Item #7

City of Carson City
Request for Board Action

Date Submitted: February 16, 2007

Agenda Date Requested: March 1, 2007
Time Requested: 10 Minutes

To: Mayor and Supervisors

From: Public Works Department - Operations

Subject Title: Action to accept Public Works recommendation and award the **"Centralized Water Treatment Plant for Wells #4 and #49 – Design and Construction Related Consulting Services Project", Contract 2006-119,** from the SDWA-Arsenic Fund as provided for in FY2006/2007, to Brown and Caldwell, located at 3264 Goni Road, Suite 153, Carson City, Nevada 89706, for a contract amount of $282,722.00 and a contingency amount of $28,000.00.

Staff Summary: This contract is the first phase of implementation of Carson City's Arsenic Compliance Implementation Plan to achieve compliance with the Arsenic Rule promulgated by the U.S. Environmental Protection Agency which resulted in a new drinking water standard of 10 parts per billion. Carson City is currently operating under a three-year exemption that was approved by the State Environmental Commission on September 6, 2006. The City has not exceeded the new arsenic standard since the rule went into effect on January 23, 2006, and would only need to under drought conditions. In the meantime staff is proceeding with steps to implement the plan to meet the new standards.

Type of Action Requested: (check one)

(____) Resolution (____) Ordinance
(XXX) Formal Action/Motion (____) Other (No action required))

Does This Action Require A Business Impact Statement: (___) Yes (XX) No

Recommended Board Action: I move to accept Public Works recommendation and award the **"Centralized Water Treatment Plant for Wells #4 and #49 – Design and Construction Related Consulting Services Project", Contract 2006-119**, from the SDWA-Arsenic Fund as provided for in FY2006/2007, to Brown and Caldwell, located at 3264 Goni Road, Suite 153, Carson City, Nevada 89706, for a contract amount of $282,722.00 and a contingency amount of $28,000.00.

Explanation for Recommended Board Action: This is a professional services contract. This consultant was selected using the guidelines of NRS as indicated below. Although not required by law, a Statement of Qualification process was used to select this consultant.

Discussion: Carson City has developed an Arsenic Compliance Implementation Plan to achieve compliance with the Arsenic Rule promulgated by the U.S. Environmental Protection Agency (EPA), which has resulted in a new drinking water standard of 10 parts per billion. The plan also supports the three-year exemption that was approved by the State Environmental Commission on September 6, 2006. To date, compliance activities have included: 1) monthly monitoring of arsenic concentrations at selected entry points to the water distribution system; 2) pilot testing of three representative arsenic-impacted wells; and 3) a detailed analysis of arsenic concentrations in the distribution system, including an assessment of a monthly Locational Running Annual Average (LRAA) approach to achieve compliance for projected 2009, operating conditions.

The LRAA approach is based on monthly sampling and laboratory analysis of arsenic concentrations from entry points to the water distribution system located immediately down-gradient of the seven existing arsenic-impacted supply wells. LRAA compliance can effectively be applied to Carson City's water system because of the relatively low number of arsenic-impacted wells, relatively low arsenic concentrations in these wells, and a treated water source with a very low arsenic concentration. The LRAA approach includes seasonal treatment of arsenic-impacted wells, limited periods of operating these wells, blending of surface and groundwater supplies, and the possible addition of new low-arsenic supply sources.

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The current plan calls for:

- Wells 4 and 49 treated using a coagulation filtration system at the wellheads or at a centralized location.
- Well 7 and 47 treated with an adsorption system using partial treatment and re-blending to meet the parameters of the LRAA.
- Well 11 and 45 compliance can be achieved using the monthly LRAA approach without treatment or blending.
- Well 24 requires blending flows with Wells 25 and 41 to meet the parameters of the LRAA.

The LRAA goal of 8 parts per billion is achieved for 2009 average day and maximum day demand conditions, assuming that new supply sources will be available to satisfy peak demands under drought conditions.

Well 4 has an arsenic concentration of 32 ppb and Well 49 arsenic levels are at 47 ppb. These wells must be addressed now. Staff has considered and concluded that a centralized treatment facility for Wells 4 and 49 is more cost effective and feasible than individualized on-site treatment. Construction time is estimated at eighteen months. Beginning now will allow sufficient time to test the system to ensure Carson City's compliance with EPA regulations (40 CFR Subpart G, 141.62, Maximum Concentration Levels for Inorganic Contaminants). The estimated cost for the treatment plant is approximately $1,722,500.00.

Applicable Statute, Code, Policy, Rule or Regulation: Architects, Engineers and Surveyors are considered professional services contracts pursuant to the requirements of N.R.S., Chapters 332 and 625; therefore, a formal bidding process is not required.

Fiscal Impact: $310,722.00

Explanation of Impact: If approved, the referenced account could be decreased by $310,722.00.

Funding Source: SDWA-Arsenic Fund 520-3505-435-7870 as provided for FY2006/2007.

Alternatives: Do not approve and direct staff otherwise.

Supporting Material:
"Proposal for Design and Construction-Related Consulting Services for a Centralized Water Treatment Plant for Wells 4 and 49", Brown and Caldwell.

Prepared By: Ken Arnold, Public Works Operations Manager

Reviewed By: _____ Date: 2-20-07
(Department Head)

_____ Date: 2-20-07
(City Manager)

_____ Date: 2-20-07
(District Attorney)

_____ Date: 2/20/07
(Finance Director)

Board Action Taken:

Motion: _____ 1) _____ Aye/Nay
2) _____ _____
_____ _____
_____ _____
_____ _____

_____
(Vote Recorded By)

PROFESSIONAL SERVICES AGREEMENT RELATED TO CONSTRUCTION PROJECTS

THIS AGREEMENT, made and entered into this 1st day of March, 2007, by and between the City and County of Carson City, a political subdivision of the State of Nevada, hereinafter referred to as the **"CITY"**, and Brown and Caldwell, a qualified firm, licensed in the State of Nevada and Carson City, with an office located at 3264 Goni Road, Suite 152, Carson City, Nevada 89706, hereinafter referred to as the **"CONSULTANT"**.

WITNESSETH:

WHEREAS, the Contracts Division for the City and County of Carson City is authorized to approve and accept the Agreement as set forth in and by the following provisions; and

WHEREAS, no contract or agreement concerning the duties, responsibilities, and/or scope of work by the **CONSULTANT** presently exists; and

WHEREAS, the **CITY** desires to employ the services of the **CONSULTANT** for the intended work of hereinafter referred to as **"CONTRACT #2006-119"**, and titled **"Centralized Water Treatment Plant for Wells #4 and #49 – Design and Construction Related Consulting Services Project"**; and

WHEREAS, the **CONSULTANT** shall be compensated for all services rendered as herein agreed.

NOW, THEREFORE, in consideration of the premises, mutual promises, covenants and undertakings hereinafter set forth, the parties agree as follows:

ARTICLE 1

1) **SCOPE OF WORK:**

a) **Description of Work:**

i) **See attached proposal from Consultant dated February 16, 2007.**

b) The **CONSULTANT**, as promptly and as economically as practicable, shall perform the services as described in the ***Description of Work.***

c) This agreement represents the entire understanding between the parties. Any amendments to this Agreement shall be agreed upon in writing between the **CITY** and **CONSULTANT**.

PROFESSIONAL SERVICES AGREEMENT RELATED TO CONSTRUCTION PROJECTS

ARTICLE 2

2) **TIME OF COMPLETION:**

a) **CONSULTANT** shall complete the ***Scope of Work*** on or before December 2008, however, this contract continues as long as funding exists to continue. The contract may be terminated after this date by either party giving five (5) days written notice to terminate the contract.

b) If, however, the **CONSULTANT** is delayed in the performance or completion of the work under this Agreement by labor strikes, lock-outs, fire, unavoidable casualties, or other causes beyond the control of the **CONSULTANT** and without his fault or negligence, then the time for the performance or completion of said work may be extended for a reasonable period to allow therefore.

ARTICLE 3

3) **COMPENSATION:**

a) **CITY** agrees to pay the **CONSULTANT** upon performance of the work described in ***Scope of Work***.

b) **CITY** shall pay **CONSULTANT** compensation based upon time and materials not to exceed a maximum amount of $ 282,722.00 hereinafter referred to as the **CONTRACT SUM**.

c) The compensation named herein is for the completed work, and includes the furnishing of all materials, and all labor, equipment, tools, and appliances, and all expenses, direct or indirect, connected with the proper execution of the work.

d) CITY agrees to make payments within thirty (30) days after acceptance of the completed work or from the date the correct invoice is received by the ***Contact Person***, whichever is the latter date. Payment is deemed to be made on the date payment is mailed to the **CONSULTANT**.

e) The **CITY** reasonably believes that funds can be obtained sufficiently to make all payments during the term of this Agreement. If the **CITY** does not allocate funds to continue the function performed by the **CONSULTANT** obtained under this Agreement, this Agreement shall be terminated when appropriated funds expire.

f) None of the sums due or to become due, nor any of the work to be performed under this Agreement shall be assigned, nor shall the **CONSULTANT** subcontract any substantial portion of this Agreement without the **CITY'S** prior written consent.

PROFESSIONAL SERVICES AGREEMENT RELATED TO CONSTRUCTION PROJECTS

ARTICLE 4

4) **PERMITS AND REGULATIONS:**

a) Before commencing with the performance of any work under this Agreement, the **CONSULTANT** shall obtain all necessary permits and licenses as may be necessary.

b) Before and during the progress of work under this Agreement, the **CONSULTANT** shall give all notice and comply with all the laws, ordinances, rules and regulations of every kind and nature now or hereafter in effect promulgated by any Federal, State, County, or other Governmental Authority, relating to the performance of work under this Agreement.

c) If the **CONSULTANT** performs any work that is contrary to any such law, ordinance, rule or regulation, he shall bear all the costs arising therefrom.

d) **CONSULTANT** agrees to obtain a Carson City Business License and provide a copy of same to Carson City Public Works - Contracts Division prior to commencing work.

ARTICLE 5

5) **CITY'S RESPONSIBILITIES:**

a) The **CITY** shall provide requested information to the **CONSULTANT** in a timely manner.

b) The **CITY** shall designate three (3) representatives who are authorized to act on the **CITY'S** behalf with respect to the Project. These authorized representatives shall render decisions on documents submitted by the **CONSULTANT** in a timely manner in order to avoid unreasonable delay in the orderly and sequential progress of the services.

i) **Contract Administrator:**
Sandy Scott, Contract Administrator
Carson City Public Works - Contracts Division
3505 Butti Way
Carson City, NV 89701
775-887-2355 x1101 / FAX 887-2112

ii) **Project Manager:**
Ken Arnold, Public Works Operations Manager
Carson City Public Works - Operations
3505 Butti Way
Carson City, NV 89706
775-887-2355/ FAX 887-2164

iii) **Detailed Invoices using the City's format shall be mailed to:**
Karen White, Accounting Clerk II
Carson City Public Works - Engineering
3505 Butti Way
Carson City, NV 89701
775-887-2355 x1023 / FAX 887-2112

ARTICLE 6

6) **INSURANCE:**

a) **GENERAL LIABILITY:**

i) The **CONSULTANT** agrees, as a condition precedent to any duty of the **CITY** to make any payment under this Agreement, to furnish and maintain throughout the term of the Agreement at no cost to the **CITY**, such general liability and property damage insurance as shall protect him and any subconsultant performing work covered by the Agreement from claims for, but not limited to, bodily injury, sickness, disease, death, or property damage arising or resulting from the **CONSULTANT'S** performance, or by any subconsultant, person, firm or employee directly or indirectly employed by him.

ii) The **CONSULTANT** agrees that the City of Carson City, 3505 Butti Way, Carson City, Nevada 89701 shall be listed as an additional insured.

b) **PROFESSIONAL LIABILITY:**

i) The **CONSULTANT** agrees, as a condition precedent to any duty of the **CITY** to make any payment under this Agreement, to furnish and maintain throughout the term of the Agreement at no cost to the **CITY**, errors and omissions insurance.

c) **INDUSTRIAL INSURANCE:**

i) The **CONSULTANT** agrees, as a condition precedent to any duty of the **CITY** to make any payment under this Agreement, to furnish and maintain throughout the term of the Agreement at no cost to the **CITY**, worker's compensation insurance as required by the provisions of Chapter 616 of the NRS.

d) **ADDITIONAL INSURANCE REQUIREMENTS:**

i) Upon failure to provide insurance, the **CITY** may, at its sole option, order the **CONSULTANT** to stop work, suspend the Agreement, or terminate the Agreement.

ii) The **CONSULTANT** shall furnish to the City of Carson City, 3505 Butti Way, Carson City, Nevada 89701, the certificates of said insurances prior to commencing work.

iii) Within 24 hours of any suspension, cancellation, reduction, or termination of coverage, the **CONSULTANT** agrees to provide the **CITY** written notice of same.

iv) In the event the **CITY** must pay any premium(s) on behalf of the **CONSULTANT**, after the execution of this Agreement, the **CONSULTANT** shall reimburse the **CITY** for all such payment(s). Said payment(s) shall be deducted from any compensation due, or about to become due the **CONSULTANT** by the **CITY**.

ARTICLE 7

7) **INDEMNIFICATION:**

a) This Agreement does not create an employee/employer relationship between the parties. It is the parties' intention that the **CONSULTANT** will be an independent contractor and not Carson City's employee for all purposes, including but not limited to the application of the Fair Labor Standards Act, The Federal Unemployment Tax Act, the provisions of the Internal Revenue Code, Nevada State revenue and taxation law. The **CONSULTANT** will remain sole and absolute discretion in the judgment of the manner and means of carrying out the **CONSULTANTS** activities and responsibilities hereunder. The **CONSULTANT** agrees that it is a separate and independent enterprise from the public employer, that it has full opportunity to find other business, that it has made its own investment in its business, and that it will utilize a high level of skill necessary to perform the work. This agreement shall not be construed as creating any joint employment relationship between the **CONSULTANT** and the City, and the City will not be liable for any obligation incurred by the **CONSULTANT**, including but not limited to unpaid minimum wages and/or overtime premiums.

b) The **CONSULTANT** hereby agrees to indemnify, hold harmless and defend, not excluding the City's right to participate, the City, its officers, agents and employees, from and against all liability, claims, actions, damages, losses and expense, including but not limited to reasonable attorneys' fees and costs arising out of any negligent or willful acts or omissions of the Consultant, its officers, agents and employees.

ARTICLE 8

8) **TERMINATION:**

a) Anything in this Agreement to the contrary notwithstanding, if the **CONSULTANT** should fail to make progress as to endanger performance of this Agreement in accordance with its terms, or if he should fail to make prompt payments to subconsultants for material or labor, or if he should violate any laws, ordinances or regulations, or otherwise violate any provision of this Agreement, then the **CITY** may, *without prejudice to any other right or remedy, terminate* this Agreement in whole or from time to time in part upon written notice and proceed to complete or cause the work to be completed.

b) The **CITY** may deduct the cost of completing the said work from payments then or thereafter due to the **CONSULTANT**, who shall pay the **CITY** any amount by which such cost of completion shall exceed the unpaid monies due or to become due to the **CONSULTANT**.

c) In addition to the provisions of the preceding paragraph, the **CITY** *shall have the right* to terminate this Agreement without cause upon five (5) days' written notice to the **CONSULTANT**. In that event, the **CITY** shall pay to the **CONSULTANT** a proportionate amount of the **CONTRACT SUM**, as amended, based upon the percentage of the completion of the work under this Agreement and any amendment hereto.

ARTICLE 9

9) **USE OF CONSULTANT'S DRAWINGS, SPECIFICATIONS & OTHER DOCUMENTS:**

a) The Drawings, Specifications and other documents prepared by the **CONSULTANT** for the Project are instruments of the **CONSULTANT'S** service for use solely with respect to the Project and, unless otherwise provided, the **CONSULTANT** shall be deemed the author of these documents and shall retain all common law statutory and other reserved rights, including the copyright.

b) The **CITY** shall be permitted to retain copies, including reproducible copies, of the **CONSULTANT'S** Drawings, Specifications, and other documents for information and reference in connection with the Project.

c) The **CONSULTANT'S** Drawings, Specifications and other documents shall not be used by the **CITY** or others without expressed permission of the **CONSULTANT**.

ARTICLE 10

10) **MISCELLANEOUS:**

a) This Agreement shall be construed, interpreted, and the rights of the parties determined in accordance with the laws of the State of Nevada.

b) Causes of action between the parties to this Agreement pertaining to acts or failures to act *shall be* deemed to have accrued and the applicable statutes of limitations shall commence to run not later than either the date of Substantial Completion for acts or failures to act *occurring* prior to Substantial Completion, or the date of issuance of the final Certificate for Payment for acts or failures to act occurring after Substantial Completion.

c) The **CITY** and **CONSULTANT**, respectively, bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement and to the partners, successors, assigns and legal representatives of such other party with respect to all covenants of this Agreement.

d) This Agreement represents the entire and integrated agreement between the **CITY** and **CONSULTANT** and supersedes all prior negotiations, representations or agreements, either written or oral. This Agreement may be amended only by written instrument signed by both **CITY** and **CONSULTANT**.

e) Nothing contained in this Agreement shall create a contractual relationship with or a cause of action in favor of a third party against either the **CITY** or **CONSULTANT**.

f) **CONSULTANT** shall be required to maintain telephone service such that the **CITY** may contact or leave a message for the **CONSULTANT** or their designee at any time. **CONSULTANT** shall provide advance notice to the **CITY** of any change in telephone number.

g) Written notice under this Agreement, shall be deemed to have been duly served when delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if sent by registered mail to the **CONSULTANT** at the address shown on page 9, or to the **CITY** at the address shown herein.

i) Notice to **CITY** shall be addressed to:

Carson City Public Works - Contracts Division
C/O Sandy Scott, Contract Administrator
3505 Butti Way
Carson City, NV 89701
775-887-2355 x1101 / FAX 887-2112

h) Failure of either party to this Agreement to enforce any provision of this Agreement shall not be deemed a waiver of such provision or of subsequent failures to comply with any such provision.

ARTICLE 11

11) **COST ACCOUNTING AND AUDITS:**

a) If required by the **CITY**, the **Consultant** agrees to make available to the **CITY** within two (2) years after the completion of the work under this Agreement, such books, records, receipts, vouchers, or other data as may be deemed necessary by the **CITY** to enable it to arrive at appropriate cost figures for the purpose of establishing depreciation rates for the various materials and other elements which may have been incorporated into the work performed under this Agreement.

PROFESSIONAL SERVICES AGREEMENT RELATED TO CONSTRUCTION PROJECTS

12) **ACKNOWLEDGMENT AND EXECUTION:**

a) This **AGREEMENT** entered into as of the day and year first written above.

CITY'S CONTRACTING AGENT

BY: Sandy Scott
Title: Contract Administrator

Carson City Public Works
Contracts Division
3505 Butti Way
Carson City, Nevada 89701
Telephone: 775-887-2355 x1101

_____
Signature

DATED this ____ day of February, 2007.

CITY CONTACT PERSON

NAME: Ken Arnold, Public Works Operations Manager

PHONE: 775-887-2355

CITY DEPARTMENT:

Public Works

I hereby concur with the initiation of this Agreement and I certify that the consultant will not be given authorization to begin work until this Agreement has been signed by all parties.

BY: Andrew Burnham

Title: Public Works Director

Address: 3505 Butti Way

Carson City, NV 89701

Telephone: 775-887-2355 x1001

_____
Signature

DATED this ____ day of February, 2007.

I certify that the funds are available for this project.

FUNDING SOURCE: 520-3505-435-7870

BUDGET ALLOCATION: $282,722.00

By: Ken Arnold, Public Works Operations Manager

_____
Signature

PROFESSIONAL SERVICES AGREEMENT RELATED TO CONSTRUCTION PROJECTS

STATE OF NEVADA)
) ss
CARSON CITY)

Charles Zimmerman deposes and says: That he is the Consultant, or authorized agent of the Consultant, for whom the aforesaid described work is to be performed by; that he has read the foregoing Agreement and understands the terms, conditions, and requirements thereof.

I further understand that I must not begin work on this project until this agreement has been signed by the Board of Supervisor's.

CONSULTANT

BY: Charles Zimmerman
TITLE: Principal
FIRM: Brown and Caldwell
BUSINESS LICENSE #: 07-10752
Address: 3264 Goni Road, Suite 153
City: Carson City
State/Zip Code: Nevada 89706
Telephone: 775-883-4118
Fax# 775-883-5108

_____
(Signature of Consultant)

DATED this _____ day of February, 2007.

NOTARY
NAME: _____
(printed name of notary)

L.S.

_____
(signature of notary)

DATED this ___day of February, 2007.

PROFESSIONAL SERVICES AGREEMENT RELATED TO CONSTRUCTION PROJECTS

13) **CONTRACT ACCEPTANCE AND EXECUTION:**

a) The Board of Supervisors for Carson City, Nevada at their publicly noticed meeting of March 1, 2007, approved the acceptance of the attached contract hereinbefore identified as **CONTRACT No. 2006-119** and titled **"Centralized Water Treatment Plant for Wells #4 and #49 – Design and Construction Related Consulting Services Project "** Further, the Board of Supervisors authorizes the Mayor of Carson City, Nevada, to set his hand to this document and record his signature for the execution of this contract in accordance with the action taken.

CARSON CITY, NEVADA

_____
MARV TEIXEIRA, MAYOR

DATED this 1st day of March, 2007.

ATTEST:

_____
ALAN GLOVER, CLERK-RECORDER

DATED this 1st day of March, 2007.

*** * * END OF DOCUMENT * * ***

3264 Goni Road
Suite 153
Carson City, Nevada 89706

Tel: (775) 883-4118
Fax: (775) 883-5108

www.brownandcaldwell.com

BROWN AND CALDWELL

February 16, 2007

Mr. Ken Arnold
Operations Manager
Carson City Public Works Department
3505 Butti Way
Carson City, Nevada 89701

23/071000

Subject: Revised Proposal for Design and Construction-Related Consulting Services for a Centralized Water Treatment Plant for Wells 4 and 49

Dear Mr. Arnold:

Pursuant to your request, Brown and Caldwell and Narasimhan Consulting Services ("BC/NCS") are pleased to provide the Carson City Public Works Department with this revised proposal for engineering design and office engineering support during construction of the subject water treatment plant ("WTP"). Our proposal is based on the information presented in the *Arsenic Compliance Implementation Plan* dated June 9, 2006, our Addendum to the plan dated December 29, 2006, subsequent field and office activities (field inspections and an estimate of construction costs, respectively), and discussions with Public Works staff. The WTP would be designed to accommodate an expansion of capacity beyond the combined flow rate from existing Wells 4 and 49 (approximately 1,100 gpm design flow) in anticipation that, within the next five years, an additional well in the vicinity of the two existing wells would be constructed and that Well 4 would be re-drilled.

As described below, and in the attached Exhibit A, the WTP will consist of a pressure filter system using 'Metal ease' media located inside a masonry building with metal roof, a backwash tank located outside the building, and associated piping and instrumentation. The building site is the existing Carson City warehouse facility located near the intersection of Saliman Road and Fifth Street. The existing building will be completely demolished to allow for the WTP construction. A preliminary construction cost for the WTP to accommodate Wells 4 and 49 is estimated at $1,722,500 (to be refined during the design effort, as described in Exhibit A). This cost estimate has been revised to reflect recent construction invoices for a similar WTP constructed near Fallon, Nevada as presented in the following table:

Revised Preliminary Construction Cost estimates for the Centralized Treatment of Wells 4 and 49	
Treatment systems	$500,000
Backwash tank	$70,000
Building	$375,000
Yard piping	$110,000
Site work	$90,000
Electrical and instrumentation	$180,000
Sub-Total	$1,325,000
30 Percent Construction Contingency	$397,500
Construction Total	$1,722,500

In order to meet Carson City's aggressive design and construction schedule, BC/NCS and Public Works Department staff will need to coordinate the following activities:

- Carson City will need to demolish the existing building as soon as possible;
- Locate existing utilities and the identification of any outstanding right-of-ways and easements will need to be performed by Carson City as soon as possible;
- Integration of design standards and specifications between Carson City, BC/NCS and the sub-contracted architectural firm for the WTP building will need agreement as soon as possible;
- Surveying and geotechnical scopes for the WTP facilities to be directly performed by, or contracted by Carson City, will be defined by BC/NCS with appropriate quality control procedures;
- Design of transmission pipeline(s) from the wellheads and back to the transmission mains (to be performed by Public Works Department staff) will be followed by hydraulic modeling analysis by BC/NCS to confirm that the flow from the two wells, and potentially a third well, into the WTP will be consistent with WTP hydraulics;
- Public Works Department staff and BC/NCS will define a perimeter around the new WTP building where our mutual design efforts will meet (up to fifty feet from the new building);
- A manual transfer switch will be included in the design, and Public Works Department staff and BC/NCS will agree to the location of the plug-in for a generator to be provided by Carson City (generator design not part of the BC/NCS design effort);
- Carson City will pre-purchase a package treatment plant or treatment equipment per BC/NCS specifications consistent with the design and construction schedules;
- Permitting with the Nevada Division of Environmental Protection (Carson City to take the lead with minimal BC/NCS support;

- Preparation of the engineering plans and specifications (a preliminary list of drawings is provided in Exhibit B) according to the proposed project AutoCAD format presented in Exhibit E; and
- Bid packages and specifications for the WTP facilities and the transmission pipeline(s) to the plant will need to be coordinated, pending Carson City's approach to the construction of the project (BC/NCS will perform a hydraulic analysis of the feed from the two wells into the WTP).

BC/NCS has developed a detailed engineering cost estimate in Exhibit C, associated with the Scope of Work presented in Exhibit A. Estimated engineering fees for the project total $282,722 also include support for facility start-up and commissioning. Additional, out-of-scope services, not described in Exhibit A, as requested and approved by Carson City will be invoiced according to the rate schedule presented in Appendix F.

A project schedule is provided as Exhibit D, and briefly summarized below. Our design efforts are intended to allow WTP construction to begin in May 2008, to allow construction to be completed by December 2008, ahead of the 2009 peak demand period. This will enable Carson City to run the WTP during this period in a test mode prior to the need for the WTP to be operational to achieve permit compliance in 2009. Note that Carson City's compliance obligation under the exemption issued by the Nevada Division of Environmental Protection – Bureau of Safe Drinking Water would require the WTP to be operational for the peak demand period in July-August 2009, subsequent to the compliance date of January 23, 2009.

In order to maintain the aggressive project schedule, BC/NCS has summarized the following key project milestones from the schedule provided in Appendix D:

- City Geotechnical Report – April 2007
- City Site Survey – April 2007
- Draft Design Complete – May 2007
- Bid Filter Equipment – June 2007
- Award Filter Equipment Contract – August 2007
- Building Demo – September 2007
- Final Design Complete – December 2007
- Bid WTP Construction Contract – Feb 2008
- Award WTP Contract – April 2008
- Water Main Construction Complete – June 2008
- WTP Substantial Completion – October 2008

The BC/NCS project team appreciates this opportunity to assist the Carson City Public Works Department with this important project. If you have any questions regarding the information presented in our proposal, including the Exhibits, please call the undersigned at 883-4118.

Very truly yours,

BROWN AND CALDWELL

Chuck Zimmerman
Vice President

Joel Bellin, P.E.
Project Manager

Chuck Zimmerman for
Ramesh Narasimhan
Narasimhan Consulting Services

cc: Andy Burnham
Curtis Horton

Attachments

Exhibit A - Detailed Scope of Work
Exhibit B - Preliminary Drawing List
Exhibit C - Detailed Cost Proposal
Exhibit D - Project Schedule
Exhibit E - Project AutoCAD Format
Exhibit F - Professional Rate Schedules

EXHIBIT A

CARSON CITY PUBLIC WORKS DEPARTMENT
WATER TREATMENT PLANT SCOPE OF WORK

Description of Facilities

To ensure compliance with state and federal drinking water regulations, the City of Carson City (City) intends to treat water from Wells 4 and 49 to reduce arsenic and manganese concentrations. Brown and Caldwell and Narasimhan Consulting Services (BC/NCS) will serve as the Engineer for the water treatment plant (WTP) project. The WTP will use chemical addition (ferric chloride) and pressure filtration using specialty media to accomplish trace constituent removal on well water previously treated with sodium hypochlorite at the well sites. City staff will design and supervise the construction of new interconnecting piping from Wells 4 and 49, and be responsible for verifying and obtaining all associated right-of-ways and easements. The piping will be brought to within approximately 5 feet of the building footprint, as determined by the City and the Engineer, and will be capped and marked for location if its installation precedes new building construction. The project will be bid as two public works contracts:

- Pre-purchase of the pressure filter plant equipment for the treatment of Arsenic and Manganese, based on the design criteria from the *Addendum to the Arsenic Compliance Implementation Plan dated December 28, 2006*

- Installation of the filter plant equipment and construction of the overall water treatment facility

The water treatment facility will include a new masonry block building with slab-on-grade foundation and standing seam metal roof to house the filter units, where an existing building, owned by the City and identified during a scoping field investigation, will be demolished. The City will arrange to demolish the existing building outside of this Scope of Work. The new building will be sized to accommodate an expansion of the approximate 1,100 gallon per minute (gpm) treatment capacity for Wells 4 and 49 by an additional 500 gallons per minute (gpm). The new WTP building will: 1) have an estimated footprint of approximately 2,100 square feet with an interior ceiling height of about 18 feet to accommodate equipment, maintenance, and possible future expansion; 2) will have a large rollup door for installation of equipment and expansion; 3) contain heating and ventilation systems to maintain a reasonable operating environment for the mechanical equipment; 4) house an approximate 4,200-gallon HDPE chemical storage tank for ferric chloride, along with a chemical feed system including metering pumps and valves; 5) include a wash sink, and small lab bench for sampling; 6) include an eyewash and shower near the chemical storage tank; and 7) not contain any bathrooms or office space.

A 30,000-gallon bolted-steel tank located outside, adjacent to the filter building, will receive backwash water for settling and solids separation prior to recycling. The tank will include a sludge collection system, inlet and outlet lines with floating reclaim suction, overflow line, vent, and access manholes. Backwash reclamation equipment will be housed inside the filter building. The backwash waste will discharge to the sanitary sewer system.

The site around the building and tank will be left unpaved, with a compacted road-base subgrade, except for an AC driveway to the roll-up door and concrete walkways to person-entry doors. No drainage improvements will be made to the site, other than provisions for backwash tank overflow and accommodation of floor and utility sink drainage from the building interior and general grading for site runoff away from the building. Any downspouts will discharge onto splash blocks. The site development will include no landscaping. No chain link or other security fence is anticipated around the filter building. Water, gas, electric, and telephone services will be provided at the filter building.

The WTP will be PLC-controlled from a main control panel within the filter building, which will be compatible with the City's SCADA PAK RTU system (modicon), and will include an enclosure for the controls and an antenna rise (2-inch empty conduit penetrating through the roof with weatherhead). The filter system will operate automatically, with backwashes initiated from pressure drop, timer, or manganese or arsenic breakthrough across the filter vessel, or based on filter run time. Backwash waste will be discharged to the sanitary sewer, via an automatic control valve inside the building or a vault adjacent to the backwash tank. No standby generator is included in the design, as the City has requested to use a portable generator with a manual transfer switch at the switchgear as part of the WTP design.

Scope of Work

The Engineer will perform the planned engineering services based on the *Arsenic Compliance Implementation Plan* and *Addendum* (dated June 9 2006 and December 28, 2006, respectively) under the City's Agreement. Based on information provide by the Engineer, the City will pre-purchase the packaged pressure filter equipment, ahead of bidding for construction of the new WTP. Planned engineering services comprise, and are limited to, those specifically set in this section. Additional engineering services beyond those described in this section will be considered special consulting services, as defined under Task 8. The Engineer will perform the design of the WTP in six phases:

Draft Design & Design Summary Memorandum
Prepurchase contract for pressure filter equipment
Revised Draft Design
Final Draft Design
Final Design (ready to bid plans and specifications)
Engineering Services During Bidding and Construction

To meet the aggressive project schedule, described below, the City and the Engineer will work in close coordination throughout the WTP design, bidding, construction and start-up and commissioning phases of the WTP project. Based on previous discussions, the following ten tasks will be performed by the Carson City Public Works Department and, as needed, the Carson City Building Department:

City Tasks

Task C-1 – Demolition of Existing City Building
The City will provide the means and methods to remove the existing City building where the new WTP is to be located. All utilities connecting into the existing building will be capped off outside the building footprint, pipe size recorded, and staked for inclusion in the field survey.

Target Date: Demolition of the existing City building will be complete by April 2008 to maintain project schedule.

Task C-2 – Design and Construction of the Well 4 and Well 49 Water Mains
The City will provide for the design and construction of the adjoining water mains from Well 4 and Well 49 to the WTP project site. The water main will be capped and staked about 5 feet inside the parcel boundaries for the filter building parcel. The Engineer will assist the City in this effort with hydraulic modeling verification of the City's design.

Target Date: Construction of the City water main will be completed in 2008 (as early in the year as possible) to maintain the project schedule.

Task C-3—Site Survey
After the demolition of the existing building, the City will survey the WTP site at a one-foot contour interval, and supply the survey information to the Engineer as AutoCAD drawings on a CD. The survey should include: 1) all existing utilities as marked by Underground Service Alert or from Record Drawings; 2) adjacent buildings, fences, limits of AC paving, overhead utilities, property and right-of-way lines within a 150 foot perimeter of the existing building; 3) the Basis-of-Bearing for the site survey; and 4) horizontal and vertical datum for the site.

Target Date: To maintain the project schedule, Engineer will need the survey information by the end of April 2007.

Task C-4 – Geotechnical Report
The City will provide a geotechnical report to the Engineer, with the following site-specific information: soil bearing capacity, pipe bedding and backfill recommendations, structural fill material recommendations, R-

value, maximum recommended cut slopes, depth to groundwater, site specific seismic response spectra, and corrosion potential assessment. The Engineer will assist the City in the design of the investigation.

Target Date: To maintain the project schedule, the Engineer will need the geotechnical report by the end of April 2007.

Task C-5—Access to City Staff, Facilities, and Records
Provide the following documents and information in a timely fashion:

- Record drawings for the existing site and adjacent utilities including site piping, electrical duct banks, and telephone connections.
- Record drawings for the water system in the vicinity of the WTP.
- Design drawings from Carson City DPW design with connecting water supply pipelines and product water connects brought to parcel/property line boundary (ACAD format, on CD).

Task C-6—Reviews
City staff will provide timely review of Brown and Caldwell's work products, returning one set of collated comments for each submittal where City review and/or comment is required. City will review each submittal once, and return review comments to Brown and Caldwell within two weeks of submission, prior to the review meeting, to maintain the project schedule.

Task C-7—Permits/Utility Services

The City will procure all building permits necessary for construction and occupation, including necessary fire code requirements that impact the building. The City will also pay for, and apply for, all utility services required for the project including, but not limited to: Sierra Pacific Power, Southwest Gas, and phone. Engineer will prepare the load calculations for the City to present to the utility services where such calculations are required.

Task C-8 – Bid Assistance - Packaged Pressure Filter Equipment
The City will prepare the front end contract documents, provide bidding assistance for the packaged pressure filter equipment, and be responsible for the following:

- Prepare the final contract bid documents for purchase of the pressure filter equipment, using the technical specifications and P&ID drawings provided by the Engineer.
- Provide coordination with the Engineer on the use of City specifications in the project.
- Provide copies of the Engineer's plans and specifications to prospective bidders.
- Place advertisement for bids notice.
- Issue all bid addenda to plan holders.
- Host pre-bid conference.
- Host bid opening.

Task C-9—Bid Assistance – Water Treatment Plant Construction Project

- Prepare the final contract bid documents for the construction of the WTP, using the technical specifications and design drawings provided by the Engineer.
- Provide coordination with the Engineer on the use of City specifications in the project (City specifications will be integrated with project-specific specifications).

- Provide copies of the Engineer's plans and specifications to prospective bidders.
- Place advertisement for bids notice.
- Issue all bid addenda to plan holders.
- Host pre-bid conference.
- Host bid opening.

Task C-10—Construction Administration
City staff will manage day-to-day construction including field inspection, project documentation, progress payment requests, change orders, contractor requests for information, work change directives, construction schedules, and related construction management/resident engineering duties.

Engineer Tasks

Engineer will carry out the following tasks during design, permitting and construction of the WTP:

Task 1—Project Management
Our project management approach includes the following activities and coordination meetings with City staff.

Task 1.1—Administration. Prepare a project management plan; monitor job progress, expenditures, and performance; provide quality control reviews; and prepare and submit monthly invoices and job progress reports for up to 22 months.

Task 1.2—Project Management. Prepare a project management plan including communication plans for City staff. Prepare for and attend up to six City-scheduled monthly meetings during design, to include a project kick-off meeting within two weeks of notice to proceed. In addition, prepare meeting agendas at least five days before the meetings and deliver meeting minutes electronically within two working days after the meetings.

Task 2—Draft Design & Filter Equipment Specifications.
Prepare the draft design drawings and calculations as outlined in Task 2.4 that will be the basis for the new water treatment plant. This design will be the basis for the subsequent revised draft and final designs. The design criteria will also be the basis for the filter plant equipment procurement package. The draft design will need to be finalized per the Exhibit D schedule in order to maintain the overall project schedule. (Significant changes resulting from the City's review would affect the overall project schedule.)

Task 2.1—Kickoff Meeting / Workshop. Conduct a kickoff meeting/workshop within two weeks of a signed contract, with the City's engineering and operations staff to discuss expectations and preferences. AutoCAD drawings will be formatted as shown in Exhibit E, with the City's border. The AutoCAD line-types, layers, and colors tables are included in Exhibit E. The City will supply any record drawings for the existing site prior to or at the kick-off meeting.

Task 2.2—Review Site Survey. Review the site survey information provided by the City (City Task C-3), and produce an AutoCAD base map of the site for design drawings. Review the site survey information for possible utility conflicts.

Task 2.3—Review Geotechnical Investigation. Review the draft geotechnical report from the City (City Task C-4) and deliver one set of review comments to the City.

Task 2.4—Develop Draft Design Criteria. Develop engineering analysis and preliminary hydraulic calculations to size the proposed treatment facilities with flow schematic, and identify general site layout and safety and security features, building size and type and architectural style, well and filter interface coordination, pipeline and design criteria. Use the City's WaterCAD model and latest information on

operational strategies for the water system to select final filter pipe sizing and configuration. Develop one architecture concept for the new building.

Deliverables:

- Site plan with 1 inch=20 feet scale contours that show existing utilities and proposed facilities.
- WTP building layout that show major equipment; prepare architectural concepts for the exterior elevations. Show split-face masonry block exterior with raised seam metal roof.
- Process and instrumentation diagrams that show instruments control and communications interface.
- Electrical single line diagram that shows power distribution and requirements.
- Basis of design table (design criteria).
- Design standards.
- Outline of construction specifications.
- Procurement specifications for the pressure filter water treatment equipment with all required ancillary systems, to be issued by the City for equipment pre-purchase.
- Opinion of probable construction cost (AACE International Class 5 estimate) with a contingency of 40 percent.
- Hydraulic and surge analysis for the new system.
- Control logic for the new facility.
- Final list of available standard details drawings listed on the web.

The Engineer will submit five sets with a CD of the preceding items to the City for review. Drawing size will be 11x17.

Task 2.5—Draft Design Criteria Review Meeting. Hold a meeting with City staff to present the draft design criteria and discuss findings, conclusions and recommendations. City will have two weeks to review the submittal and will be required to bring one collated set of review comments to the scheduled review meeting.

Task 2.6—Prepare Design Summary Memorandum. Address City's review comments and update the draft design. A two page memorandum will be developed summarizing the key design parameters, assumptions and note any changed conditions and amendments to SOW. Submit six copies to the City.

Task 2.7—Prepare Pressure Filter Equipment Procurement Specifications and P&ID Drawings. Submit the revised equipment procurement technical specifications, along with P&ID drawings (11x17) on vellum, to the City for inclusion in the final contract bid documents. Deliver one master set of documents to the City for the required bid sets. As part of the specifications, the Engineer will detail the submittal requirements for vendors. Submittal requirements will include information related to:

- Process design
- Process performance, including water sampling data and test results
- Process reliability
- NSF certification for use in potable water
- Site availability and foot print requirements

- Available power requirements and required service upgrades
- Height limitations
- Material specifications for compliance with local codes, design standards, and operator preferences (valves, piping, instrumentation, SCADA interface, etc.)
- Residuals management and disposal criteria
- References

Task 3—Revised Draft Design

Task 3.1—Update Design. The Engineer will expand the draft design to include all civil and mechanical drawings to about 60 percent complete and all architectural, structural, electrical, and instrumentation drawings to about 30 percent complete.

Deliverables: Submit five sets of size 11x17 Revised Draft Drawings to City for one review.

Task 3.2—Update Engineer's Opinion of Probable Construction Costs (EOPC). Update the conceptual opinion of probable construction costs, with 25 percent contingency.

Deliverables: Submit five sets with a CD of updated EOPC for City review.

Task 3.3—Review Revised Draft Design. The Engineer will hold a meeting with City staff to present the draft design and discuss findings, conclusions and recommendations. City will have two weeks to review the submittal and will be required to bring one collated set of review comments to the scheduled review meeting. Review project schedule, including coordination with City, permits and revisions to SOW.

Task 4—Final Draft Design

The final draft design will include specifications coordinating with City standards, and drawings at the 90 percent completion level. The plans will be prepared in the Exhibit E AutoCAD format, and specifications will be in CSI (17 divisions) Word format (a City specification number, when applicable, will be cross referenced as shown in Exhibit E.) Exhibit B presents a preliminary drawing list. This task includes the services below:

Task 4.1— Address Review Comments and Update Design. Address review comments from Task 3.3 and expand the revised draft design.

Deliverables: Submit five sets of size 11x17 Final Draft Drawings with a CD and EOPC to City for one review.

4.1a. Finalize the design of the WTP including: process mechanical components, chemical systems, building layout, HVAC, piping, valves, plumbing and drain plan.

4.1b. Design a split-face masonry block building with metal roof, door, and window to house all mechanical, electrical, and control equipment.

4.1c. Design electrical system, including equipment feeders, electrical and phone services, interior and exterior lighting, main breaker, metering section, manual transfer switch for City-supplied portable generator with exterior plug, and motor control center.

4.1d. Design the site improvements, including grading, yard piping; however, paving and landscaping for the entire site is excluded.

4.1e. Update the Engineer's Opinion of Probable Cost to reflect the final draft design and submit to the City.

Task 4.2—Attend Review / Coordination Meeting. Attend one review/coordination meeting with City staff. City will have two weeks to review the final draft submittal and will be required to bring one collated set of review comments to the scheduled review meeting.

Task 4.3—Attend NDEP Review Meeting. The Engineer will attend one meeting with the Nevada Division of Environmental Protection – Bureau of Safe Drinking Water (BSDW), to present the design and answer questions. BSDW will receive two sets of plans for review at least five-working days prior to the meeting.

Task 5—Final Design

The Engineer will prepare the final design plans and technical specifications, for use with the City's general conditions and "front end" documents, suitable for open, competitive bids for construction of the facilities. The Engineer proposes to use CSI technical specifications that cross reference the City's technical specifications, as appropriate. The City will collate the final bid documents, using the Engineer's technical specifications. A preliminary drawing list for the construction contract is attached in Exhibit B. Services performed during the final design will consist of the following tasks:

Task 5.1—Prepare 100 Percent Plans and Specifications. Address the City's and BSDW's final review comments for the final draft plans and specifications and submit one camera-ready set of technical specifications, together with one 22-inchx34-inch and one 11-inchx17-inch set of plans on vellum and one CD with electronic version of drawings in ACAD format, plus a master CD of specifications in Word and plans. Provide a summary of project status, schedule and budget.

Task 5.2—Prepare Final Construction Cost Estimate. Based on the final design, prepare and submit a final construction cost opinion with a contingency of 10 percent.

Task 6—Engineering Services During Construction

Engineering services during construction will be performed in accordance with the following tasks. The City will administer the construction contract. In defining the scope of work for these services, it is assumed that bidding and award time will not exceed two months, and that construction time for the WTP and building will not exceed ten months.

Task 6.1—Provide Bid Assistance. For each contract, attend one pre-bid conference, provide answers to technical questions by prospective bidders, prepare appropriate addenda, evaluate the bids received by the City, and recommend an acceptable bidder to the City. The City will copy and distribute the project manuals to potential bidders, then advertise and receive bids. The Engineer will assist the City in reviewing the bids for the arsenic filtration system prepurchase and provide recommendations on the bidder to be selected. The selected system will be incorporated into the preliminary design report and final design documents.

The total estimated Engineer's effort for this task is 154 professional hours.

Task 6.2—Review Shop Drawings. Review and take action on the construction contractor's shop drawing submittal in accordance with contract provisions. The estimated level of effort is based on one submittal and re-submittal for the WTP and construction contract. The City will charge the Contractor for their labor effort on the third and subsequent re-submittals. The Engineer will review these additional re-submittals on a time and materials basis. The estimated Engineer's level of effort for this task is 108 professional hours.

Task 6.3—Provide Consultation and Interpretation of Project Manual. Provide consultation with the City Inspector or authorized construction contractor's representative on questions associated with the work. This task includes investigation and response to formal Requests For Information of the provisions of the project manual. The estimated Engineer's level of effort for this task is 118 professional hours.

Task 6.4—Evaluate Change Orders. Provide interpretation of the intent of contract documents and any changes thereto, and provide comments on contractor-prepared change orders. The estimated Engineer's level of effort for this task is 54 professional hours.

Task 6.5—Conduct Field Visits & Assist in Plant Startup. As requested by the City, conduct observation visits to ensure that construction is proceeding in accordance with project manual requirements. At the conclusion of construction, assist City staff in preparing a punch list based on final inspection by civil/mechanical, electrical, and instrumentation engineers. Provide coordination with the filtration system vendor and Contractor during startup. Assist with automation of the system and facility. The estimated Engineer's level of effort for this task is 150 professional hours.

Task 7—Project Schedule

The City has requested that the project be completed and online by October 8, 2008, to provide some field operating experience before the mandated compliance deadline. The Engineer's project schedule, Exhibit D, estimates final completion at the end of December 2008. This date would still provide Carson City several months of operating experience before the plant is needed online in August 2009 based on typical summer water demands.

Due to the aggressive nature of this schedule, it is critical that: both the City and the Engineer meet the target deadlines described in the City's and Engineer's tasks described above. The attached schedule (Exhibit D) assumes an executed, signed agreement on March 1, 2007.

Task 8—Supplemental Services

All tasks listed under Section 8 are supplemental engineering services, are considered outside the scope of services, and will only be provided at the request of, and subject to, mutual agreement with the City. These supplemental services will be performed on a time-and-materials basis, per the schedule of rates in Exhibit F. Services include:

Task 8.1	Provide pre-startup checkout of all equipment, supervising system startup, and instruct operating personnel in system operation and maintenance
Task 8.2	Provide services beyond the dates and time periods defined for planned services.
Task 8.3	Divide the project manuals into more than two contracts
Task 8.4	Carry out additional engineering beyond the project scope as defined in this exhibit
Task 8.5	Appear as an expert witness
Task 8.6	Participate in public meetings beyond those listed in the scope and preparing EIR
Task 8.7	Preparation of project easements or rights-of-way.
Task 8.8	Permitting activities beyond what is covered in this scope of work (Task 4.3).
Task 8.9	Preparation of Operating and Maintenance Manuals.
Task 8.10	Analyze individual samples for trace metals and organics
Task 8.11	Prepare electronic artist's renderings for building concepts
Task 8.12	Provide construction management services and/or resident engineering inspection during construction.
Task 8.13	Based on red-lined drawings from the Contractors, prepare Record Drawings after construction is complete.
Task 8.14	SCADA system improvements, other than what is included in this Scope.

CARSON CITY WATER TREATMENT PLANT
PRELIMINARY DRAWING LIST

General	
Cover	Title and Signatures
G1	Drawing Index and Notes
G2	General Notes, Legend, and Abbreviations
G3	Standard Symbols
Civil	
C1	Existing Site Plan
C2	Site Plan
C3	Grading and Utility Plan - North
C4	Grading and Utility Plan – South
C5	Details – 1
C6	Details – 2
C7	Details – 3
C8	Details – 4
Architectural	
A1	Filter Building Floor Plan
A2	Filter Building Roof Plan
A3	Filter Building Interior Elevations, Door and Material Schedule
A4	Filter Building Exterior Elevations – 1
A5	Filter Building Exterior Elevations – 2
A6	Filter Building Sections and Details – 1
A7	Filter Building Sections and Details – 2
A8	Filter Building Sections and Details – 3
Structural	
S1	General Structural Notes
S2	Typical Concrete Details
S3	Masonry Details
S4	Operations Building Foundation Plan, Sections, and Details
S5	Operations Building Roof Plan
S6	Details
S7	Details
S8	Details

Process and Instrumentation

P1	Symbols and Legend – 1
P2	Symbols and Legend – 2
P3	Pressure Filter Plant
P4	Well Pumps and Chemical Feed System
P5	Storage Tank and Backwash Recovery Tank

Mechanical

M1	Filter Building General Plan
M2	Filter Plant Plan and Elevation
M3	Filter Plant Elevations
M4	Filter Building Plumbing and Drain Plan
M5	Backwash Tank Plan, Elevation, Sections and Details
M6	Backwash Tank Sludge Collector
M7	Details – 1
M8	Details – 2
M9	Details -3
M10	Details -4

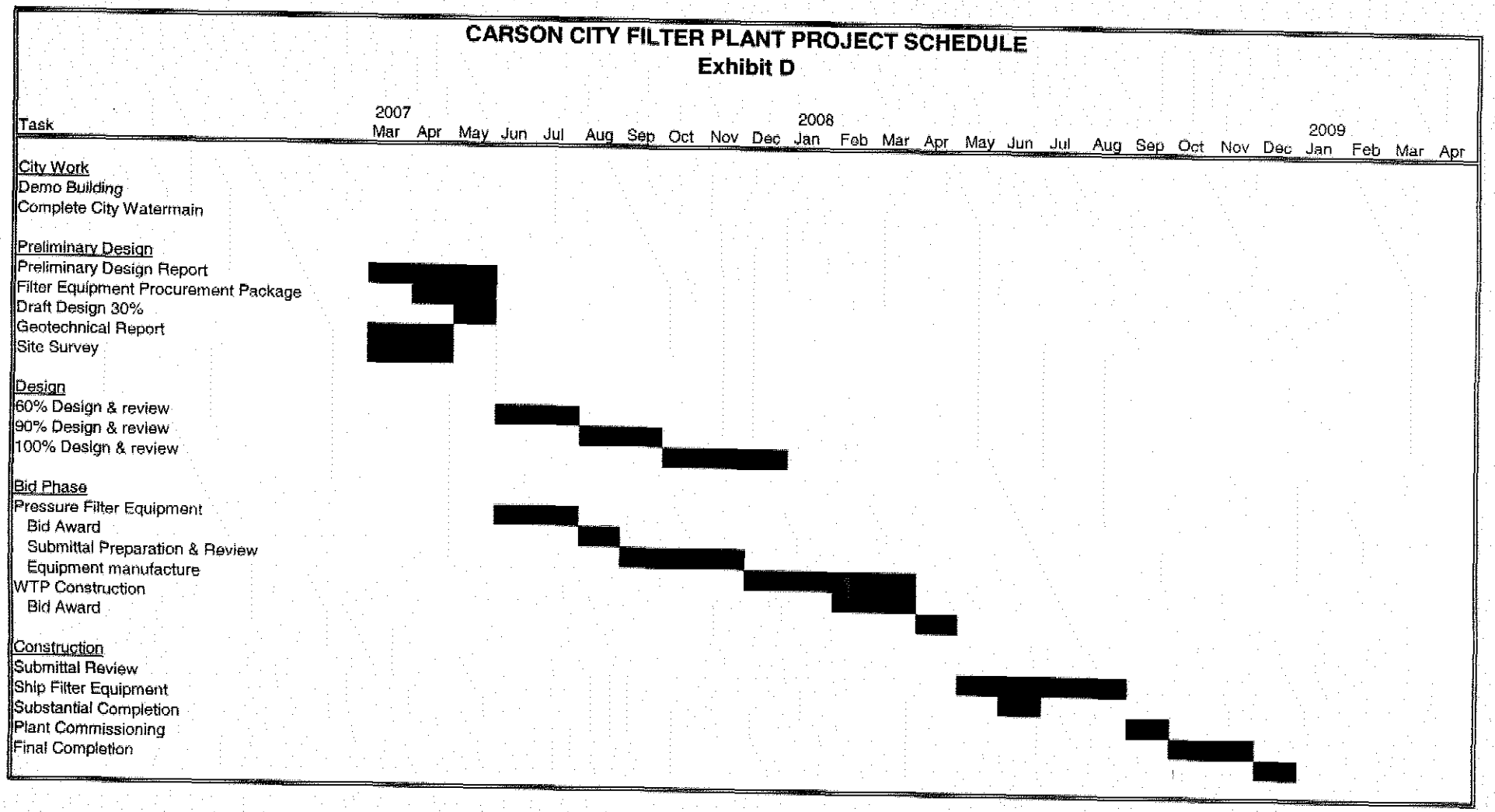
HVAC

H1	Filter Building Plan
H2	Filter Building Section and Schedule
H3	Filter Building Section and Details

Electrical

E1	Symbols and Legends – 1
E2	Symbols and Legends – 2
E3	Single Line Diagram
E4	PNL 1 Single Line Diagram
E5	PLC 100 Single Line Diagram
E6	Miscellaneous Single Line Diagram
E7	Backwash Tank Plan
E8	Control Schematics
E9	Area Power & Grounding Plan
E10	Filter Building Power Plan
E11	Filter Building Lighting Plan
E12	Details
E13	Details

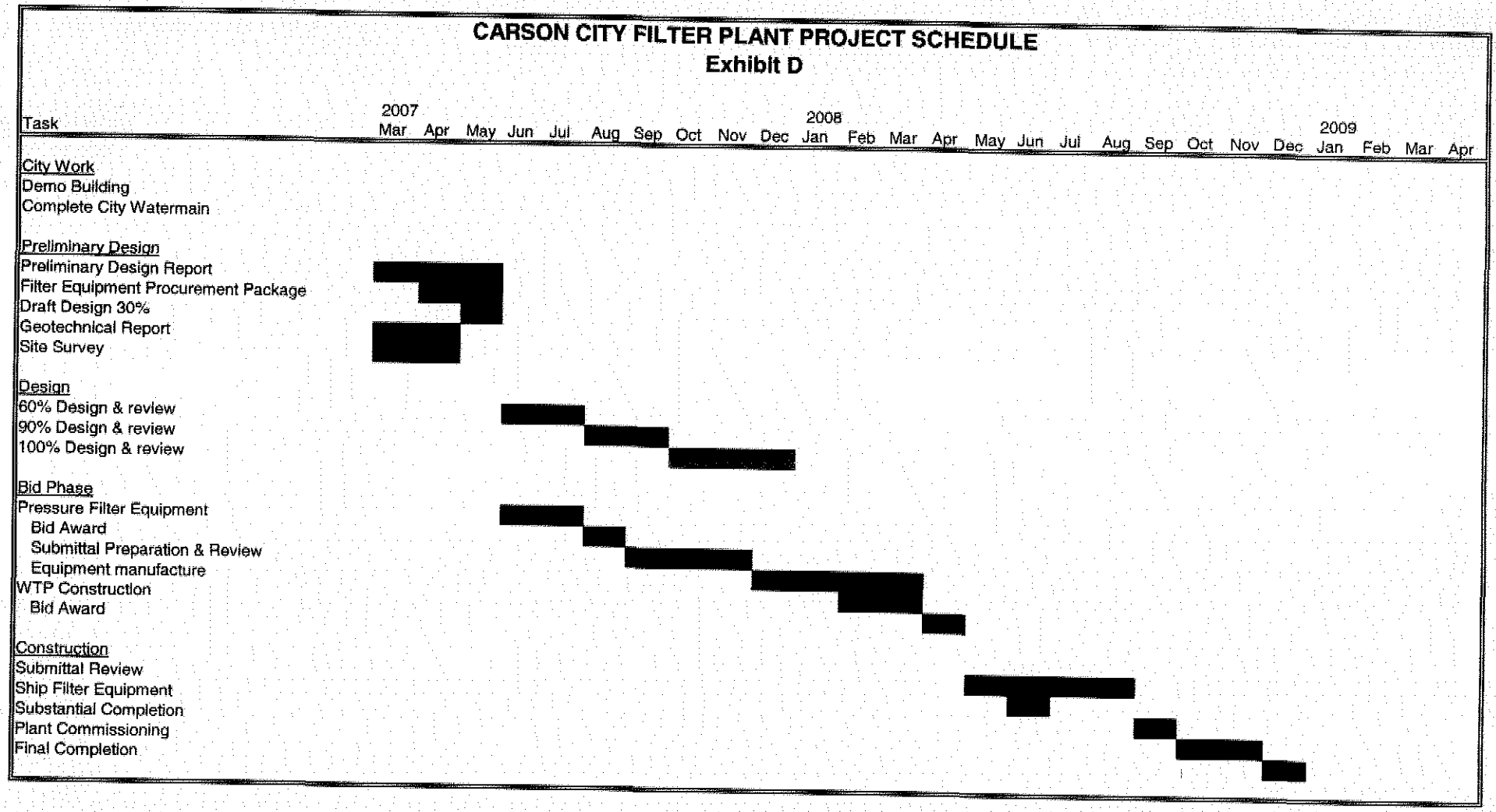
CARSON CITY FILTER PLANT PROJECT SCHEDULE
Exhibit D



Estimated Cost: Carson City WTP Design and Construction Management Services
Exhibit C

TASK	Technical Advisor QA/QC Bill Faust ($150) Hrs		PM Joel Rellin ($125) Hrs		Principal Engineer Ramesh Narasimhan, NCS ($137) Hrs		Senior Project Engineer, Pranam Joshi, NCS ($94) Hrs		Project Engineer Sanjh Karori, NCS ($85) Hrs		Drafting/Field Technician, NCS ($70) Hrs		Electrical Engineer Gary Barrett ($135) Hrs		Project Engineer Alok Gupta ($90) Hrs		Drafting ($90) Hrs		Administrative ($75 & $55) Hrs		Support Schedule, Estimates & Cost Opinions Hrs	Total Hours	Total Labor	ODCs	TOTAL
1. Design Coordination and Project Management	4	$600	24	$3,000	8	$1,096													4	$260		40	$4,956		$4,956
2. Preliminary Design																									
Preliminary Design Report	6	$900	16	$2,000	16	$2,192	140	$13,160	100	$8,500	16	$1,120	16	$1,840	16	$1,440	40	$3,600	8	$520		374	$35,272	$200	$35,472
Draft Design 30% (includes prepurchase contract)	6	$900	40	$5,000	8	$1,096			24	$2,040	16	$1,120	20	$2,300	20	$1,800	40	$3,600		$0	$600	174	$18,456	$150	$18,606
Review Geotechnical Report	1	$150	2	$250										$0	4	$360		$0	1	$65		8	$825		$825
Review Survey/Prepare Base Maps		$0	6	$750									4	$460	12	$1,080	20	$1,800	1	$65		43	$4,155		$4,155
3. Design																									
60% Design & Review	6	$900	60	$7,500	16	$2,192			60	$5,100	60	$4,200	40	$4,600	120	$10,800	150	$13,500	4	$260		516	$49,052	$150	$49,202
90% Design & Review	6	$900	60	$7,500	16	$2,192			60	$5,100	60	$4,200	40	$4,600	120	$10,800	150	$13,500	4	$260		516	$49,052	$150	$49,202
100% Design & Specifications	6	$900	60	$7,500	16	$2,192			40	$3,400	40	$2,800	40	$4,600	116	$10,440	150	$13,500	4	$260		472	$45,592	$250	$45,842
4. Cost Opinions																					$5,400	0	$5,400		$5,400
5. Permitting Assistance			12	$1,500	4	$548			4	$340					8	$720	20	$1,800				48	$4,908		$4,908
6. Bid Phase																									
Filter Equipment					2	$274			4	$340															
Questions & Addenda	2	$300	16	$2,000	2	$274			4	$340			10	$1,150	4	$360	6	$540	4	$260		48	$5,224		$5,224
Pre-Bid Mtg & Bid Review/Recommendation	2	$300	8	$1,000	4	$548							6	$690	4	$360			4	$260		28	$3,158		$3,158
Construction Project					2	$274																			
Questions & Addenda	2	$300	16	$2,000	2	$274							10	$1,150	4	$360	12	$1,080	4	$260		50	$5,424		$5,424
Pre-Bid Mtg & Bid Review/Recommendation	2	$300	10	$1,250									8	$920	4	$360			4	$260		28	$3,090		$3,090
7. Construction																									
Submittal Review - Filter Equipment	4	$600	12	$1,500	4	$548			24	$2,040			12	$1,380								76	$6,068		$6,068
Submittal Review - Construction		$0	20	$2,500	4	$548			16	$1,360			12	$1,380								52	$5,788		$5,788
Consultation & Interpretation of Project Docs	4	$600	40	$5,000									30	$3,450	20	$1,800	24	$2,160				118	$13,010		$13,010
Evaluate Change Orders	4	$600	35	$4,375									15	$1,725		$0						54	$6,700		$6,700
Field Visits/Observation & Startup	4	$600	30	$3,750	16	$2,192			40	$3,400	20	$1,400	20	$2,300	20	$1,800						150	$15,442	$250	$15,692
SUBTOTAL	55	$8,850		$58,375		$16,440		$13,160		$31,960		$14,840		$32,545		$42,480		$55,080		$2,730	$6,000	2,775	$281,572	$1,150	$282,722

CARSON CITY FILTER PLANT PROJECT SCHEDULE
Exhibit D



PROPOSED CARSON CITY ARSENIC TREATMENT PLANT
CADD MANAGEMENT PLAN

INTRODUCTION

The purpose of the CADD Plan is to assure consistency in drawing quality and uniformity in file structure, in all drawings produced for the project. The plan consists of a file naming convention, drawing structure, discipline specific symbols, layer naming convention, and plotting standards. The project team will make use of this document in planning and performing the work. Proposed samples of text types, linetypes, symbols abbreviations and pen plotting palette is attached.

In terms of appearance, see the attached Design/Drafting Standards, for a supplementary set of guidelines and conventions.

SECTION 1: PROJECT

Robert Hunt (Brown and Caldwell) will be the **point-of-contact CADD Coordinator** for the project and will be responsible for assuring the CADD goals are met.

SECTION 2: DRAWING PRODUCTION APPROACH

Plan Drawings will be assembled from base files using external referencing file (XREF) techniques. See Section 7 for external reference file policies for this project. Brown and Caldwell's layering guidelines for the Carson City Development Services will be implemented as the layering interface for all drawings produced as outlined in Section 5. **Drawing files will be saved as AutoCAD 2004 format.** BC symbols, block library and hatch patterns, as shown on the standard symbols sheet for this project, will be used on all drawings.

The drawings shall be organized by discipline. Plotted sheet files shall include objects such as the project title blocks, which are to be inserted as an externally referenced file in paper-space. The plotted sheet also contains general notes, key notes, scale bar and north arrows as appropriate. Base files shall be located in model-space, making use of AutoCAD's viewport conventions and set to the correct viewport magnification. Linework and text call-outs not referenced in other drawing files shall be drawn in the plotted sheet file.

A project directory structure will be established for this project with each key piece of the drawings under its own directory whiles each plotted sheet discipline will be placed into its own directory.

SECTION 3: DRAWING DEVELOPMENT

To prevent redundancy, duplication of effort and to maintain consistency throughout all disciplines, base sheets will be generated as externally referenced (XREF) drawings for use in each discipline.

Base files shall not have title blocks, title block text, general notes, or unique discipline information. Reference text and leaders shall be consistent throughout each discipline.
All object properties are to be set to **BYLAYER**. Do not modify the individual properties of entities such as the colors, linetypes, lineweight or polyline widths. Polyline widths shall be set to 0 (zero). Adhering to this practice ensures ease of layer control within the file and when using externally referenced files and allows for manipulation of the appearance of the plotted sheet. Text and text leader types shall be placed on specific layers allowing for isolating and control of

the layers with "on/off", "freeze/thaw", or changing the layer color at the operator's discretion. (Example: Toggling all layers off, except potable water lines and the associated piping labeling and change color to Red.)

Drawing units shall be as listed below:

- Site plans - The units are to be decimal units in fractions of a foot. (For example: 1" = 10 feet and one unit = 1 foot.)
- Architectural unit drawings of a structure or building plans, sections, and elevations shall be in fractions of a foot. (For example: 1/4" = 1'-0" and one unit = 1 foot.)
- Details of small-scale objects may use units set to fractions of an inch. (For example: 1/4"= 1" and one unit = 1 inch.)

Electrical and Instrumentation schedules or schematic drawings using units of one unit = 1 inch or 1 decimal unit.

The preferred scales are:

View	Viewport Scales
Plans	1/4" = 1'-0"
Building Elevations	1/4" = 1'-0"
Interior Elevations	1/4" or 3/8" = 1'-0"
Building Sections	1/4" or 3/8" = 1'-0"
Full Wall Sections	1/4", 3/8" or 3/4" = 1'-0"
Sections and Details	1/4", 3/8", 3/4", 1-1/2" or 3" = 1'-0"

Proper use of Grid, Snap, Osnap, and Ortho commands shall be followed. Set the precision of the "SNAP" and "GRID" in the "DRAWING AIDS" dialog box. Drawing elements shall be accurately placed and joined to other elements using the commands listed above. Lines shall measure the exact length (i.e., 3.0 is not 3.002).

Two distinct means of condensing information are available for construction documents. These are the abbreviations and identifiers:

> **Abbreviation:** A shortened form of a word or phrase. It is generally formed either by truncation of a single word or as an acronym, using the initial letters of words in a phrase.
> **Identifier:** A label that indicates the specific properties of a system component. Such information may be a pipe, flowstream or equipment that would include the component's function or signal.

Abbreviations may have more than one abbreviation listed or different combinations. Concrete block may be called out as Conc Blk, or CMU. At the same time abbreviations must be consistent, if CMU is used then Conc Blk may not be used. CMU must be used thoughout the document when referring to the same material. Abbreviations should be used only when space is limited. If there is sufficient space, spell it out, including drawing details, tables, and schedules. Abbreviations and identifiers must be consistent between the drawing sheets and the

specifications. If the specifications reference "Floor Drain-Type 2", the drawings must use the same term, "Floor Drain-Type 2"; "Type 2 -Floor Drain" is not acceptable. A list of all abbreviations and identifiers used in the project drawing documents will be included.

A style name of **"BC"** shall be used for MOST general notation, notes, dimensions, and certain titles. The BC style name should use the Arial font type. Title information will be supplied by the CADD Coordinator. Other special or proprietary fonts shall not be used. Text heights used for most general notation, notes, and dimensions shall be 0.125" high (plotted size).

The Mtext command should be used for all annotations which may include callouts, key notes, general notes, lists or schedules, reference symbols, designators and leaders.

Dimension style shall be set to the current BC Standard which has preset dimension variables to meet guidelines (Note: DIMASSOC = 2 shall be used where the dimension scale is read automatically).

- Dimensions should be used sparingly, and only as indicated by the designer or engineer.
- Avoid placing any duplicate dimensions. Dimension an object or feature only once.
- Where an item is called out by description, do not dimension the item (e.g., W10x30, 12¢-0² LG.).
- Do not put building or structural dimensions on other disciplines' drawings (e.g., mechanical, electrical).
- Dimension styles may not be altered by any person. If any alteration is required on a project, the project CADD Coordinator should prepare a new dimension style.
- Use of associated dimensions is required. Use the AutoCAD wipeout command to give the appearance of broken dimension lines as necessary.
- All dimensions should be placed using object snaps.
- New equipment should be dimensioned to appropriate equipment centerlines from structural elements or grid lines.
- Dimensions should read from the bottom or from the right.
- Dimensions are placed above the dimension line, without gaps in the dimension line.

The same project CTB (color-dependent plot style table) file will be used on all plotted sheets. This CTB file determines how an object's color will plot Colors, Lineweights, Linetypes, Screening Factors of the pen numbers at plot time. You change an object's color to control how it plots. For example, all red objects in a drawing plot the same way.
This CTB has been associated with layer guidelines; refer to Section 5 for layering information. For drawings being plotted on 17"x11" sheet, click on your scale lineweights box on the plot window. For drawings being plotted on 34"x22", make sure your scale lineweight box on the plot window is not checked. The CAD Coordinator will supply this CTB file.

SECTION 4: SUBMITTALS

For review submittals, all drawings will be submitted as hard copies, produced on 11-inch by 17-inch bond, which would be known as ½ size set of the plans. During this review submittal, an electronic version of the plotted sheets may be requested. For final submittals, all drawings will be submitted as hard copies, produced on a 22-inch by 34-inch bond, which would be known as full size set of plans. Also, all plan sheets shall be submitted in an electronic format with all associates reference files included.

SECTION 5: LAYERING STANDARDS

Layering standards are critical for this project. **All drawings will use the BC Layering Guidelines**. Objects and lines are assigned to specific, descriptive named layers in order to facilitate identification and "freezing" of unwanted layers on referenced (Xref) drawings. This convention utilizes layer names consisting of a short description of entity objects, colors, linetype, and line widths making it easier to describe each object and line. This open layering convention is functional, easily recognizable, and expandable for "on-the-fly" layer creation. **Each discipline is responsible for setting up their own layers using these Guidelines.** When producing new layers, please follow the BC Layering Guidelines.

SECTION 6: PAPERSPACE / MODELSPACE

Each drawing is made up of components, elements, images, xref's, Rtext, title blocks/borders and attributes. Brown and Caldwell will utilize modelspace and paper (layout) space.

Modelspace is where the drawing resides. Text, callouts, labels and dimensions will reside in modelspace.

Paperspace (Layout) is where the title block/border and attributes are located, along with notes. Layouts are to be limited to one per sheet/drawing on design projects. Usage of multiple layouts is not permitted, unless determined necessary by the CADD Coordinator.

Paperspace / Modelspace (PS/MS) is mandatory on all submitted plans for this project. Paperspace will consist of the title block at a 1=1 scale. All annotation, dimensions, and all other symbols are also to be inserted into modelspace. Paperspace will include key and general notes. North arrows and scale bars may be in either modelspace or paperspace. Final Submitted plots will be plotted at 1=1 scale. Modelspace will consist of all design linework. Text and dimensions belong in modelspace in the sheet drawings. **All text will be placed on layers that can be turned off and on.**

Images are used when necessary. Whether the image is located in modelspace versus paperspace is dependent upon what the image is.

The project border which is assigned by the CADD Coordinator will be located in Paperspace. The border is made up of text and linework and is externally referenced into each sheet drawing. It consists of information fixed for the project, including the client logo, the project name and address, the Brown and Caldwell logo and the revision box information. In addition, it lays out the individual areas for the Engineer's seal, designer, checker and approval signatures. The title block/border is used in conjunction with the Title Attribute Block (see below).

Title attribute blocks are attributable blocks with insertion point 0,0,0. The block consists solely of text, in the form of attributes, and allows the user to vary the information from sheet to sheet. The information included in the block is that which only pertains specifically to the current sheet, such as drawing number, title, drawing scale, designer, engineer, etc. This attributed block is used in conjunction with the border (see above).

SECTION 7: XREFING

To prevent redundancy and duplication of effort and promote consistency throughout all disciplines, base sheets will be generated using AutoCAD's external reference capabilities. All disciplines may utilize background information from other disciplines.
Base sheets shall not contain text, dimensioning, etc., except for referencing only. **Reference text will be put on a reference layer so it can be turned on and off at the operators discretion.**

Base file (reference file) is an AutoCAD file containing a single discipline's information. An external reference files shall only contain properly layered linework. General hatch patterns, notes, dimensions, etc. are added to the Paperspace environment during creation of the plotted sheet. **All external reference files shall use relative paths which afford greater flexibility and are easier to use than absolute paths.**

All base files are drawn at full size. Scaled views are added using AutoCAD's "mview" and "zoom" commands to establish the correct view represented in the Paperspace environment. Once a base file has been attached, the base file is not to be moved from its original coordinates for any reason. All plans of the same structure, for all disciplines, are drawn at the same coordinates. **ALL EXTERNAL REFERENCE BASES SHOULD HAVE AN ORIGIN OF 0,0,0 AND BE INSERTED AT 0,0,0.**

External reference (XREF) procedures shall follow the guidelines listed below:

1) Background linework shall be plotted in a subdued method to allow the linework of the current disciple to dominate the plotted sheet.
2) Existing civil site files are the basis of civil sheets. These drawings shall contain site survey information, topography, etc.
3) Structural base files shall refer to architectural and civil drawings during development. Civil bases are not shown as part of the plotted sheet, architectural bases may be shown, if desired, to accommodate structural work.
4) HVAC and electrical sheets shall reference the mechanical or architectural base files, when applicable.
5) Entities are not edited to accommodate drawing appearance in the sheet file. This will prevent "holes" in the drawings when used by other disciplines. (Example: Erasing a staircase or part of a wall to make space for call-outs.)

GENERAL ABBREVIATIONS

A	AMPERE
ABND	ABANDONED
AC	ASPHALTIC CONCRETE
A/C	AIR CONDITIONING
ACC	AREA CONTROL CENTER
ACP	ASBESTOS CEMENT PIPE
ACST	ACOUSTIC
AF	AIR FILTER
AHU	AIR HANDLING UNIT
AMD	AIR MONITORING DEVICE
ANC	ANCHOR
AR	AIR RETURN
AS	AIR SUPPLY
AV	ANGLE VALVE
BAC	BACTERIOLOGICAL
BC	BEGINNING OF CURVE
BCR	BEGINNING OF CURVE RETURN
BCOP	BARE COPPER
BGAT	BOOLEAN GATE
BF	BLIND FLANGE
BHP	BRAKE HORSEPOWER
BSN	BAR SCREEN
BUV	BUTTERFLY VALVE
BV	BALL VALVE
CAB	DIRECT BURIAL CABLE
CAF	COMBUSTION AIR FAN
CC	COOLING COIL
C-C	CENTER TO CENTER
CCP	CONCRETE CYLINDER PIPE
CCSP	CONCRETE LINED AND COATED STEEL PIPE
CD	CEILING DIFFUSER
CDR	CONDUCTOR
CDU	CONDENSING UNIT
CED	CEILING EXHAUST DIFFUSER
CER	CEILING EXHAUST REGISTER
CF	CUBIC FEET
CFH	CUBIC FEET PER HOUR
CFR	CODE OF FEDERAL REGULATIONS
CHR	CHILLER
CIRC	CIRCUMFERENCE
CK	CHECKER(ED)
CKPL	CHECKER PLATE
℄	CENTERLINE
CL	CLEARANCE
CL2	CHLORINE
CM	MANUAL CONTROL STATION
CMA	MANUAL AUTO CONTROL STATION
CMC	CEMENT MORTAR COATED
CML	CEMENT MORTAR LINED
CMPA	ASBESTOS PROTECTED CORRUGATED METAL PIPE
CNTL	CONTROL
CO	CLEAN OUT
CO2	CARBON DIOXIDE
COD	CHEMICAL OXYGEN DEMAND
COF	COOLING AIR FAN
COM	COMMINUTOR
CON	CONVEYOR
COND	CONDUCTIVITY
CJ	CONSTRUCTION JOINT
CONT	CONTINUED
CP	COMPRESSOR
CPVC	CHLORINATED POLYVINYL CHLORIDE
CR	CONDUIT RACK
CRF	CHEMICAL FEEDER
CRN	CRANE
CREJ	CORRUGATED RUBBER EXPANSION JOINT
CSD	CEILING SUPPLY DIFFUSER
CTF	CENTRIFUGE
CTR	CONTRACTOR, CONTROL UNIT
CV	CONTROL VALVE
CY	CUBIC YARDS
DB	DUCT BANK
DE	DENSITY METER
DF	DRINKING FOUNTAIN
DFD	DUCT FIRE DAMPER
DG	DOOR GRILLE
DM	DAMPER MOTOR
DR	DRAIN ROCK
DT	DRAIN TRAP
DWF	DRY WEATHER FLOW
EA	EXHAUST AIR, EACH
EAT	ENTERING AIR TEMPERATURE
EAU	ENGINE ALTERNATOR UNIT
EC	END OF CURVE
ED	EXTRACTOR DAMPER, EQUIPMENT DRAIN
EE	EACH END
EFF	EFFLUENT
EG	EXHAUST GRILLE
EJ	EXPANSION JOINT
EL	ELEVATION
ELL	ELBOW
EMBD	EMBEDDED
E/P	ELECTRIC/PNEUMATIC
EPR	EVAPORATOR
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EXISTING SURFACE
EWEF	EACH WAY EACH FACE
EWT	ENTERING WATER TEMPERATURE
EXG	EXHAUST GRILLE
EXIST	EXISTING
F	FAHRENHEIT, FACE, FUSE(D)
FAI	FRESH AIR INTAKE
FB	FLAT BAR, FLOOR BEAM
FC	FAIL CLOSED
FCl	FREE CHLORINE
FCR	FINE CRUSHED ROCK
FE	FLOWMETER
FF	FAR FACE
F-F	FACE TO FACE
FH	FIRE HYDRANT, FLATHEAD
FIN	FINISHED
FL	FLOW LINE
FLC	FLOCCULATOR
FLP	FLUID POWER UNIT
FLR	FLOOR
FLT	FILTER
FM	FORCE MAIN
FMH	FLEXIBLE METAL HOSE
FMX	FLASH MIXER
FO	FAIL OPEN
FP	FILTER PRESS
FPC	FLEXIBLE PIPE COUPLING
FPC-T	FPC TO TAKE TENSION
FRZ	FREEZESTAT
FS	FLOW SWITCH, FIRESTAT
FT	FLASH TANK
G	POWER ACTUATED GATE
GBV	GLOBE VALVE
GDR	GRINDER
GFI	GROUND FAULT INTERRUPTOR
GPD	GALLONS PER DAY
GRDR	GRINDER
GRT	GROUT
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
HA	HAND AUTO
HC	HEATING COIL
HEX	HEAT EXCHANGER
HDOT	HEAVY DUTY OIL TIGHT
HG	MERCURY, HAND GRADE
HHV	HEAT HOSE VALVE
HOA	HAND-OFF-AUTO
HOR	HORIZONTAL
HP	HIGH PRESSURE, HIGH POINT, HORSEPOWER
HR	HANDRAIL, HEAT RESERVOIR
HSS	HIGH SIGNAL SELECT
HTV	HIGH TEMPERATURE VENT
HV	HOSE VALVE
H/V	HEATING AND VENTILATING
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HWL	HIGH WATER LINE
HWTR	HIGH WATER
HYDT	HYDRANT
ICN	INCINERATOR
IE	INVERT ELEVATION
IF	INSIDE FACE
IL	INDICATING LAMP
INF	INFLUENT
INS	INSULATE(D)(ION)
INTER	INTERMEDIATE
INT	INTERIOR
INV	INVERT
IT	INSTRUMENT TAP
JST	JOIST
K	KIP (1000 POUNDS)
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVAR
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE, LATERAL, LATITUDE
LEL	LOWER EXPLOSIVE LIMIT
LF	LINEAR FEET
LOS	LOCKOUT STOP
LS	LIMIT SWITCH, LUMP SUM
LWL	LOW WATER LINE
MBH	THOUSAND BTU'S PER HOUR
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILLS
MCU	MASTER CONTROL UNIT
MD	MOTORIZED DAMPER
MEE	MISCELLANEOUS ELECTRICAL EQUIPMENT
MGD	MILLION GALLONS PER DAY
MG/L	MILLIGRAMS PER LITER
MIE	MISCELLANEOUS INSTRUMENTATION EQUIPMENT
MILSPEC	MILITARY SPECIFICATION
MIN	MINIMUM, MINUTE
MJ	MECHANICAL JOINT
ML	MILLILITER
MME	MISCELLANEOUS MECHANICAL EQUIPMENT
MOP	MOTOR OPERATOR
MUL/DIV	MULTIPLY/DIVIDE
MV	MUD VALVE, MILLIVOLT
MX	MIXER
N	NEUTRAL
NA	NONAUTOMATIC
NAOH	SODIUM HYDROXIDE
NEG	NEGATIVE
NF	NONFUSED
NOX	NITRATES AND NITRITES
NPSH	NET POSITIVE SUCTION HEAD
NRS	NONRISING STEM
OA	OUTSIDE AIR, OVERALL
OAI	OUTSIDE AIR INTAKE
OB	OPPOSED BLADE
OHE	OVERHEAD ELECTRIC LINE
OL	OVERLOAD
O-O	OUT TO OUT
ORF	ODOR REMOVAL FILTER
ORP	OXIDATION REDUCTION POTENTIAL
ORT	ODOR REMOVAL TOWER
OSA	OUTSIDE AIR
OSC	ODOR SCRUBBER
P	PUMP
PAR	PARALLEL
PC	PLAIN CONCRETE, PIPE COUPLING
PCC	PLANT CONTROL CENTER
PCHV	PINCH VALVE
PCP	PLAIN CONCRETE PIPE
PC-T	PIPE COUPLING TO TAKE TENSION
PCU	PHOTOELECTRIC CONTROL UNIT
P/E	PNEUMATIC/ELECTRIC
PF	POWER FACTOR
PI	PROPORTIONAL PLUS INTEGRAL CONTROL
PID	PROPORTIONAL PLUS INTEGRAL PLUS DERIVATIVE CONTROL
PIVC	POINT OF INTERSECTION ON VERTICAL CURVE
PL	PROPERTY LINE, PIPELINE, PLATE
PLYWD	PLYWOOD
PNL	PANEL, PANELBOARD
PO4	PHOSPHATE
POP	PNEUMATIC OPERATOR
PP	POWER POLE
PRES	PRESSURE
PRD	PRESSURE RELIEF DAMPER
PRV	PRESSURE REGULATING (REDUCING) (RELIEF) VALVE
PRS	PRESSURE REDUCING STATION
PS	PRESSURE SWITCH, PRESSURE SENSOR
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PV	PLUG VALVE, PROCESS VARIABLE
PVL	PRESSURE VESSEL
PVT	PAVEMENT
Q	RATE OF FLOW
QCPLG	QUICK COUPLING
R	RADIUS
RA	RETURN AIR
RAF	ROLL TYPE AIR FILTER
RCR	RECORDER
REC	RECEIVER
RECD	RECEIVED
RECP	RECEPTACLE
RED	REDUCE(R)
REG	REGULATOR
REL	RELAY
RT	RIGHT
RTP	REINFORCED THERMOSET PLASTIC
RTU	REMOTE TERMINAL UNIT
RGS	RIGID GALVANIZED STEEL
RL	REDUCED LEVEL
RWL	RAINWATER LEADER
S	SOUTH, SILENCER, SLOPE
SB	SIGNAL BOX
SCR	SCRUBBER
SD	SPLITTER DAMPER, SMOKE DETECTOR
SEP	SEPARATOR
SG	SUPPLY GRILLE, SLUICE GATE
SI	SPEED INCREASER
SIM	SIMILAR
SL	SLOPE
SLG	SLIDE GATE
SN	SCREEN
SP	SPACE, SET POINT, STATIC PRESSURE
SPG	SPACING
SPT	SOUND POWERED TELEPHONE
SO2	SULFUR DIOXIDE
SPL	SPLICE
SR	SPEED REDUCER
SRV	SAFETY RELIEF VALVE
SRG	SPLIT-RANGING
SS	STAINLESS STEEL, SANITARY SEWER, SPEED SELECTOR
SSC	SOLID STATE CONTROLLER
SSFH	STAINLESS STEEL FLAT HEAD
SSK	SERVICE SINK
ST	START
STD	STANDARD
STGA	STARTING AIR
SUB	SUBSTITUTE
SWB	SWITCHBOARD
SYM	SYMMETRICAL
TP	TANGENT POINT
TB	TERMINAL BOX
T/B	TOP OF BANK
TBN	TURBINE
T/C	TOP OF CURB
TCL	TOTALLY CLOSED
TCP	TEMPERATURE CONTROL PANEL
TD	TIME DELAY RELAY
TFR	TRANSFORMER
TOA	TEST-OFF-AUTO
TOC	TOTAL ORGANIC CARBON
TOS	TOP OF SLOPE, TOP OF SLAB
TOW	TOP OF WALL
TPG	TOPPING
TPLX	TRIPLEXED
TR	TIMING RELAY, STAIR TREAD
TRM	TRANSMITTER
TRN	TRANSDUCER
TRS	TRANSFER SWITCH
TS	TEMPERATURE SWITCH
TV	THERMOSTATIC VALVE
TYP	TYPICAL
UL	ULTIMATE LOAD
UN	UNION
UP	UTILITY POLE
UPS	UNINTERRUPTIBLE POWER SUPPLY
US	UTILITY STATION
USS	UNIT SUBSTATION
V	VALVE, VOLTS
VAC	VOLTS ALTERNATING CURRENT
VAR	VARIES, VARIABLE
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VD	VOLUME DAMPER
VDC	VOLTS DIRECT CURRENT
VFT	VACUUM FILTER
VP	VAPOR PRESSURE, VACUUM PUMP
VSC	VARIABLE SPEED COUPLING
VTR	VENT THROUGH ROOF
VV	VARIABLE VOLUME BOX
WC	WATER CLOSET, WATER COLUMN
WCO	WALL CLEANOUT
WEG	WALL EXHAUST GRILLE
WER	WALL EXHAUST REGISTER
WF	WIDE FLANGE
WG	WASTE GAS
WSR	WALL SUPPLY REGISTER, WASHER
WSTP	WATERSTOP
WT	WATERTIGHT
WWF	WELDED WIRE FABRIC, WET WEATHER FLOW
X	SPARE CONDUIT
XLP	CROSS LINKED POLYETHYLENE
XP	EXPLOSIONPROOF
YCO	YARD CLEANOUT
ZS	POSITION SWITCH

NOTES:

1. ADDITIONAL ABBREVIATIONS ARE DEFINED IN ANSI Y1.1-1972.
2. ABBREVIATIONS FOR PIPING SYSTEMS ARE SPECIFIED IN SECTION 15050

REV	DATE	DESCRIPTION	BY	APP'D

CARSON CITY ARSENIC TREATMENT PLANT
SAMPLE DRAWINGS

GENERAL ABBREVIATIONS

PREPARED BY:
BROWN AND CALDWELL
3264 GONI ROAD, SUITE 153
CARSON CITY, NEVADA 89706
Phone: (775) 883-4118

DESIGNED BY:
DRAWN BY:
CHECKED BY:
BWC NO.:
SCALE:
LAYOUT NAME:
PLOT DATE: FEB 24, 2003

SHEET
— OF —
X

GENERAL

- EXISTING EQUIPMENT OR MATERIALS TO BE REMOVED
- TO BE BUILT FOR FUTURE REMOVAL
- NEW FACILITIES (SOLID)
- EXISTING (OR SCREENED)
- WATER SURFACE
- NOTE DESIGNATION
- W/ WITH
- W/O WITHOUT

CIVIL

- NATURAL GROUND OR GRADE
- GRANULAR MATERIAL SUCH AS CRUSHED ROCK OR GRAVEL
- ASPHALT PAVEMENT OVERLAY
- AC PAVEMENT IN SECTION
- AC PAVEMENT IN PLAN
- CEMENT CONCRETE PAVEMENT IN PLAN
- FENCE (EXISTING SCREENED)
- RAILROAD
- EL 110.50 FINISH GRADE SPOT ELEVATION
- 112.50 / 112.00 TOP OF CURB ELEVATION / GUTTER OR GROUND ELEVATION
- EDGE OF WATER, FLOWLINE WITH DIRECTIONAL ARROW
- 3:1 SLOPE (3 HOR TO 1 VERT), PLAN
- SLOPE (3 HOR TO 1 VERT), SECTION
- CUT SLOPE; ARROWS POINT DOWN SLOPE
- FILL SLOPE; ARROWS POINT DOWN SLOPE
- TREES, SHRUBS OR HEDGE
- SOIL BORING AND DESIGNATION
- BURIED VALVE, EXISTING (OR SCREENED)
- VT BURIED ACCESS VAULT
- SURVEY CONTROL POINT
- N1000 E1000 COORDINATES W/GRID POINT
- SEWER LATERAL SEE DETAIL D/C-53
- BLOW OFF/FLUSH VALVE ASSEMBLY SEE DETAIL D/C-52
- CAV COMBINATION AIR VALVE ASSEMBLY SEE DETAIL D/C-54
- FH FIRE HYDRANT ASSEMBLY SEE DETAIL D/C-52
- SINGLE METER SET
- DOUBLE METER SET
- GATE VALVE
- CLEAN OUT

PIPING SYSTEMS FOR MECHANICAL DRAWINGS

PIPING SYSTEMS ARE CALLED OUT BY SIZE FOLLOWED BY PIPING SYMBOL, ENCLOSED AS SHOWN.

- 12" DS — PIPE SIZE, PIPING SYSTEM
- EXISTING PIPING* 12" DS
- FUTURE PIPING 12" DS

* PIPING SYSTEM DESIGNATIONS FOR EXISTING PIPE INDICATE TYPE OF SERVICE ONLY AND DO NOT IMPLY PIPE MATERIALS USED.

ARCHITECTURAL/STRUCTURAL

- CONCRETE
- REINFORCEMENT IN SECTION
- PRECAST CONCRETE
- MORTAR, GROUT OR PLASTER
- CONCRETE BLOCK
- BRICK OR CAST IRON
- GRATING SPAN
- CHECKER PLATE
- STEEL OR STAINLESS STEEL
- ALUMINUM
- NEOPRENE, RUBBER OR PLASTIC
- OPENING OR DEPRESSION IN SLAB OR WALL
- OPENING WITH GRATING COVER
- OPENING WITH CHECKER PLATE COVER
- METAL STUD WITH LATH AND PLASTER PARTITION
- JOINT FILLER
- WATER STOP
- HANDRAIL

MECHANICAL PIPE AND FITTINGS

(SINGLE LINE / DOUBLE LINE)

- FLANGED JOINT
- GROOVED END/FLANGED JOINT
- PLAIN OR GROOVED END MECHANICAL COUPLING
- PUSH ON, MECHANICAL OR BALL AND SOCKET JOINT
- WELDED JOINT
- SLEEVE TYPE MECHANICAL COUPLING
- RESTRAINED SLEEVE TYPE MECHANICAL COUPLING
- RESTRAINED FLANGED COUPLING ADAPTER
- GROOVED END ADAPTER FLANGE
- UNION
- EXPANSION JOINT (SEE SPECS FOR TYPE)
- FLEXIBLE METAL HOSE
- ELBOW UP
- ELBOW DOWN
- TEE UP
- TEE DOWN
- LATERAL UP
- LATERAL DOWN
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER

EQUIPMENT AND INSTRUMENTATION IDENTIFICATION SYSTEM

EQUIPMENT IS CALLED OUT BY ITS PREFIX FOLLOWED BY A NUMBER, ENCLOSED AS SHOWN:

- THICKENED SLUDGE TRANSFER PUMP — EQUIPMENT NAME
- P 1201 — EQUIPMENT DESIGNATION
- EQUIPMENT PREFIX
- EQUIPMENT NUMBER

MECHANICAL VALVES

- BUTTERFLY VALVE
- ANGLE VALVE
- CHECK VALVE
- PUMP DISCHARGE VALVE
- KNIFE GATE VALVE
- FLAP GATE
- PRESSURE REGULATING VALVE
- BACK PRESSURE REGULATING VALVE
- PRESSURE REDUCING REGULATOR (SELF-CONTAINED)
- BACK PRESSURE REGULATOR (SELF-CONTAINED)
- SOLENOID VALVE
- MOTOR OPERATED VALVE
- MUD VALVE

ELEVATION VIEWS

- 1 — ELEVATION VIEWS ARE CALLED OUT ON PLANS AND NUMBERED CONSECUTIVELY
- LS-2 — LOCATION OF ELEVATION VIEW

MISCELLANEOUS DEVICES

- A — UTILITY STATION (LETTER, IF ANY, DESIGNATES TYPE)
- HOSE RACK
- FLOOR DRAIN
- XCO CLEANOUT; X=DESIGNATION IF ANY
- C — SEAL WATER OR WATER PURGE CONTROL UNIT
- P — AIR OR WATER PURGE FOR LEVEL MEASUREMENT
- PIPE ANCHOR
- IN LINE PRESSURE SENSOR
- ROTAMETER
- XX INSTRUMENT
- DE DENSITY ELEMENT
- FE FLOW ELEMENT
- LE LEVEL ELEMENT
- PE PRESSURE ELEMENT
- PI PRESSURE INDICATOR (GAUGE)
- TE TEMPERATURE ELEMENT
- TI TEMPERATURE INDICATOR

SECTION AND DETAIL NUMBERING SYSTEM

(1) SECTION CUT ON DRAWING M2

- 2 / M3 — SECTION NUMBER; DRAWING ON WHICH SECTION APPEARS; SECTION CUTTING PLANE

(2) ON DRAWING M3 THIS SECTION IDENTIFIED

- 2 / M2 — SECTION NUMBER; DRAWING ON WHICH SECTION WAS CUT

(3) DETAILS ARE CROSS-REFERENCED IN A SIMILAR MANNER, EXCEPT THAT DETAILS ARE IDENTIFIED BY LETTER RATHER THAN BY NUMBER.

GENERAL NOTES:

1. THIS DRAWING IS GENERAL IN NATURE. SOME SYMBOLS SHOWN HEREON MAY NOT BE USED ON THE CONTRACT DRAWINGS.
2. SEE DRAWING G2 FOR ABBREVIATIONS.
3. NOT USED.
4. NOT USED.
5. SYMBOLS ARE ARRANGED ON SPECIFIC DRAWINGS AND IN CATEGORIES FOR CONVENIENCE ONLY. SYMBOLS MAY BE USED ON ANY OF THE CONTRACT DRAWINGS.

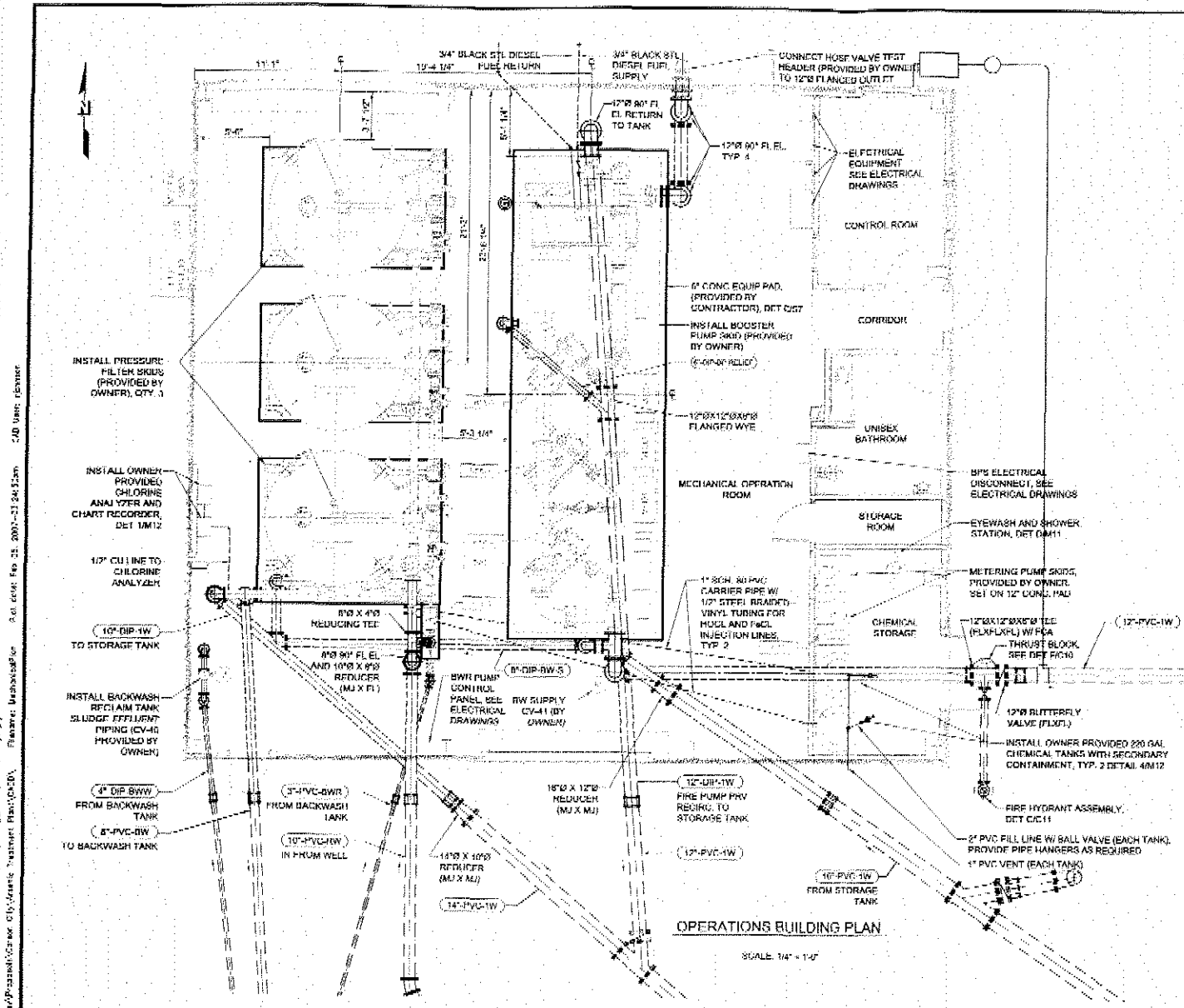
PREPARED BY:
BROWN AND CALDWELL
3264 GONI ROAD, SUITE 153
CARSON CITY, NEVADA 89706
Phone: (775) 883-4118

REV	DATE	DESCRIPTION	BY	APP'D

CARSON CITY ARSENIC TREATMENT PLANT
SAMPLE DRAWINGS

GENERAL SYMBOLS

SHEET X



OPERATIONS BUILDING PLAN

SCALE: 1/4" = 1'-0"

KEY NOTES:

1. CONTRACTOR RESPONSIBLE FOR INSTALLING ALL OWNER SUPPLIED EQUIPMENT.
2. CONTRACTOR SHALL REFER TO THE APPROVED SHOP DRAWINGS FOR ADDITIONAL INFORMATION.
3. FILTER SKIDS ARE PROVIDED WITH PIPING PRE ASSEMBLED. CONTRACTOR RESPONSIBLE FOR CONNECTING PIPING BETWEEN SKIDS AND PROVIDING ALL PIPING, VALVING, PIPE SUPPORTS AND OTHER EQUIPMENT NOT PROVIDED BY OWNER.
4. ALL PIPE SUPPORTS OUTSIDE OF THE OWNER PROVIDED SKIDS SHALL BE PROVIDED BY CONTRACTOR.
5. SEE ELECTRICAL SHEETS FOR LOCATION AND DETAILS OF ADDITIONAL ELECTRICAL EQUIPMENT.
6. FIRE PUMP DRIVER EXHAUST NOT SHOWN FOR CLARITY.
7. ALL PIPING UNDER CONCRETE FLOOR SLAB OR FOOTING SHALL BE DIP OR WELDED STEEL, AND CONCRETE ENCASED, 8" MIN. AROUND ALL SIDES. PIPE MATERIAL SHALL TRANSITION TO PVC OUTSIDE OF THE BUILDING FOOTING.
8. DOUBLE SLEEVE COUPLINGS SHALL BE PROVIDED FOR ALL PIPING IN OR OUT OF THE BUILDING. COUPLINGS SHALL BE SPACED APPROXIMATELY THREE PIPE DIAMETERS APART.

NOT FOR CONSTRUCTION

DESIGNED BY
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NO.	DATE	DESCRIPTION	BY	APP'D

CARSON CITY ARSENIC TREATMENT PLANT
SAMPLE DRAWINGS

OPERATIONS BUILDING
GENERAL MECHANICAL PLAN

SHEET
OF
X

1	65	129	193
2	66	130	194
3	67	131	195
4	68	132	196
5	69	133	197
6	70	134	198
7	71	135	199
8	72	136	200
9	73	137	201
10	74	138	202
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45	109	173	237
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53	117	181	245
54	118	182	246
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56	120	184	248
57	121	185	249
58	122	186	250
59	123	187	251
60	124	188	252
61	125	189	253
62	126	190	254
63	127	191	255
64	128	192	

X OF — SHEET

CARSON CITY ARSENIC TREATMENT PLANT
SAMPLE DRAWINGS

PEN SETTINGS

REV	DATE	DESCRIPTION	BY	APP'D

PREPARED BY:

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CARSON CITY, NEVADA 89706
Phone: (775) 883-4118

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DWG NO: PenPlottingLines.DWG
SCALE (FORS):
LAYOUT NAME:
PLOT DATE: FEB 24, 2003

EXHIBIT F

BROWN AND CALDWELL CARSON CITY RATE SCHEDULE

TITLE	RATE/HR
Principal in Charge	$150
Vice President	$150
Principal Engineer	$145
Project Manager	$125
Senior Engineer	$115
Senior Electrical Engineer	$115
Project Engineer	$90
Drafting	$90
Administrative	$50 - $75

EXHIBIT F

Brown and Caldwell Schedule of Hourly Billing Rates

Level	Engineering	Technical/Scientific	Administrative	Hourly Rate
A			Office/Support Services I	$49
B	Drafter Trainee	Field Service Technician I	Word Processor I Office/Support Services II	$61
C	Assistant Drafter	Field Service Technician II	Word Processor II Office/Support Services III	$69
D	Drafter Engineering Aide Inspection Aide	Field Service Technician III	Accountant I Word Processor III Office/Support Services IV	$80
E	Engineer I Senior Drafter Senior Illustrator Inspector I	Geologist/Hydrogeologist I Scientist I Senior Field Service Technician	Accountant II Word Processor IV	$95
F	Engineer II Inspector II Lead Drafter Lead Illustrator	Geologist/Hydrogeologist II Scientist II	Accountant III Area Business Operations Mgr Technical Writer Word Processing Supervisor	$113
G	Engineer III Inspector III Senior Designer Supervising Drafter Supervising Illustrator	Geologist/Hydrogeologist III Scientist III	Accountant IV Administrative Manager	$135
H	Senior Engineer Principal Designer Senior Construction Engineer Senior Engineer	Senior Geologist/Hydrogeologist Senior Scientist	Senior Technical Writer	$153
I	Principal Engineer Principal Construction Engineer Supervising Designer	Principal Geologist/Hydrogeologist Principal Scientist	Corp.Contract Administrator	$174
J	Supervising Engineer Supervising Constr. Engineer Supervising Engineer	Supervising Scientist Supervising Geologist/ Hydrogeologist	Assistant Controller	$181
K	Managing Engineer	Managing Geologist/Hydrogeologist Managing Scientist	Area Bus Ops Mgr IV	$203
L	Chief Engineer Executive Engineer	Chief Scientist Chief Geologist/Hydrogeologist	Corp Marketing Comm. Mgr.	$219
M	Vice President			$235
N	Senior Vice President			$246
O	President/Executive Vice President			$256
P	Chief Executive Officer			$268