BID FOR

2022 DOWNTOWN SAFETY BARRICADES PHASE 2 INSTALLATION

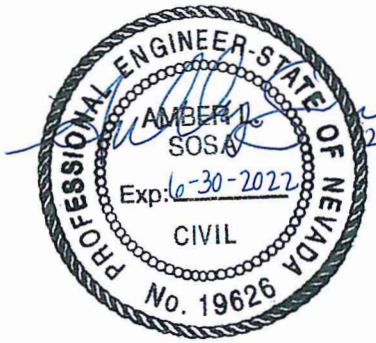
BID # 21/22-010

PWP # WA-2022-206

BIDS DUE NOT LATER THAN: 1:45 PM ON MARCH 2, 2022

PUBLIC BID OPENING: 2:00 PM ON MARCH 2, 2022

[NOTE: TIME BIDS ARE DUE IS DIFFERENT FROM BID OPENING TIME]



431 PRATER WAY
P.O. BOX 857
SPARKS, NV 89432-0857

Company Name: _____

CITY OF SPARKS
NOTICE TO BIDDERS
2022 DOWNTOWN SAFETY BARRICADES
PHASE 2 INSTALLATION
BID # 21/22-010 / PWP # WA-2022-206

NOTICE IS HEREBY GIVEN that the City of Sparks, Nevada, will receive written sealed bids only, for the project listed above. Said bids must be in the hands of the Contracts and Risk Manager at 431 Prater Way, Sparks, Nevada, NO LATER THAN **1:45 PM ON MARCH 2, 2022.** Bids postmarked prior to, but not received until after this deadline will not be accepted. Vendor bid response submittals may not be sent to the City of Sparks via the Internet/e-mail and will not be entertained for award by the City of Sparks. The right is reserved to reject any Bid/Proposal or to accept the Bid/Proposal which is deemed by the City of Sparks to be in the best interest of the City of Sparks. The City of Sparks reserves the right to waive any irregularities and/or informalities in the bid process.

All Bids are to be marked clearly on the outside. Due to the City's response to the COVID-19 virus and associated reduction in staff, in-person staff availability is limited. Bidders wishing to physically deliver their bids on the bid due date shall note that the Purchasing Office will receive bids in the lobby of City Hall beginning at 1PM on March 2nd. Bids are due no later than 1:45PM. Bids may also be delivered to the Purchasing Department physical dropbox/mailbox, also located in the lobby of City Hall.

Bids will be opened and publicly read at **2:00 PM ON MARCH 2, 20222**, at Sparks City Hall, 431 Prater Way Sparks, NV 89431. Due to social distancing concerns specific to the COVID-19 situation, the bid opening will be available to all interested parties via Zoom video/audio conferencing. Meeting # 880 0512 1712. Meeting Passcode: 139737 with a direct link of:
https://us02web.zoom.us/j/88005121712?pwd=TTBNMmZIVTFHNk5RaXpWOW5hM0R3QT09

PROJECT DESCRIPTION: Installation of high security barricades and bollards to be provided by the City, removal and replacement of PCC colored sidewalk improvements, and traffic control on City streets identified within the bid documents.

PRE-BID MEETING: There will be a **NON-MANDATORY** pre-bid meeting held at 9AM on February 23, 2022 at the job site. Interested bidders should meet at the intersection of Victorian Plaza Circle (old 14th St.) and Victorian Avenue.

BONDING/LICENSING: A Bid Bond in the amount of 5% of bid amount is required. This bid bond will function as a penalty in the event the successful bidder fails to enter into a written contract with the City in accordance with the bid documents. Additionally, the City will be entitled to actual damages, if any. Prospective bidders will be required to have a current Contractor's License under the Nevada State Law for the type of work specified herein.

The work to be performed under this Contract shall be commenced by the successful Bidder after all executed Contract documents have been submitted, and after being notified to proceed by the City of Sparks.

Bid documents and specifications may be obtained from the City of Sparks website. Please visit http://www.cityofsparks.us/bids to obtain complete bid documents. There is no cost to use the system or obtain plans, but registration at the site is required. It is the responsibility of all potential bidders/responders to monitor the Purchasing Division's website for any changing information prior to submitting their bid/proposal. The City of Sparks will not be responsible for the timeliness or completeness of information provided by any 3rd party bid listing or re-selling service. For further information, contact the Purchasing Division at dmarran@cityofsparks.us

or at (775) 353-2273. The individual responsible for coordinating this bid is: Dan Marran, CPPO, C.P.M. – Contracts and Risk Manager

Reno Gazette Journal Legal Notices Section
Publish Date: February 16, 2022
Proof of publication required

Bidder's Checklist

Bidders are instructed to complete and return the following forms in order for their bids to be complete. Failure to return the following items may result in your bid being declared "non-responsive."

1. _____ Bid Item Schedule
2. _____ Bidder Information Sheets
3. _____ Subcontractor Information Form (5% list due with bid submittal)
4. _____ Acknowledgement and Execution Form
5. _____ Certification Regarding Debarment
6. _____ "Certificate of Eligibility" (Local Preference) - If bid exceeds $250,000 and Contractor wishes to potentially apply their preference.
7. _____ Bid Bond
8. _____ Signed Bid Addenda (if applicable)

CITY OF SPARKS
BID ITEM SCHEDULE

BID TITLE: 2022 DOWNTOWN SAFETY BARRICADES – PHASE 2 INSTALLATION

BID #21/22-010 / PWP#WA-2022-206

PRICES must be valid for 90 calendar days after the bid opening.

COMPLETION of this project is expected **PURSUANT TO CONTRACT DOCUMENTS**.

BIDDER acknowledges receipt of _____ Addenda.

_____ _____
Bidder Name (signature)

Refer to Special Technical Section for a map depicting the street locations and plan sheets provided

Item No.	Quantity	Unit	Description	Unit Price	Total Price
1	1	LS	Remove Existing and Construct Colored PCC Foundation with Transition, including Installation of High Security Shallow Mount Barricade System - Manual, complete and in place.	$ _____ /LS	$ _____
2	1	LS	Remove Existing and Construct Colored PCC Foundation with Transition, including Installation of High Security Shallow Mount Barricade System - Hydraulic, complete and in place.	$ _____ /LS	$ _____
3	1	LS	Install Schedule 40 PVC Sleeves, complete and in place.	$ _____ /LS	$ _____
4	4	EA	Remove Existing and Construct PCC Foundation for High Security Removable Bollard, complete and in place.	$ _____ /EA	$ _____
5	15	EA	Remove Existing and Construct PCC Foundation including Installation of High Security Fixed Bollard, complete and in place.	$ _____ /EA	$ _____
6	1,616	SF	Remove Existing and Construct Colored PCC Sidewalk, complete and in place.	$ _____ /SF	$ _____
7	100	LF	Remove Existing and Construct Colored PCC Curb – Match Existing, complete and in place.	$ _____ /LF	$ _____

8	345	SF	Remove Existing and Construct Eight Inch (8”) Thick, PCC Pad, complete and in place.	$ _____ /SF	$ _____
9	330	SF	Remove Existing and Construct Eight Inch (8”) Thick, Colored PCC Pad, complete and in place.	$ _____ /SF	$ _____
10	225	SF	Remove Existing and Construct Colored PCC Median Island Commercial Driveway, complete and in place.	$ _____ /SF	$ _____
11	276	SF	Remove Existing and Construct Colored PCC ADA Accessible Ramp, complete and in place	$ _____ /SF	$ _____
12	1	EA	Install Arrow, (Thermoplastic), complete and in place.	$ _____ /EA	$ _____
13	26	LF	Install 24” Stop Bar (Thermoplastic), complete and in place	$ _____ /LF	$ _____
14	1	LS	Provide Traffic Control, complete and in place.	$ _____ /LS	$ _____
15	1	LS	Force Account	$ 30,000.00	$ 30,000.00

Total Price for 2022 DOWNTOWN SAFETY BARRICADES – PHASE 2 INSTALLATION **$_____** **(written total bid price)**	$ _____

Bidder Information

COMPANY INFORMATION:

Company Name:
Contact Name:
Address:
City:
State / Zip Code:
Telephone Number including area code:
Fax Number including area code:
E-mail:

COMPANY BACKGROUND

1) Has your company ever failed to complete any contracts awarded to it? No___ Yes___ (If yes, please provide details.)

2) Has your company filed any arbitration request or law suits on contracts awarded within the last five years? No___ Yes___ (If yes, please provide details.)

3) Does your company now have any legal suits or arbitration claims pending or outstanding against it or any officers relating to the performance of a public contract? No___ Yes___ (If yes, please provide details.)

4) Does your company now employ any officers or principals who were with another firm when that company failed to complete a contract within the last five years? No___ Yes___ (If yes, please provide details.)

5) Has your company had a contract partially or completely terminated for default (cause) within the past five years? No___ Yes___ (If yes, please provide details.

6) Has your company been found non-responsible on a government bid within the last five years? No___ Yes___ (If yes, please provide details.)

Bidder Information

CONTRACTOR LICENSE INFORMATION:

Nevada State Contractor's License Number (If Applicable):
License Classification(s):
Limitation(s) of License:
Date Issued:
Date of Expiration:
Name of Licensee:
City, State, Zip Code of Licensee:
Telephone Number of Licensee:

BUSINESS LICENSING INFORMATION All vendors doing business within the City of Sparks are required to obtain and maintain a current business license from the City of Sparks prior to commencement of work (Sparks Municipal Code Section 5.08.020A). Vendor(s) awarded a contract resulting from this bid shall be required to obtain a current business license if they do not already hold one.

City of Sparks Business License Number:
Date Issued:
Date of Expiration:
Name of Licensee:
City, State, Zip Code of Licensee:
Telephone Number of Licensee:
Taxpayer Identification Number:

Bidder Information

DISCLOSURE OF PRINCIPALS:

a) **Individual and/or Partnership:**

Owner 1) Name:
Address:
City, State, Zip Code:
Telephone Number:
Owner 2) Name:
Address:
City, State, Zip Code:
Telephone Number:
Other 1) Title:
Name
Other 2) Title:
Name:

b) **Corporation:**

State in which Company is Incorporated:
Date Incorporated:
Name of Corporation:
Address
City, State, Zip Code:
Telephone Number:
President's Name:
Vice-President's Name:
Other 1) Name:
Title:

Awarded Contract Information

If your company is determined to be the awardee of the contract for this scope of work, the contract form for the work will be routed via electronic means. Therefore, please identify the authorized individual that will be signing the resulting contract. Presumably this will be the company owner or corporate officer authorized to bind the company for future work.

COMPANY INFORMATION:

Company Name:
Authorized Name:
Title:
Individual E-Mail Address:
Telephone Number including area code:
Mailing Address:

SUBCONTRACTOR DETAIL
SUBCONTRACTORS EXCEEDING FIVE PERCENT OF BID AMOUNT

INSTRUCTIONS: Per NRS 338.141, Bidder submits the following names of First-Tier Subcontractors who will provide to Bidder labor or a portion of the Work or improvements for which Subcontractor will be paid an amount exceeding five percent (5%) of the Bid Price. The Bidder shall list the name of a Subcontractor for each portion of the Work, the value of which exceeds five percent (5%) of the Bid Price. **If Bidder will perform more than 5% of the Work, BIDDER SHALL ALSO LIST HIS NAME and description of the work that the prime contractor will perform in the space provided below.**

Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description of Work:		

Bidder Name: _____ **Authorized Signature:** _____

SUBCONTRACTOR DETAIL
SUBCONTRACTORS EXCEEDING ONE PERCENT OF BID AMOUNT OR $50,000

INSTRUCTIONS: In compliance with NRS 338.141, Bidder submits the following names of First-Tier Subcontractors who will provide to Bidder labor or a portion of the Work or improvements for which Subcontractor will be paid an amount exceeding one percent (1%) of the Bid or $50,000, whichever is greater.

Since all Subcontractors listed on the Bidder's 5% Subcontractor Information Form are over 1% of the Bid amount, those Subcontractors shall automatically be deemed incorporated into this 1% Subcontractor Information form and need not be re-listed below.

Information provided must be submitted within two (2) hours after the completion of the opening of the bids (Per NRS 338.141). Bidder shall enter "**NONE**" under "**Name of Subcontractor**" if not utilizing subcontractors exceeding this amount. This form must be complete in all respects. If, additional space is needed, attach a separate page. The bidder may elect to submit this information with the bid proposal and, in that case, the bidder will be considered as having submitted this information within the above two hours.

Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description of Work:		
Name of Subcontractor	Address	
Phone	Nevada Contractor License #	Limit of License
Description of Work:		

Bidder Name: _____ **Authorized Signature:** _____

CITY OF SPARKS ACKNOWLEDGMENT AND EXECUTION:

STATE OF _____)
) SS
County of _____)

_____ (Name of Principal) being first duly sworn, deposes and says: That he/she is the Bidder, or authorized agent of the Bidder for whom the aforesaid described work is to be performed by; that he/she has read the Plans, Specifications, and related documents including but not limited to, any addenda issued and understands the terms, conditions, and requirements thereof; that if his/her bid is accepted that he/she agrees to furnish and deliver all materials except those specified to be furnished by the City of Sparks (Owner) and to do and perform all work for the **2022 DOWNTOWN SAFETY BARRICADES-PHASE 2 INSTALLATION,** Bid # **21/22-010,** together with incidental items necessary to complete the work to be constructed and/or services to be provided in accordance with the Specifications, Plans, and Contract Documents annexed hereto.

TO THE CONTRACTS AND RISK MANAGER OF THE CITY OF SPARKS:
The undersigned, as Bidder, declares that the only persons or parties interested in this proposal, as principals, are those named herein, the Bidder is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid: that this proposal is made without collusion with any other person, firm or corporation; that he/she has carefully examined the location of the proposed work; the proposed form of Contract, the Contract Provisions, Plans, Specifications and Contract Documents incorporated therein referred to and made part thereof; that he/she proposes and agrees if this proposal is accepted, that he/she will contract with the City of Sparks in the form of the Contract prescribed, to provide all necessary machinery, tools, apparatus and other means of construction, and to do all the work and furnish all the materials specified in the Contract and annexed Contract Provisions, Plans and Specifications, in the manner and time prescribed and according to the requirements of the Project Representative as therein set forth, it being understood and agreed that the quantities shown herein are approximate only and are subject to increase or decrease, and that he/she will accept, in full, payment therefore the indicated prices.

Contractor/Bidder:

(Printed Name of Contractor/Bidder) BY:

Firm:

Address:

City:

State / Zip Code:

Telephone Number:

Fax Number:

E-mail Address:

(Signature of Principal) Signature:

DATED this day of , 2022.

State of Nevada)
) SS.
County of _____)

On this day of , in the year 2022, before me,

/Notary Public, personally appeared Personally known to me (or proved

to me on the basis of satisfactory evidence) to be the person whose name is subscribed to this instrument, and acknowledged that he (she) executed it. WITNESS my hand and official seal.

Notary's Signature: My commission Expires:

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBIILTY MATTERS
(This form to be signed and returned at the time of bid)

The prospective bidder, _____ certifies to the best of its knowledge and belief that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. Any exceptions provided will not necessarily result in denial of award, but will be considered in determining bidder responsibility and whether or not the City will enter into contract with the party. For any exception noted, indicate on an attached sheet to whom it applies, initiating agency, and dates of action. Providing false information may result in criminal prosecution or administrative sanctions.

_____

Typed Name & Title of Authorized Representative

_____

Signature of Authorized Representative Date

I am unable to certify to the above statement. My explanation is attached.

Signature_____Date_____

Local Preference Affidavit

***NEW Instructions*:** This form is required to receive a preference in bidding on projects exceeding $250,000. This form must be submitted no later than two (2) hours following the opening of bids, only if the bidder wishes for their preferential status(established by their current Certificate of Eligibility) to be considered in the evaluation of bids. A copy of the bidder's Certificate of Eligibility must be submitted at the time the contractor submits their bid.

I, _____, on behalf of the Contractor, _____, swear and affirm that in order to be in compliance with NRS 338.0117 and be eligible to receive a preference in bidding **2022 DOWNTOWN SAFETY BARRICADES-PHASE 2 INSTALLATION (Bid #21/22-010**) certify that the following requirement will be adhered to, documented and attained on completion of the contract. Upon submission of this affidavit on behalf of _____, I recognize and accept that failure to comply with any requirements is a material breach of the contract and entitles the City to damages. In addition, the Contractor may lose their preference designation and/or lose their ability to bid on public works for a period of time, pursuant to NRS 338:

1. The Contractor shall ensure at least 50 percent of workers employed on the public work possess a Nevada driver's license or identification card;

2. The Contractor shall ensure all vehicles used primarily for the public work will be registered and (where applicable) partially apportioned to Nevada;

3. The Contractor shall ensure payroll records related to this project are maintained and available within the State of Nevada.

These requirements are not applicable to Contractors who do not use the "Bidder's Preference" eligibility certificate in their bid or do not receive an advantage in ranking of bids due to their preference status.

By:_____ Title:_____

Signature:_____ Date:_____

Signed and sworn to (or affirmed) before me on this _____ day of _____, 20_____, by_____ (name of person making statement).

State of _____)
)ss.
County of _____)

_____ STAMP AND SEAL
Notary Signature

CITY OF SPARKS, NEVADA – 5% Bid Bond

KNOW ALL MEN BY THESE PRESENTS: That we the undersigned _____, as "Principal," and _____, as "Surety," are hereby held and firmly bound unto the City of Sparks, Nevada, as "Obligee," in the penal sum of _____dollars ($_____) for the payment of which, well and truly to be made, the Principal and Surety bind themselves, their heirs, executors, and administrators, successors and assigns, jointly and severally, by this instrument. The condition of the obligation of this bid bond is as follows:

WHEREAS, NRS 332.105 authorizes local governments to require bid bonds to insure execution and proper performance of the Contract and the Bonding Company has an "A" or better rating with Moody's or A.M. Best and T-Listed with the U.S. Treasury Department;

AND, WHEREAS, the Principal has submitted a bid for Bid # **21/22-010**, PWP # **WA-2022-206**, for the **2022 DOWNTOWN SAFETY BARRICADES-PHASE 2 INSTALLATION**.

NOW, THEREFORE,

(a) If said Bid shall be rejected; or

(b) If said Bid shall be accepted and the Principal shall execute and deliver the contract in the bid documents ("Contract") to Obligee in accordance with the terms of the bid documents, and give such bond or bonds as may be specified in the bid or contract documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or

(c) If the Principal shall pay to the Obligee the full amount of the bid bond as a penalty irrespective of the Obligee's actual damages in the event of the failure of the Principal to enter into such Contract and give such bond or bonds,

then, this obligation shall be null and void. Otherwise it shall remain in full force and effect, it being expressly understood and agreed that the liability of the Surety (but not of the Principal) for any and all claims hereunder shall, in no event, exceed the penal amount of the obligation as herein stated.

The Surety, for the consideration for which this bond was executed, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Obligee may accept such bid, and hereby waives notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and the Surety has caused their seal to be hereto affixed and these present to be signed by their proper officers.

Signed, Sealed and dated: _____

_____
Principal
By: _____

_____
Surety
By: _____

GENERAL CONDITIONS

GENERAL CONDITIONS

Please Read Carefully
These Provisions Are a Part of Your Bid and any Contract Awarded

Scope of Bid/Proposal: Bids/Proposals are hereby requested for **2022 DOWNTOWN SAFETY BARRICADES-PHASE 2 INSTALLATION**, as per specifications herein.

The bidder agrees that:

A. Bidder has carefully examined the specifications, and all provisions relating to the item(s) to be furnished or the work to be done; understands the meaning, intent, and requirements; and

B. Bidder will enter into a written contract and furnish the item(s) or complete the work in the time specified, and in strict conformity with the City of Sparks specifications for the prices quoted.

Note: Bidder is defined as any individual, partnership, or corporation submitting a bid, proposal, or quotation in response to a request for bid (RFB), request for proposal (RFP), request for information (RFI) or request for quotation (RFQ). A bidder may also be referred to as a bidder, contractor, supplier or vendor.

The use of the title "Bidder:, "Vendor", "Contractor" or "Consultant" within this solicitation document and any resulting contract shall be deemed interchangeable and shall refer to the person or entity with whom the City of Sparks is soliciting and/or contracting for the service or product referenced within the bid document.

1. Prices:
All prices and notations must be in ink or typewritten. Mistakes may be crossed out and corrections typed or written with ink adjacent to the error. Bids shall indicate the unit price extended to indicate the total price for each item bid. Any difference between the unit price correctly extended and the total price shown for all items bid shall be resolved in favor of the unit prices. Bidders are encouraged to review all prices prior to bid submittal, as withdrawal or correction may not be permitted after the bid has been opened.

2. Firm Prices:
Prices on bid shall be firm prices not subject to escalation unless otherwise provided for in the specifications. In the event the specifications provide for escalation, the maximum limit shall be shown, or the bid shall not be considered. In the event of a decline in market price below a price bid, the City of Sparks shall receive the benefit of such decline.

3. Items Offered:
If the item offered by the bidder has a trade name, brand and/or catalog number, such shall be stated in the bid. If the bidder proposes to furnish an item of a manufacturer or vendor other than that mentioned on the face hereof, bidder must specify maker, brand, quality, catalog number, or other trade designation. Unless such is noted on the bid form, it will be deemed that the item offered is that designated even though the bid may state "or equal".

4. Brand Names:
Whenever reference to a specific brand name is made by the City, it is intended to describe a component that has been determined to best meet operational, performance, or reliability standards of the City, thereby incorporating these standards by reference within the specifications. These specifications are not meant to limit the vendor; they are guidelines to minimum qualifications. The bidder shall indicate their compliance or non-compliance for each line of the specification. Any deviations from the specifications or where submitted literature does not fully support the meaning of the specifications must be clearly cited in writing by the bidder.

An equivalent ("or equal") may be offered by the bidder, subject to evaluation and acceptance by the City. It is the bidder's responsibility to provide, at bidder's expense, samples, test data, or other documentation the City may require to fully evaluate and determine acceptability of an offered substitute. The City reserves the sole right to reject a substituted component that will not meet or exceed City standards.

5. **Samples:**
Samples may be required for bid evaluation and testing purposes. Bidders shall agree to provide samples upon request and at no additional cost to the City.

6. **Withdrawal of Bids:**
Bids may be withdrawn by written or facsimile notice received prior to the exact hour and date specified for receipt of bid. A bid may also be withdrawn in person by a bidder, or bidder's authorized representative, prior to the exact hour and date set for receipt of bids. Telephone withdrawals are not permitted.

7. **Late Bids, Modifications, or Withdrawals:**
Bids, modifications of bids, or bid withdrawals received after the exact time and date specified for receipt will not be considered.

8. **Mistake in Bid:**
   (a) If the bidder discovers a mistake in bid prior to the hour and date specified for receipt of bid, bidder may correct the mistake by withdrawing the bid in accordance with Item 7 above and resubmit prior to the stated bid deadline.
   (b) If within seventy-two hours of the bid closing and prior to the issuance of a purchase order or a contract, the apparent low bidder discovers a mistake in bid of a serious and significant nature, bidder may request consideration be given to withdrawing the bid. The mistake must be evident and provable. The right is reserved by the City to reject any and all requests for withdrawal of bids. The decision of the Purchasing Manager is final as regards acceptance or rejection of requests for withdrawal after closing of bids.
   (c) A mistake in bid cannot be considered once a purchase order or contract is issued.

9. **Signature:**
All bids shall be signed and the title and firm name indicated. A bid by a corporation shall be signed by an authorized officer, employee or agent with his or her title.

10. **Exceptions:**
A bidder deviating from specifications must specify any and all deviation(s). Failure to note said exceptions shall be interpreted to convey that the bidder shall propose to perform in the manner described and/or specified in this bid solicitation. If exception(s) are taken or alternatives offered, complete descriptions must be shown separately.

11. **Confidential Information:**
Any information deemed confidential or proprietary should be clearly identified by the bidder as such. It may then be protected and treated with confidentiality only to the extent permitted by state law. Otherwise the information shall be considered a public record. Information or data submitted with a bid will not be returned.

12. **Quality:**
Unless otherwise required in the specifications, all goods furnished shall be new and unused.

13. Litigation Warranty:

The bidder, by bidding, warrants that bidder is not currently involved in litigation or arbitration concerning the materials or bidder's performance concerning the same or similar material or service to be supplied pursuant to this contract of specification, and that no judgments or awards have been made against bidder on the basis of bidder's performance in supplying or installing the same or similar material or service, unless such fact is disclosed to the City in the bid. Disclosure may not disqualify the bidder. The City reserves the right to evaluate bids on the basis of the facts surrounding such litigation or arbitration and to require bidder to furnish the City with a surety bond executed by a surety company authorized to do business in the State of Nevada and approved by The City of Sparks in a sum equal to one hundred percent (100%) of the contract price conditional on the faithful performance by bidder of the contract in the event the bid is awarded to bidder, notwithstanding the litigation or arbitration.

14. Royalties, Licenses and Patents:

Unless otherwise specified, the bidder shall pay all royalties, license and patent fees. The bidder warrants that the materials to be supplied do not infringe any patent, trademark or copyright and further agrees to defend any and all suits, actions and claims for infringement that are brought against the City, and to defend, indemnify and hold harmless the City from all loss or damages, whether general, exemplary or punitive, as a result of any actual or claimed infringement asserted against the City, the bidder or those furnishing material to bidder pursuant to this contract.

15. Performance Standards:

Performance of work and acceptability of equipment or materials supplied pursuant to any contract or award shall be to the satisfaction and full discretion of the City.

16. Americans with Disabilities Act (ADA) Standards:

Bidders shall be required to comply with current ADA Standards in preparing their bids and executing work required under any contract resulting from this bid. Completed work must comply with current ADA Standards.

17. Warranties:

(a) Unless otherwise specified, all workmanship, material, labor or equipment provided under the contract shall be warranted by bidder and/or manufacturer for a minimum of twelve (12) months after acceptance by City. Greater warranty protection will be accepted. Lesser warranty protection must be indicated by bidder on the bid proposal as an exception.

(b) Bidder shall be considered primarily responsible to the City for all warranty service, parts and labor applicable to the goods or equipment provided by bidder under this bid or award, irrespective of whether bidder is an agent, broker, fabricator or manufacturer's dealer. Bidder shall be responsible for ensuring that warranty work is performed at a local agency or facility convenient to City and that services, parts and labor are available and provided to meet City's schedules and deadlines. If required and defined within the Scope of Work, the Bidder will post a performance bond after contract award to guarantee performance of these obligations. Bidder may establish a service contract with a local agency satisfactory to City to meet this obligation if bidder does not ordinarily provide warranty service.

18. Addenda:

The effect of all addenda to the bid documents shall be considered in the bid, and said addenda shall be made part of the bid documents and shall be returned with them. Before submitting a bid, each bidder shall ascertain

whether or not any addenda have been issued, and failure to acknowledge any such addenda may render the bid invalid and result in its rejection.

All potential bidders are responsible for monitoring the City website regarding the availability of new bid documents or addenda (where applicable). The City of Sparks will not be responsible for the results of any potential failures in automatic notification systems to potential bidders or plan holders with respect to these documents and will not adjust bid schedules or requirements due to any potential failures of those systems. It is the responsibility of all potential bidders/responders to monitor the Purchasing Division's website for any changing information prior to submitting their bid/proposal. The City of Sparks will not be responsible for the timeliness or completeness of information provided by any 3rd party bid listing or re-selling service.

19. Specifications to Prevail:

The detailed requirements of the Specifications, Scope of Work or Special Conditions shall supersede any conflicting reference in these General Conditions or the stated language on the City of Sparks Standard Purchase Order that are in conflict therewith.

20. Taxes:

The City is exempt from State, City and County Sales Taxes per NRS 372.325. The City will furnish Exemption Certificates for Federal Excise Tax when applicable. The successful bidder shall pay all taxes, levies, duties and assessments of every nature, which may be applicable to any work or materials under this Contract. The Contract Sum and any agreed variations thereof shall include all taxes imposed by law. The successful bidder shall make any and all payroll deductions required by law. The successful bidder herein indemnifies and holds the City harmless from any liability on account of any and all such taxes, levies, duties, assessments and deductions.

21. Prevailing Wages:

Bidder is responsible for complying with all applicable local, State and Federal wage laws, whether or not specifically cited in this bid document.

Per NRS Sections 338.020 through 338.090, certain projects defined as "public works" require the payment of the prevailing wage as determined by the Labor Commissioner. Generally speaking, projects/contracts for construction of a public work valued at less than $100,000 are exempt from the prevailing wage requirement (NRS 338.080). Bidder shall be fully aware of the prevailing wage requirements of the State of Nevada as detailed in NRS Chapter 338 and price their bid response accordingly. Further information concerning Prevailing Wage rates can be found at:
http://labor.nv.gov/PrevailingWage/Public_Works/Prevailing_Wages/

Federal "Davis Bacon" wages may be applicable if the funding for the project includes Federal funds. These requirements are detailed in the "Special Conditions – Federal Requirements" section that will be included in this bid document when such conditions apply. Contractor shall compare the applicable wage rate for each classification used on the project and pay the higher of the two rates (Nevada State Prevailing Wage or Davis Bacon Wage) in each case.

22. Apprenticeship Utilization Act (This Section ☒ IS ☐ IS NOT Applicable to this bid):

Senate Bill 207 (Apprenticeship Utilization Act) passed during the 2019 Legislative Session added sections 338.0116 and 338.01165 to the NRS. These new provisions apply to bids for public works where the value exceeds $100,000.00. In passing SB 207, The Legislature hereby finds and declares that: (1) A skilled workforce in construction is essential to the economic well-being of the State: (2) Apprenticeship programs are a proven method of training a skilled workforce in construction; and (3) Requiring the use of apprentices on the construction of public works will ensure the availability of a skilled workforce in construction in the future for this State

A contractor or subcontractor engaged in **horizontal construction** who employs a worker on a public work pursuant to NRS 338.040 shall use one or more apprentices for at least 3 percent of the total hours of labor worked for each apprenticed craft or type of work to be performed on the public work for which more than three workers are employed.

"Horizontal Construction" " means any construction, alteration, repair, renovation, demolition or remodeling necessary to complete a public work, including, without limitation, any irrigation, drainage, water supply, flood control, harbor, railroad, highway, tunnel, airport or airway, sewer, sewage disposal plant or water treatment facility and any ancillary vertical components thereof, bridge, inland waterway, pipeline for the transmission of petroleum or any other liquid or gaseous substance, pier, and any other work incidental thereto. The term does not include vertical construction, the construction of any terminal or other building of an airport or airway, or the construction of any other building.

A contractor or subcontractor engaged in **vertical construction** who employs a worker on a public work pursuant to NRS 338.040 shall use one or more apprentices for at least 10 percent of the total hours of labor worked for each apprenticed craft or type of work to be performed on the public work for which more than three workers are employed.

"Vertical Construction" means any construction, alteration, repair, renovation, demolition or remodeling necessary to complete a public work for any building, structure or other improvement that is predominantly vertical, including, without limitation, a building, structure or improvement for the support, shelter and enclosure of persons, animals, chattels or movable property of any kind, and any other work or improvement appurtenant thereto.

A Public Body/Awarding Body, upon the request of a contractor or subcontractor, **MAY** submit a request for a modification or waiver of the percentage of hours of labor of one or more apprentices prior to (1) the bid advertisement; (2) the bid opening; or (3) the award of the contract if, "Good Cause" exists. The Labor Commissioner may also grant a modification or waiver from the requirements of NRS 338.01165 after work on the public work has commenced.

More information regarding these requirements and forms associated with this act may be found in the section following these General Conditions, labeled "Apprenticeship Requirements."

23. Conflict of Interest:

No City employee or elected or appointed member of City government, or member of the employee's immediate family, may participate directly or indirectly in the procurement process pertaining to this bid if they:

(a) Have a financial interest or other personal interest that is incompatible with the proper discharge of their official duties in the public interest or would tend to impair their independence, judgment or action in the performance of their official duties.

(b) Are negotiating for or have an arrangement concerning prospective employment with bidder. The bidder warrants to the best of his knowledge that the submission of the bid will not create such conflict of interest. In the event such a conflict occurs, the bidder is to report it immediately to the Purchasing Manager. For breach or violation of this warranty, the City shall have the right to annul this contract without liability at its discretion, and bidder may be subject to damages and/or debarment or suspension.

24. Disqualification of Bidder:

Any one or more of the following may be considered as sufficient for the disqualification of a prospective Bidder and the rejection of the Bid:

(a) The Bidder is not responsive or responsible.
(b) The quality of services, materials, equipment or labor offered does not conform to the approved plans and specifications.
(c) There is evidence of collusion among prospective Bidders (Participants in such collusion will receive no recognition as Bidders).
(d) The Bidder lacks the correct contractor's license classification required for the defined scope of work.
(e) Lack of competency, understanding of the scope of work, adequate machinery, plant and/or equipment as revealed in routine due diligence associated with bid evaluation.
(f) Unsatisfactory performance record as shown by past work for the City of Sparks, judged from the standpoint of workmanship, progress, and quality of services/goods provided.
(g) Uncompleted work which, in the judgment of the City of Sparks, might hinder or prevent the prompt completion of additional work, if awarded.
(h) Failure to pay or satisfactorily settle all bills due for labor and/or material on any contract(s).
(i) Failure to comply with any requirements of the City of Sparks.
(j) Failure to list, as required, all subcontractors who will be employed by the Bidder.
(k) Any other reason determined, in good faith, to be in the best interest of the City of Sparks.

25. Gratuities:

The City may rescind the right of the bidder to proceed under this agreement if it is found that gratuities in the form of entertainment, gifts, cash or otherwise are offered or given by the bidder, or any agent or representative of the bidder, to any officer or employee of the City with the intent of influencing award of this agreement or securing favorable treatment with respect to performance of this agreement.

26. Bidder's Security (This Section ☒ IS ☐ IS NOT Applicable to this bid):

A bid deposit in an amount equal to at least 5% of the bid may be required as a bid security by the City. The bid security may only be in cash, a cashier's or certified check made payable to the City of Sparks, or a bid bond. If the bid security is a bond, it shall be executed by a surety insurer authorized to issue surety bonds in the State of Nevada. All Bonding Companies must have an "A" rating or better with Moody's or A.M. Best Company, and be included on the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bond and as Acceptable Reinsuring Companies" as published in circular 570 (as amended) by the audit staff, Bureau of Accounts, U.S. Treasury Department. (In other words, the company is T-listed.) The bid security must be executed by the bidder and enclosed with the bid proposal in the sealed bid envelope.

27. Performance and Payment Bonds:

Per NRS 339.025, before any contract, except one subject to the provisions of chapter 408 of NRS, exceeding $100,000 for any project for the new construction, repair or reconstruction of any public building or other public work or public improvement of any contracting body is awarded to any contractor, he shall furnish to the contracting body the following bonds which become binding upon the award of the contract to the contractor (All Bonding Companies must have an "A" rating or better with Moody's or A.M. Best Company, and be included on the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bond and as Acceptable Reinsuring Companies" as published in circular 570 (as amended) by the audit staff, Bureau of Accounts, U.S. Treasury Department. (In other words, the company is T-listed.)):

Performance Bond (This Section ☒ IS ☐ IS NOT Applicable to this bid):

The Contractor awarded this bid will be required to furnish the City with a surety bond conditioned upon the faithful performance of the contract. This may take the form of a bond executed by a surety company authorized to do business in the State of Nevada and approved by the City of Sparks. The bond shall be in a sum equal to one hundred percent (100%) of the amount of the contract price. Such bond shall be forfeited to the City in the event that bidder receiving the contract shall fail or refuse to fulfill the requirements and all terms and conditions of the contract.

Payment Bond (This Section ☒ IS ☐ IS NOT Applicable to this bid):

The Contractor awarded this bid will be required to furnish the City with a payment bond. This may take the form of a bond executed by a surety company authorized to do business in the State of Nevada and approved by the City of Sparks. The bond shall be in a sum equal to one hundred percent (100%) of the amount of the contract price The bond must be solely for the protection of claimants supplying labor or materials to the contractor to whom the contract was awarded, or to any of his subcontractors, in the prosecution of the work provided for in such contract.

28. Indemnification:

To the fullest extent permitted by law, upon award, Contractor shall hold harmless, indemnify, defend and protect City, its affiliates, officers, agents, employees, volunteers, successors and assigns ("Indemnified Parties"), and each of them from and against any and all claims, demands, causes of action, damages, costs, expenses, actual attorney's fees, losses or liabilities, in law or in equity, of every kind and nature whatsoever ("Claims") arising out of or related to any act or omission of Contractor, its employees, agents, representatives, or Subcontractors in any way related to the performance of work under this Agreement by Contractor, or to work performed by others under the direction or supervision of Contractor, including but not limited to:

1. Personal injury, including but not limited to bodily injury, emotional injury, sickness or disease, or death to persons;
2. Damage to property of anyone, including loss of use thereof;
3. Penalties from violation of any law or regulation caused by Contractor's action or inaction;
4. Failure of Contractor to comply with the Insurance requirements established under this Agreement;
5. Any violation by Contractor of any law or regulation in any way related to the occupational safety and health of employees.

In determining the nature of the claim against City, the incident underlying the claim shall determine the nature of the claim, notwithstanding the form of the allegations against City.

If City's personnel are involved in defending such actions, Contractor shall reimburse City for the time and costs spent by such personnel at the rate charged City for such services by private professionals.

In cases of professional service agreements, requiring professional liability coverage:

If the insurer by which a Consultant is insured against professional liability does not so defend the City and applicable agents and/or staff, and the Consultant is adjudicated to be liable by a trier of fact, the City shall be entitled to reasonable attorney's fees and costs to be paid to the City by the Consultant in an amount which is proportionate to the liability of the of the Consultant.

Nothing in this contract shall be interpreted to waive nor does the City, by entering into this contract, waive any of the provisions found in Chapter 41 of the Nevada Revised Statutes.

29. Insurance:

BIDDERS' ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW. IT IS HIGHLY RECOMMENDED THAT BIDDERS CONFER WITH THEIR RESPECTIVE INSURANCE CARRIERS OR BROKERS TO DETERMINE IN ADVANCE OF BID SUBMISSION THE AVAILABILITY OF INSURANCE CERTIFICATES AND ENDORSEMENTS AS PRESCRIBED AND PROVIDED HEREIN. IF THE APPARENT LOW BIDDER FAILS TO COMPLY STRICTLY WITH THE INSURANCE REQUIREMENTS, THAT BIDDER MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

The City may, unless otherwise required by law, waive or reduce the insurance requirements itemized here, at the discretion of the city's Contracts and Risk Manager.

Should work be required on City premises or within the public right-of-way, upon award of the contract, the bidder shall provide proof of insurance for the types of coverage, limits of insurance and other terms specified herein, prior to initiation of any services under City, Bid, Proposal or Contract. Coverage shall be from a company authorized to transact business in the State of Nevada and the City of Sparks and shall meet the following minimum specifications:

Contractor shall at its own expense carry and maintain at all times the following insurance coverage and limits of insurance no less than the following or the amount customarily carried by Contractor or any of its subcontractors, whichever is greater. Contractor shall also cause each subcontractor employed by Contractor to purchase and maintain insurance of the type specified herein. All insurers must have AM Best rating not less than A-VII, and be acceptable to the City. Contractor shall furnish copies of certificates of insurance evidencing coverage for itself and for each subcontractor. Failure to maintain the required insurance may result in termination of this contract at City's option. If Contractor fails to maintain the insurance as set forth herein, City shall have the right, but not the obligation, to purchase said insurance at Contractor's expense.

Contractor shall provide proof of insurance for the lines of coverage, limits of insurance and other terms specified below prior to initiation of any services. Coverage shall be from a company authorized to transact business in the State of Nevada and the City of Sparks. Contractor and any of its subcontractors shall carry and maintain coverage and limits no less than the following or the amount customarily carried by Contractor or any of its subcontractors, whichever is greater.

Applicable to this Contract	Insurance Type	Minimum Limit	Insurance Certificate	Additional Insured	Waiver of Subrogation
Yes	General Liability/Umbrella (Excess) Liability	$2,000,000	✔	✔	✔
Yes	Automobile Liability	$1,000,000	✔	✔	
Yes	Workers' Compensation	Statutory	✔	N/A	✔
Yes	Employer's Liability	$1,000,000	✔	N/A	
No	Professional Liability	$1,000,000	✔	N/A	N/A
No	Pollution Legal Liability	$1,000,000	✔	N/A	N/A

Commercial General Liability

Contractor shall carry and maintain Commercial General Liability (CGL) and, if necessary to meet required limits of insurance, commercial umbrella/excess liability insurance with a total limit of not less than the limits specified herein.

For contracts that are for the construction or improvement of public facilities, the Contractor shall obtain and maintain products and completed operations liability coverage through the statute of repose after completion of the project. Continuing commercial umbrella coverage, if any, shall include liability coverage for damage to the insured's completed work equivalent to that provided under ISO form CG 00 01.

There shall be no endorsement or modification of the CGL limiting the scope of coverage for liability arising from pollution, explosion, collapse, underground property damage, or damage to the named insured's work unless Subcontractor carries and maintains separate policies providing such coverage and provides Contractor evidence of insurance confirming the coverage.

Minimum Limits of Insurance

$2,000,000 Each Occurrence Limit for bodily injury and property damage
$2,000,000 General Aggregate Limit
$2,000,000 Products and Completed Operations Aggregate Limit
$10,000 Medical Expense Limit

If Commercial General Liability Insurance or other form with a general aggregate limit is used, it shall be revised to apply separately to this PROJECT or LOCATION.

Coverage Form

Coverage shall be at least as broad as the unmodified Insurance Services Office (ISO) Commercial General Liability (CGL) "Occurrence" form CG 00 01 04/13 or substitute form providing equivalent coverage and shall cover liability arising from premises, operations, independent contractors, products-completed operations, personal and advertising injury, and liability assumed under an insured contract (including the tort liability of another assumed in a business contract).

Additional Insured

City, its officers, agents, employees, and volunteers are to be included as insureds using the applicable ISO additional insured endorsement(s) or substitute forms providing equivalent coverage, in respects to damages and defense arising from: activities performed by or on behalf of Contractor, including the insured's general supervision of Contractor; products and completed operations of Contractor; premises owned, occupied, or used by Contractor. The coverage shall contain no special limitations on the scope of protection afforded to City, its officers, employees, or volunteers. Additional insured status for City shall apply until the expiration of time within which a claimant can bring suit per applicable state law.

Primary and Non-Contributory

Contractor's insurance coverage shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded to City, its officers, agents, employees, and volunteers. There shall be no endorsement or modification of the CGL to make it excess over other available insurance; alternatively, if the CGL states that it is excess or pro rata, the policy shall be endorsed to be primary with respect to the additional insured. Any insurance or self-insurance maintained by City, its officers, employees, or volunteers shall be excess of Contractor's insurance and shall not contribute with it in any way.

Waiver of Subrogation

Contractor waives all rights against City and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by the commercial general liability or commercial umbrella liability insurance maintained pursuant to this agreement. Insurer shall endorse CGL policy as required to waive subrogation against the City with respect to any loss paid under the policy.

Endorsements

Policy forms or endorsements are required confirming coverage for all required additional insureds. The forms or endorsements for CGL shall be at least as broad as the unmodified ISO additional insured endorsement CGO 20 10 07/04 and CG 20 37 07/04 or substitute forms providing additional insured coverage for products and completed operations.

A waiver of subrogation in favor of City shall be endorsed to the policy using an unmodified Waiver of Transfer of Rights of Recovery of Others to Us ISO CG 24 04 05 09, or a substitute form providing equivalent coverage.

Electronic Data Liability

If any underground work will be performed, Contractor shall maintain electronic data liability insurance applicable to the Project and insuring against liability arising out of the loss of, loss of use of, damage to, corruption of, inability to access, or inability to manipulate electronic data. This coverage shall be maintained with a limit of liability of not less than $1,000,000 and provide coverage at least as broad as electronic data liability coverage form CG 04 37 (or substitute form providing equivalent coverage.

Railroad Protective Liability

For any construction or demolition work within fifty (50) feet of a railroad, Contractor shall maintain Railroad Protective Liability insurance on behalf of and in the name of the railroad, as named insured, with a limit of $6,000,000 per occurrence or higher limit if required by the railroad. Contractor shall also ensure that any exclusions pertaining to the indemnification of a railroad are removed from its CGL policy or that ISO form CG 24 17 (Contractual Liability-Railroads Endorsements) is included in the coverage.

Business Automobile Liability

Minimum Limits of Insurance

$1,000,000 Combined Single Limit per accident for bodily injury and property damage or the limit customarily carried by Contractor, whichever is greater. No aggregate limit may apply. Coverage may be combined with Excess/Umbrella Liability coverage to meet the required limit.

Coverage Form

Coverage shall be at least as broad as the unmodified Insurance Services Office (ISO) Business Automobile Coverage form CA 00 01 10/13, CA 00 25 10/13, CA 00 20 10/13 or substitute form providing equivalent coverage. Such insurance shall cover liability arising out of any auto (including owned, hired, and non-owned autos).

Pollution liability coverage at least as broad as that provided under the ISO pollution liability—broadened coverage for covered autos endorsement (CA 99 48) shall be provided, and the Motor Carrier Act endorsement (MCS 90) shall be attached for all contracts involving transportation of "hazardous material" as this term is defined by applicable law, including, but not limited to, waste, asbestos, fungi, bacteria and mold.

Additional Insured

City, its officers, agents, employees, and volunteers are to be included as insureds with respect to damages and defense arising from the ownership, maintenance or use of automobiles owned, leased, hired, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to City, its officers, employees, or volunteers. Additional insured status for City shall apply until the expiration of time within which a claimant can bring suit per applicable state law.

Endorsements

A policy endorsement is required listing all required additional insureds. The endorsement for Business Automobile Liability shall be at least as broad as the unmodified ISO CA 20 48 10/13 or a substitute form confirming City's insured status for Liability Coverage under the Who Is An Insured Provision contained in Section II of the coverage form ISO CA 00 01 10/13.

Waiver of Subrogation.

Contractor waives all rights against City, its officers, agents, employees, and volunteers for recovery of damages to the extent these damages are covered by the commercial general liability or commercial umbrella liability insurance maintained pursuant to this agreement. Contractor's insurer shall endorse policy to waive subrogation against City with respect to any loss paid under the policy.

Workers' Compensation and Employer's Liability

Contractor shall carry and maintain workers' compensation and employer's liability insurance meeting the statutory requirements of the State of Nevada, including but not limited to NRS 616B.627 and NRS 617.210 or provide proof that compliance with the provisions of Nevada Revised Statutes Chapters 616A-D and all other related chapters is not required. It is understood and agreed that there shall be no coverage provided for Contractor or any Subcontractor of the Contractor by the City. Contractor agrees, as a precondition to the performance of any work under this Agreement and as a precondition to any obligation of the City to make any payment under this Agreement to provide City with a certificate issued by an insurer in accordance with NRS 616B.627 and with a certificate of an insurer showing coverage pursuant to NRS 617.210.

It is further understood and agreed by and between City and Contractor that Contractor shall procure, pay for and maintain the above-mentioned coverage at Contractor's sole cost and expense.

Should Contractor be self-funded for workers' compensation and employer's liability insurance, Contractor shall so notify City in writing prior to the signing of this Contract. City reserves the right to approve said retentions, and may request additional documentation, financial or otherwise, for review prior to the signing of this Contract.

Upon completion of the project, Contractor shall, if requested by City, provide a Final Certificate for itself and each Subcontractor showing that Contractor and each Subcontractor had maintained the required Workers Compensation and Employer's Liability by paying all premiums due throughout the entire course of the project.

Nevada law allows the following to reject workers' compensation coverage if they do not use employees or subcontractors in the performance of work under the contract:

- Sole proprietors (NRS 616B.627 and NRS 617.210)
- Unpaid officers of quasi-public, private or nonprofit corporations (NRS 616B.624 and NRS 617.207)
- Unpaid managers of limited liability companies (NRS 616B.624 and NRS 617.207)
- An officer or manager of a corporation or limited liability company who owns the corporation or company (NRS 616B.624 and NRS617.207)

If a contractor has rejected workers' compensation coverage under applicable Nevada law, the contractor must indicate the basis for the rejection of coverage and complete, sign and have notarized an Affidavit of Rejection of Coverage. The Affidavit must be completed, signed and notarized prior to performance of any work.

Minimum Limits of Insurance

Workers' Compensation:	Statutory Limits
Employer's Liability:	**$1,000,000** Bodily Injury by Accident – Each Accident
	$1,000,000 Bodily Injury by Disease – Each Employee
	$1,000,000 Bodily Injury by Disease – Policy Limit

Coverage Form

Coverage shall be at least as broad as the unmodified National Council on Compensation Insurance (NCCI) Workers Compensation and Employer's Liability coverage form WC 00 00 07/11 or substitute form providing equivalent coverage.

OTHER INSURANCE COVERAGES (IF APPLICABLE)

Professional Liability Insurance (if Applicable) $1,000,000 each claim limits of liability or whatever limit is customarily carried by the Contractor, whichever is greater, for design, design-build or any type of professional services. If coverage is required on a claims-made or claims-made and reported basis, any applicable retroactive or pending & prior litigation dates mush precede the effective date of this contract. Continuous coverage shall be maintained, or an extended reporting period shall be obtained for a period of at least three (3) years following completion of the project.

Contractors Pollution Liability Insurance (If Applicable)- $1,000,000 per occurrence and $2,000,000 aggregate or whatever amount is acceptable to the City for any exposure to "hazardous materials" as this term is defined in applicable law, including but not limited to waste, asbestos, fungi, bacterial or mold.

Coverage shall apply to bodily injury; property damage, including loss of use of damaged property or of property that has not been physically injured; cleanup costs; and defense, including costs and expenses incurred in the investigation, defense, or settlement of claims.

City shall be included as an insured under Contractor's pollution liability insurance.

If coverage is required on a claims-made or claims-made and reported basis, any applicable retroactive or pending & prior litigation dates mush precede the effective date of this contract. Continuous coverage shall be maintained, or an extended reporting period shall be obtained for a period of at least three (3) years following completion of the project.

If the scope of services as defined in this contract includes the disposal of any hazardous materials from the job site, Contractor must furnish to City evidence of pollution liability insurance maintained by the disposal site operator for losses arising from the insured facility accepting waste under this contract. Coverage certified to the City under this section must be maintained in minimum amounts of $1,000,000 per loss, with an annual aggregate of at least $2,000,000.

Lower tier sub-subcontractors, Truckers, Suppliers: Evidence confirming lower tier subcontractors, truckers and suppliers are maintaining valid insurance prior to beginning work on the project to meet the requirements set forth herein on Subcontractor, including but not limited to all additional insured requirements of Subcontractor.

ALL COVERAGES
Coverage shall not be suspended, voided, canceled, or non-renewed by either CONTRACTOR or by the insurer, reduced in coverage or in limits except after thirty (30) days' prior written notice has been given to CITY except for ten (10) days' notice for nonpayment of premium.

DEDUCTIBLES AND RETENTIONS
Any deductibles or self-insured retentions that exceed $100,000.00 per occurrence or claim must be declared to and approved by the City's Contracts and Risk Manager and prior to signing this Contract. City is entitled to request and receive additional documentation, financial or otherwise, prior to giving its approval of the deductibles and self-insured retentions. Any changes to the deductibles or self-insured retentions made during the term of this Contract or during the term of any policy must be approved by City's Contracts and Purchasing Manager prior to the change taking effect. Contractor is responsible for any losses within deductibles or self-insured retentions.

OTHER INSURANCE PROVISIONS
Should City and Contractor agree that higher coverage limits are needed warranting a project policy, project coverage shall be purchased and the premium for limits exceeding the above amount may be borne by City. City retains the option to purchase project insurance through Contractor's insurer or its own source.

Any failure to comply with reporting provisions of the policies shall not affect coverage provided to City, its officers, agents, employees, or volunteers.

ACCEPTABILITY OF INSURERS
Insurance is to be placed with insurers with a Best's rating of no less than A-VII and acceptable to the City. City, with the approval of the Risk Manager, may accept coverage with carriers having lower Best's ratings upon review of financial information concerning Contractor and insurance carrier. City reserves the right to

require that Contractor's insurer be a licensed and admitted insurer in the State of Nevada, or meet any applicable state and federal laws and regulations for non-admitted insurance placement.

VERIFICATION OF COVERAGE

Contractor shall furnish City with certificates of insurance and with original endorsements affecting coverage required by this contract. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf.

Prior to the start of any Work, Contractor must provide the following documents to City of Sparks, Attention: Purchasing Division, P.O. Box 857, Sparks, NV 89432-0857:

A. Certificate of Insurance. Contractor must provide a Certificate of Insurance form to the City of Sparks to evidence the insurance policies and coverage required of Contractor.

B. Additional Insured Endorsements. An original Additional Insured Endorsement, signed by an authorized insurance company representative, must be submitted to the City of Sparks, by attachment to the Certificate of Insurance, to evidence the endorsement of the City of Sparks as additional insured.

C. Policy Cancellation Endorsement. Except for ten (10) days' notice for non-payment of premium, each insurance policy shall be endorsed to specify that without thirty (30) days prior written notice to the City of Sparks, the policy shall not be suspended, voided, cancelled or non-renewed, and shall provide that notices required by this paragraph shall be sent by certified mailed to the address specified above. A copy of this signed endorsement must be attached to the Certificate of Insurance. If endorsements are not available, Contractor shall be responsible to provide prior written notice to City as soon as practicable upon receipt of any notice of cancellation, non-renewal, reduction in required limits or other material change in the insurance required under this Agreement.

D. Bonds (as Applicable). Bonds as required and/or defined in the original bid documents.

All certificates and endorsements are to be addressed to the City of Sparks, Purchasing Division and be received and approved by City before work commences. The City reserves the right to require complete certified copies of all required insurance policies at any time.

SUBCONTRACTORS

Contractor shall include all Subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each Subcontractor. All coverages for Subcontractors shall be subject to all the requirements stated herein.

MISCELLANEOUS CONDITIONS

1. Contractor shall be responsible for and remedy all damage or loss to any property, including property of City, caused in whole or in part by Contractor, any Subcontractor, or anyone employed, directed, or supervised by Contractor.
2. Nothing herein contained shall be construed as limiting in any way the extent to which Contractor may be held responsible for payment of damages to persons or property resulting from its operations or the operations of any Subcontractors under it, and such coverage and limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to City in this contract.

3. In addition to any other remedies City may have if Contractor fails to provide or maintain any insurance policies or policy endorsements to the extent and within the time herein required, City may, at its sole option:
    a. Purchase such insurance to cover any risk for which City may be liable through the operations of Contractor under this Agreement and deduct or retain the amount of the premiums for such insurance from any sums due under the Agreement;
    b. Order Contractor to stop work under this Agreement and/or withhold any payments which become due Contractor here under until Contractor demonstrates compliance with the requirements hereof; or,
    c. Terminate the Agreement.
4. If Contractor's liability policies do not contain the standard ISO separation of insureds condition, or a substantially similar clause, they shall be endorsed to provide cross-liability coverage.

30. Safety Program:

Upon award, the Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. The Contractor shall take all necessary precautions for the safety of, and shall provide all necessary protection to prevent damage, injury, or loss to:

1. All employees on the work site and all other persons who may be affected thereby.
2. All the work, materials, and equipment to be incorporated therein, whether in storage on or off the site.
3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

Contractor shall comply with all applicable laws, ordinances, rules, regulations, and others of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss. He shall erect and maintain, as required by existing conditions and progress on the work, all necessary safeguards for safety and protection, including posting danger signs, other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent utilities. Contractor shall comply with OSHA'S Hazard Communication Standards.

Contractor shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents. This person shall be Contractor's superintendent unless otherwise designated in writing by Contractor to the Owner and the Engineer.

31. Award of Contract:

(a) Bids/Proposals will be analyzed and award will be made to the lowest, responsive and responsible bidder whose bid conforms to the solicitation and whose bid is considered to be most advantageous to the City, price and other factors considered. Factors to be considered may include, but are not limited to: bidder's past performance, total unit cost, economic cost analysis, life cycle costs, warranty and quality, maintenance cost, durability, the operational requirements of the City and any other factors which will result in the optimum economic benefit to the City.

(b) The City reserves the right to reject any item or items, to waive informalities, technical defects and minor irregularities in bids/proposals received; and to select the bid(s) or proposal(s) deemed most advantageous to the City. Should the City elect to waive a right it will not constitute an automatic waiver of that right in the future nor will it impact any other right or remedy. The City may consider bids/proposals submitted on an "all or nothing" basis if the bid/proposal is clearly designated as such.

(c) The City reserves the right to award one or more contracts on the bids/proposals submitted, either by award of all items to one bidder or by award of separate items or groups of items to various bidders as the interests of the City may require, unless the bidder clearly specifies otherwise in his bid.

(d) Upon acceptance by the City of Sparks, the solicitation, bid, proposal, or price quotation and issuance of a purchase order issued to the successful bidder shall be deemed to result in a binding contract incorporating those terms and these General Conditions without further action required by either party. Items are to be furnished as described in the bid and in strict conformity with all instructions, conditions, specifications, and provisions in the complete contract, as defined by this clause or any related integrated agreement.

32. Request for Proposal (RFP) Submittals:

In the case of Request for Proposals (RFP's), it should be noted that the documents submitted by prospective bidders are competitive sealed proposals and not competitive sealed bids. When proposals are opened, prices and other information will not be made public until the proposal is awarded. There shall be no disclosure of any bidder's information to competing bidders prior to the award of the proposal.

By their nature, proposals will include a number of variables that will vary based on the complexity of the product or service addressed within the proposal. Therefore, the evaluation of RFP's and the recommendation for award will not be based on price alone. Selection criteria will be better defined for each scope of work in the Special Conditions section of this bid.

Upon award of the contract, the executed contract and proposals will become public information. Accordingly, each proposal should be submitted on the vendor's most favorable terms from a price and technical standpoint.

33. Bidder Preference Law (This Section ☒ IS ☐ IS NOT Applicable to this bid):

This project will be bid and awarded under the Provisions(s) of NRS 338.147, which restricts preference given to certain contractors on Public Works Projects. The NRS cited in this section is meant to be a reference only. Each bidder shall acquaint himself with the latest provisions of NRS 338.147.

If the Contract for any Public Works Construction Project is expected to cost $250,000 or more, then all Contractors wishing to receive benefit of their preference status in the evaluation of bids must submit a copy of their Certificate of Bidder Preference issued by the State Contractor's Board. (Call 775-688-1141 or 775-486-1100 to obtain certification information from the State Contractors Board). Contractors who do not submit a preference certificate at the time of their bid are presumed to have wished not to exercise the benefit of their preference, or do not possess the certificate of eligibility.

To the extent Contractor has sought, qualified and receives a bidding preference on this project, pursuant to Nevada Revised Statutes Chapter 338, Contractor acknowledges and agrees that the following requirements will be adhered to, documented and attained for the duration of the Project:

1. At least 50 percent of the workers employed on the Project (including subcontractors) hold a valid driver's license or identification card issued by the Nevada Department of Motor Vehicles;

2. All vehicles used primarily for the public work will be (a) registered and (where applicable) partially apportioned to Nevada; or (b) registered in Nevada; and

3. The Contractor shall maintain and make available for inspection within Nevada all payroll records

related to the Project.

Contractor recognizes and accepts that failure to comply with any requirements herein shall be a material breach of the contract and entitle the City of Sparks to liquidated damages in the amount set by statute. In addition, the Contractor recognizes and accepts that failure to comply with any requirements herein may lose its certification for a preference in bidding and/or its ability to bid on any contracts for public works pursuant to NRS Chapter 338.

To the extent Contractor has sought, qualified and receives a bidding preference, and this project has a value of over $250,000 pursuant to Nevada Revised Statutes Chapter 338, each contract between the contractor, applicant or design-build team and a subcontractor must provide for the apportionment of liquidated damages assessed pursuant to this section if a person other than the Contractor was responsible for the breach of a contract for a public work caused by a failure to comply with a requirement of Items 1-3 within this section. The apportionment of liquidated damages must be in proportion to the responsibility of each party for the breach.

This section shall not be applicable for projects in which some or all of the funding comes from Federal sources.

34. Tie Bids:

Should identical low, responsive and responsible bids be received from two bidders, the City of Sparks Purchasing Manager shall notify all parties involved in the tie and may at his option utilize a coin-flip to determine the low bidder who shall be recommended for award. Or;

Should there be three or more low, responsive and responsible tie bids the Purchasing Manager shall exercise the following tie breaking method, unless another alternative is apparent and prudent: The City of Sparks Purchasing Manager shall set a mutually agreed upon time where, in his office, he shall shuffle a new deck of playing cards and have each bidder's representative cut the cards. The tie bidder who cuts the highest card (with Ace high) shall be recommended for bid award.

35. Appeals/Protests – Bids Only (Not Applicable to Request for Proposals):

A person who submits a bid on a contract may, after the bids are opened and within 5 business days after the date the "Recommendation to Award" is issued by the City, unless otherwise stated in the Special Conditions, file a notice of protest regarding the awarding of the contract. The City's "Recommendation to Award" will be dated and posted on the City's public website within the area where bid notices and bid re-caps are posted (Currently: http://www.cityofsparks.us/bids).

(a) A notice of protest must include a written statement setting forth with specificity the reasons the person filing the notice believes the applicable provisions of law were violated.

(b) A person filing a notice of protest may be required by the governing body or its authorized representative, at the time the notice of protest is filed, to post a bond with a good and solvent surety authorized to do business in this State or submit other security, in a form approved by the governing body or its authorized representative, to the governing body or its authorized representative who shall hold the bond or other security until a determination is made on the protest. A bond posted or other security submitted with a notice of protest must be in an amount equal to the lesser of:

(1) Twenty-five percent of the total value of the bid submitted by the person filing the notice of protest; or

(2) Two hundred fifty thousand dollars ($250,000).

(c) A notice of protest filed in accordance with the provisions of this section operates as a stay of action in relation to the awarding of any contract until a determination is made by the governing body or its authorized representative on the protest.

(d) A person who submits an unsuccessful bid may not seek any type of judicial intervention until the governing body or its authorized representative has made a determination on the protest and awarded the contract.

(e) A governing body or its authorized representative is not liable for any costs, expenses, attorney's fees, loss of income or other damages sustained by a person who submits a bid, whether or not the person files a notice of protest pursuant to this section.

(f) If the protest is upheld, the bond posted or other security submitted with the notice of protest must be returned to the person who posted the bond or submitted the security. If the protest is rejected, a claim may be made against the bond or other security by the governing body or its authorized representative in an amount equal to the expenses incurred by the governing body or its authorized representative because of the unsuccessful protest. Any money remaining after the claim has been satisfied must be returned to the person who posted the bond or submitted the security.

36. Documentation:

Due to the time constraints that affect contract performance, all required documents, certificates of insurance and bonds shall be provided to the City within ten (10) calendar days following award or date of request by City, whichever is later. Any failure to comply may result in bid being declared non-responsive and rejected, and at City's option, the bid bond may be attached for damages suffered.

37. Discounts:

(a) Prompt payment discounts will not be considered in evaluating bids for award. However, offered discounts will be taken if payment is made within the discount period, even though not considered in the evaluation of bids.

(b) In connection with any discount offered, time will be computed from date of delivery and acceptance, or invoice receipt, whichever is later. Payment is deemed to be made for the purpose of earning the discount on the date of mailing of the City check.

(c) Any discount offered other than for prompt payment should be included in the net price quoted and not included in separate terms. In the event this is not done, the City reserves the right to accept the discount offered and adjust prices accordingly on the Purchase Order.

38. Seller's Invoice:

Invoices shall be prepared and submitted in duplicate to the address shown on the Purchase Order. Separate invoices are required for each Purchase Order. Invoices shall contain the following information: Purchase Order number, item number, description of supplies or services, sizes, unit of measure, quantity, unit price and extended totals.

39. Inspection and Acceptance:

Inspection and acceptance will be at destination unless specified otherwise, and will be made by the City department shown in the shipping address or other duly authorized representative of the City. Until delivery and acceptance, and after any rejection, risk of loss will be on the bidder unless loss results from negligence of the City.

40. Lost and Damaged Shipments:
Risk of loss or damage to items prior to the time of their receipt and acceptance by the City is upon the bidder. The City has no obligation to accept damaged shipments and reserves the right to return at the bidder's expense damaged merchandise even though the damage was not apparent or discovered until after receipt of the items.

41. Late Shipments:
Bidder is responsible to notify the City department receiving the items and the Purchasing Manager of any late or delayed shipments. The City reserves the right to cancel all or any part of an order if the shipment is not made as promised.

42. Document Ownership:
All technical documents and records originated or prepared pursuant to this contract, including papers, reports, charts, and computer programs, shall be delivered to and become the exclusive property of the City and may be copyrighted by the City. Bidder assigns all copyrights to City by undertaking this agreement.

43. Advertisements, Product Endorsements:
City employees and agencies or organizations funded by the City of Sparks are prohibited from making endorsements, either implied or direct, of commercial products or services without written approval of the City Manager. No bidder may represent that the City of Sparks has endorsed their product or service without prior written approval.

44. Vendor Workplace Policies
No Vendor providing a service, program or activity to the public on behalf of the City shall discriminate against any person because of sex, race, color, creed, national origin or disability. Vendor, if providing a service, program or activity to the public on behalf of the City, shall comply with the Americans with Disability Act and City's policies pursuant thereto when providing said service, program or activity.

The City of Sparks is an Affirmative Action/Equal Opportunity Employer. Bidders shall be cognizant of the requirements for compliance with Executive Order 11246, entitled "Equal Employment Opportunity" as amended by Executive Order 11375 and as supplemented in regulations of the U.S. Department of Labor (41 CFR part 60).

45. Business License Requirement:
All companies doing business with, or within, the City of Sparks are required to obtain and maintain a current business license from the City of Sparks prior to the commencement of work per Sparks Municipal Code Section 5.08.020A. Bidder(s) awarded a contract resulting from this bid shall be required to obtain a current business license if they do not already possess one.

46. City Provisions to Prevail:
Except as indicated in the specifications, the City's standard General Conditions shall govern any contract award. Any standard terms and conditions of bidder submitted by bidder shall not be acceptable to City unless expressly agreed to by the City. The City reserves the right to reject bidder's bid as non-responsive, to consider the bid without bidder's standard terms and conditions, or to require bidder to delete reference to such, as a condition of evaluation or award of the bid. If, after award of contract, bidder (contract vendor) provides materials or services accompanied by new or additional standard terms or conditions, they too shall be considered void and City may require deletion as a further condition of performance by vendor.

47. Invalid Provisions:
In the event that any one or more of the provisions of this agreement shall be found to be invalid, illegal or unenforceable, the remaining provisions shall remain in effect and be enforceable.

48. Amendments and Modifications:
The Purchasing Manager may at any time, by written order, and without notice to the sureties, make a modification to the contract or an amendment to the Purchase Order, within the general scope of this contract, in (1) quantity of materials or service, whether more or less; (2) drawings, designs, or specifications, where the supplies to be furnished are to be specially manufactured for the City; (3) method of shipment or packing; and (4) place of delivery. If any such change causes an increase or decrease in the cost or the time required for the performance of this contract, an equitable adjustment shall be made by written modification of the contract or amendment to the Purchase Order. Any claim by the bidder for adjustment under this clause must be asserted within 30 calendar days from the notification date.

49. Assignment:
Vendor shall not assign or delegate duties or responsibilities under this agreement, in whole or in part, without prior written approval of the City.

50. Disputes After Award:
Except as otherwise provided in these provisions, any dispute concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Purchasing Manager, who shall reduce this decision to writing and mail a copy to the bidder. The decision of the Purchasing Manager shall be final and conclusive, unless bidder requests arbitration within ten (10) calendar days. Pending final decision of a dispute, the bidder shall proceed diligently with the performance of the contract and in accordance with the Purchasing Manager's decision.

51. Arbitration after Award:
Any and all disputes, controversies or claims arising under or in connection with the contract resulting from this bid, including without limitation, fraud in the inducement of this Contract, or the general validity or enforceability of this Contract, shall be governed by the laws of the State of Nevada without giving effect to conflicts of law principles, may be submitted to binding arbitration before one arbitrator, and shall be conducted in accordance with the Commercial Arbitration Rules of the American Arbitration Association in a private manner in Washoe County, Nevada. This award shall be final and judgment may be entered upon it in any court having jurisdiction thereof. In reaching this final award, the arbitrator shall have no authority to change or modify any provision of this Contract. All other expenses of arbitration shall be borne equally by the parties. All fees, including legal fees, shall be borne by the party who incurred them. All costs of enforcement shall be borne by the losing party. Each party shall have the right to discovery in accordance with the Nevada Rules of Civil Procedure.

52. Lawful Performance:
Vendor shall abide by all Federal, State and Local Laws, Ordinances, Regulations, and Statutes as may be related to the performance of duties under this agreement. In addition, all applicable permits and licenses required shall be obtained by the vendor, at vendor's sole expense.

53. Annual Appropriation of Funds:
Multi-year term supply and service contracts and leases are subject to annual appropriation of funds by the City Council. The City plans and makes appropriations to the City Budget with respect to a fiscal year that starts July 1st and ends June 30th of each year. Payments made under term contracts and leases are considered items

of current expense. Purchase Orders are funded when issued; therefore, they are current expense items and are not subject to any subsequent appropriation of funds.

Continuance of a multi-year contract beyond the limits of funds available shall be contingent upon appropriation of the requisite funds in the ensuing fiscal year and the termination of this contract due to lack of appropriation shall be without penalty.

54. Extension:
When in the City's best interest, this agreement may be extended on a daily, month-to-month, or annual basis by mutual agreement of both parties. Services and/or materials received under an extension shall be in accordance with pricing, terms, and conditions, as described herein.

55. Termination:
The City may terminate this agreement and be relieved of any consideration to the vendor should vendor fail to perform in the manner required. Furthermore, the City may terminate this agreement for any reason without penalty upon giving thirty (30) days written notice to the vendor. In the event of termination, the full extent of City liability shall be limited to an equitable adjustment and payment for materials and/or services authorized by and received to the satisfaction of the City prior to termination.

56. Venue:
This agreement shall be governed by and interpreted according to the laws of the State of Nevada, and venue for any proceeding shall be in Washoe County.

Special Conditions and Specifications
(Specific to Project)

In instances where the Special Conditions conflict with the General Conditions, the Special Conditions will prevail with respect to that instance or item(s).

SPECIAL PROVISIONS
2022 DOWNTOWN SAFETY BARRICADES – PHASE 2 INSTALLATION
BID #21/22-010 / PWP# WA-2022-206

These Special Provisions supplement and modify the Standard Specifications for Public Works Construction, 2012 version as adopted by the City of Sparks, Nevada. All of the requirements and provisions of said Standard Specifications shall apply except where modified by the plans and these Special Provisions.

SECTION 1: SCOPE OF WORK

Workscope: The work includes but is not limited to, sawcutting, removal and replacement of curb, gutter, sidewalk, median island commercial driveway, ADA accessible ramp and landscaping, installation of PVC sleeves, removal of existing composite surface for safety barricade system, placement of geotextile fabric and drain rock, placement of new aggregate base, placement of barricade system with reinforced structural concrete slabs, connection to power supply for hydraulic barricades system, connection to storm drain system for barricade system, placement of removeable and fixed bollards on City streets and property identified within the bid document, and other miscellaneous associated work activities necessary to complete the project as stated in the plans and bid specifications.

SECTION 2: SPECIAL PROVISIONS

The requirements set forth in these "Special Provisions" shall be used in addition to those set forth in "Standard Specifications for Public Works Construction".

SECTION 3: STANDARD SPECIFICATIONS

All materials furnished and work performed shall be done in accordance with the 2012 version of the "Standard Specifications for Public Works Construction" (Orange Book) and any revisions thereto if not covered or amended by the Special Provisions. The "Standard Specifications for Public Works Construction" are herein referred to as "Standard Specifications".

SECTION 4: STANDARD DETAILS

All materials furnished and work performed shall be done in accordance with the most current edition of the City of Sparks "Standard Details" located on the City's website. For any work not specifically covered by the City's 'Standard Details", the contractor shall refer to the "Standard Details for Public Works Construction" (Orange Book), and any revisions thereto if not covered or amended by the Special Provisions.

For the barricade systems and bollards, refer to Delta Scientific plans and specifications included in this package.

SECTION 5: NOTICE TO PROCEED AND TIME SCHEDULE

An official "Notice to Proceed" specifying the date by which construction operations shall be started will be issued in writing and delivered to the CONTRACTOR by the City at the Pre-construction Meeting. Contract time will begin on the date specified in the "Notice to Proceed", unless operations begin at an earlier date, in which case the date that such operations begin will apply. The CONTRACTOR shall immediately begin and diligently prosecute the work to completion. The CONTRACTOR shall obligate himself to complete the work within the stated time limits.

Delivery of the Delta Scientific barricades and bollards, to the City of Sparks, is expected in early April 2022. All work described in this document shall be completed within **thirty-five (35) working days** from the time of issuance of the Notice to Proceed. Bollard installation at Locations 1 and 3 shall be priority for

scheduling. This work must be coordinated with special consideration to events planned at the Nugget Event Center**. Installation and all work at these locations shall be completed no later than May 13, 2022. Project shall be completed no later than June 27, 2022.**

SECTION 6: LIQUIDATED DAMAGES

In case all work called for under the contract is not completed before or upon the expiration of the time limits set forth above, it is agreed by the parties to the contract that damage will be sustained by the City and that it will be impracticable to determine accurately the actual damage the City will sustain in the event of any such delay. Therefore, the CONTRACTOR shall pay to the City:

- ONE THOUSAND DOLLARS ($1000.00) for each and every working day delay after the thirty-five (35) working day completion time limit.

In finishing the work in excess of the dates prescribed and the City shall further have the right to charge to the CONTRACTOR, his heirs, assigns or sureties and to deduct from the final payment for the work, all or any part as it may deem proper of the actual cost of which are directly chargeable to the contract and which accrue during the period of such extensions, except that the cost of the final surveys and preparation of final estimate shall not be included in such charges.

The City may deduct this amount from any money due or that may become due the CONTRACTOR under the contract. This payment shall not be considered as a penalty, but as liquidated damages suffered by the City on account of the failure of the CONTRACTOR to complete the work within the time limit of the contract.

SECTION 7: EXCUSABLE DELAYS

The CONTRACTOR shall not be assessed with liquidated damage nor the cost of City Project Coordinator inspection during any delay in the completion of the work caused by acts of God, the public enemy, fire, floods, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather, or due to such causes, provided that the CONTRACTOR shall within ten (10) days from the beginning of such delay notify the City Project Coordinator in writing of the causes of delay. The City Project Coordinator's findings of the facts thereon shall be final and conclusive.

SECTION 8: INTENT OF THE PLANS AND SPECIFICATIONS

The intent of the plans and specifications is to prescribe a complete outline of work, which the CONTRACTOR undertakes to do in full compliance with the contract.

The CONTRACTOR shall furnish all required materials, equipment, tools, labor and incidentals, unless otherwise provided in the contract and shall include the cost of these items in the contract unit prices for the several units of work. All items of work called for on the plans or in the specifications and not included as a separate item in the proposal shall be considered as incidental to the other items listed in the proposal and the payment for such incidental items shall be considered as included in the contract unit prices bid.

SECTION 9: AUTHORITY OF THE CITY PROJECT COORDINATOR, INSPECTOR, AND THE DELTA SCIENTIFC REPRESENTAIVE

All work shall be done under the supervision of the City Project Coordinator acting on behalf of the City. The City Project Coordinator shall decide all questions that arise as to the quality and acceptability of materials furnished, work performed, manner of performance, rates of progress, interpretation of the plans and specifications, acceptable fulfillment of the contract and compensation under the specifications. He shall determine the amount of work performed and materials furnished and his decision and estimate shall be final. The City Project Coordinators estimate shall be "condition precedent" to the right of the

CONTRACTOR to receive money due him under the contract. The City Project Coordinator does not have authority to authorize changes in plans and specifications without prior written approval of the Engineer and the Delta Scientific representative.

The City shall provide an inspector who will represent the City and shall make inspections of all work, sample and test materials and do such other work relative to supervision of the project as he may be assigned by the City. All instructions given by the inspector are subject to approval by the City Project Coordinator. A Delta Scientific representative will be available for questions that may arise and will be available to assist with layout and any other technical aspect of construction that may be needed.

SECTION 10: CHANGE ORDERS

The City of Sparks reserves the right to make alterations or supplements to the Contract. Change Order Forms are required for all changes in decreases and/or increases of quantities and/or dollar amount changes in accordance with the Standard Specifications and required by the City of Sparks.

SECTION 11: COOPERATION WITH OTHER CONTRACTORS

The CONTRACTOR shall cooperate with other CONTRACTOR's who may be employed by the City on construction of other work adjacent to or in the proximity of the location of the project.

SECTION 12: DISPOSAL OF EXCESS AND WASTE MATERIALS

Trash, construction debris, cleared vegetation, excavated material unsuitable to be incorporated in the construction shall become the property of the CONTRACTOR and shall be removed by the CONTRACTOR and shall be legally disposed of offsite in accordance with all federal, state and local regulations.

SECTION 13: LIMITS OF CONTRACTOR'S OPERATIONS

If the CONTRACTOR's operations result in damage to any publicly or privately owned facilities outside the limitations of the construction easement, the CONTRACTOR shall, at his expense, repair such damage or indemnify the owner of the damaged property.

If the CONTRACTOR negotiates with property owners for the use of land for construction operations outside the limits of the construction easements, he shall do so at his own risk and the City will assume no liability for such use of private property. All agreements between the CONTRACTOR and private property owners shall be in writing and the City will be furnished copies of such agreements.

At no time will the CONTRACTOR be allowed to store debris or materials on the street overnight. All asphalt, concrete, soil and aggregate base will be hauled off at the conclusion of each working day. Materials for installation of Drop Inlets (Pipe, boxes frame and cover) will be allowed to be stored onsite with the approval of the City Project Coordinator or inspector.

SECTION 14: PROTECTION OF EXISTING UTILITIES

The location of existing utilities and drain lines shown on the plans are not guaranteed, but indicates generally their location according to the best knowledge of the Project Coordinator. The CONTRACTOR shall notify Underground Services Alert (USA Dig) at 1-800-227-2600, and NV Energy, Truckee Meadows Water Authority (TMWA), SBC, Charter Communications and other cable companies not less than five (5) working days prior to the start of construction to verify the location and depths of utilities.

The CONTRACTOR shall inform himself of the exact location of all vaults, boxes, conduits, ducts, cables, pipe systems, etc. and shall protect said utilities. Any damage caused by operation of the CONTRACTOR shall be repaired by the CONTRACTOR at his own expense. It shall be the CONTRACTOR's responsibility to contact the impacted utility for any replacement hardware.

SECTION 15: CONTRACT AMOUNT
The total amount payable under this contract shall be determined by the sum of the amounts earned and the various quantities of repairs actually made and determined from unit prices as furnished by the CONTRACTOR in the schedule of prices contained in his proposal. The various quantities of repairs in the bid proposal are estimates and the City of Sparks reserves the right to vary quantities as may be necessary.

SECTION 16: PRECONSTRUTION CONFERENCE
After the execution of the contract, but prior to the commencement of any work, a preconstruction conference between the CONTRACTOR and the city will be held at a mutually acceptable time and place.

SECTION 17: MEASUREMENT FOR PAYMENT
Whenever possible, the actual quantities installed or work performed on any project shall be measured on the site of the work by a crew composed of both the CONTRACTOR and the City Project Coordinator. This combined crew shall record all measured quantities in field notebooks, in legible and understandable entries. The CONTRACTOR and the City Project Coordinator shall each have a set of field notes which are to be in agreement on all quantities and items measured and shall include all work accomplished on the project under contract. Each set of field measurements shall be initialed and dated by responsible representatives of the CONTRACTOR and the City Project Coordinator participating on the combined crew. In the event that it is not possible to form a combined crew for the measurements, the area repaired shall be measured by the City Project Coordinator.

SECTION 18: SURFACE MOUNTED UTILITY ADJUSTMENT
It shall be the CONTRACTOR‘s responsibility to adjust all surface mounted utility appurtenances, such as manholes, survey monument covers and valve boxes to grade consistent with the grade of the restored street surface.

SECTION 19: PRE/POST-CONSTRUCTION WALK-THRU
The CONTRACTOR, City Inspector, and/or City Project Coordinator shall conduct a pre and post construction walk-thru. This shall be accomplished to determine limits of construction and existing conditions at each site and the surrounding area. The CONTRACTOR should walk the site and note all existing conditions. Concrete pavers, mow strips, fencing, edging, sprinklers block and brick walls, etc. are within this area. Any damage and finish back to these landscapes will be included within the scope of work and no additional pay item will be allowed for this work.

The CONTRACTOR will be required to video tape the entire project prior to any construction including all effected properties and staging locations. This video media will be in a DVD format and a copy of the DVD will be provided to the City. Areas near the property lines, back of sidewalk and driveways, landscaping, mow strips, fences and edging should be videoed in great detail to avoid any damage or disputes with property owners. The CONTRACTOR will be required to replace and or repair all areas that damaged by construction activities. Areas that are in question or concern should be noted on the video and the CONTRACTOR should notify the project coordinator or inspector.

SECTION 20: WORKING DAY, WORK HOURS, SATURDAY, SUNDAY, HOLIDAY AND OVERTIME WORK
Sparks Municipal Code 20.04.005.D restricts construction hours to 5:00 A.M. until 7:00 P.M., Monday through Friday and 8:00 A.M. until 5:00 P.M. on Saturday. For this project, the defined construction hours will be 7:00 A.M until 7:00 P.M., Monday through Friday unless otherwise required by these specifications or requested by the City Project Coordinator. The CONTRACTOR shall not commence

Construction operations before seven o'clock (7:00 A.M. Pacific Time) each working day except as directed by the City Project Coordinator and as specified herein.

The CONTRACTOR shall not perform any contract work on Saturday, Sunday, legal Holidays and outside of the twelve (12) hours available during a regular working day except as directed and approved by the City Project Coordinator and as specified herein.

When directed to or requesting to work outside of the legally permitted construction hours defined above, the CONTRACTOR shall first obtain approval from the City Project Coordinator at least seventy-two (72) hours prior to commencing such overtime work. If the CONTRACTOR plans to perform work on Saturday or Sunday, he/she shall obtain approval by the Wednesday prior to work on the Saturday or Sunday for which work is planned. If the CONTRACTOR plans to perform work on a legal Holiday, he/she shall first obtain approval from the City Project Coordinator at least 72 hours in advance.

CONTRCTOR shall obtain approval through the Temporary Use Permit (T.U.P.) and pay a fee of one hundred ($100.00) dollars to work outside of the above legally permitted construction hours. The request shall include justification of how public safety or project performance will be enhanced through working outside of the restricted construction hours. Submittal and payment of fees does not guarantee approval.

The CONTRACTOR shall be charged for all of City of Sparks' employee(s) time spent for overtime, Saturday, Sunday or Holiday work, based on the employee's hourly rate, plus benefits. The CONTRACTOR will be notified of the costs incurred and if the payment is not made, such costs will be deducted from any payment due to the CONTRACTOR. In addition to the charge for the City employee(s) time outside a standard workday,

The City of Spark recognizes the following legal Holidays:

January 1	New Year's Day
3rd Monday in January	Martin Luther King, Jr. Birthday
3rd Monday in February	President's Day
Last Monday in May	Memorial Day
July 4	Independence Day
1st Monday in September	Labor Day
Last Friday in October	Nevada Day
November 11	Veteran's Day
4th Thursday in November	Thanksgiving Day
4th Friday in November	Family Day (day after Thanksgiving)
December 25	Christmas Day

Special consideration for scheduling shall be considered to accommodate events being held at the Nugget Event Center. The CONTRACTOR and the City Project Coordinator will work together to schedule work with consideration for all special events in Downtown Sparks.

SECTION 21: SUBMITTALS

Submittals for the following items shall be provided at the time of the preconstruction meeting and shall have been performed within the previous 12 months. Two (2) copies of each item should be submitted.

- New Aggregate Base
- Geotextile Fabric
- Drain Rock

- Portland Cement Concrete Mix Design
- Concrete Curing Compound
- Pavement Markings

SECTION 22: TRAFFIC CONTROL PLANS

All traffic control shall conform to the latest editions of the NDOT Work Zone Traffic Control Handbook and the Manual on Uniform Traffic Control Devices (MUTCD) and as directed by the City of Sparks Community Services Department.

The CONTRACTOR shall designate a Traffic Control Supervisor (TCS), certified by the American Traffic Safety Services Association (ATSSA), who shall be responsible for planning, initiating, installing and maintaining all traffic control devices, as shown on the traffic control plan, as specified in the MUTCD and these specifications. The designated construction TCS shall be available to be contacted twenty-four (24) hours a day, seven (7) days a week, for the life of this Contract.

The traffic control plan shall scaled such that all proposed signage and traffic control for all streets in the entire unit can be seen on one full size (24"x 36") or half size (11"x17") plan sheet. The CONTRACTOR shall submit two (2) copies of proposed traffic control plan to the City Project Coordinator for review and comments five (5) working days prior to the pre-construction meeting. The proposed traffic control plan shall be prepared and signed by a certified TCS, retained by the CONTRACTOR.

The CONTRACTOR's traffic control plans shall include, but not be limited to, the following:

Proposed construction zone and existing speed limits
All construction signing
Message board locations
Location of flaggers
Types and locations of traffic control devices
Temporary lane striping
Construction phasing
Lane crossovers between construction phases
Method for maintaining traffic signal functions
Special events accommodations
Detours
Accommodations for pedestrian, bicycle, and transit facilities

If, during construction, revisions to the accepted plan is necessary or safety or accommodation to traffic, these changes must also be prepared by the ATSSA certified, Traffic Control Supervisor.

The City Project Coordinator may authorize a suspension of work during unfavorable weather or other conditions beyond the control of the CONTRACTOR. During such a suspension, the CONTRACTOR shall make passable and shall open to traffic such portions of the project under improvement and such temporary roadways or portions thereof as may be agreed upon between the CONTRACTOR and the City Project Coordinator for the accommodation of necessary traffic during the period of suspension. The maintenance of the temporary route, replacement or renewal of any work or materials lost or damaged, removal of any work or materials and temporary maintenance shall be at the expense of the CONTRACTOR.

Victorian Avenue will be allowed to be closed for the installation of the manual and hydraulic barricade systems. Duration of this closure is anticipated NOT to exceed 14 calendar days without prior authorization from the City Project Coordinator. Flaggers will be required if the City Project Coordinator believes it is needed due to current activity or traffic safety. Failure to comply with Flagger requirements

will result in an immediate shut down of all construction activity. Work will resume when the flagger requirement has been satisfied.

During non-working hours any hazardous section of the work shall be outlined with markers and flares. If deemed necessary by the Project Coordinator, barricades shall be erected to protect public traffic or he may direct the CONTRACTOR to furnish flagger(s) and pilot cars. Such markers, flares, barricades, flagging or piloting shall be at the expense of the CONTRACTOR.

When the CONTRACTOR's hauling equipment is required to merge with a cross traffic and at such other points which may be necessary to maintain safe traffic conditions, flaggers shall be provided to each side of the impairment to stop and direct traffic.

In case of damage to detours due to storms or other causes, the CONTRACTOR shall at once repair the damage, provide other detours or provide for carrying traffic through construction operations. Water shall be applied at points and in amounts as directed by the Project Coordinator, to keep the roadbed firm, smooth, stable and to reduce the dust hazard to a minimum.

Construction Zone Signs shall be placed on all cross streets where traffic is to be maintained. They shall be placed a sufficient distance from the construction to give motorist's adequate warning of the construction. None of the provisions herein shall be construed to restrict or prohibit, at any time, the prosecution of items of work, which will not interfere with the use of existing streets.

All flagging, piloting, signs, barricades, maintenance of work, streets, structures, detours, temporary approaches, replacement or renewal of work, water applied for these items or for dust control, shall not be paid for directly, but shall be included in various pay items of the proposal and the CONTRACTOR shall not be paid an additional amount for such work. When so ordered by the Project Coordinator, detours shall be surfaced and the materials needed shall be paid for by the cubic yard or ton as set forth in the pay items of the proposal.

SECTION 23: CLEANUP AND DUST CONTROL

It shall be the CONTRACTOR's responsibility to provide cleanup and dust control throughout all phases of construction, including suspension of work, and until final acceptance of the project. The CONTRACTOR shall keep the work site and other adjacent areas clean and free from rubbish and debris. The CONTRACTOR shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. A power broom will not be an acceptable means of cleaning the site unless used in conjunction with water to prevent dust from the power broom operation. The use of water resulting in mud on public streets will not be permitted as a substitute for sweeping or other methods. All water used for dust control must be from a potable water source.

All construction procedures shall conform to WCDHD-AQMD standards.

Excess excavated material from trenches, manholes, catch basins or similar structures in public streets shall be removed from the site immediately. Sufficient material may remain for use as backfill, but shall not remain during non-working hours. Forms and form lumber shall be removed from the site as soon as practical after stripping. No screening of excavated material will be allowed in the street. The CONTRACTOR shall remove all trash from the site in a timely manner. At no time shall the CONTRACTOR permit disposal of trash in any excavation.

Materials and equipment shall be removed from the site as soon as they are no longer necessary; and, upon completion of the work and before final inspection, the entire worksite shall be cleared of

equipment, waste and unused materials, construction debris and rubbish so as to present a satisfactory clean and neat appearance.

Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.

Failure of the CONTRACTOR to comply with the City's cleanup orders may result in an order to suspend work until the condition is corrected. Working days will continue to be counted during the suspension. No additional compensation will be allowed as a result of such suspension. No extension of contract time will be allowed as a result of such suspension.

If the contract time expires before final cleanup has been completed, liquidated damages, as specified in these Special Provisions, may be imposed.

SECTION 24: FORCE ACCOUNT

THIS ITEM SHALL BE IDENTIFIED AS A CONTINGENT ITEM. The use of this contingent item will be as directed by the Project Coordinator. The quantity of the above contingent item of work, as set forth on the bid schedule represent no actual estimate, is nominal only and may be greatly increased or decreased or reduced to zero. The increase or reduction of this quantity as compared with that set forth on the bid schedule shall not constitute a basis for claim by the CONTRACTOR for extra payment or damages.

Force Account items as defined by the City of Sparks will be additions to the contract arising within the course and scope of the contract for incidental costs due to unforeseen circumstances. Unforeseen circumstances include but are not limited to the following:

Emergency repairs, complications arising with interfacing new improvements to existing improvements, emergency pumping, emergency light/power plants, premium time or overtime to accelerate portions of work, unexpected utility modifications or conflicts, correcting existing substandard work, requested traffic control measures or signage, over-excavation of unsuitable materials, unknown field conditions, underground storage tanks, asbestos encountered, or any other miscellaneous or incidental items related to unforeseen circumstances.

Any force account items shall be adjusted daily upon report sheets, furnished to the City Project Coordinator by the CONTRACTOR and signed by both parties. These daily reports shall thereafter be considered the true record of force account items for unforeseen circumstances. No additional incidental work shall be performed or made except upon a written order from the Project Coordinator.

SECTION 25: INSURANCE AND INDEMNIFICATION

The CONTRACTOR shall not commence any work nor permit a Subcontractor to commence work on this project until satisfactory proof has been presented to the City of Sparks Purchasing Division that all insurance requirements as outlined by the City have been met.

The CONTRACTOR shall provide and maintain, during the effective life of the awarded contract, Comprehensive General Liability Insurance covering the CONTRACTOR and the City of Sparks.

SECTION 28: LOCATION OF WORK, PUBLIC RELATIONS

It shall be the CONTRACTOR'S responsibility to notify, in writing, all residents and businesses adjacent to this project of the construction working hours and duration of work. Notification shall be provided directly to impacted properties (i.e. properties abutting the work) seven (7) calendar days prior to beginning work at that

location **excepting** notification for Monday and Tuesday work shall be provided no later than 7:00 PM Thursday. Notification shall be in the form of a "door hanger" or flyer that is hand-delivered by the CONTRACTOR to each residence/business. A copy of the written communication must be provided to the City Project Coordinator and approved before being dispersed.

"NO PARKING" signs shall be displayed on streets at least 24 hours prior to operations. Signs shall be legible from inside vehicles and state the day and dates work will be performed. Signs shall be free from defects and unbroken.

In the event of delays that require rescheduling of work, the CONTRACTOR shall re-notify impacted properties in the same manner as described in the paragraphs above.

SECTION 29: CONSTRUCTION STAKING AND MATERIAL TESTING

Compaction testing, asphalt and concrete testing will be provided by the City. Twenty-four (24) hour notice must be given by the CONTRACTOR to the City Project Coordinator or Inspector prior to any testing.

BID ITEM CLARIFICATIONS
2022 DOWNTOWN SAFETY BARRICADES – PHASE 2 INSTALLATION
BID #21/22-010 / PWP# WA-2022-206

BID ITEM 1 ~ Remove Existing and Construct Colored PCC Foundation with Transition, including Installation of High Security Shallow Mount Barricade System - Manual

The work shall consist of all labor, equipment, materials, and incidentals necessary, but not limited to, sawcutting, excavation and disposal of existing composite roadway surface to a depth of 37 inches (37"), along with any unsuitable sub grade material including existing base, installation of geotextile fabric (180N or equal), installation of Class C drain rock to a depth of twelve inches (12"), installation of new Type 2 aggregate base to a depth of twelve inches (12") compact to 95% MDD, and placement of thirteen inch (13") colored PCC pad with 3-foot transition on either side of the foundation, and reinforcement as detailed in Delta Scientific general standard details A thru D for DSC2000 barricades, installation of Delta Scientific DSC2000M barricade system and Appendix A, including piping for drainage and connection to existing storm drain system to the satisfaction of the Delta Scientific Representative, and incidentals necessary to install a fully functioning barricade system.

Delta Scientific Barricade System to be supplied by the City of Sparks.

Colored concrete shall be Sequoia Sand.

Delta Scientific Representative to confirm layout and any variances from general standard provided.

Item may require protection and/or moderate lowering of City of Sparks owned interconnect infrastructure and/or other utilities. If a situation requires significant relocation, coordination between the CONTRACTOR and the City Project Manager will determine payment utilizing the Force Account.

Payment for this item shall be made at the contract lump sum price, which shall be deemed full compensation to complete the work as specified.

BID ITEM 2 ~ Remove Existing and Construct Colored PCC Foundation with Transition, including Installation of High Security Shallow Mount Barricade System - Hydraulic

The work shall consist of all labor, equipment, materials, and incidentals necessary, but not limited to, sawcutting, excavation and disposal of existing composite roadway surface to a depth of 37 inches (37"), along with any unsuitable sub grade material including existing base, installation of geotextile fabric (180N or equal), installation of Class C drain rock to a depth of twelve inches (12"), installation of new Type 2 aggregate base to a depth of twelve inches (12") compact to 95% MDD, connection to identified power source, connection of hydraulic lines to the control/motor unit, placement of thirteen inch (13") colored PCC pad with 3-foot transition on either side of the foundation, and reinforcement and construction of control pedestal as detailed in Delta Scientific general standard details, A thru N for DSC2000 barricades, installation of Delta Scientific DSC2000 barricade system and Appendix A, including piping for drainage and connection to existing storm drain system to the satisfaction of the Delta Scientific Representative, and incidentals necessary to install a fully functioning barricade system.

Delta Scientific Barricade System to be supplied by the City of Sparks.

Colored concrete shall be Sequoia Sand.

Delta Scientific Representative to confirm layout and any variances from general standard provided.

Item may require protection and/or moderate lowering of City of Sparks owned interconnect infrastructure and/or other utilities. If a situation requires significant relocation, coordination between the CONTRACTOR and the City Project Manager will determine payment utilizing the Force Account.

Payment for this item shall be made at the contract lump sum price, which shall be deemed full compensation to complete the work as specified.

BID ITEM 3 ~ Install Schedule 40 PVC Sleeves
The work shall consist of all labor, equipment, materials, and incidentals necessary, but not limited to, installing schedule 40 PVC sleeves for existing irrigation infrastructure, as necessary, within the limits of the in-ground barricades and the median opening. Item shall include one (1) 6-Inch sleeve for the irrigation main and two (2) 2-Inch sleeves for irrigation drip and wiring. Sleeves shall extend a minimum of 2-feet beyond the limits of the installed improvements.

Payment for this item shall be made at the contract lump sum price, which shall be deemed full compensation to complete the work as specified.

BID ITEM 4 ~ Remove Existing and Construct PCC Foundation for High Security Removable Bollard
The work shall consist of all labor, equipment, materials, and incidentals necessary, but not limited to, sawcutting, excavation and disposal of existing composite surface to a depth of 39 inches (39”), along with any unsuitable sub grade material including existing base, installation of new Type 2 aggregate base to a depth of twelve inches (12”) compact to 95% MDD, and placement of a 27 inch (27”) reinforced PCC foundation and sleeve as detailed in Delta Scientific general standard details for DSC800RFP removable bollard to the satisfaction of the Delta Scientific Representative, and incidentals necessary to install a fully functioning removable bollard.

Delta Scientific Removable Bollards to be supplied by the City of Sparks.

Delta Scientific Representative to confirm layout and any variances from general standard provided.

Item may require protection and/or moderate lowering of City of Sparks owned utility infrastructure and/or other utilities. If a situation requires significant relocation, coordination between the CONTRACTOR and the City Project Manager will determine payment utilizing the Force Account.

Quantity for payment for this item will be per each, complete, in place.

BID ITEM 5 ~ Remove Existing and Construct PCC Foundation including Installation of High Security Fixed Bollard
The work shall consist of all labor, equipment, materials, and incidentals necessary, but not limited to, sawcutting, excavation and disposal of existing composite surface to a depth of 39 inches (39”), along with any unsuitable sub grade material including existing base, installation of new Type 2 aggregate base to a depth of twelve inches (12”) compact to 95% MDD, and placement of a 27 inch (27”) PCC foundation and sleeve and detailed in Delta Scientific general standard details for DCS800FP fixed bollard to the satisfaction of the Delta Scientific Representative, and incidentals necessary to install a fully functioning fixed bollard.

Delta Scientific Fixed Bollards to be supplied by the City of Sparks.

Delta Scientific Representative to confirm layout and any variances from general standard provided.

Item may require protection and/or moderate lowering of City of Sparks owned utility infrastructure and/or other utilities. If a situation requires significant relocation, coordination between the CONTRACTOR and the City Project Manager will determine payment utilizing the Force Account.

Quantity for payment for this item will be per each, complete, in place.

BID ITEM 6 ~ Remove Existing and Construct Colored PCC Sidewalk

This work shall include the removal of the existing PCC sidewalk and the existing aggregate base and/or subgrade materials, sawcutting adjacent bituminous plantmix pavement and/or concrete, and removal of existing materials, including tree roots, to the bottom of the new aggregate base depth in the areas indicated on the plans. Also included in this item is the construction of Colored PCC sidewalk and to supply and install 4-inch depth, of new aggregate base material. Any grading necessary behind the new sidewalk to achieve a maximum slope of 3:1; and placement of bituminous plantmix and/or concrete transition patches at the back of improvements, as necessary, shall be included in this item at no additional charge to the Agency.

Colored concrete shall be Sequoia Sand.

Any existing improvements adjacent to new or replaced sidewalk that are displaced or damaged, i.e. sod, sprinkler systems, signs, mailboxes, trees, shrubs, other facilities or appurtenances shall be replaced or restored to the original position and condition prevailing prior to the start of operations at the Contractor's expense.

Quantity for payment will be based upon the actual square feet, complete, in place.

BID ITEM 7 ~ Remove Existing and Construct Colored PCC Curb – Match Exisitng

The unit price bid for these items shall include all labor, equipment, materials and all incidentals necessary to remove and replace Colored PCC curb and gutter matching existing at the locations indicated on the plans. Work shall include, but not be limited to the removal of the existing PCC curb and gutter, and the existing aggregate base and/or subgrade materials, sawcutting adjacent bituminous plantmix pavement and/or concrete, and removal of existing materials, including tree roots, to the bottom of the new aggregate base depth in the areas indicated on the plans. Colored PCC curb and gutter includes all types of curb and gutter indicated on the plans. Also included in these items is the construction of PCC curb and gutter and to supply and install new aggregate base material with a compacted thickness of 6-inches.

Colored concrete shall be Sequoia Sand.

Colored PCC curb and gutter includes all types of curb and gutter indicated on the plans. Curb and gutter removal and replacements shall be "neat line" sawcut at the existing asphalt pavement.

Quantity for payment will be based upon the actual linear feet, complete, in place.

BID ITEM 8 ~ Remove Existing and Construct Eight Inch (8") Thick, PCC Pad

The work shall consist of all labor, equipment, materials, and incidentals necessary, but not limited to, sawcutting, excavation and disposal of existing composite surface, along with any unsuitable sub grade material including existing base, installation of new Type 2 aggregate base to a depth of six inches (6") compact to 95% MDD, and placement of eight inch (8") PCC pad adjacent to bollard placement.

Item may require protection and/or moderate lowering of City of Sparks owned utility infrastructure and/or other utilities. If a situation requires significant relocation, coordination between the CONTRACTOR and the City Project Manager will determine payment utilizing the Force Account.

Quantity for payment will be based upon the actual square feet, complete, in place.

BID ITEM 9 ~ Remove Existing and Construct Eight Inch (8") Thick, Colored PCC Pad – Colored
The work shall consist of all labor, equipment, materials, and incidentals necessary, but not limited to, sawcutting, excavation and disposal of existing composite surface, along with any unsuitable sub grade material including existing base, installation of new Type 2 aggregate base to a depth of six inches (6") compact to 95% MDD, and placement of eight inch (8") thick colored PCC pad adjacent to bollard placement.

Colored concrete shall be Sequoia Sand.

Item may require protection and/or moderate lowering of City of Sparks owned utility infrastructure and/or other utilities. If a situation requires significant relocation, coordination between the CONTRACTOR and the City Project Manager will determine payment utilizing the Force Account.

Quantity for payment will be based upon the actual square feet, complete, in place.

BID ITEM 10 ~ Remove Existing and Construct Colored PCC Median Island Commercial Driveway
The work shall consist of all labor, equipment, materials, and incidentals necessary, but not limited to, sawcutting, excavation and disposal of existing curb and gutter, along with any unsuitable sub grade material including existing base, installation of new Type 2 aggregate base to a depth of six inches (6") compact to 95% MDD, reinforcing steel and placement of median island commercial driveway per Standard Specifications and Details.

Neat line sawcut at existing lip of curb to avoid asphalt patching in front of the newly placed curb and gutter.

Colored concrete shall be Sequoia Sand.

Item may require protection and/or moderate lowering of City of Sparks owned interconnect infrastructure and/or other utilities. If a situation requires significant relocation, coordination between the CONTRACTOR and the City Project Manager will determine payment utilizing the Force Account.

Quantity for payment will be based upon the actual square feet, complete, in place.

BID ITEM 11 ~ Remove Existing and Construct Colored PCC ADA Accessible Ramp
The work shall consist of all labor, equipment, materials, and incidentals necessary, but not limited to, excavation and disposal up to 40 feet of existing curb, gutter and sidewalk, along with any unsuitable sub grade material including existing base, installation of new Type 2 aggregate base to a depth of six inches (6"), and placement of a new 4-foot wide ADA access ramp including two (2) sets of truncated domes and any needed curbing on the back edge of the walkway per Standard Specifications and Details. Also included in this bid item shall be the replacement of the curb and gutter adjacent to the front side of the ADA access ramp from the top of each wing. Placement of bituminous plantmix pavement transition patches, as necessary, shall be included in this item at no additional charge to the Agency.

Colored concrete shall be Sequoia Sand.

Quantity for payment will be based upon the actual square feet, complete, in place.

BID ITEM 12 ~ Preformed Pavement Markings (Thermoplastic)
This item of work shall consist of all labor, equipment, materials, and incidentals necessary, but not limited to, installation of various symbols and words that direct traffic. Typical symbols include, but are not limited to, arrows, bicyclist, yield triangles, etc. Typical words include, but are not limited to, STOP, SCHOOL, etc. Work shall include, but not be limited to surface preparation, priming, application, surveying layout, and incidentals necessary for a complete installation.

Quantity for payment for this item will be per each, complete, in place.

BID ITEM 13 ~ Install 24" Stop Bar (Thermoplastic)
This item of work shall consist of all labor, equipment, materials, and incidentals necessary, but not limited to, surface preparation, priming, application, surveying layout, and installing 24-inch, white, 0.90 mil. Thermoplastic markings (Pre mark or hot tape).

Length of striping is measured from end to end of the line.

Quantity for payment will be based upon the actual linear feet, complete, in place.

BID ITEM 14~ PROVIDE TRAFFIC CONTROL
This item is the provision of traffic control in accordance with the Section 22 "Traffic Control Plans" of the Special Provisions for all items in the base bid. The work comprising the unit price bid for this item shall consist of all labor, equipment, materials and incidentals necessary to comply with Section 22 of the Special Provisions including, but not limited to, preparation and distribution of plans, notices and reports; setup, removal and maintenance of all barricades, signs, channelizing devices, barrels, cones, flag persons, detours, pilot cars, arrow boards, and message boards; temporary striping; temporary paving; temporary aggregate base; and plantmix bituminous ramps.

Victorian Avenue closure for the installation of the barricade systems will require specialty warning devises and signs including but not limited to, traffic control plans, street name placards on all detour signs, detour signs with arrows, mounting devices for detour signs, message boards, and any additional traffic control plan revisions, warning devices and signs as needed and requested by the City Project Coordinator and shall be included in this bid item.

There shall be no additional payment for changes in the traffic control plan required as a result of changes in the Contractor's work method or schedule

Payment for PROVIDE TRAFFIC CONTROL shall be made at the contract lump sum price, which shall be deemed full compensation to complete the work as specified.

BID ITEM 15 ~ Force Account
A force account has been established for this project and can be included in project bid items. The Force Account will be utilized for extra work authorized by the engineer per the bid document and Standard Specification**.**

TECHNICAL SPECIFICATIONS
2022 DOWNTOWN SAFETY BARRICADES – PHASE 2 INSTALLATION
BID #21/22-010 / PWP# WA-2022-206

Unless otherwise amended in these Technical Specifications, all materials, construction methods, etc. shall follow the Standard Specifications for Public Works Construction (Orange Book), 2012 version.

200 AGGREGATES

200.03.04 Class C Backfill. Class C backfill ("drain rock") shall conform to the requirements of Tables 200.03.04-I and 200.03.04-11. Class C backfill need not be washed but shall be free of any organic impurities, clay lumps, or unstable substances.

300.05 Basis of payment. There shall be NO DIRECT PAYMENT for drain rock. Compensation shall be deemed included in other items of work.

300 CLEARING AND GRUBBING

300.02.03 Protection of plants. Trimming and Root Mitigation - If existing landscaping (trees, shrubs, roots, branches, etc.) encroach into the public right-of-way and interfere with construction activity, the contractor shall notify the adjacent property owner and the City of Sparks before commencing any landscaping modifications such as pruning, trimming, or removal of landscaping. City of Sparks Assistant Public Works Manager, Mark Andersen (775) 353-2271, shall be notified within three (3) days notice of work to be performed. The Contractor shall employ an ISA certified Arborist to perform root crown excavation/root pruning, and shall coordinate this though the Urban Forester.

300.05 Basis of payment. There shall be NO DIRECT PAYMENT for clearing and grubbing. Compensation shall be deemed included in other items of work.

301 REMOVAL OF EXISTING IMPROVEMENTS

301.02.02 Bituminous Pavement. Item shall include the removal and disposal of bituminous pavement, base rock, or native subgrade to the depth as outlined on bid item description. The Contractor is advised that steep crowns, flat crowns, offset crowns, excessive pavement depths or other variations in the existing pavement may necessitate removal of existing to depths greater than the proposed pavement section.

301.04.02 Responsibility. This section to include sod, topsoil, decorative rock, and weed barrier fabric. Where lawn or landscape areas have been disturbed, contaminated or removed, the Contractor shall replace the topsoil with an imported, high quality, garden topsoil. The topsoil shall be free of debris, weeds, harmful substances, and rocks larger than ¾" in any direction. Topsoil shall meet the specifications of 200.08. Where existing lawn is disturbed it shall be repaired with sod. Grass seed will not be accepted. There will be no direct payment for sod, topsoil, decorative rock, and weed barrier fabric.

Existing facilities whether above or below grade shall be protected from damage by the Contractor's operations. Any damage shall be repaired to the satisfaction of the City Project Coordinator at the Contractor's expense.

The locations of existing underground utilities shown on the drawings were determined from various

sources. It is the Contractor's responsibility to determine the actual location of underground facilities as noted in the design drawings. Potholing shall be required and shall be incidental to the most appropriate bid item.

Irrigation Systems - In the event an existing irrigation system is damaged, it shall be repaired within twenty-four (24) hours; the Contractor shall provide water to the affected area until such time the irrigation is repaired to the satisfaction of the City Project Coordinator. There will be no direct payment for repairing the irrigation system, or watering of the affected area if needed.

Replacement of damaged irrigation parts shall be made with the same brand name and model.

Should the Contractor neglect or fail to repair the damaged irrigation within forty-eight (48) hours then the City Project Coordinator may, after written notice to the Contactor, have the deficiencies repaired and deduct the cost from the monies owed to the Contractor.

301.05 Basis of Payment. There shall be NO DIRECT PAYMENT for the removal of existing improvements. Compensation shall be deemed included in other items of work.

302 SUBGRADE PREPARATION

302.02 Preparation of Subgrade. Subgrade below barricades, bollards and concrete slabs shall be prepared by removing all 4" plus material from the surface and static rolling with a smooth drum roller.

Filter fabric, Mirafi 180N or equal, shall be placed on the prepared subgrade immediately after static rolling. The fabric shall cover the entire surface of the subgrade and come up at the lip of gutter on both sides of the road to the top of the aggregate base grade. The Contractor shall place the aggregate base as soon as practical and all subgrade must be covered with at least 6-inches of aggregate base before the end of each shift.

302.07 Basis of payment. There shall be NO DIRECT PAYMENT for excavation and preparation of the subgrade. Compensation shall be deemed included in other items of work.

308 AGGREGATE BASE COURSES

308.02 Materials. Material used for Aggregate Base shall be Type 2, Class B, Aggregate Base per Standard Specifications Subsection 200.01.03.

New Type 2, Class B aggregate base shall be used under concrete curb and gutter, driveway aprons, pedestrian ramps, valley gutter, alley aprons, and sidewalks. Material submitted as Recycled Asphalt Base for use under bituminous pavement shall conform to the Standard Specifications, Subsection 200.01.04, for Type 1, imported, recycled asphalt concrete base.

308.07 Basis of Payment. There shall be NO DIRECT PAYMENT for preparation and placement of aggregate base course. Compensation shall be deemed included in other items of work.

312 CONCRETE FOR HIGH SECURITY BOLLARD FOUNDATIONS, REMOVABLE AND FIXED BOLLARDS, CURB, CURB AND GUTTER, SIDEWALK, ADA ACCESSIBLE RAMPS, AND MEDIAN ISLAND COMMERCIAL DRIVEWAY,

312.01.01 Description. This work shall consist of construction of Portland Cement Concrete high security bollard foundations, curb and gutter, and driveways, including supplying aggregate base as called out in the plans. Sections of curb and gutter shall match existing style and construct to the standard Type I, except as noted below:

a. In all instances curb and gutter is being removed and replaced on an adjacent roadway the Contractor shall match the existing top of curb and maintain the flow line of the gutter. If the curb height varies, there shall be NO Direct Payment for the additional work and materials to match the existing curb section on either side of the removed item

b. The replacement of all disturbed landscaping and irrigation, in kind, and any plantmix bituminous pavement patching shall be included in the bid price for the curb and gutter, sidewalk, and ADA accessible ramps.

312.02 Materials. All concrete shall be Type II Portland Cement which shall have: a coarse aggregate gradation conforming to Size 67 in subsection 200.05.03 of the Standard Specifications, between 6 to 8 sacks of cement per cubic yard, a maximum of 5 gallons of water added per sack of cement, a 1 to 4-inch slump, 6 percent plus or minus 1-1/2 percent entrained air, 0.45 maximum water to cement ratio, and have a minimum 28 day compressive strength of 4,000 psi. **Polypropylene or Cellulose fibers shall be added to the P.C.C at 1.5 LBS. per cubic yard.**

All colored concrete shall be Sequoia Sand.

The ADA truncated dome warning panel shall be CASTinTACT3, Tekway Dome Tiles, ADA Solutions, and Access Tile or approved equal**. Color shall be Red.**

312.03.02.02 Finishing. The base shall be placed, compacted and available for inspection prior to placement of any concrete. The base shall be well-drained and be uniformly graded below finished grade. It must be moistened to a nominal depth, densified to 95% relative compaction and free of frost at the time of placing any concrete. If necessary, the base should be dampened with water just prior to placing concrete, but there shall be no free-standing water on the base surface.

The concrete shall be placed and consolidated to fill all spaces in the forms completely and to provide a suitable surface for finishing. The concrete adjacent to the forms shall be tamped to eliminate excess voids. Water must not be sprayed on the surface to re-temper the plastic concrete for toweling. Hard steel toweling shall be minimized to avoid trowel burns.

When concrete is placed in hot, cold or windy conditions, precautions must be taken to prevent cracking resulting from excessively rapid drying or freezing at the surface.

Expansion joints ½ wide will NOT be placed in the curb and gutter unless otherwise directed by the City Project Coordinator.

Transverse expansion joints ½ inch wide will NOT be placed in the sidewalk unless otherwise directed by the City Project Coordinator. New sections of sidewalk shall be doweled into the existing adjacent concrete sidewalk with a minimum of two (2) No. 4 reinforcing bars equally spaced across the width of the sidewalk. Dowels shall penetrate a minimum of 4-inches into existing concrete. Epoxy will not be required.

312.03.02.03 Curing. Immediately after finishing operations have been completed, all exposed surfaces shall be sealed by applying an impervious curing compound membrane. Within 30 minutes after form work is removed, the concrete surface covered by the form shall be coated with curing compound.

The liquid curing compound shall conform to the requirements of the Standard Specifications for Liquid Membrane-Forming Compounds for Curing Concrete meeting both ASTM C 309, Type 2, Class B and ACI 302 specifications. The application rate shall be at 200 square feet per gallon of curing agent, unless a greater rate of coverage is specified by the manufacturer. The curing compound shall be W.R. Meadows 1200-White-Concrete Curing Compound for all non-colored concrete and W.R Meadows 1100 Curing Compound for all colored concrete or approved equal.

The placement of bituminous pavement adjacent to concrete curbs, gutters, or alley intersections shall not be permitted until the newly placed concrete has reached eighty percent (80%) of the mix design twenty-eight (28) day design strength.

312.04 Basis of Payment. Refer to Bid Item Clarification.

335 CLEANUP

335.01 Description. This work shall consist of furnishing all materials, equipment, and labor for the cleanup of construction areas as specified and/or as directed by the City Project Coordinator. In addition, all requirements of the Washoe County District Health Department for the Dust Control Permit and NDEP's Stormwater Pollution Prevention Plan shall be complied with at all times during the work.

335.03 Pavement Surfaces. A power sweeper and/or water truck shall be used to clean the roadway section. A power broom will not be an acceptable means of cleaning the site. Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and free from rubbish and debris.

The Contractor shall also abate dust nuisance by cleaning, sweeping and sprinkling with water, or other means necessary. The use of water resulting in mud on public streets will not be permitted as a substitute for sweeping or other methods.

Care shall be taken to prevent spillage and tracking on haul routes. Any such spillage and tracking shall be removed immediately and the area cleaned. There shall be no additional compensation for cleanup and maintenance of the site or for cleanup of spillage and tracking on haul routes.

All debris from any affected manholes and catch basins shall be removed at the time of the disturbance.

336 INSPECTION AND TESTING

336.01 Description. The City of Sparks reserves the right to eliminate the requirement for individuals performing acceptance or field testing and sampling to be certified in accordance with the Nevada Alliance for Quality Transportation Construction (NAQTC). This determination will be made prior to issuance of Contract Documents and will be noted accordingly.

336.02 Control of Materials. ASTM D 2922, Nuclear Gauge Method, shall be included in the approved test methods for testing soils and aggregates. .

The Contractor shall be back charged for the cost of all tests that fail.

349 TRAFFIC CONTROL

349.01 Description. This work shall consist of furnishing all materials, equipment and labor to maintain proper traffic routing, parking control, access to all residences and businesses, and public safety for the duration of the project. All construction traffic control plans shall conform to the latest editions of either the NDOT Work Zone Traffic Control Handbook or Part VI of the MUTCD. All signs and barricades shall conform to Section 332 of the Standard Specifications, these Special Provisions, Construction Plans, Part VI of the MUTCD, and/or said Handbook, where applicable.

Flag persons shall be used during working hours to control traffic flows in accordance with the NDOT Work Zone Traffic Control Handbook and as directed by the City Project Coordinator.

Traffic control signs shall include the names of the streets involved for detour or closure.

"Road Construction Ahead" signs shall be replaced with either the Road Work Ahead sign (W20-1). No "Road Construction Ahead" signs shall be allowed on the project.

All streets shall be open for normal traffic movement during night time and weekend periods, unless previously approved by the City Engineer. The closure of any two adjacent parallel streets at the same time is prohibited. A street will be considered closed to through traffic if it is barricaded, or a closed sign is posted on any portion of the street, including intersections of crossing streets.

The storage of construction materials within the public streets and alleys during nighttime and weekend periods is prohibited.

A minimum of two (2) working days written notification shall be given to adjacent residents, businesses, Police and Fire Departments, paramedic/ambulance services, Waste Management, and the City Project Coordinator, of planned street closures and when parking restrictions are required. Where work is being performed along Citifare bus routes, the Regional Transportation Commission shall also be notified in similar fashion. Such notification shall be made separately for each work site and shall be made each time work commences at that site when operations are intermittent. This notification shall state the date work will commence and the hours and days to be worked. When construction will necessitate traffic control affecting access to any hospital, forty-eight (48) hours notification and coordination will be given in person mutually by the Contractor and the City Project Coordinator.

The Police Department will not enforce parking restrictions indiscriminately applied. A "No Parking" notification, supplied by the contractor, shall be applied only as and when needed, and shall be removed unless absolutely necessary.

The Contractor shall submit a Project Work Schedule and a detailed Traffic Control plan to the City Project Coordinator five (5) working days prior to the pre-construction conference. Prior to the start of construction the Contractor must have a Traffic Control plan approved by the City Project Coordinator.

Any signs, barricades, or barriers which are necessary for night time hours or poor visibility shall utilize warning lights as specified in the latest editions of either the NDOT Work Zone Traffic Control Handbook or Part VI of the MUTCD.

The Contractor shall coordinate Traffic Control with the Sparks Police Department with respect to any special events that may be affected by construction activities.

The Contractor shall notify Sparks Dispatch (775) 353-2231 24 hours prior to any scheduled detour.

The Contractor shall be responsible for Traffic Control until such time as any street markings eradicated by the work are replaced with permanent markings. The Contractor shall be required to provide and install any temporary pavement markings as required and these shall conform to spacing and other requirements as established by the City.

The approval by the City Project Coordinator of the submitted Traffic Control Plan shall in no way relieve the Contractor of his responsibility for safety requirements conforming to Section 22 of the Special Provisions. Failure to comply with any specification herein or with direction from the City Project Coordinator may result in a stoppage of work until compliance is restored.

349.04 Measurement of Quantities and Basis of Payment. Refer to Bid Item Clarification

LOCATION #1

Install two (2) fixed bollards

Construct colored PCC pad

Construct PCC pad

***Exact placement to be field verified**

Location #1A

Remove Existing and Construct PCC Foundation including Installation of High Security Fixed Bollard

See Detail P

Construct +/- 25 SF colored PCC pad

Location #1B

Remove Existing and Construct PCC Foundation including Installation of High Security Fixed Bollard

See Detail P

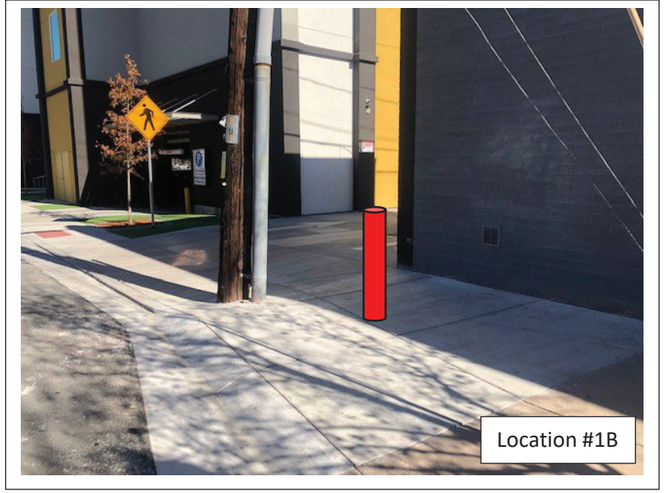
Construct +/- 55 SF PCC pad

LEGEND

Fixed Bollard

PCC Pad


Location #1A


Location #1B

LOCATION #2

Install five (5) fixed bollards

Construct colored PCC pad

***Exact placement to be field verified**

VICTORIAN PLAZA CIRCLE

NUGGET EVENT CENTER

N

Location #2A

VICTORIAN AVENUE

Location #2B

existing traffic signal pole

NUGGET CASINO

032-201-20

032-202-35

Location #2A

Remove Existing and Construct PCC Foundation including Installation of High Security Fixed Bollard

See Detail P

Construct +/- 35 SF colored PCC pad

Location #2B

Remove Existing and Construct PCC Foundation including Installation of High Security Fixed Bollard

See Detail P

Construct +/- 270 SF colored PCC pad

LEGEND

Fixed Bollard

PCC Pad

Location #2B

City of Sparks Community Services

LOCATION #3

Install three (3) fixed bollards

Construct PCC pad

***Exact placement to be field verified**

BRIDGES PROJECT

existing hydrant

Location #3A

Remove Existing and Construct PCC Foundation including Installation of High Security Fixed Bollard

See Detail P

Construct +/- 45 SF PCC pad

Location #3B

Remove Existing and Construct PCC Foundation including Installation of High Security Fixed Bollard

See Detail P

existing street light

VICTORIAN PLAZA CIR

NUGGET EVENT CENTER

Location #3A

Location #3B

LEGEND

Fixed Bollard

PCC Pad

N

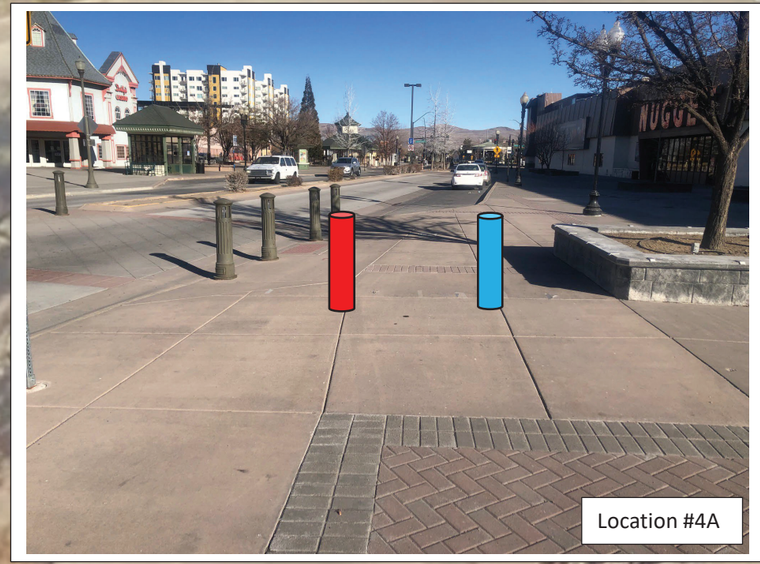
LOCATION #4

Install one (1) fixed bollard

Install five (5) removeable bollards

Construct colored PCC pad

***Exact placement to be field verified**



Location #4A

Location #4B

VICTORIAN AVE

Location #4A

Remove Existing and Construct PCC Foundation including Installation of High Security Fixed Bollard and High Security Removeable Bollard

See Detail O
See Detail P

Construct +/- 90 SF colored PCC pad

Location #4B

Remove Existing and Construct PCC Foundation including Installation of High Security Removeable Bollard

See Detail O

Construct +/- 155 SF colored PCC pad

LEGEND

Fixed Bollard

Removeable Bollard

PCC Pad

N

City of Sparks Community Services

LOCATION #5

Install three (3) fixed bollards

Install sleeves for exiting irrigation

Install manual pop-up barricade systems (WB)

Install hydraulic pop-up barricade systems (EB)

Construct colored PCC median island driveway

Construct colored PCC ADA accessible ramp

Construct colored PCC sidewalk

***Exact placement to be field verified**

Remove Existing and Construct PCC Foundation with Transition, including Installation of High Security Shallow Mount Barricade System – manual

See Details A-D and Appendix A

Install 24" Stop Bar (Thermoplastic)

Install Arrow (Thermoplastic)

Approximate location of existing interconnect. Contractor to field verify depths and coordinate relocations, as necessary, with the City of Sparks

Remove Existing and Construct Median Island Commercial Driveway, colored PCC

Opening Width = 25'

Location #5A

Remove Existing and Construct PCC Foundation with Transition, including Installation of High Security Shallow Mount Barricade System – hydraulic

See Details A – N and Appendix A

Remove Existing and Construct Colored PCC ADA Accessible Ramp

Furnish and install one (1) 6-inch Schedule 40, PVC sleeve and two (2) 2-inch Schedule 40, PVC sleeves under both the barricades system and commercial driveway. Sleeves to extend +/-2' beyond each structure.

VICTORIAN AVE

VICTORIAN PLAZA CIRCLE

Approximate location of existing storm drain. Contractor to field verify depths and coordinate protection with the City of Sparks

Location to install Control Panel for Barricade Hydraulic System

Location for Power Pedestal (not included with this project)

Location #5A

Remove Existing and Construct PCC Foundation including Installation of High Security Fixed Bollard

See Detail P

Location #5A

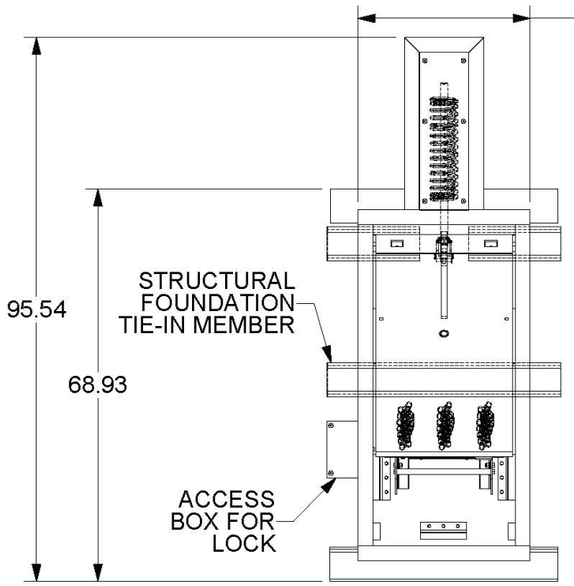
Remove Existing and Construct +/- 1,616 SF colored PCC sidewalk

N

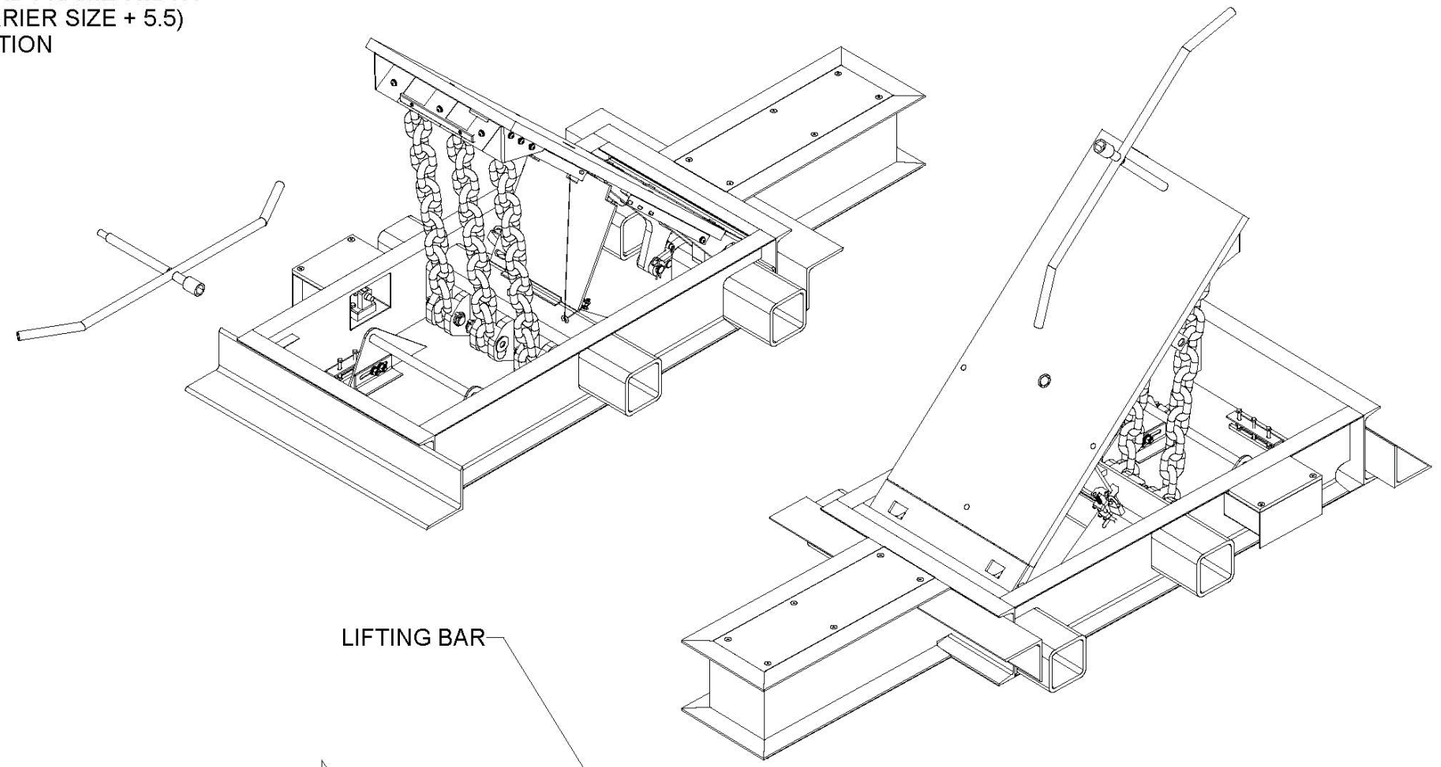
LEGEND

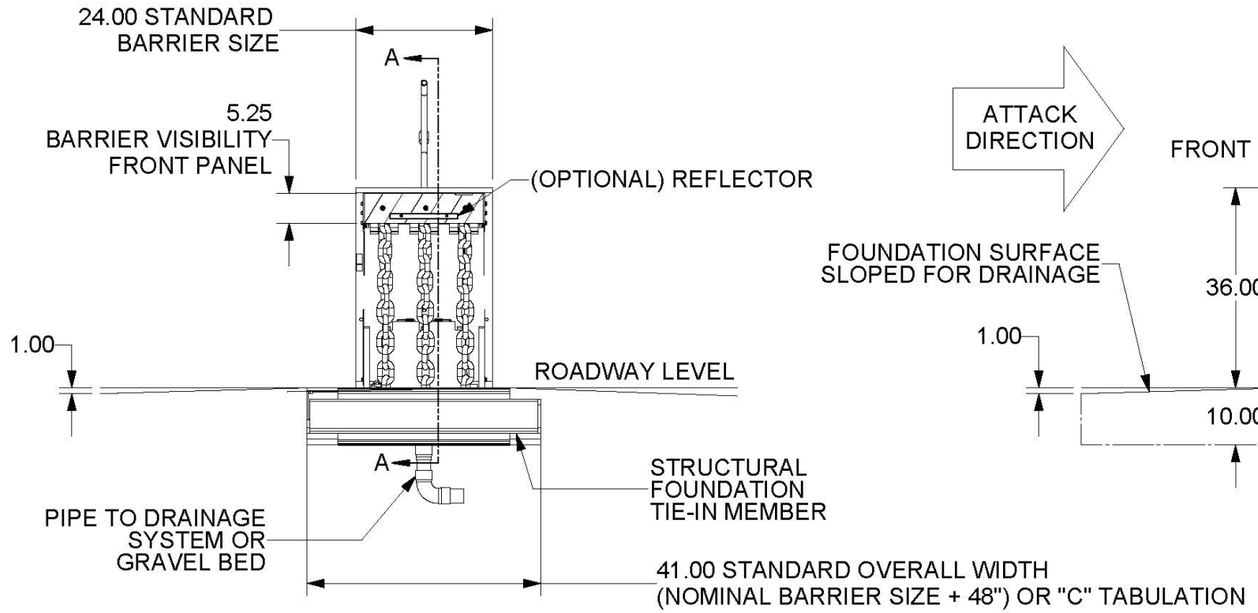
- Pop Up Barricade - manual
- Pop Up Barricade – hydraulic
- Fixed Bollard
- PCC Sidewalk

City of Sparks Community Services

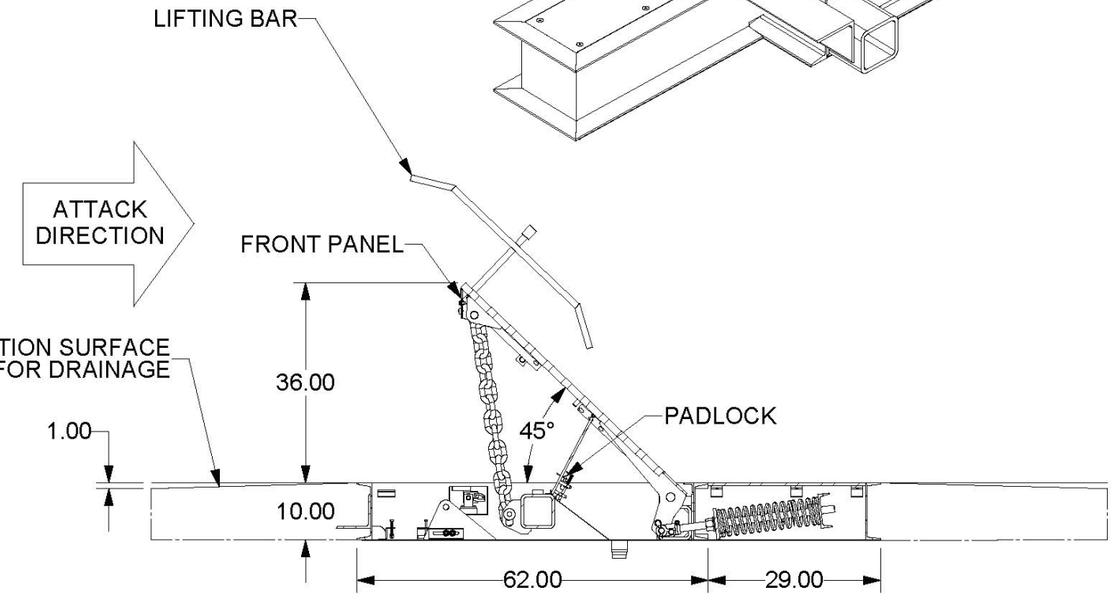


PLAN VIEW - UP POSITION





FRONT ELEVATION - UP POSITION



SECTION A-A

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ± .060/FT
.XX = ± .030/FT
.XXX = ± .010/FT
ANGLES = ± 0°

SURFACE FINISH
125

REMOVE ALL BURRS AND BREAK SHARP EDGES .02 MAX.

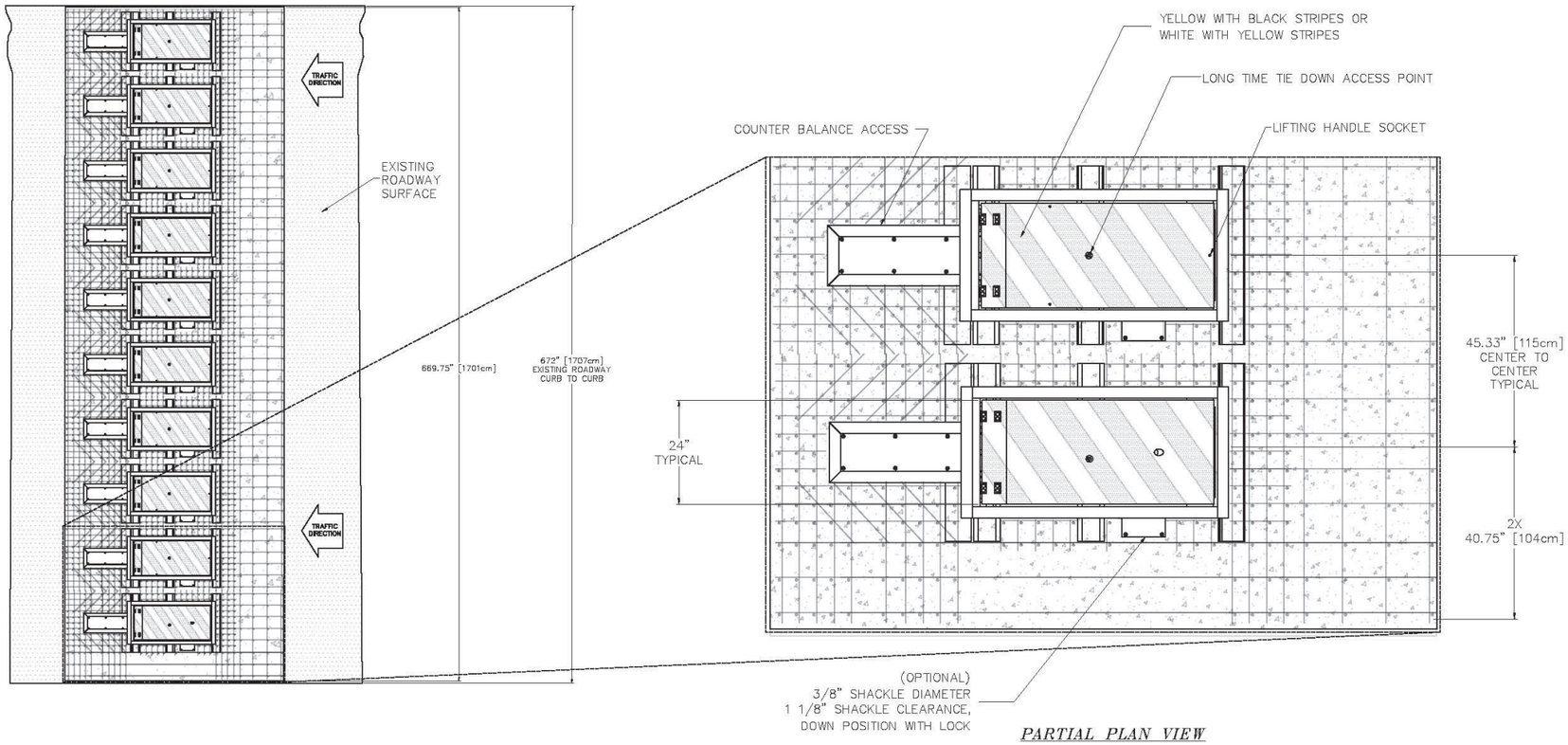
DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575-1000 FAX (661) 575-1109

DSC2000(M) MANUAL PHALANX BARRIER
GENERAL ARRANGEMENT

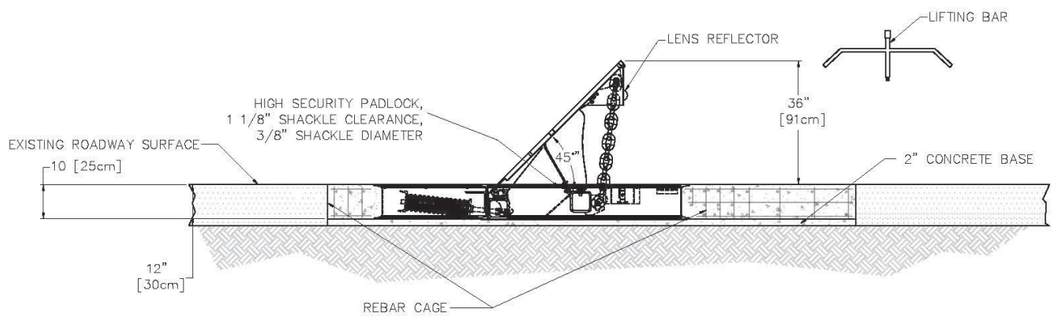
DRAWN BY	DATE	DRAWING NO.	REV.
AWL	3/31/2020	90133	-
CHKD BY	DATE		
APPV BY	DATE	SCALE: 1:12	SHEET: SHEET 1 OF 1

DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION

DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL A



PARTIAL PLAN VIEW



SIDE ELEVATION

CONCRETE NOTES & RECOMMENDED SPECIFICATIONS:

1. CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE.
2. FOUNDATION CONCRETE MAY BE PLACED DIRECTLY INTO NEAT EXCAVATIONS, PROVIDED THE SIDES OF THE EXCAVATION ARE STABLE. WHERE CAVING OCCURS, PROVIDE SHORING. TYPE AND METHOD OF SHORING SHALL BE AT CONTRACTORS OPTION.
3. THE EXCAVATION SHALL BE KEPT DRY AT ALL TIMES. GROUND WATER, IF ENCOUNTERED, SHALL BE PUMPED FROM THE EXCAVATION.
4. CONCRETE SHALL BE LABORATORY DESIGNED, MACHINE MIXED, PRODUCING 3,000 PSI (20,68 MPA) AT 28 DAYS.
5. CEMENT SHALL BE TESTED PORTLAND CEMENT CONFORMING TO ASTM C150, TYPE II ONLY.
6. AGGREGATES SHALL CONFORM TO ASTM C33 & B GRADE PER STANDARD SPECIFICATIONS. MAXIMUM SIZE OF AGGREGATE SHALL BE 1-1/2 INCHES (38mm).
7. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60 (60,000 PSI OR 413.7MPA).
8. HOOKS AND BENDS SHALL CONFORM TO ACI STANDARD 318. LATEST REVISION. INSIDE DIAMETER OFF HOOKS AND BENDS SHALL BE AT LEAST SIX (6) BAR DIAMETERS.
9. PROVIDE SPACER BARS, CHAIRS, SPREADERS, BLOCKS, ETC. AS REQUIRED TO POSITIVELY HOLD THE STEEL IN PLACE BEFORE CONCRETE IS POURED.
10. CONCRETE SHALL BE CONVEYED FROM THE MIXER TO FINAL DEPOSIT BY METHODS THAT WILL PREVENT SEPARATION OR LOSS OF MATERIALS.
11. CONCRETE SHALL BE THOROUGHLY CONSOLIDATED BY SUITABLE MEANS DURING PLACEMENT AND SHALL BE THOROUGHLY WORKED AROUND REINFORCEMENT AND EMBEDDED FIXTURES AND CORNERS OF FORMS.
12. CONCRETE SHALL BE MAINTAINED ABOVE 50°F (10°C) AND IN A MOIST CONDITION FOR AT LEAST SEVEN (7) DAYS AFTER PLACEMENT. ADEQUATE EQUIPMENT SHALL BE PROVIDED FOR HEATING CONCRETE MATERIALS AND PROTECTING CONCRETE DURING FREEZING OR NEAR FREEZING WEATHER.
13. WHERE EXTERIOR WALL FACE REQUIRES SHORING AND/OR FORMING, THE FORMS SHALL BE SUBSTANTIAL AND SUFFICIENTLY TIGHT TO PREVENT LEAKAGE. FORMS SHALL NOT BE REMOVED UNTIL THE CONCRETE IS SEVEN (7) DAYS OLD.
14. BACKFILLING SHALL BE DONE BY DEPOSITING AND TAMPING INTO PLACE CLEAN SAND OR POURING LEAN CONCRETE, TO 95% COMPACTION. WATER JETTING SHALL NOT BE ALLOWED.
15. CONDUITS AND PIPES OF ALUMINUM SHALL NOT BE ALLOWED.
16. CONSTRUCTION JOINTS NOT INDICATED ON THE DRAWINGS SHALL NOT BE ALLOWED. WHERE A CONSTRUCTION JOINT IS TO BE MADE, THE SURFACE OF THE CONCRETE SHALL BE THOROUGHLY CLEANED AND ALL LAITANCE AND STANDING WATER REMOVED.
17. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT AREAS AGAINST DAMAGE AND SHALL REPAIR OR PATCH ALL DAMAGED AREAS TO MATCH EXISTING IMPROVEMENTS.
18. CONTRACTOR SHALL KEEP THE CONSTRUCTION AREA CLEAN AT ALL TIMES AND AT COMPLETION OF WORK, REMOVE ALL SURPLUS MATERIALS, EQUIPMENT AND DEBRIS AND LEAVE THE PREMISES IN A CLEAN CONDITION ACCEPTABLE TO THE OWNER OR OWNER'S REPRESENTATIVE.

* TESTED IN FULL SCALE CONFIGURATION BY AN INDEPENDENT TEST LABORATORY.
ATTACK VEHICLE: 3/4 TON PICKUP TRUCK (5,512 POUNDS)
ATTACK SPEED: 60.78 MPH.
PENETRATION: NONE.

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ±.050/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH 125

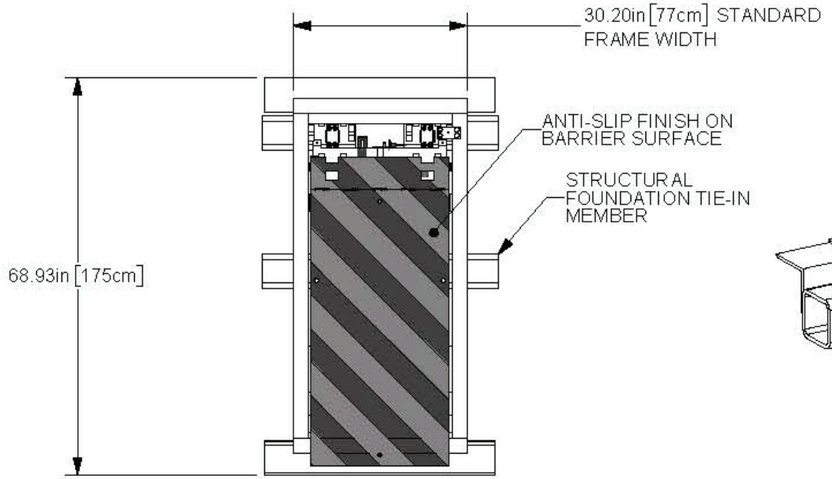
REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

DELTA SCIENTIFIC CORPORATION
24901 WEST AVE. STANFORD
VALENCIA, CA 91355 U.S.A.
(661) 257-1800 FAX (661) 257-0617

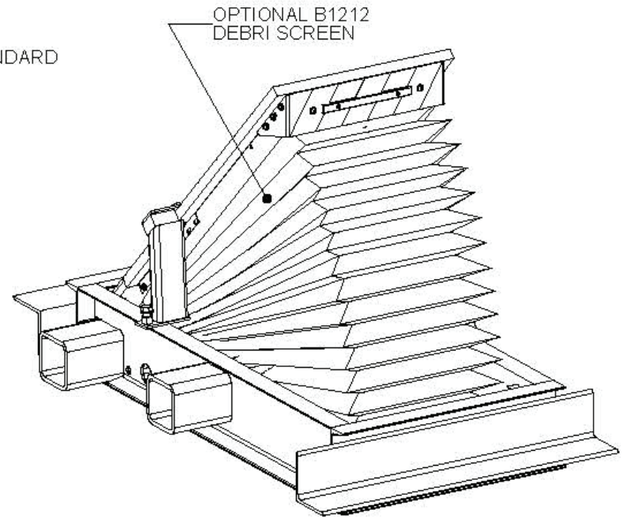
MODEL DSC2000(M)-10 BARRIERS
FULL MANUAL OPERATION SITE LAYOUT*

DRWN BY	DATE	DRAWING NO.	REV.
AWL	2/4/2022	J10262A-11	–
CHKD BY	DATE		
APPVD BY	DATE	SCALE: N.T.S.	SHEET: 1 OF 1

DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION
DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL B



PLAN VIEW - DOWN POSITION



NOTES:

1. OPTIONAL FEATURES (PARTIAL)

		PART NO.
(A)	HEATER, 300 WATTS @ 120 VOLTS	B1283
(A)	HEATER, 300 WATTS @ 240 VOLTS	B1284
(B)	LIMIT SWITCH, FULLY DOWN	B2005
(C)	LIMIT SWITCH, FULLY UP	B2006
(D)	HOT-DIP GALVANIZING PRIOR TO PAINTING	
(E)	DEBRI SCREEN	B1212
(F)	RED LED BARRIER LIGHT	B1213
(G)	REFLECTOR	2534-45

2. COLOR OPTIONS:

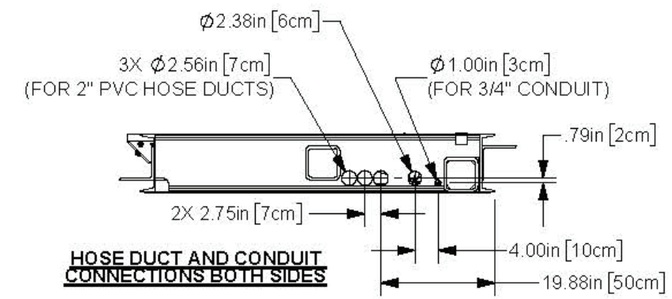
   SCHEME 90130-20: WHITE W/4" WIDE YELLOW STRIPES
   SCHEME 90130-25: BLACK W/4" WIDE YELLOW STRIPES
   SCHEME 90130-30: WHITE W/4" WIDE RED STRIPES

   FOUNDATION - ASBESTOS FREE ASPHALT EMULSION UNDERCOAT.

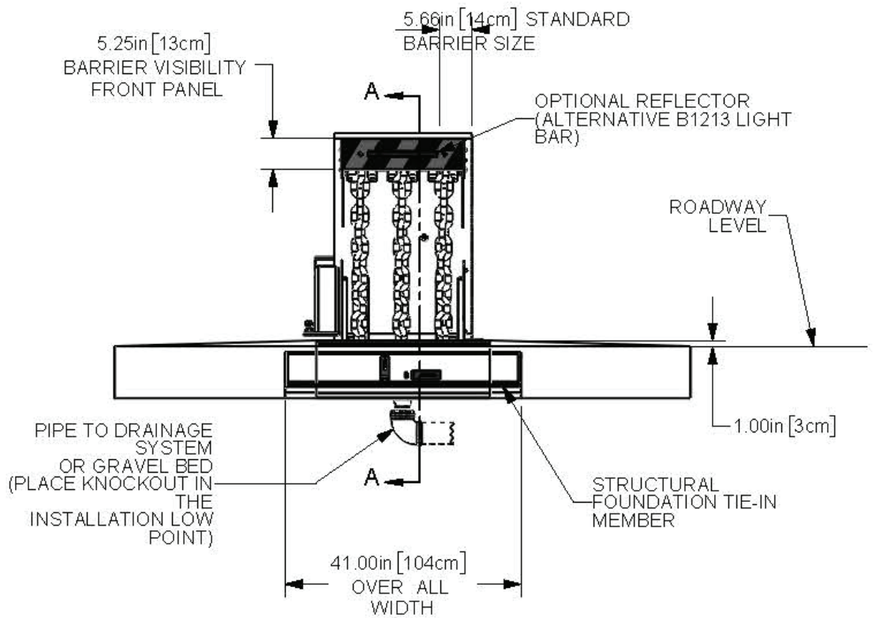
3. ALL STEEL MEMBERS PER AISC STANDARDS WELDING DESIGN CRITERIA AWS D1.1, LATEST REVISION.

4. ALL VISIBLE TOP STEEL COMPONENTS SANDBLASTED TO NEAR WHITE METAL AFTER FABRICATION AND PRIOR TO COATING.

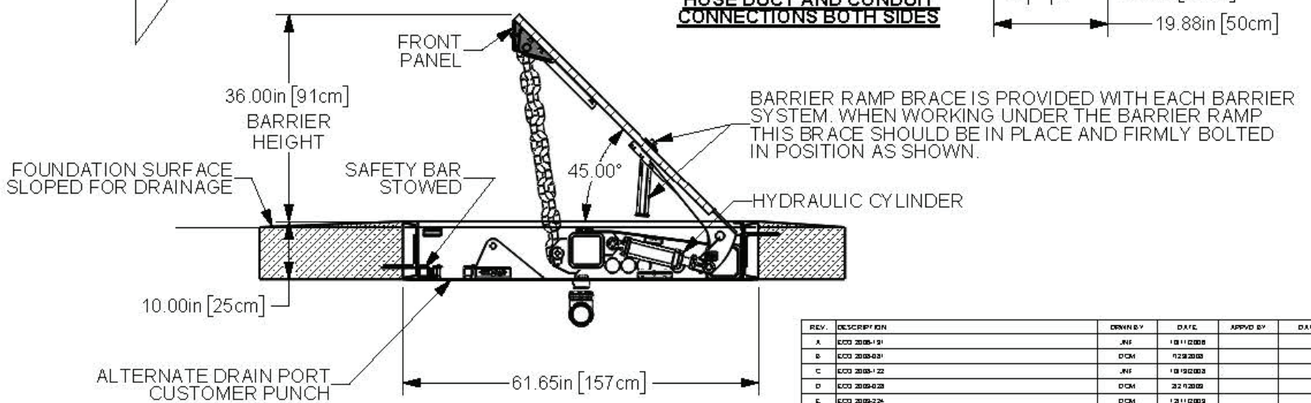
5. REFER TO DRAWING 91130 FOR FOUNDATION SPECIFICATION.



HOSE DUCT AND CONDUIT CONNECTIONS BOTH SIDES



FRONT ELEVATION - UP POSITION



SECTION A-A

REV.	DESCRIPTION	DRWN BY	DATE	APPVD BY	DATE
A	ECO 2008-151	JNF	10/11/2008		
B	ECO 2008-031	DCM	02/28/2008		
C	ECO 2008-122	JNF	10/10/2008		
D	ECO 2009-028	DCM	02/19/2009		
E	ECO 2009-224	DCM	12/11/2009		
F	ECO 2010-158	JNF	10/28/2010		
G	ECO 2013-025	AWL	3/15/2013		
H	ECO 2020-081	AWL	6/4/2020		

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES
TOLERANCES
X = ± .0000 T
.XX = ± .0100 T
.XXX = ± .0010 T
ANGLES = ± 5°
SURFACE FINISH
125
REMOVE ALL BURRS AND BREAK SHARP EDGES .02 MAX

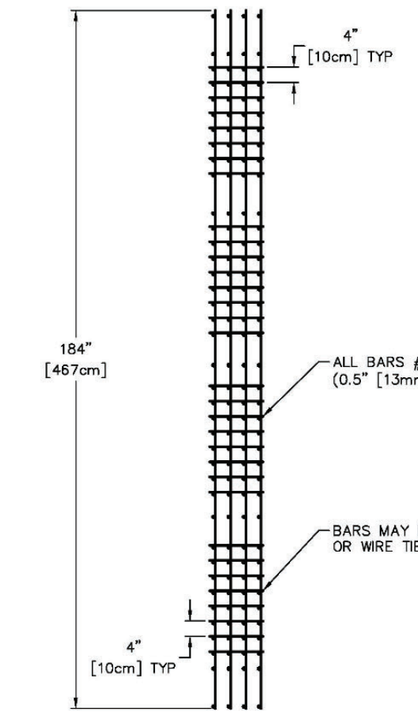
DELTA SCIENTIFIC CORPORATION
4055 B DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575-1000 FAX (661) 575-1009

DSC2000(H)
GENERAL ARRANGEMENT

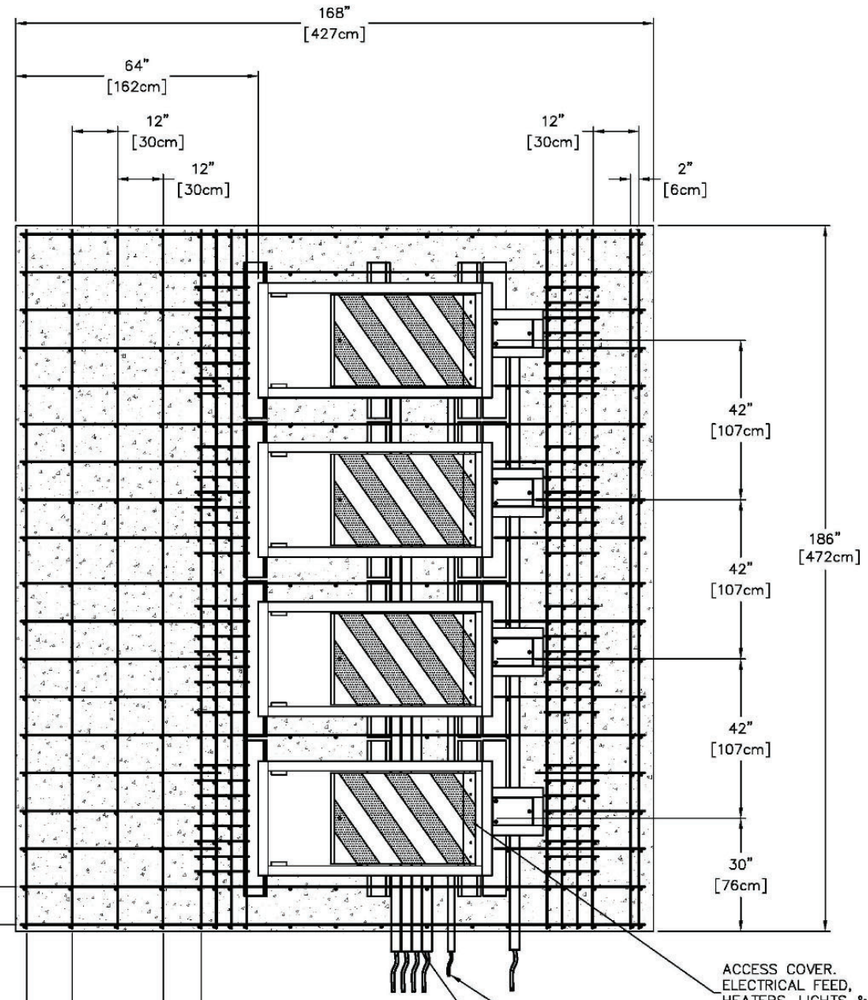
DRAWN BY	DATE	DRAWING NO.	REV.
AWL	6/2/2020	90130	H
CHKD BY	DATE		
APPV'D BY	DATE	SCALE: 1:12	SHEET 1 OF 1

PHALANX™

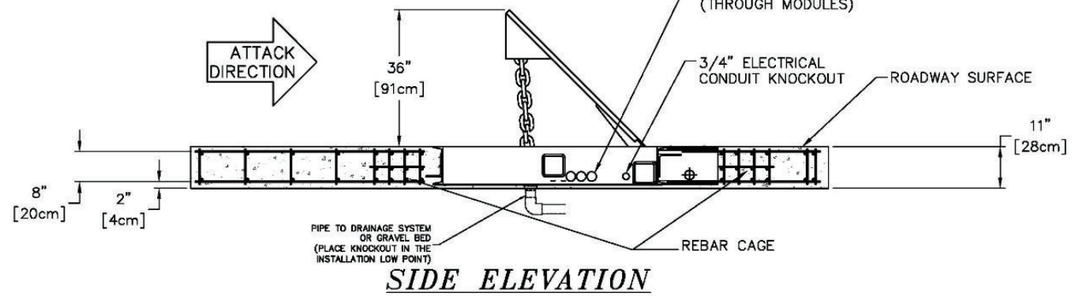
DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION
DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL C



MAIN REBAR BEAM
TWO REQUIRED



PLAN VIEW



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12. CONCRETE SHALL BE MAINTAINED ABOVE 50°F (10°C) AND IN A MOIST CONDITION FOR AT LEAST SEVEN (7) DAYS AFTER PLACEMENT. ADEQUATE EQUIPMENT SHALL BE PROVIDED FOR HEATING CONCRETE MATERIALS AND PROTECTING CONCRETE DURING FREEZING OR NEAR FREEZING WEATHER.
13. WHERE EXTERIOR WALL FACE REQUIRES SHORING AND/OR FORMING, THE FORMS SHALL BE SUBSTANTIAL AND SUFFICIENTLY TIGHT TO PREVENT LEAKAGE. FORMS SHALL NOT BE REMOVED UNTIL THE CONCRETE IS SEVEN (7) DAYS OLD.
14. BACKFILLING SHALL BE DONE BY DEPOSITING AND TAMPING INTO PLACE CLEAN SAND OR POURING LEAN CONCRETE, TO 95% COMPACTION. WATER JETTING SHALL NOT BE ALLOWED.
15. CONDUITS AND PIPES OF ALUMINUM SHALL NOT BE ALLOWED.
16. CONSTRUCTION JOINTS NOT INDICATED ON THE DRAWINGS SHALL NOT BE ALLOWED. WHERE A CONSTRUCTION JOINT IS TO BE MADE, THE SURFACE OF THE CONCRETE SHALL BE THOROUGHLY CLEANED AND ALL LAITANCE AND STANDING WATER REMOVED.
17. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT AREAS AGAINST DAMAGE AND SHALL REPAIR OR PATCH ALL DAMAGED AREAS TO MATCH EXISTING IMPROVEMENTS.
18. CONTRACTOR SHALL KEEP THE CONSTRUCTION AREA CLEAN AT ALL TIMES AND AT COMPLETION OF WORK, REMOVE ALL SURPLUS MATERIALS, EQUIPMENT AND DEBRIS AND LEAVE THE PREMISES IN A CLEAN CONDITION ACCEPTABLE TO THE OWNER OR OWNER'S REPRESENTATIVE.

* AS TESTED IN ACCORDANCE WITH THE UNITED STATES DEPARTMENT OF STATE, CERTIFICATION STANDARD SD-STD-02.01, REV. A
RATING: K12

PHALANX™

REV.	DESCRIPTION		DRWN BY	DATE	APPVD BY	DATE
A	ECO #2006–131		JNF	10/11/06		

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ±.060/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH 125

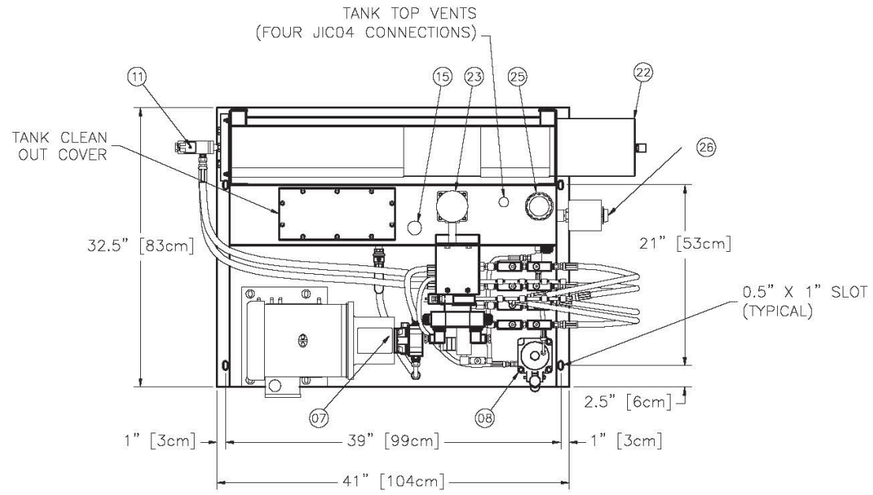
REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575-1100 FAX (661) 575-1109

MODEL DSC2000 PHALANX BARRIER
FOUNDATION SPECIFICATION *

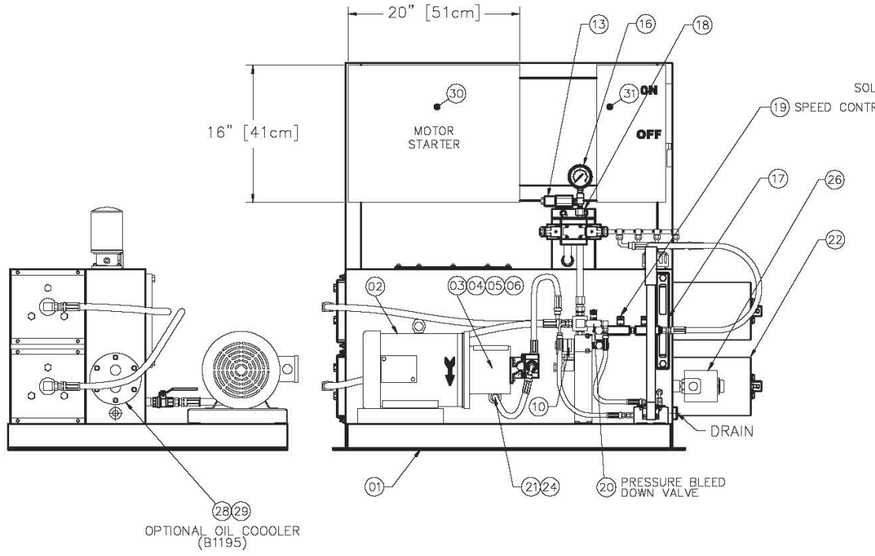
DRAWN BY	DATE	DRAWING NO.	REV.
J. FRIEND	03/28/05	91130–4	A
CHKD BY	DATE		
APPVD BY	DATE	SCALE: 1:18 (D SIZE)	SHEET 1 OF 1

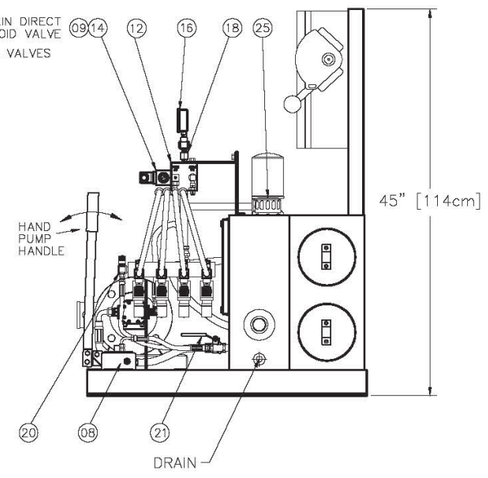
DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION
DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL D

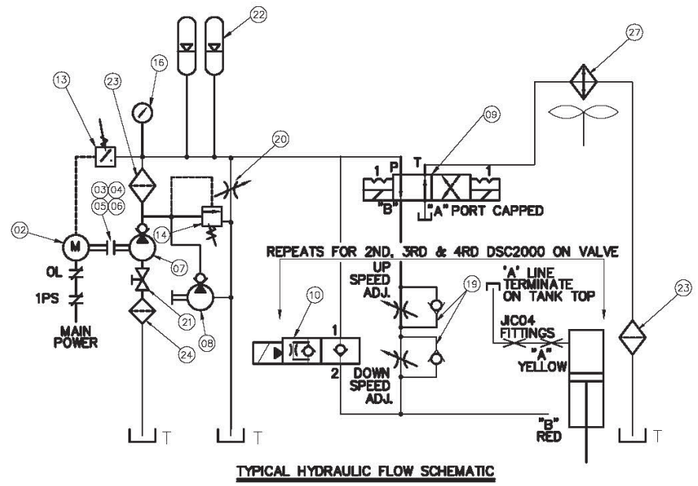


	ITEM	REQ'D	MATERIAL DESCRIPTION	STK. NO.
	01	1	HPU, TANK AND FRAME	8050-00
	02	1	MOTOR, 'H' HP @ 'V' (SPECIFIED VOLTAGE)	2464-'M'
	03	1	PUMP/MOTOR ADAPTER, 8.5" AK TO SAE 4 BOLT,	2464-32
	04	1	PUMP HALF COUPLING, 1/2"	2464-53
	05	1	MOTOR HALF COUPLING, 1 1/8"	2464-52
	06	1	COUPLING SPIDER,	2464-61
	07	1	HYD PUMP, 0.258 CUBIC INCH/REV	2471-27
OPTIONAL	08	0 or 1	HANDPUMP, B1325 OPTION	2471-21
	09	1	VALVE,SOLENOID, D03, 24 VDC, SPRING DETENTED	2467-01
	10	3	VALVE, EFO, 24 VDC	2467-31
OPTIONAL	11	0 or 1	VALVE, AUXILIARY EFO, 24 VDC, B1020 OPTION	2467-33
	12	1	MANIFOLD, ISO 03, SINGLE STATION	2467-71
	13	1	PRESSURE SWITCH, OFF @ 1900 PSIG/REST 1400 PSIG,	2465-01
	14	1	PRESSURE RELIEF VALVE, SET 2200 PSIG,	2465-05
	15	1	LEVEL SWITCH,	2465-11
	16	1	PRESSURE GUAGE, 0-3000 PSIG,	2465-21
	17	1	LEVEL GAUGE, 10",	2465-22
	18	1	GAUGE SNUBBER, 1/4" NPT SIZE,	2465-23
	19	8	VALVE, FLOW CONTROL, 3/8" NPT,	2466-02
	20	1	VALVE, NEEDLE, 1/4" NPT,	2466-11
	21	1	VALVE, BALL, 1/2" NPT, BRONZE	2466-33B
	22	1 or 2	ACCUMULATOR, PISTON TYPE, 5 GALLON,	2469-94
	23	1	FILTER ELEMENT/HOUSING, TANK TOP TYPE,	2470-02
	24	1	SUCTION STRAINER,	2470-41
	25	1	FILLER BREATHER,	2470-43
OPTIONAL	26	0 or 1	TANK HEATER, B1190 or B1191 OPTION	2465-xx
OPTIONAL	27	0 or 1	OIL RESERVOIR COOLER (AIR), B1196 OPTION	2465-xx
OPTIONAL	28	0 or 1	OIL COOLER, WATER COOLED, B1195 OPTION	2465-52
OPTIONAL	29	0 or 1	OIL COOLER WATER THERMOSTAT, B1195 OPTION	2465-53
	30	1	MOTOR STARTER, CONTROL CIRCUIT	906xx
OPTIONAL	31	0 or 1	DISCONNECT SWITCH, B1260 OPTION	2531-110

TOTAL WEIGHT = 750 POUNDS [340 KG] DUAL ACCUMULATORS
TOTAL WEIGHT = 555 POUNDS [250 KG] SINGLE ACCUMULATOR







TYPICAL HYDRAULIC FLOW SCHEMATIC

BARRIERS OPERATE SINGLE ACTING WITH ROD END VENTS

REV.	DESCRIPTION	DRWN BY	DATE	APPVD BY	DATE
A	ECO #2011-035	JNF	05/19/11		

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES:
.X = ±.060/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH
125

REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575-1100 FAX (661) 575-1109

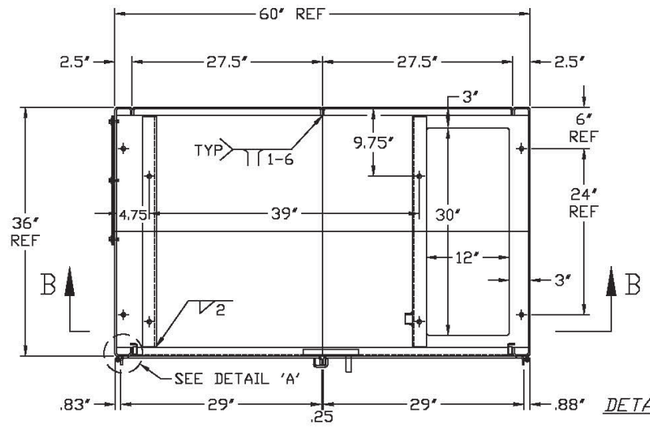
DELTA HYDRAULIC POWER UNIT
GENERAL ARRANGEMENT

DRWN BY	DATE	DRAWING NO.	REV.
J. FRIEND	01/23/06	90535-4	A
CHKD BY	DATE		
APPVD BY	DATE	SCALE: 1:8 (D SIZE)	SHEET: SHEET 1 OF 1

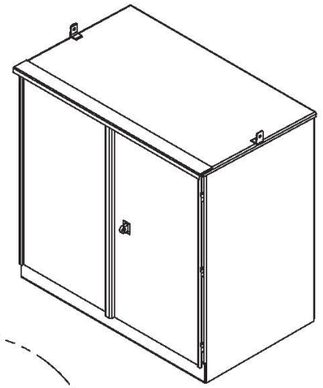
DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION
DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL E

ITEM	REQ'D	DESCRIPTION/MATERIAL	CUT or SHEAR	WT EA	TOT WT	REF NO
1	2	END PANELS, LEFT AND RIGHT	PART	176.5	353.0	7436-1
2	2	REAR PANELS	PART	110.5	221.0	7436-2
3	1	BOTTOM PANEL	PART	199.0	199.0	7436-3
4	1	CABINET BRACKET, RIGHT	PART	17.1	17.1	7436-4
5	1	TOP CHANNEL	PART	15.3	15.3	7436-5
6	1	TOP PANEL	PART	168.5	168.5	7436-6
7	1	DOOR PANEL, RIGHT	PART	117.9	117.9	7436-7
8	1	DOOR PANEL, LEFT	PART	117.9	117.9	7436-8
9	2	LIFTING TABS	PART	0.3	0.7	7436-9
10	1	CABINET BRACKET, LEFT	PART	16.2	16.2	7436-10
11	1	DOOR STOP	PART	4.0	4.0	7436-11
12	1	HALF COUPLING, 1 1/2" NPT	PART	0.1	0.1	COU1015
13	4	WELD NUT, BLIND, 3/8-16	PART	0.1	0.2	WW3310
14	6	HINGE, LIFT OFF, WELDABLE, 6", 520 POUND	PART	0.1	0.6	HIN2000
15	2	GRIP ANGLE	PART	7.8	15.6	7436-15
16	1	GAP COVER	PART	13.5	13.5	7436-16
17	1	HASP	PART	6.0	6.0	7436-17
18	1	TOP LID LIP	PART	11.6	11.6	7436-18
19	1	1/4" THK., RUBBER PAD	PART	0.5	0.5	7436-19
20	1	2" x 3" x 11GA (.120 THK.), SS SHEET METAL	PART	0.9	0.9	7436-20
21	1	HPU ACCUMULATOR ACCESS DOOR PLATE	PART	51.1	51.1	14372
22	12	1/4", FLAT WASHER	PART	0.3	3.6	WAS14SAE
23	12	1/4-20 x 1", HEX HEAD BOLT STAINLESS STEEL	PART	0.9	10.8	HHC14201SS

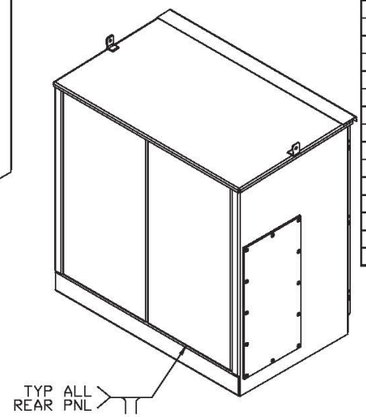
TOTAL WEIGHT 1,345.0



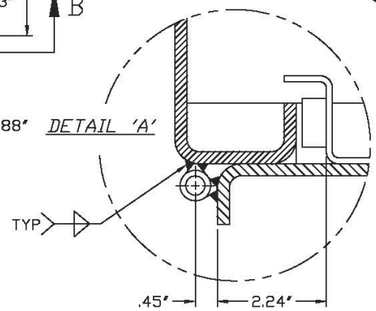
SECTION A-A

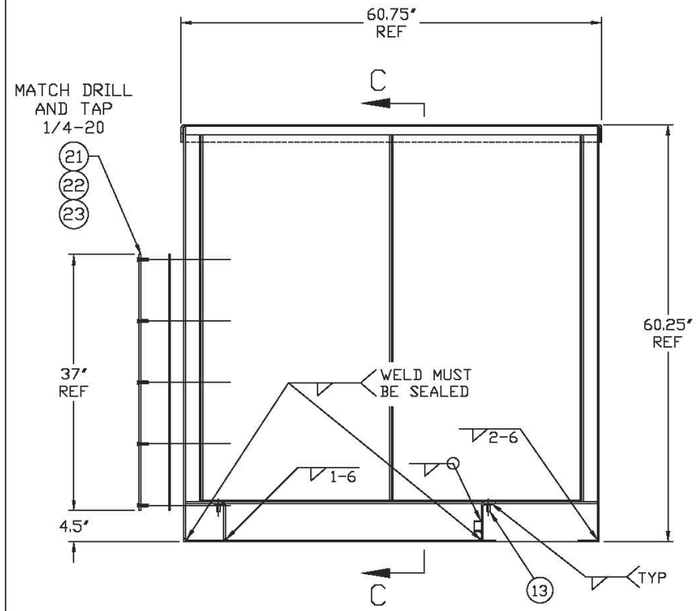


FRONT ISO VIEW

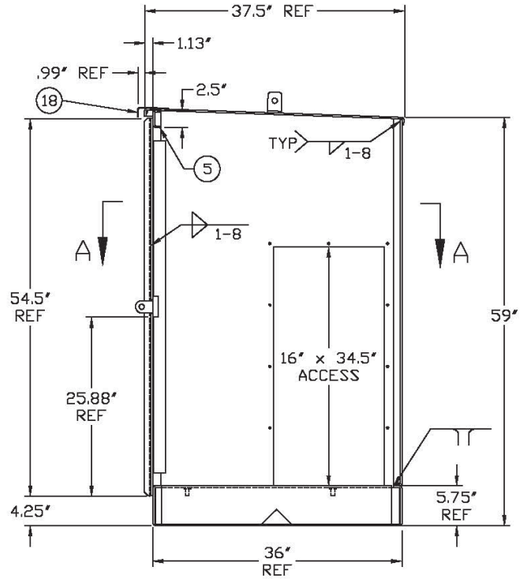


REAR ISO VIEW



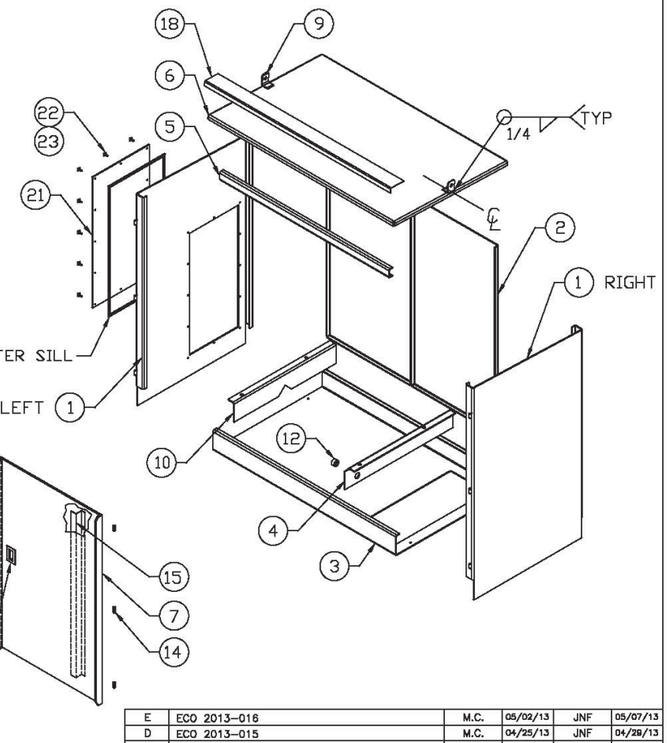


SECTION B-B



SECTION C-C

ITEM 20 DETAIL



REV.	DESCRIPTION	DRWN BY	DATE	APPVD BY	DATE
E	ECO 2013-016	M.C.	05/02/13	JNF	05/07/13
D	ECO 2013-015	M.C.	04/25/13	JNF	04/29/13
C	ECO 2006-070	J.D.	5/30/06		
B	UPDATED HASP & DOOR DESIGN	R.R.	1/11/01		
A	UPDATE PER JOHN FRIEND	R.R.	10/31/00		

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ±.060/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH 125

REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575-1100 FAX (661) 575-1109

FORCE RESISTANT ENCLOSURE
FOR DELTA MODEL HPU

DRWN BY	DATE	DRAWING NO.	REV.
M. SHANA (TVK)	3/17/03	7436	E
CHKD BY	DATE		
APPVD BY	DATE	SCALE: N.T.S.	SHEET 1 OF 1

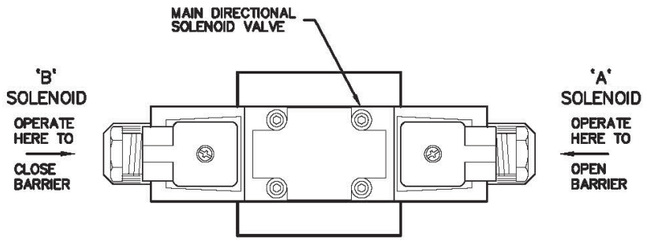
FINISH : PAINT PER CUSTOMER ORDER.

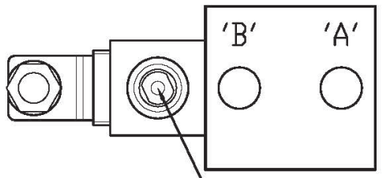
DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION

DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL F

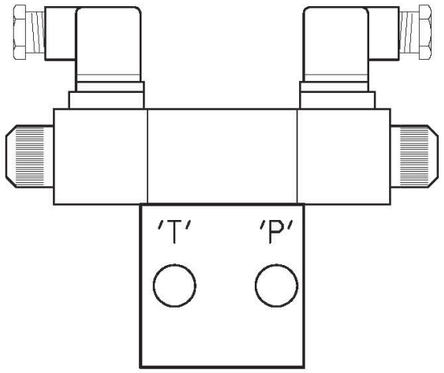
City of Sparks Community Services

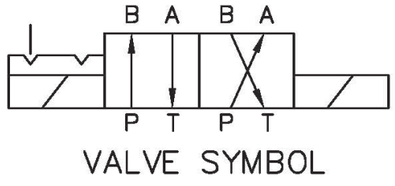
MAIN DIRECTION CONTROL VALVE
(ON MANIFOLD)



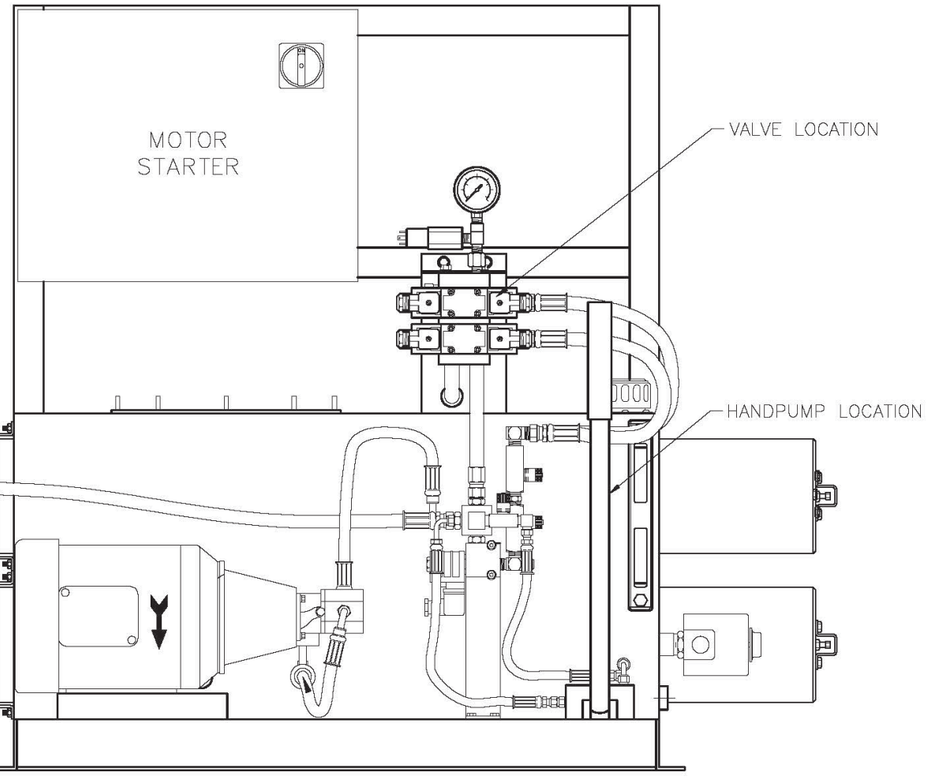


INSERT 1/8" DIAMETER PIN HERE TO SHIFT VALVE. (TYPICAL EITHER SIDE)



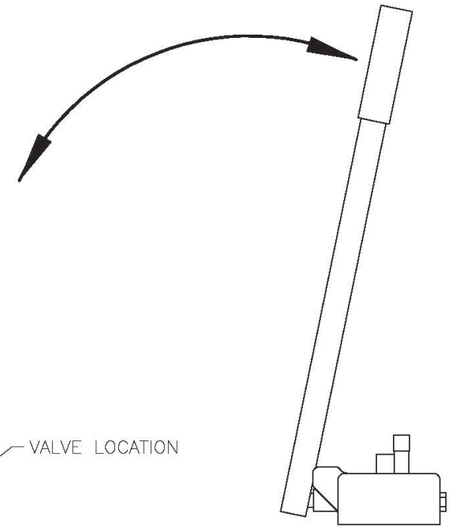


VALVE SYMBOL



FRONT ELEVATION

HANDPUMP
(ON POWER UNIT BASE)



MANUAL OPERATION INSTRUCTIONS:

1) SHIFT VALVE FROM LEFT TO CLOSE OR FROM RIGHT TO OPEN THE BARRIER.

2) OPERATE THE HANDPUMP UNTIL BARRIER IS IN THE DESIRED POSITION.

REV.	DESCRIPTION	DRWN BY	DATE	APPVD BY	DATE
A	ECO #2003-42	JNF	01/21/03		

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ±.060/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH 125

REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575-1100 FAX (661) 575-1109

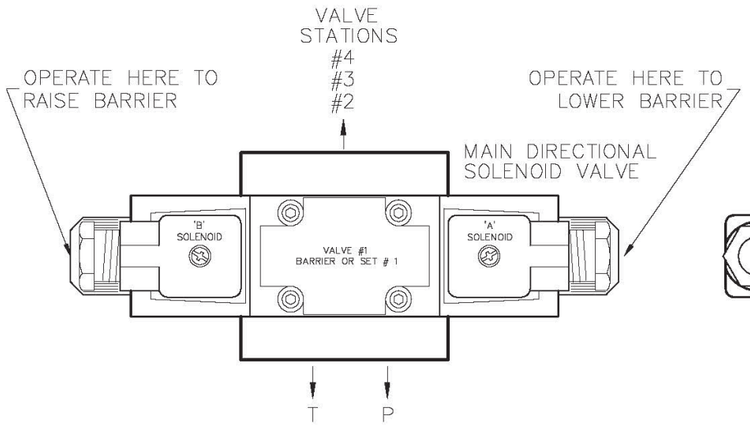
MANUAL OPERATION INSTRUCTIONS
DELTA – SOLENOID VALVE AND HANDPUMP

DRWN BY	DATE	DRAWING NO.	REV.
J.FRIEND	05/29/97	90520	A
CHKD BY	DATE		
APPVD BY	DATE	SCALE: N.T.S.	SHEET SHEET 1 OF 1

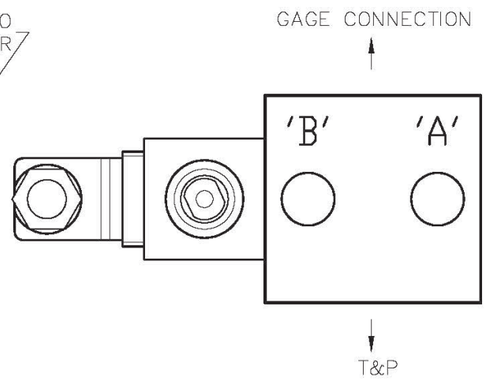
DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION
DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL G

MAIN DIRECTION CONTROL VALVES
(ON MANIFOLD)

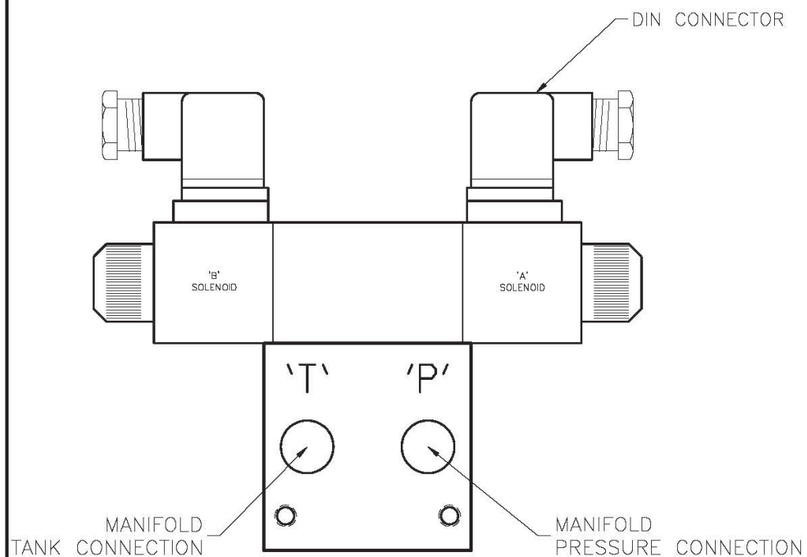
3–B



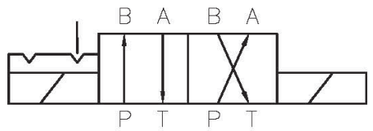
ELEVATION



RIGHT ELEVATION

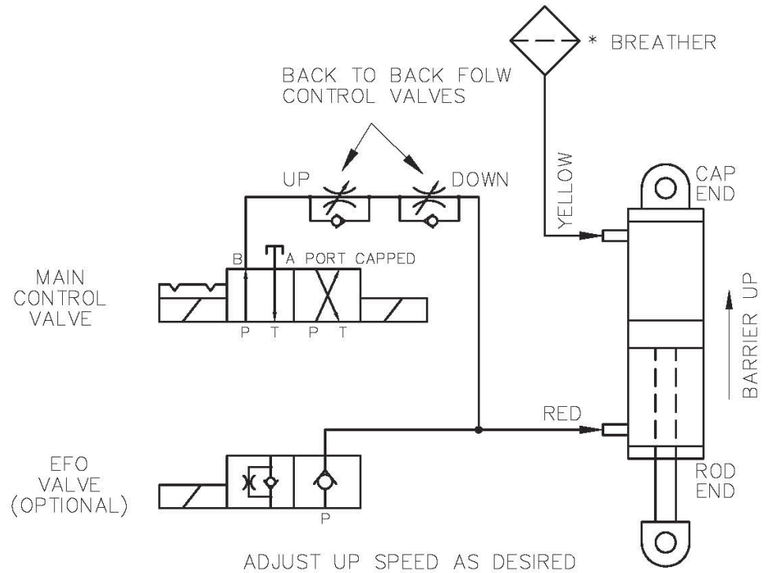


BOTTOM VIEW SHOWNING
PRESSURE AND TANK CONNECTIONS



VALVE SYMBOL

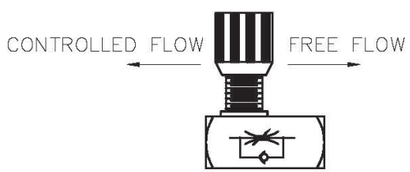
SINGLE ACTING



ADJUST UP SPEED AS DESIRED
ADJUST DOWN SPEED AS DESIRED

* BREATHER OR ALTERNATELY CONNECTED TO HPU TANK TOP

SPEED CONTROL VALVE



FLOW CONTROL VALVE

CLOCKWISE IS SLOWER
COUNTER CLOCKWISE
IS FASTER

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ±.060/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH 125

REMOVE ALL BURRS & BREAK SHARP EDGES .02" MAX

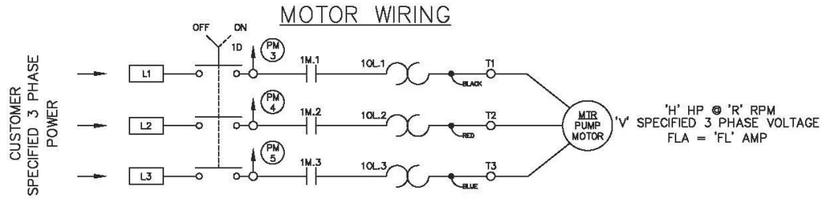
DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575-1100 FAX (661) 575-1109

VALVE CONNECTION DIAGRAM
BACK TO BACK FLOW CONTROL/S.A.

DRAWN BY	DATE	DRAWING NO.	REV.
J.FRIEND	09/21/06	90408	–
CHKD BY	DATE		
APPVD BY	DATE	SCALE: FULL (D SIZE)	SHEET: SHEET 1 OF 1

DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION
DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL H

MOTOR WIRING

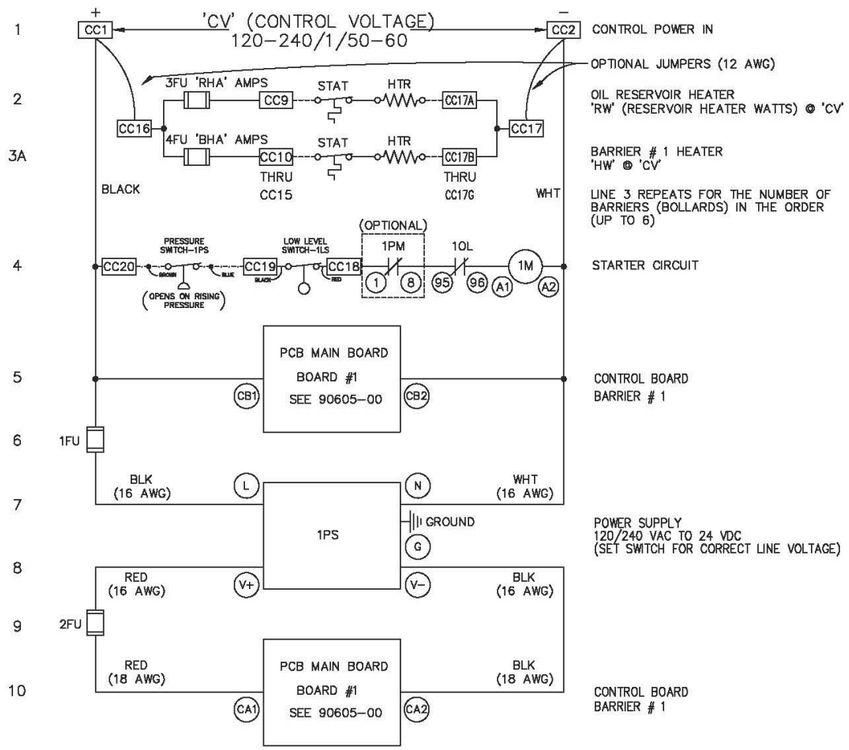


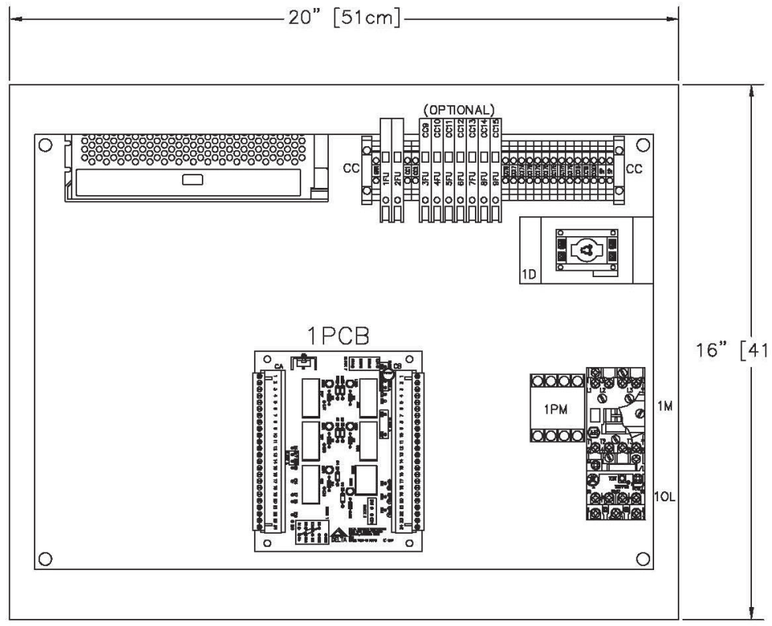
LOCATION	L1	L2	L3	NEUTRAL	GROUND
USA – 200–250 VAC	BLACK	RED	BLUE	WHITE	GREEN *
USA – 400–500 VAC	BROWN	ORANGE	YELLOW	WHITE	GREEN *
CANADA	RED	BLACK	BLUE	WHITE	GREEN *
EUROPE	BROWN	BLACK	GREY	BLUE	GRN/YEL

* GROUND CONDUCTOR MAY BE BARE COPPER WIRE

	ITEM	REQ'D.	DESCRIPTION	STK. NO.
	1PCB	1	DELTA PRINTED CIRCUIT BOARD ASSEMBLY,	90605–00
	1M	1	MOTOR STARTER,	2531–xx
	1OL	1	STARTER OVERLOAD,	2531–xx
OPTIONAL	1D	0 or 1	DISCONNECT, B1260 OPTION	2531–95
OPTIONAL	1PM	0 or 1	POWER MONITOR, B1255 OPTION	2465–6x
	1PS	1	POWER SUPPLY, 120/240 V, 50/60 HZ/24 VDC, 150 WATTS	2461–25
	1FU	1	FUSE, 250 VOLTS, 'PA' AMP, DUAL ELEMENT,	2459–xx
	2FU	1	FUSE, 250 VOLTS, 'SA' AMP, DUAL ELEMENT,	2459–xx
OPTIONAL	3FU	0 or 1	FUSE, 250 VOLTS, 'RHA' AMP, DUAL ELEMENT,	2459–xx
OPTIONAL	4FU–9FU	0 – 6	FUSE, 250 VOLTS, 'BHA' AMP, DUAL ELEMENT,	2459–xx
	01	1	ENCLOSURE, NEMA 'X', 16" x 20" x 6",	2462–xx
	02	1	CHASSIS PAN, 13" x 18.5"	2462–66
	03	9–16	TERMINALS, STANDARD BLOCK	2460–60
	04	1	TERMINALS, GROUNDING BLOCK	2460–61
	05	2	TERMINALS, END BLOCK	2460–62
	06	2–9	TERMINALS, FUSE BLOCK	2460–63

CONTROL CIRCUIT WIRING





APPROXIMATE PARTS LOCATION ON CHASSIS PAN
ENCLOSURE CLASSIFICATION NEMA 1

REV.	DESCRIPTION	DRWN BY	DATE	APPVD BY	DATE
F	ECO #2018–043	CRH	07/17/18		
E	ECO #2011–022	JNF	02/09/11		
D	ECO #2009–071	JNF	04/16/09		
C	ECO #2007–148	JNF	12/07/07		
B	ECO #2003–80	JNF	05/02/03		
A	SEPARATED HEATER CIRCUIT	JNF	09/12/01		

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
X = ±.060/FT
XX = ±.030/FT
XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH 125

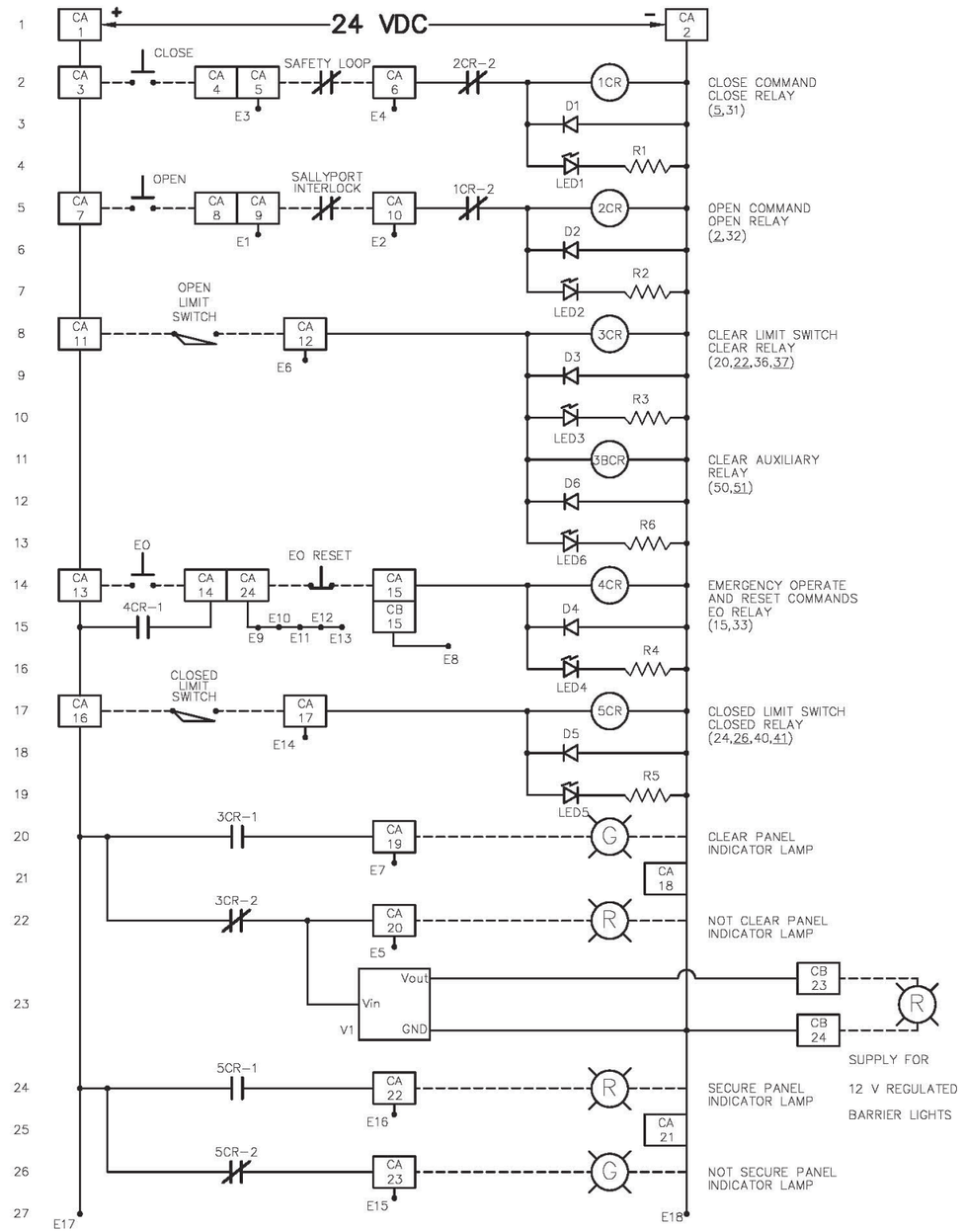
REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575–1100 FAX (661) 575–1109

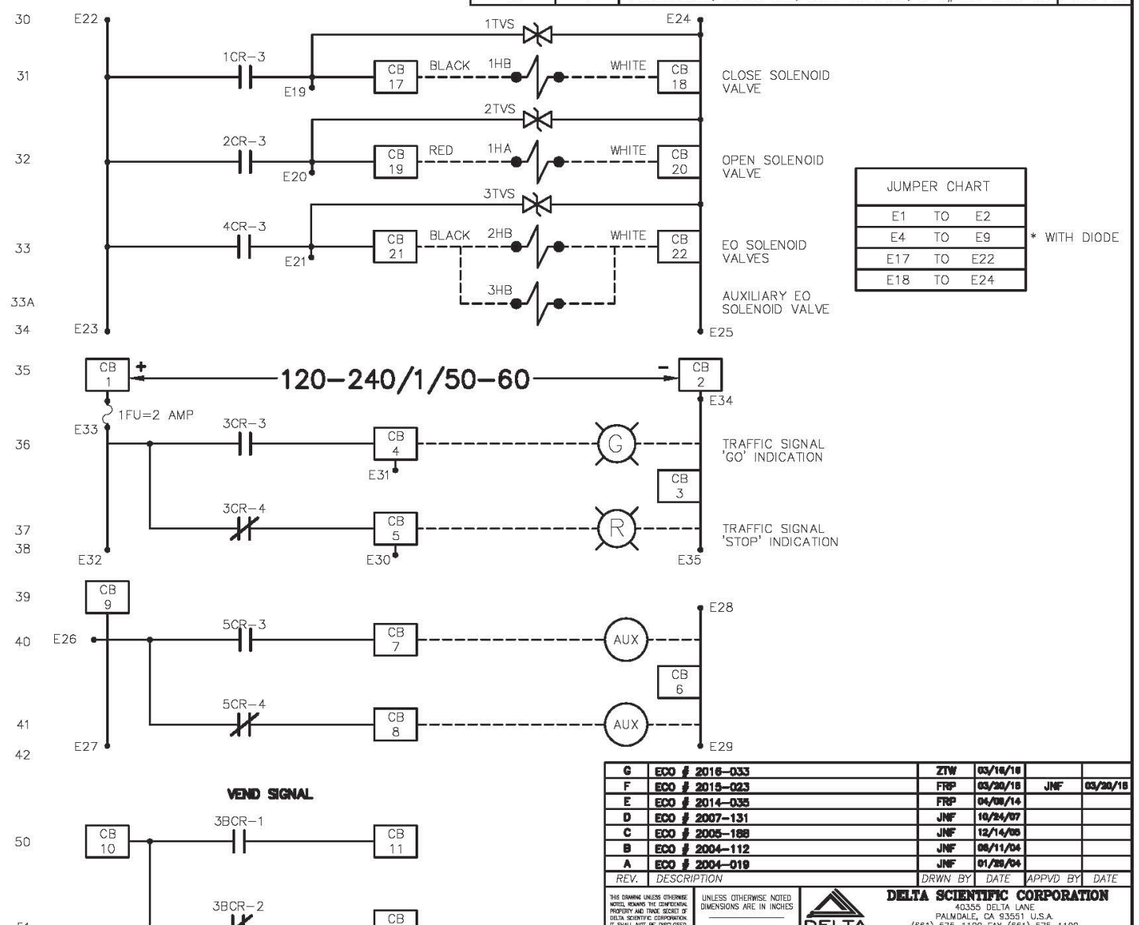
CONTROL CIRCUIT/MOTOR STARTER
SINGLE BARRIER SYSTEM

DRAWN BY	DATE	DRAWING NO.	REV.
J.FRIEND	11/18/98	90600–1	F
CHKD BY	DATE		
APPVD BY	DATE	SCALE: 1:2 (D SIZE)	SHEET 1 OF 1

DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION
DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL I



ITEM	QUAN.	DESCRIPTION	STOCK NO.
1PCB	1	MAIN BOARD, DELTA PART	90605/G
D1–D6	6	DIODE, 1N4007	3546–D1
R1–R6	6	RESISTOR, 2.2K OHMS, 1/8 WATT	3546–R1
LED1–LED6	6	LED, H–P # HLMP–3750	3546–LED
1CR–5CR	5	RELAY, DPDT, 24 VDC, OMRON G2R–24–24VDC	2457–91
3BCR	1	RELAY, SPDT, 24 VDC, OMRON G5L–114P–PS–24VDC	2457–92
1TVS 3TVS	3	TRANSIENT SUPPRESSOR, P6KE62CA	7195–TVS
1FU	1	FUSE, TIME DELAY, 2 A, 507–1114–ND (MFG #21200041)	7195–FU1
V1	1	VOLTAGE REGULATOR, 7812CT, 12 VOLT	7195–V1
01	1	TERMINAL STRIP HEADER, 24 PT, 5EHDRC–24, 1–24	2460–92
02	1	TERMINAL BLOCK, 24 PT, 5ESDV–24, 1–24	2460–93
03	1	TERMINAL STRIP HEADER, 24 PT, 5EHDRC–24, 24–1	2460–94
04	1	TERMINAL BLOCK, 24 PT, 5ESDV–24, 24–1	2460–95
05	1	HEAT SINK, THERMALLOY #60738	7195–05
06	1	6–32 X 0.3125 LG SCREW, NUT & LOCK WASHER	-----
07	1	FUSEHOLDER, MICROFUSE, 5mm PIN TYPE, D–K#486–1249–ND	7195–FH1



REV.	DESCRIPTION	DRWN BY	DATE	APPVD BY	DATE
G	ECO # 2016–033	ZTW	03/16/16		
F	ECO # 2015–023	FRP	03/20/15	JNF	03/20/15
E	ECO # 2014–035	FRP	04/08/14		
D	ECO # 2007–131	JNF	10/24/07		
C	ECO # 2005–188	JNF	12/14/05		
B	ECO # 2004–112	JNF	06/11/04		
A	ECO # 2004–019	JNF	01/29/04		

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ±.060/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH 125

REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575–1100 FAX (661) 575–1109

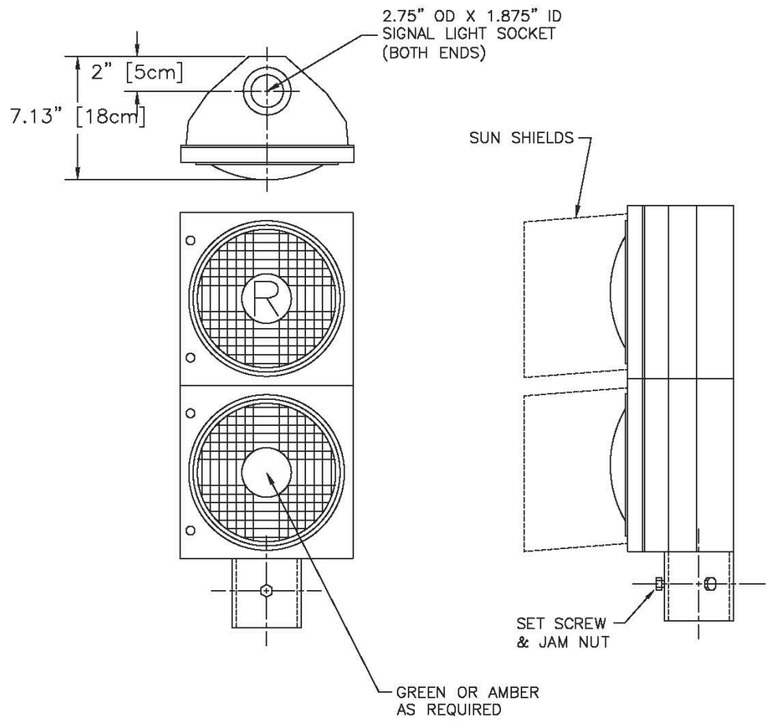
DELTA BARRIER CONTROL CIRCUIT PRINTED CIRCUIT BOARD

DRAWN BY	DATE	DRAWING NO.	REV.
J.FRIEND	11/18/98	90605	G
CHKD BY	DATE		
APPVD BY	DATE	SCALE: N.T.S.	SHEET 1 OF 1

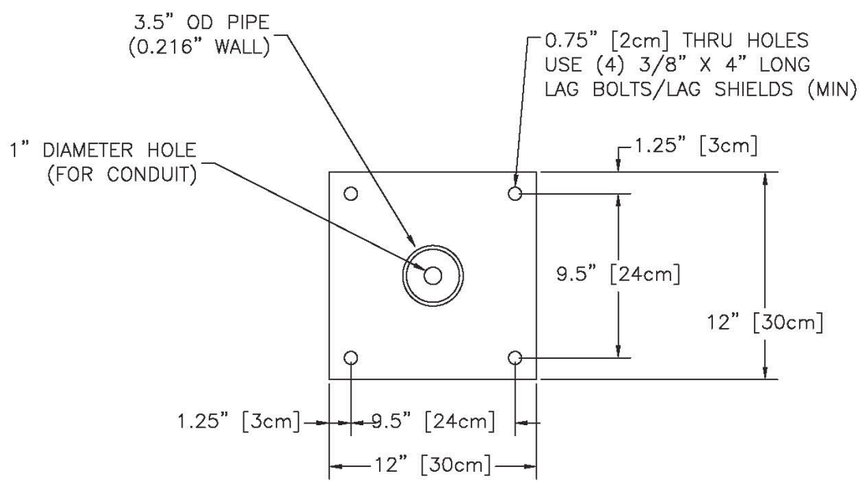
DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION

DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL J

ALL POSTS FURNISHED WITH STANDARD WHITE PAINTED FINISH (MPL–20W)
RED (MPL–20R) AND YELLOW (MPL–20Y) AVAILABLE AS AN OPTION



MODEL MPL–10LED



BASE FLANGE (TYPICAL)

FLASHER DIAGRAMS

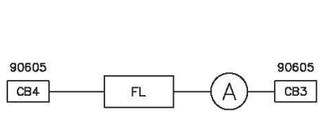


DIAGRAM 'A'

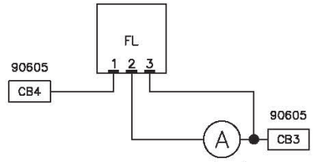
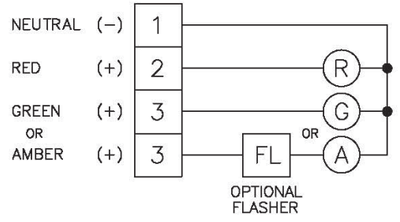
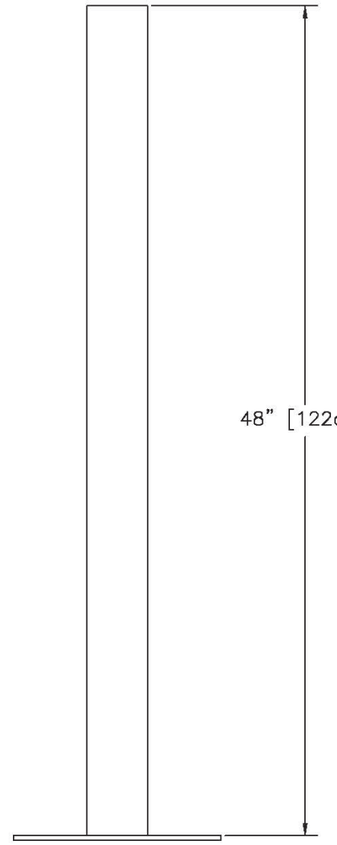


DIAGRAM 'B'

TERMINAL DIAGRAM





MODEL MPL–20

48" FLANGED POST

MPL–10LED230RFA	RED/FLASHING AMBER	200–250	50/60	B	2534–113
MPL–10LED120RFA	RED/FLASHING AMBER	100–125	50/60	A	2534–56
MPL–10LED24VDCRA	RED/AMBER	9–33	VDC		
MPL–10LED230RA	RED/AMBER	200–250	50/60	–	–
MPL–10LED120RA	RED/AMBER	100–125	50/60	–	–
MPL–10LED24VDC	RED/GREEN	9–33	VDC		
MPL–10LED230	RED/GREEN	200–250	50/60	–	–
MPL–10LED120	RED/GREEN	100–125	50/60	–	–
MODEL NO.	LED LAMP COLORS	VOLTAGE	HERTZ	DIAGRAM	FL STK.NO.

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ±.060/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

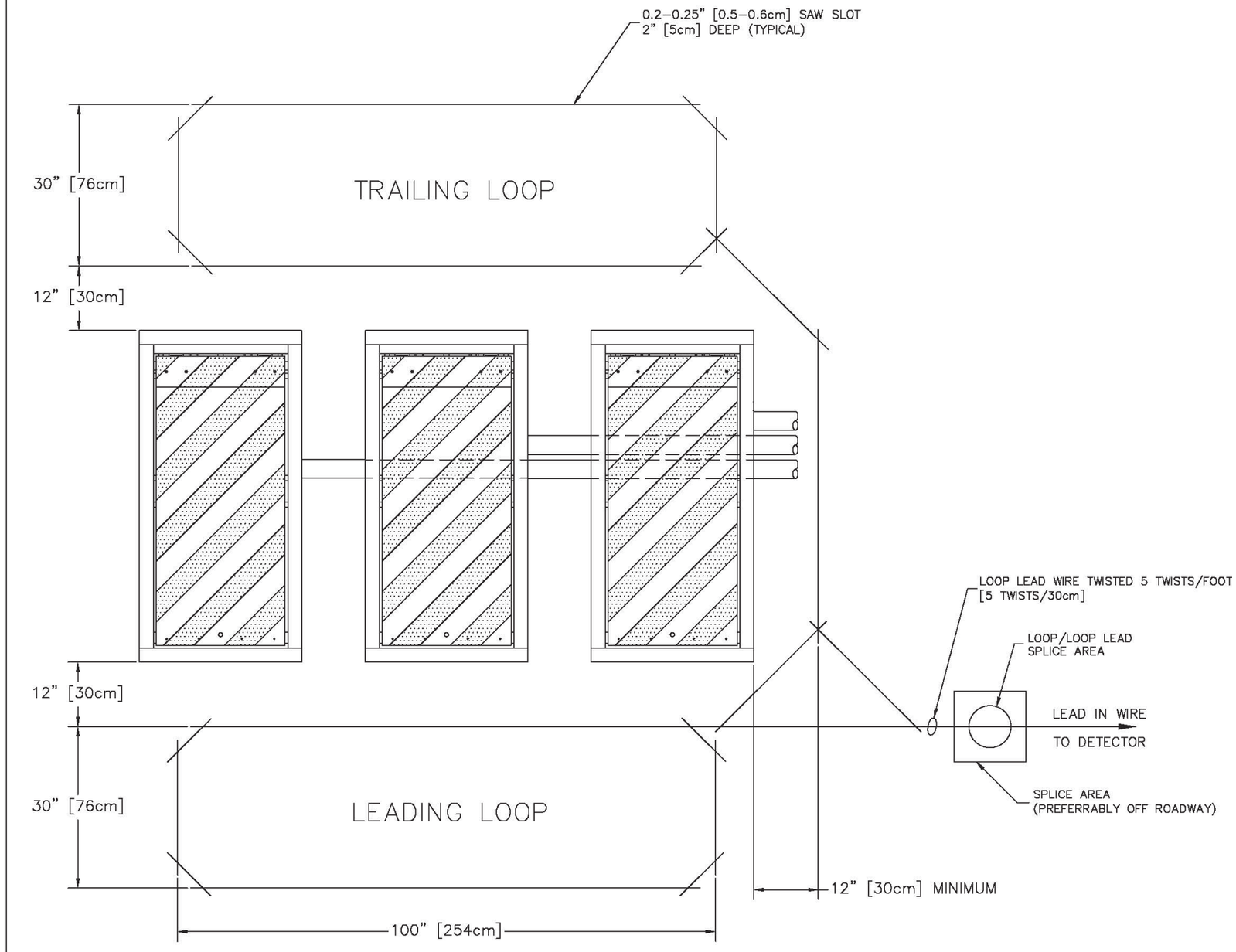
SURFACE FINISH 125

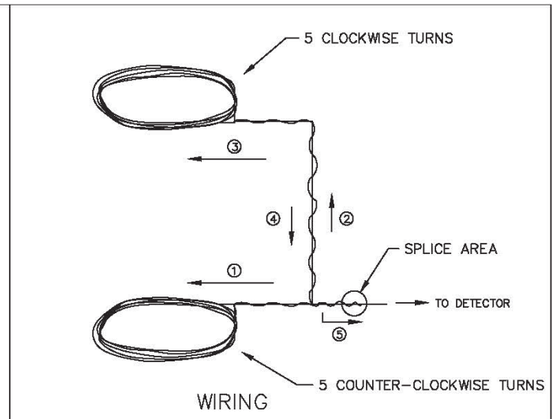
REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575–1100 FAX (661) 575–1109

MPL–10LED, MPL–20 COMBO
LIGHT WITH POST

DRAWN BY	DATE	DRAWING NO.	REV.
MLL	4/25/2018	MPL–10&20	–
CHKD BY	DATE		
APPVD BY	DATE	SCALE: 1:4 (D SIZE)	SHEET: SHEET 1 OF 1





WIRING

NOTES:

1) FOR LOOP INSTALLATION, REFER TO DSC LA2075.

2) PREFERRED LOOP MATERIAL IS 7 STRAND, #16 AWG COPPER W/0.045" CROSS LINKED POLYETHYLENE INSULATION.

ALTERNATE MATERIAL, #14 OR #16 AWG STRANDED COPPER, TYPE THHN OR BETTER INSULATION.

3) PREFERRED LOOP LEAD–IN CONDUCTOR IS 2 CONDUCTOR #16 AWG COPPER, 19–29 STRAND, TWISTED 5 TURNS PER FOOT, INNER INSULATION 20 MIL HI–DENSITY POLYETHYLENE, 1 MIL ALUMINUM SHIELD W/0.5 MIL POLYESTER FILM, #20 AWG TINNED COPPER DRAIN WIRE, OUTER JACKET 35 MIL HI–DENSITY POLYETHYLENE.

ALTERNATE LEAD–IN MATERIAL, #14 OR #16 AWG STRANDED COPPER PAIR, THHN OR BETTER INSULATION, TWISTED 5 TURNS PER FOOT MINIMUM.

4) LEAD–IN CONDUCTOR CAN BE RUN IN SAW CUT OR CONDUIT.

REV.	DESCRIPTION	DRWN BY	DATE	APPVD BY	DATE
A	UPDATED TITLE BLOCK	MLL	8/7/2017		

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ±.060/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH 125

REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575-1100 FAX (661) 575-1109

DSC2000/HD2055 SAFETY LOOPS
SUGGESTED INSTALLATION

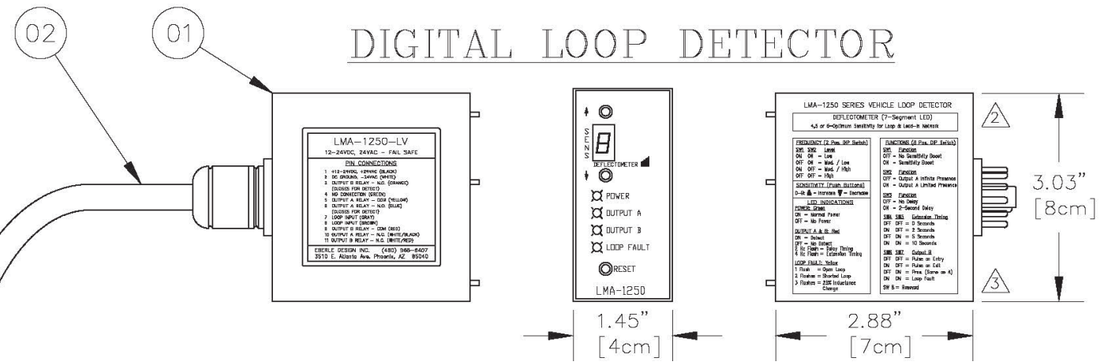
DRWN BY	DATE	DRAWING NO.	REV.
JNF	02/24/08	90425	A
CHKD BY	DATE		
APPVD BY	DATE	SCALE: N.T.S.	SHEET 1 OF 1

DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION

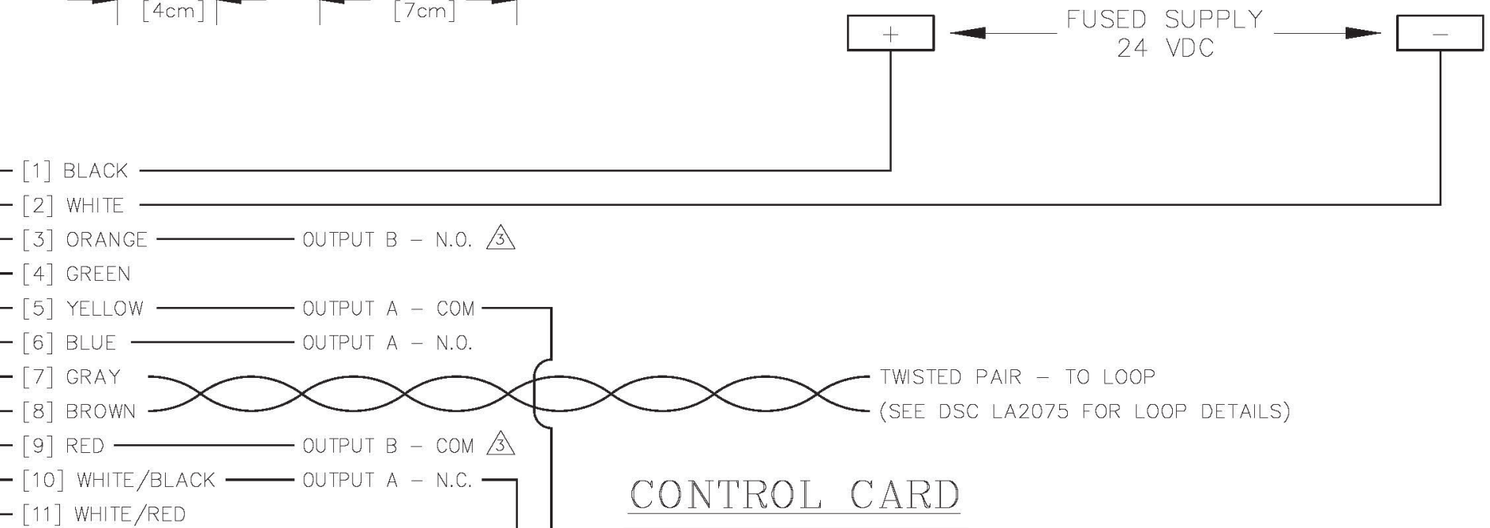
DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL L

DIGITAL LOOP DETECTOR

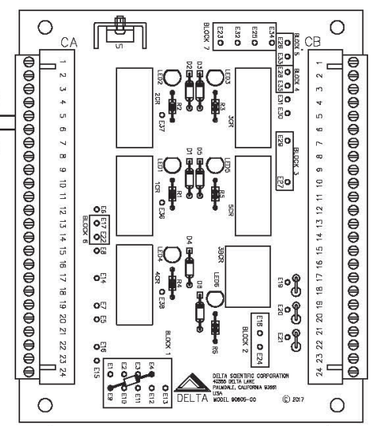
ITEM	REQ'D	DESCRIPTION	STK. NO.
01	1	DIGITAL LOOP DETECTOR, DUAL FUNCTION, 24 VDC	LMA-1250-LV
02	1	DETECTOR HARNESS, 11-WIRE	LMH4-11



DETECTOR HARNESS



CONTROL CARD



(LOCATED INSIDE CONTROL CIRCUIT)

NOTES:

1. TERMINAL DESIGNATION MAY VARY FOR CIRCUITS WITHOUT A 90605-00 CONTROL CARD. REFRENCE SYSTEM CIRCUIT HOOKUP.

2. WHEN USING MULTIPLE DETECTORS, OUTPUT A CONNECTIONS SHOULD BE WIRED IN SERIES. ADDITIONALLY, ENSURE ALL LOOPS HAVE UNIQUE FREQUENCY SETTINGS.

3. FOR OPTIONAL PULSE ON EXIT (AUTOCLOSE) OPERATION:
   1. CONNECT OUTPUT B – COM TO (+)
   2. CONNECT OUTPUT B – N.O. TO CA4
   3. SET SW6 OFF AND SET SW7 ON

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ±.080/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH 125

REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

DELTA SCIENTIFIC CORPORATION
24901 WEST AVE. STANFORD
VALENCIA, CA 91355 U.S.A.
(805) 257-1800 FAX (805) 257-0617

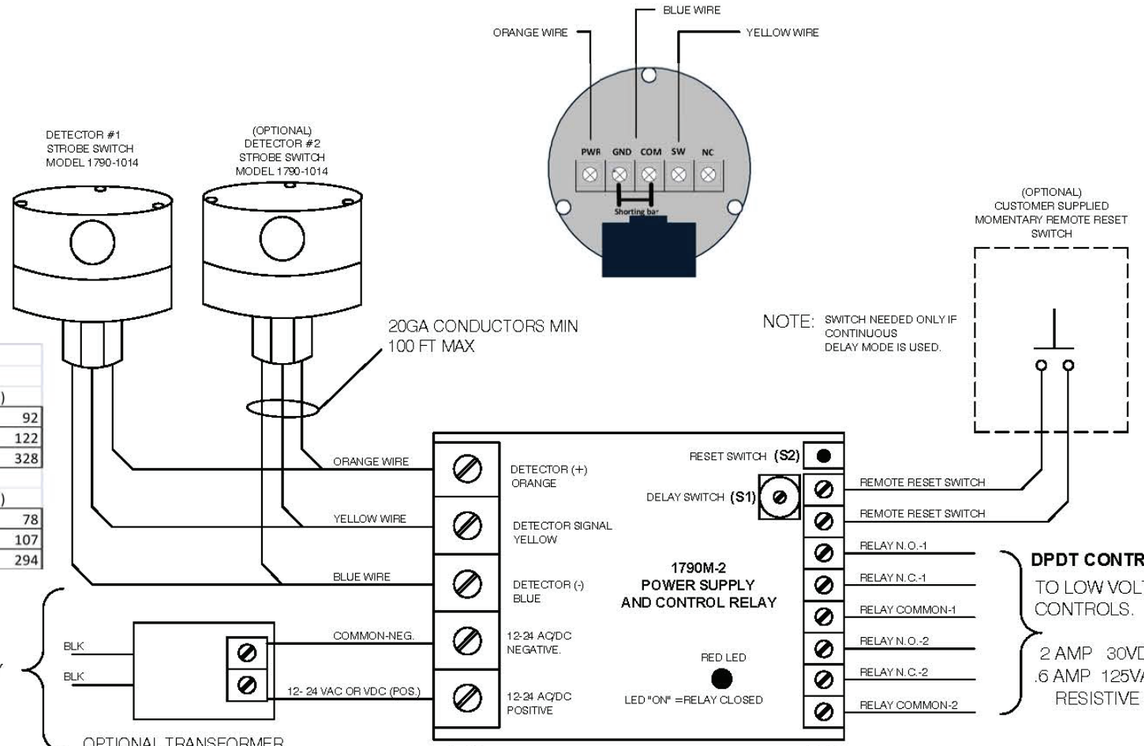
VEHICLE LOOP DETECTOR KIT
24 VDC HOOKUP

DRAWN BY	DATE	DRAWING NO.	REV.
C.HELLNER	6/23/2020	B2100	–
CHKD BY	DATE		
APPVD BY	DATE	SCALE: 1:1 (D SIZE)	SHEET 1 OF 1

DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION

DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC2000 HIGH SECURITY SHALLOW MOUNT BARRICADE SYSTEM – DETAIL M

IS0350A 1790M-2 POWER SUPPLY - INSTALLATION INSTRUCTIONS



CURRENT DRAW			
IDLING		**ACTIVATED**	
2 detectors	(mA)	**2 detectors**	(mA)
12VDC	35	12VDC	92
24VDC	39	24VDC	122
24VAC	130	24VAC	328
1 detector	(mA)	**1 detector**	(mA)
12VDC	20	12VDC	78
24VDC	24	24VDC	107
24VAC	92	24VAC	294

NOTE:
IF INPUT POWER IS 12 TO 24 VDC YOU MUST CONNECT THE POS. LEAD TO THE WIRE WITH THE ONE AMP FUSE.

STROBE SIGNAL FROM DETECTOR CLOSES RELAY FOR DURATION OF STROBE SIGNAL PLUS TIME DELAY

(S1) DELAY SWITCH POSITION	DELAY TIME
0	= NO DELAY
1	= 15 SECONDS
2	= 30 SECONDS
3	= 01 MINUTE
4	= 02 MINUTES
5	= 03 MINUTES
6	= 04 MINUTES
7	= 05 MINUTES
8	= 06 MINUTES
9	= 07 MINUTES
A	= 10 MINUTES
B	= 15 MINUTES
C	= 20 MINUTES
D	= 25 MINUTES
E	= 30 MINUTES
F	= CONTINUOUS

S2 PUSHBUTTON OPERATION

The S2 pushbutton initiates press-to-test and press-to-reset functions.

If the ROTARY DELAY SWITCH is in position 'F', S2 operates as a reset switch to open the relay and end the CONTINUOUS delay after a valid signal from a detector.

If S1 is in any other position ('0' thru 'E') S2 operates as a test switch that is;
when S2 is pressed the relay will be turned on (closed) for as long as S2 is depressed and remain
closed for the delay time selected by the rotary selector switch after S2 is released. If during the delay period, S2 is depressed, the relay will opened immediately.

S2 will not function if there is a valid signal from a detector. If a valid detector signal is received after S2 has been depressed, the test will be interrupted, and the detector signal serviced. After the detector signal and any delay time has expired, a new test can be started by depressing S2.
PROGRAM REV. 03

SAFETY NOTICES

WARNING

FAILURE TO FOLLOW ALL SAFETY PRECAUTIONS AND INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, SERIOUS INJURY OR DEATH TO YOU OR OTHERS.

SAFETY MESSAGE TO INSTALLERS, USERS, AND MAINTENANCE PERSONNEL

IT IS IMPORTANT TO FOLLOW ALL INSTRUCTIONS SHIPPED WITH THIS PRODUCT. THIS DEVICE IS TO BE INSTALLED BY A TRAINED INSTALLER WHO IS THOURGHLY FAMILIAR WITH THE NATIONAL ELECTRIC CODES AND LOCAL CODES AS WELL.

THE SELECTION FOR THE MOUNTING LOCATION FOR THE DEVICE, ITS CONTROLS AND THE ROUTING OF THE WIRING IS TO BE ACCOMPLISHED UNDER THE DIRECTION OF THE FACILITIES ENGINEER. IN ADDITION, LISTED BELOW ARE SOME OTHER IMPORTANT SAFETY INSTRUCTIONS AND PRECAUTION YOU SHOULD FOLLOW:

- READ AND UNDERSTAND ALL INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS EQUIPMENT.
- DO NOT CONNECT THIS DEVICE TO THE SYSTEM WHEN THE POWER IS TURNED ON.
- AFTER INSTALLATION, ENSURE THAT ALL SCREWS AND THREADED JOINTS ARE PROPERLY TIGHTENED.
- AFTER INSTALLATION, TEST THE SYSTEM REGULARLY TO ENSURE THAT IT IS OPERATING PROPERLY.
- AFTER INSTALLATION AND TESTING IS COMPLETE, PROVIDE A COPY OF THIS INSTRUCTION SHEET TO ALL OPERATING PERSONNEL.

INSTALLATION

1. UNPACKING

AFTER UNPACKING THE EQUIPMENT, EXAMINE IT FOR DAMAGE THAT MAY HAVE OCCURED IN TRANSIT. IF THE EQUIPMENT HAS BEEN DAMAGED, DO NOT ATTEMPT TO INSTALL OR OPERATE IT, FILE A CLAIM IMMEDIATELY WITH THE CARRIER STATING THE EXTENT OF THE DAMAGE. CAREFULLY CHECK ALL ENVELOPES, SHIPPING LABELS AND TAGS BEFORE REMOVING OR DESTROYING THEM.

2. MOUNTING AND WIRING

A. STROBE SWITCH DETECTOR

- MOUNT THE STROBE SWITCH IN A LOCATION THAT WILL ALLOW IT TO BE AIMED TO VIEW THE ACCESS ROADWAY LEADING TO THE GATE.
- ROUTE THE WIRES FROM THE STROBE SWITCH TO THE POWER SUPPLY LOCATION, MAKE SURE THE WIRES ARE PROTECTED AND SECURED.
- PARALLEL CONNECT THE TWO ORANGE,TWO YELLOW ,AND TWO BLUE WIRES TO THE TB-1 TERMINAL BLOCK.

B. POWER SUPPLY

- MOUNT THE POWER SUPPLY IN ANY CONVENIENT WATERPROOF LOCATION. REMOVE THE BACKING FROM THE TAPE ON THE BACK OF THE POWER SUPPLY AND MOUNT IT TO A CLEAN DRY SURFACE.

C. CONTROL WIRES TO GATE

- ROUTE THE LOW VOLTAGE GATE CONTROL WIRES FROM THE GATE TO THE POWER SUPPLY LOCATION. MAKE SURE THE WIRES ARE POTECTED AND SECURED.
- CONNECT THE LOW VOLTAGE GATE CONTROL WIRES TO THE RELAY OUTPUT ON THE TB-2 TERMINAL BLOCK OF THE #1790M-2 POWER SUPPLY.

D. POWER WIRES TO GATE

- LOCATE THE 24VAC POWER SOURCE ON THE GATE CONTROL UNIT AND ROUTE TWO WIRES FROM THIS POWER SOURCE TO THE #1790M-2 POWER SUPPLY.
- CONNECT ONE OF THE TWO WIRES TO THE COMMON-NEG TERMINAL OF THE TB-1 TERMINAL BLOCK. CONNECT THE OTHER WIRE TO THE ONE AMP IN-LINE FUSE HOLDER.

INSTALLATION IS COMPLETE

3. OPERATION

- WHEN DETECTOR #1 OR DETECTOR # 2 RECEIVES A SIGNAL ,THE #1790M-2 POWER SUPPLY RELAY OUTPUT WILL CLOSE AND THE RED L.E.D.WILL BE ILLUMINATED. THE RELAY WILL REMAIN CLOSED AND THE L.E.D. WILL REMAIN ILLUMINATED UNTIL THE SIGNAL TO THE DETECTOR AND THE DELAY TIME SELECTED ON THE (S-1 DELAY SWITCH) RUNS OUT. AT THAT TIME THE RELAY WILL OPEN AND THE RED L.E.D. WILL BE OFF.
- IF YOU SELECT THE CONTINUOUS MODE ON THE (S-1 DELAY SWITCH) AND A SIGNAL IS RECEIVED TO THE DETECTORS THE RELAY AND THE RED L.E.D. WILL STAY LATCHED "ON" UNTIL YOU PUSH THE RESET SWITCH (S-2) ON THE POWER SUPPLY.
- A REMOTE MOMENTARY RESET SWITCH CAN BE USED IF NEEDED.
- IF A 12 TO 24 VDC POWER SOURCE IS BEING USED, BE SURE TO NOTE POLARITY AS SHOWN.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES: DECIMALS .XX ± .XXX ± ANGLES ± SCALE NONE DO NOT SCALE DRAWING DRAWN RJG 01/29/01 APPROVED © COPYRIGHT 1995 TOMAR ELECTRONICS INC.	REV	DATE	DESCRIPTION
	00	09/09/15	ECO 2304
	01	10/21/15	ECO 2304
	02	10/30/15	ECO 2304

TOMAR ELECTRONICS INC.
2100 WEST OBISPO
GILBERT, ARIZONA 85233

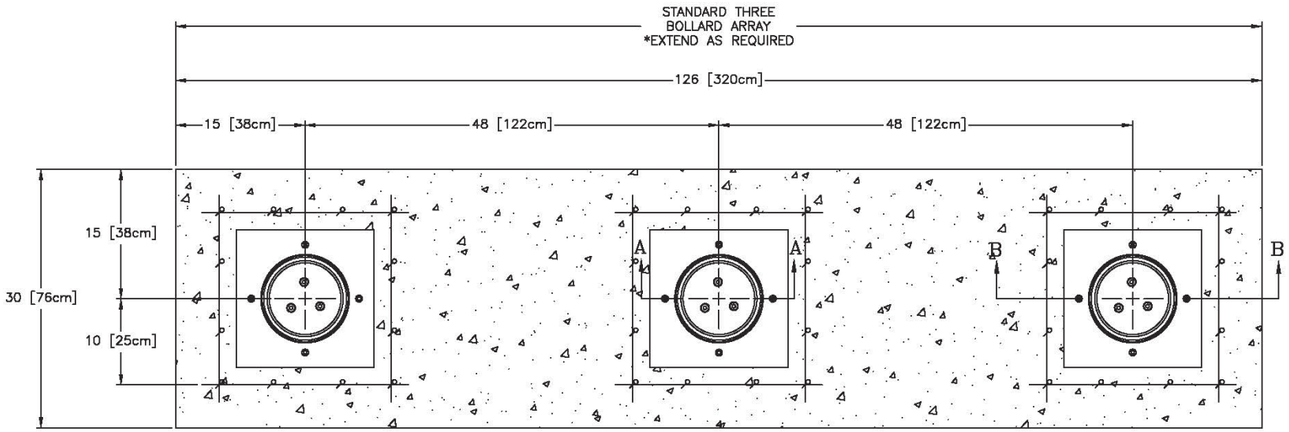
MODEL 1790M-2
DUAL STROBESWITCH SUPPLY
INSTALLATION WIRING AND INSTRUCTIONS
TOMAR PART NO: FP1211

FP 1211 PC 774 TE 177A

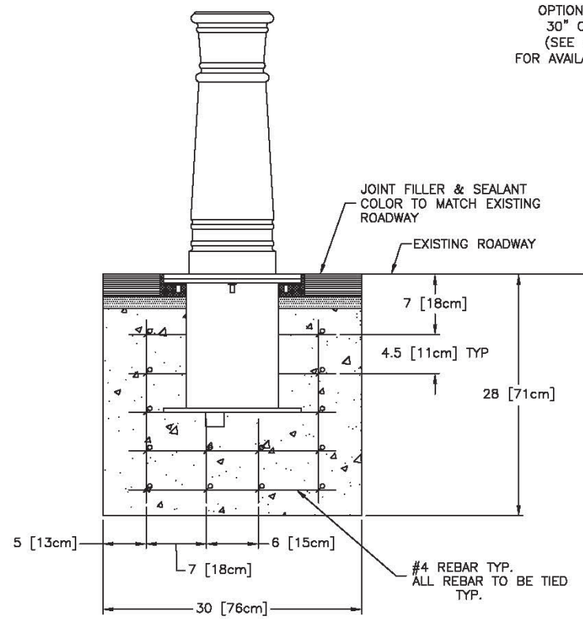
TOMAR

DRAWING NO.	REV
15241	02

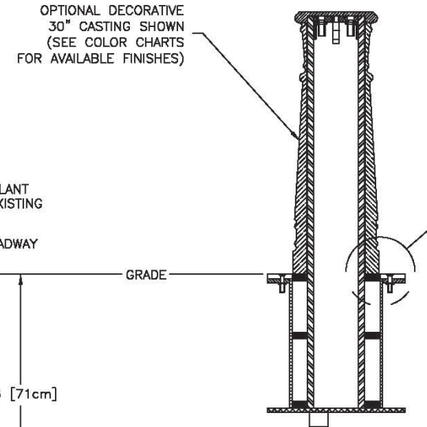
SYS0084A-1014 | SA1281 | REF 13401-02 OLD REV



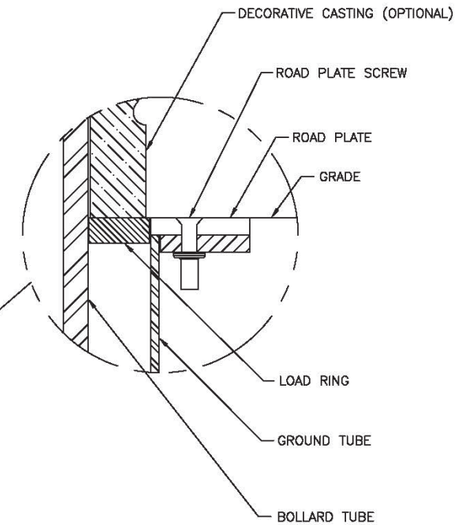
PLAN VIEW

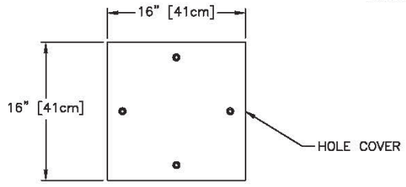


SECTION B–B



SECTION A–A





NOTES:

4. PAINT ALL COMPONENTS (EXCEPT CASTING) WITH STANDARD ACRYLIC PRIMER. SEE FLYSHEET FOR COLOR SCHEME FOR DECORATIVE CASTING.
3. THIS BOLLARD ARRANGEMENT IS CRASH RATED K4/L2 (15,000 LBS @ 30 MPH) BY DELTA SCIENTIFIC.
2. THE BOLLARD IS WELDED DIRECTLY TO THE ROAD PLATE AS SHOWN.
1. WEIGHT: BOLLARD (WITHOUT DECORATIVE CASTING)....362.5 lbs. (164.4 Kg)
   FOUNDATION TUBE.....95 lbs. (43.1Kg)
   TOTAL BOLLARD (W/DECORATIVE CASTING)...396.4 lbs. (180 Kg)

CONCRETE NOTES & RECOMMENDED SPECIFICATIONS:

1. CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE.
2. FOUNDATION CONCRETE MAY BE PLACED DIRECTLY INTO NEAT EXCAVATIONS, PROVIDED THE SIDES OF THE EXCAVATION ARE STABLE. WHERE CAVING OCCURS, PROVIDE SHORING. TYPE AND METHOD OF SHORING SHALL BE AT CONTRACTORS OPTION.
3. THE EXCAVATION SHALL BE KEPT DRY AT ALL TIMES. GROUND WATER, IF ENCOUNTERED, SHALL BE PUMPED FROM THE EXCAVATION.
4. CONCRETE SHALL BE LABORATORY DESIGNED, MACHINE MIXED, PRODUCING 3,000 PSI (20,68 MPA) AT 28 DAYS.
5. CEMENT SHALL BE TESTED PORTLAND CEMENT CONFORMING TO ASTM C150, TYPE II ONLY.
6. AGGREGATES SHALL CONFORM TO ASTM C33 & B GRADE PER STANDARD SPECIFICATIONS. MAXIMUM SIZE OF AGGREGATE SHALL BE 1–1/2 INCHES (38mm).
7. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60 (60,000 PSI OR 413.7MPA).
8. HOOKS AND BENDS SHALL CONFORM TO ACI STANDARD 318. LATEST REVISION. INSIDE DIAMETER OF HOOKS AND BENDS SHALL BE AT LEAST SIX (6) BAR DIAMETERS. BEFORE FABRICATION SUBMIT CALCS FOR APPROVAL.
9. PROVIDE SPACER BARS, CHAIRS, SPREADERS, BLOCKS, ETC. AS REQUIRED TO POSITIVELY HOLD THE STEEL IN PLACE BEFORE CONCRETE IS POURED.
10. CONCRETE SHALL BE CONVEYED FROM THE MIXER TO FINAL DEPOSIT BY METHODS THAT WILL PREVENT SEPARATION OR LOSS OF MATERIALS.
11. CONCRETE SHALL BE THOROUGHLY CONSOLIDATED BY SUITABLE MEANS DURING PLACEMENT AND SHALL BE THOROUGHLY WORKED AROUND REINFORCEMENT AND EMBEDDED FIXTURES AND CORNERS OF FORMS.
12. CONCRETE SHALL BE MAINTAINED ABOVE 50°F (10°C) AND IN A MOIST CONDITION FOR AT LEAST SEVEN (7) DAYS AFTER PLACEMENT. ADEQUATE EQUIPMENT SHALL BE PROVIDED FOR HEATING CONCRETE MATERIALS AND PROTECTING CONCRETE DURING FREEZING OR NEAR FREEZING WEATHER.
13. WHERE EXTERIOR WALL FACE REQUIRES SHORING AND/OR FORMING, THE FORMS SHALL BE SUBSTANTIAL AND SUFFICIENTLY TIGHT TO PREVENT LEAKAGE. FORMS SHALL NOT BE REMOVED UNTIL THE CONCRETE IS SEVEN (7) DAYS OLD.
14. BACKFILLING SHALL BE DONE BY DEPOSITING AND TAMPING INTO PLACE CLEAN SAND OR POURING LEAN CONCRETE, TO 95% COMPACTION. WATER JETTING SHALL NOT BE ALLOWED.
15. CONDUITS AND PIPES OF ALUMINUM SHALL NOT BE ALLOWED.
16. CONSTRUCTION JOINTS NOT INDICATED ON THE DRAWINGS SHALL NOT BE ALLOWED. WHERE A CONSTRUCTION JOINT IS TO BE MADE, THE SURFACE OF THE CONCRETE SHALL BE THOROUGHLY CLEANED AND ALL LAITANCE AND STANDING WATER REMOVED.
17. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT AREAS AGAINST DAMAGE AND SHALL REPAIR OR PATCH ALL DAMAGED AREAS TO MATCH EXISTING IMPROVEMENTS.
18. CONTRACTOR SHALL KEEP THE CONSTRUCTION AREA CLEAN AT ALL TIMES AND AT COMPLETION OF WORK, REMOVE ALL SURPLUS MATERIALS, EQUIPMENT AND DEBRIS AND LEAVE THE PREMISES IN A CLEAN CONDITION ACCEPTABLE TO THE OWNER OR OWNER'S REPRESENTATIVE.

REV.	DESCRIPTION	DRWN BY	DATE	APPVD BY	DATE
E	ECO 2010–085	D.K.	8/17/10		
D	ECO 2005–169	RES	11/10/05		
C	ECO 2005–170	RES	9/12/05		
B	ECO 2005–116	MD	7/13/05		
A	ECO 2004–256	CMS	12/9/04		

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ±.050/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH 125

REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

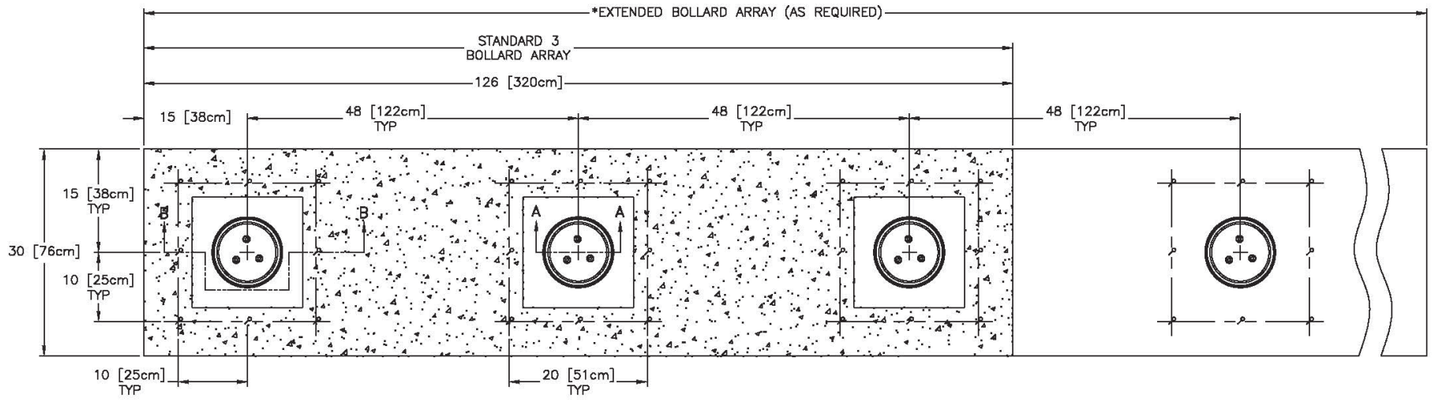
DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575–1100 FAX (661) 575–1109

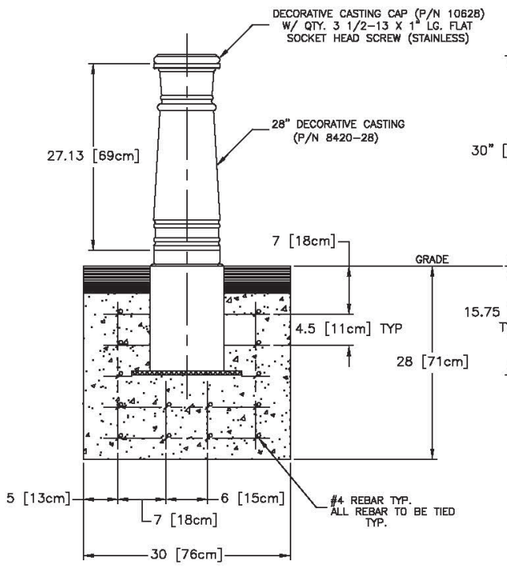
DSC800 REMOVABLE FIXED POST BOLLARD SHALLOW FOUNDATION ARRAY

DRAWN BY	DATE	DRAWING NO.	REV.
R. SMELSER	10/7/04	90469	E
CHKD BY	DATE		
APPVD BY	DATE	SCALE: 1:8	SHEET 1 OF 1

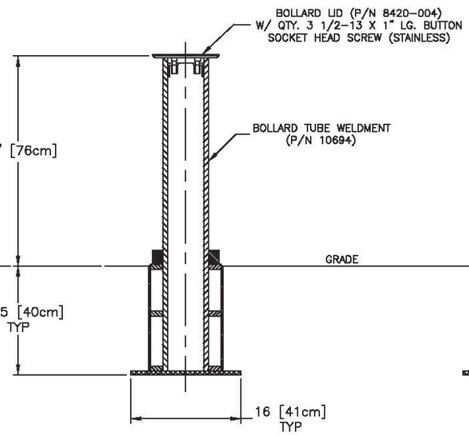
DOWNTOWN SAFETY BARRICADES PROJECT – PHASE 2 INSTALLATION

DELTA SCIENTIFIC GENERAL STANDARD DETAIL FOR DSC800RFP HIGH SECURITY DECORATIVE REMOVABLE FIXED POST BOLLARD – DETAIL O

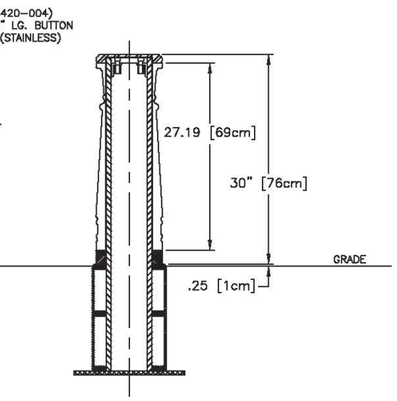




SECTION B–B



SECTION A–A
WITHOUT DECORATIVE CASTING



SECTION A–A
WITH DECORATIVE CASTING

NOTES:

3. PAINT ALL COMPONENTS (EXCEPT CASTING) WITH STANDARD ACRYLIC PRIMER. SEE FLYSHEET FOR COLOR SCHEME FOR DECORATIVE CASTING.
2. THIS BOLLARD ARRANGEMENT IS CRASH RATED K4/L2 (15,000 LBS @ 30 MPH) BY DELTA SCIENTIFIC.
1. THE BOLLARD TUBE IS WELDED DIRECTLY TO THE FOUNDATION TUBE AS SHOWN.

CONCRETE NOTES & RECOMMENDED SPECIFICATIONS:

1. CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE.
2. FOUNDATION CONCRETE MAY BE PLACED DIRECTLY INTO NEAT EXCAVATIONS, PROVIDED THE SIDES OF THE EXCAVATION ARE STABLE. WHERE CAVING OCCURS, PROVIDE SHORING. TYPE AND METHOD OF SHORING SHALL BE AT CONTRACTORS OPTION.
3. THE EXCAVATION SHALL BE KEPT DRY AT ALL TIMES. GROUND WATER, IF ENCOUNTERED, SHALL BE PUMPED FROM THE EXCAVATION.
4. CONCRETE SHALL BE LABORATORY DESIGNED, MACHINE MIXED, PRODUCING 3,000 PSI (20,68 MPA) AT 28 DAYS.
5. CEMENT SHALL BE TESTED PORTLAND CEMENT CONFORMING TO ASTM C150, TYPE II ONLY.
6. AGGREGATES SHALL CONFORM TO ASTM C33 & B GRADE PER STANDARD SPECIFICATIONS. MAXIMUM SIZE OF AGGREGATE SHALL BE 1–1/2 INCHES (38mm).
7. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60 (60,000 PSI OR 413.7MPA).
8. HOOKS AND BENDS SHALL CONFORM TO ACI STANDARD 318. LATEST REVISION. INSIDE DIAMETER OF HOOKS AND BENDS SHALL BE AT LEAST SIX (6) BAR DIAMETERS.
9. PROVIDE SPACER BARS, CHAIRS, SPREADERS, BLOCKS, ETC. AS REQUIRED TO POSITIVELY HOLD THE STEEL IN PLACE BEFORE CONCRETE IS POURED.
10. CONCRETE SHALL BE CONVEYED FROM THE MIXER TO FINAL DEPOSIT BY METHODS THAT WILL PREVENT SEPARATION OR LOSS OF MATERIALS.
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13. WHERE EXTERIOR WALL FACE REQUIRES SHORING AND/OR FORMING, THE FORMS SHALL BE SUBSTANTIAL AND SUFFICIENTLY TIGHT TO PREVENT LEAKAGE. FORMS SHALL NOT BE REMOVED UNTIL THE CONCRETE IS SEVEN (7) DAYS OLD.
14. BACKFILLING SHALL BE DONE BY DEPOSITING AND TAMPING INTO PLACE CLEAN SAND OR POURING LEAN CONCRETE, TO 95% COMPACTION. WATER JETTING SHALL NOT BE ALLOWED.
15. CONDUITS AND PIPES OF ALUMINUM SHALL NOT BE ALLOWED.
16. CONSTRUCTION JOINTS NOT INDICATED ON THE DRAWINGS SHALL NOT BE ALLOWED. WHERE A CONSTRUCTION JOINT IS TO BE MADE, THE SURFACE OF THE CONCRETE SHALL BE THOROUGHLY CLEANED AND ALL LAITANCE AND STANDING WATER REMOVED.
17. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT AREAS AGAINST DAMAGE AND SHALL REPAIR OR PATCH ALL DAMAGED AREAS TO MATCH EXISTING IMPROVEMENTS.
18. CONTRACTOR SHALL KEEP THE CONSTRUCTION AREA CLEAN AT ALL TIMES AND AT COMPLETION OF WORK, REMOVE ALL SURPLUS MATERIALS, EQUIPMENT AND DEBRIS AND LEAVE THE PREMISES IN A CLEAN CONDITION ACCEPTABLE TO THE OWNER OR OWNER'S REPRESENTATIVE.

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES

TOLERANCES
.X = ±.080/FT
.XX = ±.030/FT
.XXX = ±.010/FT
ANGLES = ±.5°

SURFACE FINISH
125

REMOVE ALL BURRS & BREAK SHARP EDGES .02 MAX

DELTA SCIENTIFIC CORPORATION
40355 DELTA LANE
PALMDALE, CA 93551 U.S.A.
(661) 575-1100 FAX (661) 575-1109

DSC800FP FIXED POST BOLLARD
SHALLOW FOUNDATION G.A.

DRAWN BY	DATE	DRAWING NO.	REV.
D.KELBER	6/21/10	12999	—
CHKD BY	DATE		
APPVD BY	DATE	SCALE: 1:10	SHEET 1 OF 1

APPENDIX A

DELTA SCIENTIFIC

DSC2000 Barrier System-General Installation/ Set-up

INSTRUCTION MANUAL **MODEL DSC2000 PHALANX**

DELTA
SCIENTIFIC CORPORATION

CORPORATE HEADQUARTERS
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Palmdale, California 93551
Phone: (661) 575-1100
Fax: (661) 575-1109
Email: info@deltascientific.com
www.deltascientific.com

DELTA
SCIENTIFIC CORPORATION

TERMS AND CONDITIONS OF PRODUCT SALE

THIS PURCHASE CONTRACT ("CONTRACT") SETS FORTH THE TERMS AND CONDITIONS FOR THE SALE BY DELTA SCIENTIFIC CORPORATION ("DELTA") TO THE BUYER SPECIFICED HEREIN ("BUYER") OF THE PRODUCTS SPECIFIED IN THE QUOTATION IDENTIFIED BELOW (THE "PRODUCTS"). THIS CONTRACT DOES NOT CONSTITUTE ACCEPTANCE OF ANY OFFER BY BUYER, WHETHER ORAL OR WRITTEN, INCLUDING BUT NOT LIMITED TO ANY PURCHASE ORDER, LETTER, E-MAIL, MEMO, OR ANY OTHER FORM. SALES OF THE PRODUCTS ARE LIMITED SOLELY TO THIS CONTRACT.

Acceptance. Buyer accepts these terms and conditions when the first of the following occurs: Buyer (a) signs or makes a written acceptance of this Contract; (b) authorizes production or shipment of any part of the Products; or c) accepts Delta's Product submittals. Acceptance is expressly limited to all terms and conditions hereof without any addition, modification or exception, and Delta expressly rejects any additional or inconsistent terms, conditions, contingencies or covenants previously or hereafter proposed by Buyer. This Contract, when accepted by Delta at its corporate offices in California, constitutes the entire agreement between Delta and Buyer, superseding any prior agreement or understanding between the parties with respect to the subject matter hereof.

1. **Shipment and Delivery**. Buyer acknowledges that this Contract, and any additional Buyer orders accepted by Delta hereunder, are firm and non--cancelable. Deliveries of the Products will be made F.O.B. Delta's plant at Palmdale, California. Delta will arrange for shipment. Buyer will bear all costs of shipment and insurance and will reimburse all such costs incurred by Delta when invoiced. Upon Delta's delivery of the Products at Delta's plant to any carrier or Buyer's representative, Buyer assumes all risk of loss and damage with respect to the Products. Buyer shall promptly inspect each shipment upon receipt, and shall promptly inform Delta in the event all Products listed in Delta's shipping documents do not arrive as scheduled or are damaged or defective.
2. **Payment Terms**. If credit is approved in advance by Delta, payment terms are net thirty (30) days from the date of invoice. If credit is not approved in advance, Buyer shall make payment in full prior to delivery. Delta's invoice will be issued and dated upon date of shipment of Products. All payments shall be made at Palmdale, California. Unpaid invoices shall bear interest at the maximum lawful rate or 1.5% per month, whichever is less, commencing upon the date payment is due. Buyer shall be responsible for all costs of collection, including but not limited to reasonable attorneys' fees and expenses.
3. **Taxes and Similar Charges**. Buyer shall bear all applicable federal, state, municipal and other taxes (such as sales, use, excise, ad valorem and similar taxes), customs duties and charges. The lack of any such tax or charge on the invoice shall not affect Buyer's tax liability.
4. **Use and Permits**. Buyer will be responsible for operation of Products, including, but not limited to, obtaining all use and export permits, building permits, licenses, certificates and the like, required by any regulatory body for installation and use of the Products. If Buyer wishes for Delta to install any Products purchased hereunder, the terms and conditions of installation shall be set forth in a separate agreement.
5. **Limited Warranty; Limitation of Liability.** Delta warrants that during the warranty period applicable to the product, the Products will be free from defect in material and workmanship. Delta's sole obligation under this warranty shall be to repair (or at Delta's option, to replace), FOB Palmdale, California any defective product, without charge to Buyer, provided that: (a) Buyer gives Delta written notice of any claimed defect within the applicable limited warranty period; (b) the Products, if installed, were installed correctly and in accordance with any instructions provided by Delta, (c) the Products have not been altered, subjected to misuse, negligence or accident, or used with parts not authorized by Delta, (d) the Products have been properly and timely maintained by Buyer in accordance with the preventive maintenance instructions provided, and (e) the replaced Product(s) and or part(s) is/are properly removed and returned to Delta, using the Material Return Authorization (MRA) number and information provided by Delta. Product and Product part troubleshooting, diagnosis and/or replacement, and the cost of such replacement installation and/or related remedial services, are the sole responsibility of Buyer. The duration of the applicable Product warranty is ninety (90) days for guard booths, gates, traffic items and spare parts and one (1) year for Delta's Barricade/Barrier Systems, from date of shipment. Primer, paint and other surface coatings are excluded from warranty. FAILURE BY BUYER TO MAKE TIMELY PAYMENT IN FULL FOR THE PRODUCTS, AND/OR FAILURE BY BUYER TO PROPERLY AND TIMELY CONDUCT PREVENTIVE MAINTENANCE, FAILURE TO FOLLOW DELTA'S INSTRUCTIONS FOR PROBLEM TROUBLESHOOTING AND/OR DIAGNOSIS, AND/OR FAILURE TO PROPERLY INSTALL, REMOVE AND/OR RE-INSTALL A PRODUCT OR PART THEREOF, INVALIDATES THIS WARRANTY. IN THE EVENT A PRODUCT PROBLEM IS NOT THE RESULT OF A PRODUCT DEFECT, BUYER SHALL BE RESPONSIBLE FOR MAINTENANCE CHARGES AT DELTA'S STANDARD TIME AND MATERIALS RATES. NO OTHER WARRANTY IS EXPRESSED AND NONE SHALL BE IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR USE OR FOR A PARTICULAR PURPOSE. THE FOREGOING STATES DELTA'S ENTIRE LIABILITY WITH RESPECT TO THE PRODUCTS. IN NO EVENT SHALL DELTA BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHICH RESULT FROM THE USE OF THE PRODUCTS BY BUYER OR ANY OTHER PARTY, AND IN NO EVENT SHALL DELTA'S LIABILITY EXCEED THE PRICE OF THE PARTICULAR PRODUCT UNIT(S) INVOLVED IN ANY CLAIM.
6. **Disclaimer and Indemnification.** Buyer acknowledges that the Products, designed for control of vehicular traffic, inherently involve a trade off of risk versus benefit. Buyer must devote careful consideration to the selection, placement and design of a barricade installation. To ensure approaching vehicles and pedestrians are fully aware of the Barricades and their operation, proper illumination, clearly worded warning signs, auxiliary devices such as semaphore gates, stop-go signal lights, audible warning devices, speed bumps, flashing lights, beacons, etc. should be considered. It is strongly recommended that the Buyer consult an architect and/or a traffic and/or safety engineer prior to installation of a Barricade/Barrier system. Delta does not purport to offer either architectural, traffic or safety engineering information. Buyer also concedes that, beyond its written installation, maintenance and operation instructions, Delta has no control as to how the Products will be utilized, or how persons in the vicinity of the Products, including but not limited to drivers, bicyclists and/or pedestrians, will act. Therefore, Buyer shall hold harmless, indemnify and defend Delta from and against all claims, demands, judgments and awards resulting from Buyer's use or misuse of the Products, including, but not limited to, claims for personal injury, wrongful death and damage to real or personal property. However, in no event shall this indemnification provision apply where Delta's sole negligence resulted in the claim, judgment or award. Each party shall give the other party prompt written notice of any claim or suit for which such other party is responsible hereunder. The responsible party shall control the defense and/or settlement of such claim; provided that neither party has the authority to enter into a settlement, make an admission, or undertake any obligation or liability without the other party's written consent..
7. **General.** Delta shall not be liable for any delays or failure of performance, beyond the reasonable control of Delta, that affect Delta or any of Delta's suppliers; including, but not limited to, those caused by acts of God, acts of public enemy, acts or omissions of Buyer or its contractors and sub-contractors, fire, strike, riot, flood, governmental interference, unavailability or shortage of materials, labor, fuel or power through normal commercial channels, or failure or destruction of plant or equipment arising from any cause whatsoever. In the event of delay, the date of delivery shall be extended for a period equal to the time lost by such delay, and this Contract shall remain in full force and effect. This Contract may be modified only in writing. This Contract shall be governed by and construed in accordance with the laws of the state of California. Neither this Contract nor any rights or benefits hereunder are assignable by Buyer without prior written consent of Delta. Any such prohibited assignment shall be null and void. Notices shall be given in writing, via certified or overnight mail with proof of deliver, to an authorized representative or officer of a party.

ACCEPTED BY: _____	DELTA SCIENTIFIC CORP	QUOTE NO: _____
NAME: _____	NAME: _____	REV / DATE: _____
DATE: _____	DATE: _____	

DELTA
SCIENTIFIC CORPORATION

WARRANTY AND LIMITATION OF LIABILITY

Delta Scientific Corporation warrants that during the first one year (365) days from date of shipment, the Products will be free from defect in material and workmanship. Delta's sole obligation under this warranty shall be to repair (or at Delta's option, to replace), FOB: Palmdale, California, any defective product, without charge to Buyer, provided that, (a). Buyer gives Delta written notice of any such claimed defect within such period of one year (365) days, (b). The Products, if installed, were installed by a Delta authorized installer, (c). The Products have not been altered, subjected to misuse, negligence or accident, or used with parts not authorized by Delta, and (d). The Products have been maintained in accordance with the instructions provided. NO OTHER WARRANTY IS EXPRESSED AND NONE SHALL BE IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR USE OR FOR A PARTICULAR PURPOSE. THE FOREGOING STATES DELTA'S ENTIRE LIABILITY WITH RESPECT TO THE PRODUCTS. IN NO EVENT SHALL DELTA BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHICH RESULT FROM THE USE BY BUYER OR ANY OTHER PARTY, OF THE PRODUCTS, AND IN NO EVENT SHALL DELTA'S LIABILITY EXCEED THE AMOUNTS PAID BY BUYER FOR THE PRODUCTS HEREUNDER.

DISCLAIMER

Please note - careful consideration must be devoted to the selection, placement and design of a Barricade installation. Just as in the case of any Barricade system, perimeter security device or security gate that blocks a roadway or drive, care must be taken to ensure that approaching vehicles as well as pedestrians are fully aware of the Barricades and their operation. Proper illumination, clearly worded warning signs, auxiliary devices such as semaphore gates, stop-go signal lights, audible warning devices, speed bumps, flashing lights, beacons, etc. should be considered. Delta has information available on many such auxiliary safety equipment not specifically listed herein. It is strongly recommended that an architect and/or a traffic and/or safety engineer be consulted prior to installation of a Barricade system. Delta will offer all possible assistance in designing the operating equipment, controls and the overall system, but we are not qualified, nor do we purport to offer either traffic or safety engineering information.

INTELLECTUAL PROPERTY, DRAWINGS, SPECIFICATIONS AND TECHNICAL DATA

The drawings and/or data included with this equipment unless otherwise noted remain the confidential property and trade secret of Delta Scientific Corporation. They shall not be disclosed, reproduced or used for manufacture, design or construction without the express authorization of Delta Scientific Corporation. The recipient by accepting these drawings and/or data, assumes custody thereof and under the above terms agrees not to allow the use of by unauthorized persons.

40355 Delta Lane - Palmdale, California 93551, USA - Phone: (661) 575-1100 - FAX: (661) 575-1109

www.deltascientific.com

DELTA

MECHANICAL
INSTALLATION INSTRUCTIONS
VEHICLE ARREST SYSTEM

MFG. UNDER U.S. PATENT #4,097,170 4,158,514 4,318,079 4,354,771 4,490,068 4,576,508 4,715,742

U.K. PATENT # GB 2,127,893B 2,138,883B

40355 DELTA LANE • PALMDALE, CALIFORNIA 93551, USA • PHONE (661) 575-1100 • FAX (661) 575-1109

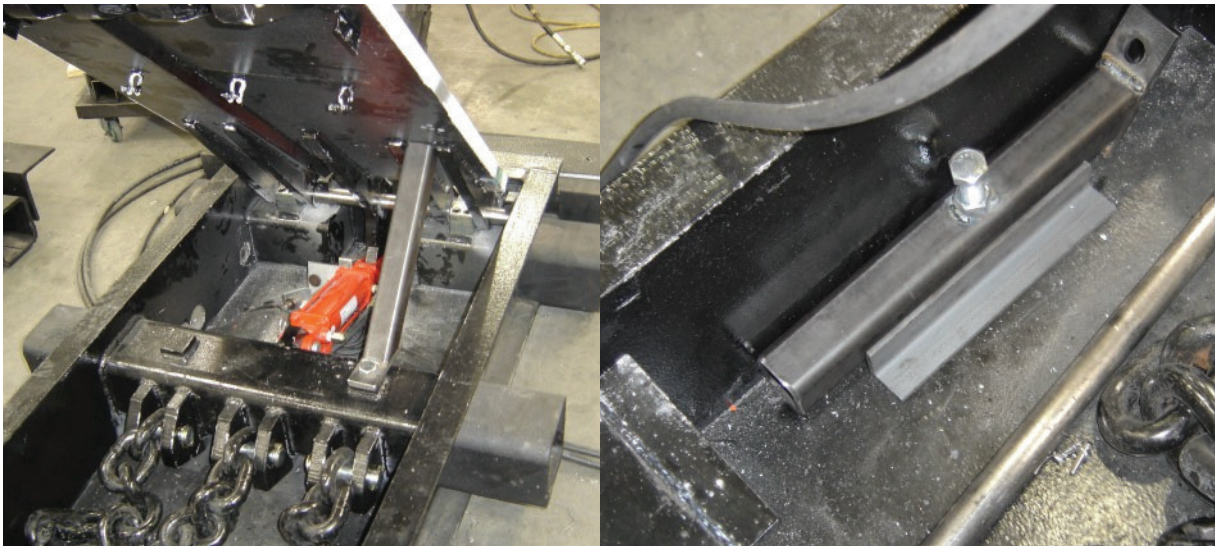
E-MAIL: info@deltascientific.com

MECHANICAL INSTALLATION INSTRUCTIONS
DELTA MODEL DSC2000 PHALANX® BARRIER SYSTEMS

Safety Precautions

At all times observe good safety practices when working on either the electrical or mechanical system. Particular attention should be paid to the danger of working on the Barrier when the power is on. Barriers are powerful hydraulic presses that can easily crush anything in their way. Keep hands free of the mechanism when the power is on or the HPU is up to pressure. Turn off the electric power and bleed the hydraulic pressure down to zero before working on any part of the system. Traffic should be controlled around the Barrier during any work so that vehicular accidents do not occur if the Barrier should happen to rise. After work is complete, do not allow traffic over the Barrier until all control and safety functions have been verified to be properly working.

A Barrier ramp brace is provided with each Barrier in the system. The Barrier ramp brace should be in place and firmly bolted in position when working under the Barrier ramp. The Barrier ramp brace is stowed in the Barrier frame when not in use. This makes the brace readily available for use at all times.



Photos 1 and 2 - Ramp brace in position for work under the Barrier.
Storage position for the ramp brace.

Particular attention should be paid to the rigging and lifting equipment used when installing, moving, removing, relocating or servicing any of the heavy elements of the Barrier system. The rigging and lifting gear should be properly sized and attached when lifting heavy components in all instances.

Each Barrier ramp has two attachment points (threaded 3/4"-10 for heavy eye bolts) that are located on the front and rear edges of the ramp and in line with the center of gravity of the ramp. The rear axle lugs can be also be used to attach the lifting gear to the ramp rear edge. The

attachment means between the Barrier ramp and the lifting gear must be sized or designed to take into consideration both the vertical lift as well as side loading conditions.

The Barrier ramp attachment points ***cannot*** be used to lift the entire Barrier assembly.

Photo 3 - Safely lifting the DSC2000 ramp plate.

Installation Scheme

The Barrier foundation frames are to be cast in place. The outside of the Barrier foundation frames are the forms; no additional flashing or forming should be necessary. The installation may performed with the Barriers assembled or by removing the Barrier ramps prior to placing the foundation frames into position in the foundation excavation. See the above precautions about working under the Barrier. Disassembly of the Barriers is outlined in the Maintenance section of this manual.

The excavation for the foundation frame for the tested configuration is shown on the Foundation Specification drawing, 91130. Other Barrier spacings are possible but the U.S Department of State certification is based on the 42 inch [107 cm] centers as shown.

The foundations shown on Delta drawings, unless specially noted, are designed on a soil load-bearing factor of 1.5 tons/ft2 [14,600 kg/m2]. The soil should be low-cohesive, well-graded crushed stone or broken gravel of a particle size comparable to Table 1. Soil depth should be at least the foundation depth and 1.5 times embedment depth behind the installation or 2 feet [0.6 meters], whichever is greater up to a maximum of 6 feet. Soil should be compacted to a density of not less than 90 percent maximum dry density.

Care should be taken to mount the Barriers in an area that is not subject to flooding. Additionally, the roadway should be crowned in the area of the Barriers to prevent standing water from draining into the Barrier foundation frames. It is not necessary for the Barriers to be level or plumb to

operate. If the roadway is not level the Barrier may be placed to match the contour; however, be sure the appearance factor is considered. An installation where the equipment is not level even if it follows the terrain can be distracting (see Figure 3).

Sieve Size	Mass Percentage Passing
50 mm (2 in.)	100
25 mm (1 in.)	75-95
9.5mm (3/8 in.)	40-75
4.75mm (no. 4)	30-60
2.00mm (no. 10)	20-45
0.425mm (no. 40)	15-30
0.075mm (no. 200)	5-20

Table 1

The Barriers are set directly on the compacted soil of the excavation, or if desired a mud slab can be poured beneath the Barriers (but this is not mandatory). The Barriers should be restrained from floating during the concrete pour.

The front face (visibility panel) of the Barrier is to be mounted toward the direction of the vehicle threat (see Figure 1). Usually, when Barriers are mounted in inbound and outbound lanes, all Barriers will be facing outside the facility. Some special installations such as sallyports may have the inner Barrier facing towards the inside of the facility. Check with the security manager if there is any question as to the proper orientation of the Barriers.

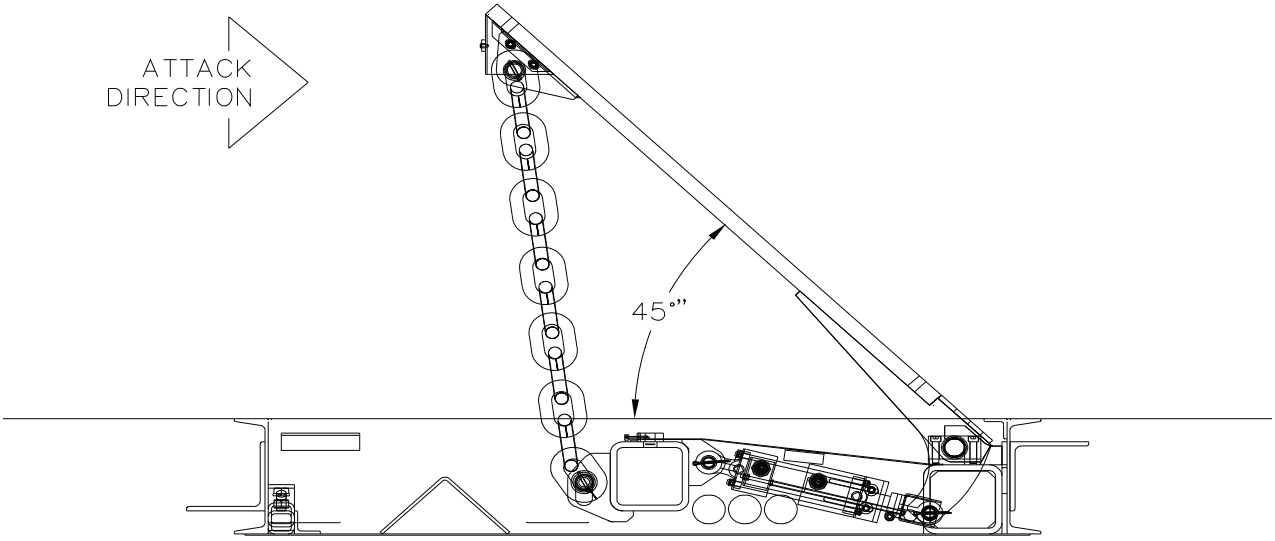


Figure 1 – Installed Barrier orientation. Barrier faces the threat and not necessarily the direction of normal approaching traffic.

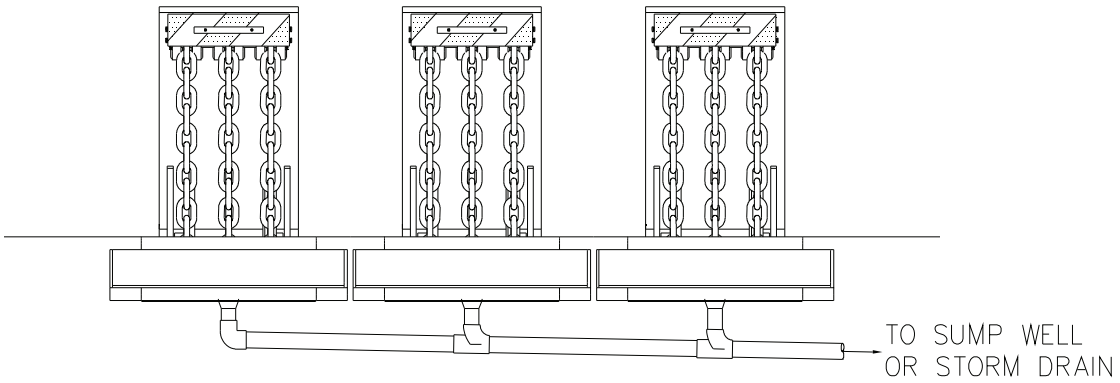


Figure 2 – DSC2000's as typically installed in a level roadway. The drain fittings are located in the lowest part of the Barriers' drain pan as installed. This may be to the center, the front, back, left or right. There should be no standing water left in a properly installed DSC2000 Barrier.

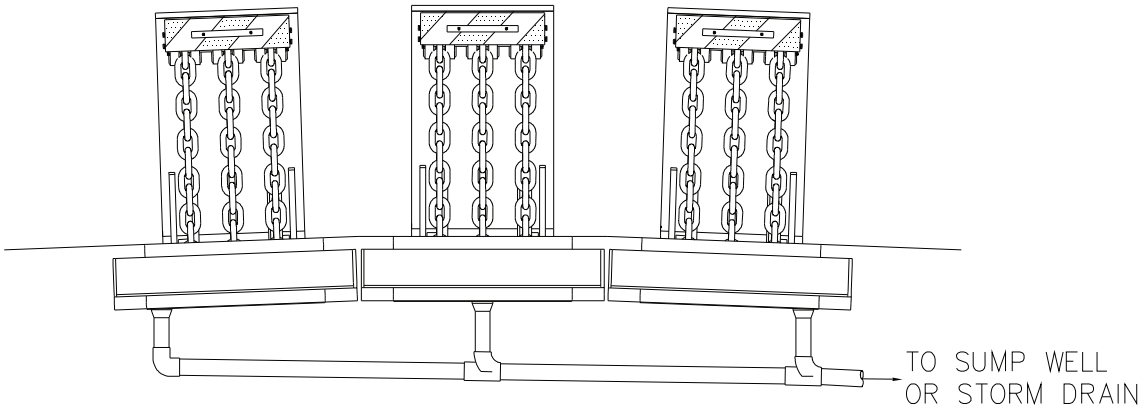


Figure 3 – DSC2000's installed in a crowned roadway. While this is a satisfactory installation, the appearance of the Barriers may be distracting. Note that the Barrier drain holes are located in the low side of each Barrier.

Environmental Control

Delta Scientific Corporation's vehicle Barrier systems can be used in all geographical areas. Since the early 1980's, Delta Barriers have been successfully installed in locations just south of the Arctic Circle (Oslo and Stockholm), in extremely cold areas of the United States such as Idaho Falls and Grand Forks, and in all the capital cities of Europe. Tropical installations include more than thirty locations within ten degrees latitude of the Equator. In between, installations run from temperate areas to Middle East desert sands.

Heating

Cold climate installations require the use of heaters to maintain proper oil viscosity and to eliminate the possibility of snow or ice blocking the Barrier mechanism. Depending on the hydraulic power unit size and rating, Delta supplies heaters ranging from 60 to 500 watts @ 120/240 volts for the oil reservoirs. The hydraulic hoses to the Barriers are to be run below the frost line where temperatures are a relatively constant 45 to 55ºF [7 to 13ºC]. If desired, the ducts carrying these hoses can be heat traced at time of installation.

The Barriers themselves may require heaters. Ratings in the range of 300 to 600 watts are common.

Delta strongly recommends that the entire roadway in the immediate vicinity of the Barriers be heat traced. This is to minimize the chance that a vehicle could lose control or traction in front of the Barriers. Also, in many cases, guard and/or inspection personnel will need to work on a vehicle in front of the Barriers. The heat tracing will reduce the personnel dangers of working on snow and ice.

Roadways containing Barriers should not be plowed. The snow plows will damage the Barrier paint and non skid finish. Additionally, the plow blade may catch the front edge of the Barrier and pull it to the guard position. This will damage the plow and possibly severely injure the operator. Only hand clear snow around the Barriers. Snow removing chemicals such as salt should also not be used around the Barriers, as the corrosion of the steel components will be greatly accelerated.

Drainage provisions in Barriers subject to freezing will also need some consideration. Heat tracing of the drain lines and/or sump well heaters may be needed to help remove the melted snow and ice from the Barrier foundations.

Cooling

Barrier installations in areas where the temperatures are frequently above 100ºF [38ºC] should have the hydraulic power units located in temperature controlled equipment rooms or be equipped with oil coolers. The simplest but least effective method is an air cooled heat exchanger. Very large surface areas are required to cool oil to 160ºF [71ºC] when only 130ºF [55ºC] cooling air is available. A more compact installation can be realized if a water cooled heat exchanger is located in the reservoir tank. Typically, less than one gallon per minute [4 liters per minute] of water at 100ºF [38ºC] or less is required. If the water stream can be returned to a cooling tower or other closed loop system, no waste of water is incurred.

Sand and Dust

Barrier locations in sand or dust areas require a few additional precautions. The hydraulic power units should be mounted in equipment rooms that can be pressurized to maintain positive air flow out of the room. This minimizes the accumulation of sand, dust and other abrasive materials on the hydraulic equipment where it could find its way into the oil and sensitive mechanical devices. Filter and fluid changes may be more frequent than at other installations.

Barriers in sand swept areas may need to have the foundation tubes cleaned frequently. This is usually accomplished by using an industrial type vacuum to sweep out the accumulated debris. Sand accumulation can be minimized by placement of suitable fences or walls around the Barrier area.

Good Drainage – The Key to a Successful Installation

Poor drainage of the Barrier system is one of the top reasons for a poorly operating Barrier system. The steel structure of the Barrier deteriorates and the mechanical components fail. Attention to drainage begins before the actual installation. The selection of the drainage method must be made with knowledge of the conditions that exist on the ground. Actual conditions must be known and not guessed.

Siting

Care should be taken to mount the Barrier in an area that is not subject to flooding. Do not allow the Barrier(s) to be the drainage for the surrounding roadway. If the Barrier(s) are mounted on a slope, a trench drain should be installed uphill of the Barriers to remove water flowing down the road (see Figure 6).

Drain Types

The best results will be had by providing hard drain lines to a sump well. The sump well can be connected directly to the storm drain or sewer system, or water in the well may be pumped to another location for disposal. The sump well also allows skimmers and other devices to remove tramp oil or contaminants from the water as needed. This type of drainage is mandatory where the water table is within the depth of the Barrier foundation. See Delta drawing 90900 for a suggested sump well design. Drain lines should be sized for the expected rainfall.

French drains or other gravel trench drains can only be used in areas of relatively light rainfall and with soils that have an ability to disperse water. Do not expect a French drain to function in clay or soils with an impervious layer of mineralized soil (hardpan) or relatively impervious rock layers underlying shallow soils.

Barrier Placement

The roadway should be crowned in the area of the Barrier to prevent standing water from draining into the Barrier foundation frame. It is not necessary for the Barrier to be level or plumb to operate. If the roadway is not level the Barrier may be placed to match the contour; however, be sure the appearance factor is considered. An installation where the equipment is not level even if it follows the terrain can be distracting (Figure 3).

Mount the Barrier above the surrounding roadway surface by 1 inch [25mm]. See Figure 4. By doing this, only the water falling in the immediate area of the Barrier can find its way to Barrier drains. (The slight bump is also desirable to help keep vehicle speeds low around the Barrier.) If the Barrier must be installed flush to the roadway for operational considerations, provide trench drains in a perimeter about the Barrier(s) to minimize roadway water from finding its way down into the Barrier (see Figure 4).

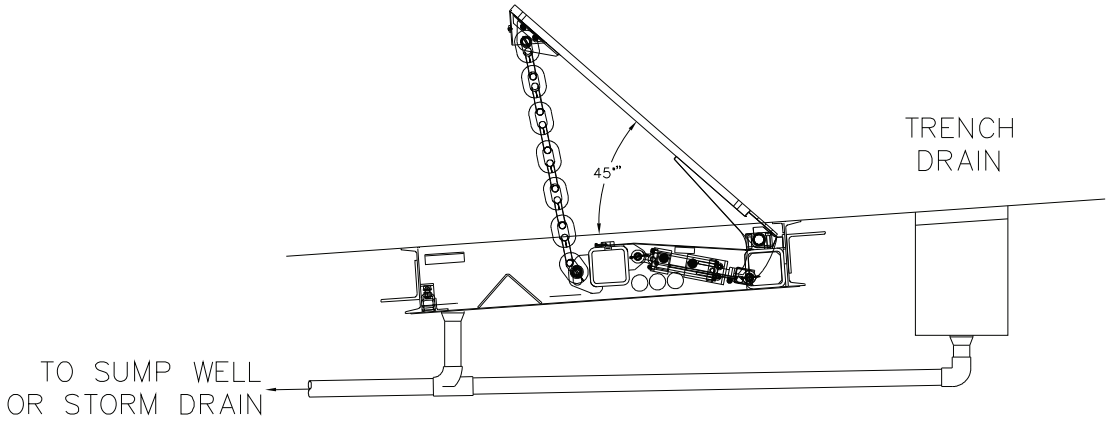


Figure 4 – DSC2000 Barrier installed in roadway ramp. Note the trench drain in the rear to minimize the amount of water that the Barrier drainage must handle.

Corrosion

Very occasionally a site is both wet and unfriendly, i.e., either highly acid or basic. In these cases, anodic protection is recommended. Delta will be happy to review specific job locations and make suitable recommendations where such protection is needed.

Interconnect

Provisions for electrical and hydraulic feed should be made prior to pouring the foundation of the Barrier.

The Barrier is provided with three 2.5" [64 mm] holes to allow the hydraulic conduit ducts to be run to each Barrier in series. The hydraulic ducts should be located on the side of the Barriers that is nearest the HPU. We recommend that a 2" [50 mm] PVC pipe be run from the hydraulic power unit to each Barrier to provide a conduit through which hoses can be pulled. Alternately, rigid steel pipe can be run from the HPU to the Barrier directly buried in the ground. See the Mechanical System section of this manual for a discussion of the various ways to interconnect the Barrier with the HPU. Block out any unused hydraulic connection holes.

The (optional) fully up and fully down limit switch conduit is also located on Barrier. Units with heaters will require a conduit for the Barrier heaters. Rigid metallic conduit or equal is to be run to these. Be sure that appropriate fittings are used that will allow wire to be pulled. It is too late to correct this error after the concrete is poured!

Connection

The hydraulic hoses are to be terminated directly on the hydraulic cylinders. The hydraulic cylinder will have to be re-oriented depending on which side the hoses enter the Barrier.

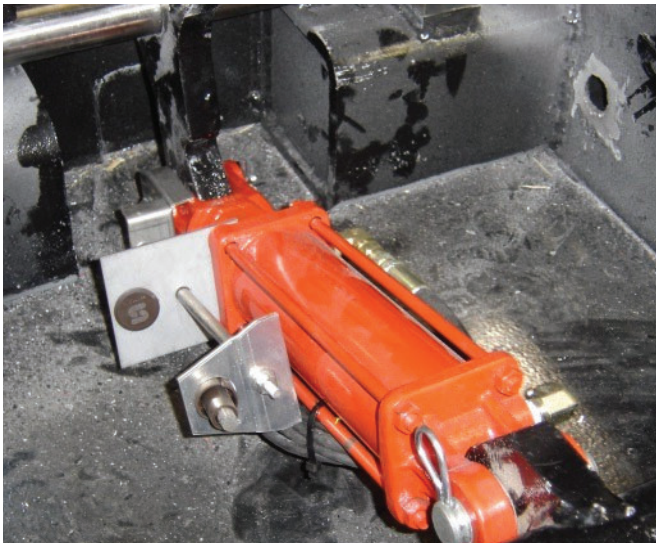


Photo 4 - Hydraulic cylinder installed for hoses to enter from the right, limit switch on left.
(View from the front facing rearward)

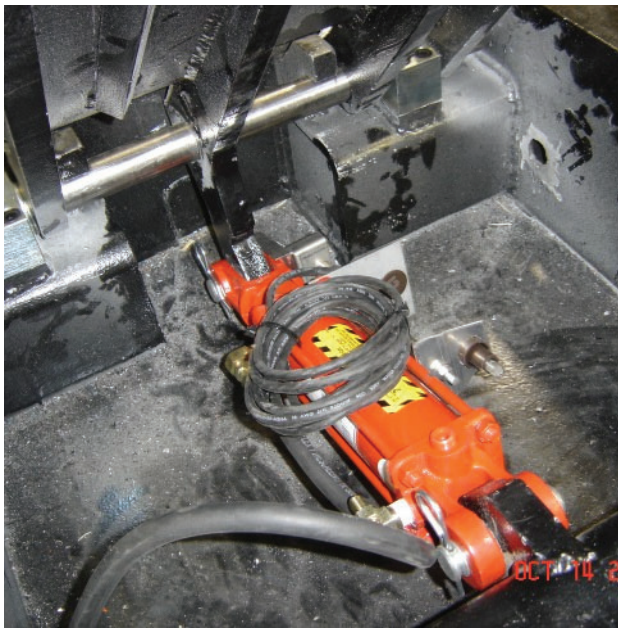


Photo 5 - Hydraulic cylinder installed for hoses to enter from the left, limit switch on right.
(View from the front facing rearward)

The hydraulic cylinders are re-oriented by pulling both cylinder clevis pins and turning the cylinder 180 degrees around its longitudinal axis. The cylinder rod clevis needs to stay in the original position (clevis clamp down for clearance). Thus the limit switch bracket will need to be moved to match the side with the limit switch magnet. Reinsert the clevis pins and securely cotter them.

Concrete Notes and Specifications Note, these are *minimum* requirements only. You may exceed these requirements with no reduction in the rating of the equipment.

1) Contractor shall verify and be responsible for all dimensions and conditions at the job site.

2) Foundation concrete may be placed directly into neat excavations, provided the sides of the excavation are stable. Where caving occurs, provide shoring. Type and method of shoring shall be at the contractor's option.

3) The excavation shall be kept dry at all times. Groundwater, if encountered, shall be pumped from the excavation.

4) Concrete shall be laboratory designed, machine mixed, producing 3,000 psi [20,68 Mpa] at 28 days.

5) Cement shall be tested Portland cement conforming to ASTM C150, Type I or II.

6) Aggregates shall conform to ASTM C33. Maximum size of aggregate shall be 1.5 inch [38 MM].

7) Reinforcing steel shall be deformed bars conforming to ASTM A615, Grade 60 (60,000 psi [413,7 Mpa]).

8) Hooks and bends shall conform to AIC Standard 318, latest revision. Inside diameter of hooks and bends shall be at least 6 bar diameters.

9) Provide spacer bars, chairs, spreaders, blocks, etc, as required to positively hold the steel in place. All dowels shall be firmly wired in place before concrete is poured.

10) Concrete shall be conveyed from the mixer to final deposit by methods that will prevent separation or loss of materials. Troughs, buckets or the like may be used to convey concrete. In no case shall concrete be allowed to free drop more than 5 feet [1,5 M].

11) Concrete shall be thoroughly consolidated by suitable means during placement and shall be thoroughly worked around reinforcement, embedded fixtures and into corners of forms.

12) Concrete shall be maintained above 50ºF [10ºC] and in a moist condition for at least 7 days after placement. Adequate equipment shall be provided for heating concrete materials and protecting concrete during freezing or near freezing weather.

13) Where exterior wall face requires shoring and/or forming, the forms shall be substantial and sufficiently tight to prevent leakage. Forms shall not be removed until the concrete is 7 days old.

14) Backfilling shall be done by depositing and tamping into place clean sand or pouring lean concrete. Water jetting shall not be allowed.

15) Conduits and pipes of aluminum shall not be embedded in concrete unless effectively coated or covered to prevent aluminum/concrete reaction or electrolytic action between aluminum and steel.

16) Construction joints not indicated on the drawings shall not be allowed. Where a construction joint is to be made, the surface of concrete shall be thoroughly cleaned and all laitance and standing water removed.

17) Contractor shall be responsible for the protection of all adjacent areas against damage and shall repair or patch all damaged areas to match existing improvements.

18) Contractor shall keep the construction area clean at all times and at completion of work remove all surplus materials, equipment and debris and leave the premises in a clean condition acceptable to the owner or owner's representative.

Photo 6 - Three DSC2000 Phalanx Barriers installed on U.S. Department of State spacing of 42 inches [107 cm]. The two rebar beams have been installed and the lighter outer rebar placed about them. All bars are size 4 (0.5 inch [13 mm]). Note that the Barriers are placed directly in the 11 inch [28 cm] deep excavation. Plywood has be placed on the ramp plates to protect the finish from the concrete pour.

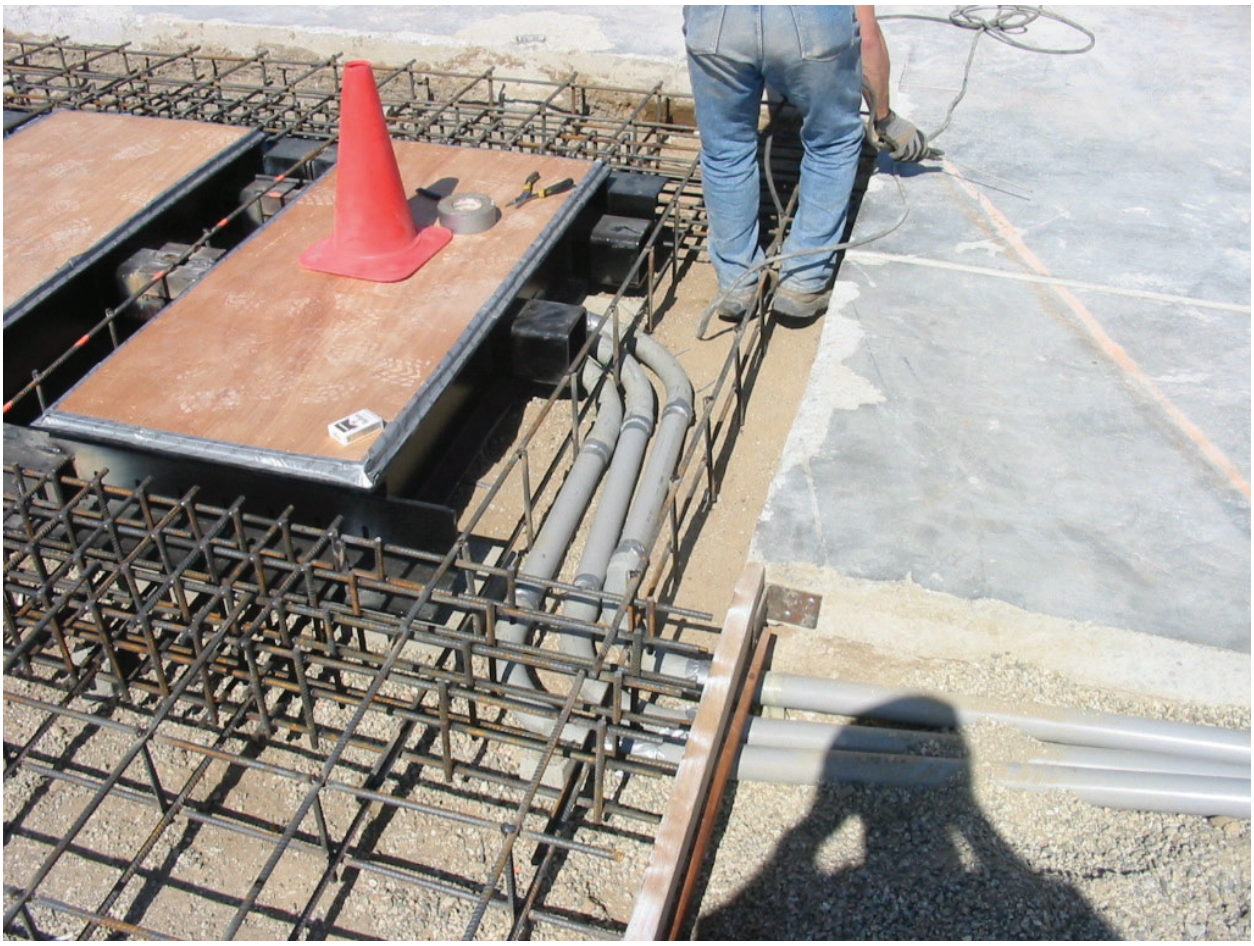


Photo 7 - Three PVC conduits have been installed for the hydraulic hose interconnect. Two of these will run straight through the first Barrier on the way to the second and third Barriers. These ducts should be run in the most direct route possible to the hydraulic power unit.

Photo 8 - 3000 psi [20.68 Mpa] transit mixed concrete is being distributed during the pour. All hydraulic hose ducts and electrical conduits have been installed by this point in the installation.

Photo 9 - The concrete has been screeded and tamped. Additional concrete has been poured to patch the other excavations necessary for a complete installation.

Photo 10 - The concrete has is cured and the protective covers have been removed. These units have been instrumented for the crash test.

Photo 11 - Delta Model DSC2000 Phalanx in the guard position from the attack side.

Photo 12 - Delta Model DSC2000 Phalanx in the guard position from the protected side. (The blue tape patches are to secure instrumentation for the crash test.)

Photo 13 - Delta Model DSC2000 Phalanx at the moment of impact by a vehicle weighing 15,000 pounds [6,800 Kg] traveling at 50 mph [80 kph].

DELTA

ELECTRICAL & CONTROLS
INSTALLATION INSTRUCTIONS
VEHICLE ARREST SYSTEM

MFG. UNDER U.S. PATENT #4,097,170 4,158,514 4,318,079 4,354,771 4,490,068 4,576,508 4,715,742

U.K. PATENT # GB 2,127,893B 2,138,883B

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Doc #100-35 P-2

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ELECTRICAL HOOK UP

Number of Barriers: One Phalanx Barrier

Control and Options: Standard 24 VDC Controls

- Barrier Fully Up Limit Switch (Optional)
- Barrier Fully Down Limit Switch (Optional)
- Barrier Front Face Lights (Optional)
- Safety Loop Detector, Model 3546 (Optional)
- Stop/Go Signal Lights, MPL-10 (Optional)
- Stop/Go Signal Gate, Model AG812 (Optional)
- Master Control Panel (Optional)
- Slave Control Panel (Optional)
- Emergency Fast Operation Circuit (Optional)
- Annunciator Circuit (Optional)

Referenced Drawings:

905XX	Hydraulic Power Unit, Single Barrier Set
906x0-1	Control Circuit and Motor Starter, 120-240/24 VDC, Single
90605	Main Board Logic Diagram
907XX-X	Master Control Panel, Single Barrier Set
908XX-X	Slave Control Panel, Single Barrier Set

The following charts have been prepared to assist in the Electrical Interconnect of the Hydraulic Power System, the System Control Circuits, the Remote Control/Status Panels (Master and Slave), as well as various other options offered with Delta Barrier Systems. These charts are designed to supplement the detailed circuit drawings that are furnished with each system.

The voltage carried by each conductor, unless otherwise specified, is 24 VDC. These conductors are indicated by this symbol ">>>>>>>>>>". The maximum power at this voltage is 250 watts for hot/neutral wires, 1 watt for device wires. Where the voltage is other than 24 VDC, the conductor is indicated by this symbol ">>>>>> * >>>>>>" and a footnote specifies the voltage and current requirement. Either multi-conductor cable or single conductor wire can be used at the option of the installer. The wire size should be selected based on the pull length, current and voltage requirements and local codes and specifications.

Terminals are designated by a PCB board number followed by two letters followed by the terminal number, i.e. 1 CB 11. The first number is PCB Board number, in this case Barrier # 1, the first letter is the strip location, in this case "control circuit", while the second letter defines the terminal voltage. `A' and some 'C' codes are low voltage 24 VDC. Some 'B' & 'C' codes are the specified local control voltage.

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ELECTRICAL CONNECTION CHART

Reference Drawings: 906x0-1 & 90605.

- Barrier #1 Fully Down Limit Switch (Optional)

Limit Switch		Control Circuit
Common Terminal	>>>>>>>>>>>>>>	1 CA 11
Norm. Opened (Up)	>>>>>>>>>>>>>>	1 CA 12

- Barrier #1 Fully Up Limit Switch (Optional)

Limit Switch		Control Circuit
Common Terminal	>>>>>>>>>>>>>>	1 CA 16
Norm. Opened (Down)	>>>>>>>>>>>>>>	1 CA 17

Load per limit switch is 0.6 watts.

- Barrier #1 Front Face Lights (Optional)

Front Lights		Control Circuit
Lights Hot Terminal	>>>> 12 VDC + >>>>	1 CB 23
Common Neutral Terminal	>>>> 12 VDC - >>>>	1 CB 24

Load per Barrier Front Face Light Set is 5 watts @ 12 VDC (from 12 V voltage regulator).

Reference Drawings: (Drawing No. 906x0-1 & 90605).

- Loop Safety Device, Barrier #1 (Contact is shown for no vehicle 'call')

Loop Detector		Control Circuit
Common Terminal	>>>>>>>>>>>>>>	1 CA 5
Normally Closed Terminal	>>>>>>>>>>>>>>	1 CA 6

Note: Jumper terminal 1 CA 5 to terminal 1 CA 6 if no loop detector safety device is used. Load per loop detector safety device is 0.6 watts.

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ELECTRICAL CONNECTION CHART

Reference Drawings: 906x0-1 & 90605.

- Signal Lights for Barrier # 1

This circuit synchronizes the stop/go lights with the Barrier. As soon as the Barrier starts to rise the red "stop" light comes on and stays on until the Barrier has been lowered and is fully down. The green "go" light comes on at this point.

Signal Lights		Control Circuit
Supply Voltage (Note 3)	>>>> Note 2 >>>>	1 CB 1
Supply Voltage (Note 3)	>>>> Note 2 >>>>	1 CB 2
Common Terminal	>>>> Note 2 >>>>	1 CB 3
Signal Green Light	>>>> Note 1 >>>>	1 CB 4
Signal Red Light	>>>> Note 1 >>>>	1 CB 5

Note 1: These lines must be sized to handle one 40 Watts (maximum) incandescent bulb operating at the AC Control Voltage. If back to back lights are used, twice the current must be handled.

Note 2: If the commons are combined, the total of all currents must be considered.

Note 3: The supply voltage is applied at terminals 1 CB 1 (Hot) and 1 CB 2 (Neutral). This voltage can be whatever the signal lights require. If the lights are to be operated on 24 VDC, customer must insure when using the Delta power supply, the power supply rating is not exceeded.

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ELECTRICAL CONNECTION CHART

- Stop/Go Signal Gate, Model AG812

Reference Drawings: 906x0-1 & 90605

The Stop/Go Signal Gate Model AG812 is designed to have its motion coordinated with its companion Barrier. Upon raising the Barrier, the Signal Gate will lower to provide visual indication to drivers to stop. The Signal Gate will remain in the down position until the Barrier is again lowered to the full down position at which point the Barrier's down limit switch will cause the Signal Gate to raise.

Stop/Go Signal Gate		Control Circuit
Terminal 12	>>>> Note 1 >>>>	1 CB 10
Terminal 14	>>>> Note 1 >>>>	1 CB 11

Note 1: The Model AG812 Signal Gate has the local control voltage brought to terminals L1 and L2. Signal Gate jumpers are on terminals CA 3 and CA 5 (changed from terminals CA 4 and CA 5).

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ELECTRICAL CONNECTION CHART

- Master Control Panel (Optional)

Reference Drawings: 906x0-1, 90605, & 907XX-X).

MASTER REMOTE CONTROL PANEL		CONTROL CIRCUIT
1 MA 3 (+)	>>>> Note 2 >>>>	1 CA 3 + (HOT) Note 1
1 MA 18 (-)	>>>> Note 2 >>>>	1 CA 18 - (NEUTRAL) Note 1
1 MA 4 (Close)	>>>>>>>>>>>>>>	1 CA 4
1 MA 8 (Open)	>>>>>>>>>>>>>>	1 CA 8
1 MA 14 (Emergency)	>>>> Note 2 >>>>	1 CA 14
1 MA 15 (Emergency Reset)	>>>> Note 2 >>>>	1 CA 15
1 MA 19 (Clear)	>>>>>>>>>>>>>>	1 CA 19
1 MA 20 (Not Clear)	>>>>>>>>>>>>>>	1 CA 20

Note 1: Size neutral and hot for 50 watts (maximum). All other lines are 1 watts each.

Note 2: If two master panels are being used: The terminals 1 MA and 2 MA for these lines are jumpered at the factory; 1 MA 3 to 2 MA 3, 1 MA 18 to 2 MA 18, etc. A jumper will be required between the circuit boards in the control circuit.

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ELECTRICAL CONNECTION CHART

- Slave Control Panel (Optional)

Reference Drawings: 908XX-X, 907XX-X, 906x0-1 & 90605. (See Note 1)

The Slave Control Panel can be wired into the Master Control Panel or directly into the Control Circuit. Both wiring diagrams are provided below. (See Note 1)

Slave Panel		Master Panel
1 SA 4	>>>>>>>>>>>>>>	1 MA 4
1 SA 8	>>>>>>>>>>>>>>	1 MA 8
1 SA 14	>>>> Note 3 >>>>	1 MA 14
1 SA 15	>>>> Note 3 >>>>	1 MA 15
1 SA 18	>>>> Note 3 >>>>	1 MA 18
1 SA 19	>>>>>>>>>>>>>>	1 MA 19
1 SA 20	>>>>>>>>>>>>>>	1 MA 20
1 SA 27	>>>> Note 3 >>>>	1 MA 27
1 SA 28	>>>> Note 3 >>>>	1 MA 28

OR

Slave Panel		Control Circuit
1 SA 4	>>>>>>>>>>>>>>	1 CA 4
1 SA 8	>>>>>>>>>>>>>>	1 CA 8
1 SA 14	>>>> Note 4 >>>>	1 CA 14
1 SA 15	>>>> Note 4 >>>>	1 CA 15
1 SA 18	>>>> Note 4 >>>>	1 CA 18
1 SA 19	>>>>>>>>>>>>>>	1 CA 19
1 SA 20	>>>>>>>>>>>>>>	1 CA 20
1 SA 27	>>>> Note 2 >>>>	1 MA 27
1 SA 28	>>>>Note 2>>>>	1 MA 28

Note 1: The Slave can be fed from either the Master or from the Control Circuit. If the Slave is fed from the Master, then connect as shown in the first chart. If the Slave is fed from the Control Circuit use the second chart.

Note 2: These connections must be made directly from the Slave Remote to the Master Remote. If the Slave Control Panel is directly connected to the Control Circuit, the routing can be made through a spare terminal on the Control Circuit.

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ELECTRICAL CONNECTION CHART

- Slave Control Panel (Optional) Continued

Note 3: If two Slave panels are being used: The terminals 1 SA and 2 SA for these lines can be commoned. A jumper will be required between the circuit boards in the control circuit.

Note 4: Size neutral and hot for 50 watts (maximum). All other lines are 1 watts each.

Note 5: If two Master panels are being used: The terminals 1 MA and 2 MA for these lines are jumpered at the factory; 1 MA 3 to 2 MA 3, 1 MA 18 to 2 MA 18, etc. A jumper will be required between the circuit boards in the control circuit.

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ELECTRICAL CONNECTION CHART

- Hydraulic Power Unit and Motor

Reference Drawings: 906x0-1 & 90605

Note: These connections have been made at the factory but are shown here as an aid for troubleshooting.

Hydraulic Power Unit Valve Solenoids		Control Circuit Barrier #1
UP	>>>> Note 1 >>>>	1 CB 17
UP COMMON	>>>> Note 1 >>>>	1 CB 18
DOWN	>>>> Note 1 >>>>	1 CB 19
DOWN COMMON	>>>> Note 1 >>>>	1 CB 20
EMERGENCY OPERATE	>>>> Note 2 >>>>	1 CB 21
EO COMMON	>>>> Note 2 >>>>	1 CB 22

		Motor Control Circuit Barrier #1
LEVEL SWITCH	>>>> Note 3 >>>>	CC 8 (CC 18)
LEVEL / PRESSURE SWITCH	>>>> Note 3 >>>>	CC 9 (CC 19)
PRESSURE SWITCH	>>>> Note 3 >>>>	CC 10 (CC 20)

Note 1: These lines must be sized to carry 30 watts at 24 VDC.

Note 2: These lines must be sized to carry 20 watts at 24 VDC.

Note 3: Starter coil power consumption is less than 100 va inrush, and less than 10 va sealed.

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ELECTRICAL CONNECTION CHART

Control Circuit

The Control Circuit is fed from the customer's local AC control voltage supply (either 100-120/1/50-60 or 200-240/1/50-60). Connection is to terminals CC 1(+) and CC 2(-).Supply should be adequate to provide a minimum of 250 Watts of power.

The control circuit contains a power supply, which reduces the local voltage to 24 VDC for use on the remote control panels. The feed out of the control circuit for these remotes is on terminal CA 1(+) and CA 2(-). Standard power capability is 150 watts. Battery back up power supply/charger and batteries are optionally available.

Note: Use caution when installing the field conduits and wiring to the control circuit enclosure. Shield metal chips and wire fragments from falling on to or in to components. Component failure can be caused by careless installation.

Power Unit Motors

The motor has been ordered and supplied to the actual site voltage. Please confirm before hookup. The motor is factory wired to an automatic starter controlled by the hydraulic power unit pressure switch, oil level switch and (optional) three phase power monitor. Thermal overload protection is integrally provided.

The customer should provide branch circuit protection as required by national and local code. Care should be taken in arriving at the correct wire size for the length of cable provided.

Hydraulic Power Unit Wiring

The three phase power is brought into the HPU terminal box to the line side of the door mounted disconnect switch at L1, L2 and L3.

Verify that the motor runs in the correct direction. Units with phase monitors (three phase only) are factory set to run in the correct direction. If motor does not run, or runs in the wrong direction, reverse any two incoming wires at L1, L2 or L3; motor should now run and in the correct direction.

Power for the starter contactor coil is the same as the primary voltage of the control circuit. Coil voltage legend plates are on the starter so that this can be confirmed. Connection points for the coil power are 'CC 1(+)' and 'CC 2(-)'. Starter coil power consumption is less than 100 va inrush, and less than 10 va sealed.

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ELECTRICAL CONNECTION CHART

Barrier and HPU Heaters

The system is furnished with electric heaters for the purpose of melting snow and ice, which may otherwise freeze the Barrier in either the up or down position.

The hydraulic oil reservoir also is equipped with an immersion heater located within the oil level. It is equipped with a thermostat dial and should be set to a value between 60 to 75ºF [15 to 25ºC].

The electric feed to the heaters is fused in the control circuit. See appropriate wiring diagram for the connections.

Important: Before energizing the heater circuits at the start of each season, the elements must be megger tested. This is typically done with a megger capable of delivering 500 volts to the circuit. A value in excess of 50,000 ohms to ground is acceptable for energizing the heater circuits. Call the factory if a lower reading is found.

Failure of the elements will in no way cause the Barrier to malfunction unless there is an ice or snow build up inside the machine.

MECHANICAL
SYSTEM THEORY
VEHICLE ARREST SYSTEM

MFG. UNDER U.S. PATENT #4,097,170 4,158,514 4,318,079 4,354,771 4,490,068 4,576,508 4,715,742

U.K. PATENT # GB 2,127,893B 2,138,883B

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'DELTA' STYLE HYDRAULIC POWER UNITS
DSC2000 SERIES PHALANX® BARRIERS WITH BACK-TO-BACK FLOW CONTROLS
THEORY OF OPERATION

Power Source

Delta Scientific Corporation's barricade systems are powered by a hydraulic oil power unit (HPU). This unit is typically mounted remote from the Barrier(s) and attached to them by hoses or steel pipes. The hydraulic power unit provides the tremendous lifting force necessary to raise the heavy steel weldments of the Barriers. The forces generated are in the range of 20,000 to 25,000 pounds for these large Phalanx® Barricades. An industrial grade electric motor drives the hydraulic gear pump to produce the HPU system pressure.

Power Storage

The HPU stores the pressurized hydraulic oil produced by the gear pump in an accumulator. The accumulator thus provides a high pressure reserve of oil available to move or maintain the position of the Barricade. The pressure of the oil in the accumulator is maintained by the automatic cycling of the pump motor on and off between the low and high settings of a pressure switch. It is important to note that the pump motor thus runs independently of any command from the Barrier control panel; if pressure is low the pump motor will run, if the pressure is within bounds (even with the Barrier moving) the pump motor will be off.

In addition to providing the high pressure oil to move the Barriers, the accumulator also acts as a hydraulic spring to cushion the various parts of the hydraulic system during normal operation and when the Barrier is performing its' designed task of arresting vehicles.

Power Access

To move a Barrier we must direct the pressurized oil in the HPU to the appropriate up or down side of a hydraulic cylinder in the Barrier. This is done by shifting a directional valve mounted on the HPU. The shifting is accomplished by energizing one of two electric solenoids on the valve. The valves used by Delta are known as 'two position, electrically actuated, spring detented'. The spring detent allows the valve to remain in the position it was last shifted to without being constantly energized. This saves energy and allows the Barrier to remain in its commanded position even if power is interrupted to the HPU.

Using two or more of these directional valves allows us to independently control two or more Barriers from one HPU. This feature is useful where Barriers are placed in multiple lanes at the entrance of a facility.

GOOD HYDRAULIC PRACTICE

Safety Precautions

At all times observe good safety practices when working on either the electrical or mechanical system. Particular attention should be paid to the danger of working on the Barrier when the power is on. The Barrier is a powerful hydraulic press that can easily crush anything in its way. Keep hands free of the mechanism when the power is on or the HPU is up to pressure. Turn off the electric power and bleed the hydraulic pressure down to zero before working on any part of the system. Traffic should be controlled around the Barrier(s) during any work so that vehicular accidents do not occur if the Barrier should happen to rise. After work is complete, do not allow traffic over the Barrier until all control and safety functions have been verified to be properly working.

Cleanliness

To maintain system efficiency and reliability great care must be taken to prevent any form of dirt, sand or grit from entering the hydraulic system. Only new, clean filtered hydraulic oil should be used for charging the unit. Unless specifically ordered as filtered, new oil should be pumped through a 25 micron filter when charging. See **Commercial Hydraulic Oil Interchangeability Chart** for our recommended oils. The tests conducted at the factory on the system have been done with the HPU charged with Shell 'Tellus' 46. This grade is for moderate temperatures and is available in most of the worlds leading cities.

Hydraulic oil is subject to degradation and contamination with age, so follow the recommendations in the Maintenance section of this manual.

Location

The hydraulic power unit should be mounted indoors in a clean, dry location away from excessive heat or cold. As an alternate the unit can be mounted outdoors if provided with a suitable cover designed for the area to exclude moisture or dust as appropriate. While HPU's have been mounted below grade in concrete pits, we do not recommend this as drainage becomes extremely important. A drain backup can cause the power unit to go under water with severe damage resulting. Also, the water condensation found in most pits is detrimental to the HPU components.

It is important that the hydraulic power unit be mounted at approximately the same or higher elevation as the Barrier(s). If the HPU is mounted lower than the Barrier(s), the oil in the lines may repeatedly drain back to tank and make the Barrier motion erratic. The power unit can be at elevation greater than the Barrier(s) if it is understood that breaking a line at the Barrier will cause oil to flow in that direction.

System Component Description

The hydraulic power unit (HPU) is assembled on a steel framework which supports the hydraulic oil reservoir and major components. Provision is made to permit bolting or lagging of the frame to a suitable foundation. See the appropriate General Arrangement drawing for hole and interface dimensions. The power unit has been pre-tested for function and leaks at the factory prior to shipment. Preparation for shipment calls for the draining of the test oil, however, approximately one inch [25 mm] will remain in the tank after draining.

Oil Reservoir Tank

The oil reservoir forms the largest component of the hydraulic power unit. It is integral with the backplate of the skid base and forms the structure to which other components are attached. On the top is mounted the filler breather cap by which oil can be added to the tank. The capacity of the reservoir is nominally 20 gallons [75 liters]. This is also approximately the charge of oil that will be required to fill the lines and hydraulic cylinders of the Barriers.

The tank's level is indicated by a sight glass on its' front face. The reservoir should only be filled with the hydraulic system pressure at zero, otherwise overflowing can occur as a result of oil being displaced out of the accumulator. The proper oil level is within 1 inch [25 mm] of the sight glass top at zero system pressure.

The reservoir tank holds the suction strainer on the pump suction line and also provides the mounting for return line filter. A oil level switch is provided to shut the pump/motor off should oil loss threaten pump failure. A reservoir heater can be supplied if the ambient temperature so dictates.

Drains are furnished at tank bottom (both sides) for removing water and/or changing fluids. This should be done at the intervals directed in the **Maintenance** section. A removable cover is provided for clean out and access to the components inside.

Gear Pump/Check Valve

The gear pump is mounted on a motor adapter and attached to the motor drive shaft by a flexible coupling. The set screws in the coupling halves should be checked for tightness on the pump and motor shafts prior to start up. The pump seals, as are all other HPU component seals, are Buna-N. A check valve is located at the pump. Its purpose is to prevent the pressurized oil in the high pressure side of the unit from running back through the pump after the motor shuts off. If it were to fail you would likely see the fan on the pump motor run backwards and the system pressure fall until zero.

Do not start the pump/motor until oil has been put into the reservoir. The pump can only be run dry for a few seconds before damage to the gears and the housing occurs. The suction line to the pump is provided with a shutoff valve to facilitate maintenance. This valve must be fully open at all times except when replacing the pump. A closed pump shutoff valve can destroy the pump in seconds.

Figure 1 – Typical Delta HPU mounted in enclosure.

Motor

The motor is mounted horizontally and bolted to the HPU framework as will as to the other side of the pump/motor adapter. It is a totally enclosed fan cooled (TEFC) design, three phase. The motor voltage and rating is shown on its nameplate; as a multi winding motor is furnished, the as wired voltage is shown on the Delta motor placard attached to the motor starter enclosure.

Motor/pump direction of rotation is critical. A direction arrow decal is provided. The motor must run in this direction when site power is brought to the HPU skid. If the motor does not run in the proper direction on startup, reverse any two incoming wires to the control circuit disconnect switch.

Phase Monitor (Optional)

An optional phase (voltage) monitor may be supplied to protect the motor from improper phasing, phase loss, or low voltage. The monitor will drop out the motor starter circuit if the three phase power is phased wrong or if the voltage is too low. The unit has been properly phased at the factory. If the motor does not run on initial startup, reverse any two incoming wires to the control circuit. The motor should now run and in the correct direction.

Magnetic Motor Starter/Overload

Site voltage is fed to the line side of the motor starter/thermal overload. See voltage placard attached to the starter enclosure for the **as wired** voltage and motor starter circuit drawing number. The feed to the HPU should be controlled from an appropriately sized circuit breaker/disconnect switch and the wires sized properly to prevent excessive voltage drop from the disconnect to the HPU skid. Motors should not be allowed to run at voltages exceeding +/- 10 percent of their ratings. This could lead to tripping of the thermal overloads or substantial damage to the motor and control circuit components.

The thermal overload is calibrated for the anticipated full load amperage of the motor at run voltage, this setting should be confirmed before start up (the amperage dial of the overload should be set for the full load amps labeled on the motor nameplate). The overload should be in the **MANUAL** position, automatic reset could cause equipment failure if a fault is not corrected in a timely manner.

A voltage/phase monitor may optionally be furnished. In addition to protecting the pump against improper rotation, it will shutdown the motor starter circuit if phase loss/reversal or low voltage is detected.

Accumulator

The accumulator is a large cylindrical pressure vessel that provides the high pressure reserve of oil used to move the Barriers and keep them in position. In addition, the oil stored in the accumulator is available to move the Barrier(s) even if the pump/motor should be inoperable. The amount of oil directed out to the Barrier(s) is not limited by the displacement rate of the hydraulic gear pump but by the oil stored in the accumulator.

An accumulator is divided into two sides by a piston (piston accumulator). On the top side, the accumulator contains dry nitrogen gas pre-pressurized (precharged) at the factory at a level determined by the type of Barriers on your order. The fittings and seals on the nitrogen fill connection should be kept tight to prevent loss of this precharge. A special tool is available from Delta Scientific to check the precharge pressure and facilitate recharging if that should become necessary. Precharge should be checked every six months (see **Maintenance** section of this manual). The pump/motor should not be run if there is no precharge, damage to the accumulator could result. Only dry nitrogen should be used for precharge, air or other gases could cause the accumulator vessel to explode. Precharge should only be done at zero hydraulic pressure or an incorrect precharge pressure will result.

The other side of the accumulator contains the system hydraulic oil. At zero hydraulic oil pressure there is little or no oil in the accumulator, the piston is down hard on the oil outlet. As the pump/motor runs, oil accumulates on the oil side at the pressure indicated by the system pressure gage (oil side). This pressure gage will read the precharge indirectly by jumping to the precharge value on motor startup then slowly running up to the shut off pressure. It is important to note that at shut off, only a portion of the accumulator contains oil, the piston has been pushed back to compress the nitrogen gas which is now also at the shutoff pressure. It is the compressed gas that provides the 'spring' to move oil out of the accumulator and to the cylinders of the Barrier.

When performing accumulator maintenance it is necessary to bring the oil side pressure to zero. Large oil loss can occur if fittings are tampered with while under pressure.

Pressure Switch

The pressure at which the oil side is maintained is determined by a pressure switch mounted on the high pressure (pump or accumulator) side of the system. The switch is factory set for the proper shutoff pressure of 1900 psig [131 bar] and has a 500 psig [34 bar] 'dead-band'. This means that the pressure will fall approximately 500 psi [34 bar] after shutoff (about 1400 psig [97 bar]) before the switch closes to restart the pump motor. These settings should be indicated on the motor starter drawing and noted in the pressure log in the **Maintenance** section. The electric side of the switch is terminated on a terminal strip in the motor starter enclosure.

Pressure Gage

A pressure gage is provided to indicate the hydraulic oil pressure of the system. It does not indicate the accumulator precharge except as noted in the **Accumulator** paragraph of this section. The gage is liquid filled with glycol to eliminate needle bounce and a vent is thus provided to allow the case to breath, preventing case blow out. Upon receipt, remove vent seal plug/label.

This gage must read zero when working on the HPU pressure lines and fittings or large oil loss can occur. A gentle tapping on the gage glass will provide the most accurate readings.

Figure 2 – Pressure switch, pressure gage and pressure relief valve mounted on directional valve manifold.

Pressure Relief Valve

A pressure relief valve is provided should the high pressure switch fail to shut off the pump motor. The relief valve is typically set 200 to 250 psig [14 to 17 bar] higher than the high pressure switch. When the pressure relief valve opens, oil is allowed to circulate from the pressure side of the system to the tank/motor suction. The motor horse power is thus being turned to heat across this valve which could cause component damage if allowed to operate uncorrected. The operators or guards should thus report to the person in charge of Barrier maintenance if they note the HPU constantly running.

An open pressure relief valve will cause a hissing sound and if the motor is not running, a falling pressure gage would be noted. See the **Mechanical Trouble Shooting** section if the relief valve does not reseat on pressure reduction.

The pressure relief valve should in no case be set higher than 1.1 times the pressure rating of the minimum rated component in the Barrier system. Please note that most components are designed with a 4 to 1 safety factor, thus the burst pressure of a 2500 psig [172 bar] rated hose would be 10,000 psig [690 bar].

Low Level Switch

As noted above, an oil reservoir low level switch is provided to shut down the pump/motor if the reservoir level drops to the point where the suction of the pump could become uncovered. The gear pump can only run dry for a few seconds before severe wear occurs on the gears and its' housing. Causes of low level are slow system leaks and catastrophic failure of the pressure lines or hoses.

Oil Filter

A return filter element is furnished to filter the oil as it is being returned to the oil reservoir. The oil filter housing is only rated at 150 psig [10 bar] or less as the oil in the return line has only to overcome the pressure drop through the filter itself. If the filter should become clogged with dirt from the system a bypass check valve inside the filter will open and allow the dirty oil to circulate back to the reservoir. For this reason regular filter maintenance is a must. See the **Maintenance** section for details.

Directional Control Valve

A solenoid actuated directional control valve is provided to direct the high pressure oil to the up or down side of the Barrier cylinder(s). One or more (depending on the number of Barriers to be controlled) are mounted on an aluminum manifold bolted to the back plate on the oil reservoir. When the 'up' side is energized, the valve connects the high pressure (P) side of the manifold to the (B) output port of the manifold. The tank return line (T) is simultaneously connected to the (A) output port. When the 'down' side is energized, the manifold (P) side is connected to the (A) port and the (T) side is connected to the (B) port.

Figure 3 – Vickers DG4V Directional valves mounted on manifold. Solenoids 'B' are on the left, solenoids 'A" are on the right.

The directional valve is equipped with pin extensions mounted on the solenoid ends so that the valve spool can be manually shifted by inserting a pin with a diameter of approximately 0.125 inch [3 mm]. As described above in the **Power Access** paragraph, the valve has spring detents so that it remains in the last commanded position until moved by the electric solenoids or the override pins. See the applicable 'Hydraulic Valve Connection' drawing.

The spool of the valve is designed to provide 'closed center ports' so that if the valve malfunctions and does not fully shift, the ports will be closed to one another. Note that these valves require clearance between the spool and the valve body to properly function, thus some leakage from pressure to tank is to be expected. Excessive valve wear will eventually cause the pump/motor to cycle on and off several times per minute even when the Barriers are not moving. Replacement or rebuilding of the affected valve will then be required.

The convention used on all Delta Barrier systems regarding the directional control solenoid valves is as follows:

Directional Control Solenoid Numbering: Valve one (station one) is the bottom most valve on the manifold with the station number increasing to the top of the valve stack.

Color Codes:

Side/Solenoid	Wire Color	Function
Left/'B'	Black	UP
Right/'A'	Red	DOWN
---	White	COMMON
---	Green	GROUND

The valve is held to the manifold with high tensile cap screws. Buna-N O-rings are used to seal the valve port face to the manifold. It is imperative that the mating faces be clean and all 'O' rings in place and lightly lubricated with hydraulic oil before evenly torquing the cap screws.

Valve mounting screw torque:
NFPA DO1/ISO 03 40 to 50 in-lbs [5 to 6 N-M]

Speed Control Valves

Each directional valve station has speed control valves to control the normal up and down speed of the Barrier. They are located in the B line before the B hose. These Barriers are furnished with two flow control valves (a flow control valve is a needle valve with and check valve integrally plumbed across the needle) mounted back to back to provide independent control of the up and down speed.

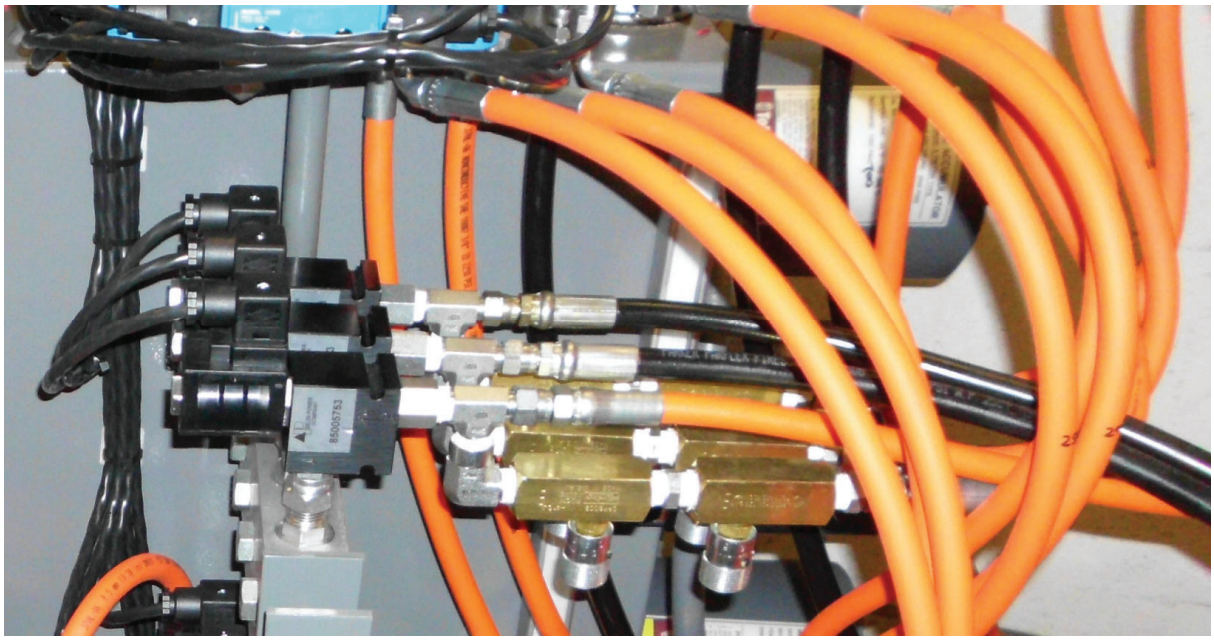

Figure 4 – Barrier speed control valves adjacent the Emergency Fast Operate (EFO) Valves

The Delta convention on flow control valves is that the 'up' speed is adjusted on the valve nearest to the directional valve manifold. The 'down' speed is adjusted on the valve nearest the Barrier. Clockwise turning of the adjustment knob is slower (valve closing), faster speed is gained by opening the valve (counter-clockwise). The valve should be locked with the set screw provided after adjustment.

Emergency Fast Operate (EFO) Valve (Optional)

Some systems are equipped with optional emergency fast operate (EFO) bypass valves. These solenoid valves when energized directly connect the high pressure (P) side of the HPU to the up side of the Barrier cylinder(s). This bypasses the normal Barrier speed control valves and allows the Barrier to rise at its' maximum possible speed. The valve is 'cartridge' style and is mounted in an aluminum body plumbed from the (P) side of the system to the (B) output port immediately before the (B) hose.

Should it become necessary to replace an EFO valve cartridge, the following mounting torques apply:

Solenoid Coil Retaining Nut	60 in-lbs [7 N-M]
Cartridge to Body	420 in-lbs [48 N-M]

Auxiliary Emergency Fast Operate Valve (Optional)

Some systems are equipped with an optional additional accumulator separated from the primary accumulator by an auxiliary emergency fast operate valve. This solenoid valve allows oil to be charged into the auxiliary accumulator and held in reserve until the 'emergency fast operate valve' is actuated. The valve then releases high pressure oil to the P side of the system, even if the primary accumulator has been exhausted. The valve is very similar to the normal EFO valve except that it is equipped with a manual override pin so that the auxiliary accumulator can be bleed down prior to performing maintenance.

Should it become necessary to replace an auxiliary EFO valve cartridge, the following mounting torques apply:

Series 14 - Solenoid Coil Retaining Nut	30 in-lbs [15 N-M]
Cartridge to Body	190 in-lbs [22 N-M]
Series 21 - Solenoid Coil Retaining Nut	30 in-lbs [15 N-M]
Cartridge to Body	475 in-lbs [55 N-M]

Hand Pump

In the event power should be lost to the pump/motor, the Barrier(s) can be raised by working a manual hand pump which is mounted adjacent to the pump/motor on the skid base. The hand pump has its' own internal check valve so no fluid is lost through the hand pump back to tank during normal motor driven pump operation. The suction line to the hand pump is located near the reservoir bottom. In use, the hand pump supplies oil to the pressure (P) side of the hydraulic system. The pump can be operated at anytime.

To raise a Barrier with the hand pump when electricity is out:

1) Check sight gage for proper fluid level, add oil as necessary.

2) Make sure accumulator bypass (bleed down) valve is closed.

3) Shift directional valve spool of Barrier from left (Up) side.

4) Start pumping (each stroke should be productive). Pump until Barrier is fully up.

5) Continue pumping for 10 to 20 strokes after the Barrier is up. This will add some oil to the accumulator to provide for some internal leakage before the Barrier would start to drift down from low pressure.

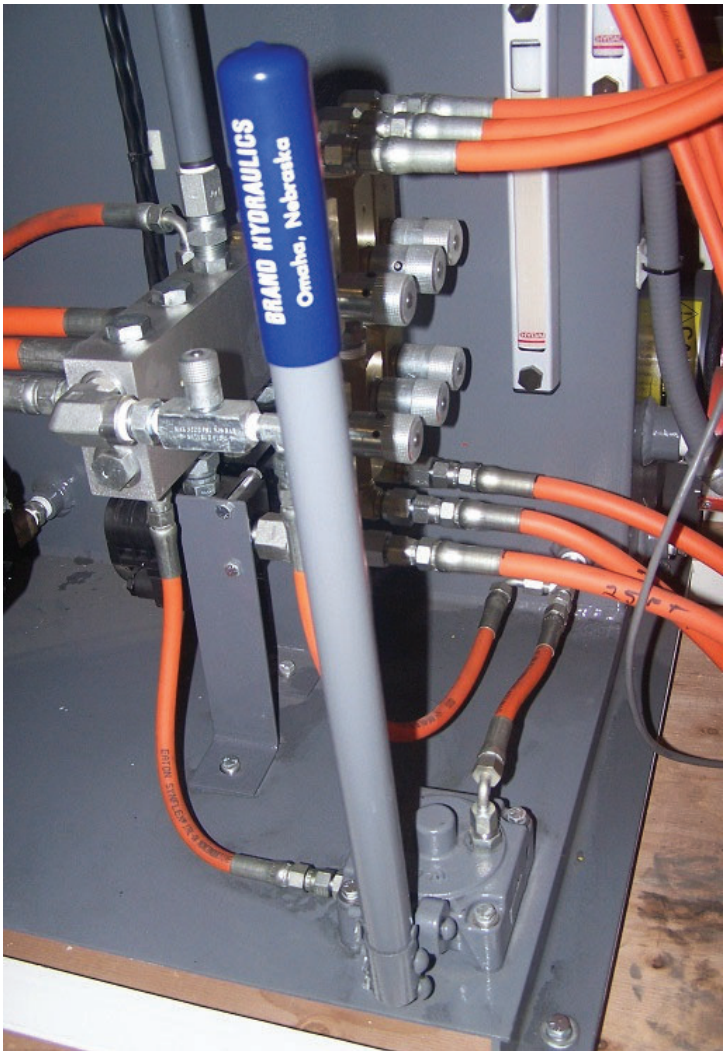

Figure 5 – Manual hand pump. The pressure bleed down valve is mounted to the left of the hand pump handle.

System Bleed Down Valve

Prior to performing any work on the hydraulic power unit or Barricades it is necessary to bleed down the pressure stored in the accumulator(s). **Note:** It is especially necessary to bleed the power unit down to zero hydraulic pressure before topping off the reservoir with fresh oil; large oil spillage can occur if the unit is not at zero pressure when the reservoir is topped off! This is accomplished with the accumulator bypass or bleed down needle valve located between the high pressure side of the system and the reservoir tank. (Typically this valve is mounted behind the hand pump in a line tied to the hand pump suction line.)

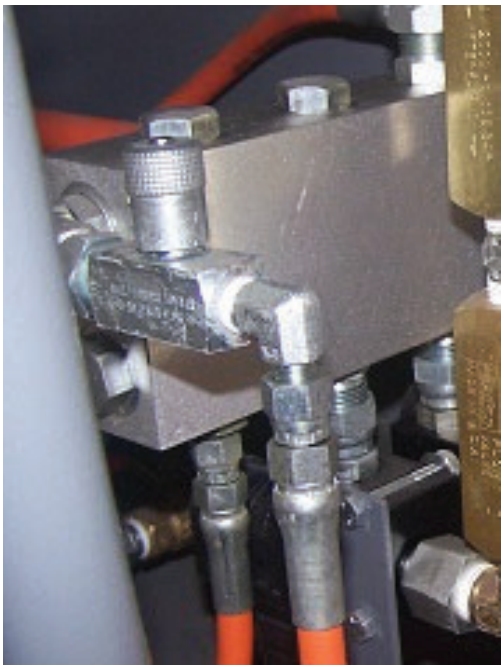

Figure 6 –The pressure bleed down valve.

To bleed down the system:

1) Turn off electrical power to the pump/motor.

2) If system is equipped with the optional auxiliary emergency fast operate system, release the auxiliary EFO valve override pin by twisting and pulling to the out position.

3) Release set screw. Crack open the bypass needle valve slightly until hissing sound is heard. Continue to open slowly until pressure on gage reads zero.

4) For added safety, leave valve open while performing maintenance.

To resume operation, close the bypass valve snugly and lock with the set screw. Turn on system power.

Hydraulic Interconnect Lines

Delta Scientific uses one of two systems to connect the hydraulic power unit to the Barrier(s). Applicable to both systems is a need to run the lines in the most direct route as possible, keeping bends to a minimum. Long runs will slow the Barrier rise time and must be compensated by increasing the flow diameter. In general, all runs over 50 feet [15 M] should first be cleared with the factory, especially if minimum emergency fast rise times are critical to the installation.

The hydraulic power unit should be mounted at approximately the same or higher elevation as the Barrier(s). Other wise, the oil in the lines may repeatedly drain back to tank and make the Barrier motion erratic.

Cleanliness is the other important requirement for the hydraulic interconnect lines. Dirt or metal chips will find their way into the tight clearances of the components, scoring shafts and spools and wearing seals. Lack of cleanliness will shorten the service life of the system.

Flexible Hydraulic Hose

This system conveys the hydraulic oil from the HPU to the Barrier through flexible hose(s) which in turn are run through a larger conduit, generally a 3 inch [75 mm] PVC tube per hose pair. The PVC conduit should be run to the Barriers in as direct a line as possible, all bends being a radius of at least 6 diameters of the conduit. The burial depth of the conduit should be deeper than the maximum permafrost level in areas subject to freeze. This will prevent excessive pressure drops in the hoses due to high viscosity from the cold. As the hose length changes under pressure, always provide some slack in the hose to allow for shrinkage or expansion.

All joints in the conduit system should be smooth and free from sharp edges and burrs to prevent scoring the hose outer sheathing during pulling and Barrier operation. A hose under pressure is very rigid and tends to bounce when the directional valves are shifted. Sharp edges will quickly cause a hose failure. Where the hose can not be clamped or fixed away from abrasive surfaces, a steel or plastic protective coil or sleeve should be placed over the hose.

Insulate the hose with a heat resistant boot, fire-sleeve or a metal baffle if the hose run passes near an exhaust manifold or other heat source.

Hoses received from the factory have caps on each end and are free from dirt and other contamination. Do not remove caps until hoses are pulled through the conduit and are ready for termination. If caps are not present, reclean the hoses by blowing out with clean compressed air. As an alternate, hose assemblies may be rinsed out with clean mineral spirits, being sure to flow the mineral spirits through from top to bottom without forming any low points which will tend to collect debris.

Before attempting to pull hoses through the conduit first inspect them. Lay the hose out straight and check that the layline of the assembly is not twisted. (Hoses pulled with a twist in them will tend to straighten, causing fitting nuts to loosen.) Check for scoring, cracks, bulging, kinks and dirt in the outer sheath. Check for proper gap between nut and socket or hex and socket; nuts should swivel freely. Be sure hose is capped securely.

If the hose must be stored for a prolonged period prior to installation it should be kept in a dark, dry atmosphere away from electrical equipment. The temperature should not exceed 90ºF [32ºC]. Storage in straight lengths is preferred. While stored, the hose should be wrapped as necessary with burlap or other suitable material to prevent damage. Hoses should be inspected regularly when in operation, especially where the hose exits the conduit at the power unit and the Barrier. Worn or damaged hose assemblies should be replaced immediately.

Note: Hoses supplied by Delta Scientific are generally supplied in lengths of 50 feet [15 M]. This is adequate for the majority of installations, however, there is generally some left over length. Coil the hose neatly in a circle approximately 20 inches [0.5 M] in diameter at the HPU. Secure the coil with loosely fitting cable ties or similar tying system. Do not allow the hose to rest on the ground or across sharp corners of equipment. If the hose is too short, extension pieces of the correct length can be ordered. As an alternate, hoses can be held back from your shipment and made to exact requirements when the length is determined if desired.

Special field assembly type fittings may be supplied to allow the factory length hoses to be cut and re-terminated to the exact length in the field without the use of special tools.

Steel Pipe Interconnect System

As an alternate to the flexible hose system, steel pipe may be used for the run from the HPU to the Barrier. The same comments above about short, direct runs to the Barrier(s) apply. Typically the pipe run is made up above grade and dropped into a trench for direct burial (below frost level if applicable). If local conditions dictate, the outer portion of the pipe and fittings can be corrosion protected by coating or tape wrapping if desired. Short lengths of hose, typically 3 feet [1 M] long, can be supplied to attach the HPU and Barrier to the pipe system. Or the piping can be plumbed directly to the fittings on HPU or Barrier (for this a union will be required).

The pipe used should be ASTM A-106B seamless (carbon steel) as a minimum. Care should be taken when selecting wall thickness Vs pipe diameter for the system design pressure (Delta can be consulted for proper line sizing, strength calculations and material selection).

Fittings for the pipe run should be forged steel, ASTM A-105 or equal. Malleable iron is not acceptable. All pipe and fittings are to be furnished black, i.e., no galvanizing is permitted; the galvanize can flake off and block or damage hydraulic components.

If desired, stainless steel pipe and fittings can be used, however, do not mix stainless steel pipe with carbon steel fittings or vis-a-vis severe corrosion of the carbon steel components could result. Copper and copper bearing alloys are generally unsuitable for hydraulic oil systems and should be avoided when possible.

Fittings

A variety of fittings are used on a Delta Barrier system; an understanding of how each style seals is important so that leak free operation can be maintained.

Pipe threads are of American National Taper Pipe Thread pattern. As the name implies they seal when the threads pull the tapers together to form a tight joint. These threaded fittings are the only style used by Delta on which Teflon tape or pipe dope may be used. Great care should be taken that pieces of tape or liquid sealant do not end up in the part being sealed as they will eventually find their way into valve seats or other critical parts. Start wrapping the tape one or two threads back from the front of the male fitting and only one or two times around is sufficient. More than twice around is detrimental to a tight joint. Fittings should be brought up snug but not too tight or the female part can be distorted. If orientation of the part is critical, stop on your mark as the part is getting snug instead of trying to force the fitting another complete turn.

SAE (Society of Automotive Engineers) straight threads are used on several fittings where the connection orientation is critical. The male fitting is oriented and a locking nut with washer and O-ring is tightened against the female part. Again, do not over tighten or distortion can occur.

The remaining fittings are SAE 37 degree flare fittings. These have a male nipple to which a compatible female hose or tube/nut can be attached. Most plumbing on the HPU is done with steel hydraulic tubing held to the SAE 37 degree male flare nipple with a ferrule and nut. The tube is not flared but cut square and deburred. The sealing pressure comes from the nut forcing the ferrule down onto the tube. These fittings can be broken and remade if necessary. Again snug is preferred to overtightened.

Most hoses supplied by Delta are terminated with SAE 37 degree female swivel ends. As the nut swivels on the hose, unions are not necessary. These screw directly onto a companion SAE 37 degree male nipple. To avoid confusion as to a fitting size, use the following table should ordering be necessary:

Hose I.D.	**Steel Tube OD**	**Thread Dimensions**
1/8"	1/8"	5/16-24
1/4"	1/4"	7/16-20
3/8"	3/8"	9/16-18
1/2"	1/2"	3/4-16
3/4"	3/4"	1-1/16-12
1"	1"	1-5/16-12

Note: To repeat, do not use Teflon tape or pipe dope on any straight thread fitting. Only taper pipe threads are to be so sealed.

Cylinders

The DSC2000 Phalanx Barriers are moved by double acting hydraulic cylinders. These are specified by the bore diameter and length of stroke, as in 2.5" by 6". When the Barrier is commanded to rise, oil is forced into the top or 'rod' end of the cylinder, collapsing the cylinder rod into the body. The rod end of the cylinder terminates in a clevis and the clevis pin pulls against the Barrier to move it in the up position. When lowering, the cylinder rod extends out of the cylinder body as the oil flows out of the rod end. These heavy Barriers operate single acting. That is, the cap end of the cylinder is allowed to breathe air, gravity alone forcing the oil out of the rod end (single acting). The cap end breather is plumbed back to a dry location (usually a group of fittings on the reservoir tank top) to prevent water from being sucked into the breather fitting.

Figure 7 – The cylinder rod vent hoses are terminated on fittings mounted on the reservoir tank top next to the oil filler breather cap and return filter.

The cylinders are equipped with fittings at the Delta factory. The fittings may be accessed from the left or right side of the Barrier. The connection fittings are color coded as noted below in the **Interconnection Convention** paragraph.

Interconnect Convention

So that the Barrier rises when the 'Raise' button is pressed it is necessary to coordinate the interconnect lines with the proper HPU and Barrier connections. The following convention has been established by Delta (Note: The 'A' ports are capped off and are *not* used.):

Color Tab	HPU Port	Barrier Cylinder	Function
Red	'B'	Rod (Top) End	UP
Yellow	TANK TOP VENT	Cap (Bottom) End	VENT

Hydraulic Oil

The hydraulic oil selected for the Barrier system is one of the most critical decisions to be made on your installation. The properties of the oil will affect the as new performance of the Barriers as will as the performance in years to come. Delta recommends the use of high grade, inhibited petroleum hydraulic oils for use in its' systems. These oils inhibit or prevent rust, oxidation, foaming and wear. They are readily available just about everywhere in the world.

A viscosity compatible to the expected ambient temperature of the job site should be used. A heavy oil used in snow conditions will tend to slow the Barrier response time down, while light grade oils in desert conditions may not provide lubricity necessary to prevent component wear. Most brands of oils are manufactured in different grades for this purpose.

If required, the new fire-resistant or environmentally friendly fluids can be selected, please consult your fluid dealer for correct selection.

Delta does not recommend the general use of automatic transmission fluid in our systems. While compatible with the seal materials used in all the system components, ATF does not have sufficient viscosity at moderate temperatures and it is generally more expensive than the specially formulated general purpose hydraulic oils. **Under no circumstances** should brake fluid be used. It is not compatible with the seals and will swell and degrade them.

Note: The unit as received from the factory has been tested with Shell Oil Company 'Tellus' 46. Although the unit has been drained after test approximately 1 inch [25 mm] of fluid remains in the reservoir bottom. The hydraulic oils in the following tables should be compatible with this fluid.

Biodegradable Oils

Environmentally friendly oils are also acceptable for use in these systems. These fluids are generally based on naturally occurring vegetable oils and are biodegradable by naturally occurring organisms when spilled or leaked in relatively small quantities. Larger spills will still need to handled similarly to currently accepted methods for conventional mineral oil spills.

Contamination of these oils by other fluids may change the biodegradability, toxicity, or other performance characteristics. Systems should be cleaned as thoroughly as possible before introducing a biodegradable fluid.

Delta has reviewed the data on biodegradable oils manufactured by both Mobil and Texaco. These are summarized below. Other manufacturers' products are acceptable if equal to the performance of these oils or the standard mineral oils listed in the following pages. Consult your local fluid dealer for his recommendation.

	Mobil Oil Corporation	**Texaco Lubricants Company**
Light	EAL 224H	Code 1607 Biostar Hydraulic 32
Medium	EAL 224H	Code 1616 Biostar Hydraulic 46

Commercial Hydraulic Oil Interchangeability Chart

*	AMOCO Oil Co. (Std. Oil Co)	AMSOIL	Ashland Oil Co. Valvoline Oil Co.
Light	Rycon Oil #15	AWH ISO 32	AW Oil #15
Medium	Rycon Oil #21	AWI ISO 46	AW Oil #20
Heavy	Rycon Oil #31	AWJ ISO 68	AW Oil #30

*	Atlantic Richfield (ARCO)	Chevron USA Inc.	Continental Oil Co
Light	Duro AW S-150	EP Hyd Oil 32	Super Hyd 15
Medium	Duro AW S-215	EP Hyd Oil 46	Super Hyd 21
Heavy	Duro AW S-315	EP Hyd Oil 68	Super Hyd 31

	Exxon USA Inc.	Getty Refining	Gulf Oil Co.
Light	Nuto H 32	Veedol Aturbrio AW 150	Harmony 43 AW
Medium	Nuto H 46	Veedol Aturbrio AW 58	Harmony 48 AW
Heavy	Nuto H 68	Veedol Aturbrio AW 61	Harmony 54 AW

	Mobil Oil Corp.	Phillips Petroleum	Pennzoil Co.
Light	DTE 24	Magnus A 150	Hyd & GP Oil #1
Medium	DTE 25	Magnus A 215	Hyd & GP Oil #2
Heavy	DTE 26	Magnus A 315	Hyd & GP Oil #3

	Shell Oil Company	Std Oil Co of Ohio	Texaco, Inc.
Light	Tellus 32	Industron 44	Rando Oil HD 32
Medium	Tellus 46	Industron 48	Rando Oil HD 46
Heavy	Tellus 68	Industron 53	Rando Oil HD 68

	Union Carbide Corp
Light	**
Medium	UCON Hyd Fluid WS34
Heavy	**

* Light oils are for cooler climates; medium for temperate zones; heavy for tropical or desert areas.

** No recommendation

START UP PROCEDURE
VEHICLE ARREST SYSTEM

MFG. UNDER U.S. PATENT #4,097,170 4,158,514 4,318,079 4,354,771 4,490,068 4,576,508 4,715,742

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START UP INSTRUCTIONS
PHALANX MODEL BARRIERS WITH DELTA PUMPS

Safety Precautions

At all times observe good safety practices when working on either the electrical or mechanical system. Particular attention should be paid to the danger of working on the Barrier when the power is on. Barriers are powerful hydraulic presses that can easily crush anything in their way. Keep hands free of the mechanism when the power is on or the HPU is up to pressure. Turn off the electric power and bleed the hydraulic pressure down to zero before working on any part of the system. Traffic should be controlled around the Barrier during any work so that vehicular accidents do not occur if the Barrier should happen to rise. After work is complete, do not allow traffic over the Barrier until all control and safety functions have been verified to be properly working.

YOUR SPECIAL ATTENTION IS CALLED TO THE FOLLOWING:

Special Safety Considerations

Delta Barrier Systems are designed to deter, and as necessary stop unauthorized vehicle traffic by inserting a nearly immovable obstacle in a roadway. During normal servicing, maintenance and testing work, every effort must be made to protect pedestrian and vehicle traffic from entering traffic lanes where work is underway.

During work on either the Barrier(s), the control circuit, control logic, power unit, power feed or the control panel(s); traffic across or near the Barrier(s) should either be stopped or directed into a safe passage.

Prior to starting, restarting or restoring power to a Barrier system all remote input devices such as radio links, card readers, remote control panels, etc. should be checked to insure that they are properly set or are inactive. This is important to insure that a signal directing the Barrier to change status is not unexpectedly received at the time when the power is restored.

Note that any device (supplied by Delta or others) that produces a contact closure to change the Barrier direction must be checked to verify that stray signals or voltages cannot cause that device to produce a false signal.

When a Barrier is powered up, whether at start-up, following a power outage or following the completion of service or maintenance work, these same precautions should be taken.

Consult the other sections of this manual for additional safety and security instructions and warnings.

System Configuration

Depending on the threat analysis and the specific layout of an installation site, Barrier systems can be configured to react differently to a variety of input signals or events. The selection of components and the configuration to meet these requirements are usually incorporated in the system at the time of manufacture. However some changes can be made in the field or by changing the nature of supplied input.

Default Status Quo

In most locations, security considerations are such that a Barrier system can be configured to 'default status quo', that is the Barrier will not change status following a power outage or interruption. If a Barrier system so configured is in the open position when power is applied at initial start-up, following service or in the event of a local power outage, the Barrier will remain in the open position as when the power was removed or interrupted. Or if the Barrier is in the guard position it will return to the guard position upon resumption of power. An exception to this is the special situation as defined below in the 'power off' section.

Default Secure

In certain high security areas Barrier systems may be configured so as to default to the Secure Status when power is applied to a system, whether following the system having been turned off or after unexpected power interruption. Thus a system on stand-by automatically goes to the guard position when the power is applied. That is, should the power be interrupted and then restored, while the Barrier is in the open position, it will return to the guard position.

If a Barrier is in the guard position when the power is interrupted it is normally designed to hold the guard position.

Power Off Operation

A Barrier system with a battery back-up for the control circuit and the power off feature, can be operated a limited number of times during a power off condition. Once the power off reserve is exhausted, the last command the system receives will dictate the Barrier position when power is restored. Hence, if the Barrier is in the open position when the 'power off' reserve is spent, and the system then receives a close signal, the Barrier will remember that last signal and close when power once power is restored.

Additional Precautions

Delta Barrier system controls are configured to meet site specific security conditions and the operating logic is most often defined at the time of procurement.

If the security or safety consideration of the site where the Barrier is installed or to be installed, dictates that the operation be altered from the original specification, contact the Engineering Department of Delta Scientific Corporation for assistance in making the desired revisions.

During routine maintenance and service work, or during thunder storms or other weather related disturbances, power interruptions can occur.

For detailed service, maintenance and safety information refer to the specific sections of this manual provided with each system.

Before operating the system for the first time, make sure that all on the interconnections have been made between the Barrier, control panels and the hydraulic power system. After you are sure that everything is in order, make a visual inspection of the site to check that tools and construction debris are removed and clear of the equipment.

Power

The electrical power that drives the system is typically supplied through a circuit breaker disconnect (customer furnished) that must be turned on before the system will operate. When the main power is turned on the pump motor will, in most cases, start and run until the system cut off pressure is reached. It is important on start up to **verify that the pump motor is turning in the proper direction** indicated by an arrow on the motor fan housing. Turning on the power without this check will destroy the pump in short order.

Control Devices and Their Function

Master Remote Control Panel On/Off Switch

The master control panel has a main power indication light to show that the control circuit power is 'on'. Turning the master control panel main power On/Off key switch to the ON position will in turn illuminate the panel 'on' light.

Barrier Up/Down Controls

There are two basic controls for each of the Barriers, one to **CLOSE** (raise) and one to **OPEN** (lower). The Barriers can be commanded to either **OPEN** or **CLOSE** at any time whether they are moving or stationary. The Barriers will instantly reverse direction if so commanded at any point in their operation.

Barrier Position Indication (optional)

The Barriers have position indication lights on the control panel. A green light indicates that the Barriers are **OPEN** (fully down) on the limit switches, any other position results in a red light indication.

Emergency Operate (optional)

This feature allows the Barriers to be raised at the maximum possible speed when the Emergency Operate button is pressed. Once the button is pressed, the panel is locked up so that all lower commands are overridden. Power is continuously applied to the UP solenoid valves as well as the EO valves until the Reset button is pressed, which will restore the system to normal operation.

Reset should be pressed within 15 minutes of EO use to prevent possible heat damage to the solenoid valves.

Annunciator (optional)

An annunciator feature is provided to alert the guards that the Barriers have been left in the down position for too long. The master remote control panel has an 'Annunciator Off/On' switch. With the switch in the 'Off' position, no alarm will sound. When placed in the 'On' position, the alarm will sound if the Barriers are left down longer than the preset value of the annunciator timer located in the control circuit. The alarm can be silenced by raising the Barriers or by turning the switch back to the 'Off' position. The timer is customer adjustable by accessing the inside of the master control panel.

Secondary, or Slave Panels (optional)

A secondary or slave panel may be incorporated in the system which allows for full operation of the Barriers from a location remote from the master control panel. The slave control panel is armed from the master control panel location. The slave panel has a main power indication light to show that the panel is armed from the master control panel. Turning the slave control panel main power On/Off key switch to the ON position will in turn illuminate the panel 'on' lights and allow full operation of the Barriers from the slave. The annunciator on/off and EO reset control is absent from the slave control panel although the slave panel does include the annunciator output siren.

Other Control Devices

Other control devices may be provided by Delta or by others. The Barrier can be raised or lowered by any normally opened, momentary closure type button or remote control device, such and radio, key pads, card readers, loops, etc.

Start Up Procedure

Safety Precautions

On initial start up, it is important to close off the roadway and clear the Barrier area of nonessential personnel. **Barrier movement may be very erratic at first.** In addition, each time the system is restarted or maintenance is performed the roadway should again be cleared to guard against unexpected Barrier movement.

Start Up Sequence

1. Block all traffic during tests. Stay clear of Barriers.

2. Check that all electrical and hydraulic inter-connections are tight.

3. Fill system with **clean, filtered** oil to within 1" [25 mm] of the top of the sight glass.

4. Confirm that the pressure bleed down valve is turned fully clockwise to close. Do not over tighten.

5. Turn all flow control valves fully clockwise to close, then open each 2 full turns. This will be the starting point for the Barrier up/down speed adjustments.

6. Briefly apply power to the motor to confirm that the motor direction is per the direction arrow on the motor fan housing. Correct if necessary.

7. Apply power to the motor and allow the pump to bring the system up to the shutoff point as shown on the motor starter drawing, 1900 psig [131 bar].

8. Check for any leaking fittings.

9. Operate each Barrier manually by pushing the override pins on the ends of the solenoid valves.

10. Check that when the **left** side solenoid pin is depressed, the Barrier **raises**. When the **right** side pin is depressed the Barrier should **lower**.

11. Cycle the system manually several times to remove air from the system. When the air is removed from the lines (no bleeding should be necessary) the Barrier motion should be smooth.

12. As the Barrier is manually moved, confirm that the pressure switch is turning the pump motor off and on at the correct values as shown on the motor starter drawing; off at 1900 psig [131 bar], on again at 1400 psig [97 bar].

13. Turn power to the pump 'Off'.

14. Bleed the system pressure down to zero by opening the bypass valve. This will help prime the hand pump.

15. **With the system at zero pressure**, top off the reservoir oil tank with **clean, filtered** oil to within 1" [25 mm] of the sight glass top.

16. Test hand pump operation by lifting the Barrier. Approximately 65 to 75 strokes will be required for these Phalanx® Barriers.

17. Turn the motor/pump power back to 'On' to bring the system back to full pressure.

18. Apply power to the control circuit and turn the Master control panel key switch to 'ON'.

19. Run the Barrier Open and Closed several times allowing time for the HPU to recover pressure between each cycle. Check function of the indicator lights on the remote control panel.

20. With the Barrier(s) in the down position and after unit has again come to full pressure, depress the Emergency Operate button. Note that Barrier(s) come to the guard position at the maximum speed. Note that the 'EO Active' light is on. Check that the **OPEN** control buttons are inactive. Press reset button to clear EO condition and lower Barriers.

21. Arm the Slave control panel (if present) from the Master control panel and repeat steps 19) and 20).

22. Arm the annunciator siren from the Master control panel and lower one of the Barriers. Check that the siren sounds at the desired time interval. (The time interval may be adjusted by opening the Master control panel and turning the time knob on the timer.)

23. Adjust the Barrier operating speed to the desired value. Delta suggests that both the up and down speeds be approximately 3 to 5 seconds. The type and adjustments of the valves are in the Drawings section of this manual. Normal operating speeds of 2 seconds or less are possible, but the increased wear and tear on the equipment should negate any considerations to so operate the Barriers. Excess noise also accompanies the faster speeds. After final adjustment is made, lock valves in position.

OPERATIONAL SUMMARY

BARRIERS OPERATED FROM A NORMALLY UP POSITION

1. Barriers are to stay in the up and locked position and are to be lowered for the passage of one vehicle at a time.

2. During the normal hours of operation, the main power key switches shall be in the 'ON' position. The panels shall be turned 'OFF' and the keys removed when no guards are present at the control stations.

3. The control panel controls Barriers in each appropriate location. **CLOSE** and **OPEN** control is provided for each Barrier. Before operating any Barrier:

   A) Check that vehicles and pedestrians are clear.

   B) Check that the controls for the correct Barrier will be pressed.

   C) Press **OPEN** to lower Barrier to permit access.

   D) After vehicle is clear of Barrier, press **CLOSE**.

4. The **EMERGENCY OPERATE** button is to be used for **emergencies** only.

   A) Pressing the **EO** button will raise **all** Barriers in approximately 1 to 2 seconds.

   B) The controls are locked until the **RESET** button is pressed. A red light indication shows that the system is in the EO Mode.

   C) The controls are locked even if all Barriers are UP when the **EO** button is pressed.

   D) The **RESET** button should be pressed within 15 to 30 minutes of the EO Actuation.

5. **Do Not Place Items On The Control Panel.** The buttons are sensitive and the Barriers may move while not intended.

6. **Use The Barriers To Control Vehicles.** If a forced entry attempt occurs, use the **EMERGENCY OPERATE** button. The Barriers are powerful and can block or lift most all vehicles.

OPERATIONAL SUMMARY

BARRIERS OPERATED FROM A NORMALLY DOWN POSITION

1. Barrier(s) are to stay in the down and clear position and are to be raised, generally in Emergency Operate mode, if a threat is detected.

2. During the normal hours of operation, the main power key switches shall be in the 'ON' position. The panels shall be turned 'OFF' and the keys removed when no guards are present at the control stations. The Barrier(s) are generally left raised and in the guard position when the entry point is closed.

3. Periodic Confirmation Tests:

   A) Where a Barrier system is infrequently cycled from the down and armed status, it is good practice to run periodic confirming cycle tests. Guard shift changes are an excellent opportunity to perform these tests. Delta strongly recommends that these tests be made once per day as a minimum.

   B) The tests should include cycling the Barrier(s) in normal mode as well as Emergency Operate (EO) mode. In addition to demonstrating that the Barrier(s) and controls are functioning normally, note can be taken that associated equipment such as loop detectors, warning lights, stop/go signal lights, caution horns, etc. are fully functional. Additionally, periodic confirming cycle tests can indicate whether there is blockage or interference from dirt, debris or water that may prevent normal operation of the Barrier.

4. If a gate runner or other vehicular threat is detected, the Barrier(s) are raised to the guard position by using the **EMERGENCY OPERATE** button. The **EMERGENCY OPERATE** button is to be used for **emergencies** only (except for testing as described above).

   A) Pressing the **EO** button will raise **all** Barriers of the system in approximately 1 to 2 seconds.

   B) The controls are locked until the **RESET** button is pressed. A red light indication shows that the system is in the EO Mode.

   C) The controls are locked even if all Barriers are UP when the **EO** button is pressed.

   D) The **RESET** button should be pressed within 15 to 30 minutes of the EO Actuation.

5. **Do Not Place Items On The Control Panel.** The buttons are sensitive and the Barriers may move while not intended.

6. **Use The Barriers To Control Vehicles.** If a forced entry attempt occurs, use the **EMERGENCY OPERATE** button. The Barriers are powerful and can block or lift most all vehicles.

MECHANICAL TROUBLE SHOOTING
VEHICLE ARREST SYSTEM

MFG. UNDER U.S. PATENT #4,097,170 4,158,514 4,318,079 4,354,771 4,490,068 4,576,508 4,715,742

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Doc #100-35 P-5

HYDRAULIC TROUBLE SHOOTING
DELTA PHALANX® BARRIER SYSTEMS

Safety Precautions

At all times observe good safety practices when working on either the electrical or mechanical system. Particular attention should be paid to the danger of working on the Barrier when the power is on. Barriers are powerful hydraulic presses that can easily crush anything in their way. Keep hands free of the mechanism when the power is on or the HPU is up to pressure. Turn off the electric power and bleed the hydraulic pressure down to zero before working on any part of the system. Traffic should be controlled around the Barrier during any work so that vehicular accidents do not occur if the Barrier should happen to rise. After work is complete, do not allow traffic over the Barrier until all control and safety functions have been verified to be properly working.

Barrier Does Not Move

Isolate the problem to either hydraulic or electrical:

1) Confirm power to the motor starter and control circuit is on. Are circuit breakers reset?

2) Check motor starter overload trip indication. Reset as necessary.

3) Check oil level in reservoir. The oil low level switch will open the starter circuit if the level is too low.

4) If the pump motor runs and the HPU maintains pressure, try operating the Barrier manually (see instructions in the Start Up section).

5) If the Barrier operates manually, run through the **Electrical Trouble Shooting** section.

Hydraulic Problems - HPU Does Not Maintain Pressure

Low pressure is usually caused by leakage, either internal or external, or low accumulator precharge.

External Leakage

External leaks are generally the result of loose or broken fittings or lines. As the path of leakage is away from the unit, the oil level falls and eventually the reservoir low oil level switch shuts down the pump motor. Look for spilled oil to locate the leak source. Correct as necessary. Bring pressure to zero before attempting repair.

Internal Leakage

Internal leakage is harder to locate than the above. Large internal leakage is generally accompanied by a hissing sound as oil flows over a valve seat or past a seal. An industrial stethoscope or a length of tubing is handy for localizing the source of the noise. Small leaks are

harder to find. Internal leakage can cause a component to become warm or hot as energy is dissipated across the leakage point. This temperature rise can also be utilized to locate the leakage source. Working through a list of the probable components may be your only alternative:

1) Bleed down needle valve. Check that valve is tight. Tighten set screw if valve is loosening. If valve will not seal due to a scored seat, replace valve.

2) Relief valve. Check that relief valve is closed at the pressure switch high setting. The valve should start to crack at approximately 2200 psig [152 bar]. Reset should be accomplished before 1900 psig [131 bar] (falling pressure). Adjust as necessary. Tighten lock nut after adjustment. If valve will not reseat, remove and clean or replace as necessary.

   Adjustment of pressure relief valve: Use ½" and 9/16" open end wrenches. Use the 9/16" wrench to slack the lock nut on the valve adjustment spindle while the spindle is being held with the ½" wrench. The pressure relief valves are set at 1000 psig from the factory. Turn the adjustment spindle clockwise to increase pressure to the desired amount (one full turn being approximately 600 psi, or 100 psi for every 1/6th turn). When the desired value is reached, tighten lock nut while holding the spindle from moving.

3) Emergency Fast Operate valve. The EFO valve directly connects the pressure ('P') side of the system to the 'B' (Barrier 'UP') manifold. If the EFO valve opens without the main directional solenoid valve shifting to the 'B' solenoid, oil will short circuit through the 'B' port back to tank. The EFO circuit requires that **both** the EFO and 'B' solenoids (left side) energize at the same time. Verify by energizing the EFO circuit. Place a metallic object (such as a screw driver blade) on the solenoid armatures of both the EFO and main directional solenoids; a slight magnetism should be felt. If not, see **Electrical Trouble Shooting** section to correct. If EFO valve leaks without being energized, disassemble and clean or replace as necessary.

4) Main directional control valve. The main directional control valve is of the spool type. This construction requires extremely close tolerances between the body and the spool of the valve for low internal leakage. However, even a new valve will leak oil from the high pressure side to the tank ports. This is most evident at pump shut off where the pressure gage is seen drifting down 50 or 100 psi [3.5 or 7 bar] or more. Older valves may cause the system to drop down to the point of motor turn on every 5 to 15 minutes (without Barrier being moved). At this point, valve replacement should be considered.

5) Check valve. The check valve (integral with the hydraulic pump, both motor driven and the handpump) keeps the oil in the high pressure side of the system from running back through the pumps to tank when the system is pressurized. Dirt or debris under the seat may allow oil to leak back through these routes. Disassemble and clean as necessary. If debris has scored the seat, seat renewal or replacement of the check valve will be necessary. (The motor driven pump check valve may be detected as being unseated by observing the motor fan slowly turning reverse of it's normal run direction. This is because the high pressure oil is reverse driving the gears of the pump.)

6) Hydraulic Pump. The gear pump performance depends upon close tolerances between the gears and the pump housing. Wear from old age or debris from dirty oil will allow oil to bypass around the gears back to the pump suction. Both the displacement and pressure capabilities of the pump will suffer. Eventually the pump will not be able to maintain pressure and will have to be rebuilt or replaced.

7) Hydraulic cylinders. Worn seals or scoring of the hydraulic cylinder walls may allow oil to bypass the cylinder piston. Seal renewal and cylinder honing may be required or the cylinder replaced. The cylinder rod seals are also a potential source of external leakage.

The leakages described above are all generally caused by debris contamination in the oil. Replacement of any of these components is an indication that the oil must be drained and replaced with clean **filtered** oil. A check of the filter and your filter changing procedures is also in order.

Zero or Low Accumulator Precharge

Zero or low accumulator precharge is usually indicated by rapid cycling of the pump motor. This is due to the fact that very little or no oil is available in the accumulator under pressure; the slightest system pressure drop will cause the pressure switch to start the motor. Because very little oil has been displaced, the pressure will then raise very rapidly and cause the switch to stop the motor. This cycle will repeat again and again and will cause rapid deterioration of the hydraulic system.

If this occurs, stop the system and measure the accumulator precharge using the instructions in the **Maintenance** section of this manual. Recharge if necessary to the values indicated in the instructions and/or as written in the pressure log.

Barrier Moves Slowly

Barrier speed is controlled by the flow control valves located between the main directional control valve and the EFO tee connection. Adjust Barrier to the desired speed and tighten the lock nuts. If speed is still undesirably slow:

1) Check temperature. Low temperature raises the viscosity of the hydraulic oil increasing line pressure drop. If temperatures are severely low the power unit should be equipped with a oil reservoir heater. The Barrier's heaters also help (this is **not** their prime function however). Installation of the hydraulic lines in the frost zone will cause Barrier slowing (below the frost line, the ground is a fairly constant 55ºF [13ºC].

   Low temperature hydraulic oils can be selected for use during the cold months. See the selection chart in the **Hydraulic Theory** section of this manual. As an alternative, heaters and line tracing can be done at time of installation.

2) Accumulator pressure. Low accumulator precharge pressure causes less oil to be stored at high pressure. This reduces the maximum Barrier speed to that allowed by the amount of oil that can be displaced by the pump. The precharge pressure is indicated on a tag on the accumulator. Delta P/N 2469-31 Accumulator Charging Kit or similar device can be used to check precharge. **Note:** On units with auxiliary EFO, the auxiliary accumulator

EFO valve override must be in the 'out' position to relieve its' pressure before reading precharge.

3) Low system pressure. Low system pressure can be the result of an out of adjustment pressure switch or internal leakage as outlined above. If motor turns off below 1900 psig [131 bar] plus/minus 50 psi [3.5 bar], replace switch. Otherwise, determine cause of internal leakage.

Barrier Does Not Fully Raise or Lower

Failure of the Barrier to obtain full raised or lowered position usually indicates a mechanical difficulty at the Barrier. Check:

1) Debris buildup. Debris or other obstructions inside the Barrier foundation frame or along the rear hinge support may restrict Barrier movement. Remove top plates to inspect. Remove offending material.

2) Low pressure. If the HPU electrical power fails and the pump cannot return the unit to system pressure, the Barrier will slow and eventually stop when pressure is exhausted. Barrier may become stuck between position. Manually shift directional valve and hand pump the Barrier to the desired full up or full down position. Check low oil level is not the cause of pump shut off.

Pump Problems

The heart of the hydraulic power unit is the pump. As it rotates at several thousand RPM, it is subject to more wear and tear than the other components. Pump problems to check are:

Pump Fails to Rotate

1) Check that the switches to the motor are properly set (see **Electrical Trouble Shooting** section). Correct as necessary.

2) Check that the coupling between the motor and the pump rotates. Check condition of the resilient 'spider' between the coupling jaws. Replace coupling key(s), spider or entire coupling if necessary.

3) Check that the pump input shaft rotates by hand. If not, replacement or disassembly of pump will be required.

Pump Delivery Abnormally Low

1) Check that oil level in reservoir adequately covers the suction strainer.

2) Check for clogged suction strainer and suction line air leaks.

3) Check motor is running at rated speed; low voltage or single phasing of three phase motors are probable causes.

4) Check that relief valve setting is not too low (leakage through relief valve back to tank).

5) Check that oil temperature is not too high (above 160ºF [71ºC]). This can cause the viscosity to be lower than the recommended range of the pump. Also check that proper oil has been selected.

Excessive Pump Noise

Hammer, gurgle or rattle noises are usually the result of a starved pump suction or air leakage in the suction lines. Causes and corrective action are:

1) Check that oil level in reservoir adequately covers the suction strainer.

2) Check for clogged suction strainer.

3) Check for suction line air leaks.

4) Check that oil temperature is not too high (above 160ºF [71ºC]). This can cause the viscosity to be lower than the recommended range of the pump. Severely excessive oil temperature may cause the pump to cavitate. Also check that proper oil has been selected.

5) Check that the oil temperature is not too low. Excessive viscosity can cause pump suction starvation.

6) Check reservoir filler/breather. A clogged breather can prevent the tank from venting, causing vacuum inside reservoir. This will again starve the suction.

DELTA

ELECTRICAL TROUBLE SHOOTING
VEHICLE ARREST SYSTEM

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ELECTRICAL TROUBLE SHOOTING
PHALANX® STYLE BARRIERS OPERATING INDEPENDENTLY

Safety Precautions

At all times observe good safety practices when working on either the electrical or mechanical system. Particular attention should be paid to the danger of working on the Barriers when the power is on. The Barriers are powerful hydraulic presses that can crush anything in their way. Keep hands free of the mechanism when the power is on or the HPU is up to pressure. Turn off the electric power and bleed the hydraulic pressure down to zero before working on any part of the system. Traffic should be controlled around the Barriers during any work so that vehicular accidents do not occur if the Barriers should happen to rise. After work is complete, do not allow traffic over the Barriers until all control and safety functions have been verified to be properly working.

Observe *all* safety precautions for the type Phalanx® Barrier being trouble shot *whenever* working under the Barrier. These precautions are found in the Maintenance section of this manual.

If the power unit will not run:

1) Check the main power distribution feed to the power unit and the control circuit. Correct as necessary.

2) Check any disconnect before the hydraulic power unit motor starter. Turn on as necessary.

3) With the disconnect/main switch turned 'on', manually operate the armature of the motor starter. If the motor starts, check the solenoid coil of the starter for continuity. Next check that voltage is being applied to the coil. If no voltage is being applied, check the various switches in the starter circuit by directly applying power to the starter coil (CC2 and coil terminal A1).

   If direct application of power to the coil causes the starter to pull in and the system is not up to pressure, then try the starter circuit switches in this order:

   A) Check hydraulic power unit for leaks or broken lines. Low oil level will cause reservoir level switch to open starter coil. Switch should be closed if oil is visible at least 1" from the bottom of the site gage glass.

   B) Check pressure switch. High and low pressure settings are indicated on the starter circuit drawing. The pressure switch is factory set, if values are plus/minus more than 50 psig from the indicated values, consider replacing the switch.

   C) Check voltage value to the starter. Values 15 percent low will cause the power monitor (if present) to interrupt power to the starter coil.

D) Check that the starter overload relay has not tripped. If so, determine the cause, i.e., high ambient, pump cavitation, failed pressure switch, etc. Be sure that overload relay is left with the reset in the 'manual' position. The 'automatic' reset feature can lead to failure of other parts in the hydraulic unit.

If power unit runs and is up to pressure but the Barriers can't be opened or closed:

4) Check control circuit voltage at terminals CC1 and CC2. Ordered voltage should be present (120-220/1/50-60). Correct as necessary.

5) The voltage selector switch on the 1PS power supply should be set for the voltage supplied in Step 4).

6) Check fuse 1FU before 1PS power supply for continuity. Replace if necessary.

7) Check fuse 2FU out of the 1PS power supply for continuity. Replace if necessary.

8) Check voltage at terminals CA1 (+) and CA2 (-). This should now be 24 VDC nominal (+2 / -0 volts). Correct if necessary by adjusting the power supply output potentiometer (adjacent incoming power conductors, labeled "V ADJ").

9) With the remote control panel key switch **ON**, check that the panel power indicator light is 'on'. If not, check the voltage across xMA3 and xMA18. It should be equal to the voltage found in step 8). If not, check the interconnect lines to xCA3 and xCA18. If voltage present, check the key switch for continuity. Replace if necessary.

10) Pressing the appropriate **OPEN/CLOSE** command button should cause the control relay in the control circuit to energize and in turn switch on power to the desired control valve solenoid. Voltage to xCA4 allows x1CR to pull in, in turn energizing the Barrier **up** (close) solenoid valve. Voltage to xCA8 allows the down relay x2CR to energize the Barrier **down** (open) solenoid.

A) Determine if command buttons and relays are functioning.

1. Press Barrier **CLOSE** button. x1CR should pull in. The safety loop detector between terminal xCA5 and xCA6, if used, should be closed; jumper these terminals for this test. If x1CR fails to operate, jumper from xCA1 to xCA6. If relay still fails to energize, replace relay or PCB assembly.

2. Repeat for Barrier **OPEN**. x2CR should pull in. If not, jumper xCA1 to xCA8. (The PCB has been factory assembled with a jumper between xCA9 and xCA10). Replace relay or PCB assembly as necessary.

B) If the **CLOSE/OPEN** relays (x1CR and x2CR) function and valve still does not shift, check:

1. With appropriate relay energized, check that line voltage is applied between terminal xCB17 and xCB18 ('close' neutral) for 'Up' and xCB19 and xCB20 ('open' neutral) for 'Down' for the appropriate Barrier.

2. If voltage is present, check affected valve coil for continuity by directly applying line voltage (xCA1 and xCA2) to the valve coil. If coil fails this, replace the valve coil or entire valve as appropriate.

Emergency Operate Circuit

11) When the emergency operate (EO) signal is given to the control circuit (by pressing the EO button), 24 VDC is applied to the EO relays x4CR which self hold as the up relays x1CR pull in and energize the directional control valves and the EO valves. The relays and valves remain energized until the reset button is actuated which releases x4CR and restores the system to normal operation. **Note:** Reset should be pressed within 15 minutes of EO actuation to prevent possible heat damage to the solenoid valve coils.

12) If the EO system is not operating, first check that the x4CR's are pulling in. If not, place a jumper across xCA13 and xCA15. If the system now works, check the EO actuate switch (button) which is normally open and the reset button which is normally closed. Correct as necessary. If the relays x4CR pull in when the EO actuate switch (button) is pressed but the valves do not shift, check that the voltage between xCB21(+) and xCB22(-) is at 24 VDC. If voltage is present, check the valve coils for continuity. Replace relay(s) or valve coil(s) as necessary.

Barrier Position Indications

13) The Barriers are equipped with limit switches which pilot relays to provide Barrier position indication. These indications are commonly used to run the Barrier **OPEN/CLOSE** (down/up) lights on the remote control panels and run traffic safety indications such as the stop/go signal lights.

If the indicator lights are not coordinated with the correct Barrier position, check:

A) Limit Switch. The Barrier limit switch is a dry contact switch powered from the control circuit. xCA11 is common; xCA12 is the connection to the limit switch relay and auxiliary relay, x3CR and x3BCR, for the two Barriers. The limit switches should be 'opened' with the Barriers in the up position. The limit switches close when the Barriers are lowered to the full down position. Verify that the contacts behave accordingly, replace if necessary.

B) If the switch is OK, jumper xCA11 to xCA12. Relays x3CR and x3BCR should pull in. Replace relay or entire PCB assembly as necessary.

C) If relays appear OK, check bulbs by applying 24VAC xCA1/xCA2 (xMA3/xMA18 or xSA28/xSA18) directly to the suspected bulb.

Delta Model AG812 Stop/Go Signal Gate (optional)

14) The Barrier control circuit provides an independent output from the down limit switch that is used to Vend (raise) a Delta Model AG812 Series Stop/Go Signal Gate when the Barrier is fully lowered. The Signal Gate then simultaneously resets (lowers) as the Barrier is again raised off the down limit switch. Restating the above:

START - Barrier 'UP' -	AG812 Gate Arm 'DOWN'
'Lower' Command	Barrier Starts Down
Barrier Full Down	Arm Starts Up
Barrier Still Down	Arm Full Up
'Raise' Command	Barrier Starts Up/Arm Starts Down
FINISH - Barrier 'UP' -	AG812 Gate Arm 'DOWN'

A) The AG812 Access Gate is installed per the instructions on Document A2021. Wire the 220 VAC power supply to L1 and L2 on the AG812 Terminal Strip.

B) When the Barrier down button is pushed, the Barrier falls making the down limit switch auxiliary relay, 3BCR. The limit switch relay energizes and the Barrier/Signal Gate synchronization contact, 3BCR.1 closes, causing the Signal Gate to raise.

C) Determine if the limit switch and limit switch relays are functioning (paragraph 13). If OK, check:

D) When contact 3BCR.1 closes, Signal Gate should raise. If not, consult Signal Gate instructions, Document A2021 to trouble shoot the Signal Gate.

Apprenticeship Utilization Act Information and Forms

APPRENTICESHIP UTILIZATION ACT

BACKGROUND
Senate Bill 207 (Apprenticeship Utilization Act) passed during the 2019 Legislative Session added sections 338.0116 and 338.01165 to the NRS. These new provisions apply to bids for public works where the value exceeds $100,000.00. In passing SB 207, The Legislature hereby finds and declares that: (1) A skilled workforce in construction is essential to the economic well-being of the State: (2) Apprenticeship programs are a proven method of training a skilled workforce in construction; and (3) Requiring the use of apprentices on the construction of public works will ensure the availability of a skilled workforce in construction in the future for this State.

A contractor or subcontractor engaged in **horizontal construction** who employs a worker on a public work pursuant to NRS 338.040 shall use one or more apprentices for at least 3 percent of the total hours of labor worked for each apprenticed craft or type of work to be performed on the public work for which more than three workers are employed.

"Horizontal Construction" means the construction of any fixed work, including any irrigation, drainage, water supply, flood control, harbor, railroad, highway, tunnel, airport or airway, sewer, sewage disposal plant or water treatment facility and any ancillary vertical components thereof, bridge, inland waterway, pipeline for the transmission of petroleum or any other liquid or gaseous substance, pier, and work incidental thereto. The term does not include vertical construction, the construction of any terminal or other building of an airport or airway, or the construction of any other building.

A contractor or subcontractor engaged in **vertical construction** who employs a worker on a public work pursuant to NRS 338.040 shall use one or more apprentices for at least 10 percent of the total hours of labor worked for each apprenticed craft or type of work to be performed on the public work for which more than three workers are employed.

"Vertical Construction" means the construction or remodeling of any building, structure or other improvement that is predominantly vertical, including, without limitation, a building, structure or improvement for the support, shelter and enclosure of persons, animals, chattels or movable property of any kind, and any improvement appurtenant thereto.

A Public Body/Awarding Body, upon the request of a contractor or subcontractor, **MAY** submit a request for a modification or waiver of the percentage of hours of labor of one or more apprentices prior to (1) the bid advertisement; (2) the bid opening; or (3) the award of the contract if, "Good Cause" exists. The Labor Commissioner may also grant a modification or waiver from the requirements of NRS 338.01165 after work on the public work has commenced.

CITY OF SPARKS – OPERATIONAL PROCESS FOR COMPLIANCE (POST-BID)
The timeline associated with initial collection of materials associated with compliance with the Apprenticeship Utilization Act ("the Act") is as follows:

Pre-Award Meeting – Following the public opening of bids (as soon as practical), a meeting will be scheduled with the apparent low bidder to discuss the bidder's ability to meet the requirements of the Act. At this meeting, the contractor will provide a "Project Workforce Checklist" that indicates the expected classification of workers on the project and the determination as to whether or not apprentices may be required per the provisions of the Act.

Determination of Availability of Apprentices
Immediately following the Pre-Award Meeting, the low bidder will survey the market to determine whether there are a sufficient number of apprentices available in the jurisdiction to meet the requirements of the Act, specific to the project at-hand. The contractor will then communicate the results of this survey to the City of Sparks by either indicating they can go forward without further action by the City or by delivering a completed "Apprenticeship Utilization Act Waiver Request" form(s) for consideration by the City and the Nevada Labor Commissioner.

Communications concerning compliance and/or delivery of waiver requests should occur within 14 calendar days of the Pre-Award Meeting.

Waiver Requests
Upon receipt of any waiver requests, the City will consider the materials provided and, as required, forward the materials to the Nevada Labor Commissioner for consideration and possible approval. Upon receipt of that determination, the City of Sparks will communicate the results back to the Contractor as soon as possible.

Contract Award
Once the City and the low bidder have completed the work required to determine the apparent compliance with the Act, the award of the construction contract will be scheduled for consideration by the City Council.

Post-Award Requests
As allowed by the Act, should an awarded Contractor determine in the course of a project that their ability to comply with the requirements of the Act has changed, additional waiver requests or other relevant information should be communicated to the City as soon as practical for further action and consideration by the City and/or the Nevada Labor Commissioner.

Sample Forms
Additional information and sample forms for use in compliance with the Act may be found on the website of the Nevada Labor Commissioner at:
http://labor.nv.gov/Apprenticeship_Utilization_Act/Apprenticeship_Utilization_Act/

This information may also be found following this page and include:

1) Apprenticeship Utilization Guide
2) Apprenticeship Verification Process
3) Project Workforce Checklist
4) Request for Apprentice Availability on a Public Work
5) Apprenticeship Utilization Act Waiver Request

STEVE SISOLAK
Governor

TERRY REYNOLDS
Director

SHANNON M. CHAMBERS
Labor Commissioner

STATE OF NEVADA

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PHONE (702) 486-2650
FAX (702 486-2660

Department of Business & Industry

OFFICE OF THE LABOR COMMISSIONER

http://www.labor.nv.gov

Senate Bill 207 – Apprenticeship Utilization Act becomes effective January 1, 2020
https://www.leg.state.nv.us/App/NELIS/REL/80th2019/Bill/6351/Text

APPRENTICE VERIFICATION PROCESS

When a Contractor and/or Subcontractor first lists an Apprentice on a Certified Payroll Report (CPR) they must submit with that CPR documentation to substantiate that the Apprentice is registered with the Bureau of Apprenticeship and Training of the Office of Apprenticeship, Training, Employer and Labor Services of the Employment and Training Administration of the United States Department of Labor or its successor **and** the State Apprenticeship Council. (Emphasis added). A properly enrolled and registered Apprentice is exempt from NRS 338.020 to NRS 338.090, inclusive. An Apprentice is paid pursuant to terms of the Apprenticeship Agreement/Standards for the type of work covered by the Apprenticeship Agreement/Standards as approved by the State Apprenticeship Council and/or Nevada Revised Statutes (NRS) section 610 or Nevada Administrative Code (NAC) section 610. (See NRS 338.080)

ELECTRONIC REPORTING/VERIFICATION OF APPRENTICES FOR CERTIFIED PAYROLL REPORTS AND SENATE BILL 207

Contractor and/or Subcontractors utilizing electronic Certified Payroll Reporting software, such as LCP Tracker or other software, should upload the documentation substantiating that the Apprentice is registered with the Bureau of Apprenticeship and Training of the Office of Apprenticeship, Training, Employer and Labor Services of the Employment and Training Administration of the United States Department of Labor or its successor **and** the State Apprenticeship Council. The Contractor and/or Subcontractor should upload any Apprentice Forms verifying the Apprentice's registration and any expiration parameters that need to be applied for the Apprentice in the Certified Payroll Reporting software.

The Awarding/Public Bodies should verify and review /certify that the Apprentice is registered and that the supporting documents were electronically uploaded before a Contractor and/or Subcontractor can certify them on the first Certified Payroll Report. The Awarding/Public Bodies and/or other entities as necessary, will validate the Apprentice information as the database Administrator for that project or multiple projects. This will allow the database Administrator, typically, the Awarding/Public Bodies, to verify and accept the Apprentice Forms for the Apprentice/Worker in question, regardless of the number of projects the Apprentice/Employee may be assigned to within the database.

****Contractors and/or Subcontractors and/or Awarding/Public Bodies will not need to obtain an Apprentice Verification Form because, the Apprentice Forms will be loaded into the database by the Contractor and/or Subcontractor along with any expiration parameters. This information will then be reviewed and verified by the Awarding/Public Bodies and/or other entities as necessary.**

This Apprentice approval process ensures an Apprentice is: 1.) Registered with the Bureau of Apprenticeship and Training of the Office of Apprenticeship, Training, Employer and Labor Services of the Employment and Training Administration of the United States Department of Labor or its successor **and** the State Apprenticeship Council; and 2.) Assists with validating Apprentice %'s for purposes of Senate Bill 207.

Compliance with Senate Bill 207 (Passed during 2019 Legislative Session.) The Awarding/Public Bodies and Contractors or Subcontractors must ensure the reporting of Apprentices complies with Senate Bill 207, unless a Waiver has been granted by the Labor Commissioner. Apprentices shall be used and reported for at least 10 % of the total hours on vertical construction and 3 % of the total hours for horizontal construction of the total hours of labor worked for each apprenticed craft or type of work to be performed on the public work when more than three employees of each a craft are employed at the site of work.

Apprenticeship Ratio: Be sure to review the apprenticeship standards to see if they provide for a ratio of apprentices to journeymen. It the ratio is not complied with the apprentice is to be paid at full journeyman rate for the type of work performed. (See NAC 338.0095). Awarding/Public Bodies may contact the Governor's Office of Workforce Innovation to verify the proper apprenticeship ratio because, they have jurisdiction over the Nevada State Apprenticeship Council and apprenticeship standards/agreements and the registration of apprentices.

STEVE SISOLAK
Governor

TERRY REYNOLDS
Director

SHANNON M. CHAMBERS
Labor Commissioner

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Department of Business & Industry

OFFICE OF THE LABOR COMMISSIONER

http://www.labor.nv.gov

SUPPLEMENTAL GUIDANCE
APPRENTICESHIP UTILIZATION ACT
MARCH 5, 2021

WHAT DOES MORE THAN 3 WORKERS EMPLOYED FOR EACH APPRENTICED CRAFT OR TYPE OF WORK PERFORMED MEAN?

For a public works project over $100,000, the Apprenticeship Utilization Act – Nevada Revised Statutes (NRS) section 338.01165, would be triggered when there were more than 3 workers employed for each apprenticed craft or type of work to be performed on the public works project. NRS section 338.01165 does not specify or clarify if the more than 3 is for the entire public works project, or more than 3 for a specific day(s), week(s), and/or another period. NRS section 338.01165 does however clarify that for Horizontal Construction, if there are more than 3 workers employed for each apprenticed craft or type of work performed, then 3% of the total hours for that apprenticed craft or type of work performed must be worked by an apprentice. For Vertical Construction, it is 10% of the total hours for that apprenticed craft or type of work performed that must be worked by an apprentice.

The Office of the Labor Commissioner/Labor Commissioner (OLC/LC) has interpreted the plain language of NRS section 338.01165 in connection with the legislative history and intent to mean that there must be more than 3 employees/workers employed on the public works project/work site at any one time and/or the same time for each apprenticed craft or type of work performed to trigger the requirements of NRS section 338.01165. In other words, there must be a "crew" of more than 3 employees/workers for each apprenticed craft or type of work performed on the public works project/work site at the same time for the requirements of NRS section 338.01165 to apply. This could include a crew of more than 3 employee/workers of an apprenticed craft or type of work performed present at the same time on the project/work site for only 1 full day of work. The OLC/LC would also look to the potential rotation of crews to avoid the requirements of NRS section 338.01165.

CITY OF SPARKS

Project Workforce Checklist

For Compliance with the Nevada Apprenticeship Utilization Act, 2019

Project: _____ Contractor: _____

Craft/Type of Work	More than 3 Employees Anticipated?	Anticipate Needing Waiver?‡
Air Balance Technician	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Alarm Installer	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Boilermaker	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Bricklayer, can also include tile setter, terrazzo workers and marble masons.	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Carpenter, can also include cement masons, floor coverer, millwright and piledriver (non-equipment), plasterers and terrazzo workers.	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Cement Mason	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Electrician, includes communication technician, line, neon sign and wireman. Can also include alarm installer.	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Elevator Constructor	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Fence Erector	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Flag Person	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Floor Coverer	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Glazier (see also Painters and Allied Trades)	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Highway Striper	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Hod Carrier, includes brick-mason tender and plaster tender.	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Iron Worker, can also include fence erectors (steel/iron)	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Laborer, can also include fence erector (non-steel/iron), flag person, highway striper and traffic barrier erector	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Lubrication and Service Engineer	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Mason, can also cement, plasterer, tile setter, terrazzo workers and marble masons	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Mechanical Insulator	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Millwright	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Operating Engineer, can also include equipment greaser, piledriver, soils and material tester, steel fabricator/erector (equipment) and surveyor (non-licensed) and well driller.	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Painters and **Allied Trades**, can also include glaziers, floor coverers, and tapers.	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Pile Driver (non-equipment)	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐

Craft/Type of Work	More than 3 Employees Anticipated?	Anticipate Needing Waiver?‡
Plasterer	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Plumber/Pipefitter	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Refrigeration	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Roofer (not sheet metal)	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Sheet Metal Worker, can also include air balance technician.	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Soils and Materials Tester, includes certified soil tester	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Sprinkler Fitter	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Surveyor (non-licensed)	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Taper	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Tile/Terrazzo Worker/Marble Mason	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Traffic Barrier Erector	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Truck Driver	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Well Driller (see also Operating Engineer)	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
Other*:	**Yes** ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
	Yes ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
	Yes ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
	Yes ☐ **No** ☐ **N/A** ☐	**Yes** ☐ **No** ☐
‡Pursuant to the Labor Commissioner's Nov. 27, 2019 Advisory Opinion, waivers are not required in those crafts/types of work where no recognized apprenticeship program exists in the region where the public work is located. Contractor is responsible for verifying whether recognized apprenticeship programs exist in the region for each craft/type of work to be performed.		
***Contractor is responsible for ensuring all crafts/types of work to be performed on the public work are accounted for in this checklist. Attach additional pages if needed.**		

I affirm I am fully authorized to acknowledge, on behalf of the Contractor listed above, the anticipated workforce, and acknowledge that changes to the anticipated workforce which may have an impact on compliance with the Nevada Apprenticeship Utilization Act, 2019 will require the submittal of a revised form within ten (10) working days of such change.

Signed: _____

Name and Title: _____

Date: _____

Contractor Name: _____

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STATE OF NEVADA
Office of the Labor Commissioner

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REQUEST FOR APPRENTICE AVAILABILITY ON A PUBLIC WORK

Senate Bill (SB) 207 - Apprenticeship Utilization Act passed during the 2019 Legislative Session adds a section to NRS section 338. In passing SB 207, The Legislature hereby finds and declares that: (1) A skilled workforce in construction is essential to the economic well-being of the State: (2) Apprenticeship programs are a proven method of training a skilled workforce in construction; and (3) Requiring the use of apprentices on the construction of public works will ensure the availability of a skilled workforce in construction in the future for this State. https://www.leg.state.nv.us/App/NELIS/REL/80th2019/Bill/6351/Text

You may use this form to request an Apprentice or determine availability of an Apprentice from a Registered Apprenticeship Program in the applicable craft or trade in the area of the Public Works Project. For information about Registered Apprenticeship Programs in your area and Registered Apprentices, please visit www.labor.nv.gov or the Nevada State Apprenticeship Council at www.owinn.nv.gov/Apprenticeship/AboutSAC/ *The Governor's Office of Workforce Innovation (OWINN) is responsible for the Nevada State Apprenticeship Council and the approval and registration of Apprenticeship Programs and Apprentices.

Requests for dispatch must be in writing and submitted (and received) at least 5 business days in advance (excluding weekends and holidays) via first class mail, fax or email. Proof of submission (and receipt) will be required. Please refer to Chapter 610 of the Nevada Revised Statutes and Nevada Administrative Code Chapter 610 for the laws and regulations governing Registered Apprenticeship Programs and Registered Apprentices.

Request Submitted to:	Date Request Submitted: _____

Name of Registered Apprenticeship Program:_____
Contact Person/Title:_____
Address:_____, _____, NV _____
Tel No.: (_____) _____ Fax No.: (_____) _____ Email: _____

Requestor Information:
Contractor/Subcontractor: _____ License Number: _____
Contact Person/Title: _____
Address: _____, _____, _____ _____
Tel No.: (_____) _____ Fax No.: (_____) _____ Email:_____

Availability Request Information:
Number of Apprentice(s) Required: ____ Craft or Trade: _____
Apprentice(s) Report Date: _____ (5 business days' notice required) Report Time: __:__ am
Name of Person to Report to: _____
Address to Report to: _____, _____, NV _____

Project Information:
Contract Name/Number: _____ Project Location:_____
Awarding Body Name:_____
Contact Person/Title:_____
Tel No.: (_____) _____ Fax No.: (_____) _____ Email: _____

_____ _____ ___/___/_____
Print Name/Title *Signature Date

*By signing this form you certify that the information you have provided is true and correct to the best of your knowledge.

Request Approved: ☐ Request Denied: ☐

Notes:_____
_____

_____ _____ ___/___/_____
Print Name/Title Signature Date

Date Received: _____ Date Returned: _____

Governor's Office of Workforce Innovation (OWINN)
Main Phone # 702-486-8080
When completed, email to:
NVApprenticeship@gov.nv.gov

REQUEST FOR NEVADA REGISTERED APPRENTICE VERIFICATION

Name of requesting contractor/awarding body/organization:	
Name and title of person requesting this verification:	
Contact phone # of person requesting this verification:	
Email address of person requesting this verification:	
Date this request was submitted to OWINN:	
Additional information regarding current Public Works projects for requester: (for example, project owner(s), PWP/contract #(s), project name(s), etc.)	

*APPRENTICE NAME (First, Last)	RAPIDS ID #	OCCUPATION	APPRENTICESHIP PROGRAM (for example, Local 12)
Additional information regarding apprentice(s): (for example, apprentice status, wage %, etc.)			

*Apprentices only need to be verified once per year/per contractor, and once approved, can be used for multiple Public Works.

Note: The Requesting Contractor/Awarding Body/Organization certifies and assures the information above is true and correct. It also acknowledges that Journeymen wages must be paid for time worked during canceled or suspended time periods or when required ratios are not met. Furthermore, the OWINN office will not process this Apprentice Verification request unless this form is signed, and ALL FIELDS are completed.

Signed: _____ **Date:** _____

Name/Title: _____

FOR OWINN USE ONLY

Date Received: _____

	Initial Ratio	Ratio Thereafter
Occupation	Apprentice(s) per Journeymen	Apprentice(s) per Journeymen
	____ / ____	____ / ____
	/	/

OWINN Verified by: _____ Date: _____

Office of the Labor Commissioner
1818 College Parkway, Suite 102
Carson City, Nevada 89706
Phone: (775) 684-1890
Fax: (775) 687-6409
E-Mail: AUA@labor.nv.gov

Office of the Labor Commissioner
3300 W. Sahara Ave., Suite 225
Las Vegas, Nevada 89102
Phone: (702) 486-2650
Fax: (702) 486-2660
E-Mail: AUA@labor.nv.gov

STATE OF NEVADA
Office of the Labor Commissioner

APPRENTICESHIP UTILIZATION ACT WAIVER REQUEST

Senate Bill (SB) 207 - Apprenticeship Utilization Act passed during the 2019 Legislative Session adds a section to NRS section 338. In passing SB 207, The Legislature hereby finds and declares that: (1) A skilled workforce in construction is essential to the economic well-being of the State: (2) Apprenticeship programs are a proven method of training a skilled workforce in construction; and (3) Requiring the use of apprentices on the construction of public works will ensure the availability of a skilled workforce in construction in the future for this State. https://www.leg.state.nv.us/App/NELIS/REL/80th2019/Bill/6351/Text

A Public Body, upon the request of a contractor or subcontractor, may submit a request for a modification or waiver of the percentage of hours of labor of one or more apprentices prior to (1) the bid advertisement; (2) the bid opening; or (3) the award of the contract if, "Good Cause" exists. The Labor Commissioner may also grant a waiver from the requirements of SB 207 after work on the public work has commenced if the public body, contractor or subcontractor submits documentation and evidence that meets the requirements to establish "Good Cause."

Public Works Project (PWP) # _____
Awarding Body Name: _____
Contact Person/Title: _____
Address: _____, _____, NV _____
Phone: (___) _____ **Fax: (___)** _____ **E-Mail:** _____

Contractor/Subcontractor: _____ **License Number:** _____
Contact Person/Title: _____
Address: _____, _____, _____
Phone: (___) _____ **Fax: (___)** _____ **E-Mail:** _____

Please check the box for the reason for a Waiver Request and provide/submit supporting documentation/evidence:

Yes No
☐ ☐ **There are no Apprentices available from an Apprenticeship Program Registered by the Nevada State Apprenticeship Council within the jurisdiction where the public work is to be completed.**

Yes No
☐ ☐ **The contractor or subcontractor is required to perform uniquely complex or hazardous tasks on the public work that require the skill and expertise of a greater percentage Apprentice or Journeyworkers.**

Yes No
☐ ☐ **The contractor or subcontractor has requested Apprentices from a Registered Apprenticeship Program and the request has been denied or the request has not been approved within 5 business days.**

Please attach additional documentation/evidence supporting the Waiver Request or describe why an Apprentice is not available or cannot be provided:

_____
_____

Contractor/Subcontractor Name	Date Waiver Request Submitted to Awarding Body	*Signature
Awarding Body Printed Name/Title	*Signature	Date

By signing this form, you certify that the information you have provided is true and correct to the best of your knowledge.

For Office of the Labor Commissioner's Use Only:

Waiver Request Approved: ☐ Waiver Request Denied: ☐

Notes: _____

Printed Name/Title	Signature	Date

Date Received: _____ **Date Returned:** _____

Forms

(to be used following award of bid)

1) Contract Form
2) Performance Bond
3) Payment Bond

TITLE
BID # BIDNUMBER
PWP# PWPNUMBER

THIS CONTRACT made and entered into on this DAY day of MONTH, YEAR by and between the City of Sparks, Nevada, a municipal corporation, existing under and by virtue of the laws of the State of Nevada, hereinafter called "City", and **CONTRACTORNAME**, a qualified Contractor in the class of work required, hereinafter called "Contractor".

W I T N E S E T H

WHEREAS, the City has awarded a contract to Contractor for providing material and/or performing the work hereinafter mentioned in accordance with the proposal of said Contractor;

WHEREAS, the Contractor will provide the material and/or perform the work for the compensation stated in said proposal, an amount which has been arrived at between the parties;

WHEREAS, each party is willing to and does assume joint liability for the contents of this Contract, and each party accordingly agrees that it shall not be construed against any party as a drafting party;

NOW, THEREFORE, IT IS AGREED as follows:

1. **Scope of Work:**
The scope of work for this contract is generally defined as **TITLE**. The City's Contract Documents and Contractor's Entire Proposal are on file with the City of Sparks. All terms, conditions and requirements contained within these Documents, including any and all bid documents, addenda and specifications issued by the City, are hereby incorporated by reference into this Contract.

The Contractor shall perform within the time stipulated, the Contract as herein defined and shall provide and furnish any and all of the labor, materials, methods or processes, equipment implements, tools, machinery and equipment, and all utility, transportation and other services required to construct, install and put in complete order for use in a good and workmanlike manner all of the work covered by the Contract in connection with strict accordance with the plans and specifications therein, which were approved by said City and are on file with the City, including any and all addenda issued by the City, and with the other contract documents hereinafter enumerated.

2. **Payment for Project Services**
As full consideration for the Services to be performed by Contractor, City agrees to pay Contractor as set forth in accordance with the bid and not to exceed fee of **$AMOUNT** for the project.

A monthly progress payment in the amount of ninety-five percent (95%) of the value of the work completed may be made every thirty (30) days upon application by the Contractor and certification by the Project Manager that such work has been completed.

Partial payments will be made once each month as the work satisfactorily progresses and after acceptance

by the authorized City representative. The progress estimates shall be based upon materials in place, or on the job site and invoiced, and labor expended thereon. From the total of the amount ascertained will be deducted an amount equivalent to five percent (5%) of the whole, which five percent (5%) will be retained by the City until after completion of the entire Contract in an acceptable manner. Any time after fifty percent (50%) of the value of the work has been completed, the City will make any of the remaining partial payments in full.

No such estimates or payments shall be required to be made, when, in the judgment of the City Project Manager, the work is not proceeding in accordance with the provision of the Contract, or when in his judgment the total value of the work done since last estimate amounts to less than Five Hundred Dollars ($500.00).

The cost of materials conforming to the plans and specifications (materials being those which are required to be contained and incorporated in a finished contract bid item) delivered to the project and not at the time incorporated in the work, may also be included in the estimate for payment. No such estimate or payment shall be construed to be an acceptance of any defective work or improper material. The Contractor shall be responsible for, and shall not remove from the project any material that has been included in the estimate for payment.

Final payment shall be made upon the Project Manager certifying that the Contractor has satisfactorily completed the work in conformity with the Contract Documents.

3. Time for Completion:

The Contractor shall deliver the material and/or services called for in the specifications/proposal and within the delivery time specified and in accordance with the terms of the contract. Work shall be completed within _____ days from the Notice to Proceed issued by the City of Sparks Purchasing Division. The Contractor shall not alter or vary any terms or conditions contained or incorporated herein, including but not limited to, the quantity, price, delivery date or date designated as After Receipt of Order (ARO) or date for commencement or completion of services as mutually agreed upon, unless such alteration or variation is consented to in writing by a duly authorized representative of the City.

The City reserves the right to cancel resultant Contract upon ten days written notice in the event the type and quality of the product or work performance is unsatisfactory or in default, subject to Contractor's right to cure as outlined in termination clause.

This is a non-exclusive Contract and the City reserves the right to acquire the material and/or services at its discretion, from other sources during the term of this Contract.

4. No Unlawful Discrimination:

In connection with the performance of work under this contract, the contractor agrees not to discriminate against any employee or applicant for employment because of race, creed, color, national origin, sex, sexual orientation, gender identity or expression, or age, including, without limitation, with regard to employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including, without

limitation, apprenticeship. The contractor further agrees to insert this provision in all subcontracts hereunder, except subcontracts for standard commercial supplies or raw materials.

Any violation of these provisions by Contractor shall constitute a material breach of contract.
In all cases where persons are employed in the construction of public works, preference must be given when the qualifications of the applicants are equal:

A) First: To honorably discharged soldiers, sailors and marines of the United States who are citizens of the State of Nevada.
B) Second: To other citizens of the State of Nevada

If the provisions of this section are not complied with by the contractor engaged on the public work, the contract is void, and any failure or refusal to comply with any of the provisions of this section renders any such contract void and subject to the exceptions contained in this section, no money may be paid out of the State Treasury or out of the treasury of any political subdivision of the State to any person employed on any work mentioned in this section unless there has been compliance with the provisions of this section. Any contractor engaged on a public work or any other person who violates any of the provisions of this section is guilty of a misdemeanor. The penalties provided for in this section do not apply where violations thereof are due to misrepresentations made by the employee or employees.

5. No Illegal Harassment:
Violation of the City's harassment policy, which is incorporated by reference and available from the Human Resource Division, by the Contractor, its officers, employees, agents, vendors, consultants, subcontractors and anyone from whom it is legally liable, while performing or failing to perform Contractor's duties under this Contract shall be considered a material breach of contract.

6. Lawful Performance:
Vendor shall abide by all Federal, State and Local Laws, Ordinances, Regulations, and Statutes as may be related to the performance of duties under this agreement. In addition, all applicable permits and licenses required shall be obtained by the vendor, at vendor's sole expense.

7. Preferences (This Section ☐ IS ☐ IS NOT Applicable to this contract):
To the extent Contractor has sought and qualified for a bidding preference and this project has a value of over $250,000 pursuant to Nevada Revised Statutes Chapter 338, Contractor acknowledges and agrees that the following requirements will be adhered to, documented and attained for the duration of the Project:

1. At least 50 percent of the workers employed on the Project (including subcontractors) hold a valid driver's license or identification card issued by the Nevada Department of Motor Vehicles;

2. All vehicles used primarily for the public work will be (a) registered and (where applicable) partially apportioned to Nevada; or (b) registered in Nevada; and

3. The Contractor shall maintain and make available for inspection within Nevada all payroll records related to the Project.

Contractor recognizes and accepts that failure to comply with any requirements herein shall be a

material breach of the contract and entitle the City of Sparks to liquidated damages in the amount set by statute. In addition, the Contractor recognizes and accepts that failure to comply with any requirements herein may lose its certification for a preference in bidding and/or its ability to bid on any contracts for public works pursuant to NRS Chapter 338.

To the extent Contractor has sought and qualified for a bidding preference and this project has a value of over $250,000 pursuant to Nevada Revised Statutes Chapter 338, each contract between the contractor, applicant or design-build team and a subcontractor must provide for the apportionment of liquidated damages assessed pursuant to this section if a person other than the Contractor was responsible for the breach of a contract for a public work caused by a failure to comply with a requirement of Items 1-5 within this section. The apportionment of liquidated damages must be in proportion to the responsibility of each party for the breach.

8. Prevailing Wages:

The Contractor and subcontractors shall be bound by and comply with all federal, state and local laws with regard to minimum wages, overtime work, hiring and discrimination, including Chapter 338 of the NRS, which is entitled, "Public Works Projects."

The Contractor shall ensure that all employees on the work site are paid in accordance with the CURRENT PREVAILING WAGE RATES AS APPROVED BY THE STATE LABOR COMMISSIONER, whenever the actual value of the Contract totals One Hundred Thousand Dollars ($100,000) or more, or when required by the Supplementary Conditions. If a Change Order causes a Contract to exceed One Hundred Thousand Dollars ($100,000), the State Labor Commissioner may audit the entire Contract period.

Questions involving the Prevailing Wage Rates for the City of Sparks should be referred to the Labor Commissioner, State of Nevada, at (775) 687-4850.

When federal money is associated with the project making the Contract subject to both state and federal wage rates, the Contractor shall not pay less than the higher rate when the two rates differ for similar kinds of labor.

A. Posting of Minimum Wage Rates - In accordance with NRS, Chapter 338, Section 338.020, the Contractor shall post the hourly and daily rate of wages to be paid to each of the classes of mechanics and workers on the site of Work of this Contract in a place generally visible to the workers.

B. Pursuant to NRS 338.060 and 338.070, the Contractor hereby agrees to forfeit, as a penalty to the City of Sparks, not less than Twenty Dollars ($20) nor more than Fifty Dollars ($50) for each calendar day or portion thereof that each worker employed on the Contract is paid less than the designated rate for any work done under the Contract, by the Contractor or any subcontractor under him, or is not reported to the City of Sparks as required by NRS 338.070.

C. The contractor and each subcontractor shall keep or cause to be kept an accurate record showing, for each worker employed by the contractor or subcontractor:
   (1) The name of the worker;

(2) The occupation of the worker;
(3) If the worker has a driver's license or identification card, an indication of the state or other jurisdiction that issued the license or card; and
(4) The actual per diem, wages and benefits paid to the worker.

In addition, the contractor and each subcontractor shall keep or cause to be kept an accurate record showing, for each worker employed by the contractor or subcontractor who has a driver's license or identification card:
(1) The name of the worker;
(2) The driver's license number or identification card number of the worker; and
(3) The state or other jurisdiction that issued the license or card.

D. The records in Section C above must be open at all reasonable hours to the inspection of the City of Sparks, and its officers and agents. A copy of the each record for each calendar Month for the General Contractor and all Sub-Contractors must be submitted to the City of Sparks no later than 15 days after the end of each month for the previous months' wages.

9. Apprenticeship Utilization Act:

Senate Bill 207 (Apprenticeship Utilization Act) passed during the 2019 Legislative Session added sections 338.0116 and 338.01165 to the NRS. These new provisions apply to bids for public works where the value exceeds $100,000.00. In passing SB 207, The Legislature hereby finds and declares that: (1) A skilled workforce in construction is essential to the economic well-being of the State: (2) Apprenticeship programs are a proven method of training a skilled workforce in construction; and (3) Requiring the use of apprentices on the construction of public works will ensure the availability of a skilled workforce in construction in the future for this State.

A contractor or subcontractor engaged in **horizontal construction** who employs a worker on a public work pursuant to NRS 338.040 shall use one or more apprentices for at least 3 percent of the total hours of labor worked for each apprenticed craft or type of work to be performed on the public work for which more than three workers are employed.

"Horizontal Construction" means any construction, alteration, repair, renovation, demolition or remodeling necessary to complete a public work, including, without limitation, any irrigation, drainage, water supply, flood control, harbor, railroad, highway, tunnel, airport or airway, sewer, sewage disposal plant or water treatment facility and any ancillary vertical components thereof, bridge, inland waterway, pipeline for the transmission of petroleum or any other liquid or gaseous substance, pier, and any other work incidental thereto. The term does not include vertical construction, the construction of any terminal or other building of an airport or airway, or the construction of any other building.

A contractor or subcontractor engaged in **vertical construction** who employs a worker on a public work pursuant to NRS 338.040 shall use one or more apprentices for at least 10 percent of the total hours of labor worked for each apprenticed craft or type of work to be performed on the public work for which more than three workers are employed.

"Vertical Construction" means any construction, alteration, repair, renovation, demolition or remodeling necessary to complete a public work for any building, structure or other improvement that is predominantly vertical, including, without limitation, a building, structure or improvement for the support, shelter and enclosure of persons, animals, chattels or movable property of any kind, and any other work or improvement appurtenant thereto.

A Public Body/Awarding Body, upon the request of a contractor or subcontractor, **MAY** submit a request for a modification or waiver of the percentage of hours of labor of one or more apprentices prior to (1) the bid advertisement; (2) the bid opening; or (3) the award of the contract if, "Good Cause" exists. The Labor Commissioner may also grant a modification or waiver from the requirements of NRS 338.01165 after work on the public work has commenced.

10. Acceptance by the City:
It is expressly understood and agreed that all materials provided and/or work done by the Contractor shall be subject to inspection and acceptance by the City at its discretion, and that any progress inspections and approval by the City of any item or work shall not forfeit the right of the City to require the correction of faulty workmanship or material at any time during the course of the work, although previously approved by oversight. Nothing herein contained shall relieve the Contractor of the responsibility for proper construction and maintenance of the work, materials and equipment required under the terms of this Contract until all work has been completed and accepted by the City.

11. Waiver:
No waiver of any term, provision or condition of this Contract, whether by conduct or otherwise, in any one or more instances, shall be deemed to be nor shall it be construed as a further or continuing waiver of any such term, provision or condition of this Contract. No waiver shall be effective unless it is in writing and signed by the party making it.

12. Notices:
All notices required to be given in writing by this Contract shall be deemed to be received (i) upon delivery if personally delivered, or (ii) when receipt is signed for if mailed by certified or registered mail, postage prepaid, or by express delivery service or courier, when addressed as follows (or sent to such other address as a Party may specify in a notice to the others):

PURCHASING MANAGER	CONTRACTOR:
CITY OF SPARKS	CONTACT
431 PRATER WAY	CONTRACTORNAME
PO BOX 857	ADDRESS
SPARKS, NV 89432-0857	CITY, STATE ZIP
	e-mail:

13. Arbitration:
Any and all disputes, controversies or claims arising under or in connection with this Contract, including without limitation, fraud in the inducement of this Contract, or the general validity or enforceability of this Contract, shall be governed by the laws of the State of Nevada without giving effect to conflicts of law principles, may be submitted to binding arbitration before one arbitrator, and shall be conducted in

accordance with the Commercial Arbitration Rules of the American Arbitration Association in a private manner in Washoe County, Nevada. This award shall be final and judgment may be entered upon it in any court having jurisdiction thereof. In reaching this final award, the arbitrator shall have no authority to change or modify any provision of this Contract. All other expenses of arbitration shall be borne equally by the parties. All fees, including legal fees, shall be borne by the party who incurred them. All costs of enforcement shall be borne by the losing party. Each party shall have the right to discovery in accordance with the Nevada Rules of Civil Procedure.

14. Jurisdiction and Venue:

In the event the arbitration award is challenged, any action or proceeding seeking to do so must be brought in the courts of the State of Nevada, County of Washoe, or if the party can acquire subject-matter jurisdiction, in the United States District Court for the District of Nevada in the City of Reno. Each of the parties consents to the personal jurisdiction of such courts (and of the appropriate appellate courts) in any such action or proceeding and waives any objection to venue laid therein. Process in any action or proceeding referred to in the preceding sentence may be served on either party by sending it certified mail to the respective addresses designated for notice.

15. Indemnification:

To the fullest extent permitted by law, upon award, Contractor shall hold harmless, indemnify, defend and protect City, its affiliates, officers, agents, employees, volunteers, successors and assigns ("Indemnified Parties"), and each of them from and against any and all claims, demands, causes of action, damages, costs, expenses, actual attorney's fees, losses or liabilities, in law or in equity, of every kind and nature whatsoever ("Claims") arising out of or related to any act or omission of Contractor, its employees, agents, representatives, or Subcontractors in any way related to the performance of work under this Agreement by Contractor, or to work performed by others under the direction or supervision of Contractor, including but not limited to:

1. Personal injury, including but not limited to bodily injury, emotional injury, sickness or disease, or death to persons;
2. Damage to property of anyone, including loss of use thereof;
3. Penalties from violation of any law or regulation caused by Contractor's action or inaction;
4. Failure of Contractor to comply with the Insurance requirements established under this Agreement;
5. Any violation by Contractor of any law or regulation in any way related to the occupational safety and health of employees.

In determining the nature of the claim against City, the incident underlying the claim shall determine the nature of the claim, notwithstanding the form of the allegations against City.

If City's personnel are involved in defending such actions, Contractor shall reimburse City for the time and costs spent by such personnel at the rate charged City for such services by private professionals.

In cases of professional service agreements, requiring professional liability coverage:

If the insurer by which a Consultant is insured against professional liability does not so defend the

City and applicable agents and/or staff, and the Consultant is adjudicated to be liable by a trier of fact, the City shall be entitled to reasonable attorney's fees and costs to be paid to the City by the Consultant in an amount which is proportionate to the liability of the of the Consultant.

Nothing in this contract shall be interpreted to waive nor does the City, by entering into this contract, waive any of the provisions found in Chapter 41 of the Nevada Revised Statutes.

16. Licenses and Permits:

The Contractor shall procure at his own expense all necessary licenses and permits and shall adhere to all the laws, regulations and ordinances applicable to the performance of this Contract.

All Contractors, Sub-Contractors and Suppliers doing business within the City of Sparks are required to obtain a current business license from the City of Sparks prior to commencement of this contract. Per Sparks Municipal Code Section 5.08.020A: "It is unlawful for any person to transact business in the City without first having obtained a license from the City to do so and without complying with all applicable provisions of this title and paying the fee therefore."

17. Insurance:

BIDDERS' ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW. IT IS HIGHLY RECOMMENDED THAT BIDDERS CONFER WITH THEIR RESPECTIVE INSURANCE CARRIERS OR BROKERS TO DETERMINE IN ADVANCE OF BID SUBMISSION THE AVAILABILITY OF INSURANCE CERTIFICATES AND ENDORSEMENTS AS PRESCRIBED AND PROVIDED HEREIN. IF THE APPARENT LOW BIDDER FAILS TO COMPLY STRICTLY WITH THE INSURANCE REQUIREMENTS, THAT BIDDER MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

The City may, unless otherwise required by law, waive or reduce the insurance requirements itemized here, at the discretion of the city's Contracts and Risk Manager.

Should work be required on City premises or within the public right-of-way, upon award of the contract, the bidder shall provide proof of insurance for the types of coverage, limits of insurance and other terms specified herein, prior to initiation of any services under City, Bid, Proposal or Contract. Coverage shall be from a company authorized to transact business in the State of Nevada and the City of Sparks and shall meet the following minimum specifications:

Contractor shall at its own expense carry and maintain at all times the following insurance coverage and limits of insurance no less than the following or the amount customarily carried by Contractor or any of its subcontractors, whichever is greater. Contractor shall also cause each subcontractor employed by Contractor to purchase and maintain insurance of the type specified herein. All insurers must have AM Best rating not less than A-VII, and be acceptable to the City. Contractor shall furnish copies of certificates of insurance evidencing coverage for itself and for each subcontractor. Failure to maintain the required insurance may result in termination of this contract at City's option. If Contractor fails to maintain the insurance as set forth herein, City shall have the right, but not the obligation, to purchase said insurance at Contractor's expense.

Contractor shall provide proof of insurance for the lines of coverage, limits of insurance and other terms specified below prior to initiation of any services. Coverage shall be from a company authorized to transact business in the State of Nevada and the City of Sparks. Contractor and any of its subcontractors shall carry and maintain coverage and limits no less than the following or the amount customarily carried by Contractor or any of its subcontractors, whichever is greater.

Applicable to this Contract	Insurance Type	Minimum Limit	Insurance Certificate	Additional Insured	Waiver of Subrogation
Yes	General Liability/Umbrella (Excess) Liability	$2,000,000	✔	✔	✔
Yes	Automobile Liability	$1,000,000	✔	✔	
Yes	Workers' Compensation	Statutory	✔	N/A	✔
Yes	Employer's Liability	$1,000,000	✔	N/A	
No	Professional Liability	$1,000,000	✔	N/A	N/A
No	Pollution Legal Liability	$1,000,000	✔	N/A	N/A

Commercial General Liability

Contractor shall carry and maintain Commercial General Liability (CGL) and, if necessary to meet required limits of insurance, commercial umbrella/excess liability insurance with a total limit of not less than the limits specified herein.

For contracts that are for the construction or improvement of public facilities, the Contractor shall obtain and maintain products and completed operations liability coverage through the statute of repose after completion of the project. Continuing commercial umbrella coverage, if any, shall include liability coverage for damage to the insured's completed work equivalent to that provided under ISO form CG 00 01.

There shall be no endorsement or modification of the CGL limiting the scope of coverage for liability arising from pollution, explosion, collapse, underground property damage, or damage to the named insured's work unless Subcontractor carries and maintains separate policies providing such coverage and provides Contractor evidence of insurance confirming the coverage.

Minimum Limits of Insurance

$2,000,000 Each Occurrence Limit for bodily injury and property damage
$2,000,000 General Aggregate Limit
$2,000,000 Products and Completed Operations Aggregate Limit
$10,000 Medical Expense Limit

If Commercial General Liability Insurance or other form with a general aggregate limit is used, it shall be revised to apply separately to this PROJECT or LOCATION.

Coverage Form
Coverage shall be at least as broad as the unmodified Insurance Services Office (ISO) Commercial General Liability (CGL) "Occurrence" form CG 00 01 04/13 or substitute form providing equivalent coverage and shall cover liability arising from premises, operations, independent contractors, products-completed operations, personal and advertising injury, and liability assumed under an insured contract (including the tort liability of another assumed in a business contract).

Additional Insured
City, its officers, agents, employees, and volunteers are to be included as insureds using the applicable ISO additional insured endorsement(s) or substitute forms providing equivalent coverage, in respects to damages and defense arising from: activities performed by or on behalf of Contractor, including the insured's general supervision of Contractor; products and completed operations of Contractor; premises owned, occupied, or used by Contractor. The coverage shall contain no special limitations on the scope of protection afforded to City, its officers, employees, or volunteers. Additional insured status for City shall apply until the expiration of time within which a claimant can bring suit per applicable state law.

Primary and Non-Contributory
Contractor's insurance coverage shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded to City, its officers, agents, employees, and volunteers. There shall be no endorsement or modification of the CGL to make it excess over other available insurance; alternatively, if the CGL states that it is excess or pro rata, the policy shall be endorsed to be primary with respect to the additional insured. Any insurance or self-insurance maintained by City, its officers, employees, or volunteers shall be excess of Contractor's insurance and shall not contribute with it in any way.

Waiver of Subrogation
Contractor waives all rights against City and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by the commercial general liability or commercial umbrella liability insurance maintained pursuant to this agreement. Insurer shall endorse CGL policy as required to waive subrogation against the City with respect to any loss paid under the policy.

Endorsements
Policy forms or endorsements are required confirming coverage for all required additional insureds. The forms or endorsements for CGL shall be at least as broad as the unmodified ISO additional insured endorsement CGO 20 10 07/04 and CG 20 37 07/04 or substitute forms providing additional insured coverage for products and completed operations.

A waiver of subrogation in favor of City shall be endorsed to the policy using an unmodified Waiver of Transfer of Rights of Recovery of Others to Us ISO CG 24 04 05 09, or a substitute form providing equivalent coverage.

Electronic Data Liability
If any underground work will be performed, Contractor shall maintain electronic data liability insurance applicable to the Project and insuring against liability arising out of the loss of, loss of use of, damage to,

corruption of, inability to access, or inability to manipulate electronic data. This coverage shall be maintained with a limit of liability of not less than $1,000,000 and provide coverage at least as broad as electronic data liability coverage form CG 04 37 (or substitute form providing equivalent coverage.

Railroad Protective Liability
For any construction or demolition work within fifty (50) feet of a railroad, Contractor shall maintain Railroad Protective Liability insurance on behalf of and in the name of the railroad, as named insured, with a limit of $6,000,000 per occurrence or higher limit if required by the railroad. Contractor shall also ensure that any exclusions pertaining to the indemnification of a railroad are removed from its CGL policy or that ISO form CG 24 17 (Contractual Liability-Railroads Endorsements) is included in the coverage.

Business Automobile Liability
Minimum Limits of Insurance
$1,000,000 Combined Single Limit per accident for bodily injury and property damage or the limit customarily carried by Contractor, whichever is greater. No aggregate limit may apply. Coverage may be combined with Excess/Umbrella Liability coverage to meet the required limit.

Coverage Form
Coverage shall be at least as broad as the unmodified Insurance Services Office (ISO) Business Automobile Coverage form CA 00 01 10/13, CA 00 25 10/13, CA 00 20 10/13 or substitute form providing equivalent coverage. Such insurance shall cover liability arising out of any auto (including owned, hired, and non-owned autos).

Pollution liability coverage at least as broad as that provided under the ISO pollution liability—broadened coverage for covered autos endorsement (CA 99 48) shall be provided, and the Motor Carrier Act endorsement (MCS 90) shall be attached for all contracts involving transportation of "hazardous material" as this term is defined by applicable law, including, but not limited to, waste, asbestos, fungi, bacteria and mold.

Additional Insured
City, its officers, agents, employees, and volunteers are to be included as insureds with respect to damages and defense arising from the ownership, maintenance or use of automobiles owned, leased, hired, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to City, its officers, employees, or volunteers. Additional insured status for City shall apply until the expiration of time within which a claimant can bring suit per applicable state law.

Endorsements
A policy endorsement is required listing all required additional insureds. The endorsement for Business Automobile Liability shall be at least as broad as the unmodified ISO CA 20 48 10/13 or a substitute form confirming City's insured status for Liability Coverage under the Who Is An Insured Provision contained in Section II of the coverage form ISO CA 00 01 10/13.

Waiver of Subrogation.
Contractor waives all rights against City, its officers, agents, employees, and volunteers for recovery

of damages to the extent these damages are covered by the commercial general liability or commercial umbrella liability insurance maintained pursuant to this agreement. Contractor's insurer shall endorse policy to waive subrogation against City with respect to any loss paid under the policy.

Workers' Compensation and Employer's Liability

Contractor shall carry and maintain workers' compensation and employer's liability insurance meeting the statutory requirements of the State of Nevada, including but not limited to NRS 616B.627 and NRS 617.210 or provide proof that compliance with the provisions of Nevada Revised Statutes Chapters 616A-D and all other related chapters is not required. It is understood and agreed that there shall be no coverage provided for Contractor or any Subcontractor of the Contractor by the City. Contractor agrees, as a precondition to the performance of any work under this Agreement and as a precondition to any obligation of the City to make any payment under this Agreement to provide City with a certificate issued by an insurer in accordance with NRS 616B.627 and with a certificate of an insurer showing coverage pursuant to NRS 617.210.

It is further understood and agreed by and between City and Contractor that Contractor shall procure, pay for and maintain the above-mentioned coverage at Contractor's sole cost and expense.

Should Contractor be self-funded for workers' compensation and employer's liability insurance, Contractor shall so notify City in writing prior to the signing of this Contract. City reserves the right to approve said retentions, and may request additional documentation, financial or otherwise, for review prior to the signing of this Contract.

Upon completion of the project, Contractor shall, if requested by City, provide a Final Certificate for itself and each Subcontractor showing that Contractor and each Subcontractor had maintained the required Workers Compensation and Employer's Liability by paying all premiums due throughout the entire course of the project.

Nevada law allows the following to reject workers' compensation coverage if they do not use employees or subcontractors in the performance of work under the contract:

- Sole proprietors (NRS 616B.627 and NRS 617.210)
- Unpaid officers of quasi-public, private or nonprofit corporations (NRS 616B.624 and NRS 617.207)
- Unpaid managers of limited liability companies (NRS 616B.624 and NRS 617.207)
- An officer or manager of a corporation or limited liability company who owns the corporation or company (NRS 616B.624 and NRS617.207)

If a contractor has rejected workers' compensation coverage under applicable Nevada law, the contractor must indicate the basis for the rejection of coverage and complete, sign and have notarized an Affidavit of Rejection of Coverage. The Affidavit must be completed, signed and notarized prior to performance of any work.

Minimum Limits of Insurance

Workers' Compensation:	Statutory Limits
Employer's Liability:	**$1,000,000** Bodily Injury by Accident – Each Accident

$1,000,000 Bodily Injury by Disease – Each Employee
$1,000,000 Bodily Injury by Disease – Policy Limit

Coverage Form
Coverage shall be at least as broad as the unmodified National Council on Compensation Insurance (NCCI) Workers Compensation and Employer's Liability coverage form WC 00 00 07/11 or substitute form providing equivalent coverage.

OTHER INSURANCE COVERAGES (IF APPLICABLE)
Professional Liability Insurance (if Applicable) $1,000,000 each claim limits of liability or whatever limit is customarily carried by the Contractor, whichever is greater, for design, design-build or any type of professional services. If coverage is required on a claims-made or claims-made and reported basis, any applicable retroactive or pending & prior litigation dates mush precede the effective date of this contract. Continuous coverage shall be maintained, or an extended reporting period shall be obtained for a period of at least three (3) years following completion of the project.

Contractors Pollution Liability Insurance (If Applicable)- $1,000,000 per occurrence and $2,000,000 aggregate or whatever amount is acceptable to the City for any exposure to "hazardous materials" as this term is defined in applicable law, including but not limited to waste, asbestos, fungi, bacterial or mold.

Coverage shall apply to bodily injury; property damage, including loss of use of damaged property or of property that has not been physically injured; cleanup costs; and defense, including costs and expenses incurred in the investigation, defense, or settlement of claims.

City shall be included as an insured under Contractor's pollution liability insurance.

If coverage is required on a claims-made or claims-made and reported basis, any applicable retroactive or pending & prior litigation dates mush precede the effective date of this contract. Continuous coverage shall be maintained, or an extended reporting period shall be obtained for a period of at least three (3) years following completion of the project.

If the scope of services as defined in this contract includes the disposal of any hazardous materials from the job site, Contractor must furnish to City evidence of pollution liability insurance maintained by the disposal site operator for losses arising from the insured facility accepting waste under this contract. Coverage certified to the City under this section must be maintained in minimum amounts of $1,000,000 per loss, with an annual aggregate of at least $2,000,000.

Lower tier sub-subcontractors, Truckers, Suppliers: Evidence confirming lower tier subcontractors, truckers and suppliers are maintaining valid insurance prior to beginning work on the project to meet the requirements set forth herein on Subcontractor, including but not limited to all additional insured requirements of Subcontractor.

ALL COVERAGES
Coverage shall not be suspended, voided, canceled, or non-renewed by either CONTRACTOR or by the

insurer, reduced in coverage or in limits except after thirty (30) days' prior written notice has been given to CITY except for ten (10) days' notice for nonpayment of premium.

DEDUCTIBLES AND RETENTIONS
Any deductibles or self-insured retentions that exceed $100,000.00 per occurrence or claim must be declared to and approved by the City's Contracts and Risk Manager and prior to signing this Contract. City is entitled to request and receive additional documentation, financial or otherwise, prior to giving its approval of the deductibles and self-insured retentions. Any changes to the deductibles or self-insured retentions made during the term of this Contract or during the term of any policy must be approved by City's Contracts and Purchasing Manager prior to the change taking effect. Contractor is responsible for any losses within deductibles or self-insured retentions.

OTHER INSURANCE PROVISIONS
Should City and Contractor agree that higher coverage limits are needed warranting a project policy, project coverage shall be purchased and the premium for limits exceeding the above amount may be borne by City. City retains the option to purchase project insurance through Contractor's insurer or its own source.

Any failure to comply with reporting provisions of the policies shall not affect coverage provided to City, its officers, agents, employees, or volunteers.

ACCEPTABILITY OF INSURERS
Insurance is to be placed with insurers with a Best's rating of no less than A-VII and acceptable to the City. City, with the approval of the Risk Manager, may accept coverage with carriers having lower Best's ratings upon review of financial information concerning Contractor and insurance carrier. City reserves the right to require that Contractor's insurer be a licensed and admitted insurer in the State of Nevada, or meet any applicable state and federal laws and regulations for non-admitted insurance placement.

VERIFICATION OF COVERAGE
Contractor shall furnish City with certificates of insurance and with original endorsements affecting coverage required by this contract. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf.

Prior to the start of any Work, Contractor must provide the following documents to City of Sparks, Attention: Purchasing Division, P.O. Box 857, Sparks, NV 89432-0857:

A. Certificate of Insurance. Contractor must provide a Certificate of Insurance form to the City of Sparks to evidence the insurance policies and coverage required of Contractor.

B. Additional Insured Endorsements. An original Additional Insured Endorsement, signed by an authorized insurance company representative, must be submitted to the City of Sparks, by attachment to the Certificate of Insurance, to evidence the endorsement of the City of Sparks as additional insured.

C. Policy Cancellation Endorsement. Except for ten (10) days' notice for non-payment of

premium, each insurance policy shall be endorsed to specify that without thirty (30) days prior written notice to the City of Sparks, the policy shall not be suspended, voided, cancelled or non-renewed, and shall provide that notices required by this paragraph shall be sent by certified mailed to the address specified above. A copy of this signed endorsement must be attached to the Certificate of Insurance. If endorsements are not available, Contractor shall be responsible to provide prior written notice to City as soon as practicable upon receipt of any notice of cancellation, non-renewal, reduction in required limits or other material change in the insurance required under this Agreement.

D. Bonds (as Applicable). Bonds as required and/or defined in the original bid documents.

All certificates and endorsements are to be addressed to the City of Sparks, Purchasing Division and be received and approved by City before work commences. The City reserves the right to require complete certified copies of all required insurance policies at any time.

SUBCONTRACTORS
Contractor shall include all Subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each Subcontractor. All coverages for Subcontractors shall be subject to all the requirements stated herein.

MISCELLANEOUS CONDITIONS
1. Contractor shall be responsible for and remedy all damage or loss to any property, including property of City, caused in whole or in part by Contractor, any Subcontractor, or anyone employed, directed, or supervised by Contractor.
2. Nothing herein contained shall be construed as limiting in any way the extent to which Contractor may be held responsible for payment of damages to persons or property resulting from its operations or the operations of any Subcontractors under it, and such coverage and limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to City in this contract.
3. In addition to any other remedies City may have if Contractor fails to provide or maintain any insurance policies or policy endorsements to the extent and within the time herein required, City may, at its sole option:
    a. Purchase such insurance to cover any risk for which City may be liable through the operations of Contractor under this Agreement and deduct or retain the amount of the premiums for such insurance from any sums due under the Agreement;
    b. Order Contractor to stop work under this Agreement and/or withhold any payments which become due Contractor here under until Contractor demonstrates compliance with the requirements hereof; or,
    c. Terminate the Agreement.
4. If Contractor’s liability policies do not contain the standard ISO separation of insureds condition, or a substantially similar clause, they shall be endorsed to provide cross-liability coverage.

18. Liquidated Damages:
If the Product is not delivered/Project is not completed within the time stipulated in the bid, the

Contractor shall pay to the City of Sparks as fixed, agreed and liquidated damages for delay and not as a penalty (it being impossible to determine the actual damages occasioned by the delay) **$AMT** for each _____ day of delay until delivery is completed; the Contractor shall be liable to the City of Sparks for the amount herein. This amount may be deducted from money due or to become due to the Contractor as compensation under this proposal in the event the Contractor fails to meet delivery schedules or product specifications.

19. Material Breach of Contract:
In the event Contractor fails to deliver the product and services as contracted for herein, to the satisfaction of the City of Sparks or otherwise fails to perform any provisions of this Contract, the City, after providing five (5) days written notice and Contractor's failure to cure such breach within the time specified in the notice, may without waiving any other remedy, make good the deficiencies and deduct the actual cost of providing alternative products and/or services from payment due the Contractor. Non-performance after the first notice of non-performance shall be considered a material breach of contract.

20. Force Majeure:
Neither party to the Contract shall be held responsible for delay or default caused by fire, riot, acts of God, and/or war which is beyond that party's reasonable control. City may terminate the Contract upon written notice after determining such delay or default will reasonably prevent successful performance of the Contract.

21. Termination:
The City may terminate the Contract for material breach of contract upon ten (10) days written notice and recover all damages, deducting any amount still due the Contractor from damages owed to the City, or seek other remedy including action against all bonds. The Contractor may terminate the Contract for material breach of contract upon thirty (30) days written notice to the City.

22. Assignment:
All of the terms, conditions and provisions of this Contract, and any amendments thereto, shall inure to the benefit of and be binding upon the parties hereto, and their respective successors and assigns. The Contractor shall not assign this Contract without the written consent of the City which will not be unreasonably withheld.

23. Entire Contract:
This Contract constitutes the entire agreement of the parties and shall supersede all prior offers, negotiations, agreements and contracts whether written or oral. Any modifications to the terms and conditions of this Contract must be in writing and signed by both parties.

24. Severability:
If any part of this Contract is found to be void it will not affect the validity of the remaining terms of this Contract which will remain in full force and effect.

25. Headings:
Paragraph titles or captions contained in this Contract are inserted only as a matter of convenience and for reference only, and in no way define, limit, extend, or describe the scope of this Contract or the intent of any provision herein.

26. Singular Includes the Plural; Gender; Title Reference:
Whenever the singular number is used in this Contract and when required by the context, the same shall include the plural, and the use of any gender, be it masculine, feminine or neuter, shall include all of the genders, and the word "person" or "entity" shall include corporation, firm, partnership, or any other combination or association.

The use of the title "Bidder", "Vendor", "Contractor" or "Consultant" within this contract or associated bid documents shall be deemed interchangeable and shall refer to the person or entity with whom the City of Sparks is contracting for the service or product referenced within this contract.

27. Execution:
The parties agree to execute such additional documents and to take such additional actions as are reasonably necessary or desirable to carry out the purposes hereof. They also agree, acknowledge and represent that all corporate authorizations have been obtained for the execution of this Contract and for the compliance with each and every term hereof. Each undersigned officer, representative or employee represents that he or she has the authority to execute this Contract on behalf of the party for whom he or she is signing.

THIS SPACE INTENTIONALLY LEFT BLANK

IN WITNESS WHEREOF, the City of Sparks has caused this Contract to be executed by its officers thereunto duly authorized and the Consultant has subscribed same, all on the day and year first above written.

_____	CITY OF SPARKS, NEVADA
(Vendor)	A Municipal Corporation
By: _____	By:_____
	Ed Lawson, Mayor
_____	
(Title)	
APPROVED AS TO FORM	ATTEST:
_____	_____
City Attorney	City Clerk

CITY OF SPARKS, NEVADA - BOND OF FAITHFUL PERFORMANCE

Bid #: _____
Bond #: _____
Surety Rating: _____
NV License #: _____
Appt. Agent Countersigning - List below with address

KNOW ALL MEN BY THESE PRESENTS: That WHEREAS, the City of Sparks in the State of Nevada has awarded to **CONTRACTORNAME** hereinafter designated as the "Principal" a contract for Bid # **BIDNUMBER**, PWP # **PWPNUMBER**, for the **TITLE** and

WHEREAS, said Principal is required under the terms of said contract to furnish a bond for the faithful and proper performance of the Contract and the Bonding Company has an "A" or better rating with Moody's or A.M. Best and T-Listed with the U.S. Treasury Department;

NOW, THEREFORE, we the Principal and _____ as Surety, are held and firmly bound unto the City of Sparks in the State of Nevada, in the penal sum of **WRITTENAMOUNT** dollars ($AMOUNT), lawful money of the United States, being not less than one hundred percent (100%) of the estimated contract cost of the work, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the above bound Principal, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and faithfully perform the covenants, conditions and agreements in the said contract and any alterations made as therein provided on his or their part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the City of Sparks in the State of Nevada, its officers and agents as therein stipulated, then this obligation shall become null and void; otherwise, it shall be and remain in full force and virtue.

As a condition precedent to the satisfactory completion of the said contract, the above obligation shall hold good for a period of one (1) year after the completion and acceptance of the said work, during which time, if the above bounden principal, his or its heirs, executors, administrators, successors or assigns shall fail to make full, complete and satisfactory repair and replacements or totally protect the said City of Sparks in the State of Nevada from loss or damage made evident during said period of one (1) year from the date of acceptance of said works, and resulting from or caused by defective materials or faulty workmanship in the prosecution of the work done, the obligation in the said sum of **WRITTENAMOUNT** dollars ($AMOUNT), shall remain in full force and virtue; otherwise the above obligation shall be void.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in anyway effect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the contract, to the work or to the specifications.

IN WITNESS WHEREOF, the above bound parties have executed this instrument under their seals this _____ day of _____, 20___, the name and corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____
_____
_____
Principal

By _____
_____
_____
_____
Surety
By _____

CITY OF SPARKS, NEVADA – Payment Bond – Labor & Materials

Bid #: _____
Bond #: _____
Surety Rating: _____
NV License #: _____
Appt. Agent Countersigning - List below with address

KNOW ALL MEN BY THESE PRESENTS: That WHEREAS, the City of Sparks in the State of Nevada, has awarded to **CONTRACTORNAME** hereinafter designated as the "Principal" a contract for Bid # **BIDNUMBER**, PWP # **PWPNUMBER**, for the **TITLE** and

WHEREAS, said Principal is required under the terms of said contract to furnish a Bond for the faithful and proper performance of the Contract and the Bonding Company has an "A" or better rating with Moody's or A.M. Best and T-Listed with the U.S. Treasury Department;

NOW, THEREFORE, we, the Principal, and _____ as Surety, are held and firmly bound unto the City of Sparks in the State of Nevada, in the penal sum of **WRITTENAMOUNT** dollars ($**AMOUNT**), lawful money of the United States, being not less than one hundred percent (100%) of the estimated contract cost of the work for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally firmly by these presents.

NOW, THEREFORE, THE CONDITION OF THIS OBLICATION IS SUCH that if the above bounden principal, his or its heirs, executors, administrators, successors, or assigns, shall fail to pay for any materials, provisions, provender or other supplies, implements, or machinery used in, upon, for, or about the performance of the work contracted to be done or for any work or labor thereon of any kind, or for amounts due under the Unemployment Compensation Law with respect to such work or labor as required by the provisions of NRS 612, and provided that the claimant shall have complied with the provisions of said law, the Surety hereon will pay for the same within thirty (30) calendar days an amount not exceeding the sum specified in this bond, then the above obligation shall be null and void; otherwise to remain in full force and account. In case suit is brought upon this bond, the said Surety agrees to pay a reasonable attorney's fees to be fixed by the Court.

The Bond shall insure to the benefit of any and all persons, companies and corporations entitled to file claims under NRS 339 as to give a right of action to them or their assigns in any suit brought upon this Bond.

IN WITNESS WHEREOF, the above bound parties have executed this instrument under their seals this _____ day of _____, 20___, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____
_____
_____
Principal

By _____

_____
_____
_____
Surety

By _____