure efficient operation for a period of 1 year at the particular installation.
3. The foregoing shall not relieve the Contractor of any responsibilities under the guarantee provisions of these Specifications.
4. The Contractor shall deliver all spare parts required by this contract to the Engineer or as directed by the Engineer.

B. Special Tools
1. Contractor shall furnish at no additional cost to the Owner with each piece of equipment, one complete set of suitably marked special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment.
2. Contractor shall submit for approval by the Engineer a complete list of the special tools and appliances to be furnished. Such tools and appliances shall be furnished in approved painted steel

cases properly labeled and equipped with good grade cylinder locks and duplicate keys.

3. The Contractor shall deliver all special tools required by this contract to the Engineer or as directed by the Engineer.

C. Keys

1. The Contractor shall deliver four keys for each lockset and padlocks installed under this Contract.
2. The keys shall be tagged with locations, room numbers, and key numbers.
3. The Contractor shall deliver all keys required by this contract to the Engineer or as directed by the Engineer.

1.9 EQUIPMENT START-UP SERVICES

A. Equipment start-up period for the training of plant personnel shall begin after satisfactory completion and acceptance of the field tests and coincidentally with the certified date of substantial completion for that part of the work for which the equipment is included. If the equipment is not covered by a certificate of substantial completion for a part of the work, the period shall begin upon substantial completion of the project.

B. During the equipment start-up period, the Contractor shall furnish at no additional cost to the Owner the services of factory trained representatives of the equipment manufacturers for the equipment designated in the Specifications to:

1. Assist in the start-up and operations of the equipment.
2. Assist in the training of facility personnel, designated by the Owner, in the proper operation and maintenance of the equipment.

C. The Owner shall:

1. Provide the necessary personnel to be instructed in the operation and maintenance of the equipment. The Owner's personnel shall operate all equipment.
2. Pay for all fuel, power and chemicals consumed beyond quantities specified or in the Contract Documents or required due to Contractors fault. The Contractor shall pay for fuel, power, and chemicals consumed up to the date of "certified substantial completion" except as otherwise specified herein.

D. Contractor shall be available to promptly repair all work during the start-up period so as to cause minimum disruption to the total facility operation.

E. In the event a system, equipment, or component proves defective or is unable to meet specified performance criteria, the Contractor shall replace the defective item and the one year guarantee period for the item shall start after satisfactory replacement and testing of the item.

1.10 SUBSTANTIAL COMPLETION

A. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy and utilize the facilities for its intended use.

B. When the Contractor considers that the Work, or portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Engineer a comprehensive list of items to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the Contractor's list, the Engineer will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Engineers inspection discloses any item, whether or not included on the Contractor's list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall complete or correct such item upon notification by the Engineer. The Contractor shall then submit a request for another inspection by the Engineer to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Engineer will prepare a Certificate of Substantial Completion which shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate.

1.11 WARRANTIES

A. Provide duplicate copies of all warranties.

B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers with a Table of Contents in three D side ring binder with durable plastic cover.

C. Submit warranty documents prior to final Application for Payment.

D. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

E. All parts of the work or equipment which is in the opinion of the Engineer prove defective in material, workmanship, or operation within the

warranty period shall be removed and replaced or repaired in a manner satisfactory to the Engineer and at no cost to the Owner.

F. Any service material or equipment required because of the defect shall be supplied without charge.

G. All work specified to be designed by the Contractor shall be guaranteed to perform as specified.

H. The Warranty period shall be one year from the date of Substantial Completion unless:
   1. A greater period is specified elsewhere.
   2. Owner chooses to take over and use a portion of the Work as provided for in the Specifications; in which case the warranty shall be one year from said takeover and use.

I. Equipment or work replaced and/or repaired during the warranty period shall be guaranteed for one year from the date of acceptance of the repair or replacement or until expiration of the original warranty period whichever comes later.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 02 41 03

SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. Provide demolition activities with the scope as per specifications and drawings.

B. Fully demolish all abandoned utilities within the scope of work area.

1.2 SUBMITTALS

A. Schedule: Submit for approval selective demolition schedule, including schedule and methods for capping utilities to be abandoned and maintaining existing utility service.

1.3 QUALITY ASSURANCE

A. Codes and Regulations: Comply with governing codes and regulations. Use experienced workers.

1.4 PROJECT CONDITIONS

A. Occupancy: Immediate areas of work will not be occupied during selective demolition.

B. Existing Conditions: No responsibility for buildings and structures to be demolished will be assumed by the Owner.

PART 2 PRODUCTS

2.1 DEMOLITION APPLICATIONS

A. Selective Interior Demolition:
1. Application: Selective demolition of interior partitions, systems, and building components designated to be removed.
2. Application: Notification to Owner of schedule of shut-off of utilities which serve occupied spaces.
3. Application: Removal of hollow items or items which could collapse.
4. Application: Disconnection, capping, and removal of utilities.
5. Application: Pollution control during building demolition, including noise control.
6. Application: Removal and legal disposal of materials.
7. Protection: Site and adjacent construction.
8. Salvage: Items as designated by Owner.
9. Utilities: Interruption, capping or removal as applicable.
10. Hazardous Materials: Removed under separate prior contract.

11.

PART 3 EXECUTION

3.1 SELECTIVE DEMOLITION

A. Demolition Operations: Do not damage building structure, assemblies, elements and improvements indicated to remain. Items of salvage value, not included on schedule of salvage items to be returned to Owner, shall be removed from structure. Storage or sale of items at project site is prohibited.

B. Utilities: Locate, identify, disconnect, and seal or cap off utilities in buildings to be demolished.

C. Shoring and Bracing: Provide and maintain interior and exterior shoring and bracing.

D. Occupied Spaces: Do not close or obstruct streets, walks, drives or other occupied or used spaces or facilities without the written permission of the Owner and the authorities having jurisdiction. Do not interrupt utilities serving occupied or used facilities without the written permission of the Owner and authorities having jurisdiction. If necessary, provide temporary utilities.

E. Operations: Cease operations if public safety or remaining structures are endangered. Perform temporary corrective measures until operations can be continued properly.

F. Security: Provide adequate protection against accidental trespassing. Secure project after work hours.

G. Restoration: Restore finishes of patched areas.

3.2 SCHEDULE

A. Items for Protection During Demolition and Construction: (The following are samples only)
   1. Adjacent paving and existing building structures.

B. Items to be Salvaged for Reinstallation:
   1. As identified on drawings.

C. Items to be Salvaged for Delivery to Owner:
   1. As identified on drawings

D. Utilities Requiring Interruption, Capping, or Removal:
   1. Electric.
   2. Heat.
   3. Water.
   4. Gas.
   5. Sewerage.
   6. Steam.

END OF SELECTIVE DEMOLITION

SECTION 02 82 14

ASBESTOS REMEDIATION

LAB BENCH TOPS AND ADHESIVES AND LAB FUME HOOD LINER AND SHELF

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes removal and disposal of asbestos-containing materials by full enclosure, glove bag, or entire structures methods as applicable. Demolition and debris removal of all asbestos containing materials identified by provisions of this Section, or shown on drawings, or identified at the site, shall be executed under the provisions of this Section, and other applicable sections of these specifications.

B. Extent of asbestos removal work is as follows:

1. Lab benchtop and adhesives and lab fume hood liner and shelf at areas of demolition and work contained in the construction documents and specification.

2. Marked at the site during the pre-bid inspection "walk through" with owner.

1.2 RELATED SECTIONS

A. Section 01 23 00 Alternates.

B. Section 02 41 19 Selective Demolition.

1.3 DEFINITIONS

A. Asbestos Abatement Firm: Firm engaged to perform actual removal and disposal work, either as Contractor or subcontractor.

B. Asbestos Containing Material: The term "asbestos containing material" is abbreviated ACM.

C. Owner's Consultant: Firm engaged by Owner to identify and measure asbestos containing materials, or to inspect demolition operations, including monitoring of air quality.

1.4 SUBMITTALS

A. Initial Submittals: Submit the following documents to Owner's Representative at the pre-abatement meeting:

1. Schedule of removal, specifying work locations, length and number of shifts, foreman's name, and crew size.

2. Disposal Site Certification: Letter, signed by the Contractor, certifying that an approved asbestos-accepting type II landfill will be used for disposal. Include the facility name, address, and phone number.

B. Waste Disposition Submittals: Submit to Owner signed waste shipment record stating that asbestos waste has been properly disposed. Submit the following:

1. Receipts (trip tickets) from approved landfill.

2. Asbestos Waste Shipment Record: As follows:

a. Prior to removing asbestos-containing material from the project site, provide Owner's Representative or Owner's consultant with a completed waste shipment record fully complying with Section 61.150 of the NESHAP standard, and 49 CFR Part 172.200 of the U.S. Department of Transportation, and including all required information.

b. Ensure that the landfill operator provides a signed copy of the waste shipment record to Owner within 35 days of the date that asbestos-containing material is removed from the project site. If waste is not transported directly from the project site to the landfill, the waste shipment record shall reflect each transfer.

c. The Owner will not make final payment prior to receipt of signed waste shipment record.

C. Contract Closeout Submittals: Comply with the following additional requirements of Division 01 Section "Closeout Procedures":

1. Asbestos Quantity Removal Report: Submit 3 copies of asbestos quantity removal report to Owner's Representative at least 4 weeks prior to Contractor's application for final payment. Include information in the following format:

a. Quantities of Asbestos Removed:

1) See Hazardous Materials Assessment report for square feet of asbestos-containing epoxy countertop and or Fume Hood Material.

2. Statement of Visual Inspection: Prior to application for final payment, submit to Owner a statement of visual inspection signed by the Contractor's competent person/supervisor. Include the following:

a. Name of contractor conducting work.

b. Name, signature, and title of on-site supervisor.

c. Name, location, and start and finish date of abatement work.

d. Current date.

e. Statement that the work was completed according to applicable federal, state, and local laws, and these specifications.

f. Statement that the Asbestos Abatement Firm's field supervisor has visually inspected the work site and has found no dust, debris, or other

suspect asbestos containing materials that were part of the scope of work.

1.5 QUALITY ASSURANCE

A. Pre-Qualified Asbestos Abatement Firms: Engage one of the following firms to perform abatement of asbestos containing materials. Contact Owner for approval if a contractor is not on the list (i.e. countertop contractors trained specifically to remove countertops).

1. Arrowhead Testing and Consulting
2. Gen-Grivette Environmental Management
3. ACM Engineering and Environmental
4. Acct Inc.
5. A-1 Abatement North

B. Pre-Abatement Meeting: Approximately 2 weeks prior to scheduled start of the abatement project, the Owner's Representative will hold a pre-abatement meeting with the individuals indicated below:

1. Contractor's representative.
2. Asbestos Abatement Firm's representative.
3. Owner's consultant.
4. Owner's Representative.
5. Owner's building maintenance personnel.

C. The meeting agenda will include:

1. Review of the scope of work.
2. Removal methods to be used.
3. Review of Contractor's initial submittals.
4. A walk-through survey of the site, if appropriate.

D. For small projects, the meeting may be suspended at the discretion of the Owner's Representative. If the meeting is suspended, deliver required initial submittals to the Owner's Representative's office 2 weeks prior to the start of work.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 ASBESTOS ABATEMENT, GENERAL

A. Conduct asbestos abatement operations in a manner that fully protects Contractor's and subcontractor's employees, the general public, and building occupants from exposure to asbestos and other safety and health hazards.

1. Asbestos abatement projects shall be directly supervised by a competent person as described in 29 CFR 1926.1101.

2. The supervisor/competent person must complete responsibility checklists throughout all phases of the project.

B. Protect adjacent areas, materials and surfaces from damage due to demolition operations, including but not necessarily limited to the following:

1. Water damage.
2. Dirt, dust and debris.
3. Abrasion.
4. Cuts and scratches.
5. Holes from fasteners for temporary barriers.

C. All asbestos work shall be conducted within a regulated area that complies with the following requirements:

1. Post a sufficient number of signs required by 29 CFR 1926.1101 at the asbestos abatement area and at every work area entrance, so that tenants, Owner's personnel, and other contractor's employees have an opportunity to take protective measures before exposing themselves to asbestos. Place banners if necessary, to secure open areas. Include information on signs indicating location and quantity of asbestos-containing material.

2. Allow only authorized, properly protected personnel to enter the regulated area. Immediately report unauthorized individuals entering the work area to OWNER or the Owner's consultant.

D. When required, provide employees and inspectors authorized to enter the regulated area with protective work clothing consisting of disposable Dupont "Tyvek" (or equivalent) full body coveralls, head covers, boots, and other necessary safety gear, including a hard hat and eye protection.

E. Provide respiratory protection to employees as required by current OSHA regulations including 29CFR 1910.134 and 1926.1101.

1. Provide asbestos abatement workers with powered air purifying respirators (PAPR) with full facepiece and HEPA filters for adequate protection during asbestos material removal operations. Respiratory protection may be down-graded if negative exposure assessment indicates that less protection is required.

2. A half-face respirator or PAPR must be worn while tearing down and setting up enclosures, and during pre-cleaning and post-cleaning work.

3. Do not allow respirators to be pulled away from faces while in the work area.

4. Maintain an extra PAPR unit on site at all times for the duration of the abatement project.

5. Provide full facepiece supplied-air respirators operated in pressure demand mode equipped with air auxiliary and pressure self-contained breathing apparatus or HEPA egress filters if required for measured fiber concentrations.

F. Maintain at each job site and post the following documents:

1. Employee respiratory protection program.
2. Federal Right-To-Know poster.
3. Material Safety Data Sheet locator.
4. Company standard operating procedure.
5. This specification Section.
6. Material Safety Data Sheets for products used on job.
7. CFR 1926.1101.
8. CFR, Part 61 (NESHAP).
9. Training Certificates and Medical Approval for each worker.

G. Use the following engineering controls and work practices for all asbestos abatement operations, regardless of measured exposure levels:

1. Vacuum cleaners equipped with HEPA filters to collect all asbestos-containing dust and debris.

2. Wet methods to control exposures during asbestos removal and clean-up, except where proven to be infeasible.

3. Prompt clean-up and disposal of asbestos-contaminated wastes and debris in leak-proof containers.

H. Do not use any of the following equipment or work practices during asbestos abatement operations, regardless of measured exposure levels:

1. High-speed abrasive disc saws not equipped with point-of-cut HEPA ventilation or HEPA filtered exhaust air enclosures.

2. Blowing with compressed air to remove asbestos-containing materials.

3. Dry sweeping, shoveling, or other dry methods to clean up asbestos-containing dust and debris.

4. Employee rotation as a means of reducing employee exposure to asbestos.

3.2 REMOVAL OF NON-FRIABLE ASBESTOS-CONTAINING MATERIALS

A. Removal of Non-Friable Materials, General: For each type of nonfriable asbestos-containing material indicated, comply with the following requirements:

1. Comply with requirements of Article 3.1 of this Section.

2. Conduct non-friable material removal operations to prevent the material from becoming friable during the removal and disposal process. No visible emissions are permitted. If the material does not remain substantially intact, cease operations and contact OWNER.

3. Do not conduct asbestos removal unless the Owner's Consultant is present at the site and OWNER has been notified.

4. Labeling Containerized Waste: Label containerized asbestos waste in accordance with OSHA, EPA, and Department of Transportation regulations, as follows:

a. Label each container with OSHA label that contains the following information:

DANGER CONTAINS ASBESTOS FIBERS MAY CAUSE CANCER CAUSES DAMAGE TO LUNGS DO NOT BREATHE DUST AVOID CREATING DUST

b. Label each container with Owner's and Asbestos Abatement Firm's names and addresses as required by NESHAP.

c. Label each container with Class 9 Label required by DOT and identify waste as "RQ, Asbestos NA 2212."

5. Prepare a complete and accurate NESHAP Waste Shipment Record (special manifest). Assure all information required by the U.S. Department of Transportation regulation is included. Under "special handling instructions" provide the required DOT identification information: RQ Asbestos 9,NA 2212, PG III.

a. Do not remove waste from site until Owner's Representative has signed and verified the shipment record.

6. Remove containerized asbestos waste daily from site, or store on site in a locked or secured location until ready for final disposal. Obtain approval of Owner's Representative and OWNER representative of the location of disposal containers. Outdoor waste containers shall be fully enclosed and locked. Mark vehicles used to transport waste during the loading and unloading of asbestos waste with a visible sign, as required by NESHAP.

7. Each container shall have excess water evident, or the asbestos waste shall be mixed in a slurry.

B. Removal of Epoxy countertop and Fume Hood Materials:

1. Prior to removal, critical barriers shall be placed over openings to the regulated area. During removal, air in the regulated area shall be filtered through the use of air filtration device(s).

2. Removal of floor tile with an infrared heat machine eliminates the critical barrier and negative pressure requirements.

3. Prior to removal, clean areas of dirt and debris with vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (brush tools are not permitted). Control odors and fumes with engineering controls.

4. Sanding the areas are not permitted.

5. Mechanical chipping of areas are prohibited, except when performed in a negative pressure enclosure.

6. Thoroughly wet areas with amended water. Use a slip scraper or equivalent to loosen the floor tile from the floor. Remove the floor tile in an intact state. Keep the floor tile wet throughout the removal and cleanup. a. Removal of floor tile using an infrared heat machine eliminates the wetting requirement.

7. Remove vinyl sheet flooring by cutting while wetting the snip-point. Wet sheet flooring during delamination. Rip-up of resilient flooring material is not permitted.

8. Clean resilient flooring of all debris using a HEPA vacuum, wet sweeping, mopping or equivalent and allow time to dry. Dry sweeping is prohibited.

9. Place the resilient flooring material and debris in an asbestos disposal bag. Seal the bag and place it in a properly labeled drum or polyspun bag. Comply with the disposal and labeling requirements of this Section.

C. Asbestos Mastic Removal:

1. Clean the floor of all debris using a HEPA vacuum, wet sweeping, mopping or equivalent.

2. Remove as much mastic as possible using an OWNER approved solvent. Control odors and fumes with engineering controls.

3. Perform scraping of residual adhesive and backing using wet methods.

4. After all debris is removed, thoroughly mop the floor and allow time to dry.

5. Shot blasting is prohibited, except when performed in a negative pressure enclosure.

6. Properly dispose of all asbestos and solvent waste according to all applicable regulations, and comply with the disposal and labeling requirements of this Section.

3.3 FIELD QUALITY CONTROL

A. Pre-Notification of OWNER Representative: To permit adequate time to schedule air monitoring, notify the OWNER representative not less than 10 calendar days prior to planned start of all removal operations.

B. Air Monitoring: Owner will retain a professional independent industrial hygiene consultant to collect air samples and oversee the project to insure that compliance with applicable codes, regulations, and ordinances, including 29 CFR 1926.1101, NESHAP, and P.A. 135. The consultant will collect background, contiguous, work area, personal, and post-abatement air samples. Owner will provide one copy of the report to the Contractor.

1. If contiguous sampling indicates airborne fiber concentrations above 0.01 fibers/cc or background level, work will be stopped unless otherwise approved by OWNER. Work may resume when the source of contamination has been

corrected and the contamination has been cleaned to the satisfaction of the Owner.

C. Inspection: If during the project, Owner representative or Owner's consultant determines that work practices either violate applicable rules and regulations or endanger employees, the Contractor's onsite representative shall stop operations immediately and take corrective action. Cooperate fully with Owner representative and Owner's consultant.

3.4 SCHEDULE OF ITEMS CONTAINING ASBESTOS

A. Bidding Requirements: Comply with the following requirements related to bidding:

1. Survey quantities provided are approximate. Bidders are required to field investigate as necessary and assume all responsibility to verify the work required and quantities involved for complete asbestos abatement.

2. The building is open for field inspection by all bidders during the bidding period.

3. A "pre-bid orientation meeting" will be conducted to familiarize prospective bidders with site conditions and provide for verification of marked and scheduled quantities, as applicable.

B. The following items have been surveyed and determined to have asbestos as a component:

1. Vinyl asbestos floor tile.
2. Flooring adhesives.

END OF ASBESTOS REMEDIATION- FLOOR TILE AND MASTIC

SECTION 03 54 00

CEMENTITIOUS UNDERLAYMENT

PART 1 GENERAL

1.1 SUMMARY

A. Provide cementitious underlayment.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cementitious Self-Leveling Underlayment:
1. Manufacturers: Allied; LATICRETE SUPERCAP, LLC;Maxxon Corp..
2. Type: Low-alkali, cement-based, self-leveling underlayment.
3. Compressive Strength: 4200 psi or higher.
4. Pour Depth: Average 1/4 inch to 1-1/2 inches.
5. Primer: As recommended by manufacturer based on project conditions.
6. Moisture Vapor Control coating: As recommended by manufacturer based on project conditions.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install materials in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.

B. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 07 90 00

JOINT SEALERS

PART 1 GENERAL

1.1 SUMMARY

A. Provide joint sealers and fillers.

B. Related Sections include the following:

1. Division 8, Section “Steel Frames”.

2. Division 9, Section "Gypsum Board Assemblies" for wall reinforcing.

4. Division 16 – Electrical.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
1. Include manufacturers full range of color and finish options if additional selection is required.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Interior Joints, Limited Movement, Acrylic:
1. Manufacturers: 3M, Dupont, Dow Corning, Lexan and GE.
2. Materials: Acrylic-emulsion, ASTM C 834.

B. Interior Joints, Moisture and Mildew Resistant Silicone:
1. Manufacturers: 3M, Dupont, Dow Corning, Lexan and GE.
2. Materials: One-part mildew-resistant silicone sealant, ÅSTM C 920.

PART 3 EXECUTION

3.1 INSTALLATION

A. Examine substrate; report unsatisfactory conditions in writing. Beginning work means acceptance of substrates.

B. Provide sealants in colors as selected from manufacturer's standards.

C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections. Clean and prime joints, and install bond breakers, backer rods and sealant as recommended by manufacturers.

D. Depth shall equal width up to 1/2 inch wide; depth shall equal 1/2 width for joints over 1/2 inch wide.

E. Cure and protect sealants as directed by manufacturers. Replace or restore damaged sealants. Clean adjacent surfaces to remove spillage.

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Provide steel doors and frames.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Standards: ANSI/SDI-100, Recommended Specifications for Standard Steel Doors and Frames.

C. Performance Standards:
1. Fire-Rated Assemblies: NFPA 80, and acceptable testing agency listing.

PART 2 PRODUCTS

2.1 MATERIALS

A. Interior Steel Doors:
1. Material: Minimum 18 gauge steel sheet.
2. Thickness: 1-3/4 inches.
3. Finish: Factory primed and field painted.
4. Accessories:
a. Silencers.

B. Interior Steel Frames:
1. Material: Minimum 16 gauge steel sheet.
2. Corners: Mitered or coped.
3. Type: Welded.
4. Finish: Factory primed and field painted.

PART 3 EXECUTION

3.1 INSTALLATION

A. Fabricate work to be rigid, neat and free from seams, defects, dents, warp, buckle, and exposed fasteners. Install doors and frames in compliance with SDI-100, NFPA 80, and requirements of authorities having jurisdiction.

B. Provide acoustically improved doors with minimum STC of 33 (ASTM E 90 and ASTM E 413) where indicated.

C. Hardware: Prepare doors and frames to receive hardware on final schedule. Provide for 3 silencers on single doorframes; 2 on double doorframes.

D. Shop Finish: Clean, treat and prime paint all work with rust-inhibiting primer comparable with finish paint specified in Division 9 section. Provide asphalt emulsion sound deadening coating on concealed frame interiors.

E. Touch-up damaged coatings ready to receive finish painting.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

A. Provide door hardware.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

C. Submit for approval hardware schedule proposed for use based on Owner's requirements.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Hardware for Fire-Rated Openings: NFPA 80, and local requirements.

C. Materials and Application: ANSI A156 series standards.

PART 2 PRODUCTS

2.1 MATERIALS

A. Door Hardware:
1. Manufacturers: Accurate Metal Weather Strip Co., Inc.; Acorn Mfg. Co.; DORMA Architectural Hardware; LCN Closers, Div. of Ingersoll Rand; Norton Door Controls, (An ASSA ABLOY Group company); PDQ Mfg.; Tempo Hardware, Inc.; PDQ Mfg.; Schlage Lock Co., Div. of Ingersoll Rand; Von Duprin, Div. of Ingersoll Rand; Yale Locks and Hardware; Zero International, Inc..
2. Quality Level: Commercial.
3. Locksets and Latchsets: Bored cylindrical type.
4. Lock Cylinders: Integral.
5. Keying: Match existing keying and key control system.
6. Hinges and Butts: Full-mortise type at interior, with nonremovable pins

at exterior doors.

7. Closers, Door Control, and Exit Devices: Low frequency.

8. Pivots: Offset or center-hung type.
9. Push/Pull Units: Through-bolted type.
10. Hardware Finishes: Satin chrome finish on exposed surfaces.
11. Auxiliary Materials:
    a. Stops and overhead door holders.
    b. Sound stripping.

PART 3 EXECUTION

3.1 INSTALLATION

A. Follow guidelines of DHI 'Recommended Locations for Builder's Hardware and hardware manufacturers' instructions.

B. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.

C. Adjust operation, clean and protect.

3.2 SCHEDULE

A. Hardware Schedule: See door schedule on drawings.

END OF SECTION

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

A. Provide gypsum board assemblies.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Tolerances: Not more than 1/16-inch difference in true plane at joints between adjacent boards before finishing. After finishing, joints shall be not be visible. Not more than 1/8 inch in 10 feet deviation from true plane, plumb, level and proper relation to adjacent surfaces in finished work.

C. Fire Resistance for Fire-Rated Assemblies: ASTM E 119.

D. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship and level of finish.

E. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities.

PART 2 PRODUCTS

2.1 MATERIALS

A. Gypsum Board:
1. Manufacturers: CertainTeed Gypsum, Inc.; ClarkDietrich Building Systems; Lafarge North America Inc.; Temple-Inland Forest Products Corp. - Gypsum Products.
2. Application: Interior walls, partitions, and ceilings with tape and joint compound finish.
3. Application: Remodeling at existing gypsum board construction.
4. Application: Installation of access panels in gypsum board assemblies.
5. Material Standard: ÅSTM C1396.

a. Type: Regular, moisture-resistant and fire-rated types as required.
b. Typical Thickness: 5/8 inch.

6. Joint Treatment: ASTM C474 and ASTM C840, 3-coat system, paper or fiberglass tape.
7. Auxiliary Materials:
   a. Cornerbead, edge trim and control joints.
   b. Gypsum board screws, ÅSTM C 1002.
   c. Gypsum board nails, ASTM C 514.
   d. Fastening adhesive.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install gypsum board for tape and 3-coat joint compound finish in compliance with ASTM C 840 and GA 216, Level 4 finish. Install gypsum board assemblies true, plumb, level and in proper relation to adjacent surfaces.

B. Provide fire-rated systems where indicated and where required by authorities having jurisdiction.

C. Install boards vertically. Do not allow butt-to-butt joints and joints that do not fall over framing members.

D. Where new partitions meet existing construction, remove existing cornerbeads to provide a smooth transition.

E. Provide insulation full height and thickness in partitions at conference rooms, toilet rooms, between different occupancies, and where required.

F. Provide acoustical sealant at both faces at top and bottom runner tracks, wall perimeters, openings, expansion and control joints.

G. Install trim in strict compliance with manufacturer's instructions and recommendations.

H. Repair surface defects. Leave ready for finish painting or wall treatment.

END OF SECTION

SECTION 09 22 16

NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.1 SUMMARY

A. Provide non-structural metal framing for gypsum board assemblies.

1.2 RELATED SECTIONS

A. Section 07 90 00 - Joint Sealers: Perimeter sealant and backup materials.

B. Section 09 21 16 - Gypsum Board Assemblies.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

1.4 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Tolerances: Not more than 1/8 inch in 10 feet deviation from true plane, plumb, level and proper relation to adjacent surfaces in finished work.

C. Fire Resistance for Fire-Rated Assemblies: ASTM E 119.

D. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities.

PART 2 PRODUCTS

2.1 MATERIALS

A. Steel Framing for Walls and Partitions:
1. Manufacturers: Clark Dietrich, Cemco, Marino-ware and MBA Metal Framing.
2. Material Standard: ASTM C645.
3. Stud Thickness: 20 gauge (.0329 inch).
4. Stud Depth, Typical: As per partition type detail.
5. Furring Channel Thickness: 20 gauge (.0329 inch).

6. Auxiliary Framing Components: Furring brackets, resilient furring channels, Z-furring members, and non-corrosive fasteners.

PART 3 EXECUTION

3.1 INSTALLATION

A. Provide fire-rated systems where indicated and where required by authorities having jurisdiction.

B. Where new partitions meet existing construction, remove existing cornerbeads to provide a smooth transition.

C. Provide acoustical sealant at both faces at top and bottom runner tracks, wall perimeters, openings, expansion and control joints.

END OF SECTION

SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SUMMARY

A. Provide acoustical ceilings and suspension systems.

B. Related Sections include the following:

1. Section 09 21 16, "Gypsum Board Assemblies"

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

C. Extra Stock: Submit extra stock equal to 2 percent of amount installed.

D. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities.

1. NRC of not less than 0.65 in the labs in accordance with ASTM C423.

2. Light Reflectance Value: Minimum 0.85

C. Content: Minimum 35% Recycled Content

D. Regulations: Compliance with VOC and environmental regulations.

PART 1 PRODUCTS

1.3 MATERIALS

E. Mineral Fiber Acoustical Ceilings:

F. Location: Laboratories (ACT-1)

Basis of Design Manufacturer: Armstrong, Ultima Health Zone, High NRC

1) Panel Size: 3/4" thick, 24 by 24 inches.
2) Panel Edge: Beveled Tegular
3) Color: Manufacturer's standard white.
4) Fire Resistance: Class A.
5) Grid: Exposed T-grid
6) Suspension System: Heavy duty
7) NRC: 0.80 min.

Auxiliary Materials

8) Edge molding and trim.
9) Hold-down clips and impact clips.
10) Concealed acoustical sealant.

PART 2 EXECUTION

2.1 INSTALLATION

A. Install materials and suspension systems in accordance with manufacturer's instructions and recommendations, and ASTM C 636. Coordinate installation with location of mechanical and electrical work to ensure proper locations and anchorage.

B. Level ceiling to within 1/8 inch in 10 feet in both directions. Scribe and cut panels to fit accurately. Measure and layout to avoid less than half panel units.

C. Removal and reinstallation at existing ceilings: Remove and store materials for reuse when allowed. Handle with white gloves and avoid damaging corners and edges. Clean tiles and grid system, which have been removed. Provide additional materials to complete the work and to replace damaged existing materials. New materials shall match existing materials as approved.

D. Adjust, clean, and touch-up all system components.

END OF ACOUSTICAL CEILINGS

SECTION 09 65 13

RESILIENT FLOORING

PART 1 GENERAL

1.1 SUMMARY

A. Provide floor preparation and sheet resilient flooring in the corridor, laboratory areas and other rooms noted in room finish schedule.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

C. Extra Stock: Submit extra stock equal to 5% of total used.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Performance: Fire performance meeting requirements of building code and local authorities.

PART 2 PRODUCTS

2.1 MATERIALS

A. Vinyl Sheet Flooring:

1. Description: Unbacked, nonlayered, homogeneous sheet vinyl flooring. Protected by a UV cured polyurethane finish, color and detail are throughout the thickness of the product.

2. Test Performance: ASTM E 648/NFPA 253 Critical Radiant Flux Class, ASTM E 662/NFPA 258 Smoke Density <450, ASTM F 925-02 Chemical Reaction Excellent Slip Resistance ADA Compliant Varies with surface texture FTC Slip Resistant Classified Product

3. Product Information:
a. Manufacturer: Basis of Design- Armstrong, Medntech; Flexco Floors, Esd Vinyl; Tarkett; Karndean Design Flooring

1. Color: 84197 Silver Gray

b. Classification: ASTM F 1913 Homogeneous Sheet Flooring.
c. Size: 6'-7" wide x roll
d. Surface Texture: Low gloss, Diamond 10 Technology coating
e. Slip Resistance: ASTM C 1028* Slip Resistance – V.G. / ADA Compliant. FTC Slip Resistant Classified.
f. 100% Recyclable product.
g. Warranty: 10 year Commercial Limited Wear Warranty.
h. Auxiliary Materials:
   1) Edge strips and terminations.
   2) Leveling compound.
   3) Adhesives.
   4) Vinyl Weld Rod.

PART 3 EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's instructions and recommendations. Install in proper relation to adjacent work.

B. Prepare surfaces by cleaning, leveling and priming as required. Test adhesive for bond before general installation. Level to 1/8' in 10' tolerance.

C. Sheet Flooring: Install sheets with tight joints and pattern in adjoining areas running in the same direction. Layout to minimize seams as approved.

D. Clean, polish, and protect.

END OF RESILIENT FLOORING

SECTION 09 65 13

RESILIENT BASE AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Provide resilient wall base and accessories.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

C. Submit extra stock equal to 2% of total used.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Performance: Fire performance meeting requirements of building code and local authorities.

PART 2 PRODUCTS

2.1 MATERIALS

A. Resilient Wall Base:
1. Manufacturers: Armstrong
2. Standard: ASTM F 1861.
3. Type: TV (vinyl).
4. Group: I (solid, homogeneous)
5. Style: Cove.
6. Thickness: 0.125 inch
7. Height: 4 inches.

PART 3 EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's instructions and recommendations. Install in proper relation to adjacent work.

B. Install base and accessories to minimize joints. Install base with joints as far from corners as practical.

C. Clean, polish, and protect.

END OF SECTION

SECTION 09 65 19

RESILIENT RUBBER FLOORING (ALTERNATE NO. 2)

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. (RT-1) Resilient rubber tile flooring for commercial traffic.

2. Substrate preparation.

B. Related Work: The following items are not included in this Section and are specified under the designated Sections:

1. Division 3, Section "Resurfacing and Cementitious Underlayment.

2. Division 6, Section "Miscellaneous Carpentry" for plywood substrate and surface tolerances.

C. References (Industry Standards):

1. American Association of Textile Chemists and Colorists (AATCC):

a. AATCC 134 Electrostatic Propensity of Carpets

2. American National Standards Institute (ANSI):

a. ANSI ESD S97.2 Floor Materials and Footwear – Voltage Measurement on a Person

3. ASTM International (ASTM):

a. ASTM C518 Standard Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

b. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension

c. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine

d. ASTM D2240 Standard Test Method for Rubber Property – Durometer Hardness

e. ASTM D3389 Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform, Double Head Abrader)

f. ASTM D6499 Standard Test Method for the Immunological Measurement of Antigenic Protein in Natural Rubber and its Products

g.	ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
h.	ASTM E648	Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
i.	ASTM E662	Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
j.	ASTM E1745	Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
k.	ASTM E2179	Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors
l.	ASTM E2180	Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials
m.	ASTM F386	Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces
n.	ASTM F710	Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
o.	ASTM F925	Standard Test Method for Resistance to Chemicals of Resilient Flooring
p.	ASTM F970	Standard Test Method for Static Load Limit
q.	ASTM F1344	Standard Specification for Rubber Floor Tile
r.	ASTM F1482	Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
s.	ASTM F1514	Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color
t.	ASTM F1515	Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change
u.	ASTM F1859	Standard Specification for Rubber Sheet Floor Covering Without Backing
v.	ASTM F1860	Standard Specification for Rubber Sheet Floor Covering With Backing
w.	ASTM F2055	Standard Test Method for Size and Squareness of Resilient Floor Tile by Dial
x.	ASTM F2170	Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
y.	ASTM F2199	Standard Test Method for Determining Dimensional Stability of Resilient Floor Tile after Exposure to Heat

z. ASTM F3010 Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings

aa. ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

4. International Organization for Standardization (ISO):

   a. ISO 140 Measurement of sound insulation in buildings and of building elements

5. National Fire Protection Association (NFPA):

   a. NFPA 253 Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source

   b. NFPA 258 Test Method for Specific Density of Smoke Generated by Solid Materials

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data, installation guide and maintenance guide for each material and accessory proposed for use.

B. Samples: Submit three representative samples of each product specified for verification.

C. Extra Stock: Submit extra stock equal to 2% of total used.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide resilient flooring manufactured by a firm with a minimum of 10 years' experience with resilient flooring of type equivalent to those specified.

   1. Manufacturer's quality management system must have ISO 9001:2000 approval.

   2. Provide resilient flooring products, including wall base, accessories and subfloor preparation products from one manufacturer to ensure color matching and compatibility.

   3. Manufacturer shall be capable of providing technical training and technical field service representation.

B. Installer Qualifications: Acceptable to manufacturer of resilient flooring or INSTALL (International Standards & Training Alliance) resilient certified for the requirements of the project with a minimum of 5 years of experience.

C. Sustainable Design Requirements:

   1. ISO 14001 Environmental Management Systems certification.

   2. Construction waste take back program for the purpose of reducing jobsite waste by taking back uninstalled waste flooring. Details of the nora® program are available at www.nora.com/us.

   3. Flooring surfaces that are easily cleaned and do not require coatings and stripping, or use chemicals that may be hazardous to human health.

4. Supply all required products that are CA 01350 compliant.
5. Flooring that is free of materials known to be teratogenic, mutagenic or carcinogenic.
6. Flooring that contains no polyvinyl chloride or plasticizers.
7. Flooring that contains no halogens.
8. Flooring that contains no asbestos.
9. Provide all materials, components and accessories for a complete installation.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's recommendations. Protect from damage due to weather, excessive temperatures, and construction operations.

B. Deliver materials sufficiently in advance of installation to condition materials to the required temperature for 48-hours prior to installation.

1.5 PROJECT CONDITIONS

A. Maintain temperature and humidity at service levels or the ambient temperature must remain steady (± 10°F) and be between 59°F and 80°F for at least 48-hours prior, during and 72-hours after installation. .) The ambient relative humidity is recommended to be 50% RH ± 10%; however, dew point must be avoided.

1.6 WARRANTY

A. Provide manufacturer’s standard limited warranty for wear, defect and conductivity.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturer: nora systems, Inc.

B. Approved manufacturers: Pirelli, Johnsonite and Rope.

2.2 RESILIENT SHEET FLOORING FOR COMMERCIAL TRAFFIC

A. Rubber Sheet Floor Covering:

1.	Product Name:	noraplan® sentica 3.0 mm
2.	ASTM Specification: ASTM F1859 Standard Specification for Rubber Sheet Floor Covering	Type I

3.	Limited Wear Warranty:	5 years
4.	Material:	nora® vulcanized rubber compound 913 with environmentally compatible color pigments that are free of toxic heavy metals like lead, cadmium or mercury
5.	Composition:	Heterogeneous rubber compound
6.	Color:	24 standard colors
7.	Surface:	Textured surface
8.		
9.	Material Size (ASTM F2055):is required	~49.2 feet by 48 inches (15m by1.22m), ≥ amount specified
10.	Thickness (ASTM F386):is required	3mm
11.	Dimensional Stability (ASTM F2199): ≤ 0.15% in both directions is required	Meets requirements
12.	Flammability (E648/NFPA 253):≥ 0.45 watts/sq. cm for Class 1 is required	0.93 watts/sq.
13.	Smoke Density (ASTM E662/NFPA 258): < 450 is required	186 non-flaming; 152 flaming
14.	CAN/ULC-S102.2:	FSV125 SDV370
15.	Burn Resistance:	Resistant to cigarette and solder burns
16.	Slip Resistance (ASTM D2047): ≥ 0.5 is required	Static coefficient of friction, Neolite dry 0.92, Neolite wet 0.91 (not recommended for ramps)
17.	Bacteria Resistance (ASTM E2180/ASTM G21):	Resistant to bacteria, fungi and micro-organism activity
18.	VOC's:	This flooring is GREENGUARD Gold Certified for Low VOC Emissions, Blue Angel Certified and CA 01350 compliant
19.	Latex Allergies (ASTM D6499):	Inhibition Elisa, results are below detection level
20.	Sound Absorption (ASTM E2179/ISO 140):	Δ IIC 11, Δ Lw 8dB (compare only Δ values)
21.	Sound Generation:	67.9 dBA, 69.9 dBC and 22 Sones, Independently tested
22.	Hardness (ASTM D2240):≥ 85 is required	Shore type "A", 92
23.	Static Load (ASTM F970**):** ≤ 0.005 inches with 250 lbs. is required	Residual compression of 0.003 inches with 800 lbs.
24.	Rolling Load Limit:	≤ 450 lbs. / sq. inch, with no forklift traffic
25.	Abrasion Resistance (ASTM D3389): ≤ 0.035 oz. (1.0g) is required	1.1 lbs. (500g) load on H-18 wheel with 1000 cycles, 0.008 oz. (0.24g) weight loss

26.	Elongation (ASTM D412):≥ 300 lbs. per sq. inch is required	Modulus @ 10% is 913.1 lbs. per sq. inch
27.	Oil & Grease Resistance:	No
28.	Heat Resistance (ASTM F1514):Avg. ΔE ≤ 8.0 is required	Easily achieved with all batches and regular maintenance
29.	Light Resistance (ASTM F1515): Avg. ΔE ≤ 8.0 is required	Easily achieved with all batches and regular maintenance
30.	Static Generation (AATCC 134/ANSI ESD S97.2):	< 2000 Volts at 20% RH
31.	Thermal Transmission (ASTM C518):	R-value of 0.04
32.	Cleaning:	Cleaned and maintained effectively using water, nora® cleaning pads and a suitable cleaning machine, without the use of any factory and/or field-applied coatings. Also without using any chemicals that may be hazardous or containing any teratogenic, mutagenic or any other ingredients known to be carcinogenic.
33.	Shine:	Higher shine achieved by buffing without any artificial topical applied coatings
34.	Stain Removal:	Samples of the product must be provided for stain removal testing by the owner. Sample size must be 24 inches by 24 inches, pre-cleaned by manufacture per published recommendations. Samples must have no coatings, sealers, floor finish or other manually or mechanically applied finish on the surface of the product. Stain testing must consist of application of common healthcare related disinfectants and chemicals to include, but not limited to, Betadine, Methylene Blue, Silver Nitrate and alcohol based hand sanitizer. Duration of test period must be no less than one week. Removal of chemicals must be in accordance with manufacturers published cleaning and maintenance recommendations.
35.	Substrate Preparation:	Per ASTM F710 and the nora® Installation Guide

PART 3 - EXECUTION

3.1 GENERAL CONTRACTOR RESPONSIBILITIES

A. Supply a safe, climate controlled building and subfloor as detailed in the Manufacturer's Installation Guide.

B. A subfloor that meets the requirements of ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring is required, or as detailed in the nora Installation Guide or nora® nTx Installation Guide as appropriate.

C. A secure storage area that is maintained permanently or temporarily at ambient service temperature and humidity (except walk in freezers or similar), or 68°F ± 5° F and 50% ± 10% relative humidity, for at least 48-hours prior to and during the application of the flooring, so the flooring contractor can acclimate the flooring materials is required.

D. An installation area that is weather tight and maintained either permanently or temporarily at ambient service temperature and humidity (except walk in freezers or similar), or 68°F ± 5° F and 50% ± 10% relative humidity, for at least 48-hours prior to, during and 72-hours after the application of the flooring is required.

E. Areas with direct prolonged exposure to sunlight should be protected with the use of Low E glass doors and windows or facades.

F. Areas of the flooring that are subject to direct sunlight through doors or windows should have them covered using blinds, curtains, cardboard or similar for the time of the installation and 72-hours after the installation to allow the adhesive to cure. Note: These areas should be installed using wet adhesives only.

G. Prevent all traffic for a minimum of 12-hours and rolling loads for 72-hours to allow the adhesive to cure. If required, after 12-hours protect the flooring from damage during construction operations using Masonite, plywood or a similar product, ensuring first that the flooring surface is free of all debris. Lay panels so that the edges form a butt joint and tape the joint to prevent both movement and debris entrapment underneath them. Inspect immediately before covering and after removal for final acceptance.

H. Have the flooring cleaned no sooner than 72-hours, unless given written permission from the manufacturer, after the installation using manufacturer's recommendations or a standard method as detailed in the appropriate Manufacturer Maintenance Guide.

3.2 FLOORING CONTRACTOR RESPONSIBILITIES

A. Provide trained installers that have at least one of the following:

1. Approved by manufacturer for all of the requirements of the project or INSTALL (International Standards & Training Alliance) certified for the requirements of the project.

2. An effective installation manager, to manage the project, installers, and ensure that all of the required procedures are followed as detailed in the manufacturer Installation Guide.

B. Follow all requirements in the appropriate Manufacturer Installation Guide.

END OF SECTION

SECTION 09 91 00

PAINTS

PART 1 GENERAL

1.1 SUMMARY

A. Provide painting and surface preparation.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
   1. Include manufacturers full range of color and finish options if additional selection is required.

C. Extra Stock: Submit 1unopened gallons of each paint and color used in the project.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Regulations: Compliance with VOC and environmental regulations.

C. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.
   1. Provide 6 in x 6 in mock-ups of each type of surface.

PART 2 PRODUCTS

2.1 MATERIALS

A. Painting:
   1. Manufacturers: BEHR Process Corporation; California Paints A Division of California Products Corp.; Glidden Professional; Kelly-Moore Paints; Miller Paint Co. / Devine Color; PPG Architectural Finishes, Inc. - Pittsburgh Paints; Pratt & Lambert Paints; Rodda Paint; Sherwin-Williams; Zinsser Brands / Rust-Oleum Corporation.
   2. Application: Interior unfinished surfaces.
   3. Application: Repainting of existing surfaces.
   4. Primary Coating Type: Latex based paints.

5. Primary Coating Type: Zero VOC paints.
6. Primary Paint Systems: Primer plus two finish coats.

PART 3 EXECUTION

3.1 INSTALLATION

A. Inspect surfaces, report unsatisfactory conditions in writing; beginning work means acceptance of substrate.

B. Comply with manufacturer's instructions and recommendations for preparation, priming and coating work. Coordinate with work of other sections.

C. At existing areas to be repainted, remove blistered or peeling paint to sound substrates. Remove chalk deposits and mildew and wash all surfaces with mild detergent. Perform related minor preparation including caulk and glazing compounds. Spot prime bare areas before priming and painting as specified.

D. Match approved mock-ups for color, texture, and pattern. Re-coat or remove and replace work which does not match or shows loss of adhesion. Clean up, touch up and protect work.

3.2 PAINT SCHEDULE

A. Gypsum Drywall Walls in Labs:
   1. Gloss:
      a. Eggshell

   2. System:
      a. 1 coat latex primer
      b. 2 coats latex finish

END OF SECTION

SECTION 10 11 00
VISUAL DISPLAY BOARDS

PART 1 GENERAL

1.1 SUMMARY

A. Provide visual display boards.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Markerboards (MB-1):
1. Manufacturers: Aywon Chalkboard & Corkboard, Inc.; EverWhite; Marsh Industries, Inc..
2. Materials: ¼" thick tempered glass, magnetic backer
3. Operation: Fixed
4. Trim: None
5. Finish: Anti-reflective, matte finish
6. Installation: Z-clip hardware

PART 3 EXECUTION

3.1 INSTALLATION

A. Take field measurements before fabrication where possible; do not delay progress.

B. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.

C. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 10522

FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the following:

1. Portable fire extinguishers
2. Cabinets for portable fire extinguishers

B. Related Sections include the following

1. Section 09 21 16 - Gypsum Board Assemblies
2. Section 09 22 16 - Non-structural Metal Framing
3. Section 09 91 00 - Paints

1.02 REFERENCES

A. American Disability Act (ADA), ANSI A 117.1 – Accessible and Usable Buildings and Facilities

B. American Society for Testing and Materials (ASTM)

A1008/A1008M	Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
C1036	Standard Specification for Flat Glass
E814	Standard Test Method for Fire Tests of Through-Penetration Fire Stops

C. Federal Standard (FED-STD)

FED-STD-795	Uniform Federal Accessibility Standards (UFAS)

D. National Fire Protection Association (NFPA)

NFPA 10 Portable Fire Extinguishers

E. International Building Code (IBC)

F. International Fire Code (IFC)

1.03 SUBMITTALS

A. Submit brochure and product data.

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

1.04 QUALITY ASSURANCE

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10.

B. Fire Extinguishers: Listed and labeled by Underwriter's Laboratory (UL) or Factory Mutual (FM) for type, rating, and classification.

C. Accessibility Requirements: Comply with requirements applicable in the jurisdiction of the project, including but not limited to ADA and ICC/ANSI A117.1 requirement as applicable.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
1. J.L. Industries, Inc. a division of Activar Construction Products Group
2. Larsen's Manufacturing Co.
3. Potter Roemer LLC
4. Kidde Residential and Commercial Divison, subsidiary of Kidde plc.

2.02 MATERIALS

A. Cold-Rolled Steel Sheet: Carbon steel, complying with ASTM A1008/A1008M, commercial quality, stretcher leveled, temper rolled.

2.03 PORTABLE FIRE EXTINGUISHERS

A. General: Provide fire extinguishers of type, size, and capacity for each cabinet and other locations indicated.

1. Product: A 10-lb, multi-purpose, UL listed, dry chemical fire extinguisher with a minimum rating of Class A-B-C.

2.04 FIRE EXTINGUISHER CABINETS

A. General: Unless specified otherwise on construction drawings, provide fire extinguisher cabinet of type, size, and rating as indicated below, or equivalent.

1. Semi-recessed mounted as indicated on drawings.

B. Cabinet Size: The minimum inside box dimensions shall be 24"H x 9½W x 6"D for SNL Type I and Type III fire extinguishers, and 27"H x 12"W x 8"D for SNL Type II fire extinguishers.

C. Cabinet Construction: Provide manufacturer's standard box, with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Weld joints and grind smooth. Miter and weld perimeter door frames.

D. Fire-Rated Cabinets: Listed and labeled to meet requirements of ASTM E814 for fire-resistance rating of wall where it is installed. Construct fire-rated cabinets with double walls fabricated from 0.0478-inch (1.2-mm) thick, cold-rolled steel sheet lined with minimum 5/8-inch (16-mm) thick, fire-barrier material. Provide factory drilled mounting holes.

1. Cabinet Metal: Enameled-steel sheet.
   a. Provide FX option where located in rated walls.

2. Shelf: Same metal and finish as cabinet.

E. Cabinet Mounting: Suitable for the following:

1. Recessed: Cabinet box recessed in walls of sufficient depth to suit style of trim indicated.

2. Semirecessed: Cabinet box partially recessed in walls of shallow depth to suit style of trim indicated.

3. Surface Mounted: Cabinet box fully exposed and mounted directly on wall.

F. Cabinet Trim Style: Fabricate cabinet trim in one piece with corners mitered, welded and ground smooth.

G. Cabinet Trim Material: Steel sheet.

H. Door Material: Steel sheet.

I. Door Glazing: Clear Float Glass, ASTM C1036, Type 1, Class 1

J. Door Style: Vertical side glass panel with frame.

K. Door Construction: Provide a minimum ½-inch (13 mm) thick door frames.

L. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide recessed door pull and friction latch. Provide continuous-type hinge permitting door to open 180 degrees.

M. Cabinet and Door Finishes: Provide manufacturer's standard baked-enamel paint for the exterior and interior of the cabinet and doors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where recessed and semirecessed cabinets are to be installed. Verify that rough openings for cabinets are correctly sized and located.

B. Examine fire extinguishers for proper charging and tagging. Remove and replace damaged, defective, or undercharged units.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF FIRE EXTINGUISHERS

A. Comply with manufacturer's written instructions for installing fire extinguishers and mounting brackets.

B. Mounting Height: Install extinguishers at heights indicated below.

1. Install fire extinguishers mounted on hangers or brackets attached to a wall so that the top of the fire extinguisher is not more than 3½ ft. above the floor.

2. In no case shall the clearance between the bottom of the fire extinguisher and the floor be less than 4 inches.

C. Locations: Install extinguishers at locations indicated below.

1. Install fire extinguishers at locations specified on the drawings or as directed by the authority having jurisdiction.

2. Fire extinguishers shall be conspicuously located, along normal paths of travel, including exits from areas. Extinguishers shall not be obstructed or obscured from view.

D. Install portable fire extinguishers on the hanger or in the bracket supplied, or place in the fire extinguisher cabinets provided. Verify that the extinguisher operating instructions face outward.

3.03 INSTALLATION OF FIRE EXTINGUISHER CABINETS

A. Comply with manufacturer's written instructions for installing fire extinguisher cabinets.

B. Mounting Height: Install fire extinguisher cabinets at the height required so that the top of the fire extinguisher is not more than 54 inches above the floor.

C. Install fire extinguisher cabinets at locations specified on the drawings.

D. Fire extinguisher cabinets shall protrude no more than 4 inches into corridors, passageways, or aisles.

E. Repair/paint wall surfaces surrounding fire extinguisher cabinet damaged during installation to match existing wall surface.

3.04 SIGNAGE

A. Identify bracket-mounted extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to wall surface.

B. Identify fire extinguisher in cabinet with the words "FIRE EXTINGUISHER" applied to door.

1. Application Process: Decals

2. Lettering Color: Red

3. Orientation: Vertical

3.05 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust cabinet doors that do not swing or operate freely.

B. Refinish or replace cabinets and doors damaged during installation.

C. Provide protection and maintain conditions that ensure that cabinets and doors are without damage or deterioration at the time of Construction Completion.

END OF SECTION

SECTION 11 53 33

LABORATORY SAFETY EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Division 1 Specification Sections for Guiding Principles for High Performance and Sustainable Buildings compliance requirements such as but not limited to Testing for Indoor Air Quality, Sustainable Design Requirements, Commissioning Requirements and Measurement & Verification, apply to this Section.

1.2 SUMMARY

A. This Section includes laboratory safety equipment including emergency eyewashes, showers and other related products.

B. Extent and types of safety equipment as indicated on Laboratory Equipment drawings.

C. Provide safety equipment as specified herein and as indicated on Laboratory Equipment drawings.

D. Related Sections include the following:

1. Section 11 53 13 "Fume Hoods".

2. Section 11 53 43.10 "Laboratory Accessories".

3. Section 12 35 53.13 “Painted Metal Laboratory Casework”.

4. Divisions 16, Sections for electrical requirements.

5. Divisions 16, Sections for final connections to building services and systems.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Provide certification that fixtures and fittings have been tested in accordance to and meet the performance requirements as described in SEFA 7.

B. Chemical Resistance: All coating materials shall meet the following tests for chemical resistance:

1. Fume Test: Suspend coated samples in a container at least 6 cubic feet capacity, approximately 12" above open beakers, each containing 100 cc of 70% nitric acid, 94% sulfuric acid and 35% hydrochloric acid, respectively. After exposure to these reagent

fumes for 150 hours, the finish on the samples shall show no discoloration, disintegration or other damage to the coating.

2. Direct Application Test: The test of coated samples shall consist of the direct action of the reagents listed below. This test is to be conducted in such as manner that the test surface is kept wet throughout the entire test period and at a controlled temperature of 77 degrees F +/- 3 degrees F. The test must be conducted for a period of not less than one hour. As a result of the test the coating on the samples shall not rupture or otherwise compromised exposing the base material through erosion, dissolution, cracking, splitting or other damage resulting from reagent exposure. Obvious and significant deterioration is not acceptable. However, slight discoloration or temporary softening of the coating is permissible.

Acetic Acid, 98%
Acetone
Acid Dichromate, 5%
Ammonium Hydroxide, 28%
Amyl Acetate
Amyl Alcohol
Benzene
Butyl Alcohol
Calcium Hypochlorite
Carbon Disulfide
Carbon Tetrachloride
Chloroform
Chronic Trioxide Acid
Cresol
Crude Oil
Dichlor Acetic Acid
Dimethylformanide
Dioxane
Distilled Water
Ether
Ethyl Acetate
Ethyl Alcohol
Ethyl Ether
Formaldehyde, 37%
Formic Acid, 90%
Furfural
Gasoline
Glacial Acetic Acid, 99.5%
Glycerin
Hydrochloric Acid, 38%
Hydrofluoric Acid, 48%
Hydrogen Peroxide, 5%
Iodine, Tincture of
Isopropyl Alcohol
Kerosene
Lactic Acid, 10%
Methanol
Methyl Alcohol
Methyl Ethyl Ketone
Methylene Chloride
Mineral Oil
Mono Chlorobenzene
N-Hexane
Naphthalene
Nitric Acid, 70%
Perchloric Acid, 70%
Phenol
Phosphoric Acid, 85%
Sea Water
Silver Nitrate, Saturated
Sodium Bichromate, Saturated
Sodium Carbonate, 10%
Sodium Chloride, 20%
Sodium Hydroxide, 50%
Sodium Hydroxide, Flake
Sodium Hypochlorite
Sodium Sulfide, Saturated
Sulfuric Acid, 96%
Sulfuric Acid 77% & Nitric Acid 70%, eq. parts
Toluene
Trichloroethylene
Turpentine
Urea, Saturated
Xylene
Xylem
Zinc Chloride, Saturated

3. Adhesion Test: Corrosion resistant finishes shall meet the standards set forth in "Standard Test Methods for Measuring Adhesion by Tape Test", ASTM D3359-02, "Standard Test Method for Mandrel Bend Test of Attached Organic Coatings", ASTM D522-93a and "Standard Test Method for Chipping Resistance of Coatings", ASTM D3170-03.

4. Mar and Abrasion Resistance: Coating material shall have a pencil hardness of 2H-4H with adhesion substantial enough to withstand both direct and reverse impacts of 160 inch-pounds. Coating shall have excellent mar resistance and be capable of withstanding scuffing, marring and other ordinary wear.

5. Reparability: Coating material shall be capable of surface repair in the event that a fixture is scratched or a surface rupture occurs. The service fixture manufacturer shall have available an air-drying aerosol coating, specially formulated to match the existing epoxy coating color, which may be applied in the field to repair coated surfaces.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's data and installation instructions for each type of emergency fixture.

1. Include independent laboratory certification that applied finish complies with specified chemical and physical resistance requirements.

2. Submit samples when requested by Laboratory Architect, complete with fittings and accessories with specified finish.

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

C. All products must be manufactured or substantially transformed in the United States or TAA designated country. Documentation to be provided with first submittal.
1. USA Certificate of Origin: Manufacturer shall supply with first submittal, an example of their Certificate of Origin declaring products are wholly manufactured and assembled specifically in the United States, including city and state locations. A notarized Certificate of Origin shall be provided with closeout documents.

1.5 EXTRA MATERIALS

A. Provide to Owner a complete touch-up kit for surface repair of emergency fixtures. Provide an air drying aerosol or liquid coating specially formulated to match the coating color which can be applied in the field to repair coated surfaces.

1.6 QUALITY ASSURANCE

A. Single Source Responsibility: All laboratory safety equipment, including those provided as an integral part of other laboratory equipment such as fume hoods, shall be the product of one service fixture manufacturer, unless specified otherwise.

B. All fixtures shall be in accordance with IBC, NFPA and OSHA for the intended use.

C. All emergency eye wash and shower equipment shall be certified to comply with ANSI Z358.1-2014.

D. All fixtures shall comply with the ADA requirements of Section 309.4 of ANSI/ICC A117.1-2009, where a fixture is to be ADA compliant, the maximum force required to open or close a manually activated fitting shall not exceed 5 lbs.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

A. All mechanical laboratory service fixtures shall be the product of one of the following:

1. Water Saver Faucet Co.
2. Chicago Faucet
3. Far laboratory Faucets Ltd.

2.2 FABRICATION; GENERAL

A. All laboratory service fixtures shall have the construction and shall meet the performance requirements set forth in this specification. Fixture types shall be as indicated in the fixture schedule on the Laboratory Equipment drawings and fixture details as an attachment to this specification.

B. Emergency Fixtures: Provide all emergency fixtures factory assembled, including the assembly of all valves, flanges, and other mounting accessories. Individually factory test each fixture and provide all fixtures complete with washers, locknuts, unions, nipples and other accessories.

C. Material and Finish: Fabricate service fixtures from cast brass containing a minimum of 85% copper or forged brass containing a minimum of 60% copper.

1. Safety equipment as follows:

a. Satin Chrome Finish with Clear Epoxy Coating: All components shall be polished and electroplated with one layer of nickel. Exposed surfaces shall then be further polished to an AISI No. 6 brushed finish which is fine-grained and uniform. Components shall then be electroplated with one layer of chrome. Following chrome plating, surfaces to be coated shall be cleaned and degreased. Following plating and cleaning a clear epoxy coating shall be applied to all exposed surfaces and fully baked to permit curing. Surfaces shall have a minimum coating thickness of 2 mils.

D. Safety Equipment:

1. Signage: Provide signage identifying shower location.

2. Finish: The exposed metal components of the safety equipment shall be:

a. Stainless steel.

3. Provide emergency eye/face wash, drench hose and shower units with spray-type outlet heads to deliver a soft, wide, high volume spray of water. Safety equipment locations

are indicated on the Laboratory Equipment drawings. Provide all piping and accessories for a complete installation.

4. Dual Purpose Eye Wash/Drench Hose Units: Deck mounted eye wash/drench hose units shall be capable of use as a fixed eye wash with hands-free operation or as a drench hose. Units shall have two Gentle Spray outlet heads mounted parallel and angled forward, each with a self-regulating volume control, reticulated polyurethane filter and removable spray cover. Dust covers shall be hinged swing-away style and shall be permanently attached to the spray head with a stainless steel pin. Units shall be furnished with a deck flange with locator guide to hold the unit facing forward and an 8 ft. reinforced PVC hose.

5. Emergency shower units shall have the following:

    a. 10" diameter stainless steel shower head with ceiling trim flange.
    b. Rigid polished aluminum heavy duty pull rod.
    c. Stainless steel activating arm.
    d. Hands free stay open ball valve activating within one second or less.
    e. 30 GPM flow for a minimum of 15 minutes and 20" spray pattern of 60" above floor.
    f. Center of the water pattern shall be at least 16" from any obstructions.
    g. Semi Concealed shower head, mounting in a finished ceiling.

6. Emergency eyewash units shall have the following:

    a. Controlled, low velocity flow completely rinses eyes and face and is not injurious to user.
    b. Hands free stay open ball valve activating within one second or less.
    c. Eyewash unit must be capable of delivering at least 0.4 gpm for 15 minutes.
    d. The nozzles must be protected from airborne contaminants.

PART 3 - EXECUTION

3.1 INSTALLATION OF SERVICE FIXTURES

A. Install in a precise manner in accordance with manufacturer's directions. Adjust moving parts to operate freely without excessive bind.

B. Follow the manufacturer's recommended test and working pressures for fittings. Testing or using a fitting at pressure for which it is not designed can result in leakage or failure.

C. Provide all interconnecting conduit, wiring, and devices to junction box for final connection to building systems by Electrical Trades Contractor.

3.2 REPAIRING, CLEANING, AND PROTECTION

A. Repairing: Repair or remove and replace defective work as directed upon completion of installation.

B. Cleaning: Clean shop-finished surfaces, touch-up as required, and remove or refinish damaged or soiled areas, as acceptable to Laboratory Architect.

C. Protection: Advise Contractor of procedures and precautions for protection of installed laboratory service fixtures from damage by work of other trades.

END OF LABORATORY SAFETY EQUIPMENT

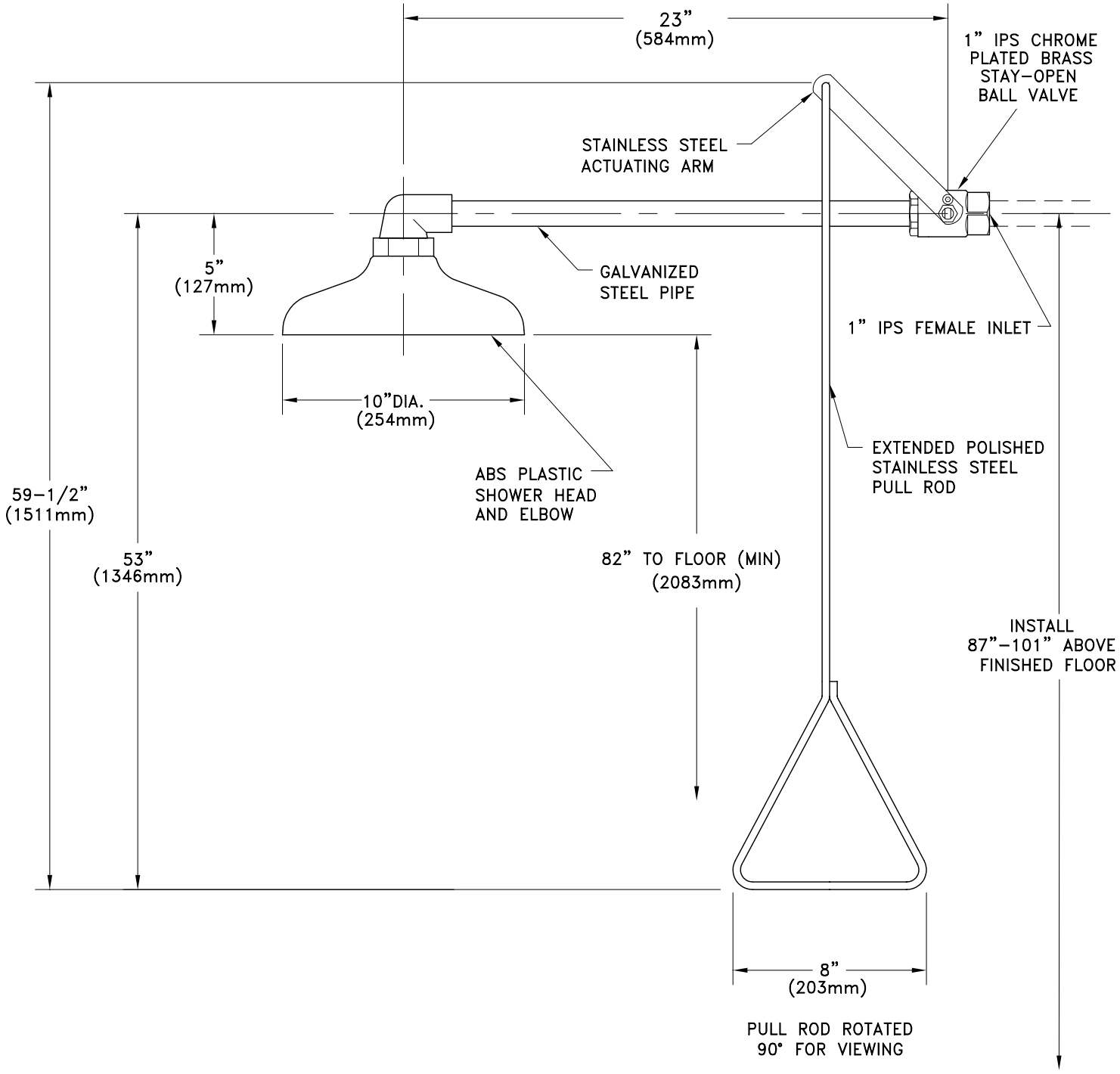
(ES-3) ADA Emergency Shower, Wall Mounted

WaterSaver Faucet Co.
Innovative Products for Research

701 West Erie Street Phone 312 666 5500
Chicago, Illinois 60610 Fax 312 666 8597

ESBF643

BARRIER-FREE HORIZONTALLY MOUNTED EMERGENCY SHOWER WITH STAY-OPEN BALL VALVE AND PULL ROD



MEASUREMENTS MAY VARY ±1/4".

Drawing Number: _____

Revision Number: 100703-DWC

(EM-1) Emergency Eyewash, Deck Mounted

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Eyewash / Drench Hose Units

- ~~**EW1028** Eyewash/Drench Hose Unit, Deck Mounted, Ball Valve with Flag Handle~~
- **EW1028VB** Eyewash/Drench Hose Unit, Deck Mounted, Ball Valve with Flag Handle, Vacuum Breaker

APPLICATION: Dual purpose eyewash/drench hose unit for deck mounting. Unit meets the provisions of ANSI Z358.1 -2004 as both an eyewash and a drench hose. Unit may be left in the deck flange for use as a fixed eyewash, leaving user's hands free. Alternatively, unit may be removed for use as a drench hose to rinse any part of user's eyes, face or body.

SPRAY HEAD ASSEMBLY: Two GS-Plus™ spray heads mounted side-by-side. Each head has a "flip top" dust cover, internal flow control and filter to remove impurities from the water flow.

VALVE: 1/2" IPS brass stay-open ball valve. EW1028 has valve mounted above counter and activated by flag handle.

HOSE: 8' reinforced PVC hose. 300 PSI maximum working pressure.

MOUNTING: Eyewash assembly has deck flange for countertop mounting. Flange has handle locator guide to position spray heads facing forward at all times.

SUPPLY: 1/2" NPT male inlet.

SIGN: ANSI-compliant identification sign.

QUALITY ASSURANCE: Unit is completely assembled and water tested prior to shipment.

Available Options

- **DC** Stainless steel dust cover for each spray head.
- **FSH** 8 ft. flexible stainless steel hose in place of PVC hose.
- **HG** Undercounter hose guide bracket to prevent hose from tangling or binding.
- **BP** In-line dual check backflow preventer installed on inlet of hose. *Note: Check with code authority for compliance with local plumbing code.*
- **VB** Atmospheric vacuum breaker installed on outlet of ball valve (EW1028VB).
- **TMV** AP3600 thermostatic mixing valve precisely blends hot and cold water to deliver warm (tepid) water as provided by ANSI Z358.1 - 2004. Refer to "Tempering Units" section for complete technical and product selection information.

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701 West Erie Street
Chicago, IL 60654

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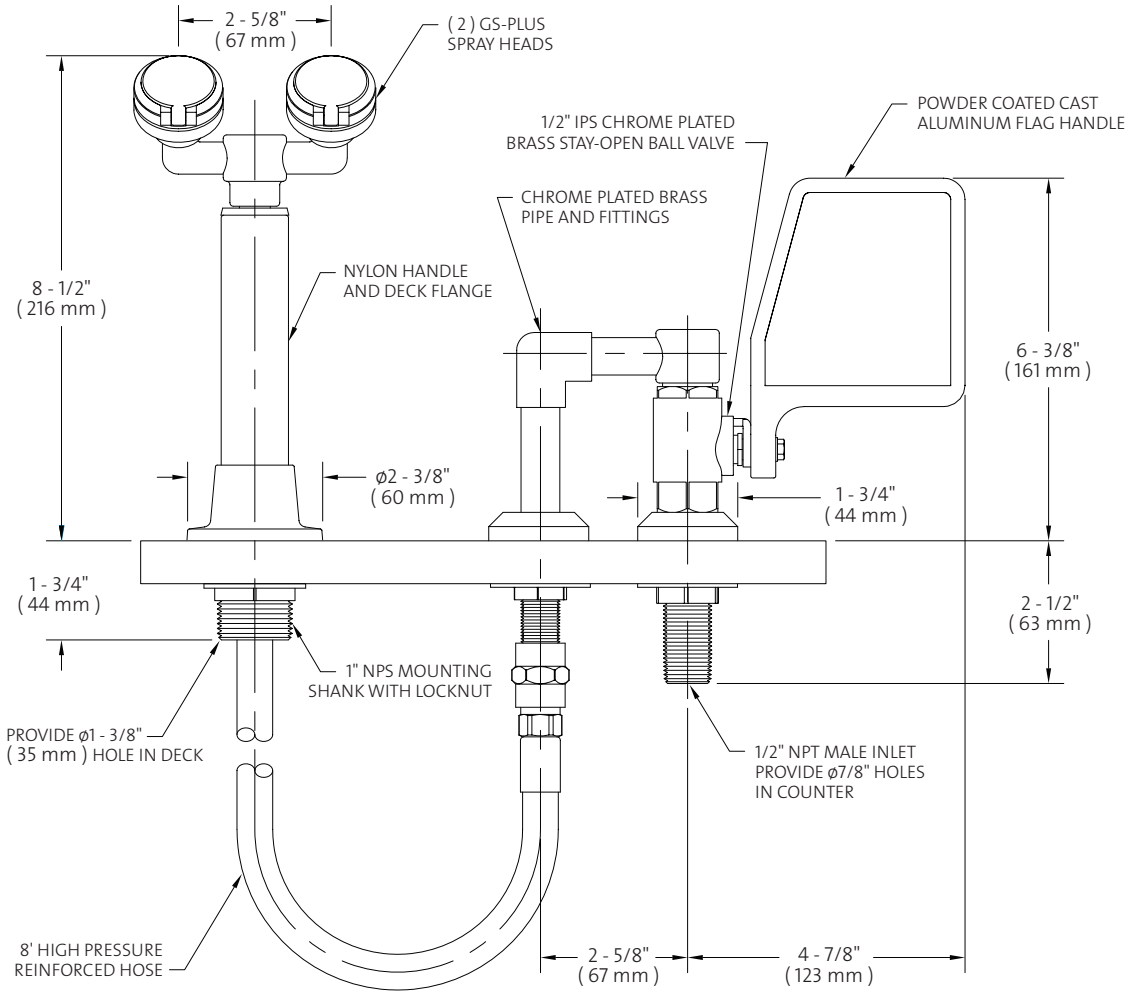
ETL Listed 101496.
Units have been tested to and comply with ANSI Z358.1 - 2004

WaterSaver

Eyewash / Drench Hose Units

- **EW1028** Eyewash/Drench Hose Unit, Deck Mounted, Ball Valve with Flag Handle
- **EW1028VB** Eyewash/Drench Hose Unit, Deck Mounted, Ball Valve with Flag Handle, Vacuum Breaker



NOTES:

1. EACH GS-PLUS SPRAY HEAD HAS A "FLIP-TOP" DUST COVER, INTERNAL FLOW CONTROL AND FILTER TO REMOVE IMPURITIES FROM THE WATER FLOW.
2. HOSE SHOULD NOT BE USED IN APPLICATIONS WHERE WATER PRESSURE EXCEEDS 90 PSI. HOSE SHOULD BE INSPECTED PERIODICALLY FOR DETERIORATION.
3. UNIT FURNISHED FOR MOUNTING ON COUNTERTOPS FROM 1/8" UP TO 1-1/2" THICK.

Sign Included

THIS SPACE FOR ARCHITECT/ENGINEER APPROVAL

Due to continuing product improvement, the information contained in this document is subject to change without notice. All dimensions are ± 1/4" (6mm). rev. 0308

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ETL Listed 101496.
Units have been tested to and comply with ANSI Z358.1 - 2004

○ AP3800 Tempering Valve, 44 Gallon Capacity

Application: Tempering valve to blend hot and cold water to deliver tepid water. Valve has flow capacity of 3.0 to 44 gallons per minute (GPM). Valve can be used with single installation of emergency showers and safety stations, and with multiple installations of emergency shower, eyewash, eye/face wash, dual purpose eyewash/drench hose, drench hose and safety station units.

Temperature Control: Valve has bimetallic thermostat that senses incoming water temperature and automatically blends water to 85°F (29°C). High temperature limit stop is set to 90°F (32°C). Valve has dial thermometer on outlet to monitor temperature of delivered water. *Note: Valve may need to be adjusted when installed based on incoming water temperature. Refer to "Installation Instructions" for further information.*

Fail Safe: In event of restriction or failure of hot water supply, internal bypass allows valve to deliver cold water to emergency unit. In bypass mode, valve will deliver 20 GPM of cold water at 30 PSI flow pressure. In event of loss of cold water supply, valve will close and not deliver water.

Flow Capacity: Refer to chart below for flow capacity of valve at specified pressure drops:

System Pressure Drop (PSI)	5	10	15	20	25	30	35	40
Flow Rate (GPM)	21	29	38	44	50	53	56	61

System Pressure Drop (Bar)	0.3	0.7	1.0	1.4	1.7	2.1	2.4	2.8
Flow Rate (Liters per Minute)	79	110	143	167	189	201	212	231

Supply Temperature: Minimum hot water supply temperature is 140° F (60° C).

Supply Pressure: 30 PSI minimum supply pressure is required for proper operation of valve. Maximum supply pressure is 125 PSI.

Mounting: Furnished with heavy duty mounting bracket for securing valve to panel or wall.

Inlets: 1" NPT female hot and cold water inlets. Inlets can be rotated 360 degrees for top or bottom supply. Each inlet has integral water strainer, check valve and supply stop.

Outlet: 1-1/4" NPT female outlet.

Quality Assurance: Valve is completely assembled and water tested prior to shipment. Valve is certified to ASSE 1071.

IMPORTANT: *Pursuant to ANSI Z358.1-2009, the water delivered by emergency equipment should be "tepid". Tepid is defined as moderately warm or lukewarm, and is generally considered to be between 60°F (15°C) and 90°F (32°C). However, in certain circumstances, a chemical reaction may be accelerated or otherwise affected by the water temperature. Please consult with a medical advisor to determine the optimum delivered water temperature prior to specifying, installing or using a tempering valve.*

Tempering valves will not deliver the appropriate water temperature if the system has not been sized correctly. Please refer to the flow capacities and supply pressure requirements listed above when designing the tempered water system and selecting tempering valves.

Tempering valves, like all emergency eyewash and shower equipment, must be installed in accordance with the manufacturer's instructions and maintained on a regular basis. Under ANSI Z358.1-2009, all emergency equipment should be activated weekly and inspected at least annually. Tempering valves should be treated the same and, in addition, must be regularly cleaned and cycled.

Additional Models

- ○ **AP3802** Same as above except valve is installed in surface mounted stainless steel cabinet.
- ○ **AP3807** Same as above except valve is installed in recess mounted stainless steel cabinet.

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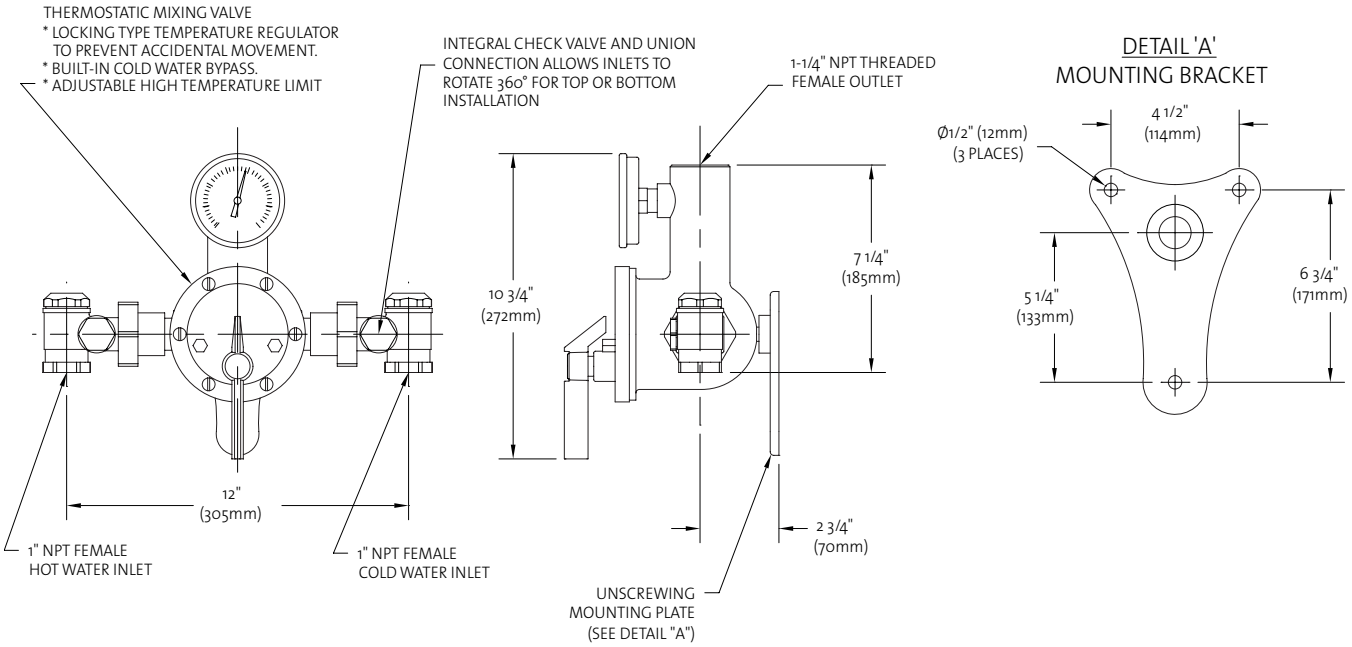
○ AP3800 Tempering Valve, 44 Gallon Capacity



1. As with all plumbing devices and emergency equipment, thoroughly flush supply lines prior to and after installation.
2. Install mounting bracket on panel or wall. Thread tempering valve securely onto mounting bracket. Valve must be installed in location where it is readily accessible for inspection, cleaning and maintenance.
3. Connect hot and cold water supply lines to valve. Connect outlet line to valve and then to inlet of emergency equipment.
4. Activate the water flow and check the temperature of the water delivered from the tempering valve and emergency equipment. Note that the temperature control knob on the tempering valve has been factory preset to deliver 85°F (29°C) tepid water and the high temperature limit stop has been factory preset at 90°F (32°C). These temperatures are based upon an incoming hot water supply at 140°F (60°C). If the incoming hot water temperature is higher than 140°F (60°C), the valve will deliver water that is warmer than 90°F (32°C). ***In this case, the high temperature limit stop must be reset by the installer.***
5. To reset the high temperature limit stop:
   - While the water is running, turn the adjusting knob counterclockwise to the maximum hot water position.
   - Remove the knob and retaining ring, loosen the set screw and remove the limit stop.
   - Replace the handle on the valve stem and rotate the valve stem until the desired outlet water temperature is reached. Confirm the outlet water temperature on the outlet thermometer.
   - Replace the limit stop on the valve stem, positioned so that the limit stop is against the web on the LEFT side of the valve cover (i.e. the valve stem cannot be turned any further counterclockwise).
   - Replace the retaining ring, tighten set screw and replace knob.

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SECTION 11 53 43

LABORATORY SERVICE FITTINGS AND FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

2. Division 1 Specification Sections for Guiding Principles for High Performance and Sustainable Buildings compliance requirements such as but not limited to Testing for Indoor Air Quality, Sustainable Design Requirements, Commissioning Requirements and Measurement & Verification, apply to this Section.

1.2 SUMMARY

A. Provide service fittings and fixtures as specified herein and as indicated on Laboratory Equipment drawings.

B. Extent and types of laboratory service fixtures and safety equipment as indicated on Laboratory Equipment drawings.

C. Related Sections include the following:

1. Section 11 53 13 "Fume Hoods".

2. Section 11 53 43.10, "Laboratory Accessories".

3. Section 12 35 53.13, "Painted Metal Laboratory Casework".

4. Divisions 16, Sections for electrical requirements.

5. Divisions 16, Sections for final connections to building services and systems.

1.3 PERFORMANCE REQUIREMENTS

D. General Performance: Provide certification that fixtures and fittings have been tested in accordance to and meet the performance requirements as described in SEFA 7.

E. Chemical Resistance: All coating materials shall meet the following tests for chemical resistance:

2. Fume Test: Suspend coated samples in a container at least 6 cubic feet capacity, approximately 12" above open beakers, each containing 100 cc of 70% nitric acid, 94% sulfuric acid and 35% hydrochloric acid, respectively. After exposure to these reagent fumes for 150 hours, the finish on the samples shall show no discoloration, disintegration or other damage to the coating.

3. Direct Application Test: The test of coated samples shall consist of the direct action of the reagents listed below. This test is to be conducted in such as manner that the test surface is kept wet throughout the entire test period and at a controlled temperature of 77 degrees F +/- 3 degrees F. The test must be conducted for a period of not less than one hour. As a result of the test the coating on the samples shall not rupture or otherwise compromised exposing the base material through erosion, dissolution, cracking, splitting or other damage resulting from reagent exposure. Obvious and significant deterioration is not acceptable. However, slight discoloration or temporary softening of the coating is permissible.

Acetic Acid, 98%
Acetone
Acid Dichromate, 5%
Ammonium Hydroxide, 28%
Amyl Acetate
Amyl Alcohol
Benzene
Butyl Alcohol
Calcium Hypochlorite
Carbon Disulfide
Carbon Tetrachloride
Chloroform
Chronic Trioxide Acid
Cresol
Crude Oil
Dichlor Acetic Acid
Dimethylformanide
Dioxane
Distilled Water
Ether
Ethyl Acetate
Ethyl Alcohol
Ethyl Ether
Formaldehyde, 37%
Formic Acid, 90%
Furfural
Gasoline
Glacial Acetic Acid, 99.5%
Glycerin
Hydrochloric Acid, 38%
Hydrofluoric Acid, 48%
Hydrogen Peroxide, 5%
Iodine, Tincture of
Isopropyl Alcohol
Kerosene
Lactic Acid, 10%
Methanol
Methyl Alcohol
Methyl Ethyl Ketone
Methylene Chloride
Mineral Oil
Mono Chlorobenzene
N-Hexane
Naphthalene
Nitric Acid, 70%
Perchloric Acid, 70%
Phenol
Phosphoric Acid, 85%
Sea Water
Silver Nitrate, Saturated
Sodium Bichromate, Saturated
Sodium Carbonate, 10%
Sodium Chloride, 20%
Sodium Hydroxide, 50%
Sodium Hydroxide, Flake
Sodium Hypochlorite
Sodium Sulfide, Saturated
Sulfuric Acid, 96%
Sulfuric Acid 77% & Nitric Acid 70%, eq. parts
Toluene
Trichloroethylene
Turpentine
Urea, Saturated
Xylene
Xylem
Zinc Chloride, Saturated

4. Adhesion Test: Corrosion resistant finishes shall meet the standards set forth in "Standard Test Methods for Measuring Adhesion by Tape Test", ASTM D3359-02, "Standard Test Method for Mandrel Bend Test of Attached Organic Coatings", ASTM D522-93a and "Standard Test Method for Chipping Resistance of Coatings", ASTM D3170-03.

5. Mar and Abrasion Resistance: Coating material shall have a pencil hardness of 2H-4H with adhesion substantial enough to withstand both direct and reverse impacts of 160 inch-pounds. Coating shall have excellent mar resistance and be capable of withstanding scuffing, marring and other ordinary wear.

6. Reparability: Coating material shall be capable of surface repair in the event that a fixture is scratched or a surface rupture occurs. The service fixture manufacturer shall have available an air-drying aerosol coating, specially formulated to match the existing epoxy coating color, which may be applied in the field to repair coated surfaces.

1.4 SUBMITTALS

D. Product Data: Submit manufacturer's data and installation instructions for each type of service fixture.

2. Include independent laboratory certification that applied finish complies with specified chemical and physical resistance requirements.

3. Submit samples of plumbing and electrical service fixtures when requested by Laboratory Architect, complete with fittings and accessories with specified finish.

E. Service Color Code: Submit samples of index disc with letter code in colors used to identify water, vacuum and compresses gas services listed.

F. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

G. All products must be manufactured or substantially transformed in the United States or TAA designated country. Documentation to be provided with first submittal.

2. USA Certificate of Origin: Manufacturer shall supply with first submittal, an example of their Certificate of Origin declaring products are wholly manufactured and assembled specifically in the United States, including city and state locations. A notarized Certificate of Origin shall be provided with closeout documents.

1.5 EXTRA MATERIALS

D. Provide to Owner a complete touch-up kit for surface repair of service fittings and fixtures. Provide an air-drying aerosol or liquid coating specially formulated to match the coating color which can be applied in the field to repair coated surfaces.

1.3 QUALITY ASSURANCE

A. Single Source Responsibility: All laboratory service fixtures and safety equipment, including those provided as an integral part of other laboratory equipment such as fume hoods, shall be the product of one service fixture manufacturer, unless specified otherwise.

B. All fixtures shall be in accordance with IBC, NFPA and OSHA for the intended use.

C. All fixtures for water service shall meet the requirements of ANSI/ASME A112.18.1M-2012.

D. Atmospheric vacuum breakers shall be certified by the American Society of Sanitary Engineers (ASSE) under Standard 1001 and faucet fixture breakers shall be certified to comply with ANSI/ASSE Standard 1035.

E. Natural gas service, ball valves shall be certified by the American Gas Association (AGA) under ANSI Z21.15-2009.

F. Electric pedestal boxes shall be listed by Underwriters Laboratories (UL) under Standard UL514A. Receptacles shall be UL labeled and commercial or specification grade.

G. The entire installation shall be in accordance with the governing rules and regulations of the National Electric Code, and all local governing boards having jurisdiction and shall meet all the standards and requirements of the Owner.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

A. All mechanical laboratory service fixtures shall be the product of one of the following:

1. Water Saver Faucet Co.
2. Chicago Faucet
3. Far laboratory Faucets Ltd.

2.2 FABRICATION; GENERAL

A. All laboratory service fixtures shall have the construction and shall meet the performance requirements set forth in this specification. Fixture types shall be as indicated in the fixture schedule on the Laboratory Equipment drawings and fixture details as an attachment to this specification.

B. Service Fixtures: Provide all service fixtures factory assembled, including the assembly of all valves and shanks to turrets, flanges, and other mounting accessories. Individually factory test each fixture and provide all fixtures complete with washers, locknuts, unions, nipples and other accessories.

C. Material and Finish: Fabricate service fixtures from cast brass containing a minimum of 85% copper or forged brass containing a minimum of 60% copper.

1. Finish service fixtures and safety equipment as follows:

a. Satin Chrome Finish with Clear Epoxy Coating: All components shall be polished and electroplated with one layer of nickel. Exposed surfaces shall then be further polished to an AISI No. 6 brushed finish which is fine-grained and uniform. Components shall then be electroplated with one layer of chrome. Following chrome plating, surfaces to be coated shall be cleaned and degreased. Following plating and cleaning a clear epoxy coating shall be applied to all exposed surfaces and fully baked to permit curing. Surfaces shall have a minimum coating thickness of 2 mils.

b. Fittings Inside Fume Hoods: shall have an epoxy finish color-coded to match the fixture service index color. Following base preparation and cleaning, coating material shall be electrostatically applied to all exposed surfaces. After application, coating shall be fully baked to permit curing. Surfaces shall have a minimum coating thickness of 2 mils.

D. Handles: Except as otherwise indicated, provide forged brass four-arm style handles on all fixtures with a color-coded screw-on index disc.

1. Benchtop service fixtures at locations identified as accessible and/or for hand-washing (HW) and where otherwise indicated on lab equipment drawing shall be fitted with 4" wrist blade handles, color coded.

2. Provide foot pedals as indicated on lab equipment drawings.

a. Provide a combination fixture at locations indicating on lab equipment plan which indicates dual functions of both foot pedals and a mixing faucet with 4" wrist blade handles.

E. Water Fixtures and Valves:

1. All fixtures and valves for water service shall have a renewable unit containing all working components subject to wear, including a stainless-steel replaceable seat and an integral adjustable volume control. The renewable unit shall be interchangeable among all faucets and valves for water service. The renewable unit shall be broached for position locking in the valve body. The unit shall have a high durometer thermoplastic valve disc and a molded TFE stem packing. The unit shall be capable of being readily converted from compression to self-closing, and vice versa, without disturbing the faucet body.

a. Water Fixtures and valves shall be fully assembled and individually factory tested at 80 PSI water pressure.

2. Goosenecks shall have a separate outlet coupling with a 3/8" IPS female thread securely brazed to the gooseneck for attachment of serrated hose ends, aspirators and other outlet fittings. Rigid goosenecks shall have a 3/8" IPS male inlet thread and be threaded directly into the faucet body so as to be absolutely rigid. Swing goosenecks shall utilize a TFE packing with an externally adjustable packing nut.

a. Gooseneck fixtures at lab sinks (LS-#)

3. Vacuum breakers, where required and indicated by the fixture number, shall be integral with the gooseneck. Vacuum breakers shall have a forged brass body, a renewable seat and an ultralight float cup with a silicone gasket for fine flow control. Vacuum breakers shall not spill over at low water volume.

F. Atmospheric Vacuum Breakers: shall be provided on Fume Hoods with water service and where otherwise indicated on the Laboratory Equipment drawings to prevent backflow or backsiphonage into the water system. Vacuum breakers shall be installed:

1. In accordance with the manufacturer's instructions and applicable plumbing codes.
2. In a location where they are accessible for maintenance.

G. Service Outlet Identification: The handle of each laboratory fitting, except pressure regulators, shall be marked to indicate the particular liquid or gas that is delivered by or through such fitting. The handle or the index button fastened to the handle shall be color coded, and the index button shall be embossed with identification letters to designate the service. Letters used to designate the service or symbol shall be legible and easy to read. Color code index discs as follows:

Basic Air & Water Indexing	**Index Color**	**Letter Color**	**Symbol**
Purified Air	Orange	Black	Pair
Air	Orange	Black	Air
Compressed Air	Orange	Black	CA
Lab Air	Orange	Black	LA
Cold Water	Dk. Green	White	CW
Chilled Water Supply	Dk. Green	White	CWS
Chilled Water Return	Dk. Green	White	CWR
Industrial Cold Water	Dk. Green	White	ICW
Hot Water	Red	White	HW
Industrial Hot Water	Red	Red	IHW
Steam	Black	White	STM
Tempered Water	Green	White	TW
Glycol Supply	Lt. Green	Black	GYLS
Glycol Return	Lt. Green	Black	GYLR
Process Water Supply	Green	White	PCWS
Process Water Return	Green	White	PCWR
Deionized Water	White	Black	DI
Distilled Water	White	Black	DW
Purified Water	White	Black	PW
Reverse Osmosis	White	Black	RO
High Vacuum	Yellow	Black	HVAC
Low Vacuum	Yellow	Black	LVAC
Vacuum	Yellow	Black	VAC
Gas	Dk. Blue	White	G
Natural Gas	Dk. Blue	White	NG
Acetylene	Violet	White	C2H2
Butane	Lt. Blue	Black	BUT
Isobutene	Silver	Black	ISO
Methane	Lt. Blue	Black	CH4
Propane	Pink	Black	PRO

Gas Indexing	**Index Color**	**Letter Color**	**Symbol**
Ammonia	Lt. Green	Black	NH3
Argon	Violet	White	Ar

Carbon Monoxide	Silver	Black	CO
Carbon Dioxide	Pink	Black	CO2
Helium	Black	White	He
Hydrogen	Pink	Black	H2
Hydrogen Sulphite	Black	White	H2S
Nitrogen	Brown	White	N2
Nitrogen, Dewar	Brown	White	N2d
Nitrous Oxide	Lt.Green	Black	N2O
Oxygen	Lt. Green	Black	O2
Phosphorus	Tan	Black	P
Special Gas	Lt. Blue	Black	SG
Sulphur Dioxide	Tan	Black	SO2

2.3 ELECTRICAL SERVICES, WIRES AND CABLES

A. Coordinate electrical service with laboratory casework. Refer to electrical drawings and specifications for wireways and electrical pedestals to me mounted to laboratory casework, framing and core assemblies.

PART 3 - EXECUTION

3.1 INSTALLATION OF SERVICE FIXTURES

A. Install in a precise manner in accordance with manufacturer's directions. Adjust moving parts to operate freely without excessive bind.

B. Follow the manufacturer's recommended test and working pressures for fittings. Testing or using a fitting at pressure for which it is not designed can result in leakage or failure.

C. Provide all interconnecting conduit, wiring, and devices to junction box for final connection to building systems by Electrical Trades Contractor.

3.2 REPAIRING, CLEANING, AND PROTECTION

A. Repairing: Repair or remove and replace defective work as directed upon completion of installation.

B. Cleaning: Clean shop-finished surfaces, touch-up as required, and remove or refinish damaged or soiled areas, as acceptable to Laboratory Architect.

C. Protection: Advise Contractor of procedures and precautions for protection of installed laboratory service fixtures from damage by work of other trades.

END OF SERVICE FITTINGS AND FIXTURES

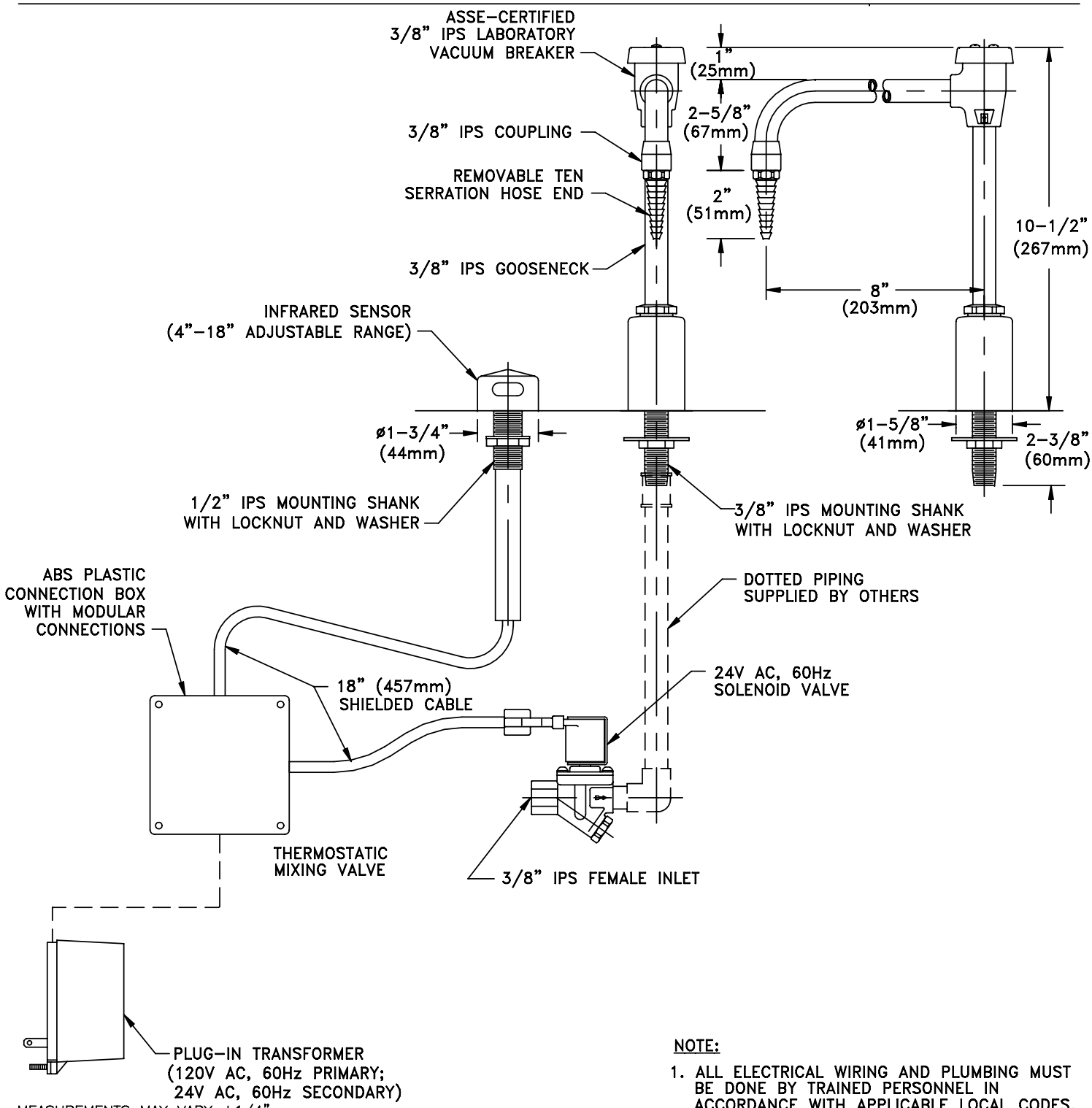
(SF-3) Sensor Operated Automatic Faucet, Deck Mounted with Vacuum Breaker

WaterSaver Faucet Co.
Innovative Products for Research

701 West Erie Street Phone 312 666 5500
Chicago, Illinois 60610 Fax 312 666 8597

L4512-8VB

DECK MOUNTED SENSOR OPERATED AUTOMATIC FAUCET WITH DECK MOUNTED 8" SWING VACUUM BREAKER GOOSENECK ASSEMBLY



MEASUREMENTS MAY VARY ±1/4".

NOTE:

1. ALL ELECTRICAL WIRING AND PLUMBING MUST BE DONE BY TRAINED PERSONNEL IN ACCORDANCE WITH APPLICABLE LOCAL CODES.

Drawing Number: _____

Revision Number: 062606-SJP

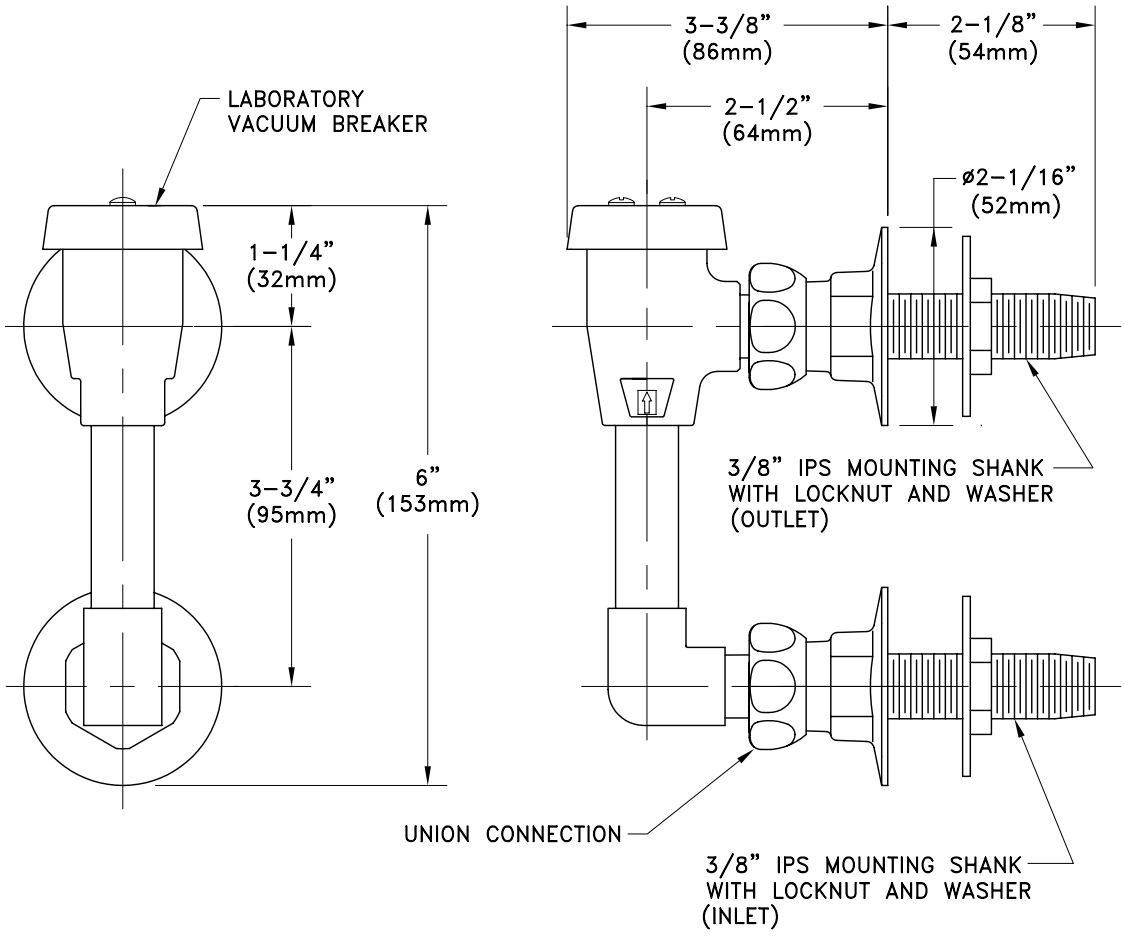
(SF-27) Atmospheric Vacuum Breaker, Panel Mounted

WaterSaver Faucet Co.
Innovative Products for Research

701 West Erie Street Phone 312 666 5500
Chicago, Illinois 60610 Fax 312 666 8597

L112WSA

PANEL MOUNTED ATMOSPHERIC VACUUM BREAKER WITH 3/8" IPS MOUNTING SHANKS



NOTE:
ASSE CERTIFIED UNDER STANDARD 1001.
CSA CERTIFIED UNDER CAN/CSA B64.

MEASUREMENTS MAY VARY ±1/4".

Drawing Number: _____

Revision Number: 012298-KJS

SECTION 11 53 43.10

LABORATORY ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Division 1 Specification Sections for Guiding Principles for High Performance and Sustainable Buildings compliance requirements such as but not limited to Testing for Indoor Air Quality, Sustainable Design Requirements, Commissioning Requirements and Measurement & Verification, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Laboratory benchtops.
2. Concealed steel brackets.
3. (CS-#) cup sinks and (LS-#) laboratory sinks.
4. (PB-#) Pegboard glass drying racks.
5. (LC-2) Lab Coat Hooks
6. (ST-1 and ST-2) Lab seating
7. (FC-1) File Cabinet
8. (UCL) Under Counter Evidence Locker
9. Fuming Chamber
10. Photo stand
11. Undercounter Refrigerator
12. Dishwasher
13. Distilled Water station (Alternate No.1)

B. Related Sections include the following:

1. Section 11 53 13 "Fume Hoods".

2. Section 11 53 33, "Laboratory Safety Equipment".

3. Section 11 53 43, " Laboratory Service Fittings and Fixtures".

4. Section 12 35 53.13 “Painted Metal Laboratory Casework”.

1.3 PERFORMANCE REQUIREMENTS

D. Seismic Performance: Provide assemblies and systems capable of withstanding the effects of earthquake motions determined according to the building code in effect for this Project or

ASCE 7, "Minimum Design Loads for Buildings and Other Structures", Section 9, "Earthquake Loads", whichever is more stringent.

1.4 SUBMITTALS

A. Product Data: Submit product data for manufactured items.

B. Samples: Submit samples of the following:

1. Benchtop materials.
2. Painted metal finishes.

C. Shop Drawings: Submit shop drawings for laboratory accessory assemblies that are factory and/or field assembled from manufactured components. Submit shop drawings showing locations, materials, connections and all details of construction and installation.

1. Benchtops showing joint locations and fixture holes and cut outs.
2. Glassware drying pegboard racks.
3. Service drops.

D. Product Test Reports: Based on tests performed by a qualified independent testing agency, indicate compliance with SEFA 3 and 8 for laboratory casework finishes and countertops with requirements specified for chemical and physical resistance.

E. Qualification Data: Firms and/or persons specified shall demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Architects and Owners, and other information specified.

F. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

G. All products must be manufactured or substantially transformed in the United States or TAA designated country. Documentation to be provided with first submittal.

1. USA Certificate of Origin: Manufacturer shall supply with first submittal, an example of their Certificate of Origin declaring products are wholly manufactured and assembled specifically in the United States, including city and state locations. A notarized Certificate of Origin shall be provided with closeout documents.

1.5 QUALITY ASSURANCE

A. Coordinate the interface of the laboratory accessories with the laboratory casework. Verify and coordinate all requirements for cutouts, attachments, reinforcing, piping, electrical devices, sizes and locations with laboratory casework and other laboratory items.

B. Manufacturer shall identify and designate a full-time factory representative for on-site supervision and coordination during the installation of laboratory casework and laboratory accessories.

C. Single Source Responsibility: Laboratory casework manufacturer shall provide and install all laboratory accessories in order to maintain single source responsibility for laboratory fit-up items.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver laboratory accessories until painting, utility roughing-in, and similar operations that could damage, soil, or deteriorate materials or assemblies have been completed in installation areas. If items must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions" Article below.

B. Protect finished surfaces from soiling and damage during handling and installation. Keep covered with polyethylene film or other protective covering.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install laboratory accessories until building is enclosed, wet-work is completed, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels through remainder of construction period.

1.8 COORDINATION

A. Coordinate layout and installation of metal framing and reinforcement in gypsum board assemblies for support of laboratory accessories.

1.9 EXTRA MATERIALS

A. Furnish complete touchup kit for each type and color of laboratory accessory provided. Include fillers, primers, paints, fabric patches, and other materials necessary to perform permanent repairs to damaged items.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, other manufacturers offering products may be incorporated into the Work subject to approval by laboratory architect.

2.2 MATERIALS

A. Unless specified otherwise under an individual laboratory accessory, provide the following materials.

1. Metal: Commercial-quality, cold-rolled, carbon-steel sheet, complying with ASTM A 366 (ASTM A 366M); matte finish; suitable for exposed applications; and stretcher leveled or roller leveled to stretcher-leveled flatness. Minimum 18 ga.

2. Stainless Steel: AISI Type 304 with No. 4 satin finish unless otherwise indicated.

3. Chemical-Resistant Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard 2-coat, chemical-resistant, baked-enamel finish consisting of prime coat and thermosetting topcoat with a minimum dry film thickness of 1 mil (0.025 mm) for topcoat and 2 mils (0.05 mm) for system.

2.3 FABRICATION

A. Laboratory Benchtops, General:

1. Provide and install type and configuration of laboratory benchtops as indicated on drawings.

2. Fabricate benchtops in as large components as practicable to minimize field jointing.

3. Provide separate box curbs and splash trims with benchtops.

4. Field Jointing: Where possible, make in the same manner as shop jointing using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project site processing of top and edge surfaces is not required. Locate field joints where shown on approved Shop Drawings.

5. Abut top and edge surfaces in one true plane, with internal supports placed to prevent deflection. Provide flush hairline joints in tops using clamping devices.

   a. Where necessary to penetrate tops with fasteners, countersink heads approximately 1/8 inch (3 mm) and plug hole flush with material equal to top in chemical resistance, hardness, and appearance.

6. Provide required holes and cutouts for service fittings.

7. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

8. Provide scribe moldings for closures at junctures of top, curb, and splash, with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.

2.4 (E-#) EPOXY RESIN BENCHTOPS

A. Benchtop Thickness: Maintain 1" thickness, except as otherwise specified with tolerance not exceeding plus or minus 1/32". Provide front and end overhang of 1" beyond face of base cabinets, formed with continuous drip groove on under surface ½" from edge.

B. Backsplash, side splashes and curbs: Same material as top, 4" high back and side splashes and 6" high curbs butt jointed and cemented to top. Provide back and side splashes where tops abut wall surfaces, tall cabinets and fume hoods. Provide and 6" high x 6" wide curbs at locations as indicated on laboratory equipment plans.

C. Reagent Pedestals and Shelves: Same material as top. Provide 6" high x 7-1/2" wide single faced units and 6" high x 9" wide double faced units as indicated on laboratory equipment drawings. Pedestal face shall permit installation of panel mounted service fixtures and top shall be removable for access to service utilities.

D. Factory molded of modified epoxy-resin formulation, uniform mixture throughout full thickness with smooth, non-glare and non-specular finish.

E. Physical Properties: Comply with the following minimum requirements:

1. Flexural Strength: 15,000 psi (100 Mpa).
2. Compressive Strength: 30,000 psi (200 Mpa).
3. Tensile Strength: 10,000 psi (69 Mpa).
4. Flexural Modulus: 2×10^6
5. Density: 2.03 g/cc
6. Hardness (Rockwell M): 100.
7. Water Absorption (24 hours): 0.02 % (maximum).
8. Heat Distortion Point: 350 deg F (177 deg C).
9. Thermal-shock Resistance: Highly restraint.

F. Chemical Resistance: Epoxy-resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, test procedure 3.9.5:

	CHEMICAL - ACIDS	RATING
1.	Hydrochloric Acid, 20%	No Effect
2.	Hydrochloric Acid, 37%	No Effect
3.	Nitric Acid, 20%	Excellent
4.	Nitric Acid, 70%	Good
5.	Sulfuric Acid, 30%	No Effect
6.	Sulfuric Acid, 77%	No Effect
7.	Sulfuric Acid, 96%	Poor
8.	Phosphoric Acid, 85%	No Effect
9.	Perchloric Acid, 60%	No Effect
10.	Aqua Regia	No Effect
11.	Chromic Acid, 60%	Good
12.	Acetic Acid, 98%	No Effect
13.	Formic Acid, 90%	No Effect
14.	Boric Acid, Sat.	No Effect
15.	Citric Acid, Sat.	No Effect
16.	Oxalic Acid, Sat.	No Effect
17.	Hydrobromic Acid, 48%	No Effect
18.	Hydroflouric Acid, 48%	Good
19.	Vinegar	No Effect

CHEMICAL - BASES

20.	Ammonium Hydroxide, 28%	No Effect
21.	Sodium Hydroxide, 10%	No Effect
22.	Sodium Hydroxide, 40%	No Effect
23.	Sodium Hydroxide, Flake	No Effect
24.	Potassium Hydroxide, 10%	No Effect
	CHEMICAL - SALTS	
25.	Zinc Chloride, Sat.	No Effect
26.	Calcium Hypochlorite, Sat.	No Effect
27.	Clorox Bleach	No Effect
28.	Silver Nitrate, 10%	No Effect
29.	Sodium Sulfide, Sat.	No Effect
30.	Sodium Chloride, Sat.	No Effect
31.	Iodine, Tincture	No Effect
32.	Hydrogen Peroxide	No Effect
33.	Phenol, 80%	No Effect
34.	Cresol	No Effect
35.	Formaldehyde, 40%	No Effect
36.	Mineral Oil, 100%	No Effect
37.	Glycerin, 100%	No Effect
	CHEMICAL - SOLVENTS	
38.	Methyl Alcohol, 100%	No Effect
39.	Ethyl Alcohol, 100%	No Effect
40.	Buty Alcohol, 100%	No Effect
41.	Naphtha, 100%	No Effect
42.	Turpentine, 100%	No Effect
43.	Kerosine,100%	No Effect
44.	Heptane,100%	No Effect
45.	Gasoline, 100%	No Effect
46.	Benzene, 100%	No Effect
47.	Toluene, 100%	No Effect
48.	Xylene, 100%	No Effect
49.	Acetone, 100%	No Effect
50.	Methyl Ethyl Ketone, 100%	No Effect
51.	Methyl Isobutyl Ketone, 100%	No Effect
52.	Ethyl Acetate, 100%	No Effect
53.	Ethyl Ether, 100%	No Effect
54.	Chloroform, 100%	No Effect
55.	Methyl Chloride, 100%	No Effect
56.	Trichlorethylene, 100%	No Effect
57.	Carbon Tetrachloride, 100%	Excellent
58.	Monochloro Benzene, 100%	No Effect
59.	Dioxane, 100%	No Effect
60.	Furfural	No Effect
	CHEMICAL - DYES	
61.	Congo Red, 1%	No Effect
62.	Eosin Y, 0.5%	No Effect
63.	Gentian Violet, 1%	No Effect
64.	Indigo Carmen, 0.5%	No Effect

65.	Methyl Green, 0.5%	No Effect
66.	Wrights Blood Stain, 0.35%	No Effect

G. Colors: Provide products that result in colors complying with the following requirements:

1. Color: Color to be selected from manufacturers' standard by laboratory architect.

H. Top Fabrication: Fabricate with factory cutouts for sinks and with plain butt-type joints assembled with epoxy adhesive and pre-fitted, concealed metal splines.

1. Top Configuration: Square edge with drip groove and separate backsplashes. Ease outside corners and edges to prevent sharp edges to the touch.

I. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Durcon Company, Inc.
2. Epoxyn, Products
3. Laboratory Tops, Inc.
4.

2.5 CONCEALED STEEL BRACKETS

A. Material: Steel
   1. Finish: Powder Coated Black
B. Design: Front Mounting Plus Countertop Support.
C. Loads: Up to 400 lbs. per bracket, evenly distributed
D. Thickness: 3/16 inch x 2 inch, A-36 steel
E. Edges: rounded for safety
F. Manufacturers: Steel Design Solutions and Centerline Brackets

2.6 (LS-#) LABORATORY SINKS and (CS-#) CUP SINKS

A. Laboratory and Cup Sinks: Provide and install laboratory sinks in materials and sizes as indicated on laboratory equipment drawings. Provide sizes as indicated or manufacturers' closest stock size of equal or greater volume. Provide all sinks complete with strainers, tail pieces, traps, stops and escutcheons.
   1. Provide ¼" high marine edge around cup sinks in fume hoods for spill containment.

B. Outlets: 1-1/2" diameter, manufacturer's standard length, fabricated of silicon iron, cast epoxy resin, stainless steel, glass, or lead; of same material as sink wherever possible, or as otherwise acceptable to laboratory architect.

C. Overflows: For each sink, except cup sinks, provide overflow of standard beehive or open top design and with separate strainer. Height 2" less than sink depth. Provide in same material as sink.

D. Material:

1. Cast Epoxy Resin Sinks: Non-glare molded in one piece with surfaces smooth, corners, coved and bottom sloped to outlet. Minimum physical properties, chemical resistance and color as specified for cast epoxy resin tops. Thickness, ½" minimum.

a. Provide factory punched cut outs for fittings for drop-in units.

b. Apply approximately 1/8-inch- (3-mm-) thick, heat-resistant, sound-deadening coating to undersink surfaces.

c. Install sink units to other than stainless steel tops with integral rim or sink ring, set in mastic or sealant to form a positive seal with top.

E. Installation of Sinks:

1. Underside Installation for Epoxy Resin Sinks: Use manufacturer's recommended adjustable support system for table- and cabinet-type installations.

2. Set top edge of sink unit in manufacturer's recommended chemical-resistant sealing compound and firmly secure to underside of benchtop to produce a tight and fully leakproof joint. Adjust sink and securely support to prevent movement.

2.7 (PB-#) PEGBOARD GLASS DRYING RACKS

A. Provide and install Glass Drying Racks as described here and as indicated on drawings. Unless otherwise indicated on drawings the size shall be:

24" W x 24" H.

B. Glass drying rack assemblies shall include the following components:

1. Front Panel: 1" thick epoxy resin or 1" stainless steel with No. 4 finish.

2. Glassware Pegs: Replaceable stainless steel or solid black polypropylene with glassware protector bases.

3. Drip Trough: Stainless steel drip trough with PVC drainage hose.

4. Finished Back Panels: Matching finish and material at front panel.

A. Provide all fittings, fasteners, bracing, brackets, etc., for installation illustrate

2.8 (LC-2) LAB COAT HOOKS

B. Manufacturer: The design standard for the lab coat hooks is Glaro Coat Hooks, solid rustproof aluminum construction model #ALS-SA".

C. Finish: Hooks shall be manufacturer's standard satin aluminum finish.

D. Installation: Install coat hooks plumb, level and square to walls unless otherwise indicated on drawings. Brace rack assemblies to walls to prevent sway. Fabricate and install with all components for a complete assembly.
1. d on drawings. Coordinate all reinforcing requirements for wall, frame or service drop mounting. Identify mounting method on shop drawings

PART 3 - EXECUTION

3.1 INSTALLATION AND CLEANING

A. Install accessories according to approved Shop Drawings and manufacturer's written instructions.

B. General: Install all items plumb, level, properly aligned, rigid, and securely anchored to building and casework components.

C. Repair, remove or replace defective work as directed on completion of installation.

D. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

END OF LABORATORY ACCESSORIES

HON Make your space work®

(FC-1) FILE CABINET

Search

Home › File Cabinets & Storage › 210 Series

210 Series

H214.P.Q

Feedback

HON 210 Series Vertical File | 4 Drawers | Letter Width | 15"W x 28-1/2"D | Light Gray Finish

List Price: **$1436**

Options

Paint Color

Add to Quote

Feedback

- A great value for small business, from HON-America's filing and storage leader

Product Information

Overview

HON 210 Series vertical files are America's record-holders, with quality you can see and feel. This 28-1/2"D four-drawer letter-width file offers the most capacity per drawer. Lock and label holders are standard. The handles coordinate with HON 34000 Series desks. Finish color is Putty.

- A great value for small business, from HON-America's filing and storage leader
- Clean visual design that complements open offices, private offices or central records management areas

- 28-1/2"D cabinet provides 27 filing inches per drawer
- Six vertical reinforcements keep the cabinet sturdy and the drawers gliding smoothly
- Double-walled front kickplate stands up to impact
- HON One Key core removable locks can be changed or interchanged as security demands change
- Finish color is Light Gray
- Thumb latches hold drawers firmly shut
- Brushed Aluminum label holder
- High drawer sides support hanging file folders, eliminating the need for extra-cost hangrails
- All-welded case construction stands up to demanding work environments
- Precision-formed steel for strength and durability
- Quality suitable for major corporations, hospitals, universities, law firms, or government facilities
- Brushed aluminum handles coordinate with HON 34000 series desks
- Steel ball-bearing drawer suspensions operate easily and quietly

Specifications

FUMING CHAMBER

Safefume™

Automatic Cyanoacrylate Fuming Chamber

- Safely Obtain Quality Latent Prints and Reproducible Results

Safefume™ CA30S

Air Science®

"The World's Most Extensive Selection of Containment Solutions."

GSA Schedule

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INTRODUCTION

Safefume™ Automatic Cyanoacrylate Fuming Chambers are designed to safely develop latent fingerprints using ethyl cyanoacrylate (CNA) vapor in a controlled environment for optimum effectiveness and safety where moisture and fuming time are critical factors. The tamper resistant compartment helps maintain the chain of custody. The unique Air Science® Multiplex™ Filtration System, together with professional design and unique construction features offer personnel protection during use.

The ductless filtration system requires no connection to an outside exhaust system. The automatic control system programs the fuming cycle. A versatile system of hanging rods and shelves allows proper positioning of items of evidence in the chamber.

APPLICATIONS

Using innovative filtration technology, the Safefume cyanoacrylate fuming chamber creates a safe work environment over the widest range of applications in the industry.

State and Federal Crime Laboratories \ Crime Scene Investigation \ Law Enforcement Agencies \ Medical Examiners' Programs \ Criminal Justice Education

KEY FEATURES

- Choose from multiple sizes, from bench top to floor standing.
- Multi-chamber cabinets available.
- Caster wheels standard on all models except bench top series.
- Optional UV Lamp decontamination.
- Optional side and rear windows for 360° view of development.

DUCTLESS TECHNOLOGY

The Eco-Friendly Choice

Advanced carbon filtration technology offers a safe, high performance alternative to conventional ducted cabinets for a broad range of applications.

Environmental Benefits. Air Science Safefume cyanoacrylate fuming chambers isolate and trap chemical vapors to prevent ecological impact through release into the environment.

Versatile. Each filtration system is selected for its specific application. Carbon filters are available in more than 14 configurations for use with vapors of organic solvents, acids, mercury and formaldehyde. Optional HEPA/ULPA filters can be added for biological safety.

Easy to Install. The cyanoacrylate fuming chamber is self-contained and does not require venting to the outside. Many units are portable and may be moved with minimal downtime and without filter changes. Set-up, operation and filter maintenance are straightforward.

Energy Efficient. Because filtered air is returned to the room, no demands are required of the facility HVAC capacity for make-up air.

Cost Effective. Facility ductwork, HVAC and construction costs are eliminated.

Safe to Use. Cabinet airflow and face velocity protect users from incidental exposures to fumes.

Self-Testing. (select models) Electronic airflow monitoring assures continuous safety. An electronic gas sensor monitors carbon filter performance.

Safefume CA30S and CA60T. CA30S shown with optional UV lamp.

Deep into its second generation, Air Science embraces the diversity and cultural heritage of the founders and co-workers who are continuing a tradition of excellence. Demonstrating a commitment to adaptation, inclusion and quality output from a United States-based company with a domestic and global reach.

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Safefume CA30T, shown open.

DESIGN FEATURES

A. Filter I.D. Window: A strategically placed front cover window shows the installed filter part number and installation date for convenience and to encourage timely filter replacement.

B. Filter Door Key: Filter access keys prevent unauthorized removal or accidental exposure to dirty filters.

C. Track and Wheel System: An efficient filter clamping mechanism allows removal of main filter(s) directly to disposal bag with track and wheel system.

D. Electrostatic Pre-Filter: The 99.5% effective electrostatic pre-filter protects and extends the life of the main filter and can be changed without tools while unit is running to prevent operator exposure to captured contaminants.

E. Dynamic Filtration Chamber: The dynamic filter chamber prevents leakage of contaminated air by maintaining partial vacuum in the filter plenum.

F. Control Panel: The microprocessor control panel manages the Printbuster™ Pro operating sequence with control, oversight and display of all processing functions. The LCD display works with a touchpad data entry keypad to establish all operating parameters.

G. Doors: Tempered glass, keyed doors with aluminum frame and tamper proof seal provide improved security, stability and ease of cleaning. Scratch-resistant glass for lasting optimum visibility.

H. Shelving: Standard height units include one shelf in a fixed position. Extra tall units include one shelf that is repositionable to fit two configurations.

I. Fan: High velocity sparkless and brushless centrifugal fan.

J. Lighting: Vapor-proof fluorescent light.

K. Hanging Rods: Removable and adjustable stainless steel hanging rod for proper orientation of evidence.

L. Cool Mist Water Nebulizer/Humidifier: Programmable to achieve preset humidity conditions quickly and accurately using a replaceable "wicking" filter to eliminate excess cyanoacrylate from building up on the unit.

M. Hot Plate Accelerator: Hot plate to polymerize ethyl cyanoacrylate. Air Science also offers optional adjustable temperature hot plates to accommodate a variety of fuming techniques, including MicroBurst™ and typical Super Glue® methods. Hot plates are available with basic knob controls as well as advanced microprocessor controls with LED display.

ADDITIONAL FEATURES

Construction: Models are available in either polypropylene and epoxy coated steel or aluminum frame with plastic wall construction. Doors are tempered glass locking doors with tamper-proof seal and aluminum frame. See selection chart for specifications and dimensions. Available in 110V, 60Hz single phase electrical supply (other voltages available on request).

Optional UV Lamp: Activated ultraviolet light creates light emission conditions known to permit disinfection of the interior between cases to prevent cross-contamination, ensuring integrity of the samples for DNA testing.

Internal Chamber Cleansing: The Internal Chamber Cleansing feature automatically activates to eliminate contamination and remove the harmful vapor from the unit. This process is especially important if the unit is used infrequently or only during certain periods of high evidence volume.

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Each Air Science Safefume cyanoacrylate fuming chamber includes features expressed through sound design and certified quality construction. Options and accessories add functional performance to meet specific applications.

PERFORMANCE

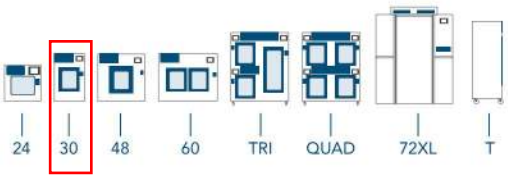
The Air Science Multiplex Filter offers a range of options for high performance protection. The filter configuration permits a customized combination of filter media for a broad range of chemical families and biological agents if required.

DESIGN

Professional quality Safefume cyanoacrylate fuming chambers comply with current technical and safety regulations. The cabinet frame and work surfaces, comprised of industrial components, are durable and chemically resistant.

The Air Science filter assembly is easy to access and easy to change, plus a unique filter clamping design eliminates bypass leakage outside the cabinet.

Through our partner company Filtco Filters, Air Science is a single source supplier of all pre-filters, carbon filters, and HEPA/ULPA filters used in our products.



SELECTION

Safefume cyanoacrylate fuming chambers are available in 5 specific sizes and multiple configurations, totaling 20 standard models.

CONTROL

Air Science Printbuster Pro LCD Interface Technology

Printbuster Pro is the industry's first use of touchscreen technology offering a simple, easy-to-use solution delivering repeatable results every time. The automatic latent fingerprint development cycle manages the following:

- Relative humidity setpoint. Relative humidity is established via a water-filled nebulizer/humidifier.
- Cabinet temperature display.
- Door status with lock alarm.
- Circulation fan On/Off.
- Hot plate On/Off. The hot plate accelerator polymerizes ethyl cyanoacrylate for a specific time interval.
- Processing time.
- Purge cycle time. Fumes are removed from the chamber through the Multiplex Filtration System via a carbon filter; air is safely exhausted to the room.
- Emergency stop.
- Filter condition. An optional electronic gas sensor emits an audible and visual warning when the main filter must be changed.

RELIABILITY

Internal systems are isolated from fumes, extending product life.

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multiplex

FILTRATION

At the heart of the cyanoacrylate fuming chamber is innovative filtration technology. **The Multiplex Filtration System** consists of a pre-filter, main activated carbon or optional HEPA/ULPA filter and safety activated carbon or optional HEPA/ULPA filter. The system permits a customized combination of filter media and configuration for chemical and physical adsorption specific to each application need.

The Air Science **carbon filtration technique** is based on enhanced, activated carbon particle formulations from specially selected, naturally occurring raw material that is superior to wood or other organic sources. The carbon is treated to attain the proper porosity and aggregate surface area and to react with several ranges of aerosolized chemicals moved through the filter by an air handling blower.

View available filters and descriptions on page 8.

secur. safe disposal service

Filter disposal services are available in selected markets providing responsible destruction or recycling of saturated filters in authorized facilities.

FILTER CONFIGURATION

The Multiplex feature permits one or more filtration options to be combined to meet a wider range of multiple-use applications.

The Safefume can be equipped with a single activated carbon main filter or with a stacked configuration which combines two main filters, each activated to adsorb one or more specific vapors or family of vapors. For safety against particulates, an optional HEPA or ULPA can also be added.

The carbon filter is sized to fit the specified product model number and configured to optimize airflow across 100% of the filter surface area. The self-contained assembly maximizes filter efficiency, prolongs filter life, optimizes diffusion and saturation and improves user safety.

P. Electrostatic Pre-Filter: Protects the main filters from aerosols, mists, dust and particulates.

C. Activated Carbon Main Filter: A single, blended or stacked filter configuration.

H. Primary HEPA/ULPA Filter, Optional: Both HEPA and ULPA filters use micro-glass fiber media designed to capture fine particles and biologicals. Both filters can capture particles smaller than the micron size for which they are tested. HEPA and ULPA filter efficiencies are 99.97% at 0.3 microns and 99.999% at 0.12 microns respectively.

MULTIPLEX FILTRATION SYSTEM SUMMARY

Application	Chemical	Powder/ Biological	Chemical & Powder	Chemical within Cleanroom
Primary Filter	C	H	H C	H C
Pre-Filter	P	P	P	P

The system can be configured for the capture of acids, bases and particulates, such as biological aerosols, when paired with HEPA or ULPA filters.

AIRFLOW

The Safefume fuming chamber maintains a constant face velocity, creating uniform conditions within the chamber. Contaminated air is pulled through the Multiplex Filtration System; clean air is returned to the room.

The main filters are easy to replace and install. The filter clamps tightly against the filter gasket to prevent filter bypass and maintain filter integrity.

⚠ **The pre-filter** may be replaced while unit is in operation.

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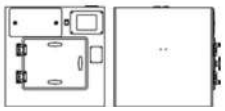
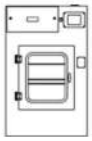
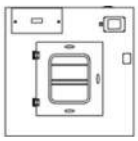
CA24S Side View



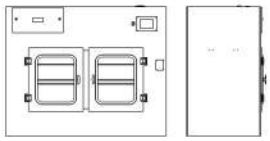
CA30S



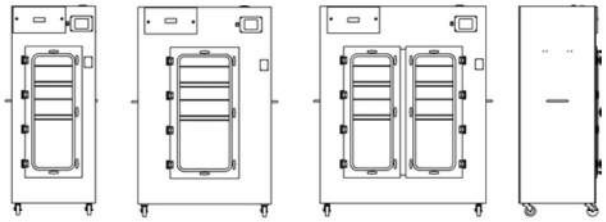
CA48S



CA60S Side View



CA30T CA48T CA60T Side View



MODEL	DIMENSIONS			WEIGHT (LBS/KG)	
	Internal Height	External (W × D × H)	Shipping (W × D × H)	Net	Ship
Benchtop Models					
CA24S	12.8" / 325 mm	24" x 17.4" x 24" / 610 x 441 x 610 mm	40" x 40" x 55" / 1016 x 1016 x 1397 mm	156 / 71	200 / 91
CA30S	36" / 914 mm	30" x 28" x 48.1" / 762 x 711 x 1220 mm	40" x 40" x 55" / 1016 x 1016 x 1397 mm	175 / 79	215 / 98
CA48S	36" / 914 mm	48" x 28" x 48.1" / 1219 x 711 x 1220 mm	58" x 40" x 55" / 1473 x 1016 x 1397 mm	306 / 139	346 / 157
CA60S	36" / 914 mm	60" x 28" x 48.1" / 1524 x 711 x 1220 mm	65" x 40" x 55" / 1651 x 1016 x 1397 mm	369 / 167	407 / 185
Tall Models					
CA30T	57.2" / 1454 mm	30" x 28" x 74.9" / 762 x 711 x 1902 mm	40" x 40" x 91" / 1016 x 1016 x 2311 mm	271 / 123	316 / 143
CA48T	57.2" / 1454 mm	48" x 28" x 74.9" / 1219 x 711 x 1902 mm	58" x 40" x 91" / 1473 x 1016 x 2311 mm	327 / 148	367 / 166
CA60T	57.2" / 1454 mm	60" x 28" x 74.9" / 1524 x 711 x 1902 mm	70" x 40" x 91" / 1778 x 1016 x 2311 mm	382 / 173	447 / 203

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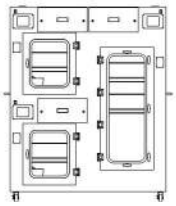
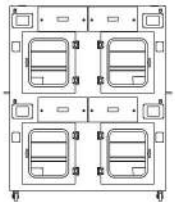
CATRI



CAQUAD



Side View

CA72XL

Side View

MODEL	DIMENSIONS				WEIGHT (LBS/KG)	
	Internal Height		External (W × D × H)	Shipping (W × D × H)	Net	Ship
Standard Triplex Model*						
Three-chamber floor model includes three individual compartments with independent controls and ductless carbon filters.						
CATRI	2 @ 24" / 610 mm	1 @ 57.2" / 1454 mm	60" x 27.75" x 75" / 1524 x 705 x 1905 mm	70" x 40" x 91" / 1778 x 1016 x 2311 mm	402 / 182	467 / 212
Standard Quad Model*						
Four-chamber floor model includes four individual compartments with independent controls and ductless carbon filters.						
CAQUAD	4 @ 24" / 610 mm		60" x 27.75" x 75" / 1524 x 705 x 1905 mm	70" x 40" x 91" / 1778 x 1016 x 2311 mm	418 / 189	476 / 216
Aluminum Frame Walk-in Model						
High-volume, stand-alone fingerprint chamber designed for departments that must process large amounts of evidence on a regular basis. Large items such as automobile doors, tires, bicycles, etc. can be easily processed in this unit. Offers the same functionality as smaller fuming chambers including the Printbuster Pro control system.						
CA72XL	1 @ 80" / 2032 mm		72" x 47.3" x 86" / 1829 x 1200 x 2184 mm	80" x 54" x 95" / 2032 x 1372 x 2413 mm	825 / 374	968 / 439

** Specifications are subject to change without notice.*

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PRODUCT SPECIFICATIONS

Filtration	CA24S CA30S CA48S CA60S	CA30T CA48T CA60T	CATRI	CAQUAD	CA72XL
Airflow	145 cfm	145 cfm	145 cfm	145 cfm	145 cfm

Construction	CA24S CA30S CA48S CA60S	CA30T CA48T CA60T	CATRI	CAQUAD	CA72XL
Finish	<... White polypropylene and epoxy coated steel. ...>				Aluminum frame with tempered glass walls.
Blower	<... Centrifugal blower. ...>				
Controls	<... Main On/Off. ...>				
Monitoring	<... Complete full monitoring of all functions. ...>				
Shelving	Single, fixed position.	Single, two position.	<... Single, per compartment. ...>		Optional.

Efficiency	CA24S CA30S CA48S CA60S	CA30T CA48T CA60T	CATRI	CAQUAD	CA72XL
Lighting	<... (2) 15 watts. ...>				

FILTER SPECIFICATIONS

Safefume Model	CA24S CA30S CA48S CA60S	CA30T CA48T CA60T	CATRI	CAQUAD	CA72XL
Primary Filter(s)*	(1)	(1)	(3)	(4)	(1)
Pre-Filter*	(1)	(1)	(3)	(4)	(1)

** For specific examples refer to Multiplex Filtration System summary on page 5.*

FILTER SUMMARY*

Formula	Description
GP Plus!	The most widely used filter in the range, primarily for solvent, organic and alcohol removal.

**Other formulas may be available.*

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OPTIONS & ACCESSORIES

Safefume Model		CA24S	CA30S	CA48S	CA60S	CA30T CA48T CA60T	CATRI	CAQUAD	CA72XL
Heavy Duty Base Stand	Provides a lower storage half shelf; accommodates wheelchair access. Locking casters fix the chamber in place. 34" tall.	CART-25	CART-30	CART-50	CART-60	--	--	--	--
Advanced Hot Plate	Advanced hot plates heat up to 400°C and offer microprocessor controls and LED display with enhanced safety features. Low profile design has a maximum capacity of 600 mL. All aluminum construction. Available in 110V or 230V configurations.	AHOTPLATE110 or AHOTPLATE230	AHOTPLATE110 or AHOTPLATE230	AHOTPLATE110 or AHOTPLATE230	AHOTPLATE110 or AHOTPLATE230	AHOTPLATE110 or AHOTPLATE230	AHOTPLATE110 or AHOTPLATE230	AHOTPLATE110 or AHOTPLATE230	AHOTPLATE110 or AHOTPLATE230
UV Lamp*	Creates light emission conditions known to permit decontamination of interior surfaces. Includes a timer, door microswitch, fully closing front sash and UV filtering clear polycarbonate panels. The UV operation must comply with local codes and facility safety practices.	UV-CA	UV-CA	UV-CA	UV-CA	UV-CA	UV-CA	UV-CA	UV-CA

**Includes timer and door microswitch. Safety precautions must be followed.*

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WARRANTY

This product is protected by the Air Science Legacy Limited Lifetime Warranty™.

For details visit the Warranty section of our website.

STANDARDS AND COMPLIANCE

Quality Management Systems	ISO 9001:2015
OSHA, Occupational Safety and Health Administration	OSHA Standard -29 CFR, Safety and Health Regulations for General Industry, 1910.1450: Occupational exposure to hazardous chemicals in laboratories. Part B, definition, laboratory type hood. This product may assist you with compliance or as part of your chemical hygiene plan. Please consult your Safety Officer and/or Industrial Hygienist.
Environment	ISO 14001:2015 ENERGY STAR® Partner

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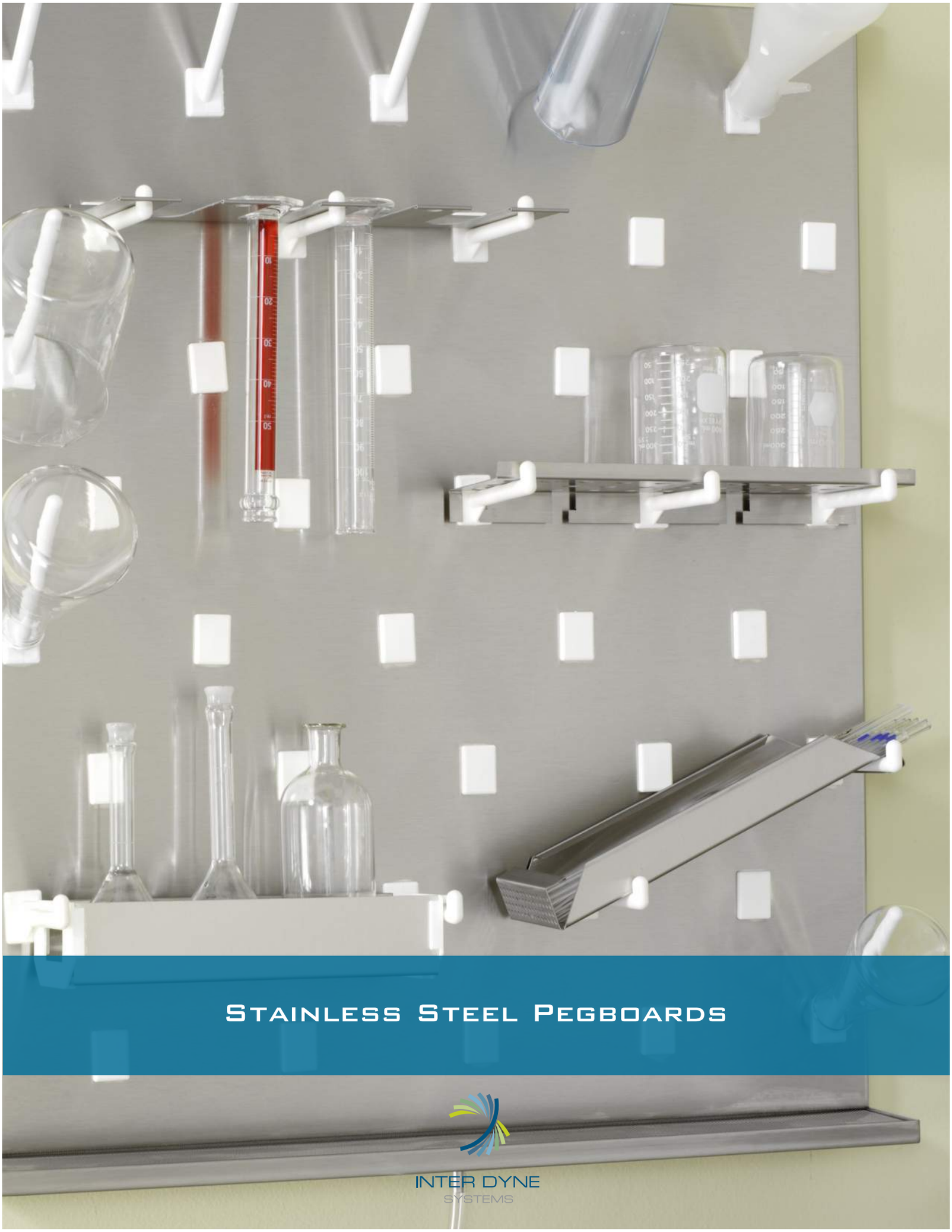


Stainless Steel Pegboards

INTER DYNE
SYSTEMS

Inter Dyne Systems

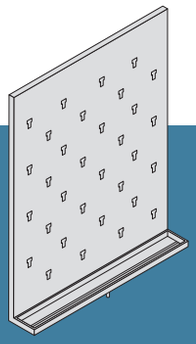
Mod-Rack™ Pegboards

At Inter Dyne Systems we believe that an organized workstation functions better and helps you to operate more efficiently. That's why we've developed a full line of versatile workstation solutions, including our Mod-Rack™ pegboards. Mod-Rack pegboards serve a dual purpose in a modern laboratory. First, they allow you to quickly dry important, and often fragile, equipment in a sanitary manner. Second, our well-crafted pegboards are a safe place to store often used materials so they are readily at-hand when you need them. Mod-Rack pegboards come in a wide variety of sizes and mounting options and our selection of accessories allow you to completely customize your workstation. Custom sizes are available at a not so custom price and are furnished in a timely manner.

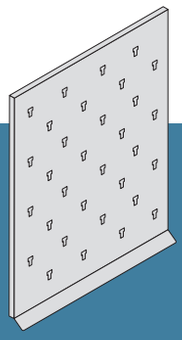
Inter Dyne Systems:
Versatile work station solutions

Inter Dyne Systems began over 25 years ago as an innovator of modular laboratory equipment by fabricating and selling stainless steel pegboards.

Over time we gained a reputation as the leader in the laboratory pegboard market. We've built upon that foundation by continuing to offer high quality pegboards with dependable service, consistent quality and on time delivery. We also offer shelving components, narcotics storage cabinets, countertops and innovative acrylic products.



"V" Victoria Style



"B" Baron Style

Mod-Rack™ Pegboards: Victoria and Baron Style

The Victoria or "V" pegboard is constructed of lightweight stainless steel, offered in a range of sizes and variety of mounting options. Along the bottom is a drip trough that funnels water away to a drain, allowing equipment to dry quickly and remain sanitized. Each "V" style pegboard includes an integral drip trough, wall bracket, standard 6" white pegs and 3 ft. of clear plastic drain hose.

The "B" Baron is also made of lightweight stainless steel. It is offered in three sizes and a variety of mounting options. A drip deflector at the bottom diverts water away from walls and directs it to a sink or drain. Each "B" style pegboard includes a wall bracket and standard 6" white pegs.

"V" Victoria Style Pegboards

Model no.	Size WxH	No. of Pegs	Shipping Wt.
V1824	18" x 24"	15	13 lbs.
V2418	24" x 18"	16	13 lbs.
V2424	24" x 24"	20	16 lbs.
V2430	24" x 30"	32	23 lbs.
V2436	24" x 36"	40	25 lbs.
V3024	30" x 24"	25	23 lbs.
V3030	30" x 30"	50	24 lbs.
V3036	30" x 36"	40	23 lbs.
V3624	36" x 24"	30	25 lbs.
V3630	36" x 30"	60	23 lbs.
V3636	36" x 36"	66	25 lbs.
V4824	48" x 24"	40	24 lbs.
V4830	48" x 30"	48	28 lbs.
V4836	48" x 36"	88	31 lbs.

"B" Baron Style Pegboards

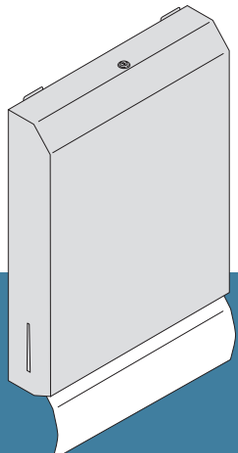
Model no.	Size WxH	No. of Pegs	Shipping Wt.
B2430	24" x 30"	32	14 lbs.
B3030	30" x 30"	50	17 lbs.
B3630	36" x 30"	50	21 lbs.

PEGBOARDS CAN BE WORKSTATIONS

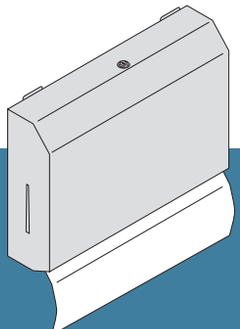
The addition of our accessories such as drain shelves, cylinder yolks and drain baskets can change a simple pegboard into a customized and efficient workstation. We offer a variety of accessories and peg options, so no matter where you are working or what you are working with, you can get what you need right away.

Accessories

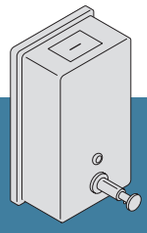
All of our accessories are made of the same high quality stainless steel as our pegboards. They come with a 5 year guarantee, can be sterilized by an autoclave and will easily help transform your Mod-Rack™ pegboard into your own customized workstation.



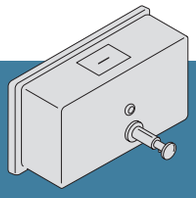
0210 Paper Towel
Holds up to 400 c-fold or 535 multi fold paper towels, 11" x 14.5" x 4".



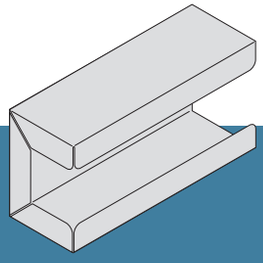
0215 Paper Towel
Holds up to 150 c-fold or multi fold paper towels, 11" x 8" x 4".



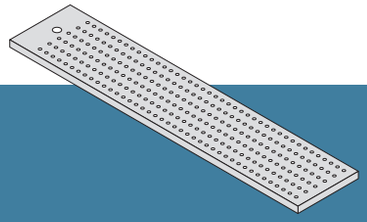
0343 Soap Dispenser
Holds up to 40 fl. oz. of liquid 4.75" x 8.5" x 3" Comes with pegboard & wall mount clips.



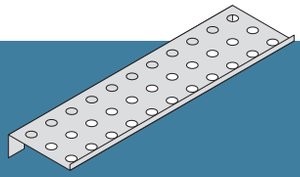
0342 Soap Dispenser
Holds up to 40 fl. oz. of liquid, 8.5" x 4.75" x 3". Comes with pegboard & wall mount clips.



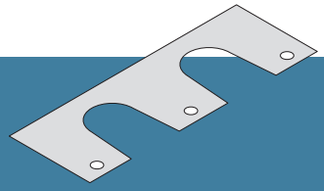
GD-10 Glove Dispenser
Holds most standard glove boxes.



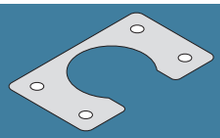
DG-2 & DG-4 Drain Grid
To accommodate smaller tools and equipment. 2" or 4" wide drain grid for drip trough.



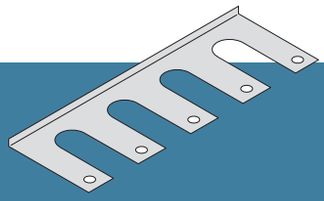
DS-12 Drain Shelf
12" shelf for drying small tools, cylinders and equipment. Shipped with required support pegs for installation.



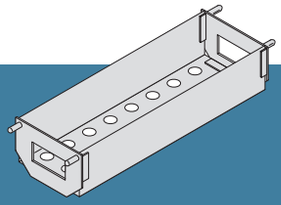
CY-12 Cylinder Yolk
12" yolk holds large cylinders or flasks. Shipped with required support pegs for installation.



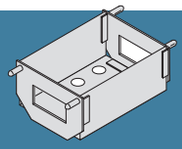
FH-6 Flask Holder
6" holder for drying Erlenmeyer flasks or large cylinders. Shipped with required support pegs for installation.



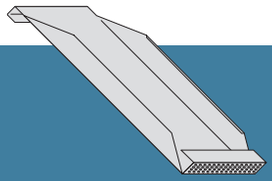
FR-12 Funnel Rack
12" rack holds up to four cylinders. Shipped with required support pegs for installation.



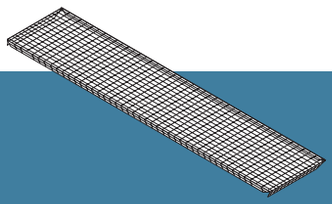
DB-12 Drain Basket
12" basket for drying smaller tools, cylinders and equipment. Shipped with required support pegs for installation.



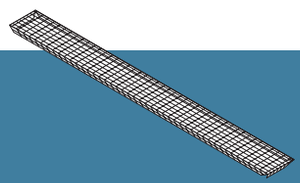
DB-6 Drain Basket
6" basket for drying smaller tools, cylinders and equipment. Shipped with required support pegs for installation.



PR-12 Pipette Rack
12" shelf for drying glass or bulbous pipettes. Shipped with required support pegs for installation.

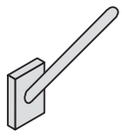


SI-4 Screen Insert
4" wide screen insert for drip troughs.

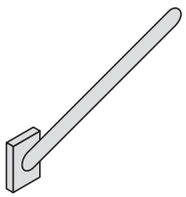


SI-2 Screen Insert
2" wide screen insert for drip troughs.

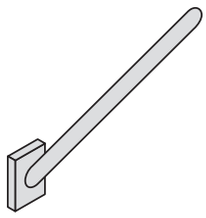
Peg Options



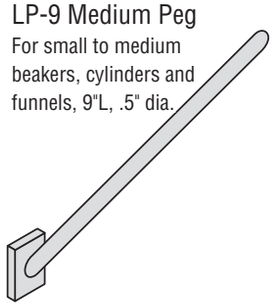
TP-4 Tube Peg
Perfect for smaller beakers, cylinders and funnels, 4"L, .25" dia.



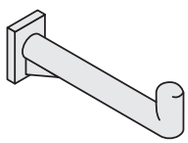
BP-6 Tube Peg
Perfect for smaller beakers, cylinders and funnels, 6"L, .5" dia.



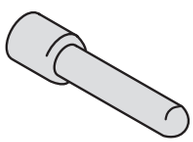
LP-9 Medium Peg
For small to medium beakers, cylinders and funnels, 9"L, .5" dia.



LP-12 Long Peg
Can accommodate medium to large beakers, cylinders and funnels, 12"L, .5" dia.



SP-4 Support Peg
Used for mounting racks, shelves and baskets, 4"L.



PE-3 Peg Extender
Lengthen all pegs an additional 3 inches.

HP-1 Peg Hole Cover
Seals unused peg holes.


0210 Paper Towel Dispenser


0215 Paper Towel Dispenser

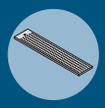

0343 Soap Dispenser


0342 Soap Dispenser


GD-10 Glove Dispenser


DB-12 Drain Basket


DB-6 Drain Basket


DG-2 or DG-4
Drain Grid


DS-12 Drain Shelf


FH-6 Flask Holder


FR-12 Funnel Rack


CY-12 Cylinder Holder


PR-12 Pipette Rack


SI-4 Screen Insert


SI-2 Screen Insert

Accessory packages

To easily help customize your Mod-Rack™ pegboard, we've created functional package options that include some of our most popular accessories.

Model No.	Size WxH	Number Pegs	Complete With
V1824/PKG	18"x24"	15	
V2418/PKG	24"x18"	16	
V2424/PKG	24"x24"	20	
V2430/PKG	24"x30"	32	
V2436/PKG	24"x36"	40	
V3024/PKG	30"x24"	25	
V3030/PKG	30"x30"	50	
V3036/PKG	30"x36"	40	
V3624/PKG	36"x24"	30	
V3630/PKG	36"x30"	60	
V3636/PKG	36"x36"	66	
V4824/PKG	48"x24"	40	
V4830/PKG	48"x30"	48	Multiple Sized Pegs
V4836/PKG	48"x36"	88	Multiple Sized Pegs

Pegboards are only the beginning

At Inter Dyne, pegboards and accessories are only the beginning of the quality laboratory equipment we offer. We also offer a wide variety of stainless steel shelving components, narcotics storage cabinets and countertops; as well as acrylic and epoxy pegboards.

Our stainless steel countertops can be ordered to size with or without back/side splashes and integral sinks.

We have narcotics cabinets and specimen pass-through boxes in a variety of size, locking and mounting options.

Convenient and safe storage is a necessity in any lab. Our shelves and shelving components put everything you need right at your finger tips.

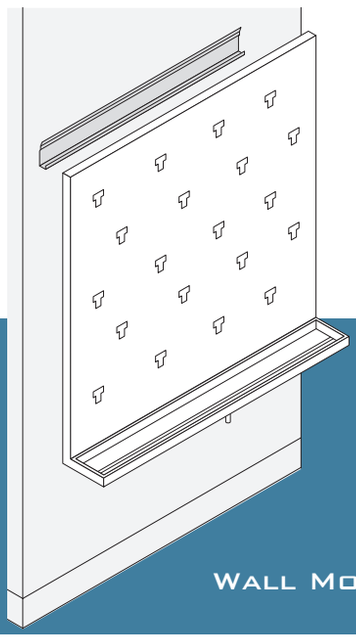
Pegboard mounting options

Wall Mount

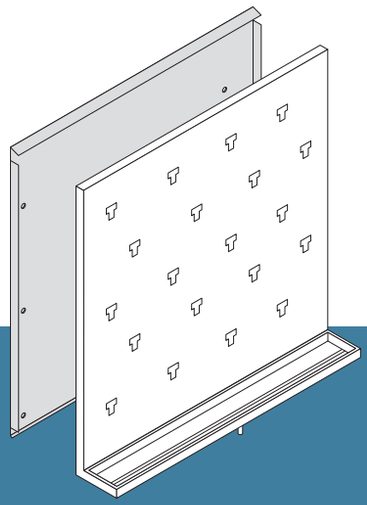
All Mod-Rack Pegboards are shipped complete with our standard wall bracket that is clearly labeled for easy installation. All 4" trough pegboards also come with a stabilizer bracket that attaches to the wall at the bottom of the pegboard and slips over the drain spout; keeping the pegboard secure against the wall.

Finished Back

In today's ever evolving lab environments wall space is not always available. Islands have become a mainstream design character in labs and can make installing pegboards slightly more challenging. However, by adding a finished back panel to your pegboard it will easily install to any utility chase, or reagent shelf system.



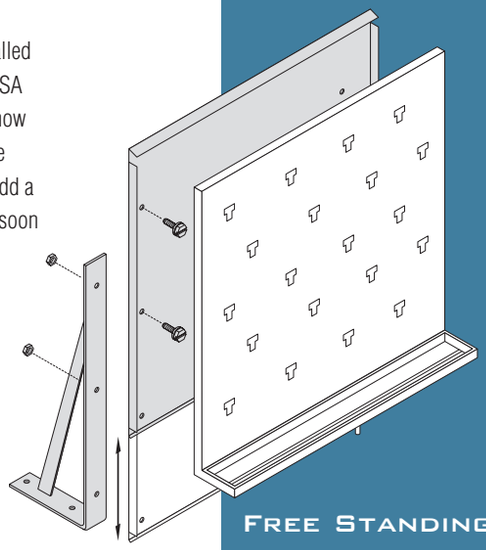
Wall Mount



Finished Back

Free Standing Assembly Brackets

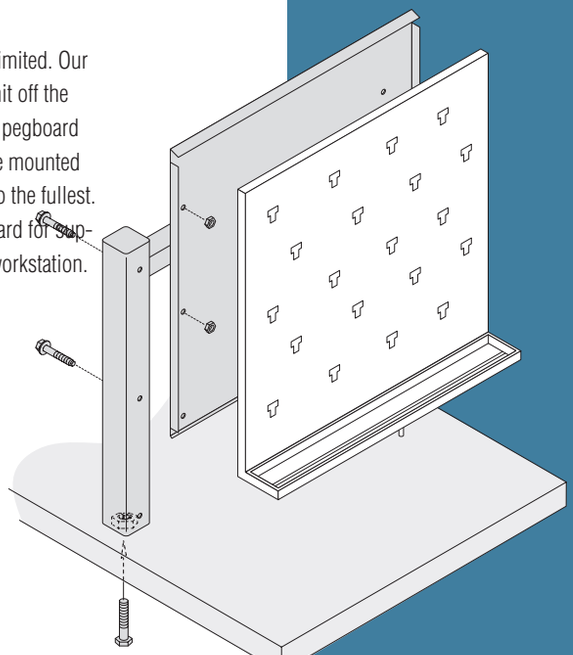
If space becomes limited any Mod-Rack can be installed to a laboratory work surface. By simply adding our FSA brackets that are 23" tall x 7.5" at the base, the unit now becomes free standing. They are supplied with all the necessary hardware for attaching to a counter. Just add a finished back panel to the pegboard for support and soon your countertop becomes a workstation.



Free Standing Assembly

Raised Top Assembly

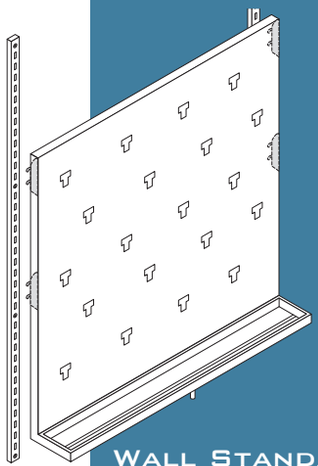
If wall, utility chase or countertop space is limited. Our raised top assembly allows you to lift the unit off the work surface as far as 12". Space below the pegboard is free and, if desired, two pegboards can be mounted back to back – maximizing your lab space to the fullest. Just add a finished back panel to the pegboard for support and soon your countertop becomes a workstation.



Raised Top Assembly

Wall Standard Mount

Mod-Racks can be mounted so they are fully adjustable, allowing you to raise or lower the unit to your desired height. The addition of an integral clip system to the back of the pegboard makes adjustment simple and any workstation that much more versatile. Just lift and clip it to the wall and now your pegboard is positioned at the height best for you. When ordering please add the suffix "AHB" to the pegboard product number and remember to order standards also.



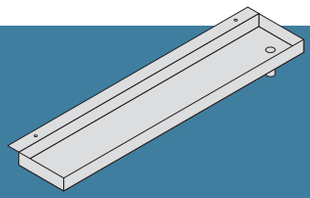
Wall Standard Mount

Acrylic Pegboards

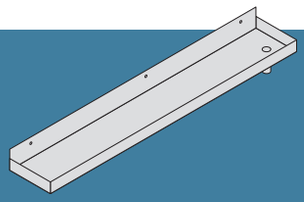
Light has become a highly desired commodity in today's ever changing lab environment. At Inter Dyne Systems we have the ability and skill to fabricate acrylic pegboards and other acrylic products. Our acrylic pegboards are made out of either 3/4" or 1" thick clear acrylic. Pegboards can be supplied with a frosted back to screen or tone down light, if desired. Pegs are available in white or black and in three different lengths. Bevels can be added at the bottom to pitch water away from wall or stainless steel troughs can be easily added. All edges are eased and flame polished for a clean, safe and aesthetically pleasing product. Standard sizes are available, as well as custom shapes and sizes.

Epoxy Pegboards

At Inter Dyne Systems we understand how time can be of the essence for many lab dealers or end users. With this issue in mind we stock various standard sized epoxy pegboards that can be shipped quickly for immediate resolve. A stainless steel drip trough can be easily mounted to the bottom edge. Epoxy pegboards are black 1" thick and available with white or black pegs in a variety of lengths.



Pegboard Mount



Face Mount

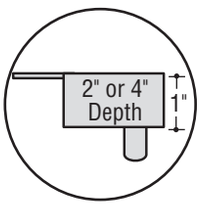
Stainless steel drip troughs can be mounted to the bottom of any acrylic or epoxy pegboard. All troughs come with three feet of clear PVC tubing and pre-drilled holes for easy installation. You can select a stainless steel screen insert or drain grid to create an additional shelf-like surface for drying. All sizes are stocked and ready for immediate shipping.

Stainless steel face-mount drip troughs are designed for use with any pegboard. Troughs come complete with three feet of clear PVC tubing and pre-drilled holes for easy instillation. Face-mount drip troughs can be ordered with a screen insert or drain grid to add additional drying or storage space. They are manufactured from high-quality stainless steel and are stocked for immediate shipment

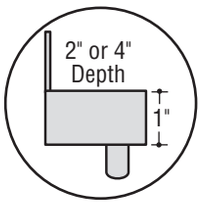
Pegboard Mount

Face Mount

Pegboard Mount	Face Mount	Screen Insert	Drain Grid
HDT-18-2	FDT-18-2	SI-18-2	DG-18-2
HDT-18-4	FDT-18-4	SI-18-4	DG-18-4
HDT-20-2	FDT-20-2	SI-20-2	DG-20-2
HDT-20-4	FDT-20-4	SI-20-4	DG-20-4
HDT-24-2	FDT-24-2	SI-24-2	DG-24-2
HDT-24-4	FDT-24-4	SI-24-4	DG-24-4
HDT-30-2	FDT-30-2	SI-30-2	DG-30-2
HDT-30-4	FDT-30-4	SI-30-4	DG-30-4
HDT-32-2	FDT-32-2	SI-32-2	DG-32-2
HDT-32-4	FDT-32-4	SI-32-4	DG-32-4
HDT-36-2	FDT-36-2	SI-36-2	DG-36-2
HDT-36-4	FDT-36-4	SI-36-4	DG-36-4
HDT-42-2	FDT-42-2	SI-42-2	DG-42-2
HDT-42-4	FDT-42-4	SI-42-4	DG-42-4
HDT-48-2	FDT-48-2	SI-48-2	DG-48-2
HDT-48-4	FDT-48-4	SI-48-4	DG-48-4



End View



End View

Stainless Steel Screen Inserts & Drain Grids

Screen Insert

Drain Grid

The stainless steel screen inserts & drain grids are ideal for keeping items off the bottom of the trough. Also they can be utilized as a drying shelf. These items can be used with any Inter Dyne Systems drip trough or Victoria Style pegboard. 4" wide screen insert and drain grid shown at left.

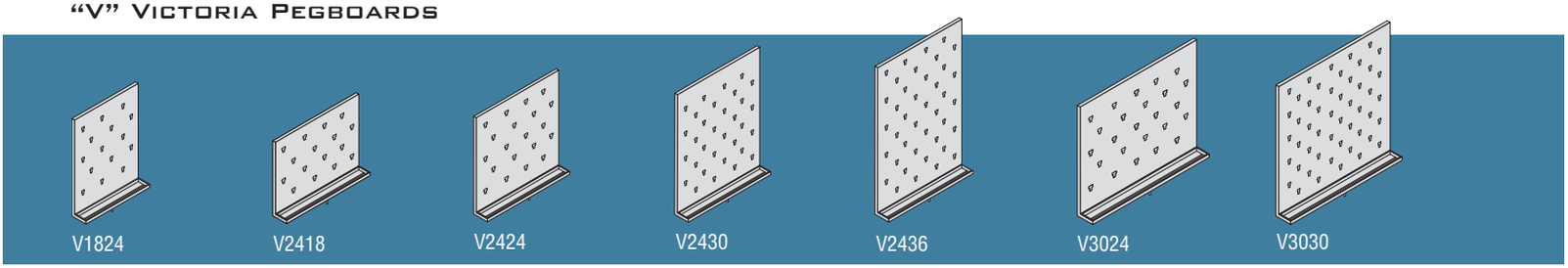
Pegboards & Accessories

Inter Dyne Systems is the solution for outfitting your laboratory. Our pegboards, shelves, countertops, narcotic cabinets and specimen pass-through boxes are made of high-quality stainless steel to ensure a sterile and versatile workstation.

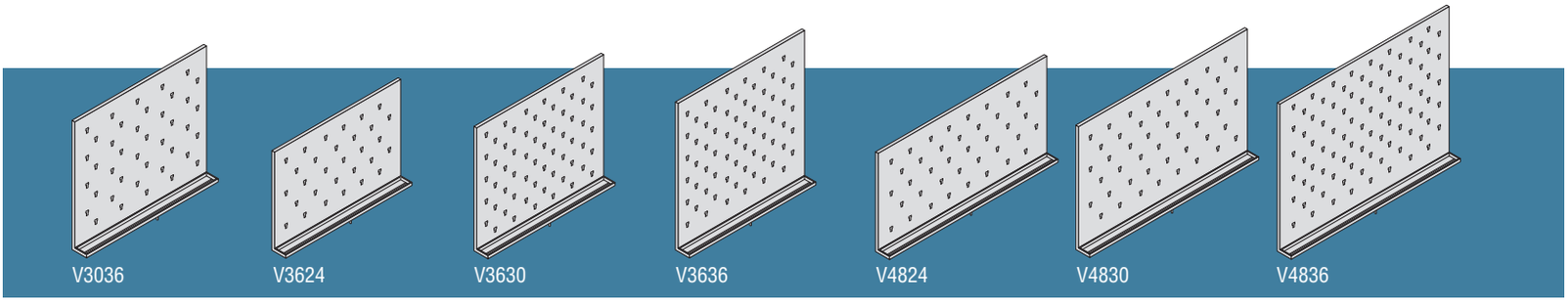
Our Mod-Rack™ pegboards come in a variety of sizes and mounting options and can be easily modified with our wide-selection of accessory options to meet the specific needs of your facility.

Contact a member of our friendly sales staff today to begin building your customized workstation.

"V" Victoria Pegboards

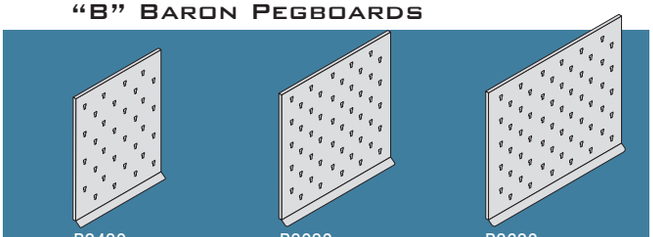


V1824 V2418 V2424 V2430 V2436 V3024 V3030



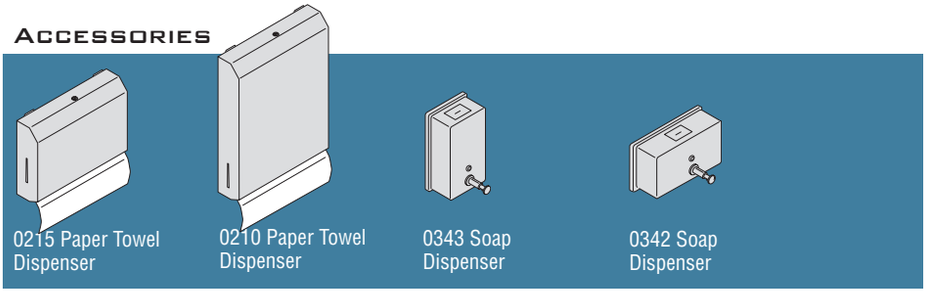
V3036 V3624 V3630 V3636 V4824 V4830 V4836

"B" Baron Pegboards

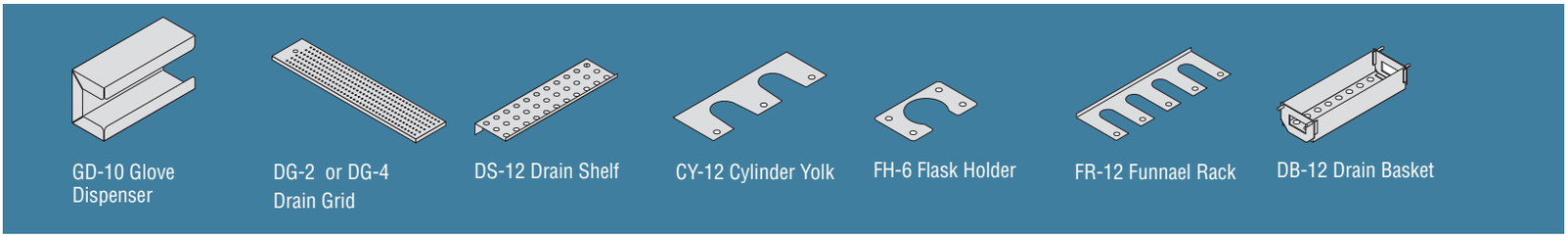


B2430 B3030 B3630

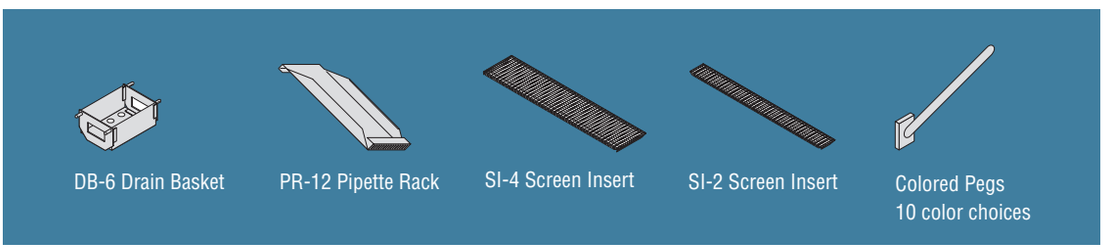
Accessories



0215 Paper Towel Dispenser
0210 Paper Towel Dispenser
0343 Soap Dispenser
0342 Soap Dispenser



GD-10 Glove Dispenser
DG-2 or DG-4 Drain Grid
DS-12 Drain Shelf
CY-12 Cylinder Yolk
FH-6 Flask Holder
FR-12 Funnael Rack
DB-12 Drain Basket



DB-6 Drain Basket
PR-12 Pipette Rack
SI-4 Screen Insert
SI-2 Screen Insert
Colored Pegs
10 color choices

These products are covered by one or more of the following patents:
4,485,929: 3,912,212: 3,770,392: 5,163,567: 5,884,784

INTER DYNE SYSTEMS

Inter Dyne Systems, Inc.
676 E. Ellis Road
Norton Shores, MI 49441

P: 877.477.5227 F: 231.799.9690
E: jack@interdynesystems.com
W: www.interdynesystems.com

Technical Information TI17-693ENG-REV2

PHTSS1000A SirchSTAND Forensic Photography Stand

Background and Purpose

Traditionally, a copy stand is used with a camera for the reproduction of images or documents. The set-up guarantees a 90 degree angle to the table surface, eliminating potential distortion caused by angled photography. It also allows the photographer to work hands free, staging the document or object with proper lighting. In forensics, copy stands are regularly used to photograph evidence, including latent fingerprints, processed documents, and cyanoacrylate fumed objects.

The PHTSS1000A SirchSTAND™ Forensic Photography Stand was created with forensic photography as the focus. The unit incorporates a series of ALS flashlights (white), UV (365nm), and blue (455nm) that can be utilized for a wide variety of evidence. It has an easy-to-use adjustable column, and a camera mount that can support from a simple digital point and shoot to a complex DSLR or SLR film camera, with a maximum weight of 3.0 lbs. (1.36 Kg.) for the camera, lens and battery. In addition, the metal base permits the use of FXMAG4 magnets to hold evidence in place. Its etched square cm grid eliminates the need for a scale in many cases. It is so simple to use, and extremely versatile, all in an easy-to-transport design.

Safety Info

Ultraviolet light can be damaging to the eyes. Do not look directly into, or point the UV light directly at a person's eyes. To prevent unnecessary damage, wear UV eye protection when operating the UV lights.

100 HUNTER PLACE, YOUNGSVILLE, NC 27596 USA
Ph: (919) 554-2244, (800) 356-7311 • Fax: (919) 554-2266, (800) 899-8181
• Web: www.sirchie.com • Email: sirchieinfo@sirchie.com

ASSEMBLY

Refer to *"Attaching the Column to the Base"* photos on final page

1. Place table on a flat surface.
2. Remove column securing knob from column support base.
3. Place column over pins in column support base and seat the column into the support base.
4. Tighten column securing knob.

OPERATION

Flashlights

1. Check that one 18650 battery is installed correctly, in each flashlight to be used with the stand.
2. Operate flashlight by pressing the black rubber on/off button on the rear end cap.
3. A flashlight can be snapped into any of the clip heads on the 4 table arms and the 2 arms on the camera mount.

Copy Stand

1. Attach a camera to the standard tripod mounting 1/4-20 screw. Make sure that the camera lens is centered with the column. There is room to adjust the camera position side to side in the camera mount bracket.

2. To raise or lower the camera, rotate the crank handle to move the camera mount vertically along the column.

Utilizing the Lights

The PHTSS1000A SirchSTAND™ provides three different light sources for different types of evidence.

LIGHT SOURCE	USAGE
UV 365nm	Physiological fluids, fluorescent powders, fluorescent staining agents (i.e. ardrox, basic yellow)
White	Standard photography, oblique lighting for indented writing or casting detail
Blue 455nm	Used with an orange filter (<530nm) to eliminate backgrounds for physiological fluids, fluorescent powder, fluorescent staining agents, DFO processed documents

The lights can be mounted in any of the six positions provided. The four table mounted flex arms are useful for general illumination as well as oblique lighting. The two camera mount plate flex arms can be utilized when the object to be photographed is taller than table mounted lights, allowing proper illumination with the camera raised higher.

Note: For large objects, the flexible arms can be removed from the table to allow the object to extend beyond the table edges. Simply unscrew the flex arms from the base plate to remove them.

Product Information

Base	Column	Flashlights	Flex Arms
Height 1.5 in. (3.8 cm)	32 in. (81.3 cm) tall	2 – White LED	4 – 16 in. (40.6 cm) flex w/C-clips, table mount
Width 16 in. (40.6 cm)	Crank height adjustment	2 – 365nm UV LED	2 – 12 in. (30.5 cm) flex w/C-clips, camera mount
Depth 20 in. (50.8 cm)	Ruled: inch and cm	2 – 455nm Blue LED	Screw mount (1/4-20 thread)
Black powder coated steel	Black powder coated AL	Black anodized AL	Black vinyl coated, flexible steel
1 cm grid			

Weight 20 lb. (9.1 kg) **Maximum Weight of Camera + Lens + Battery** 3.0 lbs (1.36 Kg.)

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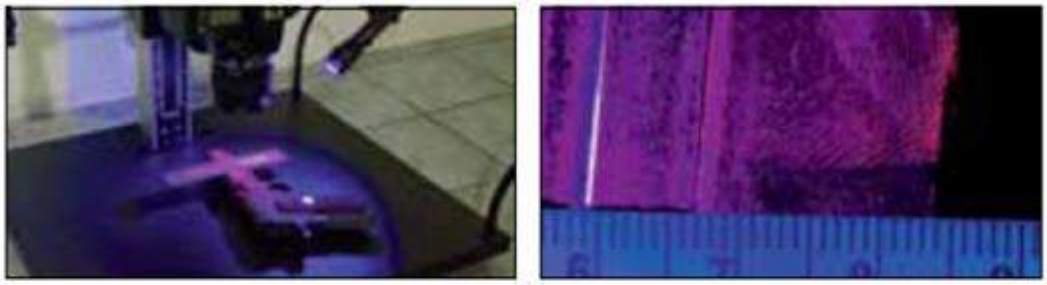
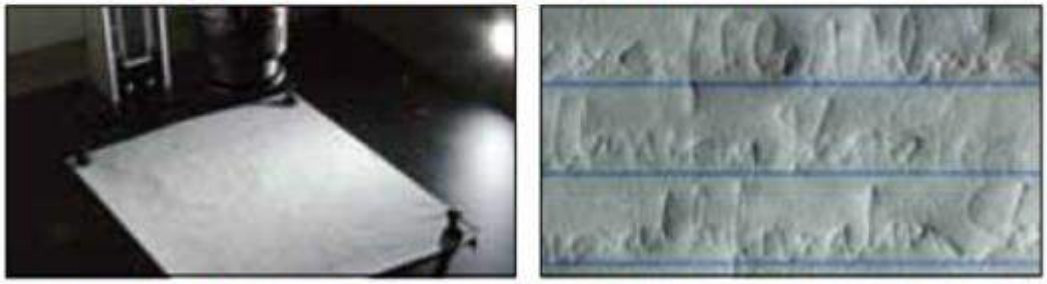
Cleaning and Maintenance

Simply wipe down surfaces with a clean damp cloth. No other maintenance is necessary.

Usage Photos



The UV light (365nm) in use with a DSLR with macro lens can be used for close-up photos of fingerprints developed with fluorescent powder (camera not included).



Oblique white light used with a DSLR with macro lens for close-up photos of indented writing (camera not included).

REFERENCES:

Halla, Susan and Ryan M. Rezelle. "Sharpening the Focus: Forensic Photography and Its Impact on Facility Design", Forensic Magazine, Dec. 2010/Jan. 2011 http://www.forensicmag.com/article/sharpening-focus-forensic-photography-and-its-impact-facility-design?page=0,0, 15 Sept. 2011

International Association of Identification SWIGIT, "General Guidelines for Capturing Latent Impressions Using a Digital Camera", Version 1.3 2010.06.11. http://www.theiai.org/guidelines/swgit/guidelines/section_8_v1-3.pdf, 15 Sept. 2011

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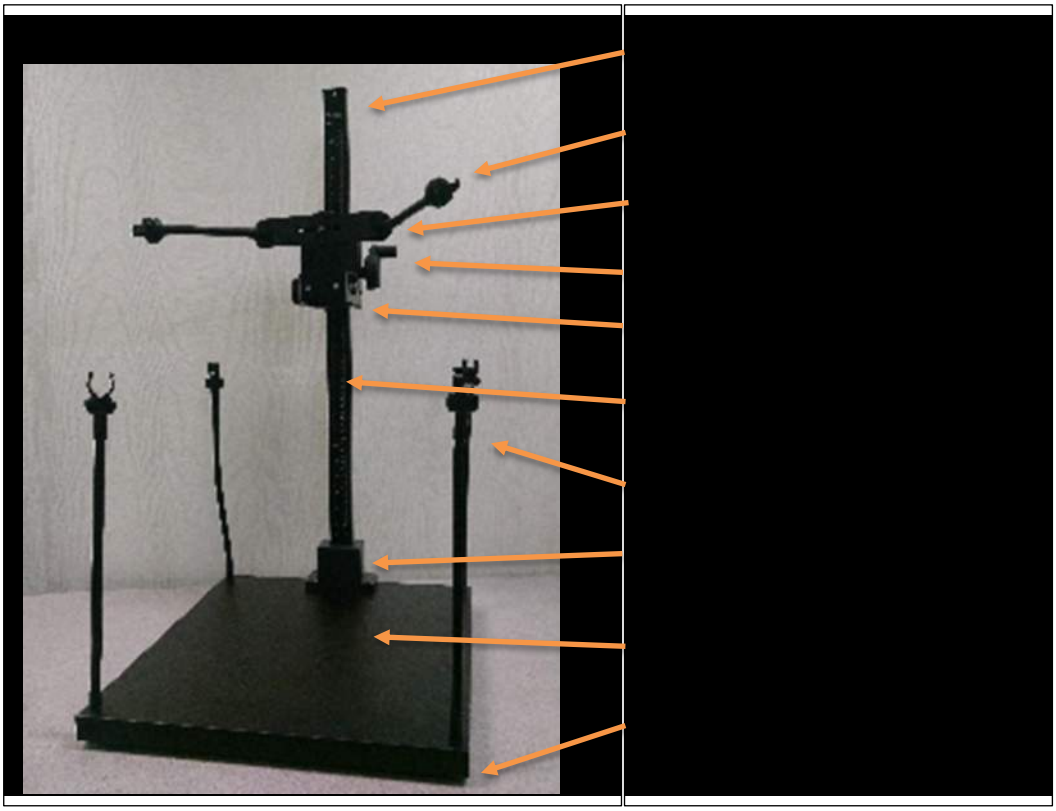
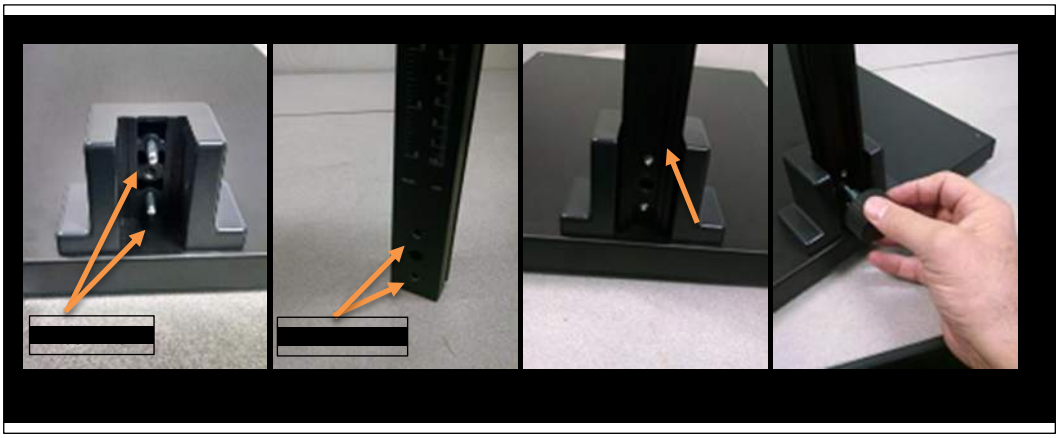
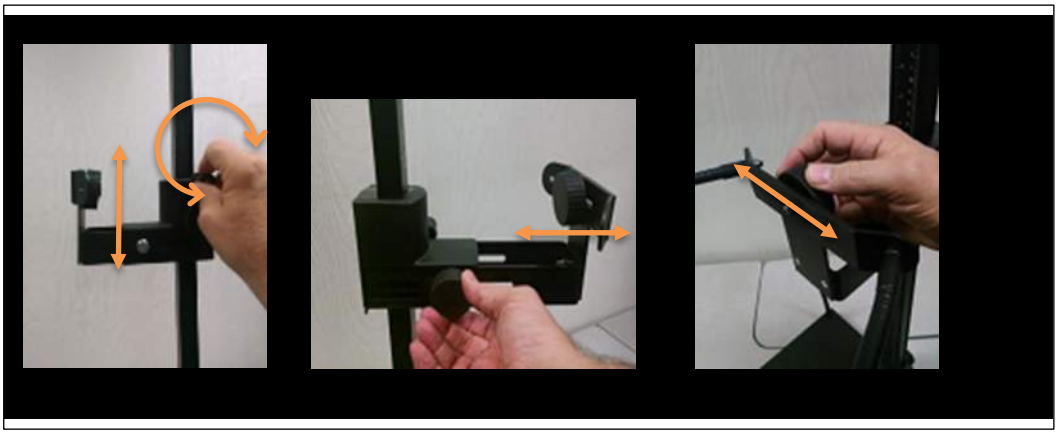
Product Photos







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(ST-1) and (ST-2) Lab stools

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ERGONOMIC LAB AND CLEANROOM SEATING

PRODUCT PORTFOLIO

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LABORATORY BASIC

PERFORMS TO YOUR NEEDS

	(ST-2)	(ST-1)
NON-ESD:	Model 9134 List $ 1487	Model 9137 List $ 1612
ESD:	Model 9155E List $ 1755	Model 9156E List $ 1905

- Excellent seating comfort
- Laboratory-specific ergonomics
- Easy to clean
- Upholstery options: Artificial Leather and Duotec fabric
- Height Adjustment of 9134/9155E: 19" to 24"
- Height Adjustment of 9137/9156E: 24" to 34"
- Pricing shown is for standard black base

Upcharge options:

Polished base	List $ 75
Multifunctional armrest	List $ 189
Footring	List $ 149

Upholstery finish and colour options

Finish	Black	Blue	Grey	Red
Skai synthetic leather (ST-1) Order no.	2571	6902	6911	6903
Duotec fabric (ST-2) Order no.	6801	6802	6811	6803

LABORATORY NEXXIT

YOUR STRONG PARTNER

NON-ESD:	Model 9033 List $ 849	Model 9031 List $ 998
ESD:	Model 9033E List $ 1119	Model 9031E List $ 1268

BLUE
GREY
ORANGE
GREEN
BLACK (ESD ONLY)

- Superior comfort, unique design, cost effective
- Extremely light, mobile, functional, compact
- Laboratory-specific ergonomics
- Automatic weight regulation
- Easy to clean
- Upholstery options: Artificial Leather or PU
- Choice of 4 accent colors (only Non-ESD)
- Durable, safe and conform to standards
- Height adjustment of 9033: 18" to 24"
- Height adjustment of 9031: 22" to 32"
- Pricing shown is for standard black base

Upcharge options:

Polished base	List $ 75
Multifunctional armrest	List $ 189
Footring for model 9033	List $ 149

Upholstery cover materials

Cover material	Magic synthetic leather	Integral foam (PU)
Order No.	MG01	2000

Issue Date: 2020.02

(UCL) Undercounter Evidence locker

X

Global Industrial™ Wire Mesh Security Cage Locker, 36"Wx24"Dx36"H, Gray, Unassembled

Item #: T9C184083

Price: $259.95

Save $13.00 with 5% off when you use your Global Industrial Credit Card.
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Ventilated Wide Span Bulk Storage Lockers are made with a 3" x 3" x 1/4" thick wire mesh with gray epoxy finish to minimize dust accumulation and maximize visibility for simple inventory control. Lockers include one height-adjustable shelf with 100 lb. capacity evenly distributed. Shelf adjusts in 3" increments. Improved latch design to accept padlock. For enhanced security, install shelf at center position to allow use of included padlock. Double doors are welded to side panels and are flush against unit top. Door hinges swing open 270° for full access to interior. Easy assembly. Choose from a variety of sizes. Additional shelves sold separately.

Weights & Dimensions

Depth	24 in
Width	36 in
Weight Capacity	200 lbs
Height	36 in
Weight	103.36 lbs

Product Details

Construction Type	Unassembled
Brand	Global Industrial
Locker Type	Bulk Storage Lockers
Warranty	1 yr
Material	Steel
Style	Wire Mesh Cage
Shelf Capacity	100 (Evenly Distributed) lbs
Standard or Speciality Lockers	Specialty Lockers
Color Family	Gray

Magic Chef

Undercounter Refrigerator

SPECIFICATIONS
Model # HMR330WE / HMR330BE / HMR330SE

Product Description	Magic Chef Refrigerator		
Model No.	HMR330WE / HMR330BE / HMR330SE		
Capacity	3.3 Cu. Ft.		
Unit Dimensions (inches)	Width	Height	Depth
	19.1”	32.9”	17.7”
Net Weight (lbs)	48.5 (lbs)		

Specifications are subject to change without notice

DISHWASHER

Undercounter SteamScrubber Glassware Washer

Catalog #: 401001000

Qty: 1

Request Quote

Attributes

Product Subcategory: SteamScrubber

Style: Undercounter

Electric Heating Phases: 115V, 60 Hz, Single Phase

ADA-Compliance: ADA Height

Conformance: CAN/CSA C22.2, ETL, UL

Viewing Window: No

Specifications

Estimated Shipping Weight: 202.0 lbs

Estimated Shipping Weight metric: 91.6 kg

Dimensions: 24.1" w x 27.7" d x 32.1-36.0" h

Dimensions metric: 61.2 w x 70.4 d x 81.5-91.4 h cm

Electrical: 115V, 60 Hz, 16 A, 1P. Requires dedicated 20A circuit.

Get the Product Datasheet

SteamScrubber Glassware Washers are designed to wash and dry a wide variety of wide-mouth and general purpose labware. Utilizing a brilliant 5” touch screen display featuring CleanWorks OS, users have full control of wash parameters and washer settings. Able to reach a maximum wash temperature of 93° C (199° F), stubborn contaminates are easily removed. Heated air is forced into the chamber, effectively drying glassware to completion.

SteamScrubber Glassware Washers come standard with stainless steel Upper and Lower Standard Racks that accommodate basket inserts for a wide variety of wide-mouth laboratory glassware and assorted labware. Specialized inserts for test tubes, culture tubes, small utensils, BOD bottles, and petri dishes make the SteamScrubber exceptionally versatile. It can accommodate Upper and Lower Spindle Racks (for forced air drying through spindles see FlaskScrubber washers).

Use our Glassware Washer Selection Tools for the right options and components

SEE OUR GREEN INITIATIVES

View Additional Features & Specifications

Our Product Representatives Are Here To Help

DISTILLED WATER SYSTEM - ALTERNATE NO. 1

Browse Categories

- Countertop Water Distillers
- Durastill Automatic Water Distillers
- Durastill Manual Water Distillers
- Durastill 240 Volt Water Distillers
- Pure Water® brand Water Distillers
- Survival Water Distillers
- Supplies, Parts and Accessories for Water Distillers
- Smart Purifier™ RO System
- Bath and Shower Filters
- Extended Warranties
- Water Testing Lab
- 800 to 6,000 Gallon-per-Day Distillation Systems

1 2 3 4

Mini-Classic CT Water Distiller

The most Compact Countertop Water Distiller Made in USA. The Mini Classic CT Countertop Distiller is a manually filled distiller designed with a glass storage container for the distilled water. It produces 8/10ths gallon per cycle every 3.5 hours and shuts off automatically.

SKU: PW46998 Weight: 25.00

Regular Price: $800.00

On Sale For: $750.00

Quantity: 1 Add to Cart

Tweet

Product Description:

The Pure Water Brand Mini-Classic CT™ is a compact, countertop water distiller that produces high-purity, great-tasting distilled water. A removable boiling chamber allowing for easy filling and cleaning. With a capacity of approximately 3 liters per three and one-half hour cycle, this manually filled mini distiller is perfect for a single user, renters or a small family. It's also perfect for use in a camper or RV, or taken to a second home for distilled water enjoyment away from home.

No installation required. Requires no water line hookup!

Help & Information

Questions? Call us!
1-800-990-3560

Customer Service hours 8:00 AM to 7:00 PM Central Time Monday through Friday. **24/7 Hotline Callback Service** also available.

Or Contact Us Online and we'll reply by the next business day.

Experiencing Issues with your water distiller? Check out our Trouble Shooting Guides for assistance.

H2o Labs Corp. Office
5940 S. Rainbow Blvd.,
Las Vegas, NV 89118
(Warehouse and fulfillment located in Kansas City Missouri; Customer Service, repair center and return shipment locations are different. Please contact us for proper address.)
Fax: 1-800-990-3560 (Main line accepts faxes)

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QUALITY CONSTRUCTION - The Pure Water Mini-Classic CT™ is constructed with top-quality, stainless steel to provide years of dependable service with minimum maintenance. It is air cooled and equipped with a unique timer to stop automatically at the end of each distilling cycle. The unit has continuous self-sterilization when in operation and is equipped with a removable boiling tank for easy filling and cleaning. A safety shut-off switch turns the unit off should it ever overheat. This small water distiller stores neatly on a countertop for your convenience. While in operation, the top of the unit should be clear of any obstruction to allow for proper air circulation.

Each Pure Water distiller is designed with purity vents to allow the organic and inorganic compounds to escape. Additionally, an activated carbon post filter is included to aid in the removal of any gaseous carryover and to improve taste. The filter pillow is housed in a stainless steel filter tray, so your distilled water never comes into contact with plastic!

STORAGE - Included with each Mini-Classic CT™ is a one-gallon, glass container. This handy dispenser comes with a handle and pour-through lid, and is used to collect the distilled water. It's a perfect fit in your refrigerator. Additional jars available.

FEATURES -
· The Mini Classic produces 8/10ths of gallon every 3.5 hours.
· It is built with 304 gauge stainless steel.
· Made in the Lincoln NE USA.
· It has a detachable boiling tank which means that you do not have to carry the whole unit to fill it up.
· No plastic components get in contact with the treated water. Ideal for customers who are allergic to plastic.
· Minimum yearly maintenance. Less than $4 a month.
· 2 Years Full warranty on electrical and 15 years on stainless steel.
· Comes with 1 filter and collection jar.

SPECIFICATIONS -
item #.....46998
width.....13.75" (35 cm)
depth.....9.875" (25 cm)
height.....15.75" (40 cm)
shipping weight.....32 lbs. (14.5 kg)
machine weight.....24 lbs. (11 kg)

current draw (120V 60 Hz).....6.9 amps
current draw (240V 50 Hz).....3.5 amps
total wattage.....800 watts
All figures are approximations and subject to change without notice.

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- Distilled Water Facts
- Doctor Recommended!
- H2oLabs Pure Water News

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- Warranty & Returns
- Privacy Policy
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4.5 Google Customer Reviews

SECTION 12 56 53.13
PAINTED METAL LABORATORY CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Painted metal laboratory casework.

2. Provide and install painted metal casework in locations listed and as indicated on laboratory equipment drawings.

B. Related Sections include the following:

1. Division 9 Section "Gypsum Board Assemblies" for sheet metal fastening ground in gypsum board partitions for anchoring laboratory casework.
2. Division 9 Section "Resilient Wall Base and Accessories" for resilient base applied to metal laboratory casework.
3. Division 11 Section 11 53 13 "Laboratory Fume Hoods" for fume hoods.
4. Division 11 Section 11 53 33, "Laboratory Service Fixtures and Safety Equipment".
5. Division 11, Section 11 53 43.10, "Laboratory Accessories", for benchtops, sinks, service chases, drying racks, adjustable shelving, cylinder restraints, etc.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Provide certification that casework, components and hardware has been tested in accordance to and meet the structural performance requirements as described in SEFA 8.

B. Structural Performance: Provide metal laboratory casework capable of withstanding the following minimum loads without permanent deformation, excessive deflection, or binding of drawers and doors:

1. Shelves of Base, Wall, and Storage Cabinets: 100 lbs (45 kg).
2. Drawers: 150 lb (68 kg).
3. Wall Cabinets: 150 lb/ft (224 kg/m) along the width of the cabinet.
4. Floor-Supported Base Cabinets: 250 lb/ft (373 kg/m) along the width of the cabinet.

C. Seismic Performance: Provide metal laboratory casework system capable of withstanding the effects of earthquake motions determined according to the building code in effect for

this Project or ASCE 7, "Minimum Design Loads for Buildings and Other Structures," Section 9, "Earthquake Loads," whichever is more stringent.

1.4 SUBMITTALS

A. Product Data: For each type of product specified.

B. Shop Drawings: For metal laboratory casework. Include plans, elevations, sections, details, and attachments to other work.

1. Indicate locations of blocking and other supports required for installing casework.
2. Indicate locations and types of service fittings, together with associated service supply connection required.
3. Include details of utility spaces including service chases showing supports for conduits and piping.
4. Show adjacent walls, doors, windows, other building components, and other laboratory equipment. Indicate clearances from above items.
5. Include coordinated dimensions for laboratory equipment, fume hoods and laboratory accessories specified in other Sections.

C. Samples for Verification: 6-inch- (150-mm-) square samples for each type of finish, including top material.

D. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience.

E. Product Test Reports: Based on tests performed by a qualified independent testing agency, indicate compliance with SEFA 3 and 8 for laboratory casework finishes and countertops with requirements specified for chemical and physical resistance.

F. Coordinate shop drawings with other work involved.

1.5 QUALITY ASSURANCE

A. Manufacturer shall identify and designate a full time factory representative for on-site supervision and coordination during the installation of laboratory casework and all components.

B. Single Source Responsibility: Provide laboratory casework with tops, sinks, accessories, fume hoods and service fixtures, manufactured or furnished by same laboratory furniture company for single responsibility.

C. Product Designations: Drawings indicate sizes and configurations of casework. Manufacturers' of casework of similar sizes, similar door and drawer configurations, and complying with the Specifications may be considered.

D. Flammable Liquid Storage: Provide units that are listed and labeled as complying with the requirements of NFPA 30 for design, construction, and capacity of storage cabinets by UL, Warnock Hersey, or another testing and inspection agency acceptable to authorities

having jurisdiction.

1. Cabinets shall be grounded.
2. Coordinate with Electrical Contractor grounding lug locations.
3. Cabinets shall have a minimum 2 inch deep liquid tight pan in bottom of same size as cabinet.
4. All OSHA cabinets shall be labeled in conspicuous lettering: "FLAMMABLE – KEEP FIRE AWAY".

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver laboratory casework until painting, utility roughing-in, and similar operations that could damage, soil, or deteriorate casework have been completed in installation areas. If casework must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions" Article below.

B. Protect finished surfaces from soiling and damage during handling and installation. Keep covered with polyethylene film or other protective covering.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install laboratory casework until building is enclosed, wet-work is completed, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels through remainder of construction period.

B. Existing Conditions: Verify casework dimensions with field measurements. Entry ways, corridors, and door openings shall be verified to ensure casework and equipment can be properly installed.

1.8 COORDINATION

A. Coordinate layout and installation of metal framing, reinforcement and sheet metal fastening grounds in gypsum board assemblies for support of metal laboratory casework.

1.9 EXTRA MATERIALS

A. Furnish to Owner complete touchup kit for each type and color of laboratory casework provided. Include fillers, primers, paints, and other materials necessary to perform permanent repairs to damaged casework finish.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Metal Laboratory Casework:

a. Labcase c/o Detroit Technical Company
b. Kewaunee Scientific Corp. c/o iscg Inc.
c. Mott Manufacturing c/o Detroit Technical Company

2. Substitutions: are subject to the review and approval of the architect. All products for consideration require documentation of equivalent performance to be submitted by the contractor.

2.2 MATERIALS

A. Metal: Commercial-quality, cold-rolled, carbon-steel sheet, complying with ASTM A 366 (ASTM A 366M); matte finish; suitable for exposed applications; and stretcher leveled or roller leveled to stretcher-leveled flatness.

B. Minimum Metal Thickness: Provide metal laboratory furniture components of the following minimum thicknesses:

1. Fixed Panels including sides, ends, backs, bottoms, tops, soffits, and items not otherwise indicated: 18 ga., 0.0478 in (1.2 mm). Except for flammable liquid storage cabinets, bottoms may be 20 ga., 0.0359 in (0.9 mm) if reinforced.
2. Removable access panels, doors, drawer fronts and cabinet bodies, security panels, sloped tops and shelves: 20 ga., 0.0359 in (0.9 mm). For back panels and doors for flammable storage cabinets, use 18 ga., 0.0478 in (1.2 mm) thick metal. For shelves more than 36 in (900 mm) long, use 18 ga., 0.0478 in (1.2 mm) thick metal or provide suitable reinforcement.
3. Top, front and intermediate horizontal rails, aprons, stretchers, cross rails, table legs, center posts, frames and gussets: 16 ga., 0.0598 in (1.5 mm).
4. Drawer suspensions, L-shaped front corner gussets sink supports, and hinge reinforcements: 14 ga., 0.0747 in (1.9 mm).

5. Table leg corner brackets and leveler gussets: 12 ga., 0.1046 in (2.7 mm).

C. Clear Tempered Glass for Glazed Doors: with ground edges ASTM C 1048, Kind FT, Condition A, Type I, Class 1, Quality q3, 7/32 in (5.5 mm) thick or Clear Laminated Safety Glass for Doors: ASTM C 1172, Kind LT; Kind FT, Condition A, Type I, Class I, Quality q3 lites with clear, polyvinyl butyryl interlayer.

2.3 FABRICATION

A. General: Complete assembly and finish work at point of manufacture. Perform assembly on precision jigs to provide units which are square; fully reinforced with angles, gussets, and channels; and integrally framed and welded to form a dirt and vermin-retardant enclosure. Where applicable, reinforce base cabinets for sink support. Maintain uniform clearance around door and drawer fronts of 1/16 to 3/32 inch (1.5 to 2.4 mm).

B. Fabricate units on precision dies for interchangeability of like-size drawers, doors, and similar parts.

C. Design: Full Flush Overlay.

D. Flat Panel Doors: Outer and inner pans formed and telescoped into box formation, with channel reinforcement's full height on center of each pan. Fill doors solid with noncombustible, sound-deadening material.

E. Glazed Doors: Hollow-metal stiles and rails of similar construction as flat panel doors and welded corners, with glass held in resilient channels or gasket material.

F. Hinged Doors: Mortise at flanges for hinges and reinforce with angles, welded inside inner pans at hinge edge.

G. Flat Panel Drawers: Assemble fronts from telescoping outer and inner pans, designed to eliminate raw edge of steel at top. Fabricate sides, back, and bottom of one piece with rolled or formed top of sides for stiffening and comfortable grasp for drawer removal. Weld drawer front to sides, back, and bottom to form a single, integral unit. Provide drawers with rubber bumpers, runners, and positive stops to prevent metal-to-metal contact or accidental removal.

H. Adjustable Shelves: Front, back, and ends formed down with returned lip at front and back.

I. Toe Space: Provide an adjustable height metal toe space, fully enclosed, adjustable in height from a minimum 4in to a maximum 6 in high set 3 inches (75 mm) back from the face of the cabinet, with no open gaps or pockets. The adjustable height shall provide backing for the resilient base in the event of varying floor elevations.

J. Base Molding: 4 in high, black rubber or vinyl.

K. Table Legs: Not less than 2 in (50 mm) square, welded tubing. Provide leg stretchers where necessary to comply with structural performance requirements. Weld or bolt leg stretchers to legs and cross-stretchers. Securely bolt legs to table aprons. Provide leveling

device welded to bottom of each leg.

L. Leg Shoes: Vinyl or rubber, black, open-bottom type.

M. Utilities: Provide space, cutouts, and holes for pipes, ductwork, conduits, and fittings in cabinet bodies to accommodate utility services and their support-strut assemblies.

N. Service Chase Framing: Manufacturer's standard steel framing units consisting of 2 cold-rolled C-channel uprights, not less than 1-5/8 inches (41 mm) square by 0.10 inch (2.5 mm) thick, connected together at the top and bottom by U-shaped brackets made from 1-1/4-by-1/4-inch (32-by-6-mm) flat bars. Framing units may be made by welding C-channel material specified for uprights into rectangular frames instead of using U-shaped brackets.

O. Filler Strips: Provide as needed to close space between cabinets and walls, ceilings, and indicated equipment. Fabricate from the same material and with the same finish as cabinets. Hem exposed edges.

P. Closure Panels: Closure panels shall be fabricated from the same material and with the same finish as cabinets, and shall mount flush with the front edge of the cabinet, self supporting and extend vertically to underside of finished ceiling.

Q. Coat Hooks: Hooks shall be formed cold roll steel with ball end tips and welded in stamped steel base. Under mount design (triple). Styles shall be design coordinated with quality satin aluminum finish. Attachment with #10 screws. (Cast hooks susceptible to breakage, non-matching finishes or designs, and smaller screw mounting not acceptable.)

2.4 FINISH FOR METAL LABORATORY CASEWORK

A. Cleaning and Pretreatment: After assembly, thoroughly clean surfaces of grease, dirt, oil, flux, and other foreign matter by physical and chemical means. Treat entire unit with metallic phosphate process, leaving surfaces with uniform, fine-grained, crystalline phosphate coating to provide bond for finish.

B. Chemical-Resistant Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard 2-coat, chemical-resistant, baked-enamel finish consisting of prime coat and thermosetting topcoat with a minimum dry film thickness of 1 mil (0.025 mm) for topcoat and 2 mils (0.05 mm) for system.

C. Chemical and Physical Resistance of Finish System: Provide metal laboratory casework with finish system complying with the following requirements for chemical and physical resistance:

1. Chemical Resistance, Moisture Resistance, Cold Crack and Adhesion and Flexibility: Compliant testing and performance requirements as outlined by with SEFA 3 and SEFA 8 standards.

2. Chemical Resistance: Capable of withstanding application of not less than 5 drops (0.25 mL) of the following reagents applied to finish surface; covered with a watch

glass for 60 minutes, rinsed, and dried; with no permanent change in gloss, color, film hardness, adhesion, or film protection.

1) Acetic acid (98%)
2) Acetone
3) Acid Dichromate (5%)
4) Ammonium hydroxide (28 %)
5) Amyl Acetate
6) Benzene
7) Carbon tetrachloride
8) Chloroform
9) Chromic Acid (60%)
10) Cresol
11) Dichlor Acetic Acid
12) Dimethylformanide
13) Dioxane
14) Ethyl acetate
15) Ethyl alcohol
16) Ethyl ether
17) Formaldehyde (37 %)
18) Formic acid (90%)
19) Furfural
20) Hydrochloric acid (37 %)
21) Hydrofluoric Acid (48%)
22) Hydrogen peroxide (5%)
23) Iodine
24) Methyl ethyl ketone
25) Methylene chloride
26) Mono chlorobenzene
27) Napthhalene
28) Nitric acid (60 %)
29) Phenol (90%)
30) Phosphoric acid (85 %)
31) Potassium hydroxide (40 %)
32) Silver nitrate
33) Sodium carbonate (saturated)
34) Sodium chloride (saturated)
35) Sodium hydroxide (40 %)
36) Sodium sulfide (saturated)
37) Sulfuric acid (85 %)
38) Toluene
39) Trichloroethylene
40) Xylene
41) Zinc chloride (saturated)

3. Moisture Resistance: No visible effect when exposed to the following:

   a. Hot water at a temperature of 190 to 205 deg F (88 to 96 deg C), trickled down the surface at a 45-degree angle for 5 minutes.

b. Constant moisture using a 2 in x 3 in x 1 in (51 mm x 76 mm x 25 mm) cellulose sponge, soaked with water, in contact with surface for 100 hours.

4. Cold Crack: No effect when subjected to 10 cycles of temperature change from 20 deg F (minus 7 deg C) for 60 minutes to 125 deg F (52 deg C) for 60 minutes.

5. Adhesion and Flexibility: No peeling or cracking or exposure of metal when metal is bent 180 degrees over a ½ in (13 mm) diameter mandrel.

D. Colors: Comply with the following requirements for colors of metal laboratory casework finish:

1. Colors: Provide manufacturer's full range of standard colors and finishes for selection by laboratory architect.

2.5 CASEWORK HARDWARE

A. Hardware, General: Provide manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.

B. Hinges: Stainless-steel, 5-knuckle hinges complying with BHMA 156.9, Grade 1, with antifriction bearings and rounded tips. Provide 2 for doors less than 48 inches (1200 mm) high and 3 for doors more than 48 inches (1200 mm) high.

C. Pulls: Stainless steel, fastened from back with 2 screws. For sliding doors, provide stainless-steel recessed flush pulls. Provide 2 pulls for drawers more than 24 inches (600 mm) wide.

D. Door Catches: Nylon-roller spring catch or dual, self-aligning, permanent magnet catch with strike. Provide 2 catches on doors more than 48 inches (1200 mm) high.

E. Drawer Guides: Metal-channel, self-closing drawer guides, designed to prevent rebound when drawers are closed, with nylon-tired, ball-bearing rollers for self centering operation, capable of supporting 100 lbs. (45 kg.) and complying with BHMA A156.9, Type B05091.

F. Full Extension Interior Drawer Guides: Accuride or equivalent drawer guide all ball bearing, rail mount, clear zinc finish and capable of supporting 100 lbs. (45kg.) at 33 inches wide or less or 200 lbs (90 kg) for 42 inches wide or less.

1. Provide where indicated on drawings.

G. Shelf Clips: Die-formed steel, zinc plated or 14 ga steel. They are to be adjustable vertically in 1 in increments.

H. Number Plates and Label Holders: Stainless steel or chrome plated, sized to receive standard label cards approximately 1 by 2 ½ inches (25 by 63 mm), attached with screws or rivets.

1. Provide where indicated on drawings.

I. Drawer and Cupboard Locks: Half-mortise or cylindrical type, 5-pin tumbler and dead bolt

or cam, only cylinder exposed, brass with chrome-plated finish, complying with BHMA A156.11, Grade 1

1. Provide minimum of 2 keys per lock and 6 master keys.
2. Provide where indicated on drawings.

J. Sliding-Door Hardware Sets: Manufacturer's standard extruded aluminum shoe with integral pulls and ball bearing wheel assemblies which slides in top and bottom extruded aluminum track.

K. Sinks, General: Provide sizes as indicated on drawings or manufacturer's closest standard size of equal or greater volume, as approved by Architect.

1. Shelf Thickness: 3/4 inch (19 mm) for spans up to 36".
2. Match Architect's sample.

L. Security Panel: Provide panels at every drawer requiring a lock.

1. Provide as indicated on drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcement, and other conditions affecting performance of metal laboratory casework installation.

1. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 CASEWORK INSTALLATION

A. Install plumb, level, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

B. Utility-Space Framing: Secure to floor with 2 fasteners at each frame. Fasten to partition framing, wood blocking, or metal reinforcements in partitions and to base cabinets.

C. Base Cabinets: Set cabinets straight, plumb, and level. Adjust subtops within 1/16 inch (1.5 mm) of a single plane. Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions with fasteners spaced 24 inches (600 mm) o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm).

1. Where base cabinets are not installed adjacent to walls, fasten to floor at toe space with concealed fasteners spaced 24 inches (600 mm) o.c. Secure sides of cabinets to floor, where they do not adjoin other cabinets, with not less than 2 fasteners.

D. Wall Cabinets: Hang cabinets straight, plumb, and level. Adjust fronts and bottoms within 1/16 inch (1.5 mm) of a single plane. Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 24 inches (600 mm) o.c. Align similar adjoining doors to a tolerance of 1/16 inch (1.5 mm).

E. Install hardware uniformly and precisely. Set hinges snug and flat in mortises, unless otherwise indicated. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.

F. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF ACCESSORIES

A. Install accessories according to approved Shop Drawings and manufacturer's written instructions. Coordinate locations and installation at all laboratory accessories specified in Section 11 53 43.10.

B. Securely fasten all casework, service chase frames, shelving, to metal fastening grounds or walls.

3.4 CLEANING AND PROTECTING

A. Repair or remove and replace defective work as directed on completion of installation.

B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

C. Protection: Provide 6-mil (0.15-mm) plastic or other suitable water-resistant covering over countertop surfaces. Tape to underside of countertop at minimum of 48 inches (1200 mm) o.c.

END OF SECTION

SECTION 12 56 53

FLEXIBLE LABORATORY FURNITURE SYSTEM

PART 1 – GENERAL

1.1 SPECIAL REQUIREMENTS

A. Flexible Laboratory Furniture System are to be Contractor Furnished and Contractor Installed. The unit will be purchased under the same contract and shall include installation and final connections.
B. Contractor to be responsible for the scheduling of the Flexible Laboratory Furniture System installation.
C. Contractor to be responsible for the site preparation and coordination of services and utilities to support the Flexible Laboratory Furniture System.

1.2 SUMMARY

This Specification identifies the minimum material and construction standards that are required to deliver a quality installation of the flexible laboratory furniture system. Laboratory furniture shall be supplied in accordance with the requirements of this Specification. The laboratory furniture identified in this Specification shall include the miscellaneous metal panels and other related components as identified on the drawings and that are necessary for the complete installation.

1.3 SECTION INCLUDES

A. Structural Table Base
B. Mobile Base Cabinets
C. Fixtures and related Service Connections

1.4 RELATED SECTIONS

A. Section 09 21 16, "Gypsum Board Assemblies".
B. Section 11 53 43, "Service Fittings and Fixtures"
C. Section 11 53 43.10, "Laboratory Accessories".
D. Section 16, "Common Work Results for Electrical".
E. Related Work To Be Performed By Others:
    1. Final installation of all plumbing, service and electrical fixtures attached to service panels.
    2. Final connection to service lines of all plumbing, service and electrical fixtures attached to service panels.

1.5 REFERENCES

A. SEFA 8: Laboratory Furniture – Casework, Shelving and Tables Guidelines
    Science Equipment and Furniture Association (SEFA)

B. ISO 9001:2000 – Quality Management
International Standards Organization (ISO)

C. ADA (ATBCB ADAAG) Americans with Disabilities Act Accessibility Guidelines
Americans with Disabilities Act (ADA)

1.4 SUBMITTALS

Refer to Section 01 33 00, "Submittal Procedures," for requirements, procedures, etc.

A. Product Data:
1. Drawings to include data and details for construction of the laboratory furniture. Further, provide name, quantity, type and construction of materials (such as hardware, gauges, etc).

B. Shop Drawings:
1. Provide shop drawings showing the layout and placement of all products by this section.
2. Show the type and location of all service fittings by this section.
3. Preparation instructions and recommendations.
4. Storage and handling requirements and recommendations.

C. Selection Samples:
1. Submit: one complete set of color chips showing the manufacturer's available quick ship range of colors. Minimum sample size: 2" x 2-1/2".

D. Quality Assurance/Control
1. Design Data/Test Reports: Submit test data and design criteria in compliance with the project specifications.

1.5 QUALITY ASSURANCE

A. Manufacturer shall identify and designate a full time factory representative for on-site supervision and coordination during the installation of laboratory casework and all components.

B. Single Source Responsibility: Provide laboratory casework with tops, sinks, accessories, fume hoods and service fixtures, manufactured or furnished by same laboratory furniture company for single responsibility.

C. Product Designations: Drawings indicate sizes and configurations of casework. Manufacturers' of casework of similar sizes, similar door and drawer configurations, and complying with the Specifications may be considered.

D. Manufacturer Qualifications:

The following list of information will be provide to the Architect at least ten (10) days prior to the bid opening:

1. List of manufacturing facilities;

2. Construction details depicting the materials, sizes and methods of construction.

1.6 DELIVERY, STORAGE AND HANDLING

A. Packaging, Shipping, Handling and Unloading
   1. Products to have packaging adequate to protect finished surfaces from soiling or damage during shipping, delivery and installation.
   2. Delivery: Casework delivery to take place after painting, utility rough-ins and related activities are completed that could otherwise damage, soil or deteriorate casework in installation areas.
   3. Handling: Use proper moving equipment and personnel at all times. Any wrapping or other method of protection to be left in place to avoid damage.
B. Acceptance at Site:
   1. Casework is not to be delivered or installed until the conditions specified under Part 3, Installation, have been met.
C. Storage:
   1. Casework to be stored in the area of installation. If it is necessary for casework to be temporarily stored in an area other than the installation area, the environmental conditions to meet the environmental requirements specified under the Project Site Conditions article of this section.
D. Waste Management and Disposal:
   1. Remove any waste or refuse resulting from the installation of laboratory casework. Leave the project site broom clean and free of debris. Trash container(s) to be provided by others.

1.7 PROJECT SITE CONDITIONS
A. Building must be enclosed. Windows and doors sealed and weather-tight.
B. An operational HVAC system that maintains temperature and humidity at occupancy levels must be in place.
C. Adjacent and related work to be complete.
D. Ceiling, overhead ductwork and lighting must be installed.
E. Site must be free of any further construction such as “wet work”.
F. Required backing and reinforcements must be installed accurately and the project must be ready for casework installation.

1.8 WARRANTY
A. Furnish a written warranty that work performed under this section to remain free from defects as to materials and workmanship for a period of two years from date of shipment. Defects in materials and workmanship that develop within this time are to be replaced without cost or expense to the Owner.
B. Defects include, but are not limited to:
   1. Ruptured, cracked, or stained coating
   2. Discoloration or lack of finish integrity
   3. Cracking or peeling of finish
   4. Slippage, shift, or failure of attachment to wall, floor, or ceiling
   5. Weld or structural failure
   6. Warping or unloaded deflection of components
   7. Failure of hardware
C. The warranty with respect to products of another manufacturer sold by Mott Manufacturing is limited to the warranty extended by that manufacturer to Mott Manufacturing.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Acceptable Manufacturer: Mott Manufacturing Ltd.; 452 Hardy Rd. Brantford, ON, Canada N3T 5L8. T (519) 752-7825. Email: inquire@mott.ca, www.mott.ca.
B. Substitutions must meet all specification requirements and have prior approval.
C. Substitutions must meet the minimum design and performance requirements of SEFA and UL 962.
D. Requests for substitutions: All requests will be considered in accordance with provisions of Section 01 60 00.

2.2 MATERIALS

A. Sheet Steel: Mild steel, cold rolled furniture grade to requirements of ASTM A1008/A1008M, Grade C or higher.
B. Galvanized Sheet Steel: Commercial quality, to ASTM 653, Designation Z275.
C. Stainless Steel: to ASTM A240, T304 and T316 alloy, #4 brushed finish.
D. Glass: ½" thick with steel frame work to protect edges.

2.3 DESIGN REQUIREMENTS:

A. Basis of design: Mott Manufacturing Altus Series Table system.
B. Modular system to be made of tubular style framing .
C. Table Supports to be adjustable height in 1" increments and complete with levelers.
D. Assembled table to be self-supporting without needing to be anchored to the building.
E. The modular system must ship complete from the factory with minimal on-site assembly.

2.4 ALTUS CONSTRUCTION

A. Tubular Table Assembly:
    1. Nominal table assembly dimensions:Width: 48", 60", 72", Depth: 23" or 29", Height: Adjustable from 29" – 36" (not including work surface).
    2. Tubular Table Legs:
        1. 2" outside square, 14ga. powder coated cold rolled steel or stainless steel outer leg.
        2. 1-¾" outside square, 11ga. powder coated cold rolled steel or stainless steel inner telescoping leg.
        3. 2" diameter nylon leveling glide 3/8" x 2-1/2" long threaded stem
    3. Tubular table identifies without uprights as indication on Architectural Elevations to have casters in lieu of leveler feet. Casters to all be rated for 165lbs minimum each and to be locking type.
    4. Capable of vertical height adjustment in 1" increments.
    5. Table assembly to be fastened to the rear upright with two (2) hex 3/8" socket head bolts.
    6. Hanging Rails: Front apron and rear support are to have rails allowing suspended cabinets to hang from.
    7. Leveling Bolt: Frame to be fitted with a leveling bolt which will allow the legs to be adjusted for proper alignment of work surface height.
    8. Load Capacity: Table frame to support 1000lbs including the work surface.
B. Suspended Base Cabinets:
    1. Design and construction to be as in section 12 35 53.19 – Wood Laboratory Casework.
    2. Suspended base cabinets: Provide a system of steel hanger rails attached to the casework frames. Installation and removal to be accomplished without the use of tools.

2.6 STEEL FURNITURE FINISH

A. Cleaning and Pretreatment: After assembly, thoroughly clean surfaces of grease, dirt, oil, flux, and other foreign matter by physical and chemical means. Treat entire unit with metallic phosphate process, leaving surfaces with uniform, fine-grained, crystalline phosphate coating to provide bond for finish.

B. Chemical-Resistant Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard 2-coat, chemical-resistant, baked-enamel finish consisting of prime coat and thermosetting topcoat with a minimum dry film thickness of 1 mil (0.025 mm) for topcoat and 2 mils (0.05 mm) for system.

C. Chemical and Physical Resistance of Finish System: Provide metal laboratory casework with finish system complying with the following requirements for chemical and physical resistance:

1. Chemical Resistance, Moisture Resistance, Cold Crack and Adhesion and Flexibility: Compliant testing and performance requirements as outlined by with SEFA 3 and SEFA 8 standards.

2. Chemical Resistance: Capable of withstanding application of not less than 5 drops (0.25 mL) of the following reagents applied to finish surface; covered with a watch glass for 60 minutes, rinsed, and dried; with no permanent change in gloss, color, film hardness, adhesion, or film protection.

    1) Acetic acid (98%)
    2) Acetone
    3) Acid Dichromate (5%)
    4) Ammonium hydroxide (28 %)
    5) Amyl Acetate
    6) Benzene
    7) Carbon tetrachloride
    8) Chloroform
    9) Chromic Acid (60%)
    10) Cresol
    11) Dichlor Acetic Acid
    12) Dimethylformanide
    13) Dioxane
    14) Ethyl acetate
    15) Ethyl alcohol
    16) Ethyl ether
    17) Formaldehyde (37 %)
    18) Formic acid (90%)
    19) Furfural
    20) Hydrochloric acid (37 %)
    21) Hydrofluoric Acid (48%)
    22) Hydrogen peroxide (5%)
    23) Iodine
    24) Methyl ethyl ketone
    25) Methylene chloride
    26) Mono chlorobenzene
    27) Napthhalene
    28) Nitric acid (60 %)
    29) Phenol (90%)

30) Phosphoric acid (85 %)
31) Potassium hydroxide (40 %)
32) Silver nitrate
33) Sodium carbonate (saturated)
34) Sodium chloride (saturated)
35) Sodium hydroxide (40 %)
36) Sodium sulfide (saturated)
37) Sulfuric acid (85 %)
38) Toluene
39) Trichloroethylene
40) Xylene
41) Zinc chloride (saturated)

3. Moisture Resistance: No visible effect when exposed to the following:
   a. Hot water at a temperature of 190 to 205 deg F (88 to 96 deg C), trickled down the surface at a 45-degree angle for 5 minutes.
   b. Constant moisture using a 2 in x 3 in x 1 in (51 mm x 76 mm x 25 mm) cellulose sponge, soaked with water, in contact with surface for 100 hours.
4. Cold Crack: No effect when subjected to 10 cycles of temperature change from 20 deg F (minus 7 deg C) for 60 minutes to 125 deg F (52 deg C) for 60 minutes.
5. Adhesion and Flexibility: No peeling or cracking or exposure of metal when metal is bent 180 degrees over a ½ in (13 mm) diameter mandrel.

D. Colors: Comply with the following requirements for colors of metal laboratory casework finish:

1. Colors: Provide manufacturer's full range of standard colors and finishes available as quick ship for selection by Architect and Client.

PART 3 – EXECUTION

3.4.1 INSTALLATION

1. Install casework within system, align and set level with levelling devices, in accordance with shop drawings.
2. At wall locations secure wall cabinets to face of finished walls and partitions, applying self-tapping screws through wall finish material into each concealed stud flange.
3. Install components to effect a secure, neat and complete installation.

END OF SECTION

SECTION 16 01 00

GENERAL ELECTRICAL, INSTRUMENT, AND CONTROL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General requirements for electrical power, instrumentation, and controls systems.

1.2 RELATED SECTIONS

A. Section 16 05 00 – Basic Electrical Materials and Methods.

1.3 REFERENCES

A. All equipment and workmanship shall be in conformance with the following documents:
   1. National Electrical Code, latest approved edition.
   2. Any and all Federal, State, and/or local codes, ordinances, or regulations.
   3. Latest approved standards of ISA, IEEE, ANSI, NEMA, and Underwriters' Laboratories.

B. All equipment shall be designed, constructed, installed, and tested in conformity with all requirements, as a minimum, of applicable standards of IEEE, NEMA, ISA, ANSI, ICEA, and OSHA, except as modified herein.

1.4 GENERAL REQUIREMENTS

A. Unless otherwise specified, provide tools, equipment, apparatus, transportation, labor, and supervision to complete and place in satisfactory operation the work indicated on the Drawings and specified herein. Where permits or inspection fees are required in connection to the work under this Specification, the Contractor shall secure such permits and pay all fees.

B. Where any public or private utilities are encountered, the Contractor shall be responsible for any damages thereto resulting from his operations. Any existing lines or utilities damaged during the construction and which are not to be abandoned or removed, shall be replaced or repaired. The Contractor shall be responsible for determining the exact location of all underground or otherwise concealed utilities, conduit runs, piping, etc. which may interfere with construction or which require modifications.

C. All work shall be done in conformity with the applicable requirements of the codes, rules, and regulations of public utilities and all others having jurisdiction.

D. Where the Specifications describe or the Drawings show materials of higher quality than required by the above rulings and codes, the Drawings and Specifications shall govern the quality of materials which shall be furnished.

E. The wire, conduit, and equipment sizes shown on the Contract Drawings are based on estimated ratings. If ratings of equipment as furnished under the Contract exceed the estimated ratings, the wire, conduit, and equipment sizes shall be adjusted to meet NEC requirements at no additional cost to the Owner.

F. The phrase "below grade," when used in reference to the interior of buildings, rooms, or other structures in these Specifications and on the Drawings, shall apply to the entire internal volume of the room, area, or structure where 50% or more of the volume is actually below the average of the exterior finished grade elevations. In all other cases, the phrase shall only apply to the volume of space actually below finished grade.

G. Dry locations are defined as interior; above grade; heated rooms, structures, buildings, cabinets, enclosures, etc. not normally subject to dampness or wetness. Damp locations are defined as interior; above grade; unheated rooms, structures, and buildings. Wet locations are defined as all outdoor areas; all underground rooms, structures, building areas, vaults, etc.; whether heated or unheated. Refer to National Electrical Code Article 100, "Location:" for additional definitions.

1.5 PROJECT CONDITIONS

A. Before submitting his proposal, this Contractor shall be held to have examined the site and satisfied himself as to the existing conditions under which he will be obliged to work. The Contractor will be allowed no claim(s) for extra(s) due to his failure to make the above examination.

1.6 INSPECTION

A. At the proper time, the Contractor shall file application for inspection of his work with the local, State, or National authority having jurisdiction and shall deliver to the Owner all required certificates attesting to approval by such authorities.

1.7 GUARANTEE

A. The equipment and installation furnished under this Section shall be guaranteed for a period of one (1) year as specified under Section 01700, Contract Closeout, except as modified by the Division 16 Specifications.

B. Repair and maintenance for the guarantee period is the responsibility of the Contractor and shall include all repairs and maintenance other than that which is considered as routine. (This is replacement of lamps, oiling, greasing, etc.) The Owner shall be the judge of what shall be considered as routine maintenance.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. All materials and equipment shall be new, except where specifically identified otherwise.

B. All materials and equipment shall be listed or labeled by Underwriters' Laboratories, Inc., except for materials and equipment not available from any source with such listing and/or labeling, or as specifically required by the Division 16 Sections.

C. All conductor terminations, lugs, and connectors on all equipment supplied under this Contract shall be 75°C rated for copper conductors.

2.2 LOOSE AND DETACHABLE PARTS

A. The Contractor shall retain all loose and small detachable parts of the apparatus and equipment furnished under his Contract, until the completion of his work, and shall then turn same over to the Owner or his representative delegated to receive them and obtain from the Owner an itemized receipt, therefore, in triplicate, the Owner retaining the original. The Contractor shall retain one copy of this receipt for his files and shall attach the other two to any request for final payment for the work.

2.3 STANDARDS

A. All materials shall be new and shall conform as a minimum with NEMA, ANSI, and Underwriters' Laboratories, Inc. (UL) in every case where such a standard has been established for the particular type of material in question.

2.4 SPARE PARTS

A. Spare parts shall be provided for electrical equipment supplied under this Contract, as specified in individual Specification Sections, and shall be furnished and delivered to the Owner.

B. Spare parts shall be packed and individually boxed for storing with each box labeled with the part's description including its part or catalog number, its use, and the equipment for which it is a part. Parts used during startup shall be replaced prior to acceptance.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. Material and equipment furnished and installed by the Contractor shall be completely protected against damage, pilferage, dampness, or abuse until turned over and accepted by the Owner.

B. The installation of all electrical, instrumentation, and control equipment shall meet the requirements of the State and Federal Occupational Safety and Health Statutes.

3.2 DRAWINGS AND MEASUREMENTS

A. Drawings shall be submitted in accordance with Sections 01300 and 01700 of these Specifications and as specified hereinafter. No work shall be undertaken until the Engineer has reviewed and approved the shop drawings. Only approved materials shall be installed and only approved installation methods shall be used.

B. The Drawings show the arrangement, general design, and extent of the systems. The work is shown on the Drawings by symbols, as shown in a legend on the Drawings. Equipment is shown in its general location, except where in certain cases the Drawings may include details giving the exact location and arrangement. Existing or otherwise concealed utilities, piping, conduit runs, etc. indicated on the Drawings are shown in approximate locations and orientations only; the Contractor shall field verify exact locations.

C. The Drawings are not intended to be scaled for roughing-in measurements nor to serve as shop drawings. Where drawings are required for these purposes or have to be made from field measurements, they shall be prepared by the Contractor. Field measurements necessary to determine the required quantities of materials and fitting the installation of all materials and equipment into the building construction shall be taken by the Contractor.

D. Installation drawings and manufacturer's shop drawings are required for all electrical, instrumentation, and control work. Installation drawings shall show panel layout, conduit connection sizes, and location and equipment foundations, details, and locations, accurately dimensioned. Exposed runs of conduit need not be dimensioned. Conduit layout and installation drawings shall be submitted for approval and shall show all conduit runs, complete from origination to termination, and shall indicate conduit sizes and fills, raceway system components, methods and spacing of supports, etc.

E. Control schematics shall be provided for all modified existing control circuits. Control schematics shall use the ladder diagram type format incorporating line numbers, operation function statements, contact location line numbers with underlines indicating normally closed contacts. A description of operation of each device and complete written sequence of operation shall be provided with all control schematics. Format and symbols shall be as approved by the Owner. Wire and terminal numbers shall be clearly shown.

F. Upon completion of the work, complete “As-Built” drawings shall be provided. For additional requirements see Section 01700, Contract Closeout, Project Record Documents.

3.3 STORING OF EQUIPMENT

A. All equipment shall be stored in accordance with the manufacturer's recommendations. A letter from the manufacturer shall be provided stating those recommendations.

B. All equipment which has been set in place but not in operation shall be protected from damage or deterioration from whatever causes in accordance with the manufacturer’s recommendations until the equipment has been accepted by the Owner.

C. All wire and cable shall be stored on the original, manufacturer’s reels, protected from the weather, and all cable end seals shall be maintained intact until the cable is installed.

D. During construction, all electrical equipment insulation shall be protected against absorption of moisture and metallic components shall be protected against corrosion by strip heaters, lamps, or other acceptable means. This protection shall be provided immediately upon receipt of the equipment and maintained continuously.

3.4 CLEANUP

A. After substantial completion and prior to final acceptance, all electrical equipment shall be cleaned up, interior and exterior, to be free of dust and other foreign matter. Internal components shall be vacuumed, including windings of dry type transformers, and wiped free of dust.

B. De-energization of equipment to accomplish the cleaning work shall be done at a time as approved by the Owner.

3.5 PAINTING

A. The exterior of all enclosures shall be cleaned and touched up with matching paint where scratched or marred so that the exterior presents an "as new" appearance.

B. All factory finished equipment shall be protected from damage during erection, thoroughly cleaned after erection, and touched up as required. If the factory finish has, in the opinion of the Owner, been seriously damaged, the equipment shall be refinished as specified in Section 09900, Painting.

3.6 SUBSTANTIAL COMPLETION

A. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete, in accordance with the Contract Documents, such that the Owner can occupy the facilities and/or utilize the system for its intended use.

B. Substantial Completion shall be determined by the Owner and/or the Engineer. See Section 01700, Contract Closeout for additional requirements.

END OF SECTION

SECTION 16 05 00

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General electrical equipment and installation requirements.

1.2 RELATED SECTIONS

A. Section 16 01 00 – General Electrical, Instrument, and Control Requirements.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.

1.4 WORK INCLUDED

A. The Contractor shall furnish all labor, material, and equipment required for the modifications to existing electrical systems and the completion of the work as herein specified and/or indicated on the Drawings. It is the intent that the Drawings and Specifications, which are general only, shall provide for finished, first-class work, and that the equipment and appurtenances thereto shall be of such construction and details, and of such materials, as to function completely and properly, and so as to be of long life; and such as not to require excessive upkeep or maintenance; and that operation shall be simple and control convenient. Any items omitted therefrom which are clearly necessary for the completion of the work or its appurtenances shall be considered a portion of the work though not directly specified or shown. All work shall conform with NECA 1-2010, Good Workmanship in Electrical Contracting.

B. The Contractor shall provide and install all conduit and wire connections required between components of equipment and systems supplied under other Sections of these Specifications, where shown or indicated on the Drawings.

C. The Contractor shall furnish and install modifications to existing secondary power distribution systems.

D. The Contractor shall furnish and install modifications to existing lighting systems.

E. The Contractor shall furnish and install existing auxiliary system modifications, as specified herein and as shown on the Drawings.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. The Contractor shall furnish and install modifications to the existing power distribution system, together with all necessary supports, framing, hangers, and all other appurtenances. He shall furnish and arrange for the setting of anchor bolts, channels, etc. which are to be set in the concrete. He shall connect and make operable any and all electrical equipment whether or not it was furnished under this section of the Specifications, except as stated in Section 15010. The work shall include, but is not limited to, the following items:
1. Motor Starters
2. Electrical Equipment and Devices
3. Raceway System
4. Power Feeder and Branch Circuit Wiring
5. Modifications to Existing Motor Control Centers
6. Disconnect Switches

B. The Contractor shall furnish and install modifications to the existing lighting system, together with all necessary supports, framing, hangers, outlets, fixtures, panels, receptacles, and all other appurtenances. He shall furnish and arrange for the setting of anchor bolts, concrete inserts, etc. which are to be set in the concrete or in masonry walls. The work shall include, but is not limited to, the following items:
1. Lighting Panelboards
2. Raceway System
3. Wiring
4. Wiring Devices and Hardware
5. Lighting Fixtures and Lamps
6. Clocks and Clock Outlets
7. Lighting Control Devices

C. The Contractor shall furnish and install modifications to the existing auxiliary systems, together with all necessary supports, framing, hangers, outlets, fixtures, panels, and all other appurtenances. He shall furnish and arrange for the setting of anchor bolts, concrete inserts, etc. which are to be set in the concrete or in masonry walls. The work shall include, but is not limited to, the following items:
1. Wire, Cable, and Raceways for all Auxiliary Systems
2. Telephone Conduit System
3. Alarm Devices
4. Warning Devices

PART 3 EXECUTION

3.1 DRAWINGS AND MEASUREMENTS

A. Outlets connected by lines show switch control or circuiting only and are not actual runs of conduit. All light and receptacle outlets are lettered and numbered; the letter indicates the panelboard from which the circuit is to be powered. All outlets bearing the same letter and number shall be connected to the same circuit.

B. Power feeders shall be run in individual conduits, from source to load, as indicated in schedules, wiring diagrams, or by home runs on the Drawings.

END OF SECTION

SECTION 16 11 00

RACEWAYS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Metal conduit.

B. Flexible metal conduit.

C. Electrical metallic tubing.

D. Fittings and conduit bodies.

1.2 RELATED SECTIONS

A. Section 16 01 00 – General Electrical, Instrument, and Control Requirements.

B. Section 16 05 00 – Basic Electrical Materials and Methods.

C. Section 16 13 00 – Boxes.

D. Section 16 17 00 – Grounding and Bonding.

E. Section 16 19 00 – Supporting Devices.

F. Section 16 19 50 – Electrical Identification.

1.3 REFERENCES

A. ANSI C80.1 – Rigid Steel Conduit, Zinc Coated.

B. ANSI C80.3 – Electrical Metallic Tubing, Zinc Coated.

C. ANSI/NEMA FB 1 – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

D. ANSI/NFPA 70 – National Electrical Code.

E. NECA 101-2013, Steel Conduits (Rigid, IMC, EMT).

F. NECA 111-2003, Standard for Installing Non-metallic Raceways.

G. NEMA RN 1 – Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.

H. NEMA TC 2 – Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).

I. NEMA TC 3 – PVC Fittings for Use with Rigid PVC Conduit and Tubing.

J. UL 6 Standard for Rigid Metal Conduit.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings: Conduit layout and installation drawings shall be submitted for approval and shall show all conduit runs, complete from origination to termination, and shall indicate conduit sizes and fills, raceway system components, methods and spacing of supports, etc. Indicate materials, finishes, dimensions, listings, and standards compliance.

C. Product Data: Provide data for conduit, tubing, duct, fittings, and accessories.

D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle Products to site under provisions of Section 01600.

B. Accept conduit on site. Inspect for damage.

C. Conduit shall be delivered at the construction site in not less than ten foot lengths; each length of conduit to have approval label of the Underwriters.

D. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

E. Protect PVC conduit from sunlight.

1.6 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Verify routing and termination locations of conduit prior to rough-in.

C. Conduit routing is shown on Drawings in approximate locations, unless dimensioned. Route as required to complete the raceway system.

PART 2 PRODUCTS

2.1 CONDUIT AND FITTINGS

A. Provide all conduit, conduit fittings, outlet boxes, pull boxes, supports, hangers, plates, and such other items as are incidental to or required for a complete installation, all of

which shall be made of cast iron, malleable iron, or galvanized steel, unless indicated otherwise.

B. No threadless couplings or running threads will be permitted on rigid conduits.

C. No conduit smaller than 3/4 inch shall be used, unless otherwise indicated or specified.

D. All raceways shall be marked with the manufacturer's name or trademark as well as type of raceway and size. This marking shall appear at least once every 10 feet and shall be of sufficient durability to withstand the environment involved.

E. Wherever conduits cross building, tank, or other structural expansion joints, the Contractor shall provide and install conduit expansion/deflection fittings as manufactured by O.Z./Gedney Type DX, Crouse-Hinds, Thomas & Betts, or equal, unless indicated on the Drawings as requiring an expansion fitting.

F. Expansion fittings with copper, ground bonding jumpers shall be installed where indicated on the Drawings and shall be O.Z./Gedney Type AX with Type BJ bonding jumper, Crouse-Hinds, or equal.

2.2 RIGID STEEL CONDUIT

A. Rigid steel conduits shall consist of heavy wall, mild steel tube, hot-dipped galvanized with threads electrogalvanized after cutting, and especially selected with reference to uniformity of thickness and freedom from defects. All fittings shall be suitable and approved for use in rigid steel conduit systems.

B. Manufacturers:
1. Wheatland Tube Company
2. Allied Tube & Conduit Corporation
3. Maverick Pipe
4. Or Approved Equal

C. Rigid Steel Conduit: ANSI C80.1, UL 6.

D. Fittings and Conduit Bodies: ANSI/NEMA FB 1; UL Standard 514B; all steel fittings.

2.3 FLEXIBLE METAL CONDUIT

A. Manufacturers:
1. AFC
2. Southwire - Alflex
3. Or Approved Equal

B. Description: Interlocked steel construction.

C. Fittings: ANSI/NEMA FB 1.

D. Flexible metallic conduit shall be 3/4 inch nominal trade size (minimum) flexible steel conduit tubing, hot-dipped galvanized, meeting Underwriters' Laboratories Standard for flexible steel conduit (UL 1).

2.4 ELECTRICAL METALLIC TUBING (EMT)

A. Electrical metallic tubing (EMT) shall be thin wall, galvanized steel conduit that complies with Underwriter's Laboratories Standard UL 797.

B. Manufacturers:
1. Wheatland Tube Company
2. Allied Tube & Conduit Corporation
3. Or Approved Equal

C. Description: ANSI C80.3; galvanized tubing.

D. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron, compression or set screw type.

2.5 MISCELLANEOUS FITTINGS AND MATERIALS

A. Insulated grounding bushings shall be Type HBLG as manufactured by O.Z./Gedney, American Fittings Corp., Thomas & Betts, or equal.

B. Insulating bushings shall be high impact resistant, thermoset plastic, 150°C rated, Type A as manufactured by O.Z./Gedney, American Fittings Corp., Thomas & Betts, or equal.

C. All locknuts shall be of the sealing type, O.Z./Gedney Type SLG, Appleton, American Fittings Corp., Thomas & Betts, or equal.

D. Liquidtight hubs shall have a sealing ring between the fitting and the box and an insulated throat to insure protection of the wires as pulled. Hubs shall be made of nodular or malleable iron steel, zinc plated for corrosion resistance, UL listed, and shall meet or exceed the requirements of UL test 514B. Liquidtight hubs shall be Bridgeport, O.Z./Gedney Type CHM, Ideal Industries 75-000 Series, American Fittings Corp., Thomas & Betts, or equal.

E. Sealing fittings shall be Crouse-Hinds Co. Type EYS, Appleton, or equal. Sealing fittings used as water stops shall have an integral drain and shall be Crouse-Hinds Type EYD, Appleton, Thomas & Betts, or equal. Sealing fittings in hazardous or corrosive areas shall be PVC coated.

F. Telephone outlets shall be floor mounted, single gang, FSY cast boxes or wall mounted, single gang FS cast boxes as indicated on the Drawings.

G. Couplings and fittings for electrical metal tubing shall be zinc plated steel compression or setscrew connectors and couplings as manufactured by O.Z./Gedney, American Fittings Corp., Thomas & Betts, or equal.

H. Conduit sealing compound shall be Waterguard Desiccants Industrial Encapsulant, Polywater FST-250, or equal.

I. Link seal for sealing conduits into sleeves and cored openings shall be GPT Industries - Thunderline, Metraflex Co. Metraseal, Calpico, or equal.

PART 3 EXECUTION

3.1 INSTALLATION OF RACEWAYS

A. Install conduit in accordance with NECA 101-2013, Steel Conduits (Rigid, IMC, EMT).

B. Arrange supports to prevent misalignment during wiring installation.

C. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.

D. Do not attach conduit to ceiling support wires.

E. Arrange conduit to maintain headroom and present neat appearance.

F. Identify raceway systems under provisions of Section 16 19 50.

G. Joints shall be made tight with standard couplings and corners turned with elbows or long radius bends in pipe.

H. Exposed multiple runs of conduit indoors shall be supported on hangers suspended from concrete inserts or structural steel. Single runs of conduit may be attached to ceilings or walls by means of approved type anchors. Conduit and other equipment may be attached to structural steel only where approved by the Owner. All conduit shall be secured to the supports by means of galvanized malleable iron clamps using two bolts or machine screws. Conduit supports, hangers, and anchors shall be as specified under Section 16 19 00.

I. The use of wood plugs for anchoring raceways to concrete or masonry will not be permitted.

J. All conduits installed exposed shall be run vertically or horizontally and shall be parallel or at right angles to the building or structure walls.

K. The Contractor shall provide and install, where required, the additional steel to adequately support all conduits, boxes, and all other electrical equipment.

L. All conduit shall be dry, clean, and free of obstructions before conductors are pulled in. If there is evidence of moisture, obstructions, or foreign matter in the conduit when the conductors are installed, the wiring shall be removed and the conduit cleaned to the satisfaction of the Owner. All wiring showing evidence of damaged insulation shall be replaced.

M. All steel conduit run exposed shall be supported at intervals not exceeding 8 feet, unless shown otherwise on the Drawings. Multiple runs of conduit shall be mounted with steel supports so arranged that each individual conduit is clamped in place.

N. Conduit installed on walls shall be mounted on spacers to provide not less than 1/4 inch space between the conduit and the wall.

O. Conduit installed exposed outdoors shall be supported by structural steel members.

P. All conduits passing through openings or sleeves in roofs, below grade walls, or floors shall be sealed in place and made watertight with link seal.

Q. All conduit stubs for future use shall be terminated with pipe caps.

R. Conduit runs installed horizontally overhead shall allow a minimum of 7 feet of headroom, except where installed along structures, piping, equipment, or in other areas where headroom cannot be maintained because of other considerations.

S. Wherever a conduit emerges from the underside of a slab or roof or enters an area from above and that slab or area or conduit is exposed to the weather, then that conduit shall be provided with a pull box or fitting and filled to a length of 12 inches minimum with conduit sealing compound where the conduit emerges indoors to prevent water from following the conduit interior. The sealing compound shall be as specified hereinbefore under Miscellaneous Fittings and Materials.

T. Wherever a conduit enters an electrical equipment enclosure from an underground or outdoor location and other locations where indicated on the Drawings, the conduit opening shall be sealed after the wires and/or cables are pulled. One and one half (1½) inch and smaller conduits with more than 20 percent wire fill may be sealed with conduit sealing compound; all other conduits, where required, shall be provided with conduit sealing bushings or compound bushings with ground conductor connectors, as manufactured by O.Z./Gedney or equal. Conduit sealing compound shall be forced into conduits to a minimum depth of 12 inches.

U. Field bends in conduit shall not be of a lesser radius than that of manufactured elbows of the same trade size and shall show no flattening of the conduit. Conduit bends shall be held to as large a radius as possible for ease in pulling of conductors and to provide a neatly installed appearance. Generally, conduits 1" and smaller shall be bent in the field. Other conduit bends shall conform to the following: 2" and 2½" conduit, 24" radius, 3" and larger with a minimum radius of 36". Except where conduit runs are shown in exact detail on Drawings, the maximum length of straight conduit runs shall be 200 ft. between pull boxes, with 50 ft. deducted for each 90 degree bend and 25 ft. deducted for each 45 degree bend, reduction in length for all other angle bends shall be figured on a similar basis.

V. Conduit parallel to or crossing uninsulated hot water or steam pipes shall be separated from same by 12", if parallel, or 7", if crossing. Where hot water or steam pipe lines are insulated, conduit shall clear the insulation surface by 2". Conduit shall not run directly under cold water lines.

W. Conduit stub-ups into the bottom of NEMA Type 12, floor mounted enclosures, including motor control centers, shall enter the enclosure through individual holes in the bottom plate or sheet steel bottom and the openings shall be sealed around each conduit to maintain the enclosure's NEMA Type 12 rating.

X. All conduits and sleeves passing through openings in walls above grade or floors shall be sealed in place and made watertight with non-shrink grout or other Owner approved sealant. Non-shrink grout used in floor or wall openings, shall be of the non-metallic type. All openings in fire rated walls and floors shall also be sealed with a fire barrier sealing system capable of maintaining the designed fire rating of the wall or

floor and suitable for sealing out smoke and fumes. The fire barrier sealing system shall be capable of passing the ASTM E-814 (UL 1479) fire test and shall be subject to compliance with through penetration firestop systems (XHEZ) listed in Volume II of the UL Fire Resistance Directory; provide products by Hilti Construction Chemicals, Inc.; 3M™ Fire Protection Products; or equal.

Y. Openings in boxouts through floors or walls or in the bottom of electrical equipment shall be closed using split insulating blocks or non-shrink grout in a manner as approved by the Owner. All unused sleeves shall be capped or plugged at both ends with approved fittings.

Z. Metallic sleeves containing a ground conductor shall be bonded at each end to the ground conductor.

AA. The ends of all metallic conduits or elbows shall be cut square, reamed, and threaded.

BB. The threads of all steel conduit connections concealed in concrete shall be coated at the time of installation with No. B69A45 Zinc clad primary coating, as manufactured by Sherwin William's Corp., Ideal Industries No. 40-630, CRC Chemicals Zinc-It, or equal.

CC. The threads (metallic) of all corrosive area and outdoor equipment connections including conduit, conduit fittings, pull and junction box covers, lighting fixture reflector, guard, and outlet box connections, wiring device boxes, etc. shall be coated with an anti-seize, lubricating, and protective compound prior to final assembly. Coating compound shall be NO-OX-ID "A Special" by Sanchem, Inc., Never-Seez as manufactured by Bostik Div. of Emhart Corp., "Dry Molybdenum Lubricant" No. 40-640 by Ideal Industries, CRC Chemicals Lectra-Shield, or equal.

DD. Ground and bond metallic raceway systems under provisions of Section 16 17 00.

EE. All metallic conduits, except those terminated in metal boxes or enclosures without knockouts and secured with double locknuts, integral hubs, or liquidtight hubs, shall be terminated with insulated grounding bushings. Conduits terminated in metal boxes or enclosures without knockouts and secured with double locknuts shall be terminated with an insulating bushing.

FF. All conduits and sleeves, metallic and non-metallic, intended for the passage of wire or cable and not terminated with a fitting, shall be terminated with a bushing or end bell.

GG. All connections between metallic conduits and NEMA Type 1 or NEMA Type 12 steel boxes shall be made with double locknuts. All connections between conduits and NEMA Type 3, 3R, 4, and 4X boxes shall be made with watertight connections. Watertight connections shall consist of integral hubs or liquidtight hubs.

HH. Electrical metal tubing or so called "Thin Wall" conduit and fittings may be used only in areas described as "finished areas" on the Drawings.

II. Flexible conduit may be used only where rigid conduit is impracticable or where indicated on the Drawings.

JJ. All final conduit connections to motors and other machinery, equipment, and devices which may be subject to movement or vibration shall be made with 15" to 18" of flexible, metallic conduit.

END OF SECTION

SECTION 16 12 30

WIRE AND CABLE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Building wire.

B. Instrumentation cable.

C. Communications cables.

D. Wiring connectors and connections.

1.2 RELATED SECTIONS

A. Section 16 05 00 – Basic Electrical Materials and Methods.

B. Section 16 11 00 – Raceways.

C. Section 16 13 00 – Boxes.

D. Section 16 19 00 – Supporting Devices.

E. Section 16 19 50 – Electrical Identification.

1.3 REFERENCES

A. ANSI/NFPA 70 – National Electrical Code.

B. Underwriters' Laboratories Standard UL-83.

C. Underwriters' Laboratories Standard UL-44.

D. Federal Specification A-A-59544.

E. ANSI Standard C33.80.

F. ICEA – Insulated Cable Engineers Association.

G. ASTM – American Society for Testing and Materials.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Provide for all wire and cable.

C. Test Reports: Indicate procedures and values obtained.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency.

1.5 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Wire and cable routing shown on Drawings is approximate. Route wire and cable as required to meet Project Conditions.

C. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

1.6 COORDINATION

A. Coordinate Work under provisions of Section 01039.

B. Determine required separation between cable and other work.

C. Determine cable routing to avoid interference with other work.

PART 2 PRODUCTS

2.1 GENERAL

A. All wires and cables shall be permanently identified, at intervals not exceeding 3 feet, indicating type, size, voltage rating, and manufacturer's name.

B. All wires and cables shall be continuous and shall be delivered in reels or in coils. Reels and coils shall be plainly marked for complete identification, including the wire or cable size, the number of conductors, the type of wire or cable, length, weight, thickness and character of the insulation, and the name of the manufacturer.

C. All coils and reels of wires or cables shall carry original date perforated inspection labels of the Underwriter's laboratories, Inc. showing the number of feet and type of wire contained.

2.2 MANUFACTURERS – BUILDING WIRE

A. General Cable

B. Southwire Corporation

2.3 BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor: Annealed, uncoated copper. All conductors shall be stranded. ASTM designation B-3.

C. Conductor Temperature Rating: 90°C in wet locations; 90°C in dry locations.

D. Insulation Voltage Rating: 600 volts.

E. Insulation: ANSI/NFPA 70, Type THWN; high temperature polyvinyl chloride with nylon jacket or Type XHHW-2, high temperature cross-linked polyethylene.

2.4 MANUFACTURERS – COMMUNICATIONS CABLE

A. RS-232/422, RS-485/DH-485, Ethernet (Category 6), DH+ (Twinaxial), Unshielded twisted pair (UTP), and telephone cables shall be as manufactured by: Belden; Alpha; or Manhattan.

2.5 COMMUNICATIONS CABLE

A. Wire type communications cables shall meet all applicable standards of EIA/TIA, IEEE, and the NEC.

B. Riser and Plenum Use Cables:
1. These cables shall be similar to the underground and general use cables specified above, except that the insulation and the overall jacket materials shall be either FEP or PVDF.

2.6 MANUFACTURERS – WIRING CONNECTORS AND ASSOCIATED MATERIALS

A. Solderless Pressure Connectors:
1. 3M™ Company Model Scotchlok
2. Thomas & Betts Model Sta-Kon
3. Burndy Model Insulug Type TN

B. Spring Wire Connectors:
1. 3M™ Company Model Scotchlok
2. Ideal Model Wing-Nut

C. Compression Connectors:
1. 3M™ Company Model Scotchlok
2. Thomas & Betts Model Color-Keyed
3. Burndy Model Hylug

D. Tap Connectors:
1. Thomas & Betts Model Color-Keyed
2. Burndy Model Crimpit
3. Anderson Model Crimptaps

E. Watertight, Twist-On Connectors:
1. 3M™ Company Direct Bury Splice Kits
2. King Innovation "DryConn"
3. Ideal Industries, Inc. Twister DB Plus

F. Watertight, Insulated Connector Blocks:
1. Utilco Type USPA-SS, Type PSA-SS, or Type PED-SS
2. Ilsco Type USPA-SS

G. Electrical Insulating Tape:
1. 3M™ Company "Scotch" No. 33+
2. Plymouth "Premium Black"

H. High Temperature Tape:
1. 3M™ Company "Scotch" No. 70
2. Plymouth "Plysil"

I. Fireproofing Tape:
1. 3M™ Company "Scotch" No. 77
2. Plymouth No. 50

J. Woven Fiberglass Tape:
1. 3M™ Company "Scotch" No. 69
2. Plymouth "Plyglas"

K. Color Coding Tape:
1. 3M™ Company "Scotch" No. 35
2. Plymouth "Slipknot" No. 45

L. Insulating and Watertight Sealing Materials:
1. 3M™ Company "Scotchcast" kits
2. Raychem WCS Series heat shrinkable sleeves
3. 3M™ Company 8400 Series cold shrink materials
4. 3M™ Company "Scotchkote" sealant

M. Watertight Cord Grip Fittings:
1. Crouse-Hinds CGB-SG Series
2. Appleton Electric Co.
3. Thomas & Betts

N. Cable or Cord Strain Relief:
1. Hubbell-Kellems
2. Daniel Woodhead Co.

O. Cable Pulling Lubricant:
1. American Polywater "Dyna-Blue"
2. Ideal "Aqua Gel"
3. Minerallac "Golden Glide"
4. 3M™ Company "GEL"

2.7 WIRING CONNECTORS AND ASSOCIATED MATERIALS

A. All wiring connectors shall be 75°C rated and suitable for use on copper conductors.

B. Cable or cord strain reliefs shall consist of stainless steel wire mesh with support bale. Strain reliefs shall be of the split rod type where required or indicated on the Drawings.

C. Cable Pulling Lubricant:
1. Lubricant shall be UL listed and approved for use on the cable jacket or insulation.
2. Lubricant shall be polymer based and shall dry completely when exposed to air.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that mechanical work likely to damage wire and cable has been completed.

3.2 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

3.3 WIRING METHODS

A. Interior Locations:
1. Wire for general power, light, and control shall be building wire, Type THWN or Type XHHW-2 insulation, in raceway.
2. Cables for instrumentation signals shall be single or multiple pair Instrumentation Cable.

B. Exterior Locations:
1. Wire and cable for general power, light, and control for use in raceways exterior to buildings shall be building wire Type THWN or Type XHHW-2 insulation.
2. Cables for instrumentation signals shall be three or more pair Instrumentation Cable.

C. Use wiring methods indicated on Drawings.

D. Color Coding:
The color schedule for the conductor insulation of wire and cable shall conform to the following:
1. Three phase lighting and power, 208Y/120 VAC-Black, Red, Dark Blue, White or Gray, and Green ground.
2. Three phase lighting and power, 120/240 VAC-Black, Red, Orange (high leg to ground), White or Gray, and Green ground.
3. Single phase lighting and power, 120/240 VAC-Black, Red, White or Gray, and Green ground.
4. Three phase lighting and power, 480 VAC-Brown, Orange, Yellow, and Green ground.
5. Three phase lighting and power, 480Y/277 VAC-Brown, Orange, Yellow, Gray, and Green ground.
6. DC power – Red with White stripe (+) and Light Blue with White stripe (-).
7. Single conductor control, AC voltage – Red.
8. Multi-conductor control cables – ICEA Method 1.

9. Alarm, annunciator, instrumentation, graphic, and telemetering (if not shielded), AC voltage – Pink.
10. Alarm, annunciator, instrumentation, graphic, and telemetering (if not shielded), DC voltage – Light Blue.
11. Intrinsically safe circuits – Purple.
12. On wire sizes larger than Number 8 AWG and/or where authorized by the Owner, coding may be identified by taping with the appropriate colored self-adhesive vinyl color coding tape.
13. Grounding conductors shall be continuous green or bare for all systems.
14. Neutral conductors shall be continuous white or gray for all systems.

E. Wiring Connections:
1. Dry location splices and tap connections shall consist of compression connectors or tap connectors, taped to 150 percent of insulation rating of the conductors.
2. Final connections to equipment wire leads for No. 8 AWG and smaller wire in dry locations only, except 480 volt motor leads, may be made with spring wire connectors.
3. Wet and damp location splices and tap connections shall consist of compression connectors or tap connectors with insulating and watertight sealing materials; water tight, twist-on connectors for wire sizes up to three No. 10 AWG; or watertight, insulated connector blocks; providing watertight connections suitable for direct burial.
4. All conductor terminations at screw terminals shall consist of solderless pressure connectors, except where conductor terminations are included with the equipment being connected.
5. Insulation of connections in lighting fixture and high temperature equipment shall consist of silicone rubber type high temperature tape with a woven fiberglass tape over-wrap.
6. Electrical insulating tape (plastic type) shall be used on all splice and tap connections, unless wire manufacturer's recommendations require otherwise.

3.4 INSTALLATION

A. The installation of communication cables shall meet the requirements of NECA/BICSI 568-2001, Telecommunications.

B. The installation of fiber optic cables shall be per NECA/FOA 301-1997, Fiber Optic Cables, requirements.

C. All wiring shall be run in rigid metal raceway systems, unless noted otherwise.

D. Install products in accordance with manufacturer's instructions.

E. The minimum size of conductors shall be No. 12 AWG, unless specifically approved and/or shown otherwise on the Drawings.

F. Use stranded conductors for control circuits, No. 14 AWG minimum, unless shown otherwise on the Drawings.

G. Use No. 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 60 feet.

H. Use No. 8 AWG conductors for 20 ampere, 120 volt branch circuits longer than 100 feet.

I. Use No. 6 AWG conductors for 20 ampere, 120 volt branch circuits longer than 170 feet.

J. Use No. 4 AWG conductors for 20 ampere, 120 volt branch circuits longer than 270 feet.

K. Use No. 3 AWG conductors for 20 ampere, 120 volt branch circuits longer than 420 feet.

L. Where conductors or cables are to be installed in non-metallic raceway systems, the Contractor shall allow 24 hours, minimum, for all solvents to evaporate after cementing the last joint before pulling wires or cables.

M. Pull all conductors into raceway at same time. Cable pulling tensions shall not exceed manufacturer's recommended values.

N. Use suitable wire pulling lubricant for wire, No. 4 AWG and larger, and for all cables. No soap flakes, vegetable oils, clays, or grease shall be permitted in raceways.

O. Use suitable cable fittings and connectors.

P. Neatly train and lace wiring inside boxes, equipment, and panelboards. Wires and cables shall be bundled and laced as specified in Section 16 19 00.

Q. All wires and cables routed through manholes, handholes, cable vaults, large pull boxes, and terminal cabinets shall be looped to provide two to three feet (minimum) of slack within the enclosure, where practical.

R. Clean conductor surfaces before installing lugs and connectors.

S. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

T. Wire and cable shall be supported in vertical runs by insulated clamps so that wire or cable weight will not be unduly supported from conductor terminations.

U. Spade or fork tongue lugs shall not be used, except where approved by the Owner.

V. Wires and cables shall, in general, be run continuously, without splicing, from origination to termination. No splices shall be permitted in any feeder circuit, except in outlet, junction, and/or pull boxes, or where specifically noted on the Drawings. Use sufficient length of wire for connecting to equipment without straining. All methods of splicing shall meet cable manufacturer's recommendations. All splices shall be carefully placed in outlet boxes, etc. without crowding. No splicing shall be permitted in signal cables.

W. Splices and tap connections shall be made in junction boxes only; condulet type fittings shall not be used as junction boxes.

X. Wires and cables shall be installed in raceways, as indicated on the Drawings or required, and shall provide a complete and operating system.

Y. All wires and cables shall be tagged as specified in Section 16 19 50.

Z. Motor control center feeder circuits and distribution panelboard branch circuits shall each be run in individual raceways from source to motor or other load.

AA. Vertical lengths of wire and cable shall be supported as required by Article 300.19 of the National Electrical Code. Cable weight shall not be unduly supported from conductor terminations.

BB. Vertical lengths of exposed cable or cord runs over ten feet long shall be supported with a strain relief.

CC. Where an exposed run of cable or cord enters a box or enclosure, provide a watertight cord grip fitting suitable for the cable or cord diameter.

DD. All 120 VAC, single phase loads shall be connected to provide a balanced load on the lighting transformers. All 480 VAC, single phase loads shall be connected to provide a balanced load on the 480 VAC, three phase system.

EE. Make conductor length for parallel feeders identical on each phase leg.

FF. Feeders shall be connected for correct phase rotation. Where possible, busses shall be connected to result in the "A" or "X" phase being in the north, east, or top position with the other phases following in sequence. The terminals H1, H2, and H3 of transformers shall be connected to A, B, and C; 1, 2, and 3; or X, Y, and Z conductors, respectively, of incoming feeders.

GG. Final connections to motors and other machinery which may be subject to movement or vibration may consist of a loop of mineral-insulated, metal-sheathed cable (Type MI) with UL listed fittings.

3.5 INTERFACE WITH OTHER PRODUCTS

A. Identify wire and cable under provisions of Section 16 19 50.

B. Identify each conductor with its circuit number or other designation indicated on Drawings.

3.6 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Sections 01400.

B. Inspect wire and cable for physical damage and proper connection.

C. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.

D. Verify continuity of each branch circuit conductor.

E. Verify continuity of each feeder conductor.

END OF SECTION

SECTION 16 13 00

BOXES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall and ceiling outlet boxes.

B. Pull and junction boxes.

C. Wireways.

1.2 RELATED SECTIONS

A. Section 16 01 00 - General Electrical, Instrument, and Control Requirements.

B. Section 16 05 00 - Basic Electrical Materials and Methods.

C. Section 16 11 00 - Raceways.

D. Section 16 14 00 - Wiring Devices.

E. Section 16 19 00 - Supporting Devices.

F. Section 16 19 50 - Electrical Identification.

1.3 REFERENCES

A. NECA - Standard of Installation.

B. NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.

C. NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

D. NEMA OS 2 - Non-metallic Outlet Boxes, Device Boxes, Covers and Box Supports.

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

F. NFPA 70 - National Electrical Code.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings: Indicate materials, finishes, dimensions, listings, and standards compliance.

C. Product Data: Provide data for boxes, wireways, and accessories.

D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.5 SUBMITTALS FOR CLOSEOUT

A. Section 01700 - Contract Closeout: Submittals for Project closeout.

B. Record actual locations and mounting heights of outlet, pull, and junction boxes on project record documents.

1.6 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70, National Electrical Code.

B. Provide Products listed and classified by Underwriters Laboratories, Inc. or other testing firm acceptable to the authority having jurisdiction, as suitable for the purpose specified and indicated.

C. All boxes shall be sized per Article 314 of the National Electrical Code as a minimum.

PART 2 PRODUCTS

2.1 OUTLET BOXES

A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch (13 mm) male fixture studs where required.
2. Concrete Ceiling Boxes: Concrete type.

B. Non-metallic Outlet Boxes: NEMA OS 2.

C. Cast Boxes: NEMA FB 1, Type FD, cast feralloy. Provide gasketed cover by box manufacturer. Provide threaded hubs.

D. Wall Plates for Finished Areas: As specified in Section 16 14 00.

E. Covers for boxes containing wiring devices shall be as specified in Section 16 14 00.

F. Telephone outlets shall be floor mounted, single gang, FSY cast boxes or wall mounted, single gang FS cast boxes as indicated on the Drawings. All telephone outlet boxes shall be furnished with a stainless steel cover with a 3/8" bushed opening for the telephone cabling.

G. Outlet boxes for pendant mounted lighting fixtures shall be ball mount, GS or AL Series as manufactured by Appleton Electric Co. or equal.

H. Floor mounted outlet boxes shall be single gang, FSY cast boxes with appropriate covers.

2.2 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Hinged Enclosures: As specified in Section 16 16 00.

C. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:
   1. Material: Galvanized cast iron.
   2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

D. Single and two gang pull boxes and junction boxes shall be rust proof, cast metal, Type FD boxes with gasketed covers.

E. Larger boxes and raceways shall be NEMA Type 12, in indoor, above grade locations, or stainless steel NEMA Type 4 or non-metallic NEMA Type 4X with stainless steel hardware in all other locations or where indicated on the Drawings, built of Code gauge steel, with angle iron supports and braces. Cable support racks shall be provided where required. Access shall be by means of removable, gasketed screw covers fastened with machine screws.

F. NEMA Type 4X boxes shall be of corrosion resistant, high impact strength, fiberglass reinforced polyester material suitable for surface mounting. Barriers shall be provided where indicated on the Drawings or required.

G. In-line pull boxes, where shown on the Drawings, shall be Appleton Type PTC with solid gasket or equal.

H. Threaded conduit fittings with gasketed covers shall be used for all exposed conduit outlets and boxes.

I. Conduit bodies and fittings shall be of cast iron, malleable iron, and/or galvanized steel.

2.3 WIREWAYS

A. Wiring ducts shall be NEMA Type 12 galvanized steel in indoor, above grade locations; non-metallic, NEMA Type 4X in corrosive locations; or stainless steel, NEMA Type 4 in all other locations or where indicated on the Drawings. Metallic wireways shall be 14 gauge steel raceways and all wireways shall be provided with removable covers held with captive screws. All fittings shall be designed to be used with the ducts to result in an unobstructed system. The ducts and fittings shall be sized as shown on the Drawings. All hardware on stainless steel and non-metallic wiring ducts shall be made of stainless steel.

B. The wiring ducts shall be as manufactured by Keystone, Hoffman Engineering Co., B-Line, or equal.

2.4 MISCELLANEOUS COMPONENTS

A. Anti-seize, lubricating, and protective compound shall be Never-Seez as manufactured by Bostik Div. of Emhart Corp., "Dry Molybdenum Lubricant" No. 40-640 by Ideal Industries, CRC Chemicals Lectra-Shield, Crouse-Hinds HTL, Sanchem, Inc. NO-OX-ID "A Special", or equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify locations of floor boxes and outlets in all work areas prior to rough-in.

3.2 INSTALLATION

A. Install boxes in accordance with NECA "Standard of Installation."

B. Install pull boxes and junction boxes in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.

C. Pull boxes and/or junction boxes shall be used in any conduit run where a splice is required. Pull boxes shall be provided every 200 feet of straight run, every 150 feet after 90 degrees of bends, every 100 feet after 180 degrees of bends, and every 50 feet after 270 degrees of bends. More than 270 degrees worth of bends shall not be installed between pulling points in any conduit run.

D. Pull boxes, auxiliary pull fittings (slip joints), and cable raceways for the pulling, nesting, or concealment of wires or cables shall be provided where indicated on the Drawings and also where required, though not indicated, as specified above.

E. Mark or label all boxes as specified in Section 16 19 50.

F. Set wall mounted boxes at elevations to accommodate mounting heights indicated.

G. Enough room shall be supplied in boxes for insulating joints, wires, and bushings, and deep boxes shall be installed where required by the type of fixture or outlet called for on the Drawings.

H. Wire and cable splices and tap connections shall be made in junction boxes only; condulet type fittings shall not be used as junction boxes.

I. Electrical boxes are shown on Drawings in approximate locations, unless dimensioned. Adjust box location up to 8 feet, if required to accommodate intended purpose.

J. Orient boxes to accommodate wiring devices oriented as specified in Section 16 14 00.

K. Maintain headroom and present neat mechanical appearance.

L. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

M. Use flush mounting outlet box in finished areas.

N. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

O. At each concealed outlet in slabs or walls in dry locations only, a galvanized, pressed steel box of the knockout type, of not less than No. 12 B & S gauge, shall be placed and securely fastened. The conduits shall be fastened to these boxes with lock nuts, inside and outside, and bushings. All unused knockouts or holes must be left sealed.

P. Support boxes independently of conduit.

Q. Use gang box where more than one device is mounted together. Do not use sectional box.

R. Use cast outlet box in exterior locations and wet locations.

S. Set floor boxes level.

T. Wall and ceiling mounted pull and junction boxes shall be spaced 1/2 inch minimum out from the wall or ceiling using corrosion resistant channel: Unistrut; Grinnell "Power-Strut", or other approved corrosion resistant spacers.

U. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

V. The threads of all corrosive area, outdoor, and below grade equipment connections including conduit, conduit fittings, pull and junction box covers, lighting fixture reflector, guard, and outlet box connections, wiring device boxes, etc. shall be coated with an anti-seize, lubricating, and protective compound prior to final assembly.

W. Telephone outlet boxes shall be provided at each telephone location where shown on the Drawings.

3.3 ADJUSTING

A. Section 01700 - Contract Closeout: Adjusting installed work.

B. Adjust flush-mounting outlets to make front flush with finished wall material.

C. Install knockout closures in unused box openings.

3.4 CLEANING

A. Section 01700 - Contract Closeout: Cleaning installed work.

B. Clean interior of boxes to remove dust, debris, and other material.

C. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 16 14 00

WIRING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall switches.

B. Receptacles.

C. Motion Sensors.

D. Device plates and box covers.

1.2 RELATED SECTIONS

A. Section 16 01 00 - General Electrical, Instrument, and Control Requirements.

B. Section 16 05 00 - Basic Electrical Materials and Methods.

C. Section 16 13 00 - Boxes.

1.3 REFERENCES

A. NECA - Standard of Installation.

B. NEMA WD 1 - General Requirements for Wiring Devices.

C. NEMA WD 6 - Wiring Device -- Dimensional Requirements.

D. NFPA 70 - National Electrical Code.

1.4 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.

B. Product Data: Provide manufacturer's catalog information showing dimensions, materials, finishes, and configurations.

C. Submit manufacturer's installation instructions.

1.5 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Provide Products listed and classified by Underwriters Laboratories, Inc., or other testing firm acceptable to the authority having jurisdiction, as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.1 WALL SWITCHES

A. Switches for local control of 120 volt lighting shall be quiet, quick make, slow break design with totally enclosed case, flush type, single pole, toggle switches, 20 ampere capacity at 120/277 volts. Switches shall be UL listed and shall meet NEMA standard WD-1.

B. Two pole, 3-way, 4-way, and key switches shall have similar ratings.

C. Where pilot lights are indicated, provide switches as specified above plus a separate pilot receptacle with plate and bull's eye in a two gang box.

D. Lighting switches shall be Hubbell Series HBL1220, Leviton Series 1220, General Electric GE5951, Cooper Wiring Devices, or equal.

2.2 OCCUPANCY SENSORS

A. PIR Wall Switch Occupancy Sensor
1. Sensor shall recess into standard single gang wall switch box.
2. Sensor shall meet NEC grounding requirements and provide a green grounding wire.
3. Sensor shall be rated 120VAC.
4. Sensor shall be provided with a dual element passive infrared (PIR) sensor with high sensitivity to infrared to detect occupancy.
5. Sensor shall have 180 degree coverage.
6. Sensor shall have a time delay adjustment, adjustable from 30 seconds to 30 minutes. Set sensor at 15 minutes.
7. Sensor shall include mounting hardware, wall plate cover and screws. Wall plate cover color shall match sensor.
8. Sensor shall be 3-Way as indicated on Drawings.
9. Sensor shall be as manufactured by Lutron, Leviton, Legrand or equal.

2.3 RECEPTACLES

A. Duplex receptacles shall be 20 amp, 125 volt, 3 wire, grounding type, Hubbell Cat. No. HBL5362, General Electric GE5362, Cooper Wiring Devices No.5362B, or equal. Covers for general use receptacles shall be Crouse-Hinds Co. No. DS23G, Leviton 5362, Appleton Electric Co., or equal.

B. G.F.C.I. duplex receptacles shall be 20 amp, 125 volt, 3 wire, ground fault circuit interrupter type receptacles with face mounted "test" and "reset" pushbuttons and matching stainless steel cover plate. G.F.C.I. receptacles shall be Hubbell Cat. No. HBL GF-5362-I, Leviton 6898-I, General Electric GFR5362, Cooper Wiring Devices, or equal.

2.4 WALL AND COVER PLATES

A. Where switches and receptacles are installed in concealed boxes, they shall be provided with Type 302 stainless steel cover plates.

B. Where switches are installed surface mounted, they shall be installed in Type FD boxes with mounting lugs and provided with surface mounting covers. Covers shall be weatherproof where required, Crouse-Hinds No. DS181 or equal.

C. Weatherproof receptacle covers shall be raintight while in use, NEMA Type 3R rated, UL listed and marked for use in Wet Locations with plug-cap inserted, and shall be made of impact resistant, ultraviolet inhibiting polycarbonate; TayMac Corp. with deep cover, Thomas & Betts WT Series with deep lid, Intermatic Flexi-Guard Series, Carlon E9U In-Use Series, or equal.

D. Weatherproof covers for single receptacles shall be UL listed and marked for use in Wet Locations, gasketed, cast alloy with spring closed door, Hubbell No. HBL7420, Cooper Wiring Devices, or equal.

E. Padlockable cover plates for switches and/or receptacles shall be weatherproof, die-cast aluminum with gasket, Killark WCV Series or equal.

2.5 MISCELLANEOUS

A. Anti-seize, lubricating, and protective compound shall be Never-Seez as manufactured by Bostik Div. of Emhart Corp., "Dry Molybdenum Lubricant" No. 40-640 by Ideal Industries, CRC Chemicals Lectra-Shield, Crouse-Hinds HTL, Sanchem, Inc. NO-OX-ID "A Special", or equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01039 - Coordination and Meetings: Verification of existing conditions prior to beginning work.

B. Verify that outlet boxes are installed at proper height.

C. Verify that wall openings are neatly cut and will be completely covered by wall plates.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean debris from outlet boxes.

3.3 INSTALLATION

A. Install in accordance with NECA "Standard of Installation."

B. Install devices plumb and level.

C. Install switches with OFF position down.

D. Install receptacles with grounding pole on top.

E. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.

F. Where more than one switch occurs in the same location, they shall be installed in gang type boxes.

G. Duplex receptacles, shown on the Drawings outdoors, shall be mounted in weatherproof boxes and cover plates. The boxes shall be rust proof, cast metal having threaded openings for conduit connections and shall be mounted horizontally on or in the wall.

H. Receptacles in dry, indoor locations shall be installed in surface mounting, Type FD boxes with mounting lugs.

I. The threads of all outdoor equipment connections including conduit, conduit fittings, outlet box connections, wiring device boxes, cover plate screws, etc. shall be coated with an anti-seize, lubricating, and protective compound prior to final assembly.

J. See Section 16195 for nameplate, circuit number marker, wire marker, etc. requirements.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Section 16 13 00 to obtain mounting heights specified or indicated on the Drawings.

3.5 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.

B. Operate each wall switch with circuit energized and verify proper operation.

C. Verify that each receptacle device is energized.

D. Test each receptacle device for proper polarity.

E. Test each GFCI receptacle device for proper operation.

3.6 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.7 CLEANING

A. Section 01700 - Contract Closeout: Cleaning installed work.

B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 16 17 00

GROUNDING AND BONDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Grounding electrodes and conductors.

B. Equipment grounding conductors.

C. Bonding.

1.2 RELATED SECTIONS

A. Section 16 01 00 - General Electrical, Instrument, and Control Requirements.

B. Section 16 05 00 - Basic Electrical Materials and Methods.

1.3 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.4 GROUNDING ELECTRODE SYSTEM

A. Metal underground utility piping.

B. Metal frame of the building.

C. Ground loops, risers, and conductors.

D. Rod electrodes.

E. Ground mat.

1.5 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 5 ohms.

1.6 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Provide data for grounding electrodes and connections.

C. Test Reports: Indicate facility's overall resistance to ground.

D. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation and installation of exothermic connectors.

1.7 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01700.

B. Accurately record actual locations of grounding electrodes.

1.8 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. or other testing firm acceptable to authority having jurisdiction, as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.1 MECHANICAL CONNECTORS

A. All compression connectors, lugs, etc., used in grounding circuits in any location shall have bolts, nuts, etc., of silicon bronze alloy equal to "Everdur" metal. Grounding connections, clamps, etc., shall be as manufactured by Burndy Engineering Company, Thomas and Betts Company, Delta-Star Electric Company, Harger, or equal.

B. Fittings for bonding a grounding conductor to metallic conduit shall be Thomas and Betts Series 3900BU or equal. Fittings for bonding a grounding conductor to its own conduit shall be Burndy Engineering Company GAR-BU Series, Thomas and Betts Series 3900, Harger, or equal.

C. Where connections to ground rods or ground mats must be disconnected for testing, the fittings shall be Burndy Engineering Co. Type GD, GG, GAR; Thomas and Betts Co. Series 3902BU; Harger; or equal.

2.2 CONDUCTORS

A. Grounding conductors, loops, and risers shall be bare, stranded, soft-drawn copper and shall be of the sizes indicated on Drawings.

B. All bonding jumpers shall be copper and of a cross-sectional area at least equal to their corresponding grounding conductors.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.2 INSTALLATION

A. Install Products in accordance with manufacturer's instructions.

B. Install rod electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground. Rod electrodes shall be driven into undisturbed earth or engineered backfill only.

C. Provide bonding to meet Regulatory Requirements.

D. The non-current carrying parts of all electrical equipment installed under this Contract, including but not limited to raceways, raceway supports, and equipment enclosures, shall be bonded by means of bare copper cable or copper strap to the grounding system as shown on the Drawings and specified hereinafter.

E. All exposed, including painted or coated, structural and architectural metal shall be bonded to the grounding system or rigidly secured to and in good electrical contact with grounded metal.

F. All grounding cables, bus, etc., in locations where subject to mechanical damage, shall be protected by rigid metal conduit, steel guards, non-metallic conduit, or other suitable shield. In all cases, where conduit or other metallic encasement of grounding conductors is required, the conductor shall be permanently and effectively grounded to the enclosure at both ends of its length. This requirement applies to all such enclosures regardless of their length.

G. Where grounding conductors pass through floor slabs, building walls, etc., and are not encased in the concrete pour, sleeves of rigid metal conduit or non-metallic conduit of the required size, shape, and length shall be provided with both ends of the sleeve sealed with duct seal after installation of the grounding conductor.

H. Where attached to equipment, conduits, cabinets, etc., suitable approved solderless lugs, compression connectors, or clamps shall be used. No soldered connections shall be used on grounding circuits at any point.

I. Where a grounding cable is to be bonded to structural or architectural metal, the exact location of each bond shall be approved by the Owner. The location of such grounding connections shall be at points where they will not be subject to mechanical damage and, if possible, shall be accessible for inspection.

J. Where welding to steel is prohibited, the grounding conductor shall be bolted directly to the steel as approved by the Owner. The contact surfaces of all bolted connections shall be thoroughly cleaned and coated with Alcoa No. 2 Electrical Joint Compound or equal.

K. Taps and splices in grounding cables and connections to ground rods shall be made by an exothermic weld process.

L. All metal ducts, conduits, starters, panels, switches, etc., which are not rigidly secured to and in good electrical contact with the grounded structural metal frame of the building or grounded conduit system, or which are subject to excessive vibration and loosened ground contacts, shall be securely bonded to grounded building steel or to

the grounded conduit system by means of stranded copper jumpers. This jumper shall have a circular-mil cross section of not less than 50 percent of that of the largest conductor entering the enclosure being grounded, with a minimum size of No. 8 AWG stranded copper being used in any jumper.

M. Conduits which run to boxes or cabinets having concentric or eccentric knockouts which partially perforate the metal around the conduit and impair the electrical connection to ground shall be provided with approved bonding jumpers. Jumpers shall consist of a stranded, braided copper wire at least No. 8 AWG with solderless indent type lugs. Jumper shall be connected from a grounding type locknut or bushing on the conduit inside the box to a stud or silicon bronze alloy bolt in the cabinet frame.

N. All metal support racks for electrical equipment and enclosures shall be securely bonded to grounded building steel or the grounding system with a No. 2 AWG grounding conductor.

O. A copper ground conductor shall be carried for each power, lighting at 120 volts and higher, and receptacle circuit with the circuit conductors. The ground conductor shall have the same type insulation as the circuit conductors and shall be green in color through No. 10 AWG and bare copper wire for larger sizes.

P. Motor control center grounding shall consist of ground connections to feeder conduits, ground busses, etc. as required or as indicated on the Drawings.

Q. Splices in wire or cable ground leads shall not be permitted.

3.3 FIELD QUALITY CONTROL

A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

END OF SECTION

SECTION 16 19 00

SUPPORTING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Conduit and equipment supports.

B. Anchors and fasteners.

1.2 REFERENCES

A. NECA - National Electrical Contractors Association.

B. ANSI/NFPA 70 - National Electrical Code.

1.3 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data: Provide manufacturer's catalog data for fastening systems.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. or other testing firm acceptable to authority having jurisdiction, as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.1 PRODUCT REQUIREMENTS

A. Materials and Finishes: Provide adequate corrosion resistance.

B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.

C. Conduit and equipment supports and hangers shall be made of galvanized structural steel, with welded or bolted joints. Conduit and equipment supports and hangers

shall be fabricated from "Unistrut" Series P1000 galvanized channels and fittings, as manufactured by the Unistrut Products Company, Superstrut A-1200 Series, Grinnell "Power-Strut" PS-200, or equal.

D. All conduit and equipment supports, hangers, beam clamps (no "C" clamps shall be allowed), and other similar devices made of steel shall be hot dipped galvanized or sherardized after fabrication. All hanger rods, U-bolts, bolts, nuts, and other threaded support components shall be electro-galvanized (per ASTM-B633 Type III SC1) or sherardized. Field cuts and all welds shall be coated with an approved cold or hot galvanizing compound: Z.R.C., CRC Chemicals Zinc-It, or equal. All hanger rods shall be 3/8 inch diameter minimum. All such hardware shall be factory encased with polyvinyl chloride (PVC) of minimum .040 inch (40 mil) thickness where indicated on the Drawings and where indicated elsewhere in Division 16. All touch-up required in the field shall be in strict accordance with the manufacturer's printed instructions.

E. Concrete inserts shall be of the continuous channel or spot type. The channel type shall be No. 12 gauge steel with integral anchors, Super Strut No. C-302, Kindorf No. D-990, or equal. Spot inserts shall be Super Strut No. 452, Kindorf No. D-255, or equal.

F. Threaded anchors for use in concrete shall be self-drilling type expansion anchors made of case hardened and drawn carburized steel. The anchors and expander plugs shall be furnished with a rustproof finish. The expansion anchors shall be concrete fasteners as manufactured by the ITW "Red Head", Ideal Industries Co., or equal.

G. Threaded anchors for heavy loads (i.e.: panels, disconnect switches) supported from masonry or precast concrete panels shall be epoxy based adhesive anchors with threaded rod and screen tube. Adhesives shall match the application, as recommended by the anchor manufacturer. Threaded rods, nuts, and washers shall be furnished with a rustproof finish. Adhesive anchors shall be Hilti Type HIT or equal.

H. Anchors for light loads (i.e.: conduit clamps, outlet boxes, small pull and junction boxes) supported from masonry or precast concrete panels shall be lead type or plastic expansion anchors with corrosion resistant screws.

I. Threaded rods, nuts, washers, screws, and bolts for anchors used in in corrosive areas shall be made of 316 stainless steel. Also expansion anchors for light loads used in masonry or precast concrete panels in these areas shall be plastic only.

J. Anti-seize, lubricating, and protective compound shall be Never-Seez as manufactured by Bostik Div. of Emhart Corp., "Dry Molybdenum Lubricant" No. 40-640 by Ideal Industries, CRC Chemicals Lectra-Shield, Crouse-Hinds HTL, Sanchem, Inc. NO-OX-ID “A Special”, or equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's instructions. Tighten all bolted connections to manufacturer’s recommended torque values with compensation for

lubricated threads (anti-seize, lubricating and protective compound applied) to avoid over-torqueing.

B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".

C. Do not anchor supports from pipes, ducts, mechanical equipment, or conduit.

D. Do not use spring steel clips and clamps.

E. Obtain permission from Architect/Engineer before using powder-actuated anchors.

F. Obtain permission from Architect/Engineer before drilling or cutting structural members.

G. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

H. Install surface-mounted cabinets and panelboards with minimum of four anchors.

I. All electrical enclosures, including raceways, boxes, panelboards, motor control equipment, etc., shall be securely attached to the building or structure walls by means of concrete inserts or expansion anchors, unless indicated as rack mounted on the Drawings or of free standing design. Unless otherwise indicated, all electrical enclosures, except conduit and outlet boxes, shall be spaced at least 1/2 inch from the wall or ceiling with Unistrut, Grinnell "Power-Strut", or equal.

J. The use of wood plugs for anchoring raceways, cabinets, enclosures, or equipment to concrete or masonry will not be permitted.

K. The Contractor shall provide and install, where required, the additional steel to adequately support all conduits, boxes, and all other electrical equipment.

L. All wires and cables shall be laced when entering or leaving pull or junction boxes and at each termination. Wires and cables shall be laced so that the wires of the individual circuits are laced together by circuit. All wiring entering and exiting electrical enclosures shall be bundled into groups. Power, lighting, control, alarm, and instrumentation wiring shall be bundled and laced as specified herein.

M. The threads of all outdoor and support connections shall be coated with an anti-seize, lubricating, and protective compound prior to final assembly.

END OF SECTION

SECTION 16 19 50

ELECTRICAL IDENTIFICATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Nameplates and labels.

B. Wire and cable markers.

C. Conduit markers.

1.2 RELATED SECTIONS

A. Section 099100 – Paints.

1.3 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Provide catalog data for nameplates, labels, signs, diagrams, and markers.

C. Submit schedule of proposed equipment labels.

D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under regulatory requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.5 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

PART 2 PRODUCTS

2.1 NAMEPLATES AND LABELS

A. The nameplates shall be 1 1/4" high by 3 1/2" wide (minimum), except pushbutton and selector switch stations and other enclosures where space is limited may have smaller plates of suitable size and shall be attached to the equipment by means of corrosion resistant screws. Nameplates may be attached to equipment located in dry, interior areas by means of pressure sensitive, firm acrylic adhesive tape, 3M "Scotch" No. 468

or equal. The plates shall be white laminated plastic with engraved black letters approximately 3/32" thick with beveled edges. Engraved letters shall be 1/8" high (minimum), block type.

B. Circuit number markers shall consist of self-adhesive vinyl cloth or polyvinyl fluoride film markers with 1/8" high (minimum), black lettering on a yellow background, W. H. Brady Co. 3410 Series, Ideal Industries 44-500 Series and 44-600 Series, or equal. Circuit number markers may also consist of computer generated, vinyl cloth, permanent, non-smearing, self-adhesive markers such as Brady Datab, BradyMarker XC Plus, 3M Scotchcode SCS or STS, or equal. Circuit number markers for panelboard circuit breakers may be the manufacturer's standard.

2.2 WIRE MARKERS

A. Wire and cable tags for use in large pull boxes, large junction boxes shall be made of minimum 1/8" thick white laminated plastic, 1-1/4" by 3-1/2", with black engraved identification in letters 3/64" deep by 3/16" high minimum. Tags shall be drilled at each end and secured twice to each cable by 3/32" minimum diameter polyethylene cord. Tags shall be engraved with the circuit number, equipment served, and associated nominal voltage level.

B. Wire and cable number tags for use in pull or junction boxes and at termination points shall be computer generated, vinyl cloth, permanent, non-smearing, self-adhesive markers such as Brady Datab, Brady Marker XC Plus, or 3M Scotchcode. Pre-printed, vinyl cloth, plastic coated, self-adhesive, tape markers as manufactured by W. H. Brady Co. or 3M Company shall also be acceptable.

PART 3 EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive nameplates and labels.

3.2 INSTALLATION

A. Nameplates shall be installed on the doors or covers of all panels, panelboards, starters, contactors, relays, control devices, signaling devices, and all other electrical equipment furnished under this Contract, except remote mounted pushbutton and selector switch stations, mounted adjacent to identified and associated disconnect switches or other control devices, need not be identified as described herein.

B. Nameplate engraving for equipment and devices associated with motor control center, motor starters, panelboard, or control panel circuits shall match the engraving indicated in schedules on the Drawings, except nameplates for spare units and devices shall be furnished blank. All other nameplates shall be engraved as follows and shall be included on nameplate schedules submitted to the Owner for approval:
1. First Line - Process description, equipment served, or area served (if applicable).
2. Second Line - Equipment or device description.
3. Third Line - Equipment or device designation number and power source circuit number.

4. Abbreviations shall be used only where full wording will not fit. See the Drawings for nameplate details.

C. All devices and equipment powered from lighting panelboards shall be marked with the appropriate circuit number(s). Lighting circuits shall be identified on switch cover plates, receptacles on cover plates, and other devices on enclosure door or on associated disconnect switch door or cover.

D. All pull boxes shall be marked with the type of system within them, i.e.: 480V power, alarm, 120V control, etc.

E. All wires and cables within control panels, motor starters, motor control centers, terminal boxes, etc. shall be tagged at each termination.

F. The wires and cables of each circuit in pull boxes and junction boxes larger than 12" by 12" by 8" shall be bundled together, neatly arranged, and clearly identified with a tag secured with polyethylene cabling twine indicating circuit number, equipment served, and nominal voltage level.

G. A system shall be developed and submitted to prevent duplication of wire numbers for all wiring external to equipment. Equipment numbers or designations may be used as prefixes. Interconnecting diagrams shall clearly show wire numbers, originating terminal numbers, and destination terminal numbers.

H. All enclosures, panels, boxes, and devices containing electrical components and circuits with exposed, energized parts when the door is open, shall have an arc flash and shock hazard warning label affixed to the door. All label blank fields shall be filled in with permanent markers.

I. Label or otherwise clearly identify all panelboard branch circuit breakers feeding emergency lighting and exit fixtures as required by National Electrical Code Article 700.12(E).

END OF SECTION

SECTION 16 44 10

ENCLOSED SWITCHES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-fusible disconnect switches.

1.2 RELATED SECTIONS

A. Section 16 01 00 - General Electrical, Instrument, and Control Requirements.

B. Section 16 05 00 - Basic Electrical Materials and Methods.

C. Section 16 13 00 - Boxes.

D. Section 16 17 00 - Grounding and Bonding.

E. Section 16 19 00 - Supporting Devices.

F. Section 16 19 50 - Electrical Identification.

1.3 REFERENCES

A. NEMA KS 1 - Enclosed Switches.

B. NFPA 70 - National Electrical Code.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Provide switch ratings and enclosure dimensions.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of Installation.

1.6 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc., or other testing firm acceptable to authority having jurisdiction, as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.1 DISCONNECT SWITCHES

A. 600 volt rated, NEMA Type 4X S.S. enclosed disconnect switches shall be Hubbell, Robroy, or Carlon.

B. Non-fused disconnect switches for 120 VAC, 240 VAC, or 208 VAC single phase loads and fractional horsepower motors shall be similar to 2 pole manual motor starters, except without overloads, Square D Class 2510, Eaton Cutler-Hammer, or equal. Enclosures for switches installed in corrosive areas shall be non-metallic, corrosion resistant, FD type boxes with weatherproof, corrosion resistant, flexible silicone rubber, bubble type covers; Pass & Seymour No. 4517, Hubbell No. HBLDS3, or equal. Enclosures for all other areas shall be FD type boxes with padlock type covers.

C. Auxiliary interlocks shall be provided where shown on the Drawings.

D. All disconnect switches shall have provisions for padlocking in either the "On" or "Off" positions and all terminals or lugs shall be 75°C rated for copper conductors.

E. Enclosures shall be NEMA Type 4X S.S. indicated on the Drawings.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install disconnect switches where indicated.

B. Provide heavy duty, 3 pole, 600 volt, non-fused disconnect switches through 100 amperes at locations indicated or as required.

C. NEMA Type 4 and Type 4X enclosures in other than corrosive areas shall be equipped with a combination drain and breather. The drain shall be mounted on a bolt-on, gasketed hub.

D. See Section 16 19 50 for nameplate, circuit number marker, labeling, etc. requirements.

END OF SECTION

SECTION 16 47 00

PANELBOARDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Modifications to existing panelboards.

1.2 RELATED SECTIONS

A. Section 16 01 00 – General Electrical, Instrument, and Control Requirements.

B. Section 16 05 00 – Basic Electrical Materials and Methods.

C. Section 16 19 00 – Supporting Devices.

D. Section 16 19 50 – Electrical Identification: Engraved nameplates.

1.3 REFERENCES

A. NECA (National Electrical Contractors Association) "Standard of Installation."

B. NEMA AB 1 – Molded Case Circuit Breakers.

C. NEMA PB 1 – Panelboards.

D. NEMA PB 1.1 – Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or less.

E. NFPA 70 – National Electrical Code.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker arrangement and sizes.

C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.5 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01700.

B. Record actual locations of Products; indicate actual branch circuit arrangement.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 01700.

B. Maintenance Data: Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.7 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of Installation.

1.8 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc., or other testing firm acceptable to authority having jurisdiction, as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.1 MODIFICATIONS TO EXISTING PANELBOARDS

A. Where indicated on the Drawings, provide modifications to existing panelboards as required. The panelboards shall be modified by the addition of new devices, connections to existing devices, and/or disconnection from existing devices.

B. Circuit breakers for addition to existing panelboards shall be the panelboard manufacturer's compatible replacement parts and shall match the panelboards existing breaker interrupting ratings. Breaker trip ratings and number of poles shall be as indicated on the Drawings.

C. Existing receptacle panels are General Electric 120/208 volt, 3 phase, 4 wire panelboards.

D. Existing lighting panels are General Electric 277/480 volt, 3 phase, 4 wire panelboards.

PART 3 EXECUTION

3.1 INSTALLATION

A. Provide filler plates for unused spaces in panelboards.

B. Revise directory to reflect circuiting changes required to balance phase loads.

C. All panelboard circuit breakers or switches shall have a circuit number marker on or adjacent to the breaker or switch.

D. Provide engraved plastic nameplates and circuit number markers under the provisions of Section 16 19 50.

3.2 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Sections 01400.

B. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

C. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers and lugs.

END OF SECTION

SECTION 16 48 10

ENCLOSED MOTOR CONTROLLERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Manual motor starters.

B. Magnetic motor starters.

C. Combination magnetic motor starters.

1.2 RELATED SECTIONS

A. Section 16 01 00 - General Electrical, Instrument, and Control Requirements.

B. Section 16 05 00 - Basic Electrical Materials and Methods.

C. Section 16 19 00 - Supporting Devices.

D. Section 16 19 50 - Electrical Identification: Engraved nameplates.

1.3 REFERENCES

A. NFPA 70 - National Electrical Code.

B. UL 198C - High-Interrupting Capacity Fuses; Current Limiting Type.

C. UL 198E - Class R Fuses.

D. NECA "Standard of Installation," published by National Electrical Contractors Association.

E. NEMA AB 1 - Molded Case Circuit Breakers.

F. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.

G. NEMA ICS 6 - Enclosures for Industrial Controls and Systems.

H. NEMA KS 1 - Enclosed Switches.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Provide catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions, and enclosure details.

C. Test Reports: Indicate field test and inspection procedures and test results.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of Installation.

1.6 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. or other testing firm acceptable to authority having jurisdiction, as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.1 MAGNETIC MOTOR STARTERS

A. Full voltage starters shall be combination motor circuit protector type, unless otherwise noted, and motor starter complete with three pole, ambient compensating overload relays, and control circuit transformer. Starters shall be equipped with a spare auxiliary contact in addition to those shown on the Drawings, shall be minimum NEMA Size 1, and shall have 120 volt coils.

B. Two speed starters shall consist of fast and slow contactors in combination with a motor circuit protector and with three pole, ambient compensating overload relays for each winding, and other devices similar to those specified for full voltage starters above. The contactors shall each be equipped with a spare auxiliary contact in addition to those shown on the Drawings, shall be NEMA Size 1 minimum, and shall have 120 volt coils. Control transformer, control (auxiliary) relays, selector switches, indicating lights, and other control devices shall be provided as indicated on the Drawings and shall be as specified hereinafter.

C. Where indicated on the Drawings, starters shall include ground fault protective devices. The ground fault protective devices shall include a current transformer, a ground fault relay, and test circuit and shall be suitable for interrupting the starter control circuit. Ground fault monitoring and test devices shall be mounted on the starter door and shall include a trip indicator, a manual reset button, and a test button. Testing with or without tripping shall be possible.

D. Starters shall be electrically operated and held type, three pole assemblies with coil, contact assemblies, and integral overload protection. Coil shall be warranted for life.

E. Motor overload protection shall consist of a thermal overload relay of the three pole, ambient compensating, manual reset, and solid state type.

F. Solid state motor overload protection shall include time-current characteristics and shall be field selectable or adjustable. Accuracy shall be within 2%. Solid state overloads shall monitor three phase motor current utilizing three current sensors. The trip Class 10, 20, and 30 shall be field selectable and provide 10, 20, or 30 second delay at six times the full load running protection respectively. Solid state overloads shall be manually reset with the ability to convert to automatic reset in the field. Overload relay shall have two outputs: 1) an alarm indicator indicating motor is running in overload and, 2) an overload trip indicator.

G. Oiltight pushbutton and selector switches and push-to-test, transformer type, indicating lights shall be provided as indicated on the Drawings. Control devices mounted on doors of NEMA Type 4 enclosed starters shall be NEMA Type 4 rated. All starters with manual reset overload relays shall have an external overload reset pushbutton mounted on the enclosure door.

H. Control circuit transformers shall have fused primary windings and 120 volt, fused, and grounded secondary windings. Control circuit transformers shall have extra capacity where required to carry connected loads.

I. All unit line and load terminals or lugs shall be 75°C rated for copper conductors. Terminal boards or blocks shall be provided for all external connections and shall be readily accessible from the front of the starter enclosure. All wiring to external devices shall be terminated at the terminal blocks, excluding incoming power feeders and motor leads. All wires and terminals shall be tagged to agree with schematic and wiring diagrams.

J. Each starter shall have a reduced size, approved, “as-built,” schematic wiring diagram, in ladder diagram format, inside each unit, indicating all internal components and wiring terminal strip connections, all 480 V. power wiring, all 120 V. control and power wiring, all instrument wiring, and all external components and wiring (shown dotted). Wiring diagrams shall have a plasticized coating to protect them from dirt, heat, and normal wear and tear.

K. Motor starters shall be Eaton Cutler-Hammer A200 Series, Allen-Bradley Bulletin 500 Line, or Square D.

2.2 MANUAL MOTOR STARTERS

A. The manual motor starters shall be of the toggle switch, "On-Off" type, and shall be horsepower rated with thermal overloads. The starters shall be three pole and the enclosures shall be NEMA Type 1. Where shown on the Drawings they shall be provided with a pilot lamp and/or a "Hand-Off-Automatic" selector switch (NEMA Type 1 enclosed only).

B. The starters shall be Type MS as manufactured by Eaton Cutler-Hammer, Square D by Schneider Electric Type 2510, or equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Provide motor starters for each motor not provided for by others or controlled by starters in motor control centers.

B. The Contractor shall verify all motor horsepowers prior to procurement of starters and installation of motor wiring.

C. Install enclosed controllers where indicated, in accordance with manufacturer's instructions.

D. Install enclosed controllers plumb. Provide supports in accordance with Section 16 19 00.

E. Height: 5 ft. (1.6 M) to operating handle or as indicated on the Drawings.

F. Install fuses in fusible switches.

G. Select and install overload heater elements or set solid state overload relays in motor controllers to match installed motor characteristics.

H. All device settings shall be provided and installed by the device supplier, based on equipment operating and protection requirements. Submit for Owner approval prior to implementation. All as-built settings shall be included in supplied O&M manuals.

I. Provide engraved plastic nameplates under the provisions of Section 16 19 50.

J. Provide neatly typed label inside each motor controller door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.

K. NEMA Type 4 and Type 4X enclosures in other than corrosive areas shall be equipped with a combination drain and breather. The drain shall be mounted on a bolt-on, gasketed hub. Combination drain and breather shall be Crouse-Hinds ECD Combination Series, Appleton, or equal.

L. Arc flash and shock hazard warning labels shall be provided on the door of each contactor and starter enclosure and shall be marked as specified in Section 16 19 50.

3.2 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Sections 01400.

B. Inspect and test each enclosed controller to NEMA ICS 2.

END OF SECTION

SECTION 16 48 20

MOTOR CONTROL CENTERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Modifications to existing motor control centers.

1.2 RELATED SECTIONS

A. Section 16 01 00 - General Electrical, Instrument, and Control Requirements.

B. Section 16 05 00 - Basic Electrical Materials and Methods.

C. Section 16 19 50 - Electrical Identification: Engraved nameplates.

1.3 REFERENCES

A. NFPA 70 - National Electrical Code.

B. UL 198C - High-Interrupting Capacity Fuses; Current Limiting Type.

C. UL 198E - Class R Fuses.

D. NECA 402-2014 – Motor Control Centers (ANSI).

E. NEMA AB 1 - Molded Case Circuit Breakers.

F. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.

G. NEMA ICS 2.3 - Instructions for the Handling, Installation, Operation, and Maintenance of Motor Control Centers.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings: Include front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars per phase, neutral, and ground; electrical characteristics including voltage, frame size and trip ratings, withstand ratings, and time/current curves of all equipment and components.

C. Wiring diagrams shall be provided as specified under Section 16 01 00.

D. Test Reports: Indicate field test and inspection procedures and test results.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.5 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 01700.

B. Maintenance Data: Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NEMA ICS 2.3.

1.7 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. or other testing firm acceptable to authority having jurisdiction, as suitable for purpose specified and shown.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 01600.

B. Deliver in shipping splits, individually wrapped for protection, and mounted on shipping skids.

C. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

D. Handle in accordance with NEMA ICS 2.3. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to motor control center components, enclosure, and finish.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Conform to NEMA ICS 2 service conditions during and after installation of motor control centers.

1.10 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on the Drawings.

PART 2 PRODUCTS

2.1 MODIFICATIONS TO EXISTING MOTOR CONTROL CENTERS

A. The existing motor control centers shall be modified by the addition of new devices and by wiring revisions as shown on the Drawings.

B. Added motor overload protection shall consist of a UL 508 solid-state overload relay for protection of the motors. The relay shall be Eaton-Cutler-Hammer type CEP7 or approved equal. The overload relay shall be self-powered and provide high accuracy through the use of state-of-the-art microelectronic packaging technology. The relay shall be suitable for application with NEMA Size 1 through Size 7 motor starters. The overload relay shall have the following features:
1. Class 10 or 20 fixed tripping characteristics
2. Manual or automatic reset
3. Phase loss protection. The relay shall trip in 2 seconds or less under phase loss condition when applied to a fully-loaded motor
4. Visible trip indication
5. One NO and one NC isolated auxiliary contact
6. Test button that operates the normally closed contact
7. Test trip function that trips both the NO and NC contacts
8. A current adjustment range of 3.2:1 or greater
9. Ambient temperature compensated
10. Ground fault protection. Relay shall trip at 50% of full load ampere setting

C. Devices on the front of unit shall be mounted as part of the removable unit.

D. Nameplates shall be installed on the door of each unit and shall be attached by means of corrosion resistant screws. The plates shall be 1-1/4" high by 3-1/2" wide (minimum), white laminated plastic with engraved black letters. Letters shall be 1/8" high (minimum), block type. Nameplate engraving shall be as indicated in schedules on the Drawings, except nameplates for spare units shall be furnished blank. See the Drawings for nameplate details.

E. All equipment devices mounted within the units shall be identified as to function and schematic identification abbreviation. Identification plates shall be 1" by 3" engraved white lamicoid with black letters, attached with corrosion resistant screws.

F. Branch feeder protection shall be thermal magnetic, molded case, circuit breakers of frame and ratings sizes as indicated on the Drawings and with interrupting capacity to match that of existing circuit breakers in the motor control center.

G. The number and size of starters and branch feeder circuit breakers added to each motor control center shall be as indicated on the Drawings and shall fit into the space shown.

H. Each added or modified circuit breaker shall have a reduced size, approved, "as-built," schematic wiring diagram, in ladder diagram format, inside each unit, indicating all internal components and wiring terminal strip connections, all 480 volt power wiring, all 120 volt control and power wiring, all instrument wiring , and all external components and wiring (shown dotted). Wiring diagrams shall have a plasticized coating to protect them from dirt, heat, and normal wear and tear.

I. Terminal blocks shall be installed, where required, to provide terminal block connections for all wiring to devices external to the motor control centers. All power feeder terminals or lugs shall be 75°C rated for copper conductors. Terminal blocks for control and alarm connections shall match the existing terminal blocks or shall be Allen-Bradley Types CA-1, CA-3, or CD-8; Square D Co.; or equal.

J. Wire for control and alarm wiring revisions within the motor control centers shall be No. 14 AWG minimum, Type MTW, 60°C. All wiring installed within a motor control center, which is powered from sources external to the MCC, shall be color coded yellow.

K. All door mounted control devices shall be furnished with anti-rotation keyways or other device to prevent slewing after mounting. Existing motor control centers are Eaton Freedom 2100 Series.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify conditions under the provisions of Section 01039.

B. Verify that area is suitable for motor control center installation.

3.2 INSTALLATION

A. Install motor control center components in accordance with manufacturer's instructions and per NECA 402-2014 Standards.

B. Tighten accessible bus connections and mechanical fasteners after placing motor control center.

C. Select and install heater elements or set solid state overload relays in motor starters to match installed motor characteristics. The Contractor shall assume full responsibility for the selection and installation of the proper rating of thermal heater elements or the settings on solid state overload relays in all motor starters to which the Contractor makes the feeder connections and/or completely wires.

D. Provide labels and engraved plastic nameplates under the provisions of Section 16 19 50.

E. Motor Data: Provide neatly typed label inside each motor starter door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.

F. Arc flash and shock hazard warning labels shall be provided on an upper door of each vertical section and shall be marked as specified in Section 16 19 50.

3.3 FIELD QUALITY CONTROL

A. Field inspection and testing shall be performed under provisions of Sections 01400.

B. Inspect and test motor control center and each added controller to NEMA ICS 2.

END OF SECTION

SEC. 2-334.1.

LABOR HARMONY THROUGH PREVAILING WAGE AND BENEFITS FOR CITY PROJECTS.

(a) ***Definitions:***

City project means new construction, alteration, repair, installation, painting, decorating, completing, demolition, conditioning, reconditioning, or improvement of public roads, land either owned by the city or under the direction and control of the city, public buildings or public facilities authorized by a contracting agent, the cost of which is clearly anticipated to be in excess of fifty thousand dollars ($50,000.00). "City project" shall not include work done pursuant to any collective bargaining agreement between the city and its employees.

Construction mechanic means a skilled or unskilled mechanic, laborer, worker, helper, assistant, apprentice, journeyman or other professional designation working on a city project, but shall not include executive, administrative, professional, office or custodial employees.

Contracting agent means any officer, board, commission or authority of the city authorized to enter into a contract for a city project, or to perform a city project by the direct employment of labor.

(b) ***Requirements:***

(1) Every contract for a city project which is executed between a contracting agent and a successful bidder or an approved responder to a request for proposal for a city project, entered into pursuant to a request for proposal advertisement and/or an invitation to bid for that city project, which requires or involves the employment of construction mechanics, and which is owned, controlled or financed, in whole or in part, by the city, shall contain an express term that the rates of wages and benefits to be paid to each class of mechanics by the bidder and all of his or her Subcontractors shall be not less than the wage and benefits rate prevailing on similar projects in the city. The city's department of public service shall determine the prevailing wage at the rate established by the most recent survey of the Michigan Department of Consumer and Industry Services for prevailing wage determination under Act 166 of the Public Acts of 1965, as amended.

(2) A schedule of the prevailing wage and benefits for the classes of construction mechanics called for in a contract shall be made a part of the specifications for the work to be performed on a city project and shall be printed in the contract forms where work is to be done by contract.

(3) Every Contractor and Subcontractor on a city project shall keep posted in a conspicuous place on the construction site a copy of all prevailing wage and fringe benefit rates prescribed by the contract and shall keep accurate records showing the name, occupation, and actual wages and benefits paid to each construction mechanic employed by him or her in connection with said contract. This record shall be made available on demand for inspection by the contracting agent or the city.

(4) Contract specifications may include, when appropriate, a requirement that the successful bidder shall enter into a project labor agreement with the Greater Detroit Building and Construction Trades Council, AFL-CIO, and its affiliated unions for the development and construction of the project.

(5) The contracting agent, by written notice to the Contractor and the sureties of the Contractor known to the contracting agent, shall terminate the Contractor's right to proceed with that part of the contract and city project for which less than the prevailing rates of wages and benefits have been paid or will be paid, and may proceed to complete the contract by separate agreement with another Contractor. The contracting agent shall withhold payment for work done until liabilities for unpaid wages and excess costs to the city for reletting the work have been met.

(6) In addition to any penalty provisions provided for in this section, any Contractor found to be in volition of this section by any contracting agent shall be prohibited for two (2) years from bidding on any city project, regardless of the anticipated cost of the contract to be bid.

(c) Exemption. The requirements set forth in this section will not apply to a project or contract of the City of Warren, or any of its authorities, agencies or departments, including those authorities, agencies and departments created by the City of Warren under statutes of the State of Michigan, if that project or contract is subject to an exemption from labor standards or prevailing wage requirements under federal or state laws or regulations.

(d) Retroactivity. The provisions of this section shall not apply to contracts entered into or the bids made before the effective date of this section, or the effective date of an amendment to this section.

(Ord. No. 80-519, § 1, 9-23-97; Ord. No. 80-684, § 1, 3-9-10)

Editor's note—

Ord. No. 80-519, § 1, adopted Sept. 23, 1997 amended ch. 2 by the addition of a new section 2-334.2, which provisions have been redesignated at the editor's discretion as section 2-334.1

APPENDIX B: GENERAL WAGE DECISION

"General Decision Number: MI20210091 12/17/2021

Superseded General Decision Number: MI20200091
State: Michigan
Construction Type: Building
County: Macomb County in Michigan.
BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.95 for calendar year 2021 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.95 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2021. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate,if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/01/2021
1	01/15/2021
2	01/29/2021
3	02/26/2021
4	04/30/2021
5	07/02/2021
6	08/13/2021
7	08/20/2021
8	09/10/2021
9	09/17/2021
10	10/01/2021
11	10/22/2021
12	10/29/2021
13	11/12/2021
14	12/17/2021

ASBE0025-002 06/01/2021

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR	$ 35.41	32.91

BOIL0169-001 01/01/2021

	Rates	Fringes
BOILERMAKER	$ 35.95	34.52

BRMI0001-001 06/01/2020

	Rates	Fringes
BRICKLAYER	$ 36.24	22.74
TILE FINISHER	$ 28.58	20.45
TILE SETTER	$ 35.71	20.45

CARP0687-003 06/01/2021

	Rates	Fringes
CARPENTER (Including Acoustical Ceiling Installation, Drywall Hanging, Form Work, Metal Stud Installation & Scaffold Building)	$ 35.16	29.22

CARP1045-001 06/01/2020

	Rates	Fringes
CARPENTER (Floor Layer - Carpet, Resilient, & Vinyl Flooring)	$ 30.60	24.58

CARP1102-002 06/01/2020

	Rates	Fringes
MILLWRIGHT	$ 35.30	34.10

ELEC0058-001 07/21/2021

	Rates	Fringes
ELECTRICIAN (Low Voltage Wiring and Installation of Alarms)		
Installer	$ 30.12	14.57
Technician	$ 37.62	14.80
ELECTRICIAN	$ 45.17	26.01

ELEV0036-002 01/01/2021

	Rates	Fringes
ELEVATOR MECHANIC	$ 55.46	36.365+a+b

ENGI0324-017 06/01/2021

	Rates	Fringes
OPERATOR: Power Equipment		
GROUP 1	$ 44.69	24.95
GROUP 2	$ 43.19	24.95
GROUP 3	$ 41.69	24.95
GROUP 4	$ 41.39	24.95
GROUP 5	$ 40.57	24.95
GROUP 6	$ 39.71	24.95
GROUP 7	$ 38.74	24.95
GROUP 8	$ 37.03	24.95
GROUP 9	$ 28.69	24.95

FOOTNOTES:

Tower cranes: to be paid the crane operator rate determined by the combined length of the mast and the boom. If the worker must climb 50 ft. or more to the work station, $.25 per hour additional.
Derrick and cranes where the operator must climb 50 ft. or more to the work station, $.25 per hour additional to the applicable crane operator rate.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Crane with boom and jib or leads 400' or longer
GROUP 2: Crane with boom and jib or leads 300' or longer
GROUP 3: Crane with boom and jib or leads 220' or longer
GROUP 4: Crane with boom and jib or leads 140' or longer
GROUP 5: Crane with boom and jib or leads 120' or longer
GROUP 6: Regular crane operator, and concrete pump with boom operator
GROUP 7: Backhoe/Excavator/Trackhoe, bobcat/skid Loader, broom/sweeper, bulldozer, grader/blade, highlift, hoist, loader, roller, scraper, tractor & trencher
GROUP 8: Forklift & extend-a-boom forklift
GROUP 9: Oiler

IRON0025-019 06/01/2019

	Rates	Fringes
IRONWORKER		
REINFORCING	$ 30.98	27.99
STRUCTURAL	$ 36.77	29.03

IRON0025-022 06/01/2019

	Rates	Fringes
IRONWORKER STRUCTURAL (Metal Building Erection Only)	$ 36.77	29.03

LABO0259-002 08/01/2021

	Rates	Fringes
LABORER: Asbestos Abatement (Removal from Floors, Walls & Ceilings)	$ 31.63	14.47

LABO0334-005 06/01/2021

	Rates	Fringes
LABORER: Landscape & Irrigation		
GROUP 1	$ 21.35	7.40
GROUP 2	$ 19.35	7.40

CLASSIFICATIONS

GROUP 1: Landscape specialist, including air, gas and diesel equipment operator, lawn sprinkler installer, skidsteer (or equivalent)

GROUP 2: Landscape laborer: small power tool operator, material mover, truck driver and lawn sprinkler installer tender

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LABO1191-002 06/01/2020

	Rates	Fringes
LABORER		
Common or General; Grade Checker; Mason Tender - Brick/Cement/Concrete; Pipelayer; Sandblaster	$ 28.93	16.90

PAIN0022-003 06/01/2015

	Rates	Fringes
PAINTER: Brush and Roller	$ 26.06	17.66
PAINTER: Drywall Finishing/Taping	$ 27.05	18.26
PAINTER: Spray	$ 26.86	17.66

PAIN0357-002 06/01/2020

	Rates	Fringes
GLAZIER	$ 34.10	21.46

PAID HOLIDAYS: New Year's Day, Decoration Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day; provided that the employee has worked the last full regular scheduled work day prior to the holiday, and the first full regular scheduled work day following the holiday, provided the employee is physically able to work.

PLAS0067-001 04/01/2014

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 30.63	14.07

PLAS0067-004 04/01/2014

	Rates	Fringes
PLASTERER	$ 30.63	14.07

PLUM0098-001 06/01/2019

	Rates	Fringes
PLUMBER, Excludes HVAC Pipe and Unit Installation	$ 37.74	34.13

PLUM0636-003 06/05/2017

	Rates	Fringes
PIPEFITTER, Includes HVAC Pipe and Unit Installation	$ 40.41	29.35

ROOF0149-001 07/01/2021

	Rates	Fringes
ROOFER	$ 38.16	25.91

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* SFMI0704-001 08/01/2021

	Rates	Fringes

SPRINKLER FITTER (Fire Sprinklers)	$ 46.13	30.99

SHEE0080-004 06/01/2020

	Rates	Fringes
SHEET METAL WORKER (Including HVAC Duct Installation; Excluding HVAC System Installation)	$ 44.13	26.27

TEAM0247-002 06/01/2018

	Rates	Fringes
TRUCK DRIVER		
GROUP 1		
Dump; Flatbed; Pickup	$ 26.71	0.70+a
GROUP 2		
Semi	$ 26.86	0.70+a
GROUP 3		
Lowboy	$ 26.96	0.70+a

PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. If any of the above holidays fall on a Sunday, the following Monday shall be considered the holiday and, if work is performed, the rate shall be double time.

FOOTNOTE:

a. $456.70 per week, plus $67.10 per day.

SUMI2011-016 02/01/2011

	Rates	Fringes
INSTALLER - OVERHEAD DOOR	$ 27.98	0.00
IRONWORKER, ORNAMENTAL	$ 18.48	7.93
TRUCK DRIVER: Tractor Haul Truck	$ 13.57	1.18

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including

preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion

date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator

U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

APPENDIX C: SELECTED COMPONENT ASBESTOS BUILDING MATERIAL INSPECTION REPORT, MJ ENVIRONMENTAL

MJ Environmental, Inc.

149 Lodewyck Street, Mount Clemens, MI 48043 (586) 465-8126

October 12, 2021

City of Warren
Police Department
29900 South Civic Center Boulevard
Warren, MI 48093

The attached report outlines the results of the Selected Component Asbestos Building Material Inspection conducted at **City of Warren Police Department, 29900 South Civic Center Boulevard, Warren** on October 05, 2021.

The following materials were tested for the presence of asbestos containing materials:

- Evidence Laboratory Room - 12"12" floor tile and floor tile adhesive mastic
- Evidence Laboratory Room - laboratory table top material
- Evidence Laboratory Room - vent hood transite material

As indicated in the attached laboratory data sheet, asbestos containing building materials were identified on the following structures at the time of this asbestos inspection:

- Evidence Laboratory Room - laboratory table top material
- Evidence Laboratory Room - vent hood transite material

Sincerely,

Kevin McNeill
MJ Environmental, Inc.

POSSIBLE ASBESTOS CONTAINING MATERIAL SAMPLING LABORATORY RESULTS

MJ Environmental

MJ Environmental Project #4086

City of Warren Police Department
29900 South Civic Center Boulevard
Warren, MI 48093

Date of Sampling: October 05, 2021
Sampled By: Kevin McNeill

SAMPLE ID	SAMPLE LOCATION	SAMPLE DESCRIPTION	Friable or Non-Friable	STANDARD FOR ASBESTOS IDENTIFICATION	SAMPLE RESULT
AS1	Evidence Laboratory Room	**Floor Tile** 12" x 12" tan vinyl	Non-Friable	1%	No Asbestos Detected
AS1a	Evidence Laboratory Room	**Floor Tile Mastic**	Non-Friable	1%	No Asbestos Detected
AS2	Evidence Laboratory Room	**Floor Tile** 12" x 12" green vinyl	Non-Friable	1%	No Asbestos Detected
AS2a	Evidence Laboratory Room	**Floor Tile Mastic**	Non-Friable	1%	No Asbestos Detected
AS3	Evidence Laboratory Room	**Floor Tile** 12" x 12" tan vinyl	Non-Friable	1%	No Asbestos Detected

POSSIBLE ASBESTOS CONTAINING MATERIAL SAMPLING LABORATORY RESULTS

MJ Environmental

MJ Environmental Project #4086

City of Warren Police Department
29900 South Civic Center Boulevard
Warren, MI 48093

Date of Sampling: October 05, 2021
Sampled By: Kevin McNeill

SAMPLE ID	SAMPLE LOCATION	SAMPLE DESCRIPTION	Friable or Non-Friable	STANDARD FOR ASBESTOS IDENTIFICATION	SAMPLE RESULT
AS4	Evidence Laboratory Room	**Laboratory Table Counter Top** black cementos material	Non-Friable	1%	**25% Chrysotile 3% Amosite Detected**
AS5	Evidence Laboratory Room	**Laboratory Table Counter Top** black cementos material	Non-Friable	1%	**25% Chrysotile 3% Amosite Detected**
AS6	Evidence Laboratory Room	**Laboratory Table Counter Top** black cementos material	Non-Friable	1%	**25% Chrysotile 3% Amosite Detected**
AS7	Evidence Laboratory Room	**Vent Hood Transite Material** grey transite material inside vent hood	Non-Friable	1%	**25% Chrysotile Detected**

EHS Laboratories

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237
Telephone: 800.347.4010

Asbestos Bulk Analysis Report

Report Number: 21-10-01461

Client: MJ Environmental Inc.
149 Lodewyck St.
Mount Clemens, MI 48043

Received Date: 10/08/2021
Analyzed Date: 10/08/2021
Reported Date: 10/11/2021

Project/Test Address: 4086; 29900 South Civic Center Boulevard; Warren, MI

Client Number:
23-3937

Fax Number:

Laboratory Results

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
21-10-01461-001A	AS1	Tile	Beige Vinyl; Homogeneous	NAD	100% Non-Fibrous
21-10-01461-001B	AS1	Mastic	Yellow Brittle; Homogeneous	NAD	2% Synthetic 98% Non-Fibrous
21-10-01461-002A	AS2	Tile	Beige Vinyl; Homogeneous	NAD	100% Non-Fibrous
21-10-01461-002B	AS2	Mastic	Yellow Brittle; Homogeneous	NAD	2% Synthetic 98% Non-Fibrous
21-10-01461-003	AS3		Beige Vinyl; Homogeneous	NAD	100% Non-Fibrous

Environmental Hazards Services, L.L.C

Client Number: 23-3937 **Report Number:** 21-10-01461

Project/Test Address: 4086; 29900 South Civic Center Boulevard; Warren, MI

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
21-10-01461-004	AS4		Black Cementitious; Homogeneous	25% Chrysotile 3% Amosite	72% Non-Fibrous
			Total Asbestos:	**28%**	
21-10-01461-005	AS5		Black Cementitious; Homogeneous	25% Chrysotile 3% Amosite	72% Non-Fibrous
			Total Asbestos:	**28%**	
21-10-01461-006	AS6		Black Cementitious; Homogeneous	25% Chrysotile 3% Amosite	72% Non-Fibrous
			Total Asbestos:	**28%**	
21-10-01461-007	AS7		Gray Cementitious; Homogeneous	25% Chrysotile	75% Non-Fibrous
			Total Asbestos:	**25%**	

Environmental Hazards Services, L.L.C

Client Number: 23-3937 **Report Number:** 21-10-01461

Project/Test Address: 4086; 29900 South Civic Center Boulevard; Warren, MI

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials

QC Sample: 47-M22018-1

QC Blank: SRM 1866 Fiberglass

Reporting Limit: 1% Asbestos

Method: EPA Method 600/R-93/116, EPA Method 600/M4-82-020

Analyst: Sloane Cantrell

Reviewed By Authorized Signatory: Melissa Kanode

Melissa Kanode
QA/QC Clerk

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Each distinct component in an inhomogeneous sample was analyzed separately and reported as a composite. Results represent the analysis of samples submitted by the client. Sample location, description, area, volume, etc., was provided by the client. This report cannot be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C. California Certification #2319 NY ELAP #11714 NVLAP #101882-0 VELAP 460172. All information concerning sampling location, date, and time can be found on Chain-of-Custody. Environmental Hazards Services, L.L.C. does not perform any sample collection.

Environmental Hazards Services, L.L.C. recommends reanalysis by point count (for more accurate quantification) or Transmission Electron Microscopy (TEM), (for enhanced detection capabilities) for materials regulated by EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by polarized light microscopy (PLM). Both services are available for an additional fee.

400 Point Count Analysis, where noted, performed per EPA Method 600/R-93/116 with a Reporting Limit of 0.25%.

* All California samples analyzed by Polarized Light Microscopy, EPA Method 600/M4-82-020, Dec. 1982.

LEGEND: NAD = no asbestos detected

EHS Laboratories™

Environmental Hazards Services, LLC

www.leadlab.com
(800)347-4010
(804)275-4907 (fax)

7469 Whitepine Rd
Richmond, VA 23237

Asbestos Chain-of-Custody

21-10-01461

Due Date:
10/12/2021
(Tuesday)
AE

7 PLM

Company Name: MJ Environmental, Inc. Address: 149 Lodewyck Street City/State/Zip: Mount Clemens, MI 48043

Phone: (586) 770-3127 Fax: (586) 465-8126 E-mail: kjmcneill@msn.com Acct. Number: 23-3937

Project Name / Testing Address: 4086 / 29900 South Civic Center Boulevard City/State (Required): Warren, MI
Collected by: Kevin McNeill Purchase Order Number: N/A

Turn Around Times: *If no TAT is specified, sample(s) will be processed and charged as 3-day TAT.*

___ 1 - Day XX 2 - Day ___ 3 - Day ___ Same Day (Must Call Ahead) ___ Weekend (Must Call Ahead)

No.	Client Sample ID	Date Collected	ASBESTOS							AIR					COMMENTS
			PLM	PLM Point Count 400	PLM Point Count 1000	PLM NY Protocol	PCM	TEM Chatfield (Bulk)	TEM AHERA (Air)	Time On	Time Off	Flow Rate (L/min)	Total Time (minutes)	Volume (Total Liters)	
1	AS1	10-05-21	X												Floor Tile
2	AS2	10-05-21	X												Floor Tile
3	AS3	10-05-21	X												Floor Tile
4	AS4	10-05-21	X												Lab Table Counter Top
5	AS5	10-05-21	X												Lab Table Counter Top
6	AS6	10-05-21	X												Lab Table Countertop
7	AS7	10-05-21	X												Vent Hood Siding
~~8~~	~~AS8~~	~~10-05-21~~	X												
~~9~~	~~AS9~~	~~10-05-21~~	X												
~~10~~	~~AS10~~	~~10-05-21~~	X												

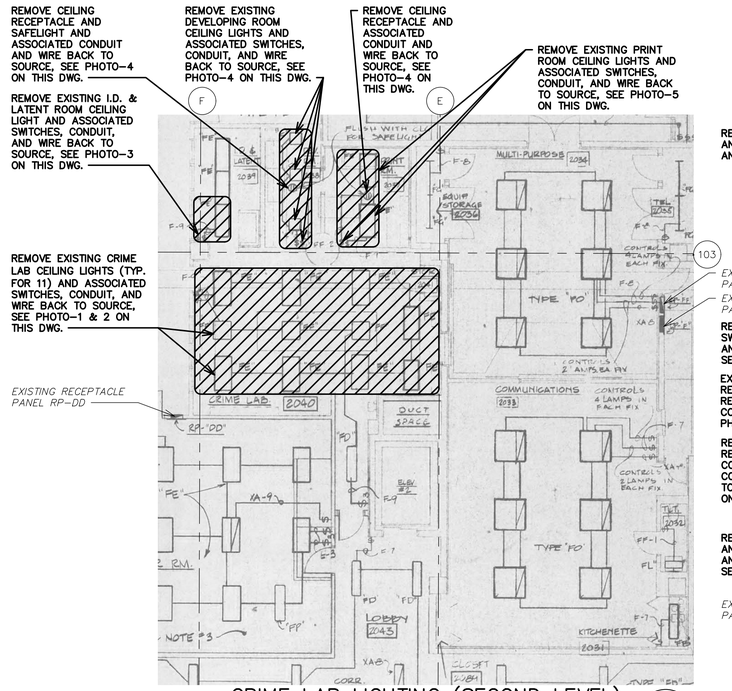
Released by: Kevin McNeill Signature: Date/Time: 10-05-21 / 4:30pm

Received by: Traci Bloom Signature: Traci Bloom Date/Time: 10/8/21 1:19 PM

DEMOLITION NOTES:

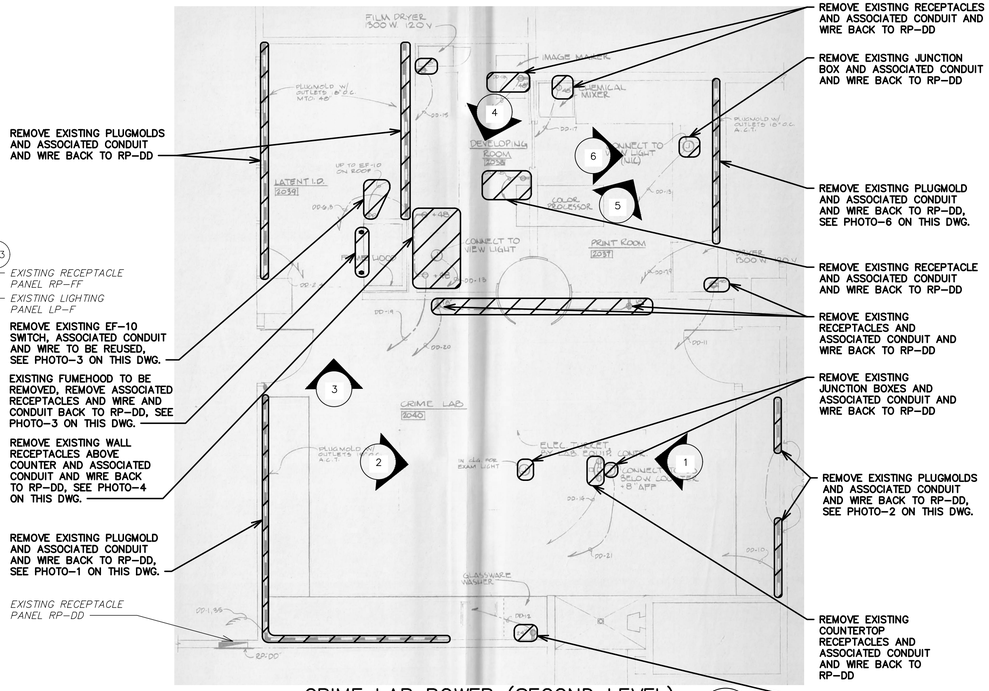
(APPLIES TO ALL DRAWINGS WHERE APPLICABLE)

1. THE CONTRACTOR SHALL VISIT THE JOB SITE AND THOROUGHLY CHECK THE FIELD CONDITIONS AND THE EXISTING ELECTRICAL INSTALLATION PRIOR TO SUBMITTING A BID.
2. ALL DEMOLITION WORK SHALL BE COORDINATED WITH THE OWNER.
3. ALL ELECTRICAL DEMOLITION WORK SHALL INCLUDE REMOVING OF EXISTING LIGHTING FIXTURES, DISCONNECT SWITCHES, WIRE, CONDUIT, BOXES, ETC., AS INDICATED ON THE DRAWINGS AND SHALL BE BY THIS CONTRACTOR.
4. REMOVE ALL CONDUIT, WIRE, HANGERS, CLAMPS, ETC. THAT ARE NOT BEING RE-USED UNLESS CONCEALED ABOVE CEILINGS OR IN WALLS, WHICH MAY BE ABANDONED AND LEFT IN PLACE. CONDUIT IN FLOOR SLAB SHALL BE CUT FLUSH WITH SLAB AND PLUGGED WITH NON-SHRINK GROUT.
5. REMOVE ALL WIRE IN EXISTING CONCEALED ABANDONED CIRCUITS.
6. ALL OPENING CREATED BY REMOVAL OF CONDUITS THROUGH EXISTING WALLS OR FLOORS SHALL BE SEALED TO MATCH EXISTING.
7. REVISE ALL EXISTING LIGHTING PANEL DIRECTORIES TO REFLECT ALL REVISIONS TO BRANCH CIRCUIT BREAKERS IN THE EXISTING PANELS.
8. VERIFY REMOVAL OF ALL EXISTING POWER AND CONTROL WIRING WITH THE OWNER PRIOR TO START OF DEMOLITION WORK.
9. ALL SALVAGE ELECTRICAL EQUIPMENT SHALL BECOME THE PROPERTY OF THE OWNER AND SHALL BE STORED AT AN ON SITE LOCATION AS DIRECTED BY THE OWNER.
10. REMOVE EQUIPMENT AS SHOWN, INCLUDING ALL ASSOCIATED CONDUIT AND WIRE.
11. ALL EXISTING ELECTRICAL EQUIPMENT SHALL BE REMOVED. ALL ABANDONED EXPOSED CONDUIT SHALL BE REMOVED.
12. ALL INTERRUPTIONS OF POWER (IF REQUIRED) FOR DISCONNECTING OR CONNECTIONS OF POWER SHALL BE AUTHORIZED BY THE OWNER.



CRIME LAB LIGHTING (SECOND LEVEL) DEMOLITION PLAN

SCALE: 1/8" = 1'-0"



CRIME LAB POWER (SECOND LEVEL) DEMOLITION PLAN

SCALE: 1/4" = 1'-0"

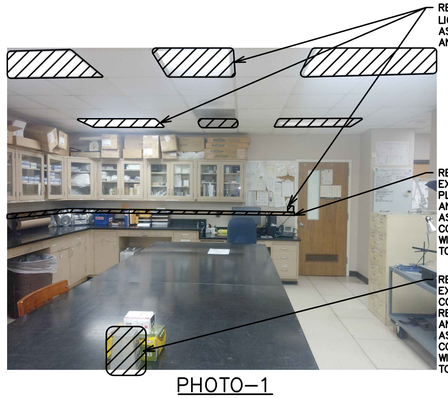
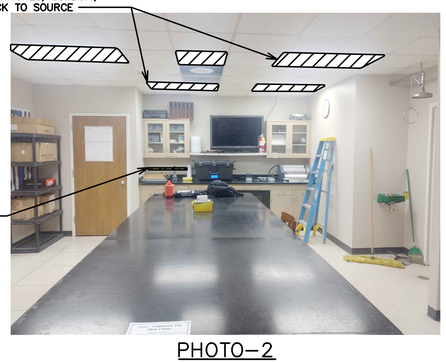


PHOTO-1



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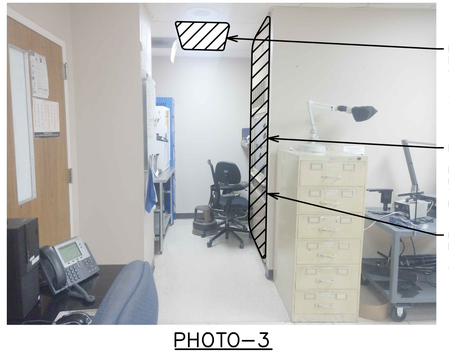

PHOTO-3

PHOTO-4

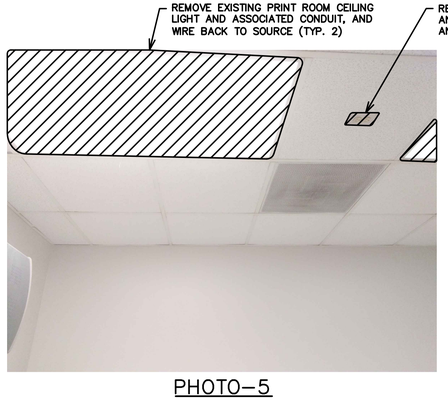

PHOTO-5

PHOTO-6

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X DENOTES GENERAL LOCATION OF PHOTO

1/4" = 1'- 0" (0 1 2 4 8)

1/8" = 1'- 0" (0 1 2 4 8 16)

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coordination checked:	STS
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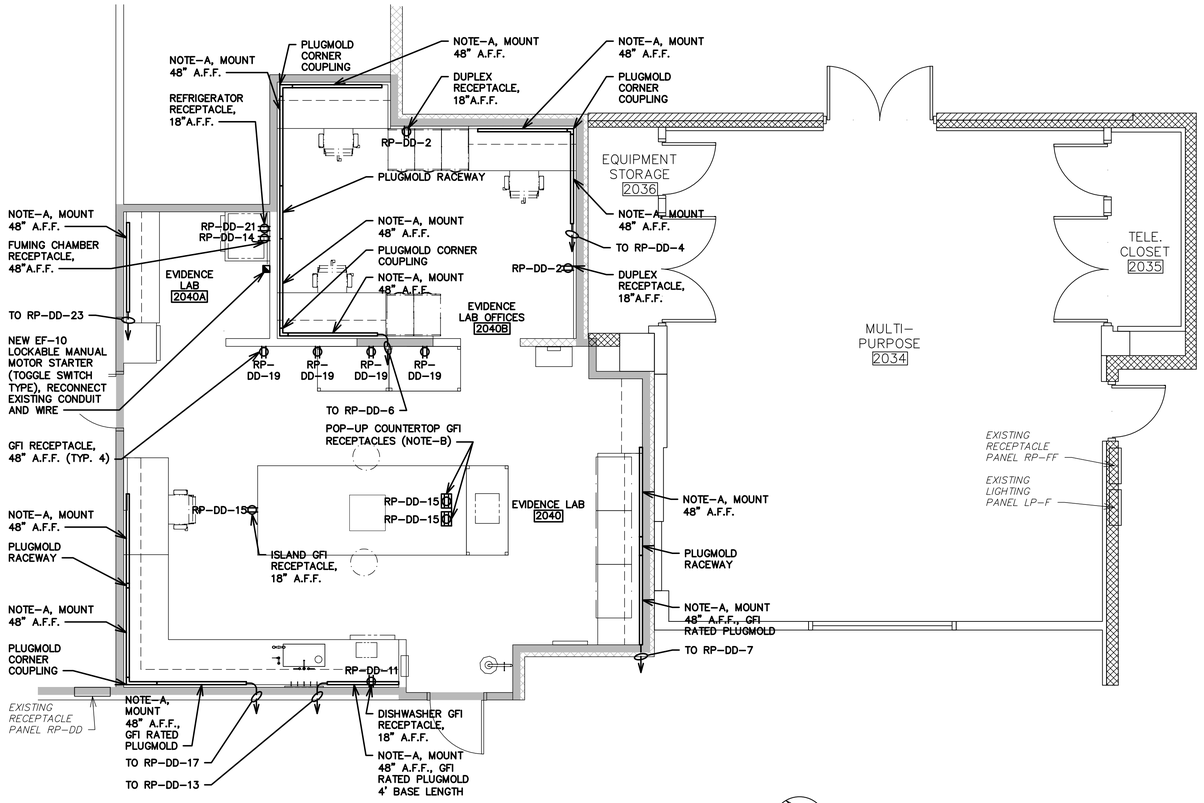
approved:	MCM

project:
Warren Police Department
Crime Lab

sheet title:
Electrical Demolition
Partial Plans, Photos,
And Demolition Notes

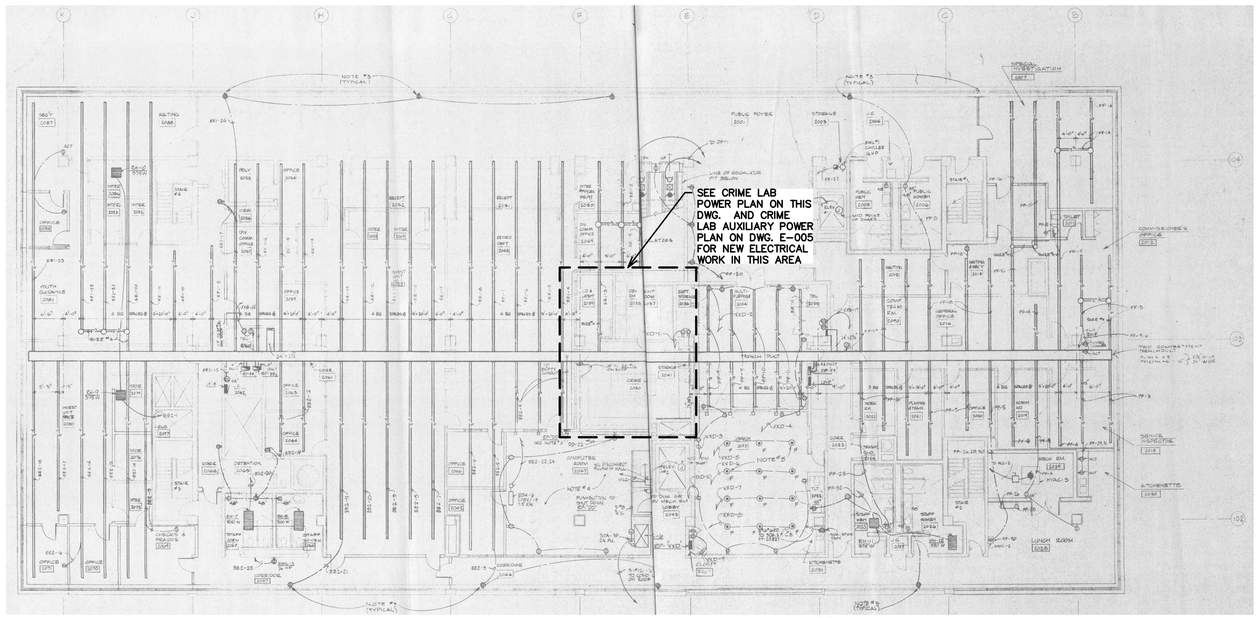
project number:	sheet number:
1201-1	DE-001



CRIME LAB POWER PLAN

SCALE: 1/4" = 1'–0"

N



SECOND FLOOR POWER PLAN

SCALE: 1/16" = 1'–0"

N

ELECTRICAL LEGEND

	RECESSED LED LIGHTING FIXTURE
	UNDERCABINET LED LIGHTING FIXTURE
	EXTENDABLE ARM LIGHTING FIXTURE
	EXIT LIGHT FIXTURE
E	EMERGENCY LIGHTING FIXT., TYPE "EM"
S	SINGLE POLE SWITCH
S_{OS}	SINGLE POLE SWITCH WITH INTEGRAL OCCUPANCY SENSOR
S_{3OS}	THREE–WAY SWITCH WITH INTEGRAL OCCUPANCY SENSOR
MP	MANUAL STARTER (THREE PHASE; P = PILOT LIGHT)
CMP	COMBINATION MOTOR STARTER (THREE PHASE)
DSF	DISCONNECT SWITCH (F=FUSED)
	LIGHTING PANEL
PA	PAGING SPEAKER; SEE INTERPHONE RISER
	120 V. DUPLEX RECEPTACLE
J.B.	JUNCTION BOX
P.B.	PULL BOX
	INTERPHONE FIXED HANDSET STATION
	TELEPHONE OUTLET (W = WALL MOUNTED 48" A.F.F.)
M	MOTOR, 1 PHASE
M	MOTOR, 3 PHASE
	CONDUIT RUN CONCEALED ABOVE CEILING OR IN WALL
	CONDUIT RUN EXPOSED
	CONDUIT HOMERUN
	MOTOR CONTROL CENTER POSITION NUMBER
	DISTRIBUTION PANELBOARD POSITION NUMBER
P.V.C.	SCHED. 40 POLYVINYL CHLORIDE CONDUIT
R.G.S.	RIGID GALVANIZED STEEL
A.F.F.	ABOVE FINISHED FLOOR
W.T.	WATERTIGHT (NEMA 4)
W.T.X.	WATERTIGHT, CORROSION RESISTANT (NEMA 4X)
W.P.	WEATHER PROOF (NEMA 3R)
C.	CONDUIT
MCC	MOTOR CONTROL CENTER
G.F.I.	GROUND FAULT INTERRUPTER
GRD.	GROUND CONDUCTOR

PLAN NOTES:

A. LEGRAND 4000 DESIGNER SERIES, PROVIDE 5' BASE LENGTHS. PROVIDE 8 DUPLEX RECEPTACLES AND ONE 4–PORT USB RECEPTACLE PER 5' LENGTH. EVENLY DISTRIBUTE RECEPTACLES THROUGHOUT. FINISH AS REQ'D BY ARCH.

B. POP–UP RECEPTACLES SHALL BE 20A, TAMPER–RESISTANT GFI OUTLET LEVITON PFGF2 SERIES. FINISH AS REQ'D BY ARCH.

GENERAL ELECTRICAL NOTES:

(APPLY TO ALL DRAWINGS)

1. THE CONTRACTOR SHALL VISIT THE JOB SITE AND THOROUGHLY CHECK THE FIELD CONDITIONS AND THE EXISTING ELECTRICAL INSTALLATION AND UTILITIES PRIOR TO SUBMITTING HIS BID.
2. OTHER PROJECTS ARE, OR MAY BE, UNDER CONSTRUCTION AT THIS SITE, AND THIS CONTRACTOR SHALL COORDINATE WITH THEM SO AS NOT TO DELAY THEIR SCHEDULES OR IMPEDE THEIR WORK.
3. PROVIDE WATERTIGHT HUBS AT CONDUIT ENTRANCES TO ALL ENCLOSURES MOUNTED OUTDOORS. ALL NEMA TYPE 4 & 4X ENCLOSURES SHALL BE EQUIPPED WITH A DRAIN/BREATHER FITTING.
4. ALL POWER FEEDERS SHALL BE RUN IN INDIVIDUAL CONDUITS, FROM SOURCE TO LOAD, AS INDICATED IN SCHEDULES, WIRING DIAGRAMS, OR BY HOME RUNS ON THE PLANS.
5. ALL CONDUITS INSTALLED SHALL BE ELECTRICAL METALLIC TUBING (EMT).
6. ALL CONDUITS SHALL BE ROUTED TO AVOID CROSSING OPENINGS IN FLOORS, ROOFS, AND WALLS. LADDERS UP WALLS SHALL NOT BE CROSSED BY EXPOSED CONDUIT RUNS. PROVIDE THE MINIMUM CLEAR SPACE REQUIRED BY ALL GOVERNING CODES BETWEEN HANDRAILS AND ALL ELECTRICAL ENCLOSURES AND RACEWAYS, WHICH IN NO CASE SHALL BE LESS THAN 1 1/2" CLEAR.
7. ALL CONDUITS FOR POWER FEEDERS, BRANCH CIRCUITS, AND CONTROLS WITHIN BUILDINGS SHALL BE RUN CONCEALED ABOVE DROP CEILINGS OR IN NEW LAB WALLS.
8. ALL ELECTRICAL FLOOR MOUNTED EQUIPMENT SUCH AS MOTORS, CONTROL PANELS, AND METALLIC SUPPORT RACKS SHALL HAVE A #2 (UNLESS OTHERWISE NOTED) BARE GROUND CONDUCTOR TIE BETWEEN THE MOTOR FRAME, ENCLOSURE, OR SUPPORT LEG AND THE BUILDING GROUND SYSTEM.
9. GROUND CONDUCTOR SPLICING AND BONDING SHALL BE ACCOMPLISHED BY THE USE OF EXOTHERMIC WELDING.
10. PROVIDE A GREEN GROUND CONDUCTOR IN ALL SYSTEMS CONDUITS, EXCEPT INSTRUMENT SIGNAL AND ALARM CONDUITS, INCLUDING BRANCH CIRCUIT CONDUITS FOR LIGHTING AND RECEPTACLES. GROUND CONDUCTOR SIZING SHALL BE PER N.E.C. TABLE 250.122 (MINIMUM) WHERE NOT SIZED ON THE DRAWINGS.
11. COORDINATE EXACT LOCATION AND MOUNTING HEIGHTS OF ALL LIGHTING FIXTURES AND ELECTRICAL DEVICES WITH MECHANICAL PIPING AND DUCTWORK BEFORE INSTALLATION.
12. ALL THREADED MECHANICAL CONNECTIONS ON ELECTRICAL EQUIPMENT (CONDUIT, COUPLINGS, JUNCTION BOXES, ETC.) INSTALLED WITHIN WET AREAS OR OUTDOORS SHALL BE COATED WITH ANTI–SEIZE COMPOUND PRIOR TO INSTALLATION.
13. ALL WALL AND RACK MOUNTED DISCONNECT SWITCHES, CONTROL PANELS, AND LIGHTING PANELS SHALL BE 5'–6" TO TOP, ABOVE FINISHED FLOOR.
14. ALL WEATHERPROOF (W.P.) DUPLEX RECEPTACLES SHALL BE INSTALLED SUCH THAT COVER DOORS OPEN UPWARD.
15. ALL PENETRATIONS OF FIRE WALLS OR FLOORS SHALL BE SEALED AFTER INSTALLATION OF CONDUIT WITH A FIRE RETARDANT SEALANT THAT IS RATED THE SAME AS THE FIRE WALL OR FLOOR.
16. ALL WALL MOUNTED ELECTRICAL EQUIPMENT SHALL HAVE A 1/2" (MINIMUM) AIR SPACE BETWEEN WALL AND EQUIPMENT (PROVIDE NON–CORROSIVE SPACERS OR BRACKETS AS REQUIRED).
17. FOR ALL 120 VAC LIGHTING AND RECEPTACLE CIRCUITS, RUN 2–#12 (MINIMUM) + #12 GRD., 3/4"C. TO THE LIGHTING PANELBOARD INDICATED, UNLESS NOTED OTHERWISE. SEE THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR BRANCH CIRCUIT WIRING.
18. ALL SALVAGED MATERIALS SHALL BE TURNED OVER TO THE OWNER OR DISPOSED OF AS DIRECTED BY THE OWNER.
19. WHEREVER POSSIBLE, UTILIZE EXISTING CAST–IN–PLACE CHANNELS/INSERTS FOR SUPPORT OF NEW WORK. WHERE NEW ANCHORS ARE REQ'D INTO FLOOR OR ROOF SLABS, SEE SPECIAL PROJECT NOTES ON SHEET S–001.

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1/4" = 1'– 0" 0 1 2 4 8

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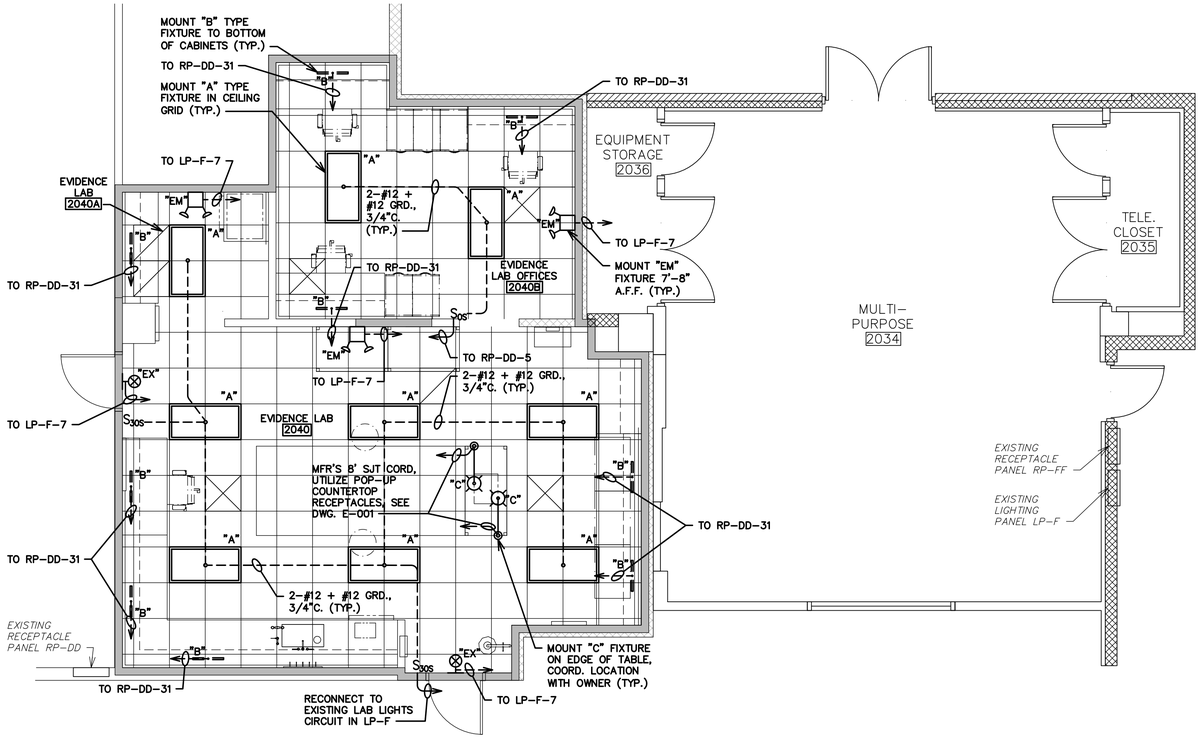
Warren Police Department
Crime Lab

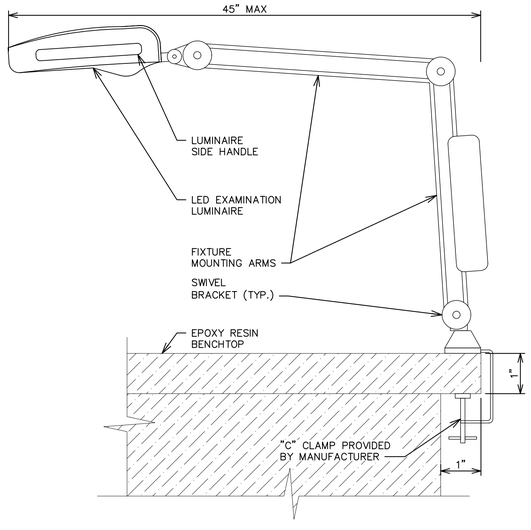
sheet title:
Electrical
Power Plan, Legend,
And General Notes

project number:	sheet number:
1201-1	E-001



CRIME LAB LIGHTING PLAN

SCALE: 1/4" = 1'-0"

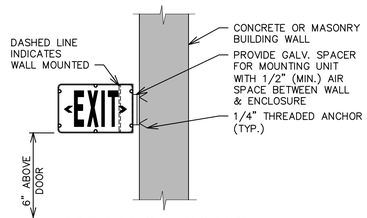


TYPE "C" MOUNTING DETAIL

N.T.S.

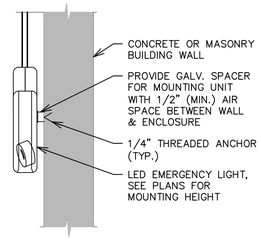
LIGHTING FIXTURE SCHEDULE

TYPE	LAMP	OPERATING VOLTAGE	DESCRIPTION	MFR. CAT. NO.
"A"	47 WATT 4800 LUMENS LED 4000K	120–277V. 1PH.	LED RECESSED TROFFER FIXTURE, 22 GAUGE COLD–ROLLED STEEL HOUSING, #12 PATTERN 0.125 THICK ACRYLIC LENS, AND 90% LED LUMEN MAINTENANCE AT 60,000 HOURS. DIMMABLE TO 1% WITH eldoLED DRIVER AND HAS 5–YEAR LIMITED WARRANTY.	LITHONIA: 2GTL 4 48L EZ1 LP840 OR APPROVED EQUAL
"B"	12 WATT 830–870 LUMENS LED 3000–4000K	120V. 1PH.	22 INCH LED UNDERCABINET FIXTURE, WITH 20 DEGREE SWIVEL IN EACH DIRECTION AND SLIM 1" PROFILE. INTEGRAL SWITCH WITH 3000K, 3500K, AND 4000K COLOR TEMPERATURE SELECTION WITH 50,000 HOUR LIFE AT 70% LUMEN MAINTENANCE. LIGHTLY FROSTED ACRYLIC DIFFUSER AND REAR WIRING ACCESS FOR DIRECT WIRE.	JUNO: UPLD 22IN SWW4 90CRI WH OR APPROVED EQUAL
"C"	14 WATT 90000 LUX LED 4100K	120V. 1PH.	LED TABLE MOUNTED EXAMINATION LIGHT WITH POSITIONABLE "K" ARM WITH MAXIMUM 45" REACH. FIXTURE HAS 2 LEVELS OF DIMMING CAPABILITY, 100% AND 50%. LED LIFETIME IS 50,000 HOURS. LIGHT FIELD DIAMETER IS 7"–7.5" AND FIXTURE HAS 5–YEAR LIMITED WARRANTY.	BURTON: NOVA EXAM LED
"EX"	2.5 WATT	120/277V. 1PH.	LED WALL MOUNTED EXIT SIGN, MOLDED THERMOPLASTIC HOUSING, RED LETTERING, SNAP IN/OUT CHEVRONS, LONG–LIFE LEDS, ADVANCED DIAGNOSTICS, NICKEL–CADMIUM BATTERY, UL LISTED FOR DAMP LOCATIONS, ROHS COMPLIANT, SURGE SUPPRESSOR, 5 YEAR WARRANTY ON ALL COMPONENTS.	EMERGI–LITE: PREMIER SERIES WPREMSNXDNR OR APPROVED EQUAL
"EM"	(2) 5W. LED 12 VDC	120/277V. 1PH.	EMERGENCY LIGHTING UNIT WITH SEALED MAINTENANCE FREE NICKEL–METAL HYDRIDE BATTERY, 120V INPUT VOLTAGE ADVANCE DIAGNOSTICS. POWERING 2–5W LED 12 VDC HEADS FOR THE MINIMUM DURATION OF 90 MINUTES.	EMERGI–LITE: PREMIER COMPACT #12MPR24H–2–LI–D (–CM) OR APPROVED EQUAL



EXIT LTG. FIXTURE TYPE "EX" MOUNTING DETAIL

N.T.S.



EMERGENCY LIGHT TYPE "EM" MOUNTING DETAIL

N.T.S.

BASIS OF DESIGN

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THIS LIGHTING PLAN WAS DESIGNED USING AGI32 VERSION 19.15.2. SPECIFIED LIGHTING LEVELS HAVE BEEN DETERMINED FROM IES RECOMMENDATIONS FOR POLICE STATION AND LABORATORIES. LIGHTING LEVELS 3 FT. ABOVE GROUND LEVEL SHALL BE AN AVERAGE OF 50 FOOTCANDLES THROUGHOUT THE LABORATORY. THIS LIGHTING PLAN IS BASED UPON THE SPECIFIED LIGHT FIXTURES ON THIS DRAWING. OTHER FIXTURES ARE ACCEPTABLE UPON SUBMITTAL OF A PHOTOMETRIC PLAN MATCHING THE LIGHTING LEVELS SPECIFIED ON THIS DRAWING WITHIN ±3.0 FOOTCANDLES AVERAGE, MEETING SPECIFICATION REQUIREMENTS AS SHOWN ON THIS DRAWING, AND ENGINEER'S APPROVAL.

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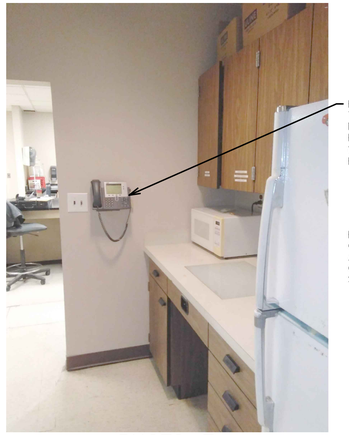
Warren Police Department
Crime Lab

sheet title:
Lighting Plan, Schedule, And Details

project number:	sheet number:
1201-1	E-002

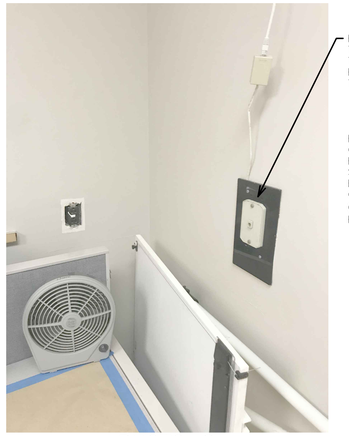


REPLACE EXISTING TELEPHONE OUTLETS TO MATCH EXISTING, PROVIDE NEW TELEPHONE WIRING IN NEW 3/4"C., REUSE EXISTING PHONE

REMOVE EXISTING CEILING SPEAKER AND ASSOCIATED WIRE AND CONDUIT BACK TO NEXT SPEAKER IN SERIES

PHOTO–7

PHOTO–9

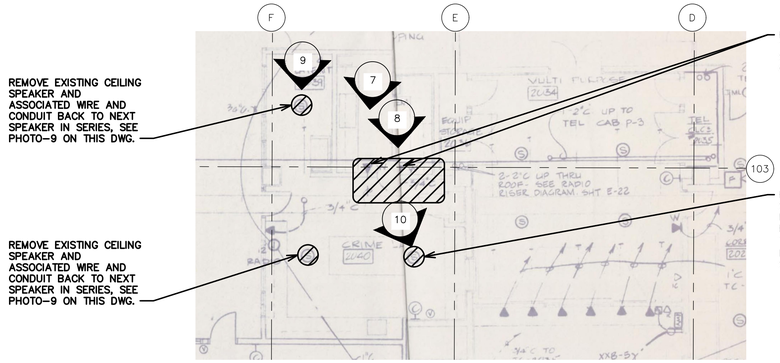


REPLACE EXISTING TELEPHONE OUTLETS TO MATCH EXISTING, PROVIDE NEW TELEPHONE WIRING

REMOVE EXISTING CEILING SPEAKER AND REPLACE WITH NEW SPEAKER TO MATCH EXISTING, WIRE AND CONDUIT TO BE REUSED (OWNER TO INSTALL PROVIDED SPEAKER)

PHOTO–8

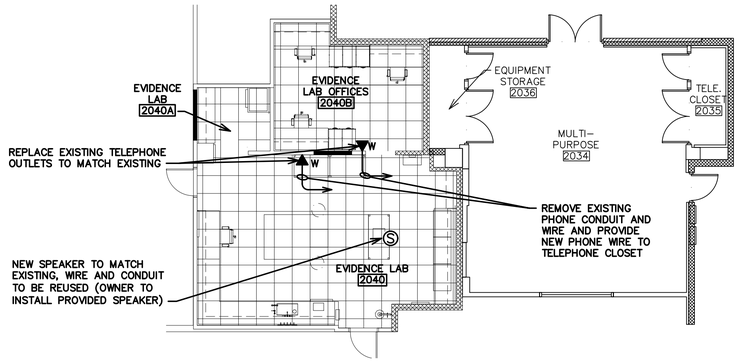
PHOTO–10



CRIME LAB AUXILIARY SYSTEMS DEMOLITION PLAN

SCALE: 1/8" = 1'–0"

N



CRIME LAB AUXILIARY SYSTEMS POWER PLAN

SCALE: 1/8" = 1'–0"

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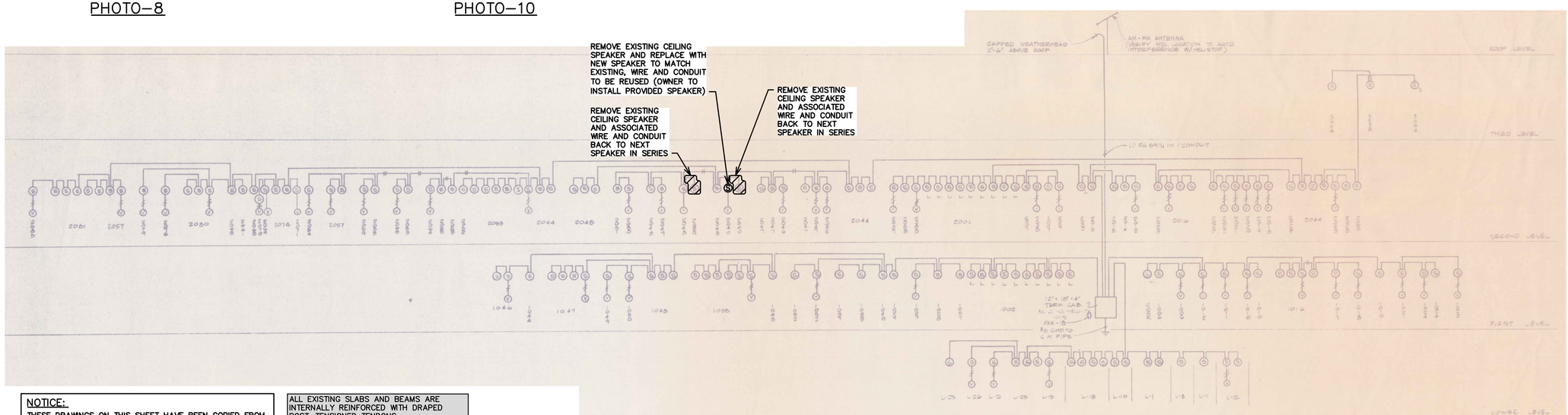

REVISED BUILDING AUXILIARY SYSTEMS RISER DIAGRAM

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0 1 2 4 8 16

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approved:	MCM

project:
Warren Police Department
Crime Lab

sheet title:
Auxiliary Systems
Plans And
Riser Diagram

project number: 1201-1

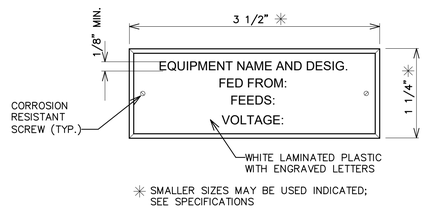
sheet number: E-003

REVISED LIGHTING PANEL "LP–F" SCHEDULE

480/277V., 3PH., 4W., WITH 100 AMP. MAIN BREAKER, NEUTRAL BUS, & GRD. BUS

CIRC. NO.	BRKR. SIZE	ITEM SERVED	LOAD (WATTS) ØX	ØY	ØZ
1	20A	LIGHTS – WEST HALL	EXIST.		
3	20A	LIGHTS – WEST HALL		EXIST.	
5	20A	LIGHTS – TOILETS – HALL – ADM LOBBY			EXIST.
7	20A	**EVIDENCE LAB 2040 & 2040A CEILING, EMERGENCY AND EXIT LIGHTS**	**349**		
9	20A	LIGHTS – MULTI–PURPOSE		EXIST.	
11	20A	DISPATCH OUTER LIGHTS AND OFFICE LIGHTS			EXIST.
13	20A	CIRCUIT FOR LIGHTS – 2 NEW OFFICES	EXIST.		
15		SPACE			
17		SPACE			
19		SPACE			
21		SPACE			
23		SPACE			
2	20A	LIGHTS – EAST HALL		EXIST.	
4	20A	LIGHTS – LUNCH			EXIST.
6	20A	LIGHTS – SPECIAL INVEST.	EXIST.		
8	20A	LIGHTS – GENERAL OFFICE		EXIST.	
10	20A	SPARE			
12	20A	SPARE			
14	20A	SPARE			
16		SPACE			
18		SPACE			
20		SPACE			
22		SPACE			
24		SPACE			
		TOTAL NEW LOAD	**349**		

UTILIZE EXISTING 20A 1P. BREAKER SPARED OUT IN DEMOLITION PHASE



✳ SMALLER SIZES MAY BE USED INDICATED; SEE SPECIFICATIONS

TYPICAL NAMEPLATE DETAIL

FULL SCALE

REVISED RECEPTACLE PANEL "RP–DD" SCHEDULE

120/208 V., 3PH., 4W., WITH 225 AMP. MAIN BREAKER, NEUTRAL BUS, & GRD. BUS

CIRC. NO.	BRKR. SIZE	ITEM SERVED	LOAD (WATTS) ØX	ØY	ØZ
1	20A	RECEPTACLES – TABLE	EXIST.		
3	20A	MISC. – JB TABLE		EXIST.	
5	20A	**EVIDENCE LAB OFFICES 2040B CEILING LIGHTS AND EXAMINATION LIGHT**			**124**
7	**20A**	**RECEPTACLES – PLUG–MOLD N. EVIDENCE LAB 2040**	**540**		
9	20A	RECEPTACLES – LAB		EXIST.	
11	**20A**	**RECEPTACLE – DISHWASHER E. EVIDENCE LAB 2040**			**180**
13	**20A**	**RECEPTACLES – PLUG–MOLD E. EVIDENCE LAB 2040**	**180**		
15	**20A**	**RECEPTACLES – EVIDENCE LAB 2040 ISLAND**		**540**	
17	**20A**	**RECEPTACLES – PLUG–MOLD S. EVIDENCE LAB 2040**			**720**
19	**20A**	**RECEPTACLES – W. EVIDENCE LAB 2040**	**720**		
21	20A	**RECEPTACLE – REFRIGERATOR EVIDENCE LAB 2040A**		**180**	
23	20A	**RECEPTACLES – PLUG–MOLD EVIDENCE LAB 2040A**			**180**
25	20A	**SPARE**			
27	20A	MISC. – FILM DRYER DEVEL. ROOM		EXIST.	
29	20A	FORENSIC TECH ROOM PLUGS			EXIST.
31	20A	**UNDER–CABINET CRIME LAB LIGHTS**	**96**		
33	20A	FIRETEK 210 PANEL		EXIST.	
35		SPACE			
37		SPACE			
39		SPACE			
41		SPACE			
2	20A	**RECEPTACLES – EVIDENCE LAB OFFICES**	**360**		
4	20A	**RECEPTACLES – PLUG–MOLD EVIDENCE LAB OFFICES**		**360**	
6	20A	**RECEPTACLES – PLUG–MOLD EVIDENCE LAB OFFICES**			**900**
8	20A	MISC. – VIEW LIGHT PRINT ROOM	EXIST.		
10	20A	RECEPTACLES – LAB		EXIST.	
12	20A	MISC. – CHEM. MIXER PRINT ROOM			EXIST.
14	20A	**FUMING CHAMBER RECEPTACLE**	**280**		
16	20A	MISC. – VIEW LIGHT DEVEL. ROOM		EXIST.	
18	20A	**SPARE**			
20	20A	RECEPTACLES FOR CRT UNITS	EXIST.		
22	20A	RECEPTACLES FOR CRT UNITS		EXIST.	
24	20A	RECEPTACLES FOR CRT UNITS			EXIST.
26	20A	RECEPTACLES FOR CRT OFFICE	EXIST.		
28	20A	FORENSIC TECH ROOM PLUGS		EXIST.	
30	20A	FORENSIC TECH ROOM			EXIST.
32	20A	FINGER PRINTING OUTLETS	EXIST.		
34		SPACE			
36		SPACE			
38		SPACE			
40		SPACE			
42		SPACE			
		TOTAL NEW LOAD	**2176**	**1080**	**2104**

UTILIZE EXISTING 20A 1P. BREAKER SPARED OUT IN DEMOLITION PHASE

REPLACE EXISTING 20A 1P. BREAKER SPARED OUT IN DEMOLITION PHASE WITH NEW 20A 1P. GFI BREAKER

UTILIZE EXISTING 20A 1P. BREAKERS SPARED OUT IN DEMOLITION PHASE

EXISTING BREAKER SPARED OUT IN DEMOLITION PHASE

UTILIZE EXISTING 20A 1P. BREAKER SPARED OUT IN DEMOLITION PHASE

UTILIZE EXISTING 20A 1P. BREAKERS SPARED OUT IN DEMOLITION PHASE

EXISTING BREAKER SPARED OUT IN DEMOLITION PHASE

ALL EXISTING SLABS AND BEAMS ARE INTERNALLY REINFORCED WITH DRAPED POST–TENSIONED TENDONS. NON–DESTRUCTIVE DETECTION TECHNOLOGY MUST BE UTILIZED TO LOCATE TENDONS. NO DRILLING, CORING, OR CUTTING OF ANY KIND IS PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER. SEE NOTES ON S–001 FOR ADDITIONAL INFORMATION.

WARREN

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100% OWNER REVIEW	06-29-2022
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BID RE-ISSUE	08-22-2023

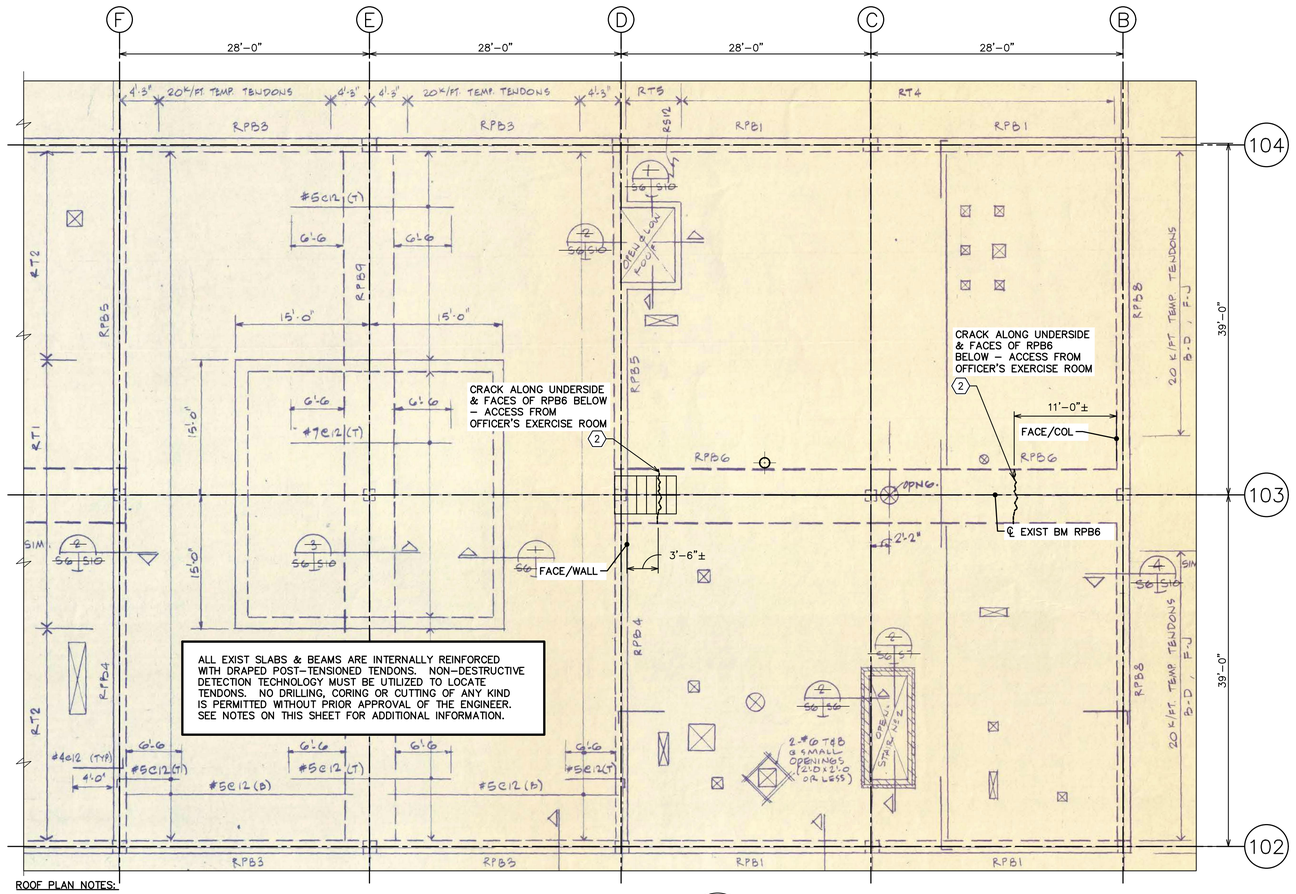
PRELIMINARY - NOT FOR CONSTRUCTION

designed by:	ESM
drawn by:	ESM
coordination checked:	STS
checked:	MJR
approved:	MCM

project:
Warren Police Department
Crime Lab

sheet title:
ELECTRICAL DETAILS AND SCHEDULES

project number:	sheet number:
1201-1	E-004



ROOF PLAN NOTES:

1. DUCTWORK & PIPING NOT SHOWN, SEE MECH AND PLUMBING SHTS.
2. FOR PROJECT CONSTRAINTS RELATING TO EXIST BUILDING CONSTRUCTION TYPE, SEE SPECIAL PROJECTS NOTES, THIS SHEET.

(2) FOR CRACK INJECTION REPAIR TYPE 2, SEE SHT S-002.

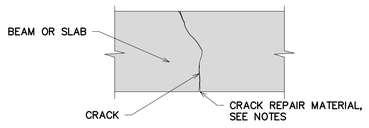
ROOF PLAN
N.T.S.

GENERAL NOTES:

1. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS AND ELEVATIONS SHOWN. SHOULD EXISTING DIMENSIONS AND ELEVATIONS DIFFER SIGNIFICANTLY, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AS SOON AS POSSIBLE OF THE DISPARITY.
2. CONTRACTOR SHALL PROCEED WITH HIS WORK IN SUCH A FASHION SO AS NOT TO DISTURB THE OWNER'S OPERATIONS.
3. ALL CONSTRUCTION MUST CONFORM TO CURRENT MIOSHA SAFETY STANDARDS.
4. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT NO DAMAGE SHALL COME TO THE EXISTING FACILITIES, UTILITIES AND ELEMENTS ADJACENT TO HIS WORK.
5. CONTRACTOR TO PROTECT THOSE EXISTING ELEMENTS DESIGNATED TO REMAIN. CONTRACTOR IS RESPONSIBLE FOR THE REPLACEMENT OF ANY ELEMENTS DAMAGED DURING CONSTRUCTION.
6. THE CONTRACTOR SHALL NOT BURN, CUT, DRILL OR MODIFY STRUCTURAL MEMBERS WITHOUT APPROVAL OF THE ENGINEER.
7. THE CONTRACTOR'S PREPARATION AND SUBMISSION INFORMATION, CERTIFICATION, DATA SHEETS, SHOP DRAWINGS, ETC. FOR ENGINEERS APPROVAL OF ALL MATERIALS USED SHALL BE INCLUDED IN THE PROJECT AND SHALL NOT BE PAID FOR SEPARATELY.

CONCRETE PAINTING

PREVIOUSLY PAINTED CMU/CONCRETE AT AFFECTED AREAS SHALL BE PAINTED IN (3) COATS WITH SHERWIN WILLIAMS PAINT SYSTEM (OR APPROVED EQUAL):
- A. SURFACE PREPARATION – THOROUGHLY AND UNIFORMLY ABRADE TO GENERATE A MINIMUM 1.0 MIL SURFACE PROFILE.
- B. PRIMER COAT (IF NEEDED) – SHERWIN WILLIAMS LOXON CONCRETE AND MASONRY PRIMER (2.1 DRY MILS MIN.)
- C. (2) FINISH COATS – SHERWIN WILLIAMS PRO INDUSTRIAL ACRYLIC, (3.0 DRY MILS MIN. EACH COAT)
- D. MATCH EXISTING COLOR/FINISH AT ADJACENT PAINTED SURFACES.



NOTES:
1. REPAIR MATERIAL SHALL BE A HIGH STRENGTH EPOXY GROUT, SPECIFICALLY DESIGNED FOR THE INJECTION OF CRACKS, 1/4" MAX TO 1/16" MIN WIDTH. "SIKADUR 52" BY SIKA CORP OR APPROVED EQUAL.
2. BRIDGING MATERIAL SHALL BE COMPATIBLE WITH EPOXY GROUT. BRIDGING MATERIAL SHALL BE "SIKADUR 31" BY SIKA CORP OR EQUAL. INSTALL PRESSURE INJECTION PORTS AND PRESSURE INJECT THE CRACK WITH SIKADUR 52. AFTER PRESSURE INJECTION HAS BEEN COMPLETED, REMOVE PORTS AND BRIDGING MATERIAL. GRIND SMOOTH TO FINISH.
3. WHERE EXISTING CONCRETE COATING IS PRESENT, REMOVE IN A NEAT MANNER TO THE LIMITS REQUIRED TO PERFORM REPAIRS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. PRIOR TO APPLICATION, CONTRACTOR SHALL ARRANGE PRE-INSTALLATION MEETING ONSITE BETWEEN APPLICATOR, ENGINEER AND MANUFACTURER'S REPRESENTATIVE TO REVIEW:
   - SUBSTRATE CONDITION
   - PROCEDURES FOR SUBSTRATE PREPARATION
   - APPLICATION LIMITS
   - INSTALLATION METHODS
   - CURING REQUIREMENTS DURATION

   PROVIDE ALL PARTIES A MINIMUM OF TWO WEEKS' NOTICE FOR SCHEDULING.
5. INCLUDES THE PROVIDING OF ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO PERFORM ALL WORK ASSOCIATED WITH PRESSURE INJECTION OF THE CRACKS. CONTRACTOR SHALL BE PAID IN FULL FOR ALL COSTS ASSOCIATED WITH THIS WORK AFTER COMPLETION OF THE WORK. ITEMS INCLUDED (NOT PAID FOR SEPARATELY):
   - ROUTING OUT AND THOROUGHLY CLEANING BOTH THE CONCRETE SURFACE ALONG THE CRACK AND CRACK ITSELF TO THE SATISFACTION OF THE ENGINEER
   - PRESSURE INJECTION OF CRACKS
   - REMOVING THE INJECTION PORTS AND BRIDGING MATERIAL
   - GRIND SMOOTH TO FINISH
6. FOR PAINT SYSTEM, SEE "CONCRETE PAINTING" THIS SHEET.

CRACK INJECTION REPAIR TYPE (2)
N.T.S.

STRUCTURAL QUANTITIES

	PROPOSED WORK ITEM DESCRIPTION	UNIT	AMOUNT
(1)	NON-DESTRUCTIVE DETECTION SCAN ITEM 1	LS	1
(2)	CRACK INJECTION REPAIR TYPE 2	LF	40

NOTES:
1. THE QUANTITIES FOR THE WORK ITEM DESCRIPTIONS ABOVE ARE APPROXIMATE. CONTRACTOR SHALL BE PAID IN FULL FOR ACTUAL AS-CONSTRUCTED AMOUNTS USED ABOVE/BELOW BASE QUANTITY SHOWN. CONTRACTOR TO FILL IN BID PROPOSAL.
2. ALL ITEM DESCRIPTIONS SHOWN AS LUMP SUM FOR THE UNIT AND ANY WORK NOT SPECIFICALLY GIVEN A UNIT QUANTITY/DESCRIPTION SHOWN ON THESE SHEETS SHALL BE INCLUDED IN THE LUMP SUM PRICE TOTAL FOR THE PROJECT ON THE BID FORM.
3. "STEEL LINTEL ITEM 3" SHALL BE PROVIDED ON AN AS-NEEDED BASIS, AS DETERMINED BY THE ENGINEER. PROVIDE UNIT PRICE PER EACH IN THE BID PROPOSAL. CONTRACTOR IS TO TO BE PAID FOR ACTUAL QUANTITIES INSTALLED.

SPECIAL PROJECT NOTES:

1. REFERENCE DRAWINGS INDICATE THAT SLABS AND BEAMS ARE INTERNALLY REINFORCED WITH UNBONDED, DRAPED, POST-TENSIONED TENDONS IN TWO DIRECTIONS. DRAWINGS INDICATE THAT SLABS ARE ALSO REINFORCED WITH MILD STEEL IN TWO DIRECTIONS.
2. SHOP DRAWINGS FOR POST-TENSIONED CONCRETE ELEMENTS ARE NOT AVAILABLE.
3. REFERENCE DRAWINGS INDICATE THAT CONCRETE CLEAR COVER TO THE TENDONS IS APPROXIMATELY 1 INCH.
4. TENDONS ARE GREASED AND WRAPPED; THEY ARE NOT ENCASED IN CONDUIT.
5. CONTRACTOR SHALL HAVE AT LEAST 5 YEARS EXPERIENCE ON A MINIMUM OF 3 PROJECTS WHERE RENOVATION WORK WAS PERFORMED ON A BUILDING OF THIS CONSTRUCTION TYPE (POST-TENSIONED SLAB). SUBMIT LETTER, DOCUMENTING QUALIFICATIONS, PRIOR PROJECT NAMES, AND DESCRIPTIONS FOR REVIEW AND APPROVAL AS PART OF THE "NON-DESTRUCTIVE DETECTION SCAN" BID ITEM.
6. REINFORCEMENT DEPICTIONS FOR SLABS AND BEAMS ARE GENERIC. FIELD VERIFY LOCATION AND DIMENSIONS OF SLABS AND BEAMS.
7. THE FOLLOWING ITEMS ARE NOT PERMITTED WITHOUT PRIOR APPROVAL FROM THE ENGINEER:
   - DRILLING, CORING, OR CUTTING OF ANY KIND
   - DEMOLITION OR REMOVAL OF EXISTING ELEMENTS
   - FIELD ADJUSTMENT OF THE LOCATION OF PROPOSED ELEMENTS
   - CHANGES TO THE QUANTITY, LAYOUT, DIAMETER, OR EMBEDMENT DEPTH OF PROPOSED ANCHORAGES INTO THE CONCRETE
8. CONCRETE REPAIRS TO BEAM RPB6 MUST BE PERFORMED PRIOR TO COMMENCING ANY PROPOSED CONSTRUCTION ON THE ROOF. SEE ROOF PLAN FOR CRACK REPAIR LOCATIONS AND SHT S-2 FOR REPAIR DETAILS.
9. MAXIMUM CONSTRUCTION LOAD LIMIT IMPOSED ON THE ROOF SLAB IS 30 PSF. THIS INCLUDES COMBINATIONS OF LOADS AT ANY ONE POINT IN TIME- EQUIPMENT, MATERIALS, ETC.
10. CONTRACTOR IS RESPONSIBLE FOR THE EVALUATION OF EFFECTS OF ALL LOADS DUE TO CONSTRUCTION-RELATED ACTIVITIES.
11. WHEREVER PRACTICAL, CONTRACTOR IS TO UTILIZE EXISTING CAST-IN-PLACE CHANNELS AND THREADED INSERTS FOR HANGING PROPOSED DUCTWORK AND PLUMBING.
12. CONTRACTOR IS REQUIRED TO SUBMIT DETAILED LAYOUTS OF PROPOSED DEMOLITION WORK, DUCTWORK AND PLUMBING. LAYOUT SHALL ALSO INCLUDE:
    - EXISTING TENDON LOCATIONS
    - LOCATIONS WHERE EXIST CAST-IN-PLACE CHANNELS/INSERTS WILL BE USED
    - LOCATIONS OF PROPOSED ANCHORS

CONTRACTOR IS TO USE NON-DESTRUCTIVE DETECTION TECHNOLOGY DESCRIBED BELOW IN ORDER TO IDENTIFY ACCEPTABLE LOCATIONS FOR PROPOSED ANCHORS. THIS WORK ITEM IS MANDATORY. FAILURE TO FOLLOW THIS PROCESS PRIOR TO INSTALLING ANCHORS IS NOT PERMITTED UNDER ANY CIRCUMSTANCES. THE COST TO REPAIR ANY DAMAGE RESULTING FROM FAILURE TO FOLLOW THIS PROCESS IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

1. PRIOR TO LAYOUT OF ANY PROPOSED ANCHORS OR DRILLING/CORING/CUTTING OF ANY KIND, THE CONTRACTOR IS REQUIRED TO USE A FORM OF NON-DESTRUCTIVE DETECTION TECHNOLOGY [EX: GROUND PENETRATING RADAR (GPR)] TO LOCATE EXISTING TENDONS. PROPOSED WORK MUST BE LOCATED A MINIMUM OF 6 INCHES FROM TENDONS.
2. CONTRACTOR PERFORMING THE NON-DESTRUCTIVE DETECTION TECHNOLOGY SHALL HAVE AT LEAST 5 YEARS EXPERIENCE ON A MINIMUM OF 10 PROJECTS WHERE NON-DESTRUCTIVE DETECTION TECHNOLOGY WAS PERFORMED ON A BUILDING OF THIS CONSTRUCTION TYPE (POST-TENSIONED SLAB). SUBMIT LETTER, DOCUMENTING QUALIFICATIONS, PRIOR PROJECT NAMES, AND DESCRIPTIONS FOR REVIEW AND APPROVAL.
3. INCLUDES THE PROVIDING OF ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO PERFORM ALL WORK ASSOCIATED WITH "NON-DESTRUCTIVE DETECTION SCAN ITEM 1". CONTRACTOR SHALL BE PAID IN FULL FOR ALL COSTS ASSOCIATED WITH THIS WORK AFTER COMPLETION OF THE WORK. ITEMS INCLUDED (NOT PAID FOR SEPARATELY):
   - PREPARATION AND SUBMISSION OF QUALIFICATION LETTERS FOR PARTIES PERFORMING 1) DEMOLITION & PROPOSED WORK AND 2) NON-DESTRUCTIVE DETECTION SCANS
   - PERFORMING NON-DESTRUCTIVE DETECTION ON ALL CONCRETE SURFACES
   - INTERPRETING OF NON-DESTRUCTIVE TECHNOLOGY SCAN INFORMATION
   - PREPARATION AND SUBMISSION OF SHOP DRAWINGS FOR ENGINEER'S REVIEW AND ACCEPTANCE

NON-DESTRUCTIVE DETECTION SCAN ITEM (1)

DRAWING NOTES:

1. WHERE SHOWN, ALL EXISTING DIMENSIONS AND ELEVATIONS ARE APPROXIMATE. FIELD VERIFY PRIOR TO CONSTRUCTION.
2. THESE DRAWINGS HAVE BEEN COPIED FROM A PREVIOUS CONSTRUCTION PROJECT AND INDICATE THE GENERAL ARRANGEMENT OF THE EXISTING FACILITY. NO GUARANTEE IS MADE, OR SHALL BE ASSUMED, AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN ON THIS DRAWING. PARTIES USING THIS INFORMATION SHALL FIELD VERIFY THE ACCURACY AND COMPLETENESS PRIOR TO CONSTRUCTION ACTIVITIES.
3. ALL EXISTING AND PROPOSED WORK SHOWN ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED ON THE FOLLOWING REFERENCE SET FROM THE CITY OF WARREN:
   - POLICE HEADQUARTERS BUILDING PROJECT NO. 76-829 DATED 3/18/77 BY COQUILLARD/DOLGNER/DUNDON/ AND ARGENTA ARCHITECTS • ENGINEERS

WARREN
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OWNER REVIEW	01-21-2022
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BID RE-ISSUE	12-16-2022
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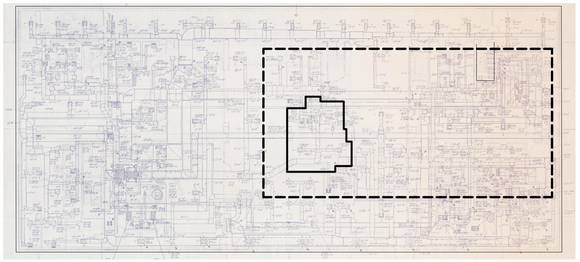
PRELIMINARY - NOT FOR CONSTRUCTION

designed by:	CKC
drawn by:	PMH
coordination checked:	STS
checked:	RBN
approved:	MCM

project:
Warren Police Department
Crime Lab

sheet title:
Structural Plans, Sections, Photographs, Details, And Notes

project number: 1201-1
sheet number: S-001



KEY PLAN
N.T.S.

ALL EXISTING SLABS AND BEAMS ARE INTERNALLY REINFORCED WITH DRAPED POST–TENSIONED TENDONS. NON–DESTRUCTIVE DETECTION TECHNOLOGY MUST BE UTILIZED TO LOCATE TENDONS. NO DRILLING, CORING, OR CUTTING OF ANY KIND IS PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER. SEE NOTES ON S–001 FOR ADDITIONAL INFORMATION.

F E D C B

103

(E) 22"x8" EXH. TO REMAIN

REMOVE (E) SPRINKLER AND CAP ABOVE CEILING

REMOVE AND REPLACE (E) DIFF (TYP. FOR 4)

LAB FOOTPRINT AREA

HVAC DEMO PLAN
SCALE: 1/4" = 1'-0"

N

WARREN

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designed by:	GS
drawn by:	STS
coordination checked:	STS
checked:	GS
approved:	MCM

project:
Warren Police Department
Crime Lab

sheet title:
Mechanical Demolition

project number:	sheet number:
1201-1	DM-001

GENERAL MECHANICAL SPECIFICATIONS

GENERAL REQUIREMENTS

READ AND BE BOUND BY THE ARCHITECTURAL SPECIFICATIONS.

THESE SPECIFICATIONS, ALL OTHER DOCUMENTS ATTACHED HERETO, ALL ADDENDA ISSUED AND THE ACCOMPANYING PLANS ARE INTENDED TO PROVIDE FOR THE COMPLETE FURNISHING AND INSTALLATION OF THE ENTIRE MECHANICAL SYSTEM.

THE WORK SHALL BE DONE IN ACCORDANCE WITH BEST PRACTICE SO AS TO CONTRIBUTE TO EFFICIENCY OF OPERATION AND MINIMUM MAINTENANCE AND SHALL BE INSTALLED WITH PROPER ACCESSIBILITY. THE MATERIALS AND EQUIPMENT, INCLUDING ALL NECESSARY ACCESSORIES, SHALL BE PUT INTO PROPER ADJUSTMENT SO THAT THE COMPONENT PARTS FUNCTION TOGETHER AS A WORKABLE SYSTEM. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIALS AND OPERATIONS AS INDICATED EITHER ON THE DRAWINGS OR CONTAINED HEREIN OR AS MAY BE REASONABLY IMPLIED BY EITHER TO ACCOMPLISH THE COMPLETE INSTALLATION.

PROVIDE ALL MATERIALS, EQUIPMENT, LABOR AND INCIDENTALS NECESSARY FOR COMPLETE AND OPERABLE MECHANICAL SYSTEMS. PROVIDE ALL NECESSARY TESTS AND PAY FOR ALL FEES, PERMITS, INSPECTIONS, ETC. AS REQUIRED BY LOCAL AUTHORITIES. SECURE PERMITS PRIOR TO STARTING WORK. OBTAIN ALL PERMITS, LICENSES, INSPECTIONS AND BONDS. PERFORM ALL TESTS REQUIRED. UPON COMPLETION OF THE WORK, OBTAIN AND SEND CERTIFICATES OF INSPECTION AND APPROVAL TO THE ARCHITECT/OWNER. PAY ALL FEES AND EXPENSES FOR PERMITS, LICENSES, TESTS AND INSPECTIONS.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR THAT HIS WORK IS INSTALLED IN THE MOST DIRECT AND WORKMANLIKE MANNER AND THAT INTERFERENCE IS AVOIDED.

THE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND INDICATIVE OF THE EQUIPMENT AND SYSTEMS TO BE INSTALLED AND THE GENERAL LOCATION AND ARRANGEMENT OF MECHANICAL WORK. DUE TO THE SCALE OF THE DRAWINGS IT IS NOT POSSIBLE TO INDICATE THE EXACT LOCATION AND ROUTING OF MECHANICAL WORK, UNLESS REFERENCE DIMENSIONS ARE SPECIFICALLY INDICATED ON DRAWINGS. DEVIATIONS FROM CONTRACT DRAWING LAYOUT IN ORDER TO AVOID INTERFERENCES WITH OTHER TRADES, OR OTHER MECHANICAL WORK SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT, WITH NO INCREASE IN CONTRACT PRICE. ALL COSTS FOR REMOVAL AND RELOCATION OF MECHANICAL WORK RESULTING FROM FAILURE TO COORDINATE WITH OTHER TRADES SHALL BE PAID BY THE MECHANICAL SUBCONTRACTOR.

INSTALLATION SHALL CONFORM TO ALL LOCAL CODES AND ORDINANCES. THE CONTRACTOR SHALL BE HELD TO BE FULLY INFORMED OF ALL LAWS, ORDINANCES AND CODES, AND SHALL, IN THE PERFORMANCE OF THE CONTRACT, COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL AFORESAID REGULATIONS. ANY DEVIATION FROM THE PLANS OR SPECIFICATIONS AND ANY ADDITIONAL WORK NECESSARY TO MEET CODE REQUIREMENTS, SHALL BE MADE BY THE CONTRACTOR WITHOUT EXTRA COST TO THE OWNER.

ALL EQUIPMENT IS TO BE U.L. LISTED AND LABELED.

THE MECHANICAL TRADES (M.T.) SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. NOTIFY THE ARCHITECT OF INTERFERENCES OR DISCREPANCIES.

LOCATIONS AND SIZES OF EXISTING EQUIPMENT, DUCTWORK, PIPING, ETC., HAVE BEEN TAKEN FROM ORIGINAL DESIGN DRAWINGS AND MAY NOT BE EXACTLY AS SHOWN. THE M.T. SHALL FIELD VERIFY LOCATIONS, SIZES, ETC., PRIOR TO ANY NEW WORK.

ALL ROOF MOUNTED EQUIPMENT IS TO BE IDENTIFIED WITH THE UNIT NAME AND NUMBER USING 2" HIGH LETTERS.

EACH TRADE SHALL BE RESPONSIBLE FOR ITS OWN CLEAN-UP. COORDINATE WITH THE ARCHITECTURAL TRADES (A.T.).

UNLESS OTHERWISE NOTED, ALL CUTTING SHALL BE PROVIDED BY THE M.T. AND PATCHING BY THE A.T. ROOF PENETRATIONS ARE TO BE PERFORMED BY THE OWNER'S ROOFER AND PAID FOR BY THE M.T. COORDINATE ALL OPENINGS WITH THE A.T.

FURNISH ELECTRIC MOTORS AND CONTROL DEVICES IN CONNECTION WITH THE VARIOUS PIECES OF MOTOR-DRIVEN EQUIPMENT SPECIFIED IN MECHANICAL WORK SECTIONS, AS SPECIFIED HEREIN. ALL MOTORS SHALL BE OF THE "PREMIUM" HIGH EFFICIENCY TYPE.

SHOP DRAWING SUBMITTALS ARE REQUIRED. REFER TO THE A.T. SPECIFICATIONS.

AIR SYSTEMS BALANCING IS REQUIRED. REFER TO THE HVAC SPECIFICATIONS.

PROVIDE ACCESS DOORS IN CEILINGS AND WALLS FOR ACCESS TO ALL VALVES, VENTS, CONTROLS, DAMPERS, MOTORS, ETC. DOORS SHALL BE SAME AS SPECIFIED BY ARCHITECTURAL TRADES. ACCESS DOORS ARE NOT REQUIRED IN LAY-IN CEILINGS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SEALING AND FIRE-STOPPING OF ALL HOLES ASSOCIATED WITH THE PIPING, CONDUIT, ETC., IN WALLS, FLOORS AND ROOF. IN WALLS, FLOORS AND ROOF, WRAP EACH RISER, PIPE, ETC., WITH NON-COMBUSTIBLE MATERIAL AND FILL ALL FLOOR OPENINGS WITH A MINIMUM OF 5" OF INTUMESCENT FIRE-STOPPING MATERIAL EQUAL TO 3M OR FIBERFRAX "FYRE PUTTY". PIPES REQUIRING INSULATION SHALL BE INSULATED BEFORE PLACING FIRE-STOPPING MATERIAL.

DEMOLITION: EXISTING PLUMBING SYSTEMS, HVAC AND FIRE PROTECTION SYSTEMS ARE TO BE REMOVED OR ABANDONED BY THE M.T. REFER TO MECHANICAL AND ARCHITECTURAL DEMOLITION DRAWINGS AND NOTES.

FURNISH THE OWNER WITH TWO COPIES OF OPERATION/MAINTENANCE MANUALS FOR ALL EQUIPMENT AND PROVIDE FULL OPERATION INSTRUCTIONS TO THE OWNERS PERSONNEL.

GUARANTEE: THE M.T. SHALL REPAIR OR REPLACE ANY PART OF THE MECHANICAL SYSTEMS INSTALLATION WHICH MAY FAIL WITHIN A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE.

PLUMBING SPECIFICATIONS

GENERAL

SEWERS 3" AND LARGER ARE TO BE PITCHED DOWN IN DIRECTION OF FLOW AT 1/8" PER FOOT UNLESS OTHERWISE NOTED. 1-1/2" TO 2-1/2" PIPES TO PITCH AT ¼" PER FOOT. PITCH VENT PIPING UP. WATER PIPING SHALL BE PITCHED TO FACILITATE DRAINAGE.

NEW PLUMBING SERVICES ARE TO CONNECT TO EXISTING STUBS OR MAINS. FIELD VERIFY EXACT SIZE AND LOCATIONS.

PROVIDE PVC "P" TRAPS AT ALL ROOF TOP AIR CONDITIONING UNITS. DISCHARGE TO SPILL ON A SPLASH BLOCK ON THE ROOF.

PROVIDE MINIMUM 12" LONG DRIP LEGS AND PIPE UNIONS AT NATURAL GAS PIPE CONNECTIONS TO APPLIANCES.

ALL VALVES ARE TO BE TYPES AS RECOMMENDED BY THE MANUFACTURER FOR THE INTENDED SERVICE AND SHALL BE PROPERLY RATED FOR PRESSURE AND TEMPERATURE.

TO PREVENT ELECTROLYTIC CORROSION, PROVIDE INSULATED COUPLINGS WHERE DISSIMILAR METALS ARE JOINED. COUPLINGS SHALL BE EQUAL TO LOCHINVAR "V-LINE" WITH AN INERT, NON-CONDUCTIVE, LINED-IMPREGNATED LAMINATE MATERIAL AND THREADED TO NPS STANDARDS. COUPLINGS SHALL BE SUITABLE FOR HYDROSTATIC PRESSURE UP TO 300 PSI AND 225 DEGREE F. TEMPERATURE.

PIPE INTERIOR CLEANING:

PROVIDE ALL NECESSARY LABOR, MATERIALS AND EQUIPMENT TO FLUSH THE LISTED PIPING SYSTEM WITH CLEAN WATER AT A MINIMUM VELOCITY OF 6 FEET/SECOND UNTIL DIRTY WATER DOES NOT APPEAR AT THE OUTLETS. USE OPEN END BRANCHES, SETTLING BASINS, PUMPS, OR TEMPORARY FILTERS AS SUITABLE FOR THE JOB CONDITIONS AND AS THE REASONABLE DISPOSAL OF FLUSHING WATER PERMITS. THE CONTRACTOR HAS THE OPTION OF HIGH PRESSURE HYDRAULIC JET CLEANING IN LIEU OF FLUSHING.

PROTECT ALL VALVES AND DEVICES FROM DAMAGE DURING THE CLEANING OPERATION.

PLUMBING SPECIFICATIONS – CONTINUED

DISINFECTION:

A. ALL DOMESTIC WATER SYSTEMS SHALL BE PURGED OF DELETERIOUS MATTER AND DISINFECTED PRIOR TO UTILIZATION. THE METHOD TO BE FOLLOWED SHALL BE AS PRESCRIBED BY THE HEALTH AUTHORITY HAVING JURISDICTION, OR IN THE ABSENCE OF A PRESCRIBED METHOD, THE PROCEDURE IN EITHER AWWA C651 OR AWWA C652 OR AS FOLLOWS:

1. FLUSH OUT SYSTEM FIRST, THEN HOLD A SOLUTION MIXTURE OF 50 PPM OF CHLORINE/ WATER FOR A 24 HOUR PERIOD OR THE SYSTEM SHALL BE FILLED WITH WATER/CHLORINE SOLUTION CONTAINING AT LEAST 200 PPM OF CHLORINE AND ALLOWED T REMAIN TO STAND FOR AT LEAST 3 HOURS. DRAIN SYSTEMS AND FLUSH WITH CLEAN WATER UNTIL THE CHLORINE IS PURGED FROM THE SYSTEM.

2. CHLORINATION PROCEDURES SHALL CONFORM TO AWWA C651 OR AWWA C652. REPEAT CHLORINATION AS NECESSARY UNTIL NO CONTAMINANTS REMAIN IN THE SYSTEM.

PROVIDE PIPE CONTENT AND FLOW DIRECTION IDENTIFICATION LABELS EQUAL TO SETON SETMARK ON ALL PIPE MAINS, ADJACENT TO EACH VALVE, AT EACH FITTING, AT BUILDING ENTRANCE, AT LEAST ONCE IN EACH ROOM AND AT INTERVALS NO LONGER THAN 20 FEET. TEXT TO BE 2" HIGH ON PIPES 4" AND LARGER AND 3/4" HIGH ON PIPES 3" AND SMALLER.

PLUMBING MATERIALS

UNDERGROUND SEWERS AND VENTS SHALL BE STANDARD WEIGHT CAST IRON SOIL PIPE WITH COMPRESSION TYPE FITTINGS OR SCHEDULE 40 PVC.

ABOVEGROUND WASTE AND VENT PIPING SHALL BE CAST IRON WITH NO-HUB JOINTS, SCHEDULE 40 GALVANIZED STEEL, ALUMINUM WITH NO-HUB CAST IRON JOINTS OR DWV COPPER. SCHEDULE 40 PVC MAY BE USED ABOVEGROUND WHERE CODE PERMITS.

DOMESTIC WATER PIPING 2-1/2" AND SMALLER SHALL BE TYPE "L" HARD DRAWN COPPER WITH LEAD-FREE SOLDER TYPE FITTINGS.

NATURAL GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL WITH MALLEABLE IRON FITTINGS, SCREWED TO 2" SIZE AND WELDED FOR 2-1/2" AND LARGER. PIPING LOCATED IN CEILING PLENUMS SHALL BE WELDED STEEL OR BRAZED TUBING AND SHALL NOT HAVE UNIONS, COUPLINGS OR OTHER AS IDENTIFIED IN THE INTERNATIONAL FUEL GAS CODE. PIPING LOCATED OUTDOORS SHALL BE WEATHER PROTECTED IN ACCORDANCE WITH UTILITY COMPANY RECOMMENDATIONS. MOUNT PIPING ABOVE THE ROOF ON PRE-FAB PIPE SUPPORTS EQUAL TO B-LINE, MAPA, MIRO OR E-Z SLEEPER SPACED PER INTERNATIONAL FUEL GAS CODE RECOMMENDATIONS. PAINT ALL PIPING ON EXTERIOR WALLS SAME COLOR AS THE WALL AND ALL OTHER PIPING ABOVE THE ROOF IS TO BE PAINTED YELLOW.

WATER, SEWER, VENT AND GAS PIPING SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE ON CLEVIS TYPE HANGERS SPACED IN ACCORDANCE WITH ASHRAE GUIDE RECOMMENDATIONS. PIPE SUPPORT SPACING FOR NATURAL GAS PIPING SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL FUEL GAS CODE.

ROOF PIPE PENETRATIONS

SINGLE PIPE: ONE PIECE SPUN ALUMINUM BASE WITH FIVE (5") INCH SLOPED ROOF SURFACE FLANGE, GRADUATED, STEPPED PVC BOOT AND ADJUSTABLE STAINLESS STEEL CLAMPS. PATE "PATE PIPE SEAL"OR THYCURB.

MULTIPLE PIPES: 12"X 12", WELDED, GALVANIZED STEEL RAISED CANT CURB WITH 2"X 2" NAILER, ACRYLIC CLAD ABS PLASTIC COVER, FASTENING SCREWS, GRADUATED NEOPRENE STEP BOOTS WITH STAINLESS STEEL BAND CLAMPS. PATE MODEL PCA-2 OR THYCURB.

HEATING, VENTILATING AND AIR CONDITIONING SPECIFICATIONS

GENERAL

SUPPLY, RETURN AND EXHAUST AIR DUCTWORK SHALL BE GALVANIZED STEEL, CONSTRUCTED OF PROPER PRESSURE CLASSIFICATION GAUGES AND INSTALLED IN ACCORdANCE WITH SMACNA STANDARDS. MINIMUM 2" PRESSURE RATING FOR LOW VELOCITY SYSTEMS.

RECTANGULAR DUCT JOINTS SHALL BE CONNECTED WITH DUCTMATE 25/35/45 JOINT SYSTEMS THAT UTILIZE ROLL-FORMED FLANGES, CORNER PIECES, GASKET AND CLEAT. DUCT JOINTS MAY BE INDIVIDUALLY REMOVED. SEAL ALL JOINTS WITH UL 181B-M LISTED JOINT SEALANT EQUAL TO DUCTMATE PROSEAL, HARDCAST OR AIRSEAL FOR THE APPROPRIATE PRESSURE CLASSIFICATION, TEMPERATURE AND WEATHER-RESISTANCE.

ROUND SPIRAL DUCT FITTINGS AND ELBOWS SHALL BE JOINED USING SLIP-JOINT FITTINGS. FITTING SHALL HAVE A STOP BEAD TO LOCATE FITTING INSIDE PIPE. ALL PIPE TO PIPE CONNECTIONS REQUIRE A SLIP COUPLING THAT FITS INSIDE BOTH MATING SECTIONS. SEAL ALL JOINTS WITH UL 181B-M LISTED JOINT SEALANT EQUAL TO DUCTMATE PROSEAL, HARDCAST OR AIRSEAL FOR THE APPROPRIATE PRESSURE CLASSIFICATION, TEMPERATURE AND WEATHER-RESISTANCE.

FUME HOOD EXHAUST DUCT SHALL BE SHEET METAL EQUAL TO FOREMOST, POLYVINYL (PVC) COATED SPIRAL DUCT. DUCT SHALL HAVE A 4 MIL COATING ON THE INTERIOR OF THE DUCT. JOINTS ARE TO BE FINISHED WITH P.C.D. TAPE, P.C.D. DUCT SEALER OR HARDCAST TAPE AND SEALANT AS REQUIRED FOR THE APPROPRIATE APPLICATION. ALL SCRATCHED SURFACES ARE TO BE REPAIRED WITH P.C.D. SPRAY TYPE SCRATCH REPAIR.

DUCTWORK FITTINGS SHALL BE PER SMACNA RECOMMENDATIONS. RADIUS TURNS ON SUPPLY AIR DUCTS SHALL BE 1-1/2 TIMES DUCT WIDTH MINIMUM. WHERE SPACE OR CLEARANCE REQUIRES THE USE OF MITERED TURNS, PROVIDE HIGH PERFORMANCE DOUBLE THICKNESS TURNING VANES EQUAL TO AERO/DYNE "HEP" AND VOLUME DAMPERS. REFER TO DETAILS ON THE DRAWINGS.

PROVIDE FACTORY MANUFACTURED TEST HOLE UNITS IN DUCTWORK WHERE REQUIRED TO FACILITATE AIR BALANCE.

ALL DUCTWORK AND PIPING INSIDE THE BUILDING IS TO BE SUSPENDED FROM THE POST-TENSIONED CONCRETE STRUCTURE. WHEREVER PRACTICAL, CONTRACTOR IS TO UTILIZE EXISTING CAST-IN-PLACE CHANNELS AND THREADED INSERTS FOR HANGING PROPOSED DUCTWORK AND PIPING. SEE SHEET S-001 FOR ADD'L INFORMATION REGARDING MANDATORY SCANNING TO LOCATE POST-TENSIONED TENDONS PRIOR TO COMPLETING DEMOLITION OR PROPOSED WORK. DUCTS LOCATED ON THE ROOF ARE TO BE MOUNTED ON MIRO MODEL DS DUCT SUPPORTS. STANDS ARE TO BE FULLY ADJUSTALE FOR HEIGHT AND CONSTRUCTED OF HOT DIPPED GLAVANIZED STEEL SITING ON A PAIR OF UV STABLE POLYCARBONATE BASES. SELECT THE APPROPRIATE STAND FOR THE DUCT SIZE. CONTRACTOR HAS THE OPTION TO USE MIRO INDUSTRIES OR PORTABLE PIPE HANGERS, INC. PILLOW BLOCK PIPE STANDS IN LIEU OF THE PATE PIPE CURBS.

DUCT SIZES INDICATED ON THE DRAWINGS ARE CLEAR INSIDE DIMENSIONS.

PROVIDE DUCT VOLUME DAMPERS AT EACH BRANCH CONNECTION TO DIFFUSERS AND REGISTERS FOR PROPER AIR SYSTEMS BALANCING. REFER TO DETAILS ON THE DRAWINGS.

PROVIDE GRAVITY BACKDRAFT DAMPERS FOR ALL EXHAUST FANS AND BUILDING PRESSURE RELIEF VENTS (UNLESS OTHERWISE NOTED.) USE COUNTERBALANCE WEIGHTS TO SET OPERATION PRESSURE ON RELIEF DAMPERS.

THE CONTRACTOR HAS THE OPTION OF USING EQUIVALENT SIZE ROUND DUCT (NOT FLEXIBLE DUCT) WHERE SPACE PERMITS.

NO OUTDOOR AIR INTAKES ARE TO BE LOCATED WITHIN 10 FEET OF EXHAUST FAN DISCHARGE OR PLUMBING VENTS.

PROVIDE FLEXIBLE CONNECTORS ON ALL DUCT CONNECTIONS TO AIR HANDLING UNITS. MAXIMUM FLAME SPREAD/SMOKE DEVELOPED RATING NOT TO EXCEED 25/50. FLEXIBLE CONNECTORS SHALL BE MINIMUM 8" LONG, MADE OF TWO LAYERS OF 8 OZ. OR ONE LAYER OF 16 OZ. NEOPRENE COATED CLOTH WITH AIRTIGHT SEAMS. FASTEN WITH BOLTED GALVANIZED METAL BANDS.

M.T. SHALL FURNISH AND INSTALL ALL REQUIRED AUTOMATIC TEMPERATURE CONTROLS INCLUDING ELECTRICAL WIRING, TRANSFORMERS AND THERMOSTATS FOR PROPER

HEATING, VENTILATING AND AIR CONDITIONING SPECIFICATIONS – CONTINUED

OPERATION OF THE HVAC SYSTEMS. WIRING SHALL BE IN ACCORDANCE WITH N.E.C. STANDARDS. POWER FOR CONTROLS IS AVAILABLE IN ONE OF THE ELECTRICAL PANELS. COORDINATE CIRCUIT AND BREAKER SIZE REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.

FLEXIBLE AIR DUCT

FLEXIBLE AIR DUCT (INSULATED) SHALL BE CLEVAFLEX OR FLEXMASTER TYPE 5, U.L.-181 LISTED, LOW PRESSURE RATED (6") WITH A TRILAMINATE OF ALUMINUM FOIL, FIBERGLASS AND POLYESTER INNER LINER ON GALVANIZED STEEL HELIX WITH R-5.0 (6.0)(8.0) FIBERGLaSS INSULATION WITH 25/50 FIRE RETARDANT VAPOR BARRIER JACKET.

ALL CONNECTIONS ARE TO BE MADE WITH ADJUSTABLE CLAMPS AND TAPED AIR TIGHT.

FLEXIBLE DUCT SHALL ONLY BE USED WHERE CONCEALED ABOVE CEILINGS.

AIR SYSTEMS BALANCING

THE AIR SYSTEMS ARE TO BE BALANCED TO WITHIN 5% OF THE QUANTITIES INDICATED ON THE DRAWINGS.

PREPARE AN AIR BALANCE REPORT COMPLETE WITH AN 8-1/2" X 11" SKETCH OF EACH SYSTEM ON FORMS SIMILAR TO AABC OR NEBB AND SCHEDULE EACH OUTLET, FAN, TERMINAL UNIT, ETC. INCLUDE SUCTION AND DISCHARGE STATIC PRESSURES AND OUTDOOR AIR, RETURN AIR AND MIXED AIR TEMPERATURES AT EACH FAN. SUBMIT (6) COPIES OF THE REPORT TO THE ARCHITECT.

ALL SHEAVE, BELT AND IMPELLER CHANGES REQUIRED TO MEET DESIGN PERFORMANCE WILL BE MADE BY THE MECHANICAL SUBCONTRACTOR AS REQUIRED AND DIRECTED BY THE TESTING AND BALANCING CONSULTANT, WITH NO INCREASE IN THE CONTRACT AMOUNT.

ACOUSTIC DUCT LINER

ACOUSTICAL DUCT LINER SHALL BE 2" THICK FIBERGLASS TYPE 200, "R" = 7.7 WITH BLACK VINYL COATING EQUAL TO KNAUF OR OWENS CORNING "AEROFLEXPLUS". PROVIDE METAL NOSING WHERE LINED SHEET METAL DUCTWORK MEETS UNLINED DUCTWORK. INCREASE DUCT SIZES TO COMPENSATE FOR THE INSULATION THICKNESS. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

ALL SUPPLY DUCTWORK ABOVE THE ROOF IS TO BE INTERNALLY LINED WITH TYPE 200 LINER.

SPIN-IN FITTINGS

ROUND BRANCH CONNECTIONS TO DIFFUSERS MAY BE MADE WITH SPIN-IN FITTINGS WITH VOLUME DAMPERS AND SCOOP EQUAL TO FLEXMASTER FL/DB FOR SHEET METAL DUCT.

DIFFUSERS AND REGISTERS

DIFFUSERS AND REGISTERS SHALL BE MANUFACTURED BY PRICE, CARNES, TUTTLE & BAILEY, TITUS OR KRUEGER. PROVIDE DAMPERS AT EACH DIFFUSER AND REGISTER. BAKED OFF-WHITE ENAMEL FINISH UNLESS NOTED.

CD-1 PRICE SCDA SERIES, 24"X 24" ADJUSTABLE DIFFUSER FOR LAY-IN CEILINGS, ROUND INLET, STEEL CONSTRUCTION.

RG-1 PRICE 81 SERIES, EXHAUST GRILLE, 1/2"X 1/2"X 1", ALL ALUMINUM EGG CRATE

TESTS, ADJUSTMENTS AND ACCEPTANCE

UPON COMPLETION OF THE ERECTION OF ALL EQUIPMENT AND ALL WORK SPECIFIED HEREIN AND/OR SHOWN ON THE APPROVED SHOP DRAWINGS, OR AT SUCH TIME AS DIRECTED BY THE ARCHITECT, THIS SUBCONTRACTOR SHALL START ALL APPARATUS, MAKE NECESSARY TESTS AS DIRECTED AND AS SPECIFIED HEREIN, AND MAKE COMPLETE ADJUSTMENTS OF ALL ITEMS OF EQUIPMENT BEFORE ACCEPTANCE BY THE ARCHITECT TO WHOSE REPRESENTATIVE THIS SUBCONTRACTOR SHALL DEMONSTRATE (BY PERFORMANCE) ALL OF THE VARIOUS APPARATUS AND EQUIPMENT. START UP AND ADJUSTMENT OF EQUIPMENT SHALL INCLUDE ALL EQUIPMENT FURNISHED AND INSTALLED BY THIS CONTRACTOR.

WORK UNDER THIS SECTION OF THE SPECIFICATIONS SHALL NOT BE CONSIDERED COMPLETE UNTIL THIS SUBCONTRACTOR HAS OBTAINED REQUIRED INSPECTIONS, CONDUCTED PERFORMANCE TESTS, MADE NECESSARY ADJUSTMENTS AND HAS SUBMITTED SATISFACTORY EVIDENCE OF COMPLIANCE. THE ARCHITECT SHALL MAKE SPOT CHECKS TO DETERMINE THE ACCURACY AND COMPLETENESS OF FINAL ADJUSTMENTS. SHOULD SPOT CHECKS INDICATE MORE THAN A REASONABLE DEVIATION FROM DESIGN DRAWINGS AND REQUIREMENTS, THIS SUBCONTRACTOR SHALL REPEAT TESTS AND ADJUSTMENTS TO THE SATISFACTION OF THE ARCHITECT. DURING THE TESTING PERIOD, THIS SUBCONTRACTOR SHALL MAINTAIN ON THE JOB A COMPETENT INDIVIDUAL, THOROUGHLY FAMILIAR WITH ALL PHASES OF THE HEATING AND VENTILATION SYSTEMS, FOR AS LONG AS MAY BE REQUIRED TO THOROUGHLY ADJUST ALL OF THE SYSTEMS AND TO DEMONSTRATE TO THE ARCHITECT AND/OR ENGINEER THAT THEY ARE FUNCTIONING PROPERLY.

TEMPERATURE CONTROL WIRING AND CONTROL TESTING SHALL BE BY TEMPERATURE CONTROLS CONTRACTOR.

AUTOMATIC TEMPERATURE CONTROLS

FANS

LAB ROOM EXHAUST FAN IS MANUALLY STARTED AND OPERATES 24/7.

INSULATION SPECIFICATIONS

GENERAL

INSULATION SHALL BE INSTALLED ON ALL PIPING AND DUCTWORK SYSTEMS WHERE SPECIFIED BELOW. INSULATION PRODUCTS SHALL BE MANUFACTURED BY OWENS CORNING, CERTAINTEED, JOHNS-MANVILLE OR KNAUF AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS.

INSULATION MATERIALS SHALL MEET CURRENT ASHRAE 90.1 REQUIREMENTS INCLUDING MAXIMUM FLAME SPREaD RATING OF 25 AND SMOKE DEVELOPED RATING OF 50 OR LESS.

DUCTWORK THAT IS ACOUSTICALLY LINED SHALL NOT BE INSULATED.

INSULATION PRODUCTS

ALL DOMESTIC HOT AND COLD WATER PIPING SHALL BE INSULATED WITH 1" THICK FIBERGLASS INSULATION WITH VAPOR BARRIER. TAPE JOINTS AND COVER ELBOWS WITH PRE-FABRICATED PVC OR ALUMINUM ELBOW WRAPS.

AT THE CONTRACTOR'S OPTION, CLOSED CELL POLYMER FOAM INSULATION EQUAL TO ARMAFLEX OR NOMACO MAY BE USED ON DOMESTIC WATER PIPING. 3/4" THICKNESS FOR PIPES UP TO 1-1/4" IN SIZE AND 1" THICK FOR PIPES 1-1/2" AND LARGER.

ALL CONCEALED INDOOR HEATING AND/OR COOLING SUPPLY AIR DUCTWORK SHALL BE INSULATED WITH 1-1/2" THICK FIBERGLASS INSULATION WITH VAPOR BARRIER. TAPE ALL JOINTS WITH VAPOR BARRIER TAPE. MINIMUM INSTALLED "R" VALUE TO BE 4.2.

MECHANICAL LEGEND

—H—	HOSE BIBB (HB)	CO	CLEANOUT
—×—	ANCHOR	CW	COLD WATER (DOMESTIC)
—⌊—	AIR BALANCING DAMPER	DN	DOWN
—GM—	GAS METER	E	EXISTING
	NEW CONNECTION TO EXISTING	EF	EXHAUST FAN
	DEMOLITION LIMITS	EWH	ELECTRIC WATER HEATER
ø	DIAMETER	FD	FLOOR DRAIN
	PLUG VALVE NON LUBRICATED TYPE (KEYPORT 400 SERIES) (GAS COCK)	HB	HOSE BIBB
	BALL VALVE	HO	HUB OUTLET
	GATE VALVE	HW	HOT WATER
	CHECK VALVE	I.E.	INVERT ELEVATION
	RELIEF VALVE	LAV	LAVATORY
	THERMOMETER	O.A.	OUTSIDE AIR
T	THERMOSTAT (ELECTRIC)	RPZ BFP	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
	GAUGE	S.A.	SUPPLY AIR
	UNION	SAN	SANITARY
	PIPE DOWN	(TYP)	DENOTES "TYPICAL"
	PIPE UP	V.T.R.	VENT THRU ROOF
	PIPE TEE	W	WASTE
	STRAINER	WC	WATER CLOSET
	FLOOR DRAIN	— - —	DOMESTIC COLD WATER
	SUPPLY DIFFUSER	— - - —	DOMESTIC HOT WATER
	EXHAUST GRILLE	—GAS—	NATURAL GAS
M	MOTORIZED DAMPER	- - - - -	SANITARY SEWER
	REDUCER		VENT PIPING
A.F.F.	ABOVE FINISHED FLOOR		
A.R.	ABOVE ROOF		
CFH	CUBIC FEET PER HOUR		
CFM	CUBIC FEET PER MINUTE		

ALL EXISTING SLABS AND BEAMS ARE INTERNALLY REINFORCED WITH DRAPED POST-TENSIONED TENDONS. NON-DESTRUCTIVE DETECTION TECHNOLOGY MUST BE UTILIZED TO LOCATE TENDONS. NO DRILLING, CORING, OR CUTTING OF ANY KIND IS PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER. SEE NOTES ON S-001 FOR ADDITIONAL INFORMATION.

WARREN

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PRELIMINARY - NOT FOR CONSTRUCTION

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drawn by:	STS
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Crime Lab

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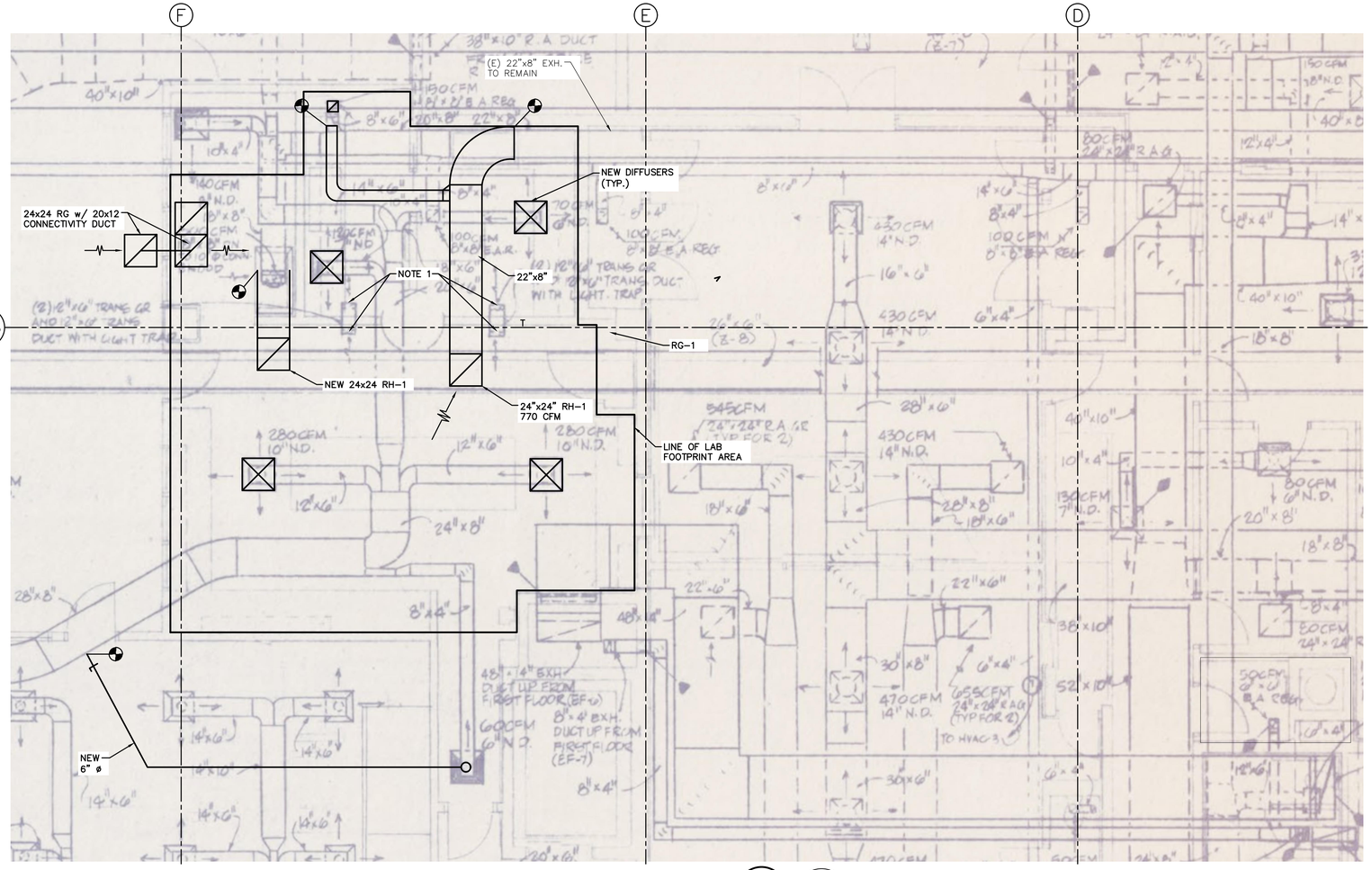
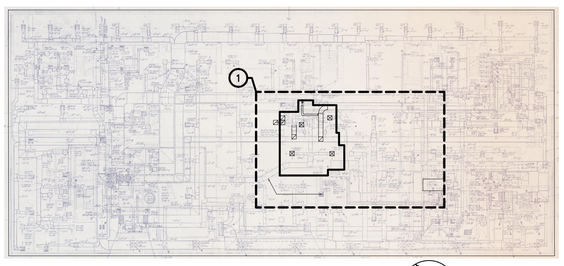
ALL EXISTING SLABS AND BEAMS ARE INTERNALLY REINFORCED WITH DRAPED POST-TENSIONED TENDONS. NON-DESTRUCTIVE DETECTION TECHNOLOGY MUST BE UTILIZED TO LOCATE TENDONS. NO DRILLING, CORING, OR CUTTING OF ANY KIND IS PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER. SEE NOTES ON S-001 FOR ADDITIONAL INFORMATION.

NOTES:
1. REMOVE, THOROUGHLY CLEAN AND RE-INSTALL EXISTING TRANSFER AIR GRILLES.



SECOND LEVEL HVAC PLAN (1 / M-002)
SCALE: 1/4" = 1'-0"



SECOND LEVEL KEY PLAN
N.T.S.

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Warren Police Department
Crime Lab

sheet title:
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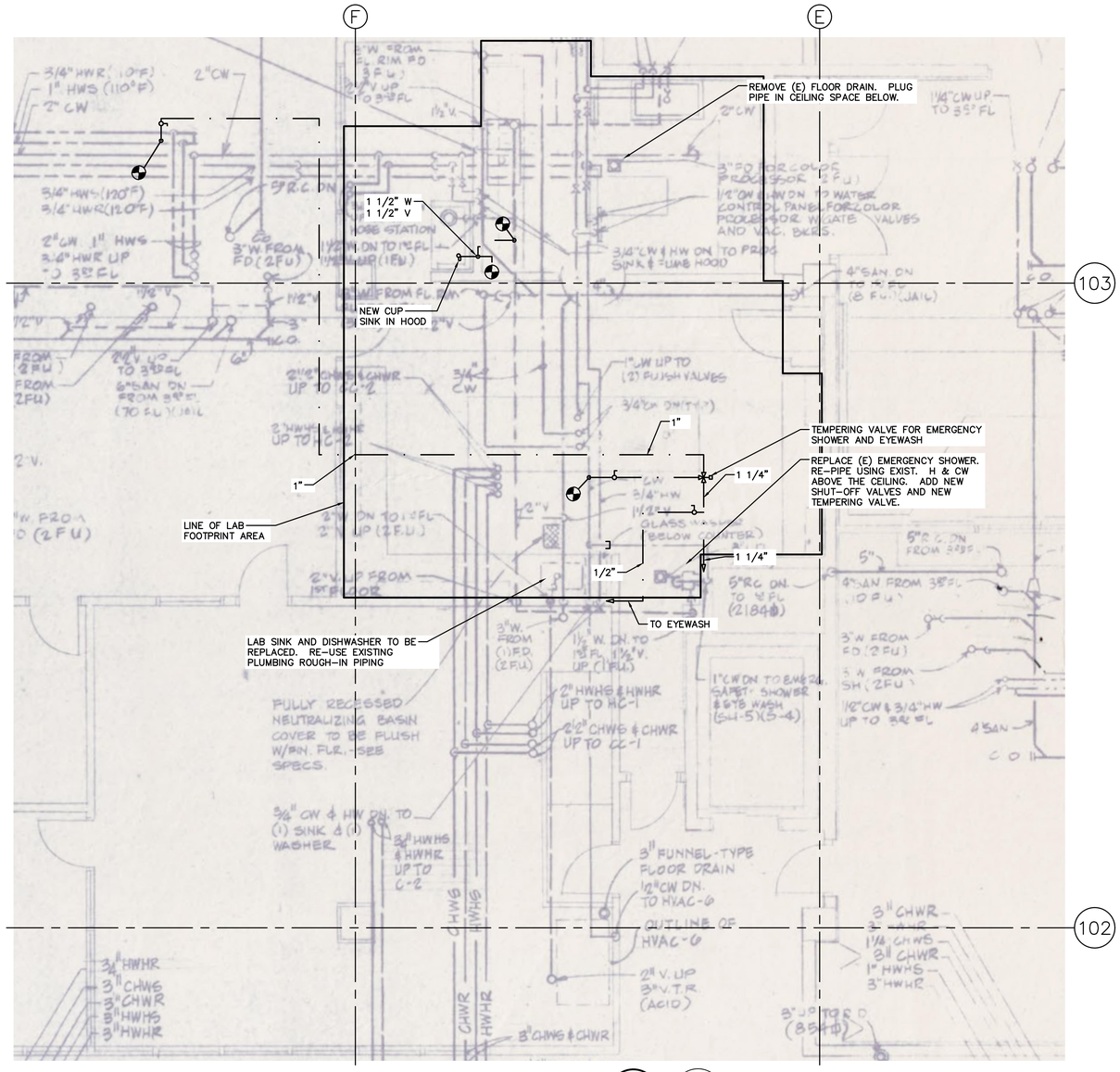
1201-1	M-002



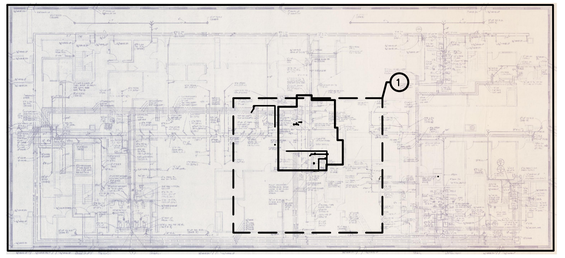
SECOND FLOOR PLUMBING PLAN (1 / M-003)
SCALE: 1/4" = 1'-0"

N

PLUMBING DRAWING NOTES

1. THE DRAWINGS ARE DIAGRAMMATIC AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS AND COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE ADDITIONAL FITTINGS AND OFFSETS THAT MAY BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, DUCTWORK, PIPING SYSTEMS, ELECTRICAL CONDUIT, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC., AND/OR OTHER SPACE CONSTRAINTS.
2. REFER TO REFLECTED CEILING AND LIGHTING PLANS FOR EXACT LOCATION OF LIGHTS, CEILING DROPS, ELEVATIONS, ETC.
3. REFER TO PLUMBING FIXTURE SCHEDULE FOR ROUGH-IN PIPE SIZES TO FIXTURES.
4. CAP PIPING ABOVE CEILING, BELOW FLOOR OR INSIDE WALL. (TYP).

ALL EXISTING SLABS AND BEAMS ARE INTERNALLY REINFORCED WITH DRAPED POST-TENSIONED TENDONS. NON-DESTRUCTIVE DETECTION TECHNOLOGY MUST BE UTILIZED TO LOCATE TENDONS. NO DRILLING, CORING, OR CUTTING OF ANY KIND IS PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER. SEE NOTES ON S-001 FOR ADDITIONAL INFORMATION.



SECOND FLOOR KEY PLAN
N.T.S.

WARREN
Warren Police Department
Evidence Lab
29900 S. Civic Center Blvd
Warren, MI 48093

iDesign
iDesign Solutions, LLC
248-440-7310
www.iDesign-Solutions.info
1042 N. Milford Road, Ste. 204b
Millford, MI 48381

HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915
555 HULET DRIVE
BLOOMFIELD HILLS, MICH.
P.O. BOX 824
48303 - 0824
PHONE: (248) 454-6300
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EAM Engineers, Inc.
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www.eam-engineers.com ● eam@eam-engineers.com

issue:	date:
OWNER REVIEW	01-21-2022
100% OWNER REVIEW	06-29-2022
BID ISSUE	08-09-2022
BID RE-ISSUE	12-16-2022
BID RE-ISSUE	08-22-2023

PRELIMINARY - NOT FOR CONSTRUCTION

designed by:	GS
drawn by:	STS
coordination checked:	STS
checked:	GS
approved:	MCM

project:
Warren Police Department
Crime Lab

sheet title:
Plumbing Plan

project number:	sheet number:
1201-1	M-003

Warren Police Dept.

EVIDENCE LAB RENOVATION

PROJECT NO. 1201-1
ISSUE: BID ISSUE 08-22-23

OWNER: Warren Police Department
29900 S. Civic Center Blvd
Warren, MI 48093

PROJECT LOCATION: Warren Police Department
Evidence Lab
29900 S. Civic Center Blvd
Warren, MI 48093

ARCHITECT AND CONSULTING ENGINEERS: Hubbell, Roth & Clark, Inc.
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P.O. Box 824
Bloomfield Hills, MI 48303-0824
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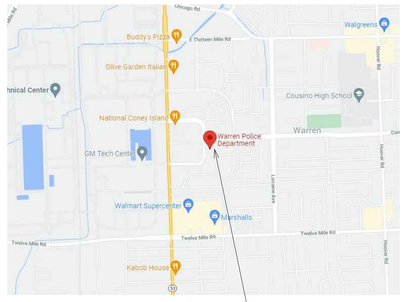
MECHANICAL ENGINEERS: EAM Engineers, Inc.
180 High Oak Road, Suite 200
Bloomfield Hills, MI 48304
Tel: 248-528-2670

LAB CONSULTANT: iDesign Solutions
1042 N. Milford Road, Suite 204b
Milford, Michigan 48381
Tel: 248.440.7310
www.iDesign-Solutions.info

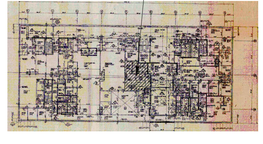
ADD ALTERNATE NO. 1: INCLUDE DISTALLED WATER STATION IN PROJECT
ADD ALTERNATE NO. 2: FLOOR FINISH TO BE RUBBER

Note: most of the affected areas are restricted access areas. Contractors to coordinate activities daily and arrange access with occupants.



29900 S. Civic Center Blvd.
Warren, MI 48093

NORTH
Vicinity Map
Scale: Not to Scale



NORTH
Second Floor Plan
Scale: No Scale

DRAWING INDEX

Sheet #	Sheet Title
GENERAL	
G-000	COVER SHEET
G-001	STANDARD ABBREVIATIONS AND INFORMATION
G-002	LIFE SAFETY PLANS AND CODE INFORMATION
G-003	TYPICAL INTERIOR PARTITION TYPES
ARCHITECTURAL DRAWINGS	
D-100	PARTIAL 2ND FLOOR DEMO PLANS
A-100	PARTIAL 2ND FLOOR ARCHITECTURAL/LAB PLAN & REFLECTED CEILING PLAN
LABORATORY DRAWINGS	
Q-100	LABORATORY EQUIPMENT SCHEDULES AND INFORMATION
Q-101	LABORATORY CASEWORK SCHEDULES AND NOTES
Q-102	LABORATORY CASEWORK FIXTURE AND ACCESSORY DETAILS
Q2-00	LABORATORY ELEVATIONS
MECHANICAL DRAWINGS	
DM-001	MECHANICAL DEMOLITION
M-001	MECHANICAL NOTES
M-002	DUCT PLANS
M-003	PLUMBING PLANS
ELECTRICAL DRAWINGS	
DE-001	ELECTRICAL DEMOLITION PARTIAL PLANS, PHOTOS AND DEMOLITION NOTES
E-001	ELECTRICAL POWER PLAN, LEGEND AND GENERAL NOTES
E-002	LIGHTING PLAN, SCHEDULE AND DETAILS
E-003	AUXILIARY SYSTEMS PLANS AND RISER DIAGRAM
E-004	ELECTRICAL DETAILS AND SCHEDULES
STRUCTURAL DRAWINGS	
S-001	STRUCTURAL PLANS, SECTIONS, PHOTOGRAPHS, DETAILS, AND NOTES

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designed by:	LAC
drawn by:	RLB
coordination checked:	RLB
checked:	CTW
approved:	LAC

project:
Warren Police Department
Crime Lab

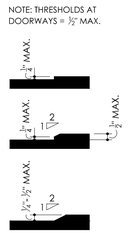
sheet title:
Cover Sheet

project number:	sheet number:
1201-1	G-000

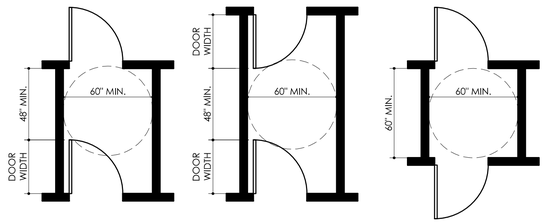
MOUNTING HEIGHTS / ACCESSIBLE STANDARDS

MEASURED TO THE ℄ OF HIGHEST OPERABLE PART

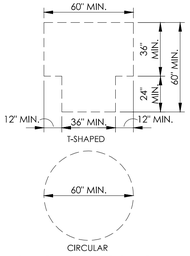
CONVENIENCE CONTROLS AND OUTLETS



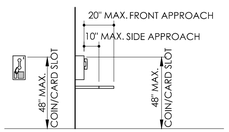
CHANGES IN LEVEL



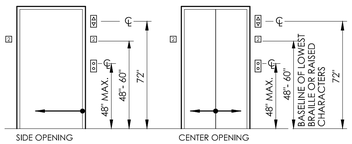
DOORS IN SERIES



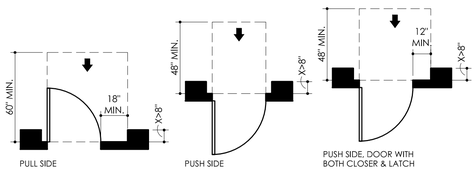
SIZE OF TURNING SPACE



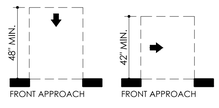
TELEPHONES



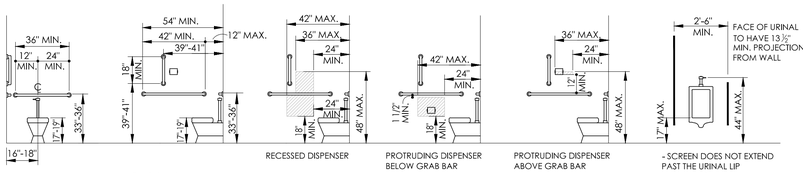
ELEVATORS



MANEUVERING CLEARANCE AT RECESSED DOOR

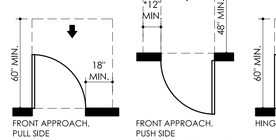


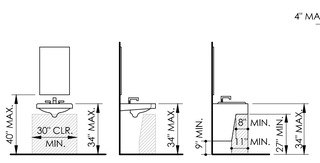
MANEUVERING CLEARANCE AT DOORWAYS WITHOUT DOORS



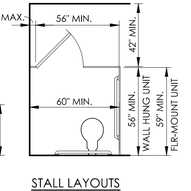
BARRIER FREE WATER CLOSETS

URINALS

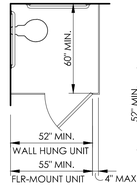


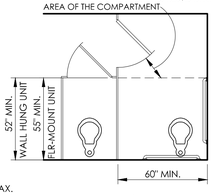


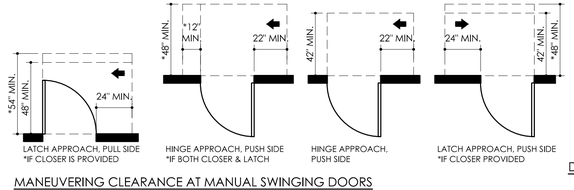
BARRIER FREE LAVATORIES



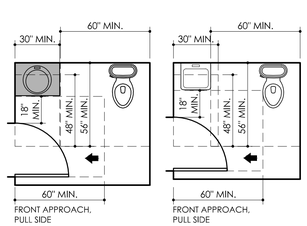
STALL LAYOUTS



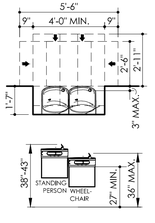




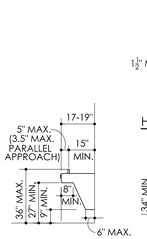
MANEUVERING CLEARANCE AT MANUAL SWINGING DOORS



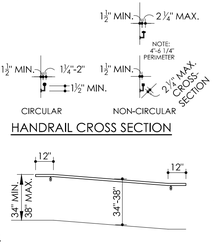
WATER CLOSET



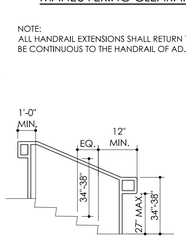
DRINKING FOUNTAIN/ ELECTRIC WATER COOLER



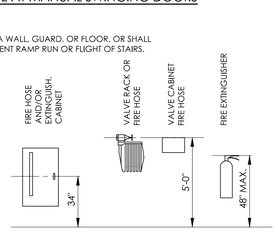
HANDRAIL AT RAMP



HANDRAIL CROSS SECTION

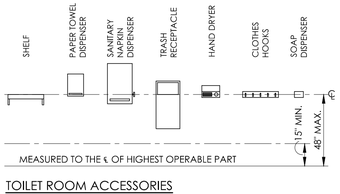


HANDRAIL AT STAIRS

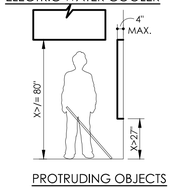


FIRE EXTINGUISHER EQUIPMENT

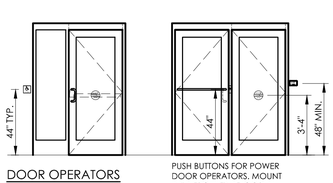
NOTE:
ALL HANDRAIL EXTENSIONS SHALL RETURN TO A WALL, GUARD, OR FLOOR, OR SHALL BE CONTINUOUS TO THE HANDRAIL OF ADJACENT RAMP RUN OR FLIGHT OF STAIRS.



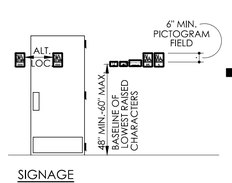
TOILET ROOM ACCESSORIES



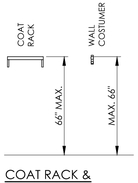
PROTRUDING OBJECTS



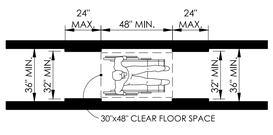
DOOR OPERATORS



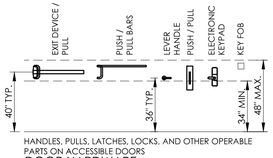
SIGNAGE



COAT RACK & WALL COSTUMER



CLEAR WIDTH OF AN ACCESSIBLE ROUTE



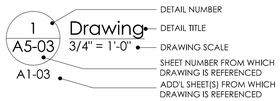
HANDLES, PULLS, LATCHES, LOCKS, AND OTHER OPERABLE PARTS ON ACCESSIBLE DOORS

DOOR HARDWARE

BF UNISEX TOILET ROOM SIGN (6" x 9")
BF MEN TOILET ROOM SIGN (6" x 9")
BF WOMEN TOILET ROOM SIGN (6" x 9")
BF EXIT SIGN (5" x 3")

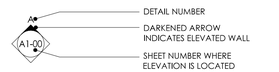
TYPICAL TACTILE WALL SIGNS

SYMBOL LEGEND



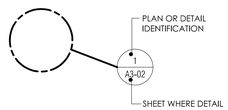
DRAWING SYMBOL

DETAIL LOCATOR



INTERIOR ELEVATION SYMBOL

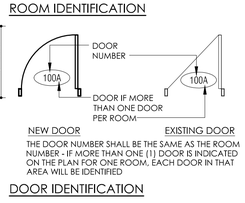
BUILDING SECTION LOCATOR



PLAN OR DETAIL BLOW-UP

COLUMN GRID

ROOM IDENTIFICATION



THE DOOR NUMBER SHALL BE THE SAME AS THE ROOM NUMBER - IF MORE THAN ONE (1) DOOR IS INDICATED ON THE PLAN FOR ONE ROOM, EACH DOOR IN THAT AREA WILL BE IDENTIFIED

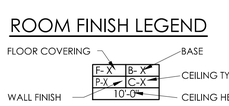
DOOR IDENTIFICATION

MISCELLANEOUS SYMBOLS

∠ ANGLE	± PLUS/MINUS
℄ CENTERLINE	& AND
℞ PROPERTY LINE or PLATE	@ AT
⊥ PERPENDICULAR	Φ ELECTRICAL PHASE
Ø ROUND	

TEXT SYMBOLS

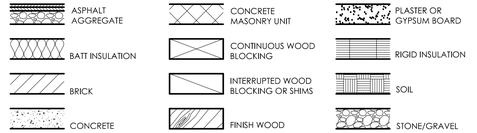
ROOM FINISH LEGEND



ABBREVIATION LEGEND

AC	AIR CONDITIONING
ACOUST	ACOUSTICAL
ACT	ACOUSTICAL CEILING TILE
ADA	AMERICANS WITH DISABILITIES ACT
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AGG	AGGREGATE
AL	ALUMINUM
ALT	ALTERNATE
APPROX	APPROXIMATE
ARCH	ARCHITECT (URAL)
ASPH	ASPHALT
AV	AUDIO/VISUAL
BD	BOARD
BF	BARRIER FREE
BIT	BITUMINOUS
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM / BENCH MARK
BOTT	BOTTOM
BRCKT	BRACKET
BRG	BEARING
BUR	BUILT-UP ROOF
CAB / CABNT	CABINET
CB	CATCH BASIN
CEM	CEMENT
CER	CERAMIC
CFM	CUBIC FEET PER MINUTE
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLK	CAULK
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COMP	COMPACTED
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CORR	CORRIDOR
CPT	CARPET
CSK	COUNTERSUNK
CT	CERAMIC TILE
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
DAMPG	DAMPROOFING
DEG / o	DEGREE
DEMO	DEMOLITION
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DIV	DIVISION
DP	DEPTH / DEEP
DR	DOOR
DS	DOWNSPOUT
DTL	DETAIL
DWG	DRAWING
DWL	DOWEL
EF	EXHAUST FAN
EIFS	EXTERIOR INSULATION & FINISH SYSTEM
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC(AL)
ELEV	ELEVATOR
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
EWC	ELECTRICAL WATER COOLER
EX / EXIST	EXISTING
EXH	EXHAUST
EXP	EXPANSION
EXT	EXTERIOR
FA	FRESH AIR
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FORCED FLOW CABINET HEATER
FHC	FIRE HOSE CABINET
FIN	FINISH
FLASH	FLASHING
FLR	FLOOR
FOUND	FOUNDATION
FRMG	FRAMING
FT	FEET
FTG	FOOTING
FURG	FURRING
G	GAS
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GL	GLASS
GLZD / GLZG	GLAZED / GLAZING
GRV	GRAVITY ROOF VENT
GYP	GYPSUM
HB	HOSE BIB
HDCP	HANDICAP
HDR CO	HEADER COURSE
HDWR	HARDWIRE
HGT / HT	HEIGHT
HM	HOLLOW METAL
HORZ	HORIZONTAL
HP	HIGH POINT
HR	HOUR
HVAC	HEATING, VENTILATION, AIR CONDITIONING
ID	INSIDE DIAMETER
IN	INCH
INCL	INCLUDED
INSUL	INSULATION
INT	INTERIOR
JST	JOIST
JT	JOINT
L	ANGLE
LAM	LAMINATE(D)
LAV	LAVATORY
LB / #	POUND
LG	LENGTH
LKR	LOCKER
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LOC	LOCATIONS
LP	LOW POINT
LT FIX	LIGHT FIXTURE
LT WT	LIGHT WEIGHT
MANUF	MANUFACTURER
MAR	MARBLE
MAS	MASONRY
MAT	MATERIAL
MAU	MAKE UP AIR UNIT
MAX	MAXIMUM
MB	MARKER BOARD
MD	METAL DECK
MECH	MECHANICAL
MET	METAL
MEZZ	MEZZANINE
MH	MANHOLE
MIN	MINIMUM / MINUTE
MISC	MISCELLANEOUS
ML	METAL LATH
MO	MASONRY OPENING
MS	METAL STUD
MT	METAL THRESHOLD
MTP	METAL TOILET PARTITION
NIC	NOT IN CONTRACT
NO / #	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHEAD DOOR
OPNG	OPENING
OPP	OPPOSITE
PARG	PARGING
PART	PARTICLE
PARTN	PARTITION
PERF	PERFORATED
PL	PLATE / PROPERTY LINE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLUMB	PLUMBING
PLYWD	PLYWOOD
PORC	PORCELAIN
PREFAB	PREFABRICATED
PSF	POUNDS PER SQUARE FEET
PSI	POUNDS PER SQUARE INCH
PTD	PAINTED / PAPER TOWEL DISPENSER
PVC	POLYVINYL CHLORIDE
QT	QUARRY TILE
R	RADIUS / RISER
RAG	RETURN AIR GRILLE
RB	RUBBER BASE
RC	RAIN CONDUCTOR
REF	REFERENCE
REINF	REINFORCING
REQD	REQUIRED
RES	RESILIENT
REV	REVISION
RF	ROOF EXHAUST FAN
RLGT	REGLET
RM	REMOVABLE MULLION / ROOM
RO	ROUGH OPENING
ROW	RIGHT OF WAY
ROWLK	ROWLOCK
RS	ROOF SUMP
RTU	ROOF TOP UNIT
RV	ROOF VENT
S	SINK
S & V	STAIN & VARNISH
SAG	SUPPLY AIR GRILLE
SAN	SANITARY
SCHED	SCHEDULE
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SKYLT	SKYLIGHT
SLDR	SOLDIER
SLNT	SEALANT
SPEC(S)	SPECIFICATION
SPKR	SPEAKER
SQ	SQUARE
SS	SERVICE SINK / STAINLESS STEEL
ST	STORM
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SUSP	SUSPENDED
T	TREAD
T&B	TOP AND BOTTOM
TB	TACK BOARD
TC	TOP OF CURB
TEMP	TEMPERED / TEMPORARY
TERR	TERRAZZO
TH	THRESHOLD
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOM	TOP OF MASONRY
TOS	TOP OF STEEL
TV	TELEVISION
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UV	UNIT VENTILATOR
VAP BARR	VAPOR BARRIER
VB	VINYL BASE
VCT	VINYL COMPOSITE TILE
VERT	VERTICAL
VIF	VERIFY IN FIELD
VWC	VINYL WALL COVERING
W	WATER
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET
WD	WIDTH / WOOD
WH	WATER HEATER
WP	WATERPROOFING / WORKING POINT
WWF	WELDED WIRE FABRIC

MATERIAL LEGEND



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issue:	date:
OWNER REVIEW	01-21-2022
100% OWNER REVIEW	06-29-2022
BID ISSUE	08-09-22
BID RE-ISSUE	12-16-22
BID RE-ISSUE	08-22-23

designed by:	LAC
drawn by:	RLB
coordination checked:	RLB
checked:	CTW
approved:	LAC

project:
Warren Police Department
Crime Lab

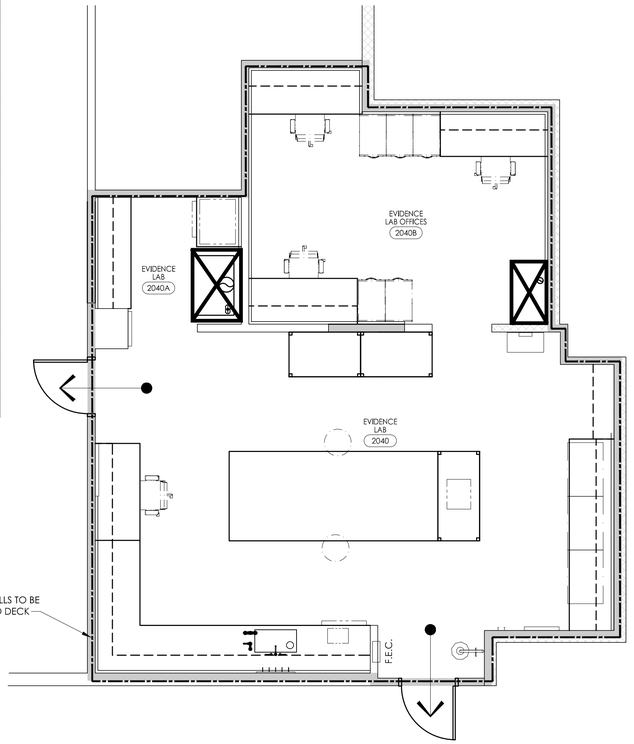
sheet title:
Standard Abbreviations and Information

project number: 1201-1

sheet number: G-001

CODE WORKSHEET

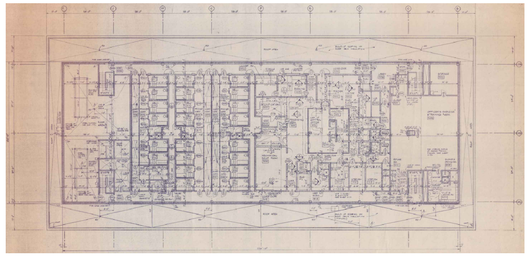
Item				Reference
1.	**APPLICABLE CODES**			
	Michigan Rehabilitation Building Code (ALTERATION LEVEL 2)			2015
	Michigan Building Code			2015
	Michigan Mechanical Code			2015
	Michigan Electrical Code Part 8 Rules			2017
	Michigan Plumbing Code			2015
	Michigan Energy Code (ASHRAE 90.1 - 2013 with Amendments)			2017
	Natl. Fire Protection Assoc. 101 - Life Safety			2015
	ANSI A117.1			2009
	LABORATORYREFERENCE CODES AND STANDARDS			
	NFPA 30 - FLAMMABLE AND COMBUSTIBLE LIQUIDS			2012
	NFPA 45 - STANDARD ON FIRE PROTECTION FOR LABORATORIES USING CHEMICALS			2011
	NFPA 55 - COMPRESSED GASSES AND CRYOGENIC FLUIDS			2013
2.	**Project Description**			
	THIS PROJECT IS FOR INTERIOR IMPROVEMENTS AND ALTERATIONS TO THE EVIDENCE LAB SUITE OF THREE ROOMS ON THE SECOND FLOOR OF THE EXISTING WARREN POLICE DEPARTMENT BUILDING. THE PURPOSE OF THIS PROJECT IS TO PROVIDE IMPROVEMENTS TO THE EXISTING EVIDENCE LAB TO ACCOMMODATE THE EVIDENCE LABORATORY AND A SUPPORTING ROOM FOR OFFICE SPACE. THE ELECTRICAL, HVAC AND PLUMBING SERVICES WILL BE REPLACED AND/OR UPGRADED TO MEET THE CURRENT NEEDS SUITING THE PROPOSED ACTIVITIES. THE PROJECT DOES NOT REQUIRE ANY STRUCTURAL ADDITIONS OR MODIFICATIONS TO THE EXISTING BUILDING STRUCTURE. IN SUMMARY, THESE IMPROVEMENTS ARE NECESSARY TO ACCOMMODATE SPECIFIC LABORATORY ACTIVITIES. THIS PROJECT DOES NOT CHANGE THE OCCUPANCY, USE OR FUNCTION OF THE SPACE. THE WORK PROPOSED WILL IMPROVE THE EXISTING FIRE SEPARATION BOUNDARIES TO ONE HOUR AROUND THE RENOVATED LAB. THEREFORE THE SCOPE OF WORK COMPLIES WITH THE MICHIGAN REHABILITATION BUILDING CODE OF ALTERATION LEVEL II			
3.	**Occupancy**			
		Existing Room 2040	Provided	
	Existing Building - Mixed Use Group Business (B)	B	No Change	MBC 304
4.	**Construction Classification**			
		Existing	Provided	
	Type II-B			
	Fire Suppresion: Existing Limited Sprinkered			
			No Change	MBC 601
5.	**Allowable Height**			
		Existing	Provided	
	Number of Stories Above Grade - 4 Stories	3 Stories + 1 level below grade	No Change	MBC 504
6.	**Allowable Area**			
		Existing	Provided	
	Allowable Area -112,500 sf			
	Basement Floor	15,055 sf	No Change	MBC 503
	First Floor	16,453 sf	No Change	MBC 503
	Second Floor	26,840 sf	No Change	MBC 503
	Third Floor	19,520 sf	No Change	MBC 503
	Total Area	77,868 gross sf	No Change	MBC 506
7.	**Occupant Load**			
		Existing Esimated	Provided	
	Basement Floor	151	No Change	MBC1004.1.2
	First Floor	165	No Change	MBC1004.1.2
	Second Floor	268	No Change	MBC1004.1.2
	Third Floor	195	No Change	MBC1004.1.2
	Total Occupant Load	1,006 (Existing Estimate)	No Change	MBC1004.1.2
8.	**Accessible Means of Egress**			
		Existing	Provided	
	Basement Floor	5(Existing)	No Change	MBC 1009.1
	First Floor	5(Existing)	No Change	MBC 1009.1
	Second Floor	5(Existing)	No Change	MBC 1009.1
	Third Floor	5(Existing)	No Change	MBC 1009.1
9.	**Number of Exits and Exit Access**			
		Existing	Provided	
	Basement Floor	5(Existing)	No Change	MBC 1006.3.1
	First Floor	5(Existing)	No Change	MBC 1006.3.1
	Second Floor	5(Existing)	No Change	MBC 1006.3.1
	Third Floor	5(Existing)	No Change	MBC 1006.3.1
10.	**Exit Access Travel Distance**			
		Actual	Provided	
	Dead End Limit - 50'-0" Max (Sprinklered)	Compliant	No Change	MBC 1020.4
	Travel Distance to Exit - 300'-0" Max (Sprinklered)	Compliant	No Change	MBC 1017.2
	Common Path of Travel - 75'-0" Max	Compliant	No Change	MBC 1006.2.1
	Corridor Fire-Resistance Rating (Occupancy B)	Compliant	No Change	MBC 1020.1
11.	**Fire Protection Systems**			
		Existing Bldg	Provided	
	Automatic Sprinkler System	Existing	No Change	
	Portable extinguishers	Existing	New @ renovated lab	
	Fire Alarm System	Existing	No Change	MBC 903
12.	**Accessibility - New Work**			
		Existing Bldg	Provided	
	Comply with Chapter 11, and Appendix E	Existing	Compliant	MBC Ch 11
	Comply with ANSI 117.1 2009	Existing	Compliant	ANSI 117.1
13.	**Control Areas**			
	Allowed 3, 1-hour Fire Resistant Fire Barriers	Existing	No Change	
	Evidence Lab Suite: 2040, 2040A, 2040B	Existing + 1 at Evidence Lab	No Change	MBC 414.2.2



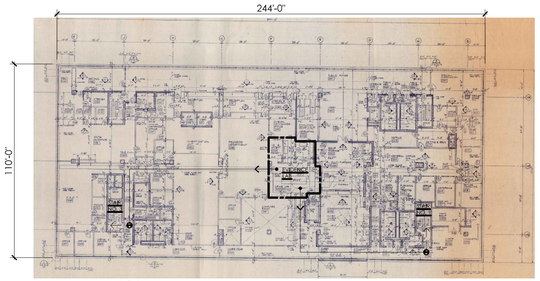
NORTH 4 Second Floor Enlarged Code Plan
Scale: 1/4"=1'-0"

CODE PLAN LEGEND

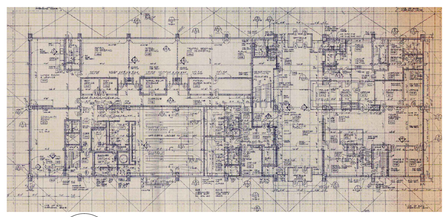
1-HOUR RATED WALL (SEE ARCHITECTURAL)	
EGRESS ROUTE	
	EXIT SIGN
F.E.C.	FIRE EXTINGUISHER CABINET
F.E.	FIRE EXTINGUISHER



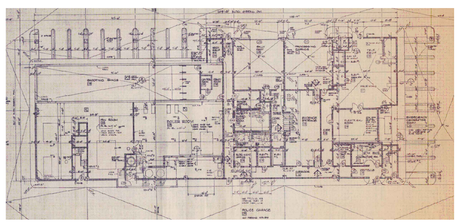
4 Third Floor Life SafetyPlan
Scale: 1/32"=1'-0"
NO NEW WORK



3 Second Floor Life Safety Plan
Scale: 1/32"=1'-0"
LIMITED AREA OF WORK



2 Grade Floor Life Safety Plan
Scale: 1/32"=1'-0"
NO NEW WORK



NORTH 1 Basement Floor Life SafetyPlan
Scale: 1/32"=1'-0"
NO NEW WORK

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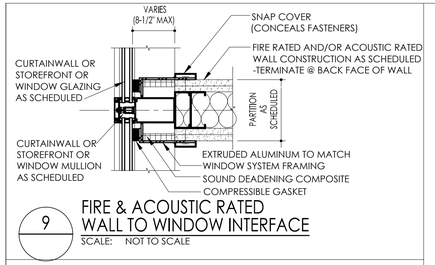
BID RE-ISSUE	12-16-22
BID RE-ISSUE	08-22-23

designed by:	LAC
drawn by:	RLB
coordination checked:	RLB
checked:	CTW
approved:	LAC

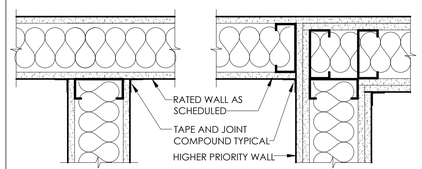
project:
Warren Police Department
Crime Lab

sheet title:
Life Safety Plans
and Code Information

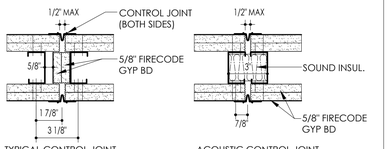
project number:	sheet number:
1201-1	G-002



9 FIRE & ACOUSTIC RATED WALL TO WINDOW INTERFACE
SCALE: NOT TO SCALE

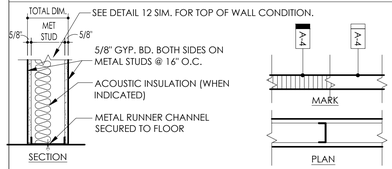


8 TYPICAL INTERSECTION OF FIRE RATED WALLS
SCALE: NOT TO SCALE



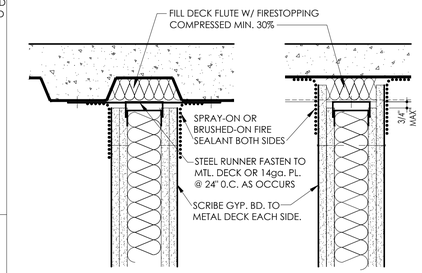
4 TYPICAL 2-HOUR FIRE RATED STEEL STUD PARTITION CONTROL JOINT
SCALE: NOT TO SCALE

3 TYPICAL 1-HOUR FIRE RATED STEEL STUD PARTITION CONTROL JOINT
SCALE: NOT TO SCALE



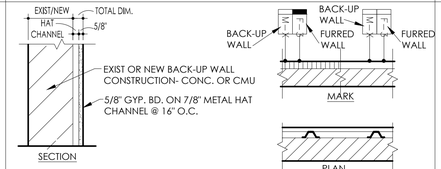
A-1	5/8" GYP. BD. BOTH SIDES ON 1-5/8" METAL STUDS @ 16" O.C. W/ 1-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 2-7/8"
A-2	5/8" GYP. BD. BOTH SIDES ON 2-1/2" METAL STUDS @ 16" O.C. W/ 2-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 3-3/4"
A-4	5/8" GYP. BD. BOTH SIDES ON 3-5/8" METAL STUDS @ 16" O.C. W/ 2-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 4-7/8"
A-6	5/8" GYP. BD. BOTH SIDES ON 6" METAL STUDS @ 16" O.C. W/ 2-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 7-1/4"
A-8	5/8" GYP. BD. BOTH SIDES ON 8" METAL STUDS @ 16" O.C. W/ 2-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 9-1/4"

A STUD WALL PARTITION
SCALE: NOT TO SCALE



NOTE:
1. REFERENCE CURRENT UL JOINT SYSTEMS DIRECTORY FOR ALL GENERAL INFORMATION, MATERIAL DESIGNATIONS, THICKNESSES AND FIRE RATINGS.
2. HEAD OF WALL - 2HR SHOWN
REF: UL DESIGN HW-D-0047 OR HW-D-0062

7 ALTERNATE FIRE-RATED HEAD OF WALL METAL STUD PARTITION CONSTRUCTION
SCALE: NOT TO SCALE

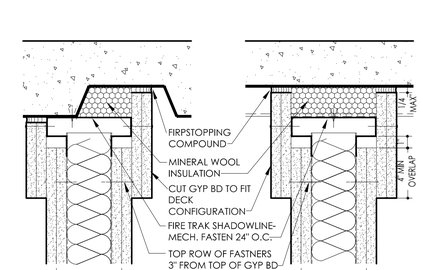


NOTE:
1. DO NOT ANCHOR VERTICAL STUDS TO TOP RUNNER. ALLOW FOR STRUCTURAL SLAB DEFLECTION.

2 TYPICAL TOP OF WALL NON-RATED CONSTRUCTION
SCALE: NOT TO SCALE

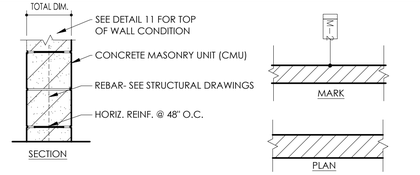
F-0	5/8" GYP. BD. ON 7/8" METAL HAT CHANNEL @ 16" O.C. W/ 3/4" RIGID INSULATION (WHEN INDICATED) ACTUAL FURRING WALL DIM.= 1-1/2" + BASE WALL DIMENSION
F-1	5/8" GYP. BD. ON 1" METAL ZEE FURRING STRIP @ 24" O.C. W/ 1" RIGID INSULATION (WHEN INDICATED) ACTUAL FURRING WALL DIM.= 1-5/8" + BASE WALL DIMENSION
F-2	5/8" GYP. BD. ON 1-1/2" METAL HAT CHANNEL @ 16" O.C. W/ 1-1/2" RIGID INSULATION (WHEN INDICATED) ACTUAL FURRING WALL DIM.= 2-1/8" + BASE WALL DIMENSION
F-3	5/8" GYP. BD. ON 2-1/2" METAL STUDS @ 16" O.C. W/ 2" RIGID INSULATION (WHEN INDICATED), HOLD STUDS 3/8" OFF FACE OF BACK-UP WALL. ACTUAL FURRING WALL DIM.= 3-1/2" + BASE WALL DIMENSION
F-4	5/8" GYP. BD. ON 3-5/8" METAL STUDS @ 16" O.C. W/ 2" RIGID INSULATION (WHEN INDICATED), HOLD STUDS 1/4" OFF FACE OF BACK-UP WALL. ACTUAL FURRING WALL DIM.= 4-1/2" + BASE WALL DIMENSION

F PARTITION WITH STUD FURRING
SCALE: NOT TO SCALE



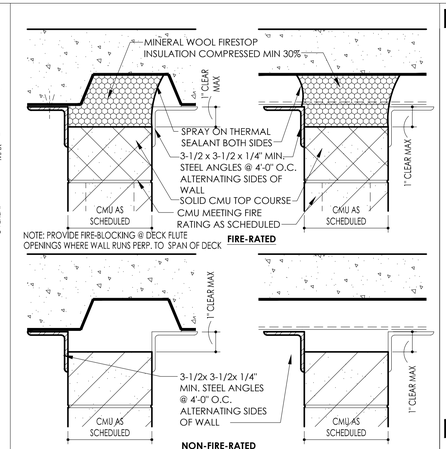
NOTE:
1. REFERENCE CURRENT UL JOINT SYSTEMS DIRECTORY FOR ALL GENERAL INFORMATION, MATERIAL DESIGNATIONS, THICKNESSES AND FIRE RATINGS.
2. HEAD OF WALL - 2HR SHOWN
REF: UL DESIGN HW-D-0060

6 TYPICAL FIRE-RATED HEAD OF WALL METAL STUD PARTITION CONSTRUCTION
SCALE: NOT TO SCALE

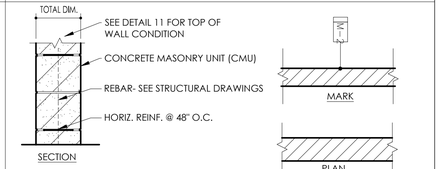


S1-2	UL DESIGN No. U415 SYSTEM A: 1hr 2-1/2" METAL C-H STUDS (20 GA) @ 24" O.C. WITH 1" FIRE-RATED SHAFTLINER BOARD AND 5/8" FIRE-RATED GYP. BD. OPPOSITE SIDE TO UNDERSIDE OF DECK W/ 1-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 3-1/8"
S1-4	UL DESIGN No. U415 SYSTEM A: 1hr 4" METAL C-H STUDS (20 GA) @ 24" O.C. WITH 1" FIRE-RATED SHAFTLINER BOARD AND 5/8" FIRE-RATED GYP. BD. OPPOSITE SIDE TO UNDERSIDE OF DECK W/ 2-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 4-5/8"
S2-2	UL DESIGN No. U415 SYSTEM B: 2hr 2-1/2" METAL C-H STUDS (20 GA) @ 24" O.C. WITH 1" FIRE-RATED SHAFTLINER BOARD AND 2-LAYERS 5/8" FIRE-RATED GYP. BD. OPPOSITE SIDE TO UNDERSIDE OF DECK W/ 2-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 3-3/4"
S2-2	UL DESIGN No. U415 SYSTEM B: 2hr 4" METAL C-H STUDS (20 GA) @ 24" O.C. WITH 1" FIRE-RATED SHAFTLINER BOARD AND 2-LAYERS 5/8" FIRE-RATED GYP. BD. OPPOSITE SIDE TO UNDERSIDE OF DECK W/ 2-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 5-1/4"

S# FIRE-RATED SHAFT WALL PARTITION
SCALE: NOT TO SCALE



5 TYPICAL CMU PARTITION CONSTRUCTION
SCALE: NOT TO SCALE



A1-4	UL DESIGN No. U419: 1hr 5/8" FIRE-RATED GYP. BD. BOTH SIDES ON 3-5/8" METAL STUDS @ 16" O.C. TO UNDERSIDE OF DECK W/ 2-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 4-7/8"
A1-6	UL DESIGN No. U419: 1hr 5/8" FIRE-RATED GYP. BD. BOTH SIDES ON 6" METAL STUDS @ 16" O.C. TO UNDERSIDE OF DECK W/ 2-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 7-1/4"
A2-4	UL DESIGN No. U419: 2hr (2) LAYERS 5/8" FIRE-RATED GYP. BD. BOTH SIDES ON 2-1/2" METAL STUDS @ 16" O.C. TO UNDERSIDE OF DECK W/ 2-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 5"
A2-6	UL DESIGN No. U419: 2hr (2) LAYERS 5/8" FIRE-RATED GYP. BD. BOTH SIDES ON 3-5/8" METAL STUDS @ 16" O.C. TO UNDERSIDE OF DECK W/ 2-1/2" ACOUSTIC INSULATION (WHEN INDICATED) ACTUAL WALL DIM.= 6-1/8"

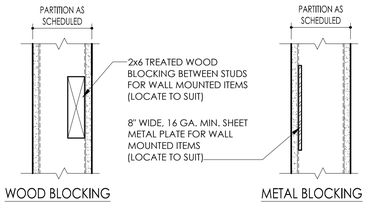
A# FIRE-RATED STUD WALL PARTITION
SCALE: NOT TO SCALE

M2-6	UL DESIGN No. U906: 2hr 6" CMU (NOMINAL) ACTUAL CMU DIM. = 5-5/8"
M2-8	UL DESIGN No. U905: 2hr 8" CMU (NOMINAL) ACTUAL CMU DIM. = 7-5/8"
M3-8	UL DESIGN No. U904: 3hr 8" CMU (NOMINAL) ACTUAL CMU DIM. = 7-5/8"
M4-8	UL DESIGN No. U901: 4hr 8" CMU (NOMINAL) ACTUAL CMU DIM. = 7-5/8"

M# FIRE-RATED CMU WALL PARTITION
SCALE: NOT TO SCALE

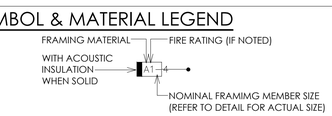
M-2	2" CMU (NOMINAL) ACTUAL CMU DIM. = 1-5/8"
M-4	4" CMU (NOMINAL) ACTUAL CMU DIM. = 3-5/8"
M-6	6" CMU (NOMINAL) ACTUAL CMU DIM. = 5-5/8"
M-8	8" CMU (NOMINAL) ACTUAL CMU DIM. = 7-5/8"
M-10	10" CMU (NOMINAL) ACTUAL CMU DIM. = 9-5/8"
M-12	12" CMU (NOMINAL) ACTUAL CMU DIM. = 11-5/8"
M-X	EXISTING MASONRY PARTITION

M NON-RATED CMU WALL PARTITION
SCALE: NOT TO SCALE



1 WALL MOUNTED ITEMS TYPICAL BLOCKING DETAIL
SCALE: NOT TO SCALE

SYMBOL & MATERIAL LEGEND



FRAMING MATERIAL CODE
- A METAL STUD
- F METAL STUD FURRING
- M MASONRY
- S METAL SHAFT STUD

X # INTERIOR WALL PARTITION CONSTRUCTION AS DETAILED, THIS SHEET.
- A) IN A NON RATED PARTITION, CARRY GYP. BD. MIN. 6" ABOVE SCHEDULED CEILING HEIGHT UNLESS NOTED OTHERWISE.
- B) ALL FIRE-RATED PARTITIONS ARE TO GO TO UNDERSIDE OF STRUCTURE.

X # INTERIOR WALL PARTITION CONSTRUCTION WITH ACOUSTIC (OR THERMAL) INSULATION AS DETAILED, THIS SHEET.
- A) IN A NON RATED PARTITION, CARRY GYP. BD. AND INSULATION MIN. 6" ABOVE SCHEDULED CEILING HEIGHT (UNLESS NOTED OTHERWISE) AND PROVIDE BATT SOUND INSULATION 2'-0" MIN. ON EACH SIDE OF PARTITION (WHEN INDICATED ON REFLECTED CEILING PLAN)
- B) IN A PARTITION NOTED TO GO TO THE UNDERSIDE OF STRUCTURE PROVIDE BATT SOUND INSULATION FULL HEIGHT OF PARTITION.
- C) PROVIDE / INSTALL SEALANT UNDER PARTITION FLOOR TRACK BOTH EDGES WHEN ACOUSTIC INSULATION IS INDICATED AND AT ALL FIRE-RATED PARTITIONS.
- D) ACOUSTIC INSULATION IS TO HAVE A MIN. STC RATING OF 50.

GENERAL NOTES

1. NOT ALL DETAILS ON THIS SHEET WILL BE USED ON THIS PROJECT. DETAILS ARE TYPICAL AND SHALL APPLY WHEN CONSTRUCTION CONDITION EXISTS.
2. REFER TO STANDARD DETAILS THIS SHEET FOR TYPICAL INTERIOR PARTITION CONSTRUCTION INFORMATION. REFER TO DETAIL PLANS AND PLAN DETAILS FOR SPECIAL PARTITION CONSTRUCTION INFORMATION.
3. ADDITIONAL SURFACE FINISHES ON FACING MATERIAL ARE NOTED ON ROOM FINISH SCHEDULE & DETAILS.
4. REFER TO REFLECTED CEILING PLAN FOR LOCATION OF ACOUSTIC INSULATION ABOVE CEILING.
5. REFER TO LIFE-SAFETY / CODE PLAN FOR LOCATION OF FIRE RATED CONSTRUCTIONS AND ADDITIONAL INFORMATION.

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL CONFORM TO FEDERAL, STATE AND LOCAL CODES AS ENFORCED BY THE AUTHORITY HAVING JURISDICTION.
2. CONTRACTOR TO CHECK AND VERIFY ALL CONDITIONS, REQUIREMENTS, NOTES AND DIMENSIONS PRIOR TO STARTING WORK. NOTIFY THE ARCHITECT IN WRITING IF FIELD CONDITIONS, DIMENSIONS, ETC. VARY FROM THOSE SHOWN OR CALLED FOR IN THE CONTRACT DOCUMENTS.
3. DIMENSIONS ARE TO FACE OF STUD OR FACE OF MASONRY UNLESS OTHERWISE NOTED.
4. ALL WORK SHALL BE PLUMB, LEVEL AND SQUARE. SCRIBE AS REQUIRED TO MAKE ALL WORK FIT.
5. DIMENSIONS NOTED AS "CLEAR" ARE TO FINISHED SURFACE AND ARE CRITICAL FOR ACCESSIBILITY REQUIREMENTS OR FURNISHINGS.
6. PROVIDE ALL BLOCKING, FURRING, SHIMS, ETC. AS NECESSARY FOR PROPER INSTALLATION OF OTHER VENDORS WORK SUCH AS BUT NOT LIMITED TO: RAILINGS, GRAB BARS, TOILET ACCESSORIES AND PARTITIONS, DOOR BUMPERS, TRIM, CABINETS, FURNITURE, MECHANICAL AND ELECTRICAL DEVICES. COORDINATE LOCATIONS WITH INSTALLING TRADE CONTRACTOR.
7. CONTRACTOR SHALL FIELD VERIFY FINISHED DIMENSIONS AND CLEARANCES IN SPACES TO RECEIVE BUILT-IN FURNISHINGS OR CASEWORK PRIOR TO FABRICATION.
8. WHERE FLOOR DRAINS OCCUR, SLOPE FLOOR TO DRAIN TYP. 1/4" PER FOOT.
9. WHEN MATERIALS AND OR FINISHES ARE NOT SPECIFICALLY SHOWN, NOTED, OR SPECIFIED, CONTRACTOR SHALL NOTIFY THE ARCHITECT FOR CLARIFICATION, PRIOR TO PROCEEDING WITH THE WORK.
10. FIRE-RETARDANT-TREATED WOOD IS ALLOWED IN TYPE I, TYPE II, TYPE III CONSTRUCTIONS PER IBC CODE SECTION 603.
    10a. ADDITIONALLY, ALL WOOD BLOCKING AND FURRING IN EXTERIOR WALLS AND ROOFING ASSEMBLIES SHALL BE PRESSURE TREATED.
11. MASONRY / CONCRETE:
    a. ALL MASONRY WALLS THAT WILL BE EXPOSED TO VIEW IN OCCUPIED AREAS SHALL HAVE MORTAR JOINTS STRUCK SMOOTH TO FACE OF WALL.
    b. PROVIDE GAP BETWEEN TOP OF MASONRY AT ALL LOCATIONS WHERE MASONRY EXTENDS TO UNDERSIDE OF STRUCTURAL MEMBERS OR ROOF DECK WITH LATERAL SUPPORT AS INDICATED IN THE STRUCTURAL DETAILS.
12. MASONRY / GYPSUM BOARD:
    PROVIDE CONTROL JOINTS IN INTERIOR MASONRY AND GYPSUM BOARD / STUD PARTITIONS AT SPACING NOT EXCEEDING 25'-0" O.C. IN STRAIGHT RUNS EXCEEDING 25 FT. IN LENGTH. IN PARTITION TYPES WHICH INCLUDE BOTH TYPES OF CONSTRUCTION, CONTROL JOINTS SHALL ALIGN FROM UPPER TO LOWER CONSTRUCTION.
13. GYPSUM BOARD / METAL STUD:
    a. PROVIDE MOISTURE RESISTANT GYPSUM BOARD ON ALL WALLS BEHIND OR ADJACENT TO PLUMBING FIXTURES.
    b. AT ALL LOCATIONS WHERE GYPSUM BOARD PARTITIONS TERMINATE AT DISSIMILAR MATERIALS, PROVIDE A FINISHABLE METAL 'J' MOLD AT EDGE OF GYPSUM BOARD AND A 1/8" GAP BETWEEN TRIM AND ADJACENT MATERIAL. FILL GAP WITH BACKER ROD AND SEALANT.
    c. PROVIDE DEFLECTION TRACK AT TOP OF ALL METAL STUD PARTITIONS WHICH EXTEND TO DECK ABOVE. OTHERS SHALL BE LATERALLY BRACED TO THE STRUCTURE ABOVE WITH 3-5/8" X 22 GA. STUDS @ 48" O.C. MAX. REFER TO DETAIL #2 ON THIS SHEET.
    d. PROVIDE DOUBLE STUDS AT ALL DOOR AND WINDOW JAMBS.

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drawn by:	RLB
coordination checked:	RLB
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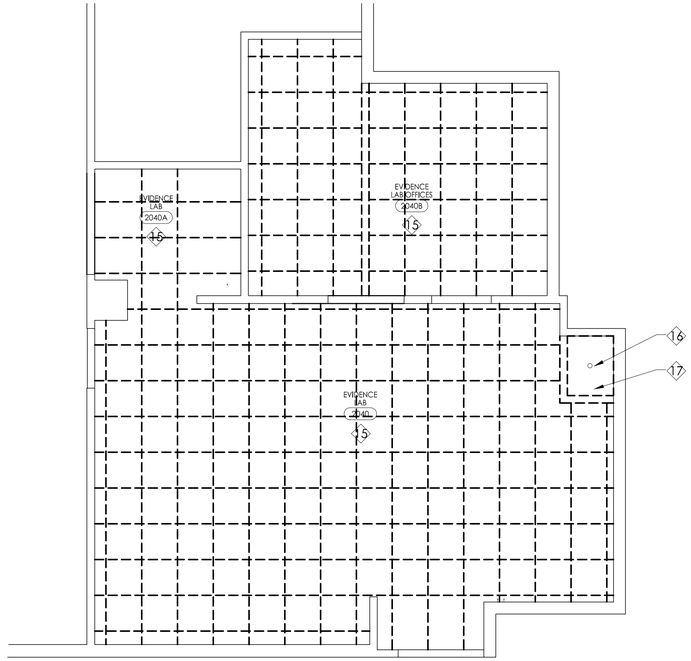
project:
Warren Police Department
Crime Lab

sheet title:
Typical Interior Partition Types

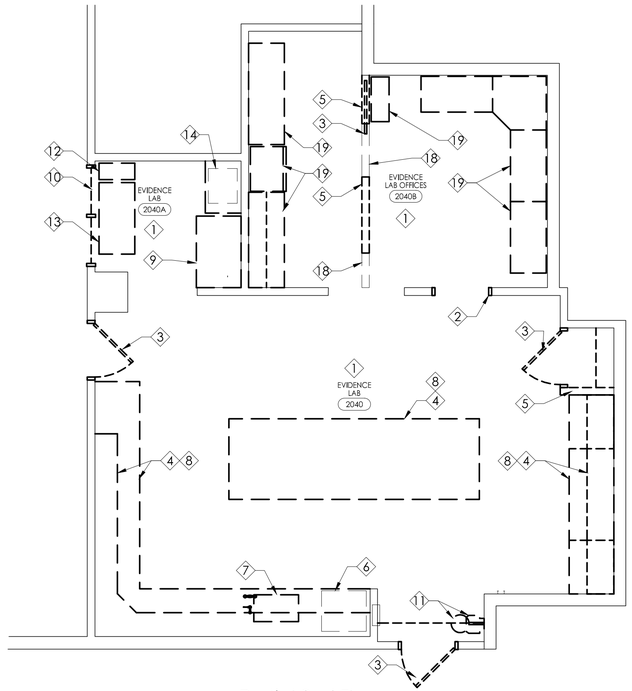
project number: 1201-1
sheet number: G-003



NORTH 2

Partial 2nd Floor Demo Reflected Ceiling Plan

Scale: 1/4"=1'-0"



NORTH 1

Partial 2nd Floor Demolition Plan

Scale: 1/4"=1'-0"

DEMOLITION CONTRACTOR NOTES

1. ALL INTERESTED CONTRACTORS MUST MEET ON SITE FOR A WALK THROUGH WITH OWNER'S REPRESENTATIVE. IF YOU DO NOT WALK THE BUILDING WITH OWNERS REP, YOUR BID WILL NOT BE ACCEPTED.
2. CONTRACTOR AWARDED BID IS RESPONSIBLE FOR DEMOLITION PERMIT.
3. A HAZ MAT ASSESSMENT REPORT IS AVAILABLE,. IF CONTRACTOR SEES ANY POTENTIAL FOR HAZARDOUS MATERIALS, THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING OWNERS REP AT THE WALK THROUGH. IF A CONTRACTOR DOES NOT NOTIFY THE OWNERS REP OF ANY AREAS OF CONCERN, CONTRACTOR WILL BE RESPONSIBLE FOR THE COST TO ABATE ANY HAZARDOUS MATERIALS FOUND DURING DEMOLITION.
4. CONTRACTORS BID SHOULD INCLUDE COSTS OF DUMPSTERS AND DISPOSAL TO COMPLETE THE JOB.
5. IF CONTRACTOR RECEIVES MONEY FOR ANY SCRAPED MATERIALS, SUCH SHALL BE CREDITED BACK TO OWNER AND DISCOUNTED OFF THE FINAL PAYMENT INVOICE.
6. CONTRACTORS MUST LIST THEIR HOURLY LABOR RATE AS PART OF THEIR BID DOCUMENT SO IF OWNER DETERMINES ADDITIONAL DEMOLITION IS NEEDED, THAT WAS NOT PART OF THE SCOPE AS DEFINED HEREIN, THERE IS AN AGREED UPON HOURLY RATE UP FRONT FOR SUCH.
7. IF CONTRACTOR CANNOT DEMO ELECTRICAL, CONTRACTOR SHALL SUBCONTRACT TO A QUALIFIED LICENSED ELECTRICIAN.
8. OWNER RESERVES THE RIGHT TO REJECT ANY SUB-CONTRACTOR AT THEIR SOLE DISCRETION.
9. CONTRACTOR CERTIFIES THAT IT HAS PERFORMED THE FOLLOWING UPON SUBMISSION OF A BID:
   - WALKED THE SITE WITH THE OWNERS REP AND THOROUGHLY REVIEWED THE SCOPE OF WORK AND PLANS PROVIDED.
   - THAT ALL WORK SHOWN ON THE PLANS AND IN THE SCOPE OF WORK IS INCLUDED IN ITS BUDGET AND IF NOT, AGREES TO PERFORM ALL DEMOLITION AS NOTED.
   - HAS ALL COSTS FOR DUMPSTERS, SUBCONTRACTOR WORK - IF NEEDED, AND PERMITS INCLUDED IN BID PRICE.
   - CERTIFIES THAT THEY ARE LICENSED, CAPABLE AND PROPERLY INSURED TO PERFORM THE WORK DEFINED HEREIN.

DEMO / FLOOR PLAN LEGEND

- EXISTING WALLS TO REMAIN.
- TO BE REMOVED/ DEMOLISHED.
- S3 — NEW METAL STUD PARTITION / WALL FURRING AS SCHEDULED. SEE SHEET G-03.
- S4 — NEW MASONRY WALL/ MASONRY INFILL AS SCHEDULED. SEE SHEET G-03.
- EXIST — EXISTING DOOR TO REMAIN. SEE DOOR SCHEDULE.
- XXX — NEW DOOR AND FRAME . SEE DOOR SCHEDULE.
- # — DEMOLITION KEY NOTE TAG

DEMOLITION GENERAL NOTES

1. ALL DEMOLITION SHALL COMPLY WITH ALL APPLICABLE LOCAL CODES, STATE CODES AND ORDANCES.
2. REFER TO STRUCTURAL, ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION REQUIREMENTS, SCOPE AND COORDINATION OF WORK.
3. CONTRACTOR SHALL VERIFY ALL EXISTING BUILDING DIMENSIONS, PARTITION AND WALL LOCATIONS, FLOOR ELEVATIONS AND BUILDING CONDITIONS IN THE FIELD AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES BEFORE THE COMMENCEMENT OF WORKS.
4. MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING DEMOLITION OPERATIONS. DO NOT INTERRUPT UTILITIES SERVING OCCUPIED OR USED FACILITIES, EXCEPT WHEN AUTHORIZED IN WRITING BY AUTHORITIES HAVING JURISDICTION.
5. WHEN UNANTICIPATED ARCHITECTURAL, MECHANICAL, ELECTRICAL OR STRUCTURAL ELEMENTS CONFLICT WITH THE INTENDED FUNCTION OF THE DESIGN ARE ENCOUNTERED, INVESTIGATE AND MEASURE BOTH THE NATURE AND EXTENT OF THE CONFLICT AND NOTIFY THE OWNER'S REPRESENTATIVE AND ARCHITECT.
6. PROVIDE SHORING, BRACING, AND ANY OTHER MEANS REQUIRED TO PROTECT AND MAINTAIN THE SAFETY, INTEGRITY AND STABILITY OF ALL EXISTING AND NEW CONSTRUCTION.
7. ALL DEMOLITION WORK REQUIRED IS NOT NECESSARILY WHAT IS SHOWN ON THE DEMOLITION PLANS. THE INTENT IS TO REMOVE ALL MECHANICAL, ELECTRICAL, AND ARCHITECTURAL ITEMS AS REQUIRED TO FACILITATE NEW CONSTRUCTION.
8. WHERE DEMOLITION IS REQUIRED BEYOND THE LIMITS OF THE CONTRACT TO ROUTE NEW DUCTWORK, PIPING, CONDUITS, ETC., RATED WALLS AND SMOKE BARRIERS REQUIRING PENETRATIONS SHALL BE PATCHED BY CONTRACTOR. ALL FINISHES DAMAGED BY THE WORK SHALL BE RESTORED TO THEIR ORIGINAL CONDITION.
9. REPAIR DEMOLITION PERFORMED IN EXCESS OF THAT REQUIRED. RETURN ELEMENTS OF CONSTRUCTION AND SURFACES TO REMAIN TO THE CONDITION EXISTING PRIOR TO START OF OPERATIONS. REPAIR ADJACENT CONSTRUCTION SURFACES SOILED OR DAMAGED BY SELECTIVE DEMOLITION.
10. REMOVE AND REPLACE EXISTING CONSTRUCTION AS REQUIRED FOR THE EXECUTION OF NEW WORK.
11. PROTECT EXISTING CONSTRUCTION TO REMAIN FROM DAMAGE AS REQUIRED DURING DEMOLITION. PROTECT FLOORS WITH SUITABLE COVERING WHERE NECESSARY.
12. DISCONNECT ALL MISCELLANEOUS FEATURES (I.E. ELECTRICAL, MECHANICAL, PLUMBING, ETC.) ASSOCIATED WITH ITEMS TO BE DEMOLISHED (I.E. PARTITIONS, WALLS, CEILINGS, CABINETS ETC.).
13. REMOVAL OF ANY MECHANICAL, ELECTRICAL AND MISCELLANEOUS ITEMS WILL REQUIRE PATCH AND REPAIR OF ADJACENT MATERIALS TO REMAIN.
14. REMOVAL OF ANY WALLS, PARTITIONS, DOORS OR OTHER PERMANENT BUILDING ELEMENTS WILL REQUIRE PATCH AND REPAIR OF ADJACENT WALL, FLOOR, CEILING MATERIALS TO REMAIN.
15. REMOVAL OF ITEMS NOTED INCLUDES REMOVAL OF ANCHORS, ADHESIVES HARDWARE, CONDUIT, WIRE, PIPING, ETC. FOR A COMPLETE REMOVAL OF THE ITEMS OR SYSTEMS.
17. CONTRACTOR SHALL PLACE ANY ITEMS OR MATERIALS TO BE SALVAGED AND/OR RETAINED AS DIRECTED BY OWNER.
18. REFER TO PLUMBING DEMOLITION SHEET P1-00 FOR AREAS TO SAWCUT AND REMOVE CONC. SLAB AS REQUIRED FOR NEW WORK. COORDINATE WITH MECHANICAL, ELECTRICAL, PLUMBING AND ARCHITECTURAL.

DEMOLITION KEY NOTES

1. DEMO ALL FLOORING AND WALL BASE.
2. DEMO DOOR FRAME.
3. DEMO DOOR AND FRAME.
4. DEMO CASEWORK/MILLWORK.
5. DEMO GYP. BD. WALL.
6. REMOVE AND SALVAGE DISHWASHER. TURN OVER TO OWNER.
7. DEMO SINK AND FAUCET. COORD W/ PLUMBING DWGS.
8. ABATE EPOXY BENCHTOPS. SEE SPEC SECTION 02132 ASBESTOS REMOVAL.
9. ABATE FUME HOOD. SEE SPEC SECTION 02132 ASBESTOS REMOVAL.
10. DEMO WINDOW.
11. DEMO EM EYEWASH AND SHOWER FIXTURES. COORD W/ PLUMBING DWGS.
12. DEMO LOCKERS.
13. REMOVE AND SALVAGE TABLE AND FLAMMABLE CABINET. TURN OVER TO OWNER.
14. DEMO COUNTER. REMOVE AND SALVAGE UNDERCOUNTER REFRIGERATOR, TURN OVER TO OWNER.
15. DEMO ACT TILES AND GRID. COORD W/ MEP DRAWINGS.
16. DEMO AND CAP SPRINKER HEAD. COORD W/ PLUMBING DRAWINGS.
17. DEMO GYP. BD. CEILING. COORD W/ MEP DRAWINGS.
18. DEMO CEILING DROP ABOVE
19. REMOVE AND SALVAGE FURNITURE, TURN OVER TO OWNER.

NOTE:
ALL EXISTING SLABS AND BEAMS ARE INTERNALLY REINFORCED WITH DRAPED POST-TENSIONED TENDONS. NON-DESTRUCTIVE DETECTION TECHNOLOGY MUST BE UTILIZED TO LOCATE TENDONS. NO DRILLING, CORING, OR CUTTING OF ANY KIND IS PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER. SEE NOTES ON S-001 FOR ADDITIONAL INFORMATION.

WARREN

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drawn by:	RLB
coordination checked:	RLB
checked:	CTW
approved:	LAC

project:
Warren Police Department
Crime Lab

sheet title:
Partial 2nd Floor Demo Plans

project number: 1201-1
sheet number: D-100

DOOR SCHEDULE

DOOR NO.	DOOR SIZE	DOOR			FRAME			DETAILS		THRES	LABEL	HDWE TYPE	REMARKS
		TYPE	MAT	FINISH	TYPE	MAT	FINISH	HEAD	JAMB				
2040A	3'-0" x 7'-0"x 1 3/4"	A	HM	PT	1	HM	PT			-	45 MIN.	5.6	2, 3, 6
2040B	3'-0" x 7'-0"x 1 3/4"	A	HM	PT	1	HM	PT			-	45 MIN.	5.6	2, 3, 6

GENERAL DOOR INFORMATION

1. All door sizes scheduled are based on actual frame openings, sizes noted on schedule are clear jamb to jamb frame dimensions and from reference floor line to head frame opening. Dimension tolerances must be considered for flooring materials to actual door dimensions.
2. All hollow metal and wood doors including all fire labeled doors shall have special internal blocking to allow surface mounted closures and other hardware to be connected to the doors without the use of through bolts.
3. All door numbers are the same as the room number noted on plans - if more than one door is indicated at a room, all doors will be numbered for that room. Fire rated doors and frames are listed in minutes. See door schedule.
4. Door undercuts for mechanical requirements require a 5/8" max. clear distance measured from the top of the finished floor material or threshold to the bottom of the door. Standard tolerances of undercutting of doors for thresholds and other floor covering materials are not noted and must be considered in determining the actual overall dimensions of the door. Coordinate with affected trades.
5. Location of doors noted on plans are dimensioned to the face of door jamb unless otherwise noted or detailed. If door location is not dimensioned - face of jamb shall be 4" to the wall.
6. Reinforce all doors and millwork for hardware.
7. All Hollow metal door frames must be grouted solid unless specifically noted otherwise. NOTE: coordinate cavities for hardware items.
8. Thickness of doors are 1 3/4" unless noted or detailed.
9. All wood doors shall be solid cores.
10. Factory prepare door and frame for installation of card reader or electrical strike as scheduled.

DOOR HARDWARE TYPE

1. Manual Hold Open (to be used for temporary moving of equipment only)
2. Panic Hardware/Emergency Egress
3. Card Reader
4. Key Lock
5. No Locks
6. Delay closer

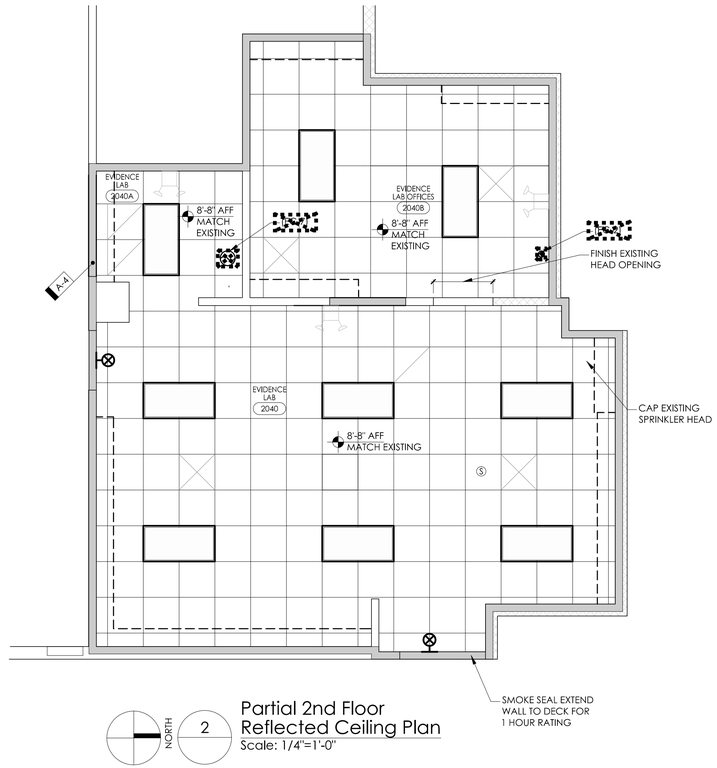
DOOR REMARKS

1. New doors and frames in existing openings.
2. All HM doors to be painted: alkyd paint, satin finish, color to match existing.
3. All HM frames to be painted: alkyd paint, satin finish, color to match existing.

Door Types

Frame Types

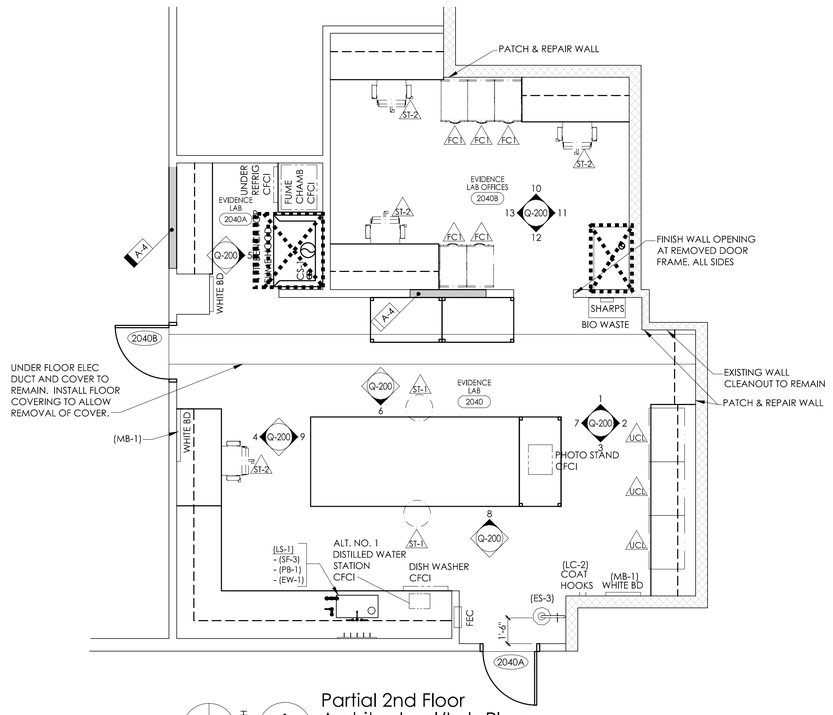
NOTE:
ALL EXISTING SLABS AND BEAMS ARE INTERNALLY REINFORCED WITH DRAPED POST-TENSIONED TENDONS. NON-DESTRUCTIVE DETECTION TECHNOLOGY MUST BE UTILIZED TO LOCATE TENDONS. NO DRILLING, CORING, OR CUTTING OF ANY KIND IS PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER. SEE NOTES ON S-001 FOR ADDITIONAL INFORMATION.



NORTH 2

Partial 2nd Floor Reflected Ceiling Plan

Scale: 1/4"=1'-0"



NORTH 1

Partial 2nd Floor Architectural/Lab Plan

Scale: 1/4"=1'-0"

REFLECTED CEILING PLAN LEGEND

- 2x2 LAY-IN ACOUSTIC CEILING TILES IN SUSPENDED METAL GRID
- SUPPLY AIR DIFFUSER
- RETURN AIR GRILLE
- EXHAUST DUCT- SEE LAB AND MECH
- ELEVATION OF CEILING ABOVE FINISH FLOOR
- 2x4 LED LIGHT- SEE ELECT
- EXIT LIGHT- SEE ELECT
- EMERGENCY LIGHT- SEE ELECT
- SPEAKER- SEE ELECT

FLOOR PLAN LEGEND

MECHANICAL, ELECTRICAL AND PLUMBING IS TO BE DESIGN-BUILD. DRAWINGS SHOW DESIGN INTENT ONLY.

- NEW METAL STUD PARTITION / WALL FURRING AS SCHEDULED. SEE SHEET G-003.
- NEW MASONRY WALL/ MASONRY INFILL AS SCHEDULED. SEE SHEET G-003.
- XXX — NEW DOOR AND FRAME . SEE DOOR SCHEDULE.
- FEC — FIRE EXTINGUISHER CABINET
- FE — FIRE EXTINGUISHER
- CJ — CONTROL JOINT. SEE TILE SPECIFICATION.
- ST-1 — CFCI FURNITURE. SEE SPECIFICATIONS.

GENERAL NOTES AND INFO

- MOBLE CASEWORK
- FIXED CASEWORK

1. LABORATORY DRAWINGS INDICATE ALL LABORATORY CASEWORK, EQUIPMENT AND ACCESSORIES. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL & PLUMBING FOR ALL OTHER INFORMATION.
2. ALL BENCHTOPS TO BE EPOXY RESIN U.N.O.
3. ALL BENCHTOPS TO BE 30" DEEP U.N.O.
4. ALL BENCHTOPS TO BE 36" HIGH U.N.O. (REFER TO ELEVATIONS)
5. ALL LABORATORY CASEWORK BASE CABINET DOORS AND DRAWERS SHALL INCLUDE LABEL HOLDERS, (EXCEPT AT SINK, VENTED, FLAMMABLE OR ACID TYPE CABINETS), TYPICAL.

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Warren Police Department
Crime Lab

sheet title:
Partial 2nd Floor Architectural/Lab Plan & Reflected Ceiling Plan

project number:	sheet number:
1201-1	A-100

LABORATORY ACCESSORY, CASEWORK, FUME HOOD, AND SERVICE FITTING FINISH SCHEDULE

I.D.	ITEM	MATERIAL & FINISH	COLOR	NOTES	DETAIL
ACCESSORIES					
(ALS-2)	ADJUSTABLE LAB SHELVES	PAINTED METAL	LINEN	MOTT -(DESIGN STANDARD)	23/Q1-02
(ALS-5)	ADJUSTABLE LAB SHELVES	PAINTED METAL	LINEN	MOTT -(DESIGN STANDARD)	23/Q1-02
	SHELF BRACKETS & SUPPORT STANDARDS (ALS-2/ALS-5)	PAINTED METAL	LINEN	MOTT -(DESIGN STANDARD)	23/Q1-02
(LC-2)	LAB COAT HOOKS	SATIN ALUMINUM	MFR. STD.	SEE PAINTED METAL LAB CASEWK SPEC SECTION	
(PB-1)	PEGBOARD DRYINGRACK	STAINLESS STEEL	MFR. STD.	POLYPROPYLENE PEGS	24/Q1-02
(WW-1)	DUAL SERVICE WIREWAY	STEEL BAKED ENAMEL	DESIGNER GRAY	LEGRAND 4000 DESIGNER SERIES (DESIGN STD) (SEE ELECTRICAL DOCUMENTS)	
	ELECTRICAL RECEPTACLES & SWITCHES	MANUFACTURER STANDARD	STANDARD BLACK	EMERGENCY POWER = RED (SEE ELECTRICAL DOCUMENTS)	
	ELECTRICAL COVERPLATES	STAINLESS STEEL, SATIN	NATURAL	(SEE ELECTRICAL DOCUMENTS)	
BENCHTOPS, SINKS & CUP SINKS					
(E)	EPOXY RESIN	EPOXY RESIN, MATTE	MFR. STD. BLACK	DURCON (DESIGN STD)	12,13/Q1-02
CASEWORK					
	BASE CABINETS	PAINTED METAL, SEMI-GLOSS	LINEN	MOTT LABORATORY CASEWORK (DESIGN STD)	Q1-01,1-02
	WALL AND TALL CABINETS	PAINTED METAL, SEMI-GLOSS	LINEN	MOTT LABORATORY CASEWORK (DESIGN STD)	Q1-01,1-02
	~~VENTED CABINETS~~	~~PAINTED METAL, SEMI-GLOSS~~	~~LINEN~~	~~MOTT LABORATORY CASEWORK (DESIGN STD)~~	~~Q1-01,1-02~~
	FLAMMABLE CABINETS	PAINTED METAL, SEMI-GLOSS	LINEN	MOTT LABORATORY CASEWORK (DESIGN STD)	Q1-01,1-02
	ACID CABINETS	PAINTED METAL, SEMI-GLOSS	LINEN	MOTT LABORATORY CASEWORK (DESIGN STD)	Q1-01,1-02
	CASEWORK HARDWARE, DOOR & DRAWER PULLS	STAINLESS STEEL, SATIN FINISH	NATURAL	-	
	CASEWORK LETTERING	PAINTED	RED		
FUME HOODS					
(FH-#)	ENCLOSURE	PAINTED METAL, SEMI-GLOSS	LINEN	MOTT - (DESIGN STANDARD)	Q1-02
	ELEC. COVER PLATES	STAINLESS STEEL, SATIN		MOTT - (DESIGN STANDARD)	Q1-02
	RECEPTACLES AND SWITCHES	STAINLESS STEEL, SATIN		MOTT - (DESIGN STANDARD)	Q1-02
EMERGENCY FIXTURES, SINK FIXTURES AND SERVICE FITTINGS					
(SF-#)	SINK FIXTURES	CHROME, SATIN FINISH	NATURAL	WITH CLEAR EPOXY COATING	
(SF-#)	SERVICE FITTINGS	CHROME, SATIN FINISH	NATURAL	WITH CLEAR EPOXY COATING	
(ES-#) (EW-#)	EMERGENCY FIXTURES	STAINLESS STEEL, SATIN FINISH	NATURAL		

EXHAUST CONNECTIONS LEGEND

ID	DESCRIPTION NOTE: SEE MECHANICAL DOCUMENTS FOR ALL DUCTWORK AND CONNECTIONS (COORDINATE WITH MECHANICAL)
EC-1	EXHAUST CONNECTION AND DUCTWORK BY MECHANICAL TRADES ROUTED VERTICALLY THROUGH SERVICE CHASES (SC-#) AND HORIZONTALLY BEHIND CASEWORK TO VENTED BASE CABINETS (BC-#, BV-# & BP-#).
EC-2	EXHAUST CONNECTION AND DUCTWORK BY MECHANICAL TRADES ROUTED VERTICALLY TO VENTED CABINETS (UC-#, UV-#, UF-#&CC-#).
EC-3	DIRECT VERTICAL EXHAUST CONNECTION TO (FED-1) EXHAUST PORT, (FED-2) FLEX TRUNK SNORKEL AND (FED-6) AA FUME EXTRACTOR.
EC-4	HORIZONTAL EXHAUST CONNECTION TO CEILING BRACKET SUPPORTED JOINTED ARM (FED-4 & FED-5) FUME EXTRACTOR DEVICE TO DUCTWORK BY MECHANICAL TRADES.
EC-5	DEDICATED EXHAUST CONNECTION FOR EQUIPMENT CONNECTIONS AND DUCTWORK BY MECHANICAL TRADES.
EC-6	EXHAUST CONNECTION AND DUCTWORK BY MECHANICAL TRADES ROUTED VERTICALLY THRU SERVICE CHASES (SC-#) AND HORIZONTALLY BEHIND CASEWORK TO BENCHTOP MOUNTED FUME EXTRACTOR (FED-3).
EC-7	DIRECT EXHAUST CONNECTION & DUCTWORK BY MECHANICAL TRADES TO FUME HOODS AND/OR CANOPY HOODS. SEE FUME HOODS AND/OR CANOPY HOOD DETAILS. (COORDINATE WITH MECHANICAL DOCUMENTS)
EC-8	DIRECT EXHAUST CONNECTION & DUCTWORK BY MECHANICAL TRADES TO OWNER FURNISHED BIOSAFETY CABINET (COORDINATE WITH MECHANICAL DOCUMENTS).

EXHAUST CONNECTION ACCESSORY CODE SCHEDULE

ID	SYMBOL	DESCRIPTION
D		DOME
S		SQUARE
F		FLAT
N		NOZZEL (SUCTION)
X		FLEX NOZZEL
M		METAL DOME

EXHAUST CONNECTIONS SCHEDULE (FED-#-Accessory Code)

ID	FED-1	FED-2	FED-3	FED-4	FED-5	FED-6
DESCRIPTION	EXHAUST PORT (BY MECH.)	FLEXIBLE TRUNK SNORKEL FUME EXTRACTOR	BENCH FUME EXTRACTOR	(2) JOINT ARM FUME EXTRACTOR	(3) JOINT ARM FUME EXTRACTOR	TELESCOPING AA FUME EXTRACTOR
SYMBOL						

EMERGENCY SAFETY EQUIPMENT FIXTURES SCHEDULE

ID	SYMBOL	DESCRIPTION
EW-1		EMERGENCY EYE WASH & DRENCH HOSE, DECK MOUNTED (@ SINK)
EW-2		EMERGENCY EYE WASH & DRENCH HOSE, PANEL MOUNTED PULL DOWN
ES-1		EMERGENCY SHOWER- RECESS CEILING MOUNTED
ES-2		EMERGENCY SHOWER AND EYEWASH FREESTANDING COMBINATION UNIT
ES-3		EMERGENCY SHOWER- WALL MOUNT
ES-4		EMERGENCY SHOWER- SUSPENDED BELOW CEILING
ES-#-C		EMERGENCY SHOWER/ EYE UNIT WITH CURTAIN ACCESSORY

(ALS-1) ADJUSTABLE LAB SHELVES TABLE FRAME PAINTED METAL LINEN

SINK FIXTURES AND GAS SERVICE FITTINGS SCHEDULE

ID	SYMBOL	DESCRIPTION NOTE : PROVIDE "FINE CONTROL" GAS NEEDLE VALVES FOR FLAMMABLE AND HIGH PURITY GASES.
SF-1		LAB MIXING FAUCET WITH WRIST BLADES AND VACUUM BREAKER (HW-CW - ADA)
SF-2		LAB MIXING FAUCET WITH VACUUM BREAKER (HW-CW)
SF-3		HANDS FREE ELEC FAUCET WITH VACUUM BREAKER (HW-CW)
SF-4		FOOT OPERATED MIXING VALVE (HW-CW)
SF-5		CUP SINK SINGLE FAUCET WITH VACUUM BREAKER (CW-ADA)
SF-6		CUP SINK SINGLE FAUCET WITH VACUUM BREAKER (CW)
SF-7		DECK MOUNTED WATER LEVER (ADA)
SF-8		DECK MOUNTED WATER VALVE
SF-9		DECK MOUNTED PURIFIED VALVE (RO/DI)
SF-10		DECK MOUNTED GAS NEEDLE LEVER (ADA)
SF-11		DECK MOUNTED GAS NEEDLE VALVE
SF-12		DECK MOUNTED FINE CONTROL GAS NEEDLE VALVE
SF-20-S		STRAIGHT PANEL MOUNTED WATER AND GAS LEVER (FUME HOOD-ADA)
SF-21		ANGLE PANEL MOUNTED GAS VALVE (FUME HOOD)
SF-22		ANGLE PANEL MOUNTED GAS FINE CONTROL VALVE (FUME HOOD)
SF-23		ANGLE PANEL MOUNTED COLD WATER VALVE (FUME HOOD) (CW)
SF-24		DECK MOUNTED SWING GOOSE NECK OUTLET (FUME HOOD) (CW)
SF-25		WALL MOUNTED SWING GOOSE NECK OUTLET (FUME HOOD) (CW)
SF-26		WALL MOUNTED GAS OUTLET (FUME HOOD)
SF-27		ATMOSPHERIC VACUUM BREAKER (FUME HOOD)
SF-30		PANEL MOUNTED WATER LEVER (ADA)
SF-31		PANEL MOUNTED WATER VALVE
SF-32		PANEL MOUNTED PURIFIED VALVE (RO/DI)
SF-33		PANEL MOUNTED GAS NEEDLE LEVER (ADA)
SF-34		PANEL MOUNTED GAS NEEDLE VALVE
SF-35		PANEL MOUNTED FINE CONTROL GAS NEEDLE VALVE
SF-40		WALL MOUNTED GAS NEEDLE VALVE
SF-41		WALL MOUNTED FINE CONTROL GAS NEEDLE VALVE
SF-50		OVERHEAD SERVICE CARRIER MOUNTED WATER VALVE
SF-51		OVERHEAD SERVICE CARRIER MOUNTED GAS NEEDLE VALVE
SF-52		OVERHEAD SERVICE CARRIER MOUNTED FINE CONTROL GAS NEEDLE VALVE
SF-60		SCULLERY SINK - DECK MOUNTED, SPRAY HOSE (HW-CW)
SF-61		SCULLERY SINK - PANEL MOUNTED, LAB MIXING FAUCET WITH VACUUM BREAKER (HW-CW)

GENERAL NOTES:

1. THIS PROJECT MAY NOT UTILIZE ALL THE SYMBOLS, MATERIALS, ABBREVIATIONS & STANDARD INFORMATION SHOWN ON THIS SHEET.
2. FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION. DO NOT SCALE DRAWINGS.
3. REFER TO SHEET Q1.01 FOR LABORATORY CASEWORK SCHEDULE AND NOTES.
4. REFER TO SHEET Q1.02 FOR LABORATORY CASEWORK, FIXTURE AND ACCESSORY DETAILS.
5. REFER TO SHEET Q1.03 FOR LABORATORY EXHAUST AND BENCH SERVICE CHASE EQUIPMENT DETAILS.
6. REFER TO SHEET Q1.04 FOR LABORATORY EQUIPMENT SUPPORT DETAILS.
7. REFER TO ARCHITECTURAL FLOOR PLANS FOR ROOM DIMENSIONS, CONSTRUCTION AND FINISHES.
8. ALL DIMENSIONS ARE NOMINAL. COORDINATE VARIATIONS BASED ON MANUFACTURER OR CLOSEST MANUFACTURER STANDARD, SUBJECT TO LAB ARCHITECT'S AND/ OR LABORATORY CONSULTANT'S APPROVAL.
9. PROVIDE BLOCKING OR BACKING PLATE FOR WALL REINFORCEMENT AND SUPPORT FOR WALL MOUNTED EQUIPMENT, SHELVING AND CABINETS.

LINEN MOTT - ALTUS (DESIGN STANDARD) Q1-01

LABORATORY SYMBOL LEGEND

ID	SYMBOL	DESCRIPTION	NOTES
CC-#		GAS CYLINDER CABINET	REFER TO LAB PLAN FOR LOCATIONS AND L-1.00 SERIES FOR DETAILS
CH-#		CANOPY HOOD	REFER TO LAB PLAN FOR LOCATIONS AND L-1.00 SERIES FOR DETAILS
CR-#		CYLINDER RESTRAINT	REFER TO LAB PLAN FOR LOCATIONS AND L-1.00 SERIES FOR DETAILS
EC-#		EXHAUST CONNECTION	SEE SCHEDULE THIS SHEET
FH#-#		FUME HOOD	REFER TO LAB PLAN FOR LOCATIONS AND L-1.00 SERIES FOR DETAILS
BSC#-#		BIOSAFETY CABINET	REFER TO LAB PLAN FOR LOCATIONS AND L-1.00 SERIES FOR DETAILS
PB-#		PEG BOARD DRYING RACK	REFER TO LAB PLAN FOR LOCATIONS AND L-1.00 SERIES FOR DETAILS
LC-#		LAB COAT RACK	REFER TO LAB PLAN FOR LOCATIONS, ELEVATIONS FOR WIDTH AND THIS SHEET FOR TYPICAL MOUNTING HEIGHT
FE-#		FIRE EXTINGUISHER	REFER TO LAB PLAN FOR LOCATIONS AND ARCHITECTURAL SPECIFICATION
FEC-#		FIRE EXTINGUISHER CABINET	REFER TO LAB PLAN FOR LOCATIONS AND ARCHITECTURAL SPECIFICATION
W PH		EM WALL-MOUNTED PHONE	REFER TO LAB PLAN FOR LOCATIONS AND ELECTRICAL DOCUMENTS
FD		FLOOR DRAIN	REFER TO LAB PLAN FOR LOCATIONS AND MECHANICAL DOCUMENTS
PWR		DUPLEX POWER OUTLET	REFER TO ELECTRICAL DOCUMENTS
PWR		SPECIAL POWER OUTLET	REFER TO ELECTRICAL DOCUMENTS
VD		VOICE/ DATA OUTLET	REFER TO ELECTRICAL DOCUMENTS

SINK SCHEDULE

(REFER TO LAB PLAN FOR LOCATIONS)
- PROVIDE SINKS W/ STRAINERS, TAIL PIECES, TRAPS, FITTINGS, SUPPLIES, STOPS & ESCUTCHEONS.

ID	SYMBOL	MATERIAL	NOMINAL SIZE	DESCRIPTION
LS-1		EPOXY RESIN	28" x 15" x 12" DEEP	TYPICAL LAB SINK
LS-2		EPOXY RESIN	25" x 15" x 5" DEEP	ADA LAB SINK
LS-3		EPOXY RESIN	18" x 15" x 11" DEEP	TYPICAL HANDWASH SINK
LS-4		EPOXY RESIN	18" x 15" x 5" DEEP	ADA HANDWASH SINK
LS-5		EPOXY RESIN	36" x 15" x 11" DEEP	DOUBLE BOWL LAB SINK (OVERALL DIMENSION)
CS-1		EPOXY RESIN	6" x 3" x 4" DEEP	CUP SINK (@ FUME HOOD)
CS-2		EPOXY RESIN	9" x 3" x 6" DEEP	CUP SINK
SS-1		STAINLESS STL.	SEE DETAIL 14a/L1.02 SEE PLAN FOR LENGTH	SCULLERY SINK - SINGLE BOWL, SINGLE DRAIN BOARD
SS-2		STAINLESS STL.	SEE DETAIL 14b/L1.02 SEE PLAN FOR LENGTH	SCULLERY SINK - SINGLE BOWL, DOUBLE DRAIN BOARD
SS-3		STAINLESS STL.	SEE DETAIL 14c/L1.02 SEE PLAN FOR LENGTH	SCULLERY SINK - SINGLE BOWL, NO DRAIN BOARD
SS-4		STAINLESS STL.	SEE DETAIL 14d/L1.02 SEE PLAN FOR LENGTH	SCULLERY SINK - DOUBLE BOWL, DOUBLE DRAIN BOARD

BENCHTOP SCHEDULE

EXAMPLE: E - 36"H
MATERIAL - HEIGHT (inches)

- ALL BENCHTOPS TO BE EPOXY RESIN UNLESS OTHERWISE NOTED ON PLAN.
- ALL BENCHTOPS TO BE 30" DEEP UNLESS OTHERWISE NOTED ON PLAN.
- ALL BENCHTOPS TO BE 36" HIGH UNLESS OTHERWISE NOTED ON ELEVATIONS.

ID	MATERIAL	THICKNESS
E	EPOXY RESIN	1"
P	PHENOLIC RESIN	3/4"
PLAM	CHEMICAL RESISTANT PLASTIC LAMINATE	3/4"
SSTL	STAINLESS STEEL, 16 GAGE, #304 SATIN FINISH	1 1/4"
W	WOOD	
S	STONE	

VERTICAL SERVICE CHASE SCHEDULE

ID	SYMBOL	NOMINAL SIZE	LOCATION (REFER TO LAB PLAN FOR ACTUAL LOCATIONS)	DETAIL
SC-1		24" x 7" DEEP	@ WALL WITH BENCHTOP W/ SINK	1/L1.03
SC-2		24" x 7" DEEP	@ ADJ. FUME HOODS WITH BENCHTOP W/ or W/OUT SINK	2/L1.03
SC-3		24" x 7" DEEP	@ BENCHTOP ISLAND END W/ SINK	3/L1.03
SC-4		24" x 7" DEEP	@ BENCHTOP ISLAND END W/ SINK	4/L1.03
SC-5		24" x 7" DEEP	@ BENCHTOP ISLAND END W/OUT SINK	5/L1.03
SC-6		15" x 7" DEEP	@ WALL WITH BENCHTOP W/OUT SINK	6/L1.03
SC-6A		14" x 7" DEEP	@ WALL CORNER WITH BENCHTOP W/OUT SINK	6A/L1.03

TYPICAL LABORATORY ABBREVIATIONS

A	AIR (15 psi)
AFM	ATOMIC FORCE MICROSCOPE
AL	ALCOVE
ALS	ADJUSTABLE SHELVES
AT	AIR TABLE
ADJ	ADJUSTABLE
BSC	BIO-SAFETY CABINET
CAB	CABINET
CC	GAS CYLINDER CABINET
CH	CANOPY HOOD
C.F.C.I.	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CL	CENTER LINE
CO2	CARBON DIOXIDE
COL	COLUMN
CR	CARD READER/ or CYLINDER RESTRAINT
CS	CUPSINK
CSP	CEILING SERVICE PANEL
CYL	CYLINDER
C2H2	ACETYLENE
C2H4	ETHYLENE
CH4	METHANE
CV	CONSTANT VOLUME
D	DATA OUTLET/ OR DEPTH
DIA	DIAMETER
DH	DRENCH HOSE
DMB	DRY MARKER BOARD
DR	DISTILLATION RACK (INSIDE FUMEHOOD)/ or DOOR
E	EPOXY RESIN
EC	EXHAUST CONNECTION
EL	ELEVATION
EN	ENTRY
EO	EQUIPMENT OPENING
EP	ELECTRICAL PANEL
ER	ENVIRONMENTAL ROOM
ES	EMERGENCY SHOWER STATION
EMS	EMERGENCY STATION; COMBINATION EYEWASH & SHOWER
ESG	ELECTRIC STEAM GENERATOR
EW	EYEWASH
EXH	EXHAUST
EXIST	EXISTING
F	FILLER
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FED	FUME EXTRACTOR DEVICE
FH	FUMEHOOD
FLAM	FLAMMABLE
FRZ	FREEZER
GFI	GROUND FAULT INTERRUPTER
GR	GROMMET
GWD	GLASS WASHER/DRYER
HB	HOSE BIB
HRS	HOSE REEL STATION
HWS	HAND WASH SINK
ICE	ICE FLAKER
INC	INCUBATOR
IS	ILLUMINATED SIGN
K0	KNEE OPENING
L or X	LOCK
LC	LAB COAT RACK
LN	LIQUID NITROGEN
LS	LAB SINK
MM	MONITOR MOUNT/ or MATERIALS MECHANIC
MTC	MECHANICAL TESTING CORE
MRL	MAIN RESEARCH LAB
MT	MOVEABLE TABLE
MW	MODULAR WALL
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
O.F.C.I.	OWNER FURNISHED/CONTRACTOR INSTALLED
O.F.O.I.	OWNER FURNISHED/OWNER INSTALLED
OH	OPPOSITE HAND
OSC	OVERHEAD SERVICE CARRIER
OT	OPTICS TABLE
OTOS	OPTICS TABLE OVERHEAD SHELF
OSS	OVERHEAD SHELVING SYSTEM
P	PHENOLIC RESIN
Pair	PURIFIED AIR
PB	PEGBOARD
PART	PARTIAL
PBCV	PARTIAL BYPASS CONSTANT VOLUMN
PC	PERSONAL COMPUTER
PCA	PERSONAL COMPUTER ACCESSORIES
PE	POINT EXHAUST
PL	PROCEDURE LIGHT
PLAM	PLASTIC LAMINATE (CHEMICAL RESISTANT)
PROC	PROCEDURE
PSI	POUNDS PER SQUARE INCH
PWR	POWER
RFVRBW	REDUCED FACE VELOCITY- RESTRICTED BYPASS VARIABLE VOLUME
RFVCV	REDUCED FACE VELOCITY-CONSTANT VOLUME
REF	REFRIGERATOR
RGW	REAGENT GRADE WATER
RG	REGENT GRADE
RM	ROOM
S	STANDBY POWER
SC	SERVICE CHASE
SS	SCULLERY SINK
SF	SINK FIXTURE/ OR SERVICE FITTING
SF6	SULFUR HEXAFLOURIDE
SG	SPECIAL GAS
SIM	SIMILAR
SK	SINK
SP	SPRAYER
SSTL	STAINLESS STEEL
ST	STERILIZER
SVC	SERVICE CABINET
T	TELEPHONE OUTLET/ or THIMBLE CONNECTION FOR BSC
TC	TALL CABINET/ or TISSUE CULTURE
TS	TABLE SYSTEM/ or TALL SHELVING
TYP	TYPICAL
UC	UNDER COUNTER
UCR	UNDER COUNTER REFRIGERATOR
UCW	UNDER COUNTER WASHER
ULV	ULTRA-LOW VIBRATION
UON	UNLESS OTHERWISE NOTED
US	UNISTRUT SUPPORT SERVICE CARRIER
V	VOLTAGE OR VACUUM
V/D	VOICE DATA OUTLET
VGC	VENTED GAS CABINET
WC	WALL CABINET
WD	WALL DRAIN
WFH	WALK-IN FUME HOOD
WIRE	WIRE SHELVING
WPH	WALL-MOUNTED EMERGENCY PHONE
WW	WIRE WAY

WATER SERVICE ABBREV.- REF. MECH.

CW	COLD WATER
DI	DEIONIZED WATER
HW	HOT WATER
LW	LAKE WATER
PW	PURIFIED WATER
RO	REVERSE OSMOSIS WATER
TW	TEMPERED WATER

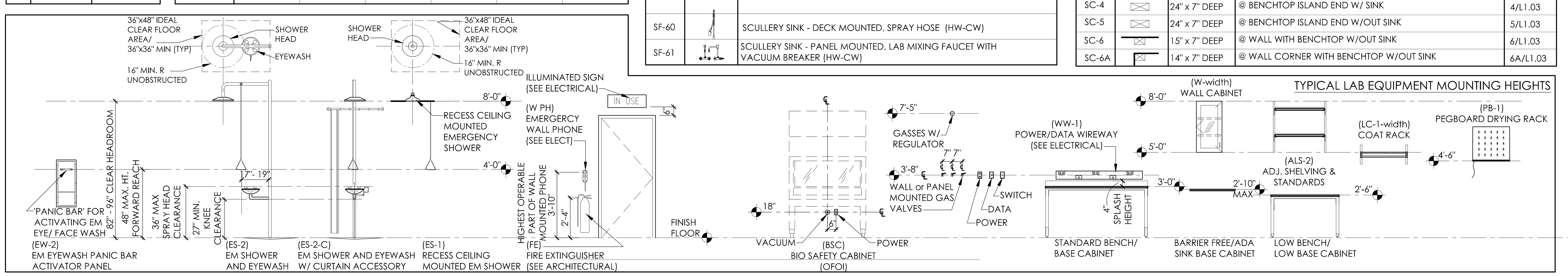
GAS SERVICE ABBREV.- REF. MECH.

LA	LAB AIR (15psi)
CA	COMPRESSED AIR (100 psi)
VAC	VACUUM
G	NATURAL GAS

CYLINDER GAS ABBREV.- REF. MECH.

Ar	ARGON GAS (Inert)
He	HELIUM GAS (Inert)
H2	HYDROGEN (Flammable)
O2	OXYGEN (Oxidizer)
N2	NITROGEN (Inert)

TYPICAL LAB EQUIPMENT MOUNTING HEIGHTS



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Warren Police Department
Crime Lab

sheet title:
Laboratory Equipment Schedules and Information

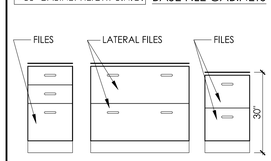
project number: 1201-1
sheet number: Q1-00

LABORATORY CASEWORK SCHEDULE

REFER TO SHEET Q1.02 FOR LABORATORY CASEWORK DETAILS AND ASSOCIATED FIXTURES & ACCESSORY DETAILS.

BASE FILE CABINETS

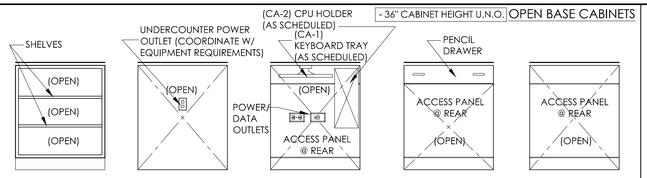
- 36" CABINET HEIGHT U.N.O.



B3F- width (3) DRAWERS | B2F - 36 LATERAL FILE CABINET | B2F - width FILE CABINET

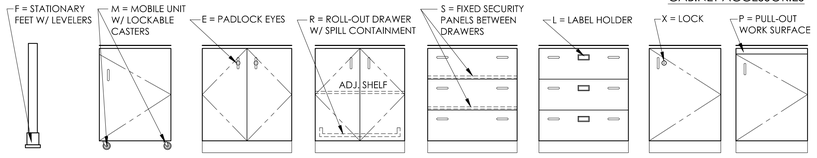
OPEN BASE CABINETS

- 36" CABINET HEIGHT U.N.O.



BOS - width OPEN WITH SHELVES | EO - width EQUIPMENT OPENING | KC - width KNEE OPENING W/ COMPUTER ACCESSORIES | K1D - width KNEE OPENING W/ (1) DRAWER | KO - width KNEE OPENING

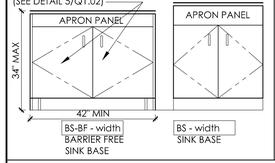
CABINET ACCESSORIES



x - width - F FIXED (STATIONARY) | x - width - M MOBILE | x - width -E PADLOCK EYES | x - width - R ROLL-OUT DRAWER | x - width - S SECURITY PANEL | x - width - L LABEL HOLDER | x - width - X LOCK | x - width - P PULL-OUT WORK SURFACE

SINK BASE CABINETS

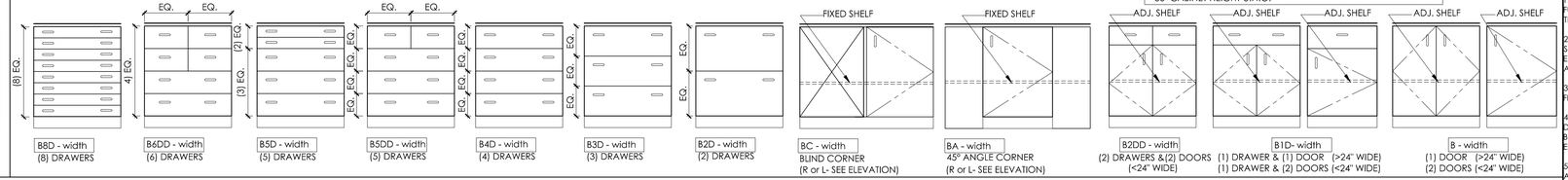
POCKET DOORS CONVERT SINK BASE TO BARRIER FREE SINK BY SLIDING DOORS INTO POCKETS (SEE DETAIL 5/Q1.02)



BS-BF - width BARRIER FREE SINK BASE | BS - width SINK BASE

BASE CABINETS

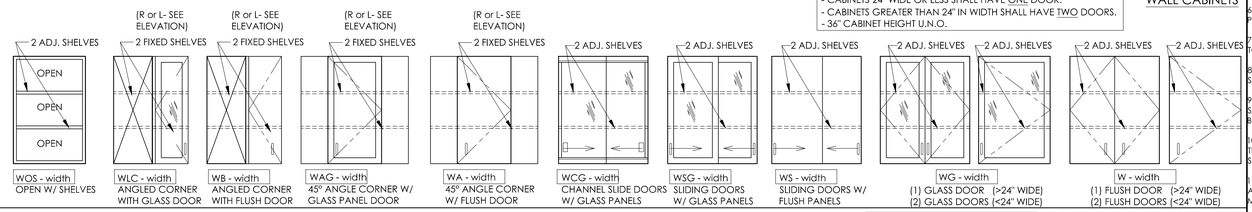
- CABINETS 24" WIDE OR LESS SHALL HAVE ONE DOOR.
- CABINETS GREATER THAN 24" IN WIDTH SHALL HAVE TWO DOORS.
- 36" CABINET HEIGHT U.N.O.



B8D - width (8) DRAWERS | B6DD - width (6) DRAWERS | B5D - width (5) DRAWERS | B5DD - width (5) DRAWERS | B4D - width (4) DRAWERS | B3D - width (3) DRAWERS | B2D - width (2) DRAWERS | BC - width BLIND CORNER (R or L- SEE ELEVATION) | BA - width 45° ANGLE CORNER (R or L- SEE ELEVATION) | B2DD - width (2) DRAWERS &(2) DOORS (<24" WIDE) | B1D- width (1) DRAWER & (1) DOOR (>24" WIDE) (1) DRAWER & (2) DOORS (<24" WIDE) | B - width (1) DOOR (>24" WIDE) (2) DOORS (<24" WIDE)

WALL CABINETS

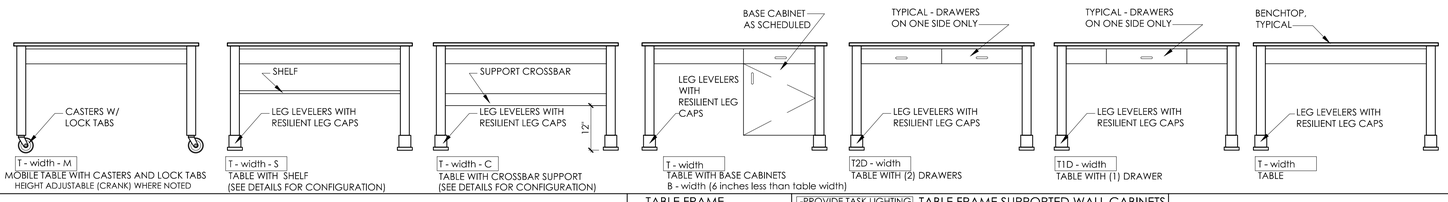
- CABINETS 24" WIDE OR LESS SHALL HAVE ONE DOOR.
- CABINETS GREATER THAN 24" IN WIDTH SHALL HAVE TWO DOORS.
- 36" CABINET HEIGHT U.N.O.



WOS - width OPEN W/ SHELVES | WLC - width ANGLED CORNER WITH GLASS DOOR | WB - width ANGLED CORNER WITH FLUSH DOOR | WAG - width 45° ANGLE CORNER W/ GLASS PANEL DOOR | WA - width 45° ANGLE CORNER W/ FLUSH DOOR | WCG - width CHANNEL SLIDE DOORS W/ GLASS PANELS | WSG - width SLIDING DOORS W/ GLASS PANELS | WS - width SLIDING DOORS W/ FLUSH PANELS | WG - width (1) GLASS DOOR (>24" WIDE) (2) GLASS DOORS (<24" WIDE) | W - width (1) FLUSH DOOR (>24" WIDE) (2) FLUSH DOORS (<24" WIDE)

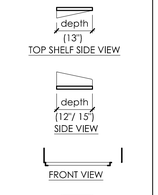
TABLES and TABLE ACCESSORIES

- SEE FLOOR PLAN FOR TABLE HEIGHT



T - width - M MOBILE TABLE WITH CASTERS AND LOCK TABS HEIGHT ADJUSTABLE (CRANK) WHERE NOTED | T - width - S TABLE WITH SHELF (SEE DETAILS FOR CONFIGURATION) | T - width - C TABLE WITH CROSSBAR SUPPORT (SEE DETAILS FOR CONFIGURATION) | T - width TABLE WITH BASE CABINETS B - width (6 inches less than table width) | T2D - width TABLE WITH (2) DRAWERS | T1D - width TABLE WITH (1) DRAWER | T - width TABLE

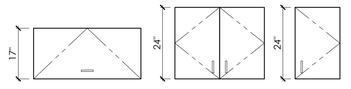
TABLE FRAME SUPPORTED SHELVING



ALS-1 ADJUSTABLE METAL SHELVES

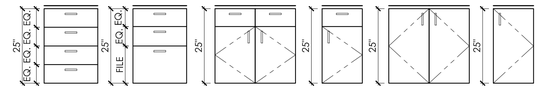
TABLE FRAME SUPPORTED WALL CABINETS

-PROVIDE TASK LIGHTING UNDER UPPER CABINETS, TYPICAL U.N.O.



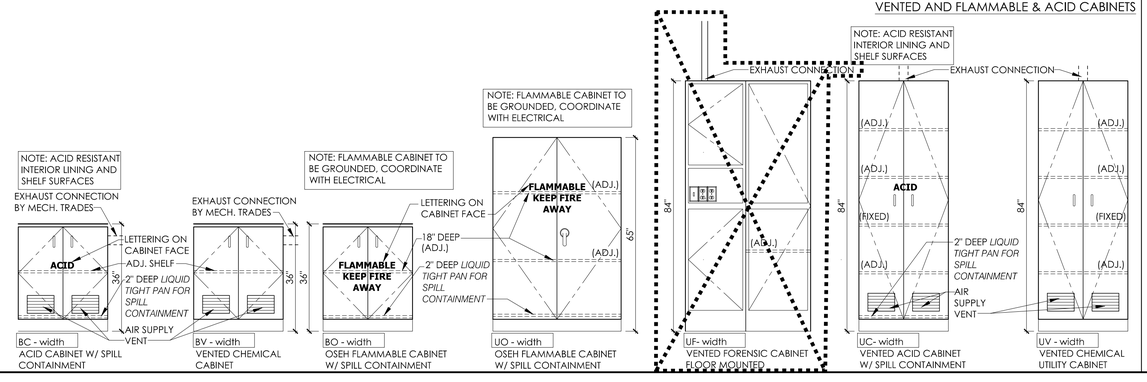
WFH - width HUTCH TYPE HINGED CABINET | WF - width FLUSH DOORS (<24" WIDE) | WF - width FLUSH DOOR (>24" WIDE)

TABLE FRAME SUPPORTED BASE CABINETS



BF4D - width (4) DRAWERS | BF3D - width (3) DRAWERS (<24" WIDE) | BF2DD - width (2) DRAWERS &(2) DRS (>24" WIDE) | BF1D- width (1) DRAWER & (1) DR (<24" WIDE) | BF - width (2) DOORS (>24" WIDE) | BF- width (1) DOOR

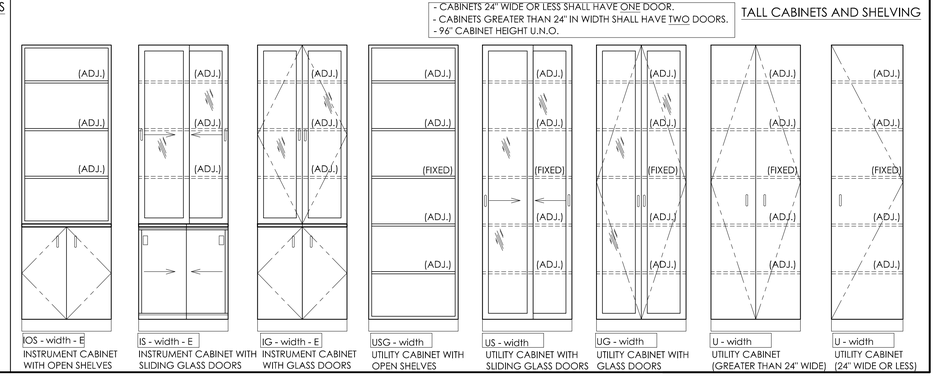
VENTED AND FLAMMABLE & ACID CABINETS



BC - width ACID CABINET W/ SPILL CONTAINMENT | BV - width VENTED CHEMICAL CABINET | BO - width OSEH FLAMMABLE CABINET W/ SPILL CONTAINMENT | UO - width OSEH FLAMMABLE CABINET W/ SPILL CONTAINMENT | UF- width VENTED FORENSIC CABINET FLOOR MOUNTED | UC- width VENTED ACID CABINET W/ SPILL CONTAINMENT | UV - width VENTED CHEMICAL UTILITY CABINET

TALL CABINETS AND SHELVING

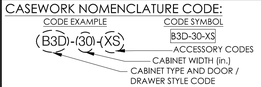
- CABINETS 24" WIDE OR LESS SHALL HAVE ONE DOOR.
- CABINETS GREATER THAN 24" IN WIDTH SHALL HAVE TWO DOORS.
- 96" CABINET HEIGHT U.N.O.



IOS - width - E INSTRUMENT CABINET WITH OPEN SHELVES | IS - width - E INSTRUMENT CABINET WITH SLIDING GLASS DOORS | IG - width - E INSTRUMENT CABINET WITH GLASS DOORS | USG - width UTILITY CABINET WITH OPEN SHELVES | US - width UTILITY CABINET WITH SLIDING GLASS DOORS | UG - width UTILITY CABINET WITH GLASS DOORS | U - width UTILITY CABINET (GREATER THAN 24" WIDE) | U - width UTILITY CABINET (24" WIDE OR LESS)

NOTES

CASEWORK NOMENCLATURE CODE:



GENERAL NOTES

1. THIS PROJECT MAY NOT UTILIZE ALL THE SYMBOLS, MATERIALS, ABBREVIATIONS AND STANDARD INFORMATION SHOWN ON THIS SHEET.
2. ALL BENCHTOPS TO BE EPOXY RESIN UNLESS OTHERWISE NOTED ON PLAN.
3. ALL BENCHTOPS TO BE 30" DEEP UNLESS OTHERWISE NOTED ON PLAN.
4. ALL BENCHTOPS TO BE 36" HIGH UNLESS OTHERWISE NOTED ON ELEVATIONS.

CASEWORK NOTES

1. LABORATORY EQUIPMENT CONTRACTOR IS RESPONSIBLE FOR FURNISHING, INSTALLING AND COORDINATING WITH BUILDING TRADES.
2. ANY DISCREPANCIES OR INTERFERENCE BETWEEN UNISTRUT SERVICE CARRIERS, BRACES, SERVICE CHASES, FUME HOODS AND EXHAUST DEVICES SHALL BE BROUGHT TO THE LABORATORY ARCHITECT/ LABORATORY CONSULTANT'S ATTENTION.
3. REFER TO ARCHITECTURAL PLANS FOR ROOM DIMENSIONS AND FIELD VERIFY FOR ACTUAL DIMENSIONS PRIOR TO FABRICATION.
4. BENCHTOP LENGTHS SHALL BE DETERMINED BY CASEWORK AND DIMENSIONS INDICATED ON PLANS AND ELEVATIONS. ALL BENCHTOPS SHALL OVERHANG CASEWORK BY 1" AT ALL EXPOSED EDGES.
5. ALL EXPOSED EDGES AT BENCHTOPS AND SPLASHES SHALL HAVE AN EASED EDGE.
6. ALL BENCHTOP MATERIAL SEAMS SHALL BE FILLED FLUSH TO PROVIDE AN EVEN SMOOTH SURFACE.
7. BENCHTOPS AND BACK SPLASHES SHALL BE SCRIBED TO WALL TO CONFORM TO IRREGULARITIES OF THE WALL PLANE.
8. ALL BENCHTOPS FLANKED BY FUME HOODS, TALL CABINETS AND SIDE WALLS SHALL HAVE SIDE SPLASHES.
9. LAB EQUIPMENT CONTRACTOR SHALL USE AN ACID-RESISTANT SEALANT AT SPLASHES AND ALL PENETRATIONS THROUGH BENCHTOP.
10. CASEWORK INSTALLATION SHALL BEGIN AT THE HIGH POINT OF THE ROOM FOR EACH RUN OR ISLAND WITH THE LEVELERS SET AS SHORT AS POSSIBLE.
11. PROVIDE FILLERS, SIDE PANELS, END PANELS, BACK PANELS AND CLOSURE PANELS TO COMPLETE INSTALLATION WITH SAME MATERIAL AND FINISH AS CASEWORK.
12. ALL CASEWORK AND FREESTANDING UTILITY SHELVING SHALL BE SECURED TO ADJACENT WALLS.
13. ALL INTERSECTIONS BETWEEN FIXED CASEWORK AND ADJACENT SURFACES SUCH AS WALLS ARE TO BE FILLED SOLID WITH ACID-RESISTANT SEALANT.
14. COORDINATE DIMENSIONS OF CASEWORK WITH TABLE STRUCTURE TO ENSURE THAT THE CASEWORK ATTACHED TO TABLE FRAMES SHALL FIT.
15. FUME HOOD AND CONTROLS CONTRACTOR TO COORDINATE AND DOCUMENT ALL INTERFACES BETWEEN FUME HOODS AND CONTROLS.
16. FUME HOOD CONTRACTOR TO PROVIDE AND COORDINATE DUCT TRANSITION AND CONNECTION PIECE WITH MECHANICAL TRADES.

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issue:	date:
OWNER REVIEW	01-21-2022
100% OWNER REVIEW	06-29-2022
BID ISSUE	08-09-22
BID RE-ISSUE	12-16-22
BID RE-ISSUE	08-22-23

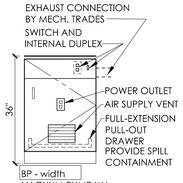
designed by:	LAC
drawn by:	RLB
coordination checked:	RLB
checked:	CTW
approved:	LAC

project:
Warren Police Department
Crime Lab

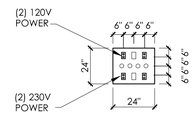
sheet title:
Laboratory Casework Schedules and Notes

project number: 1201-1
sheet number: Q1-01

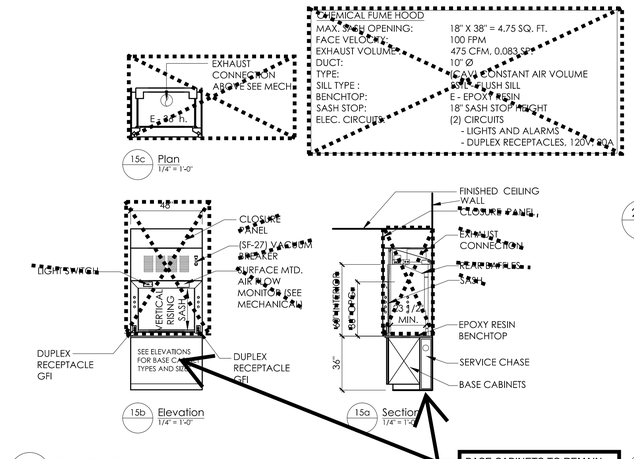
TABLE FRAME SUPPORTED WALL CABINETS



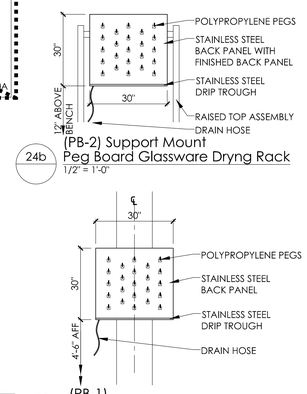
BP - width VACUUM PUMP W/ PULL-OUT DRAWER



16 (CSP-1) 2x4 Typ. Ceiling Service Panel
1/2" = 1'-0"

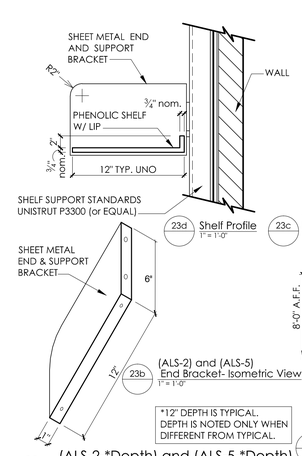


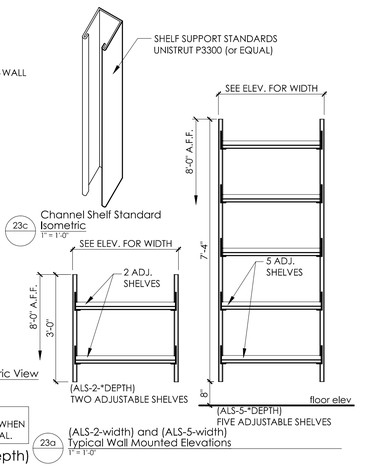
15 [TYP.] Chemical Fume Hood Details
1/4" = 1'-0"



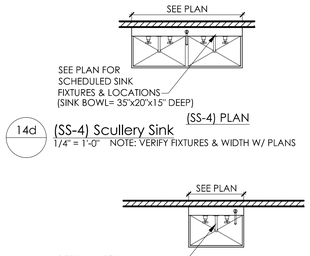
24b (PB-2) Support Mount Peg Board Glassware Dryng Rack
1/2" = 1'-0"

24 (PB-1) Peg Board Glassware Dryng Rack
1/2" = 1'-0"

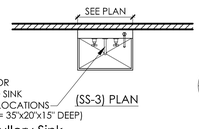




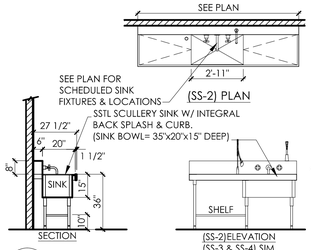
23 (ALS-2-*Depth) and (ALS-5-*Depth) Adjustable Shelving Details
1/2" = 1'-0"



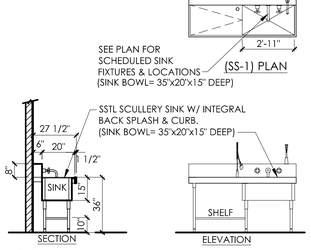
14d (SS-4) Scullery Sink
1/4" = 1'-0" NOTE: VERIFY FIXTURES & WIDTH W/ PLANS



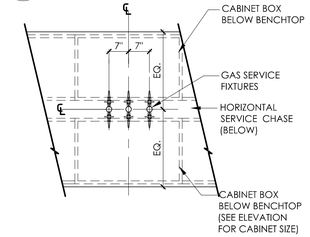
14c (SS-3) Scullery Sink
1/4" = 1'-0" NOTE: VERIFY FIXTURES & WIDTH W/ PLANS



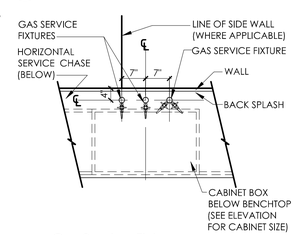
14b (SS-2) Scullery Sink
1/4" = 1'-0" NOTE: VERIFY FIXTURES & WIDTH W/ PLANS



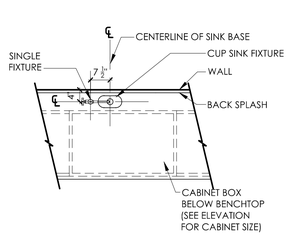
14a (SS-1) Scullery Sink
1/4" = 1'-0" NOTE: VERIFY FIXTURES & WIDTH W/ PLANS



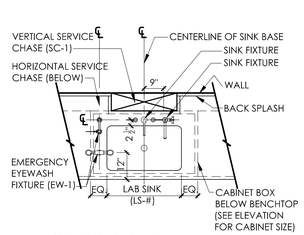
21 Double Gas Service Fixture Deck Mounting Detail
1/2" = 1'-0"



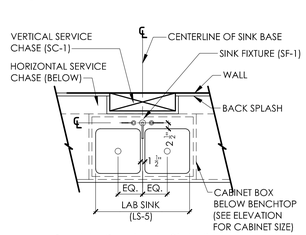
20 Gas Service Fixture Deck Mounting Detail
1/2" = 1'-0"



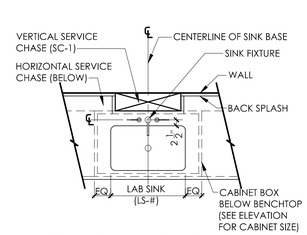
19 Cup Sink Fixture Mounting Detail
1/2" = 1'-0"



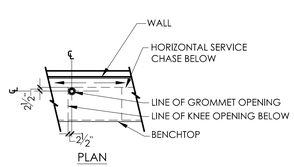
18 CW/RO/DI & EM Eyewash Lab Sink Fixture Mounting Detail
1/2" = 1'-0"



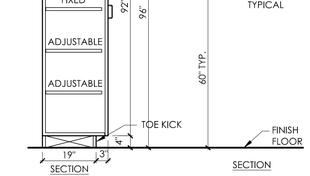
17 Double Bowl Lab Sink Fixture Mounting Detail
1/2" = 1'-0"



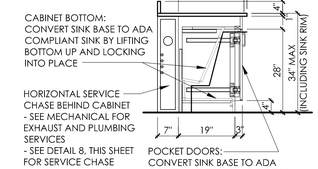
16 Single Bowl Lab Sink Fixture Mounting Detail
1/2" = 1'-0"



8 TYPICAL GROMMET LOCATION AT KNEE OPENING
1/4" = 1'-0"



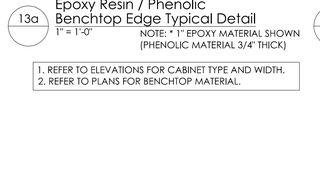
7 Typical Tall Cabinet
1/2" = 1'-0"



6 Typical Wall Cabinet
1/2" = 1'-0"

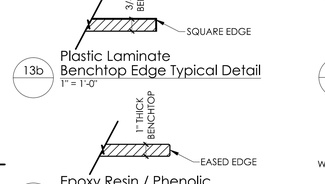
13c Benchtop Marine Edge Detail
1" = 1'-0"

12c (CO) Curbed Opening Typical Phenolic Benchtop Detail
1" = 1'-0"



13b Plastic Laminate Benchtop Edge Typical Detail
1" = 1'-0"

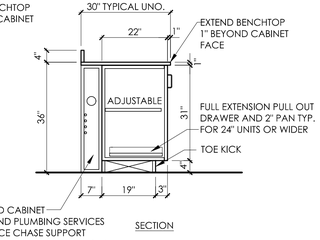
12b (CO) Curbed Opening Typical Epoxy Benchtop Detail
1" = 1'-0"



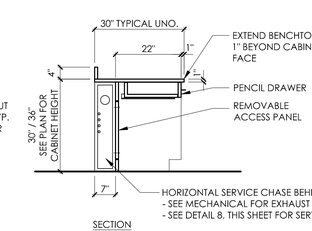
13a Epoxy Resin / Phenolic Benchtop Edge Typical Detail
1" = 1'-0"
NOTE: * 1" EPOXY MATERIAL SHOWN (PHENOLIC MATERIAL 3/4" THICK)

12a Typical Back and Side Splash Detail
1" = 1'-0"
NOTE: * 1" EPOXY MATERIAL SHOWN (PHENOLIC MATERIAL 3/4" THICK)

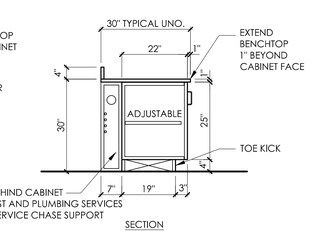
1. REFER TO ELEVATIONS FOR CABINET TYPE AND WIDTH.
2. REFER TO PLANS FOR BENCHTOP MATERIAL AND HEIGHT.



11 (ALS-#) Shelving and (B-#) Base Cabinet Section
1/4" = 1'-0"



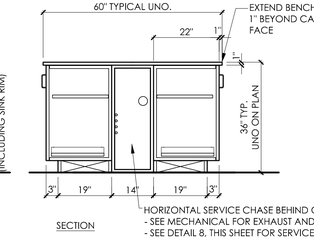
10 (BS-#) Sink Base Cabinet Section
1/4" = 1'-0"



9 (W-#) Wall Cabinet and (B-#) Base Cabinet Section
1/4" = 1'-0"

1. REFER TO ELEVATIONS FOR CABINET TYPE AND WIDTH.
2. REFER TO PLANS FOR BENCHTOP MATERIAL.

5 (BS-BF-width) Typical Barrier Free Sink Base Cabinet
1/2" = 1'-0"



4 Typical Island Detail
1/2" = 1'-0"

3 36" High Typical Base Cabinet
1/2" = 1'-0"

2 (K1D) Typical Knee Opening w/ Pencil Drawer
1/2" = 1'-0"

1 30" High Typical Base Cabinet
1/2" = 1'-0"

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issue:	date:
OWNER REVIEW	01-21-2022
100% OWNER REVIEW	06-29-2022
BID ISSUE	08-09-22
BID RE-ISSUE	12-16-22
BID RE-ISSUE	08-22-23

designed by:	LAC
drawn by:	RLB
coordination checked:	RLB
checked:	CTW
approved:	LAC

project:
Warren Police Department
Crime Lab

sheet title:
Laboratory Casework, Fixture and Accessory Details

project number: 1201-1

sheet number: Q1-02

Room Finish Material Legend

MATERIAL	MANUFACTURER	DESCRIPTION AND COLOR
FLOOR		
VB-1	ARMSTRONG	STYLE: 4" VINYL COVE BASE SIZE: 4" COLOR: 02 IRON
ADD ALT NO. 2 RT-1	NORA	STYLE: NORAPLAN SENTICA SIZE: SHEET COLOR: FROST BITE 6524
VCS-1	ARMSTRONG	STYLE: MEDINTECH SIZE: SHEET COLOR: 84197 SILVER GRAY
WALL		
PNT-1	SHERWIN WILLIAMS	EPOXY PAINT IN LAB AREAS. COLOR: AMAZING GRAY SW7044 FINISH: EGGSHELL
PNT-2	SHERWIN WILLIAMS	ALKYD PAINT DOOR AND FRAME COLOR: TO MATCH EXISTING FINISH: SATIN
CEILING		
ACT-1	ARMSTRONG	STYLE: ULTIMA HEALTH ZONE COLOR: WHITE. GRID: WHITE IN LAB AREAS

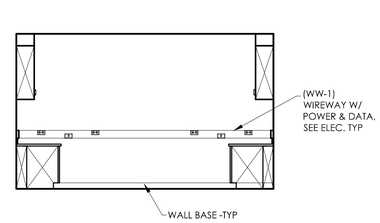
Room Finish Schedule

ROOM NO.	ROOM NAME	FLOOR	BASE	WALLS				CEILING		REMARKS
				NORTH	EAST	SOUTH	WEST	FIN.	HGT.	
Ground Floor										
2040	EVIDENCE LAB	VCS-1	VB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1	8'-8"	FLOORING ADD ALTERNATE NO. 2: RT-1
2040A	EVIDENCE LAB	VCS-1	VB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1	8'-8"	FLOORING ADD ALTERNATE NO. 2: RT-1
2040B	EVIDENCE LAB OFFICES	VCS-1	VB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-2	8'-8"	FLOORING ADD ALTERNATE NO. 2: RT-1

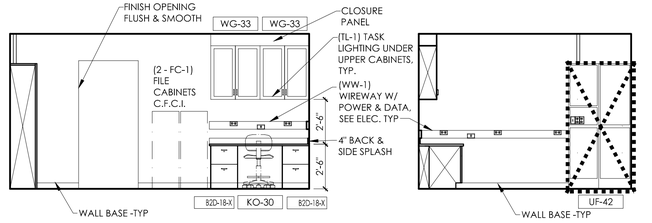
Room Finish Remarks

NOTE: CONTRACTOR IS TO COMPLETE A MOCK UP OF THE WALL AND DOOR FRAME PAINT COLORS FOR THE OWNER AND ARCHITECT'S APPROVAL BEFORE PROCEEDING WITH THE PAINT FOR THE ENTIRE PROJECT.

NOTE:
ALL EXISTING SLABS AND BEAMS ARE INTERNALLY REINFORCED WITH DRAPED POST-TENSIONED TENDONS. NON-DESTRUCTIVE DETECTION TECHNOLOGY MUST BE UTILIZED TO LOCATE TENDONS. NO DRILLING, CORING, OR CUTTING OF ANY KIND IS PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER. SEE NOTES ON S-001 FOR ADDITIONAL INFORMATION.

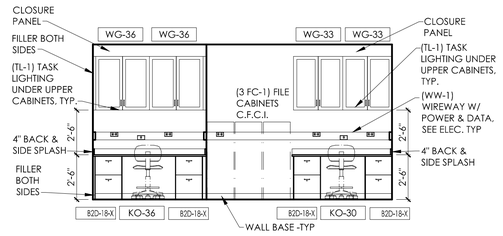


13 A-100 Lab Office Elevation
Scale: 1/4"=1'-0"

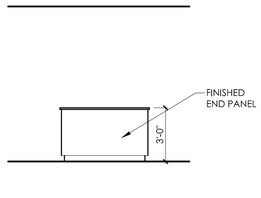


12 A-100 Lab Office Elevation
Scale: 1/4"=1'-0"

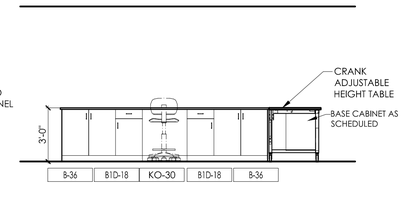
11 A-100 Lab Office Elevation
Scale: 1/4"=1'-0"



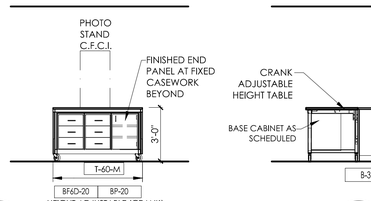
10 A-100 Lab Office Elevation
Scale: 1/4"=1'-0"



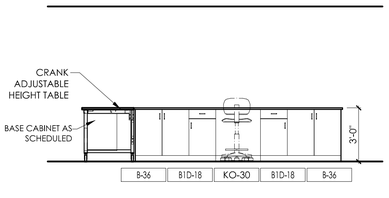
9 A-100 Lab Island Elevation
Scale: 1/4"=1'-0"



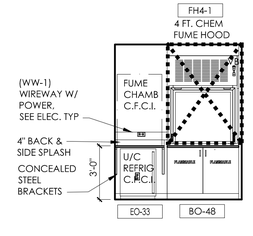
8 A-100 Lab Island Elevation
Scale: 1/4"=1'-0"



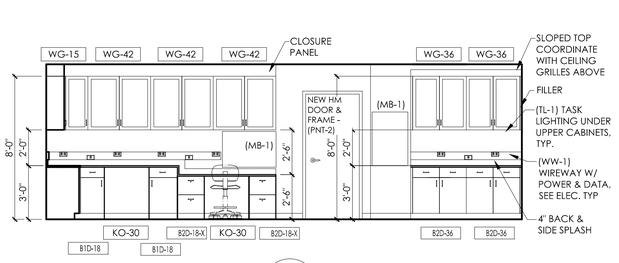
7 A-100 Lab Island Elevation
Scale: 1/4"=1'-0"



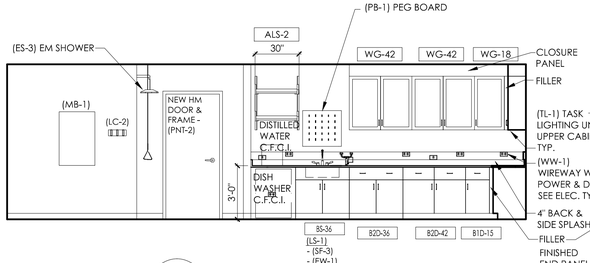
6 A-100 Lab Island Elevation
Scale: 1/4"=1'-0"



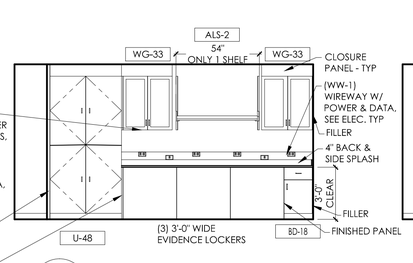
5 A-100 Lab North Elevation
Scale: 1/4"=1'-0"



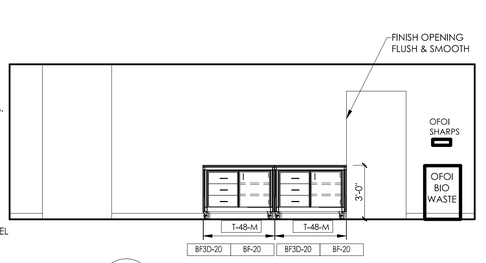
4 A-100 Lab South Elevation
Scale: 1/4"=1'-0"



3 A-100 Lab East Elevation
Scale: 1/4"=1'-0"



2 A-100 Lab North Elevation
Scale: 1/4"=1'-0"



1 A-100 Lab West Elevation
Scale: 1/4"=1'-0"

WARREN

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OWNER REVIEW	01-21-2022
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BID ISSUE	08-09-22
BID RE-ISSUE	12-16-22
BID RE-ISSUE	08-22-23

designed by:	LAC
drawn by:	RLB
coordination checked:	RLB
checked:	CTW
approved:	LAC

project:
Warren Police Department
Crime Lab

sheet title:
Laboratory Elevations

project number: 1201-1

sheet number: Q2-00