GW - 73

WORK PLANS

1992

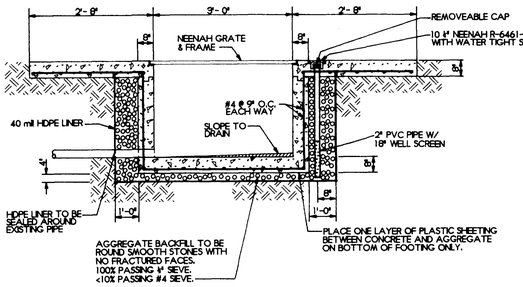
1991

DOWELL-SCHLUMBERGER
MAINTENANCE SHOP WASH WATER
COLLECTION & OIL/WATER TREATMENT SYSTEM
HOBBS, NEW MEXICO

INDEX	
01	SITE PLAN
02	TRENCH AND SOLIDS SEPARATOR LAYOUT
03	SOLIDS SEPARATOR
04	EQUIPMENT LAYOUT
05	MISCELLANEOUS DETAILS

RECEIVED
APR 27 1992
OIL CONSERVATION DIV.
SANTA FE

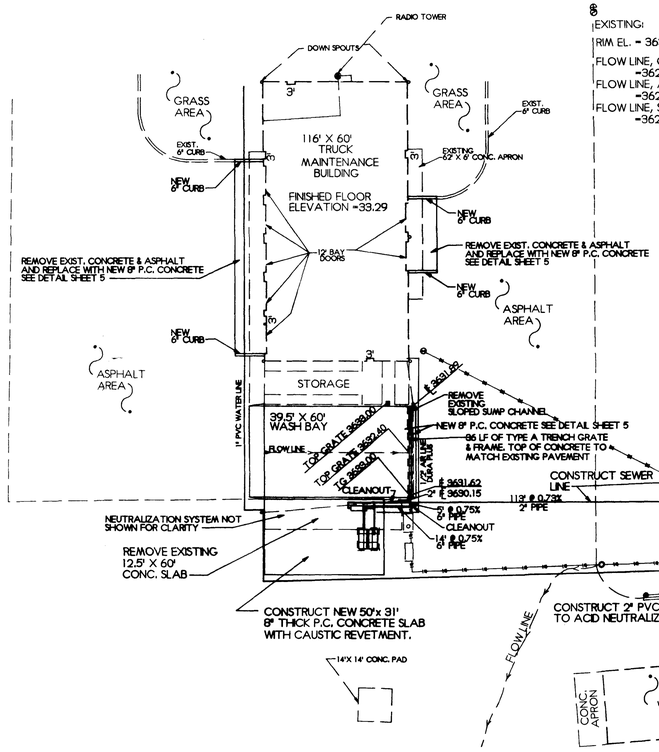
ENVIRONMENTAL
ENGINEERING
CONSULTANTS, INC
311 S. DUCK STREET STILLWATER, OK 74074
405 - 377-5558



ACID DOCK SUMP INLET DETAIL

NTS

COAT EXPOSED CONCRETE WITH OVERCOAT INDUSTRIAL FLOORING. DRIVING SLAB COATING TO BE 1/4" THICK. SUMP WALLS & BOTTOM TO BE 1/8" THICK.



SCALE: 1"=30'

LEGEND:

- WATER VALVE
- WATER METER
- GAS VALVE
- GAS METER
- WATER PUMP
- SEWER CLEAN OUT
- POWER POLE
- PIPE BOLLARD
- SEWER MAN HOLE
- CABLE FENCE — CX —
- CHAIN LINK FENCE — X —
- SUMP LINE
- SEWER LINE
- GAS LINE
- WATER LINE

REV.	DESCRIPTION	DATE

SITE SURVEY AND EXISTING FEATURES PREPARED BY:

PETTIGREW and ASSOCIATES, P.A.
1110 N. GRIMES HOBBS, NEW MEXICO
(505)393-9827

DRAWN BY: BRECK A. SNEED
APPROVED BY: GREG NAUERT
DATE: NOVEMBER 27, 1991
REVISION: A

DOWELL-SCHLUMBERGER
MAINTENANCE SHOP WASH WATER COLLECTION & OIL/WATER TREATMENT SYSTEM
HOBBS, NEW MEXICO

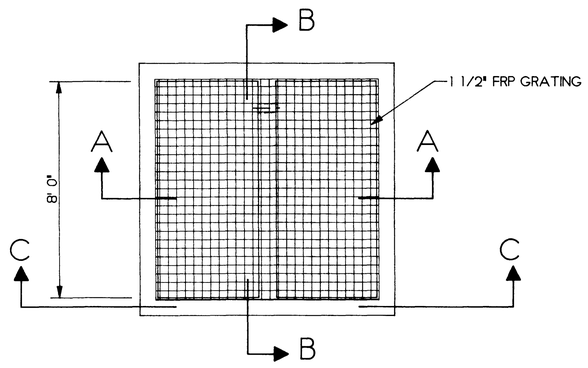
SCALE 1"=30'	APPROVED BY:	DRAWN BY: TBH
DATE 11 DEC. '91		REVISED

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC
311 S. DUCK STREET
STILLWATER, OK 74074

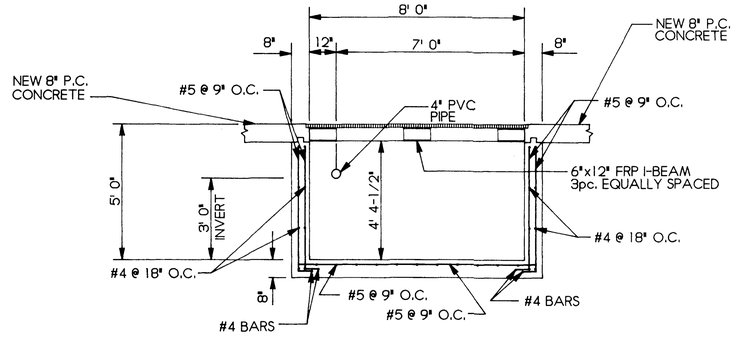
SITE PLAN

DRAWING NO. 1 OF 5


6' CURB
NEW 6' CURB
116' X 60' TRUCK MAINTENANCE BUILDING
FINISHED FLOOR ELEVATION =33.29
REMOVE EXISTING 82'x 12' ASPHALT & CONC. AND REPLACE WITH NEW 8" P.C. CONCRETE. SEE DETAIL SHEET 5
12' BAY DOORS
EXISTING 62' X 6' CONC. APRON
NEW 6" CURB
REMOVE EXIST. 32'x 12' ASPHALT & CONCRETE AND REPLACE WITH NEW 8" P.C. CONCRETE SEE DETAIL SHEET 5
NEW 6" CURB
NEW 6" CURB
ASPHALT AREA
EXIST. CONC. SLAB & BLOCK WALL
4"
NEW 6" SLAB
DETAIL A
SCALE: 1"=10'
CALICHE AREA
REMOVE EXISTING LINE (NOT IN USE)
CONSTRUCT NEW MANHOLE
4" ℄ 3628.40
TOP RIM 3632.10
4" ℄ 3628.50
54' @ 0.73% 2" PIPE
FUTURE WASH BAY
60' @ 0.73% 2" PIPE
CX
STORAGE
FORM 4" WIDE TRENCH TO DRAIN SEE DTL. A THIS SHT.
PWR POLE
℄ 3632.52
3633.30 EXISTING
REMOVE EXISTING SLOPED SUMP CHANNEL
3633.6
MATCH EXISTING
CONSTRUCT NEW 6" PC CONCRETE SLAB IN WASHBAY. SEE DTL SHEET 5 PROTECT EAST BAY AND 5' OF WEST BAY WITH 1/4" OVERCOAT INDUSTRIAL FLOORING.
TOP SLAB 3633.00
3633.50
3633.00
TOP GRATE 3632.90
2' 0"
LIMITS OF OVERCOAT PROTECTIVE COATING
TOP NEW SLAB
FLOW LINE
36± LF OF ACCO DRAIN TYPE XHD-475.
TOP OF CONCRETE TO MATCH EXISTING PAVEMENT
3633.19 EXISTING
3633.6
EXISTING 39.5' X 60' WASH BAY
6'
3632.90
TOP GRATE 3632.90
CAUTION: OVERHEAD POWER LINES THIS AREA
℄ 3632.30
3633.06 EXISTING
3633.6
MATCH EXISTING
OIL/WATER SEPERATOR SYSTEM
3633.50
EXISTING PWR POLE
5' @ 0.75% 6" PIPE
EXIST. CONC. BLOCK WALL
CLEANOUT ℄ 3632.26
113' @ 0.73% 2" PIPE
2" VALVE WITH VALVE BOX
STUB FOR FUTURE LINE TO WASH BAY
2"x 2"x 2" TEE
2" VALVE AND PLUG WITH VALVE BOX
CAUTION: OVERHEAD POWER LINES THIS AREA
ACID NEUTRALIZATION SYSTEM NOT SHOWN FOR CLARITY
8' 0"
AIR
2" ℄ 3630.15
20' @ 0.75% 6" PVC PIPE
PWR POLE
REMOVE EXISTING 12.5' X 60' CONC. SLAB
3' 1"
2' 0"
10' 2"
50'
TOP CONC. 3633.00
6" ℄ 3631.47
TOP CONC. 3632.75
6" ℄ 3632.00
T.O.S. EL. 3628.04 AT SUMP FLOOR
TOP CONC. 3633.04 NEXT TO SUMP
TOP CONC. 3632.75
3633.00
CONSTRUCT NEW 8" P.C. CONCRETE SLAB SEE DETAIL SHEET 4.
2" PVC PIPE
CALICHE AREA
REV. | DESCRIPTION | DATE
SITE SURVEY AND EXISTING FEATURES PREPARED BY:
PETTIGREW and ASSOCIATES, P.A.
1110 N. GRIMES HOBBS, NEW MEXICO
1(505)393-9827
DRAWN BY: BRECK A. SNEED
APPROVED BY: GREG NAUERT
DATE: NOVEMBER 27, 1991
REVISION: A
DOWELL-SCHLUMBERGER
MAINTENANCE SHOP WASH WATER
COLLECTION & OIL/WATER TREATMENT SYSTEM
HOBBS, NEW MEXICO
SCALE 1"=10'
APPROVED BY:
DRAWN BY: TBH
DATE 11 DEC. '91
REVISED
ENVIRONMENTAL ENGINEERING CONSULTANTS, INC
311 S. DUCK STREET
STILLWATER, OK 74074
TRENCH AND SOLIDS SEPARATOR LAYOUT
DRAWING NO. 2 OF 5



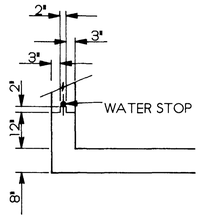
SOLID SEPARATOR PLAN



SECTION B-B

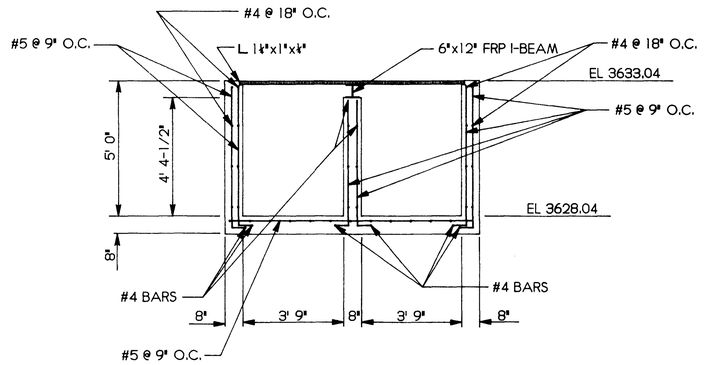
NOTE:

COAT FLOOR & WALLS WITH OVERKOTE PROTECTIVE SYSTEM 1/8" THICK. EXTEND COATING 1' AROUND ON TOP OF SLAB.

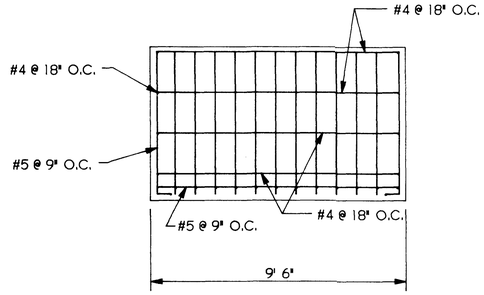


CONSTRUCTION JOINT

REINFORCING STEEL NOT SHOWN FOR CLARIFIER



SECTION A-A



SECTION C-C

DOWELL-SCHLUMBERGER

MAINTENANCE SHOP WASH WATER
COLLECTION & OIL/WATER TREATMENT SYSTEM
HOBBS, NEW MEXICO

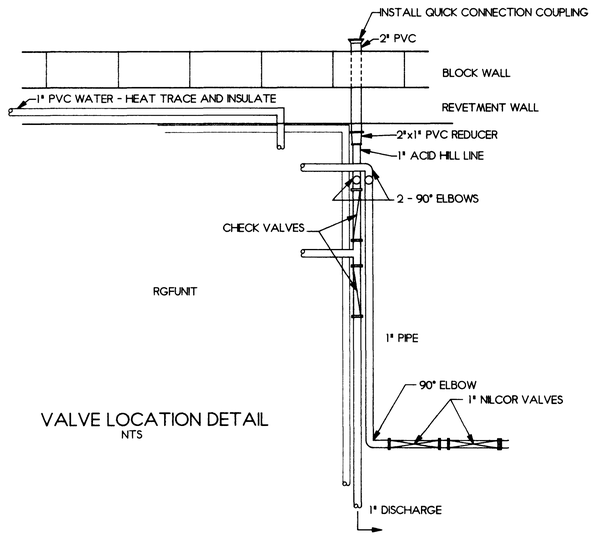
SCALE 3/8"=1'	APPROVED BY:	DRAWN BY: TBH
DATE 10 DEC. '91		REVISED

REV.	DESCRIPTION	DATE

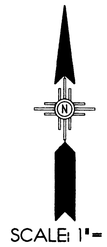
ENVIRONMENTAL ENGINEERING CONSULTANTS, INC
311 S. DUCK STREET
STILLWATER, OK 74074

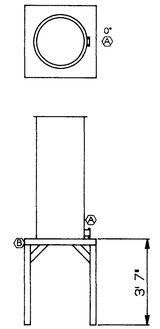
SOLIDS SEPARATOR

DRAWING NO. 3 OF 5



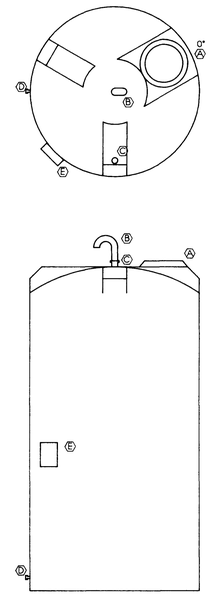
VALVE LOCATION DETAIL
NTS





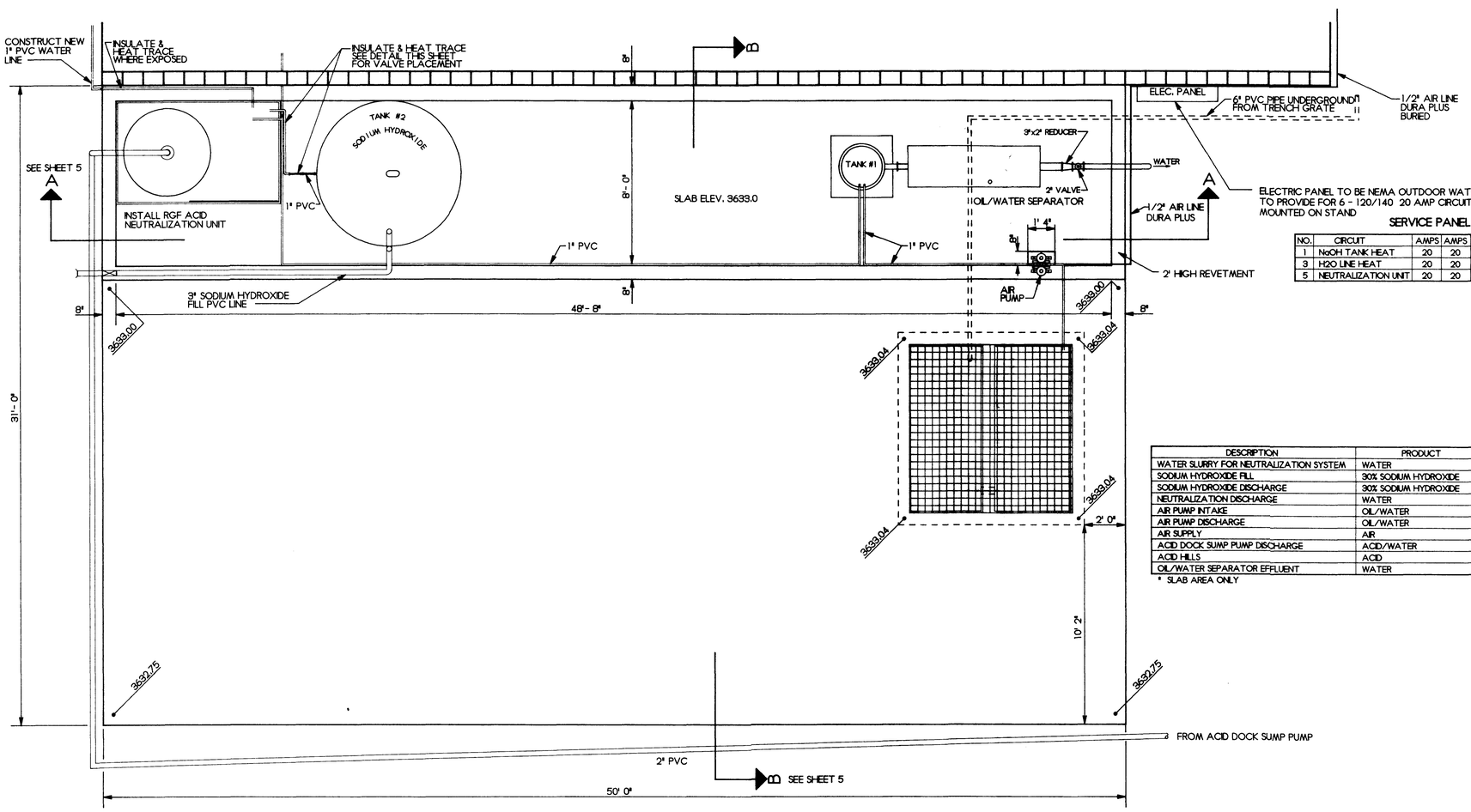
TANK #1 100 GALLON POLYETHYLENE OPEN TOP

MK	NO.	SIZE	FITTING	DEG	ELEV
A	1	3"	OUTLET, FLANGED AND GUSSETTED	0°	3"
B	1		TANK STAND PER TANK MANUFACTURER		



TANK # 2 4,000 GALLON POLYETHYLENE CLOSED TOP

MK	NO	SIZE	FITTING	DEG	ELEV
A	1	19"	MANWAY WITH COVER AND GASKET	0°	TOP
B	1	3"	VENT, FLANGED AND GUSSETTED	CENT.	TOP
C	1	3"	FILL, FLANGED AND GUSSETTED	120°	TOP
D	1	1"	OUTLET, FLANGED AND GUSSETTED	210°	6"
E	1		HEAT CONTROLS	165°	5'-2"



SERVICE PANEL

NO.	CIRCUIT	AMPS	AMPS	CIRCUIT	NO.
1	NaOH TANK HEAT	20	20	NaOH LINE	2
3	H2O LINE HEAT	20	20	LIGHTING	4
5	NEUTRALIZATION UNIT	20	20	CONTROLS	6

EQUIPMENT SCHEDULE

ITEM	MANUFACTURER
NEUTRALIZATION SYSTEM	RGF
OIL/WATER SEPARATOR	NAUTUS, INC.
20 GPM AIR DIAPHRAGM PUMP	SANDPIPER
TANK #1 100 GAL POLYETHYLENE	POLY PROCESSING CO.
TANK #2 4000 GAL INSULATED & HEAT TRACED, CLOSED TOP	POLY PROCESSING CO.

PIPING SCHEDULE

DESCRIPTION	PRODUCT	SIZE	MATERIAL	INSULATED & HEAT TRACED	BALL VALVES	CHECK VALVES	REDUCERS	90° BENDS
WATER SLURRY FOR NEUTRALIZATION SYSTEM	WATER	1"	PVC SCHEDULE 40	WHERE EXPOSED				3
SODIUM HYDROXIDE FILL	30% SODIUM HYDROXIDE	3"	PVC SCHEDULE 40		1			4
SODIUM HYDROXIDE DISCHARGE	30% SODIUM HYDROXIDE	1"	PVC SCHEDULE 40	ENTIRE LENGTH	2			3
NEUTRALIZATION DISCHARGE	WATER	1"	PVC SCHEDULE 40	ENTIRE LENGTH		1		5
AIR PUMP INTAKE	OIL/WATER	1"	PVC SCHEDULE 40	ENTIRE LENGTH				3
AIR PUMP DISCHARGE	OIL/WATER	1"	PVC SCHEDULE 40	ENTIRE LENGTH				4
AIR SUPPLY	AIR	1/2"	DURA LINE PLUS	NO				5
ACID DOCK SUMP PUMP DISCHARGE	ACID/WATER	1"	PVC SCHEDULE 40	WHERE EXPOSED				4
ACID HILLS	ACID	2"-1"	PVC SCHEDULE 40	NO		1	1 - 2"x1"	2
OIL/WATER SEPARATOR EFFLUENT	WATER	2"	PVC SCHEDULE 40	WHERE EXPOSED	1		1 - 3"x2"	2

* SLAB AREA ONLY

REV.	DESCRIPTION	DATE

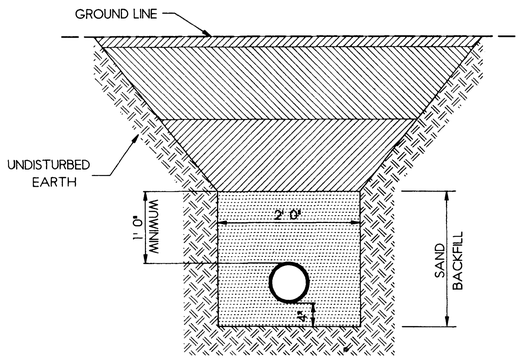
DOWELL-SCHLUMBERGER
MAINTENANCE SHOP WASH WATER
COLLECTION & OIL/WATER TREATMENT SYSTEM
HOBBS, NEW MEXICO

SCALE	APPROVED BY:	DRAWN BY:
1"= 3'		TBH
DATE 1 APRIL '92		REVISED

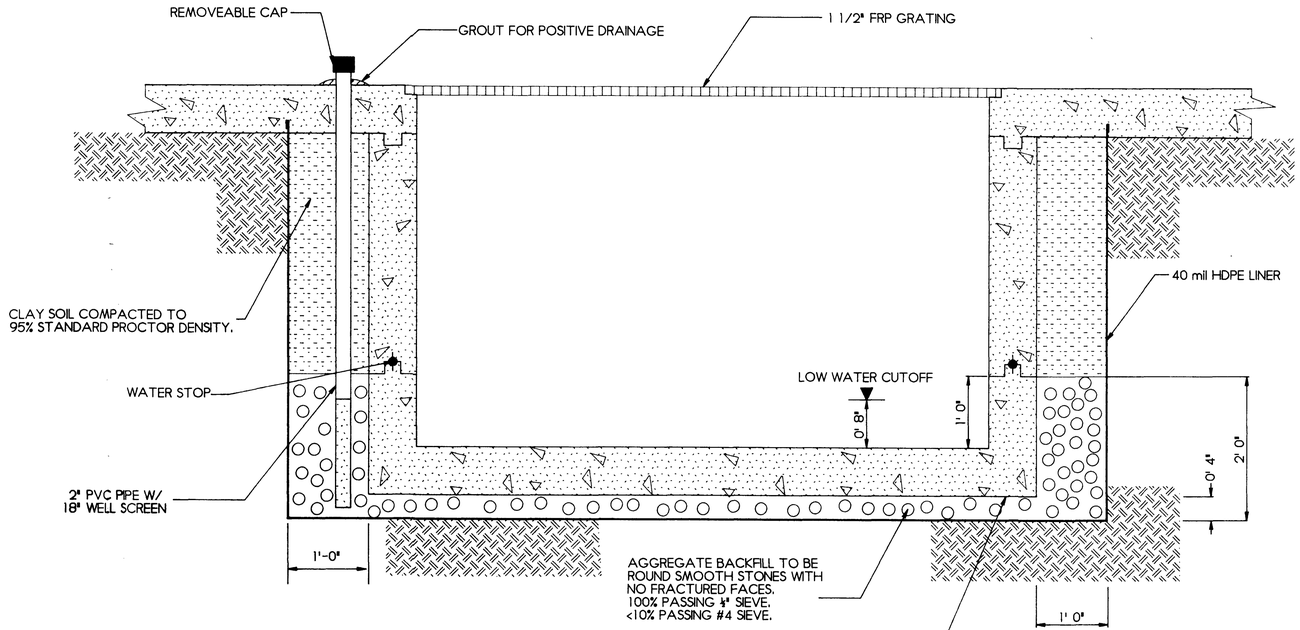
ENVIRONMENTAL ENGINEERING CONSULTANTS, INC
311 S. DUCK STREET
STILLWATER, OK 74074

EQUIPMENT LAYOUT

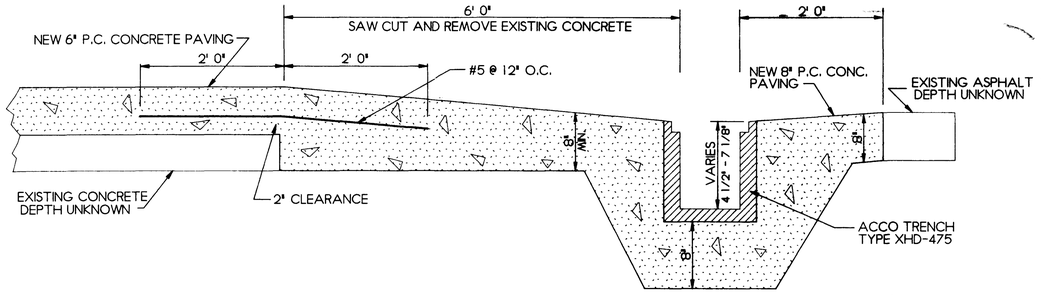
DRAWING NO. 4 OF 5



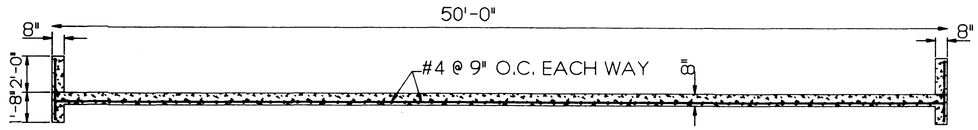
TRENCH CROSS-SECTION



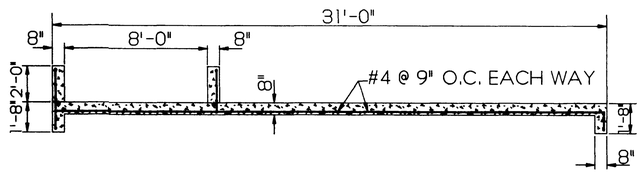
SECONDARY CONTAINMENT DETAILS



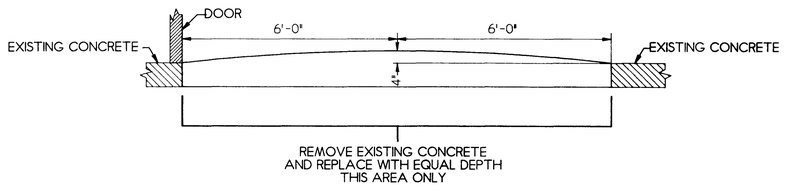
WASH BAY TRENCH SECTION



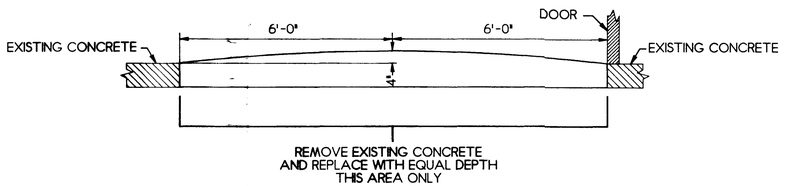
SECTION A-A
8" CONC. SLAB
FROM SHEET 4
1"=4'-0"



SECTION B-B
8" CONC. SLAB
FROM SHEET 4
1"=4'-0"



SPILL CONTAINMENT BARRIER
EAST OF SHOP



SPILL CONTAINMENT BARRIER
WEST OF SHOP

REV.	DESCRIPTION	DATE

DOWELL-SCHLUMBERGER

MAINTENANCE SHOP WASH WATER
COLLECTION & OIL/WATER TREATMENT SYSTEM
HOBBS, NEW MEXICO

SCALE 1"=1'	APPROVED BY:	DRAWN BY: PWH
DATE 10 DEC. '91		REVISED

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC
311 S. DUCK STREET
STILLWATER, OK 74074

MISCELLANEOUS DETAILS

DRAWING NO. 5 OF 5

BID DOCUMENT AND SPECIFICATIONS FOR RESURFACE WASH BAY AND INSTALL OIL AND WATER SEPERATOR WITH COLLECTION SYSTEM

PREPARED FOR
DOWELL SCHLUMBERGER
HOUSTON, TEXAS

APRIL 1992

ENVIRONMENTAL
ENGINEERING
CONSULTANTS, INC.

311 S. DUCK
STILLWATER, OK 74074
405-377-5558

CONTENTS

CONTENTS (continued)

SECTION 00020

NOTICE TO BIDDERS

Dowell-Schlumberger will receive sealed bids at the office at 1105 W. Bender Blvd., Hobbs, NM 88240 until 5:00 pm on the 30th day of April, 1992 for the Construction of:

Resurface Wash By and Install Oil/Water Seperator With Collection System

A pre bid conference will be held at the site on April 21, 1992 at 10:00 am. Bids shall be made in accordance with Notice to Bidders, Instruction to Bidders, General Conditions, Supplementary Conditions, Plans, Specifications, and Form.

Bids filed with the Engineer shall be privately opened and considered by the Owner and Engineer.

A Performance Bond, Payment Bond and Defect Bond in the amount of 100% of the contract price will be required for the faithful performance of the General Construction Contract, and the bidder shall state in the proposal the name and address of the surety of sureties who will sign this bond in case the contract is awarded to him.

The Owner reserves the right to reject any and all bids and waive any informalities or irregularities therein.

Bids and affidavits must be filed in sealed envelopes within the time limit for receiving proposals as stated herein. Each envelope shall bear a legible notation thereon, "Proposal", and name or project.

Monty Karns

Monty Karns, P.E.
Environmental Engineering Consultants, Inc.
Engineer for Dowell-Schlumberger

SECTION 00110

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS

Terms used in these Instructions to Bidders which are defined in the Standard General Conditions of the Construction Contract (No. 1910-8, 1983 ed.) have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to Owner, as distinct from a sub-bidder, who submits a bid to a Bidder. The term "Successful Bidder" means the lowest, qualified, responsible and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award. The term "Bidding Documents" includes the Advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

2. COPIES OF BIDDING DOCUMENTS

2.1 Complete sets of the Bidding Documents in the number and for the cost stated in the Advertisement or Invitation to Bid may be obtained from Engineer.

2.2 Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.3 Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

3. QUALIFICATIONS OF BIDDERS

To demonstrate qualifications to perform the Work, each Bidder must submit with the Bid a completed, executed, and notarized copy of AIA Document A305, Contractor's Qualification Statement, supplement as necessary by attaching written evidence, such as financial data, previous experience, present commitments and other such data as may be necessary. Each Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the contract. Each Bidder must submit with the Bid a completed, executed, and notarized copy of Section 00412, Supplementary Questionnaire.

4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

4.1 It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with local conditions that may affect cost, progress, performance or furnishing of the Work, (c) consider federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the

Work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors or discrepancies in the Contract Documents.

4.2 Reference is made to the Supplementary Conditions and Section 00200 Information Available to Bidders for identification of:

4.2.1 Subsurface Explorations and Reports: None relied on.

4.2.2 those drawings of physical conditions in or relating to existing surface and subsurface conditions (except Underground Facilities) which are at or contiguous to the site which have been utilized by Engineer in preparation of the Contract Documents. Bidder may rely upon the accuracy of the technical data contained in such drawings but not upon the completeness thereof for the purposes of bidding or construction.

Copies of such reports and drawings will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the technical data contained therein upon which Bidder is entitled to rely as provided in Paragraphs 4.2.1 and 4.2.2 are incorporated therein by reference. Such technical data has been identified and established in Section 00200.

4.3 Before submitting a Bid each Bidder will be responsible to make or obtain such explorations, tests and data concerning physical conditions (surface, subsurface and Underground Facilities) at or contiguous to the site, or otherwise which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

4.4 On request in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations.

4.5 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

5. INTERPRETATIONS AND ADDENDA

5.1 All questions about the meaning or intent of the Contract Documents are to be directed to Engineer. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than ten days prior to

the date for opening of Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

5.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner or Engineer.

6. BID SECURITY

6.1 Each Bid must be accompanied by Bid security made payable to Owner in an amount of five percent of the Bidder's maximum Bid price and in the form of a certified or bank check or a Bid Bond (on AIA Document A310) issued by a surety meeting the requirements of Paragraph 5.1 of the General Conditions.

6.2 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within fifteen days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the seventh day after the Effective Date of the Agreement or the forty-sixth day after the Bid opening, whereupon Bid security furnished by such Bidders will be returned. Bid security with Bids which are not competitive will be returned within seven days after the Bid opening.

7. CONTRACT TIME

The numbers of days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment (the Contract Time) are set forth in the Bid Form and the Agreement.

8. SUBSTITUTE OR "OR-EQUAL" ITEMS

The Contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible subsitute or "or-equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement. The procedure for submission of any such application by Contractor and consideration by Engineer is set forth in Paragraphs 6.7.1, 6.7.2 and 6.7.3 of the General Conditions and may be supplemented in the General Requirements (Division 1).

9. SUBCONTRACTORS, SUPPLIERS AND OTHERS

9.1 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers and other persons and organizations (including those who are to furnish the principal items of material and equipment) to be submitted to Owner prior to the Effective Date of the Agreement, the apparent

Successful Bidder, and any other Bidder so requested, shall within seven days after the Bid opening submit to Owner a list of all such Subcontractors, Suppliers and other persons and organizations proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, person or organization if requested by Owner. If Owner or Engineer after due investigation has reasonable objection to any proposed Subcontractor, Supplier, other person or organization, either may before the Notice of Award is given request the apparent Successful Bidder to submit an acceptable substitute without an increase in Bid price.

If apparent Successful Bidder declines to make any such substitution, Owner may award the contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers and other persons and organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, Supplier, other person or organization listed and to whom Owner or Engineer does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.8.2 of the General Conditions.

9.2 No Contractor shall be required to employ any Subcontractor, Supplier, other person or organization against whom Contractor has reasonable objection.

10. BID FORM

10.1 The Bid Form is included with the Bidding Documents; additional conformed copies may be made by the Bidder.

10.2 All blanks on the Bid Form must be completed in ink or by typewriter.

10.3 Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.

10.4 Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.

10.5 All names must be typed or printed below the signature.

10.6 The Bid shall contain an acknowledgement of receipt of all Addenda (the numbers of which must be filled in on the Bid Form).

10.7 The address and telephone number for communications regarding the Bid must be shown.

11. SUBMISSION OF BIDS

11.1 Bids shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope, marked with the Project title and name and address of the Bidder and accompanied by the Bid security and other required documents. If the Bid is sent through the mail or other delivery system the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it.

11.2 The Bid Form and required attachments shall be submitted in the number of copies stated in the Advertisement or Invitation to Bid (Notice to Bidders). All copies shall be conformed copies made by the Bidder (at his expense) from the Bidding Documents furnished to Bidder.

11.3 The following items shall be completed, executed, notarized (if required) and attached to and accompany the Bid Form:

~~A. Bid Security or Bid Bond~~

B. Contractor's Qualification Statement (AIA Document A305)

C. Supplementary Questionnaire (Section 00412)

D. Anti-Collusion Affidavit (Section 00480)

E. Business Relationships Affidavit (Section 00481)

11.4 Any Bid received more than 96 hours (excluding Saturdays, Sundays, and holidays) before the time set for opening of bids, or any bid so received after the time set for opening of bids shall not be considered and shall be returned unopened.

12. MODIFICATION AND WITHDRAWAL OF BIDS

12.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

12.2 If, within twenty-four hours after Bids are opened, any Bidder files a duly signed, written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid and the Bid security will be returned. Thereafter, that Bidder will be disqualified from further bidding on the Work to be provided under the Contract Documents.

13. OPENING OF BIDS

Bids will be opened and (unless obviously non-responsive) read aloud publicly. An abstract of the amounts of the base Bids and alternates will be made available to Bidders after the opening of Bids.

14. BIDS TO REMAIN SUBJECT TO ACCEPTANCE

All bids will remain subject to acceptance for forty-five days after the day of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to that date.

15. DISQUALIFICATION OF BIDDERS

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

15.1.1 More than one proposal for the same work from an individual, company, partnership, or corporation under the same or different names.

15.1.2 Evidence of collusion among bidders. Participants in such collusion will receive no recognition as bidders for any future work of the City.

15.1.3 Unbalanced proposals in which the prices for some items are out of proportion to the prices for other items.

15.1.4 Failure to submit a unit price for each item of work listed in the proposal.

15.1.5 Lack of responsibility as shown by past work for the City, judged from the standpoint of workmanship and progress.

15.1.6 Uncompleted work which, in the judgment of the City, might hinder or prevent the prompt completion of additional work if awarded.

15.1.7 For being in arrears on existing contracts, in litigation with the City, or having defaulted on a previous contract or failure to comply with any qualification regulations of the City.

15.1.8 Lengthy history of litigation or arbitration with Owners and/or Architect/Engineers.

16. AWARD OF CONTRACT

16.1 Owner reserves the right to reject any and all Bids, to waive any and all informalities not involving price, time or changes in the Work and to negotiate contract terms with the Successful Bidder, and the right to disregard all nonconforming, nonresponsive, unbalanced or conditional Bids. Also, Owner reserves the right to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner. Discrepancies in the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

16.2 In evaluating the Bids, Owner will consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

16.3 Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. Owner also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

16.4 Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid to establish the responsibility, qualifications and financial ability of Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

16.5 If the contract is to be awarded, it will be awarded to the lowest Bidder whose evaluation by Owner indicates to Owner that the award will be in the best interests of the Project.

16.6 If the contract is to be awarded, the basis for award with regard to the Base bid and alternates will be as follows:

No Award

Base Bid

Base Bid plus one or more alternates

Base Bid plus all alternates

All alternates are additive alternates.

16.7 If the contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within forty-five days after the day of the Bid opening.

17. CONTRACT SECURITY

Paragraph 5.1 of the General Conditions and the Supplementary Conditions set forth Owner's requirements as to performance, payment, and defect Bonds. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by the required performance, payment, and defect Bonds.

18. SIGNING OF AGREEMENT

When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within fifteen days thereafter Contractor shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds. Within ten days thereafter Owner shall deliver one fully signed counterpart to Contractor. Each counterpart is to be accompanied by a complete set of the Drawings with appropriate identification.

19. RETAINAGE

Provisions concerning retainage and Contractors' rights to deposit securities in lieu of retainage (if permitted) are set forth in the Agreement.

"END OF SECTION"

SECTION 00310

BID FORM

NAME OF BIDDER: _____

PROJECT IDENTIFICATION:

RESURFACE WASH BAY AND INSTALL OIL AND WATER SEPERATOR
WITH COLLECTION SYSTEM AND NEUTRALIZATION SYSTEM
HOBB, NM

THIS BID IS SUBMITTED TO:

DOWELL-SCHLUMBERGER
1105 W. BENDER BLVD.
HOBBS, NM 88240

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to complete all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the Contract Documents.

2. BIDDER accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid Security. This Bid will remain open for forty-five days after the day of Bid opening. BIDDER will sign the Agreement and submit the Contract Security and other documents required by the Contract Documents within fifteen days after the date of OWNER'S Notice of Award.

3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

A. BIDDER has examined copies of all the Contract Documents and of the following addenda (receipt of all of which is hereby acknowledged):

Date	Number

B. BIDDER has familiarized itself with the nature and extent of the Contract Documents. Work, site, locality, and all local conditions and Laws and Regulations, that in any manner may affect cost, progress, performance or furnishing of the Work.

C. BIDDER has studied carefully all reports and drawings of subsurface conditions and drawings of physical conditions which are identified in the Section 00200, and paragraph SC 4.2 of the Supplementary Conditions as provided in paragraph 4.2 of the General Conditions, and accepts the determination set forth in Section 00200 of the extent of the technical data contained in such reports and drawings upon which BIDDER is entitled to rely.

D. BIDDER has obtained and carefully studied (or assumes responsibility of obtaining and carefully studying) all such examinations, investigations, explorations, tests and studies (in addition to or to supplement those referred to in (c) above) which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as BIDDER considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports or similar information or data are or will be required by BIDDER for such purposes.

E. BIDDER has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examination, investigations explorations, tests, reports or similar information or data in respect of said Underground Facilities are or will be required by BIDDER in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.

F. BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

G. BIDDER has given Engineer written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to BIDDER.

H. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or a corporation to retrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

4. BIDDER will complete the Work for the following prices:

Base Bid

Shall include the Construction of the Facility, Furnishing of all materials and equipment, except equipment noted to be furnished by Owner in the Specification and Installation of all equipment including equipment furnished by the Owner.

Lump Sum _____ ($_____
(use words) (figures)

5. BIDDER agrees that the Work:

will be substantially completed within 90 calendar days after the date when the Contract Time commences to run as provided in paragraph 2.3 of the General Conditions, and completed and ready for final payment within 120 calendar days after the date when the Contract Time commences to run.

6. If BIDDER is awarded this work, Performance, Statutory and Defect Bonds will be provided by the following surety:

_____
Name of Surety

_____
Address of Surety

7. The following documents are attached to and made a condition of this Bid:

B. Required Bidders Qualification Statement (AIA Document A305) with supporting data.

C. Supplementary Questionnaire (Section 00412)

D. Business Relationships Affidavit (Section 00481)

8. Communications concerning this bid shall be addressed to:

Environmental Engineering Consultants, Inc. ATTN: Monty Karns
311 S. Duck
Stillwater, OK 74074
(405) 377-5558

9. The terms used in this Bid which are defined in the General Conditions of the Construction Contract included as part of the contract Documents have the meanings assigned to them in the General Conditions.

SUBMITTED ON _____, 19____

If Bidder is:

An Individual

By _____ (SEAL)
(Individual's Name)

doing business as _____

Business Address: _____

_____

Phone No: _____

A Partnership

By _____
(Firm Name)

_____
(General Partner)

Business Address: _____

_____

Phone No: _____

A Corporation

By _____
(Corporation Name)

_____
(State of Incorporation)

By _____
(Name of Person Authorized to Sign)

_____
(Title)

(Corporate Seal)

Attest _____
(Secretary)

Business Address: _____

_____

Phone No: _____

A Joint Venture

By _____
(Name)

_____
(Address)

By _____
(Name)

_____
(Address)

(Each joint venturer must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above).

"END OF SECTION"

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A305

Contractor's Qualification Statement

Required in advance of consideration of application to bid or as a qualification statement in advance of award of contract. Approved and recommended by The American Institute of Architects and the Associated General Contractors of America.

The Undersigned certifies under oath the truth and correctness of all statements and of all answers to questions made hereinafter.

SUBMITTED TO:

Corporation ☐
Partnership ☐
Individual ☐
Joint Venture ☐
Other

SUBMITTED BY:
NAME:
ADDRESS:
PRINCIPAL OFFICE:

(Note: Attach Separate Sheets As Required)

1.0 How many years has your organization been in business as a general contractor?
2.0 How many years has your organization been in business under its present business name?
3.0 If a corporation answer the following:
- 3.1 Date of incorporation:
- 3.2 State of incorporation:
- 3.3 President's name:
- 3.4 Vice-president's name(s):

- 3.5 Secy's or Clerk's name:
- 3.6 Treasurer's name:

4.0 If individual or partnership answer the following:

4.1 Date of organization:

4.2 Name and address of all partners. (State whether general or limited partnership.):

5.0 If other than corporation or partnership, describe organization and name principals:

6.0 We normally perform % of the work with our own forces. List trades below:

7.0 Have you ever failed to complete any work awarded to you? If so, note when, where, and why:

8.0 Has any officer or partner of your organization ever been an officer or partner of another organization that failed to complete a construction contract? If so, state circumstances:

9.0 List name of project, owner, architect, contract amount, percent complete and scheduled completion of the major construction projects your organization has in process on this date:

10.0 List the name of project, owner, architect, contract amount, date of completion, percent of work with own forces of the major projects your organization has completed in the past five years:

11.0 List the construction experience of the principal individuals of your organization:

12.0 List states and categories in which your organization is legally qualified to do business:

13.0 Trade References:

14.0 Bank References:

15.0 Name of Bonding Company and name and address of agent:

16.0 Attach Statement of Financial Conditions, including Contractor's latest regular dated financial statement or balance sheet which must contain the following items:

Current Assets: (Cash, joint venture accounts, accounts receivable, notes receivable, accrued interest on notes, deposits, and materials and prepaid expenses), net fixed assets and other assets.

Current Liabilities: (Accounts payable, notes payable, accrued interest on notes, provision for income taxes, advances received from owners, accrued salaries, accrued payroll taxes), other liabilities, and capital (capital stock, authorized and outstanding shares par values, earned surplus).

Date of statement or balance sheet:

Name of firm preparing statement:

17.0 Dated at

this day of 19

Name of Organization:

By:
Title:

18.0

M being duly sworn deposes and says that he (she) is

the of , Contractor(s)

and that answers to the foregoing questions and all statements therein contained are true and correct.

Subscribed and sworn before me this day of 19

Notary Public:

My Commission Expires:

SECTION 00412

SUPPLEMENTARY QUESTIONNAIRE

SUBMITTED TO (OWNER): _____

ADDRESS: _____

SUBMITTED BY (BIDDER): _____

NAME: _____

ADDRESS: _____

1.0 For all projects your organization has in process, or has completed in the past five years, list all projects on which litigation or arbitration with the owner of such projects and/or architect-engineer of such projects is pending, or has been settled, or for which a final judgment has been entered, giving full details of all such litigation or arbitration for each project. If none, so state: (Attach separate sheets as required)

2.0 Dated at _____

this _____ day of _____, 19____.

BIDDER: _____

By: _____

Title: _____

3.0

M_____ being duly sworn deposes and says that he/she is the _____ (TITLE) of _____ (FIRM), Contractor(s), and that answers to the foregoing questions and all statements therein contained are true and correct.

Subscribed and sworn before me this _____ day of _____, 19____.

Notary Public: _____

My Commission Expires: _____, 19____.

"END OF SECTION"

SECTION 00481

BUSINESS RELATIONSHIPS AFFIDAVIT

STATE OF _____)
) ss.
COUNTY OF _____)

_____, of lawful age, being first duly sworn, on oath says that he is the agent authorized by the bidder to submit the attached bid. Affiant further states that the nature of any partnership, joint venture, or other business relationship presently in effect or which existed within one (1) year prior to the date of this statement with the architect, engineer, or other party to the project is as follows:

_____

Affiant further states that any such business relationship presently in effect or which existed within one (1) year prior to the date of this statement between any officer or director of the bidding company and any officer or director of the architectural or engineering firm or other party to the project is as follows:

_____

Affiant further states that the names of all persons having any such business relationships and the positions they hold with their respective companies or firms are as follows:

_____

(If none of the business relationships hereinabove mentioned exist, affiant should so state.)

_____
Name of Bidder

By_____

Subscribed and sworn to before me this _____ day of _____, 19___.

_____
Notary Public

My Commission Expires:

_____

SECTION 00510

AGREEMENT

THIS AGREEMENT is dated as of the 24 day of December in the year 1992 by and between

Dowell Schlumberger
(hereinafter called OWNER) and

Canam Construction Co., Inc.
(hereinafter called CONTRACTOR)

OWNER AND CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

Article 1. WORK.

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Construction and installation of equipment for a catagory 2 standard acid module

Article 2. ENGINEER.

The Project has been prepared by Environmental Engineering Consultants, Inc., who is hereinafter called ENGINEER and who will assume all duties and responsibilities and will have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

Article 3. CONTRACT TIME.

3.1 The Work will be substantially completed on or before May 1, 1992, and completed and ready for final payment in accordance with paragraph 14.13 of the General Conditions on or before June 1, 1992.

Article 4. CONTRACT PRICE.

4.1 OWNER shall pay CONTRACTOR for performance of the Work in accordance with the Contract Documents in current funds as follows:

Three Hundred Twelve Thousand Dollars, ($312,000)

Article 5. PAYMENT PROCEDURES.

Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. applications for Payment will be processed by ENGINEER as provided in the General Conditions.

5.1 Progress Payments. OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment as recommended by ENGINEER, during construction as provided below. All progress payments will be on the basis of the progress of the Work measured by the schedule of values provided for in paragraph 14.1 of the General Conditions. Contractor shall submit application for payment on or about the 30th Day of each Month. Payment time is typically 6 weeks after submittal of application for payment.

5.1.1 Prior to completion of work in excess of 50% of the contract price, progress payments will be an amount equal to:

Ninety percent of the Work completed, and

One Hundred percent of materials and equipment not incorporated in the Work but delivered and suitably stored, less in each case the aggregate of payments previously made.

5.1.2 Upon completion of a minimum of 50% of the contract price in work completed, and upon a determination by the ENGINEER that satisfactory progress is being made, and upon approval by the Contractor's surety, progress payments will be in an amount equal to:

Ninety-Five percent of the Work completed, and

One Hundred percent of the materials and equipment not incorporated in the Work but delivered and suitably stored, less in each case the aggregate of payments previously made.

5.1.3 The CONTRACT may from time to time withdraw any part, or the whole, of the amount which has been retained from progress payments upon depositing with the OWNER Securities as permitted by Title 61 Oklahoma Statutes Section 113.12

5.1.4 Upon Substantial Completion, OWNER shall pay an amount sufficient to increase total payments to CONTRACTOR to Ninety-Five percent of the Contract Price, less such amounts on ENGINEER shall determine in accordance with paragraph 14.7 of the General Conditions.

5.2 Final Payment. Upon final completion and acceptance of the Work in accordance with paragraph 14.13 of the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said paragraph 14.13.

Article 6. NOT USED

Article 7. CONTRACTOR'S REPRESENTATIONS.

In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

7.1 CONTRACTOR has familiarized himself with the nature and extent of the Contract Documents, Work locality, and with all local conditions and Laws and Regulations that in any manner may affect cost, progress or performance of the Work.

7.2 CONTRACTOR has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in paragraph 4.2 of the General Conditions, and accepts the determination set forth in Section 00200 of the extent of the technical data contained in such reports and drawings upon with CONTRACTOR is entitled to rely.

7.3 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examination, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in paragraph 7.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise CONTRACTOR considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.

7.4 CONTRACTOR has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies or similar

information or data in respect of said Underground Facilities are or will be required by CONTRACTOR in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.

7.5 CONTRACTOR has correlated the results of all such observations, examinations, investigations, tests, reports and data with the terms and conditions of the Contract Documents.

7.6 CONTRACTOR has given ENGINEER written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

Article 8. CONTRACT DOCUMENTS.

The Contractor Documents which comprise the entire agreement between OWNER and CONTRACTOR are attached to the Agreement, made a part hereof and consists of the following;

8.1 This Agreement.

8.2 Performance, Statutory, and Defect Bonds.

8.3 Notice of Award.

8.4 General Conditions.

8.5 Supplementary Conditions (Section 00810).

8.6 Specifications bearing the title Specifications for Resurface Wash Bay & Install Oil & Water Seperator With Collection System

consisting of sections as listed on the attached table of contents.

8.7 Drawings, consisting of sections as listed on the attached table of contents with each sheet bearing the following general title:

RESURFACE WASH BAY & INSTALL OIL & WATER
SEPERATOR WITH COLLECTION SYSTEM
HOBBS, NEW MEXICO

consisting of a cover sheet and sheets listed on the attached index.

8.8 Addenda numbers _____ to _____, inclusive.

8.9 CONTRACTOR's Bid (Attached).

8.10 Documentation submitted by CONTRACTOR prior to Notice of Award.

8.11 The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto; All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to paragraphs 3.4 and 3.5 of the General Conditions.

8.12 The documents listed in paragraphs 8.2 et seq. above are attached to this Agreement (except as expressly noted otherwise above).

There are no Contract Documents other than those listed above in this Article 8. The Contract Documents may only be amended, modified or supplemented as provided in paragraphs 3.4 and 3.5 of the General Conditions.

Article 9. MISCELLANEOUS.

9.1 Terms used in this Agreement which are defined in Article 1 of the General Conditions shall have the meanings indicated in the General Conditions.

9.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

9.3 OWNER and CONTRACTOR each binds himself, his partners, successors, assigns and legal representatives to the other party hereto, his partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

IN WITNESS WHEREOF, the parties hereto have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER, CONTRACTOR, and ENGINEER. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or by ENGINEER on their behalf.

This Agreement will be effective on the 27th day of December, 1991

OWNER	CONTRACTOR
By_____	By_____
Title_____	Title_____

(CORPORATE SEAL)

Attest_____

Title_____

Address for Giving Notices:

_____

_____

(CORPORATE SEAL)

Attest_____

Title_____

Address for Giving Notices:

_____

_____

STATE OF _____)
) ss.
COUNTY OF _____)

_____, of lawful age, being first duly sworn, on oath says that (s)he is the agent authorized by Contractor to submit the above contract to _____.
(OWNER)

Affiant further states that Contractor has not paid, given, or donated or agreed to pay, give or donate to any officer or employee of _____ any money or other thing of
(OWNER)
value, either directly or indirectly, in procuring of the contract.

Name of Contractor _____

Affiant's Signature _____

Title _____

Subscribed and sworn to before me this _____ day of _____, 19____.

_____
Notary Public

My Commission Expires:

_____

SECTION 00610

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That _____,

as Principal, and _____,

a corporation organized under the laws of the State of _____

and authorized to transact business in the State of Oklahoma, as Surety, are held and firmly bound unto _____ in the penal sum of
(State or Other Entity)

_____ Dollars

($_____) in lawful money of the United States of America, for the payment of which, well and truly to be made, we bind ourselves and each of us, our heirs, executors, administrators, trustees, successors, and assigns, jointly and severally, firmly by these presents.

The condition of this obligation is such that:

WHEREAS, said Principal entered into a written Contract with _____, dated the _____ day of _____, 19___ for
(State or Other Entity)

_____

_____

all in compliance with the plans and specifications therefor, made a part of said Contract and on file in the office of _____

_____
(Name and Address of Agency)

NOW, THEREFORE, if said Principal shall, in all particulars, well, truly, and faithfully perform and abide by said Contract and each and every covenant, condition, and part thereof and shall fulfill all obligations resting upon said Principal by the terms of said Contract and said specifications; and if said

Principal shall protect and save harmless said _____
(State or Other Entity)

from any pecuniary loss resulting from the breach of any of the items, covenants and conditions of said contract resting upon said Principal, then this obligation shall be null and void, otherwise to be and remain in full force and effect.

It is further expressly agreed and understood by the parties hereto that no changes or alterations in said Contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the sureties, or any of them, from the obligations of this Bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers, and the said Surety has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its attorney-in-fact, duly authorized so to do, the day and year set forth below.

Dated this _____ day of _____, 19____.

PRINCIPAL

_____

By_____

ATTEST

_____

SURETY

_____

By_____
Attorney-in-Fact

SECTION 00620

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

That _____,

as Principal, and _____,

a corporation organized under the laws of the State of_____

Surety, as held and firmly bound unto_____
(State or Other Entity)

in the penal sum of_____

Dollars ($_____) in lawful money of the United States of America, for the payment of which, well and truly to be made, we bind ourselves and each of us, our heirs, executors, administrators, trustees, successors, and assigns, jointly and severally, firmly by these presents.

The condition of this obligation is such that:

WHEREAS, said Principal entered into a written Contractor with

_____ dated _____ day of _____, 19____, for

_____

_____

all in compliance with the plans and specifications therefor, made a part of said contract and on file in the Office of _____

_____
(Name and Address of Agency)

NOW, THEREFORE, if said Principal shall fail or neglect to pay all indebtedness incurred by said Principal or subcontractors of said Principal who perform work in the performance of such contract, for labor and materials and repairs to and parts of equipment used and consumed in the performance of said contract after the same becomes due and payable, the person, firm, or corporation entitled thereto may sue and recover on this bind, the amount so due and unpaid.

It is further expressly agreed and understood by the parties hereto that no changes or alterations in said Contract and no deviations form the plan or mode of procedure herein fixed shall have the effect of releasing the sureties, or any of them, form the obligations of this Bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers, and the said Surety has caused these presents to be executed in its name and its corporate seal and to be hereunto affixed by its attorney-in-fact, duly authorized so to do, the day and year set forth below.

Dated this _____ day of _____, 19____.

PRINCIPAL

_____

By_____
Title

ATTEST

_____

SURETY

_____

By_____
Attorney-in-Fact

SECTION 00640

DEFECT BOND

KNOW ALL MEN BY THESE PRESENTS:

That _____,

as Principal, and _____,

a corporation organized under the laws of the State of _____

and authorized to transact business in the State of Oklahoma, as Surety, are held and firmly bound unto _____ in the penal sum of

_____ Dollars ($_____)

in lawful money of the United States of America, said sum being equal to One Hundred Percent (100%) of the contract price, for the payment of which, well and truly to be made, we bind ourselves and each of us, our heirs, executors, administrators, trustees, successors, and assigns, jointly and severally, firmly by these presents.

The condition of this obligation is such that:

WHEREAS, said Principal entered into a written contract with

_____, dated the _____ day of _____, 19____ for
(State or other Entity)

_____

_____

all in compliance with the plans and specifications therefor, made a part of said contract and on file in the office of _____

_____.
(Name and Address of Agency)

NOW, THEREFORE, if said Principal shall pay or cause to be paid to _____ all damage, loss, and expense which may result
(State or Other Entity)

by reason of defective materials and/or workmanship in connection with said work, occurring within a period of one (1) year from and after the acceptance of said project by _____; then this obligation
(State or Other Entity)

shall be null and void, otherwise to be and remain in full force and effect.

It is further expressly agreed and understood by the parties hereto that no changes or alterations in said Contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the sureties, or any of them, from the obligations of this Bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers, and the said Surety has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its attorney-in-fact, duly authorized so to do, the day and year set forth below.

Dated this _____ day of _____, 19____.

PRINCIPAL

_____

By_____

ATTEST

_____

SURETY

_____

By_____
Attorney-in-Fact

NOTICE OF AWARD

Dated _____, 19 ___

TO: _____
(BIDDER)

ADDRESS: _____

_____

_____

OWNER'S PROJECT NO. _____

PROJECT _____

OWNER'S CONTRACT NO. _____

CONTRACT FOR _____

_____
(Insert name of Contract as it appears in the Bidding Documents)

You are notified that your Bid dated _____, 198___ for the above Contract has been considered. You are the apparent successful bidder and have been awarded a contract for _____

_____

_____
(Indicate total Work, alternates or sections of Work awarded)

The Contract Price of your contract is _____

_____ Dollars ($).

Three copies of each of the proposed Contract Documents (except Drawings) accompany this Notice of Award. Three sets of the Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within fifteen days of the date of this Notice of Award, that is by _____, 198___.

1. You must deliver to the OWNER three fully executed counterparts of the Agreement including all the Contract Documents. This includes the triplicate sets of Drawings. Each of the Contract Documents must bear your signature on (the cover) (every) page.
2. You must deliver with the executed Agreement the Contract Security (Bonds) as specified in the Instructions to Bidders (paragraph 17), General Conditions (paragraph 5.1) and Supplementary Conditions (paragraph SC-5.1).

EJCDC No. 1910-22 (1983 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America.

3. (List other conditions precedent).

Failure to comply with these conditions within the time specified will entitle OWNER to consider your bid abandoned, to annul this Notice of Award and to declare your Bid Security forfeited.

Within ten days after you comply with those conditions, OWNER will return to you one fully signed counterpart of the Agreement with the Contract Documents attached.

_____
(OWNER)

By _____
(AUTHORIZED SIGNATURE)

_____
(TITLE)

Copy to ENGINEER
(Use Certified Mail,
Return Receipt Requested)

NOTICE TO PROCEED

Dated _____, 19 ___

TO: _____
(CONTRACTOR)

ADDRESS: _____

_____

_____

OWNER'S PROJECT NO. _____

PROJECT _____

OWNER'S CONTRACT NO. _____

CONTRACT FOR _____

_____
(Insert name of Contract as it appears in the Bidding Documents)

You are notified that the Contract Time under the above contract will commence to run on _____, 19___. By that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 3 of the Agreement the dates of Substantial Completion and Final Completion are _____, 19___ and _____, 19___, respectively.

Before you may start any Work at the site, paragraph 2.7 of the General Conditions provides that you and Owner must each deliver to the other (with copies to ENGINEER) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Also before you may start any Work at the site, you must
(add other requirements)

_____

_____

_____

_____

_____

_____

Copy to ENGINEER
(Use Certified Mail,
Return Receipt Requested)

_____
(OWNER)

By _____
(AUTHORIZED SIGNATURE)

_____
(TITLE)

EJCDC 1910-23 (1983 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America.

SECTION 00200

INFORMATION AVAILABLE TO BIDDERS

PART 1: GENERAL

1.1 PHYSICAL CONDITIONS

A. In the preparation of Drawings and Specifications, Architect/Engineer has relied upon the following drawings of physical conditions:

1. Site Plan, Paving, Grading and Details

   Prepared by Dowell Engineering
   Drawing #1L-59830 Revision A
   Dated 1/31/78

This document has important legal consequences: consultation with an attorney is encouraged with respect to its completion or modification.

STANDARD
GENERAL CONDITIONS
OF THE
CONSTRUCTION CONTRACT

Prepared by

Engineers Joint Contract Documents Committee

and

Issued and Published Jointly By

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

AMERICAN CONSULTING ENGINEERS COUNCIL

AMERICAN SOCIETY OF CIVIL ENGINEERS

CONSTRUCTION SPECIFICATIONS INSTITUTE

This document has been approved and endorsed by

The Associated General Contractors of America

These General Conditions have been prepared for use with the Owner-Contractor Agreements (No. 1910-A-1 or 1910-8-A-2) (1990 Editions). Their provisions are interrelated and a change in one may necessitate a change in the others. Comments concerning their usage are contained in the Commentary on Agreements for Engineering Services and Contract Documents (No. 1910-9) (1986 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. 1910-17) (1990 Edition). When bidding is involved, the Standard Form of Instructions to Bidders (No. 1910-12) (1990 Edition) may be used.

EJCDC No. 1910-8 (1990 Edition)

1420 King Street, Alexandria, VA 22314

American Consulting Engineers Council
1015 15th Street, N.W., Washington, DC 20005

American Society of Civil Engineers
345 East 47th Street, New York, NY 10017

Construction Specifications Institute
601 Madison St., Alexandria, VA 22314

TABLE OF CONTENTS OF GENERAL CONDITIONS

GENERAL CONDITIONS

ARTICLE 1—DEFINITIONS

Wherever used in these General Conditions or in the other Contract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

1.1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the Bidding Requirements or the Contract Documents.

1.2. *Agreement*—The written contract between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

1.3. *Application for Payment*—The form accepted by ENGINEER which is to be used by CONTRACTOR in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

1.4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

1.5. *Bid*—The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

1.6. *Bidding Documents*—The advertisement or invitation to Bid, instructions to bidders, the Bid form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

1.7. *Bidding Requirements*—The advertisement or invitation to Bid, instructions to bidders, and the Bid form.

1.8. *Bonds*—Performance and Payment bonds and other instruments of security.

1.9. *Change Order*—A document recommended by ENGINEER, which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

1.10. *Contract Documents*—The Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders and ENGINEER's written interpretations and clarifications issued pursuant to paragraphs 3.5, 3.6.1, and 3.6.3 on or after the Effective Date of the Agreement. Shop Drawing submittals approved pursuant to paragraphs 6.26 and 6.27 and the reports and drawings referred to in paragraphs 4.2.1.1 and 4.2.2.2 are not Contract Documents.

1.11. *Contract Price*—The moneys payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.9.1 in the case of Unit Price Work).

1.12. *Contract Times*—The numbers of days or the dates stated in the Agreement: (i) to achieve Substantial Completion, and (ii) to complete the Work so that it is ready for final payment as evidenced by ENGINEER's written recommendation of final payment in accordance with paragraph 14.13.

1.13. *CONTRACTOR*—The person, firm or corporation with whom OWNER has entered into the Agreement.

1.14. *defective*—An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, in that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER's recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.8 or 14.10).

1.15. *Drawings*—The drawings which show the scope, extent and character of the Work to be furnished and performed by CONTRACTOR and which have been prepared or approved by ENGINEER and are referred to in the Contract Documents. Shop drawings are not Drawings as so defined.

1.16. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

1.17. *ENGINEER*—The person, firm or corporation named as such in the Agreement.

1.18. *ENGINEER's Consultant*—A person, firm or corporation having a contract with ENGINEER to furnish services as ENGINEER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

1.19. *Field Order*—A written order issued by ENGINEER which orders minor changes in the Work in accordance with paragraph 9.5 but which does not involve a change in the Contract Price or the Contract Times.

1.20. *General Requirements*—Sections of Division 1 of the Specifications.

1.21. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

1.22. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes and orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.

1.23. *Liens*—Liens, charges, security interests or encumbrances upon real property or personal property.

1.24. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

1.25. *Notice of Award*—The written notice by OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein, within the time specified, OWNER will sign and deliver the Agreement.

1.26. *Notice to Proceed*—A written notice given by OWNER to CONTRACTOR (with a copy to ENGINEER) fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR's obligations under the Contract Documents.

1.27. *OWNER*—The public body or authority, corporation, association, firm or person with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be provided.

1.28. *Partial Utilization*—Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

1.29. *PCBs*—Polychlorinated biphenyls.

1.30. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.

1.31. *Project*—The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

1.32. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

1.33. *Resident Project Representative*— The authorized representative of ENGINEER who may be assigned to the site or any part thereof.

1.34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

1.35. *Shop Drawings*—All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.

1.36. *Specifications*—Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

1.37. *Subcontractor*—An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.

1.38. *Substantial Completion*—The Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER as evidenced by ENGINEER's definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if no such certificate is issued, when the Work is complete and ready for final payment as evidenced by ENGINEER's written recommendation of final payment in accordance with paragraph 14.13. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

1.39. *Supplementary Conditions*—The part of the Contract Documents which amends or supplements these General Conditions.

1.40. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman or vendor having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by CONTRACTOR or any Subcontractor.

1.41. *Underground Facilities*—All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

1.42. *Unit Price Work*—Work to be paid for on the basis of unit prices.

1.43. *Work*—The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.

1.44. *Work Change Directive*—A written directive to CONTRACTOR, issued on or after the Effective Date of the Agreement and signed by OWNER and recommended by ENGINEER, ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed as provided in paragraph 4.2 or 4.3 or to emergencies under paragraph 6.23. A Work Change Directive will not change the Contract Price or the Contract Times, but is evidence that the parties expect that the change directed or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times as provided in paragraph 10.2.

1.45. *Written Amendment*—A written amendment of the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly construction-related aspects of the Contract Documents.

ARTICLE 2—PRELIMINARY MATTERS

Delivery of Bonds:

2.1. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish in accordance with paragraph 5.1.

Copies of Documents:

2.2. OWNER shall furnish to CONTRACTOR up to ten copies (unless otherwise specified in the Supplementary Conditions) of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

Commencement of Contract Times; Notice to Proceed:

2.3. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement, or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within thirty days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

Starting the Work:

2.4. CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run, but no Work shall be done at the site prior to the date on which the Contract Times commence to run.

Before Starting Construction:

2.5. Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error, ambiguity or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error, ambiguity or discrepancy in the Contract Documents, unless CONTRACTOR knew or reasonably should have known thereof.

2.6. Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for review:

2.6.1. a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2.6.2. a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing and processing such submittal;

2.6.3. a preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.7. Before any Work at the site is started, CONTRACTOR and OWNER shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which CONTRACTOR and OWNER respectively are required to purchase and maintain in accordance with paragraphs 5.4, 5.6 and 5.7.

Preconstruction Conference:

2.8. Within twenty days after the Contract Times start to run, but before any Work at the site is started, a conference

attended by CONTRACTOR, ENGINEER and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.6, procedures for handling Shop Drawings and other submittals, processing Applications for Payment and maintaining required records.

Initially Acceptable Schedules:

2.9. Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER and others as appropriate will be held to review for acceptability to ENGINEER as provided below the schedules submitted in accordance with paragraph 2.6. CONTRACTOR shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until the schedules are submitted to and acceptable to ENGINEER as provided below. The progress schedule will be acceptable to ENGINEER as providing an orderly progression of the Work to completion within any specified Milestones and the Contract Times, but such acceptance will neither impose on ENGINEER responsibility for the sequencing, scheduling or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor. CONTRACTOR's schedule of Shop Drawing and Sample submissions will be acceptable to ENGINEER as providing a workable arrangement for reviewing and processing the required submittals. CONTRACTOR's schedule of values will be acceptable to ENGINEER as to form and substance.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

Intent:

3.1. The Contract Documents comprise the entire agreement between OWNER and CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.

3.2. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be furnished and performed whether or not specifically called for. When words or phrases which have a well- known technical or construction industry or trade meaning are used to describe Work, materials or equipment, such words or phrases shall be interpreted in accordance with that meaning. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in paragraph 9.4.

3.3. ***Reference to Standards and Specifications of Technical Societies; Reporting and Resolving Discrepancies:***

3.3.1. Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code or Laws or Regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

3.3.2. If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such Law or Regulation applicable to the performance of the Work or of any such standard, specification, manual or code or of any instruction of any Supplier referred to in paragraph 6.5, CONTRACTOR shall report it to ENGINEER in writing at once, and, CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as authorized by paragraph 6.23) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in paragraph 3.5 or 3.6; provided, however, that CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any such conflict, error, ambiguity or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.

3.3.3. Except as otherwise specifically stated in the Contract Documents or as may be provided by amendment or supplement thereto issued by one of the methods indicated in paragraph 3.5 or 3.6, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity or discrepancy between the provisions of the Contract Documents and:

3.3.3.1. the provisions of any such standard, specification, manual, code or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

3.3.3.2. the provisions of any such Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

No provision of any such standard, specification, manual, code or instruction shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to OWNER, ENGINEER or any of ENGINEER's Consultants, agents or employees any duty or authority to supervise or direct the furnishing or

performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of paragraph 9.13 or any other provision of the Contract Documents.

3.4. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as approved" or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of ENGINEER as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.13 or any other provision of the Contract Documents.

Amending and Supplementing Contract Documents:

3.5. The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

3.5.1. a formal Written Amendment,

3.5.2. a Change Order (pursuant to paragraph 10.4), or

3.5.3. a Work Change Directive (pursuant to paragraph 10.1).

3.6. In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the following ways:

3.6.1. a Field Order (pursuant to paragraph 9.5),

3.6.2. ENGINEER's approval of a Shop Drawing or Sample (pursuant to paragraphs 6.26 and 6.27), or

3.6.3. ENGINEER's written interpretation or clarification (pursuant to paragraph 9.4).

Reuse of Documents:

3.7. CONTRACTOR, and any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER or ENGINEER's Consultant, and (ii) shall not reuse any of such Drawings, Specifications, other documents or copies on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaption by ENGINEER.

ARTICLE 4—AVAILABILITY OF LANDS: SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

Availability of Lands:

4.1. OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of CONTRACTOR. Upon reasonable written request, OWNER shall furnish CONTRACTOR with a correct statement of record legal title and legal description of the lands upon which the Work is to be performed and OWNER's interest therein as necessary for giving notice of or filing a mechanic's lien against such lands in accordance with applicable Laws and Regulations. OWNER shall identify any encumbrances or restrictions not of general application but specifically related to use of lands so furnished with which CONTRACTOR will have to comply in performing the Work. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise provided in the Contract Documents. If CONTRACTOR and OWNER are unable to agree on entitlement to or the amount or extent of any adjustments in the Contract Price or the Contract Times as a result of any delay in OWNER's furnishing these lands, rights-of-way or easements, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.2. ***Subsurface and Physical Conditions:***

4.2.1. *Reports and Drawings:* Reference is made to the Supplementary Conditions for identification of:

4.2.1.1. *Subsurface Conditions:* Those reports of explorations and tests of subsurface conditions at or contiguous to the site that have been utilized by ENGINEER in preparing the Contract Documents; and

4.2.1.2. *Physical Conditions:* Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) that have been utilized by ENGINEER in preparing the Contract Documents.

4.2.2. *Limited Reliance by CONTRACTOR Authorized; Technical Data:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any claim against OWNER, ENGINEER or any of ENGINEER's Consultants with respect to:

4.2.2.1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto, or

4.2.2.2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings, or

4.2.2.3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such data, interpretations, opinions or information.

4.2.3. *Notice of Differing Subsurface or Physical Conditions:* If CONTRACTOR believes that any subsurface or physical condition at or contiguous to the site that is uncovered or revealed either:

4.2.3.1. is of such a nature as to establish that any "technical data" on which CONTRACTOR is entitled to rely as provided in paragraphs 4.2.1 and 4.2.2 is materially inaccurate, or

4.2.3.2. is of such a nature as to require a change in the Contract Documents, or

4.2.3.3. differs materially from that shown or indicated in the Contract Documents, or

4.2.3.4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents; then

CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as permitted by paragraph 6.23), notify OWNER and ENGINEER in writing about such condition. CONTRACTOR shall not further disturb such conditions or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

4.2.4. *ENGINEER's Review:* ENGINEER will promptly review the pertinent conditions, determine the necessity of OWNER's obtaining additional exploration or tests with respect thereto and advise OWNER in writing (with a copy to CONTRACTOR) of ENGINEER's findings and conclusions.

4.2.5. *Possible Contract Documents Change:* If ENGINEER concludes that a change in the Contract Documents is required as a result of a condition that meets one or more of the categories in paragraph 4.2.3., a Work Change Directive or a Change Order will be issued as provided in Article 10 to reflect and document the consequences of such change.

4.2.6. *Possible Price and Times Adjustments:* An equitable adjustment in the Contract Price or in the Contract Times, or both, will be allowed to the extent that the existence of such uncovered or revealed condition causes an increase or decrease in CONTRACTOR's cost of, or time required for performance of, the Work; subject, however, to the following:

4.2.6.1. such condition must meet any one or more of the categories described in paragraphs 4.2.3.1 through 4.2.3.4, inclusive;

4.2.6.2. a change in the Contract Documents pursuant to paragraph 4.2.5 will not be an automatic authorization of nor a condition precedent to entitlement to any such adjustment;

4.2.6.3. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of paragraphs 9.10 and 11.9; and

4.2.6.4. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Times if:

4.2.6.4.1. CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of Contract Price and Contract Times by the submission of a bid or becoming bound under a negotiated contract; or

4.2.6.4.2. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or

4.2.6.4.3. CONTRACTOR failed to give the written notice within the time and as required by paragraph 4.2.3.

If OWNER and CONTRACTOR are unable to agree on entitlement to or as to the amount or length of any such equitable adjustment in the Contract Price or Contract Times, a claim may be made therefor as provided in Articles 11 and 12. However, OWNER, ENGINEER and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses or damages sustained by CONTRACTOR on or in connection with any other project or anticipated project.

4.3. *Physical Conditions—Underground Facilities:*

4.3.1. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on

information and data furnished to OWNER or ENGINEER by the owners of such Underground Facilities or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

4.3.1.1. OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and

4.3.1.2. The cost of all of the following will be included in the Contract Price and CONTRACTOR shall have full responsibility for: (i) reviewing and checking all such information and data, (ii) locating all Underground Facilities shown or indicated in the Contract Documents, (iii) coordination of the Work with the owners of such Underground Facilities during construction, and (iv) the safety and protection of all such Underground Facilities as provided in paragraph 6.20 and repairing any damage thereto resulting from the Work.

4.3.2. *Not Shown or Indicated:* If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by paragraph 6.23), identify the owner of such Underground Facility and give written notice to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence of the Underground Facility. If ENGINEER concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued as provided in Article 10 to reflect and document such consequences. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.20. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, to the extent that they are attributable to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated. If OWNER and CONTRACTOR are unable to agree on entitlement to or the amount or length of any such adjustment in Contract Price or Contract Times, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12. However, OWNER, ENGINEER and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses or damages incurred or sustained by CONTRACTOR on or in connection with any other project or anticipated project.

Reference Points:

4.4. OWNER shall provide engineering surveys to establish reference points for construction which in ENGINEER's judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.

4.5. Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material:

4.5.1. OWNER shall be responsible for any Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material uncovered or revealed at the site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work and which may present a substantial danger to persons or property exposed thereto in connection with the Work at the site. OWNER shall not be responsible for any such materials brought to the site by CONTRACTOR, Subcontractor, Suppliers or anyone else for whom CONTRACTOR is responsible.

4.5.2. CONTRACTOR shall immediately: (i) stop all Work in connection with such hazardous condition and in any area affected thereby (except in an emergency as required by paragraph 6.23), and (ii) notify OWNER and ENGINEER (and thereafter confirm such notice in writing). OWNER shall promptly consult with ENGINEER concerning the necessity for OWNER to retain a qualified expert to evaluate such hazardous condition or take corrective action, if any. CONTRACTOR shall not be required to resume Work in connection with such hazardous condition or in any such affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR special written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (ii) specifying any special conditions under which such Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of such Work stoppage or such special conditions under which Work is agreed by CONTRACTOR to be resumed, either party may make a claim therefor as provided in Articles 11 and 12.

4.5.3. If after receipt of such special written notice CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order such portion of the Work that is in connection with such hazardous condition or in such affected area to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a claim therefor as provided in Articles 11 and 12. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others in accordance with Article 7.

4.5.4. To the fullest extent permitted by Laws and Regulations, OWNER shall indemnify and hold harmless CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's

Consultants and the officers, directors, employees, agents, other consultants and subcontractors of each and any of them from and against all claims, costs, losses and damages arising out of or resulting from such hazardous condition, provided that: (i) any such claim, cost, loss or damage is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, and (ii) nothing in this subparagraph 4.5.4 shall obligate OWNER to indemnify any person or entity from and against the consequences of that person's or entity's own negligence.

4.5.5. The provisions of paragraphs 4.2 and 4.3 are not intended to apply to Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material uncovered or revealed at the site.

ARTICLE 5—BONDS AND INSURANCE

Performance, Payment and Other Bonds:

5.1. CONTRACTOR shall furnish Performance and Payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

5.2. If the surety on any Bond furnished by CONTRACTOR is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.1, CONTRACTOR shall within ten days thereafter substitute another Bond and surety, both of which must be acceptable to OWNER.

5.3. ***Licensed Sureties and Insurers; Certificates of Insurance:***

5.3.1. All Bonds and insurance required by the Contract Documents to be purchased and maintained by OWNER or CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.3.2. CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which CONTRACTOR is required to purchase and maintain in accordance with paragraph 5.4. OWNER shall deliver to CONTRACTOR, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by CONTRACTOR or any other additional insured) which OWNER is required to purchase and maintain in accordance with paragraphs 5.6 and 5.7 hereof.

CONTRACTOR's Liability Insurance:

5.4. CONTRACTOR shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and furnished and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance and furnishing of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed or furnished by CONTRACTOR, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

5.4.1. claims under workers' compensation, disability benefits and other similar employee benefit acts;

5.4.2. claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;

5.4.3. claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;

5.4.4. claims for damages insured by customary personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (ii) by any other person for any other reason;

5.4.5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

5.4.6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

The policies of insurance so required by this paragraph 5.4 to be purchased and maintained shall:

5.4.7. with respect to insurance required by paragraphs 5.4.3 through 5.4.6 inclusive, include as additional insureds (subject to any customary exclusion in respect of professional liability) OWNER, ENGINEER, ENGINEER's Consultants and any other persons or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers and employees of all such additional insureds;

5.4.8. include the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

5.4.9. include completed operations insurance;

5.4.10. include contractual liability insurance covering CONTRACTOR's indemnity obligations under paragraphs 6.12, 6.16 and 6.31 through 6.33;

5.4.11. contain a provision or endorsement that the coverage afforded will not be cancelled, materially changed or renewal refused until at least thirty days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the CONTRACTOR pursuant to paragraph 5.3.2 will so provide);

5.4.12. remain in effect at least until final payment and at all times thereafter when CONTRACTOR may be correcting, removing or replacing *defective* Work in accordance with paragraph 13.12; and

5.4.13. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and CONTRACTOR shall furnish OWNER and each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued evidence satisfactory to OWNER and any such additional insured of continuation of such insurance at final payment and one year thereafter).

OWNER's Liability Insurance:

5.5. In addition to the insurance required to be provided by CONTRACTOR under paragraph 5.4, OWNER, at OWNER's option, may purchase and maintain at OWNER's expense OWNER's own liability insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

Property Insurance:

5.6. Unless otherwise provided in the Supplementary Conditions, OWNER shall purchase and maintain property insurance upon the Work at the site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

5.6.1. include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and any other persons or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

5.6.2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework and Work in transit and shall insure against at least the following perils fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, and such other perils as may be specifically required by the Supplementary Conditions;

5.6.3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

5.6.4. cover materials and equipment stored at the site or at another location that was agreed to in writing by OWNER prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by ENGINEER; and

5.6.5. be maintained in effect until final payment is made unless otherwise agreed to in writing by OWNER, CONTRACTOR and ENGINEER with thirty days written notice to each other additional insured to whom a certificate of insurance has been issued.

5.7. OWNER shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and any other persons or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

5.8. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained by OWNER in accordance with paragraphs 5.6 and 5.7 will contain a provision or endorsement that the coverage afforded will not be cancelled or materially changed or renewal refused until at least thirty days' prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with paragraph 5.11.

5.9. OWNER shall not be responsible for purchasing and maintaining any property insurance to protect the interests of CONTRACTOR, Subcontractors or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount, will be borne by CONTRACTOR, Subcontractor or others suffering any such loss and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

5.10. If CONTRACTOR requests in writing that other special insurance be included in the property insurance policies provided under paragraphs 5.6 or 5.7, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the site, OWNER shall in writing advise CONTRACTOR whether or not such other insurance has been procured by OWNER.

5.11. *Waiver of Rights:*

5.11.1. OWNER and CONTRACTOR intend that all policies purchased in accordance with paragraphs 5.6 and 5.7 will protect OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and all other persons or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds in such policies and will provide primary coverage for all losses and damages caused by the perils covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. OWNER and CONTRACTOR waive all rights against each other and their respective officers, directors, employees and agents for all losses and damages caused by, arising out of or resulting from any of the perils covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, ENGINEER, ENGINEER's Consultants and all other persons or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by OWNER as trustee or otherwise payable under any policy so issued.

5.11.2. In addition, OWNER waives all rights against CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and the officers, directors, employees and agents of any of them, for:

5.11.2.1. loss due to business interruption, loss of use or other consequential loss extending beyond direct physical loss or damage to OWNER's property or the Work caused by, arising out of or resulting from fire or other peril, whether or not insured by OWNER; and

5.11.2.2. loss or damage to the completed Project or part thereof caused by, arising out of or resulting from fire or other insured peril covered by any property insurance maintained on the completed Project or part thereof by OWNER during partial utilization pursuant to paragraph 14.10, after substantial completion pursuant to paragraph 14.8 or after final payment pursuant to paragraph 14.13.

Any insurance policy maintained by OWNER covering any loss, damage or consequential loss referred to in this paragraph 5.11.2 shall contain provisions to the effect that in the event of payment of any such loss, damage or consequential loss the insurers will have no rights of recovery against any of CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and the officers, directors, employees and agents of any of them.

Receipt and Application of Insurance Proceeds

5.12. Any insured loss under the policies of insurance required by paragraphs 5.6 and 5.7 will be adjusted with OWNER and made payable to OWNER as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph 5.13. OWNER shall deposit in a separate account any money so received, and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.

5.13. OWNER as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within fifteen days after the occurrence of loss to OWNER's exercise of this power. If such objection be made, OWNER as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, OWNER as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, OWNER as fiduciary shall give bond for the proper performance of such duties.

Acceptance of Bonds and Insurance; Option to Replace:

5.14. If either party (OWNER or CONTRACTOR) has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within ten days after receipt of the certificates (or other evidence requested) required by paragraph 2.7. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent Bonds or insurance to protect such other party's interests at the expense of the party who was

required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

Partial Utilization—Property Insurance:

5.15. If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished in accordance with paragraph 14.10; provided that no such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be cancelled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6—CONTRACTOR'S RESPONSIBILITIES

Supervision and Superintendence:

6.1. CONTRACTOR shall supervise, inspect and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of others in the design or specification of a specific means, method, technique, sequence or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

6.2. CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications to the superintendent shall be as binding as if given to CONTRACTOR.

Labor, Materials and Equipment:

6.3. CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. Except as otherwise required for the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER's written consent given after prior written notice to ENGINEER.

6.4. Unless otherwise specified in the General Requirements, CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.

6.5. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of OWNER. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

Progress Schedule:

6.6. CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.9 as it may be adjusted from time to time as provided below:

6.6.1. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.9) proposed adjustments in the progress schedule that will not change the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

6.6.2. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of paragraph 12.1. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.

6.7. *Substitutes and "Or-Equal" Items:*

6.7.1. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be accepted by ENGINEER under the following circumstances:

6.7.1.1. *"Or-Equal":* If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the proposed item may, in ENGINEER's sole discretion, be accomplished without compliance with some or all of the requirements for acceptance of proposed substitute items.

6.7.1.2. *Substitute Items:* If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item under subparagraph 6.7.1.1, it will be considered a proposed substitute item. CONTRACTOR shall submit sufficient information as provided below to allow ENGINEER to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. The procedure for review by the ENGINEER will include the following as supplemented in the General Requirements and as ENGINEER may decide is appropriate under the circumstances. Requests for review of proposed substitute items of material or equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall first make written application to ENGINEER for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as that specified. The application will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by ENGINEER in evaluating the proposed substitute. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute.

6.7.1.3. *CONTRACTOR's Expense:* All data to be provided by CONTRACTOR in support of any proposed "or-equal" or substitute item will be at CONTRACTOR's expense.

6.7.2. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence or procedure of construction acceptable to ENGINEER. CONTRACTOR shall submit sufficient information to allow ENGINEER, in ENGINEER's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in subparagraph 6.7.1.2.

6.7.3. *Engineer's Evaluation:* ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 6.7.1.2 and 6.7.2. ENGINEER will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized without ENGINEER's prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any "or-equal" or substitute. ENGINEER will record time required by ENGINEER and ENGINEER's Consultants in evaluating substitutes proposed or submitted by CONTRACTOR pursuant to paragraphs 6.7.1.2 and 6.7.2 and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER accepts a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute item.

Concerning Subcontractors, Suppliers and Others:

6.8.1. CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization (including those acceptable to OWNER and ENGINEER as indicated in paragraph 6.8.2), whether initially or as a substitute, against whom OWNER or ENGINEER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

6.8.2. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials or equipment) to be submitted to OWNER in advance of the specified date prior to the Effective Date of the Agreement for acceptance by OWNER and ENGINEER, and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, OWNER's or ENGINEER's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the bidding documents or the Contract Documents) of any such Subcontractor, Supplier or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute, the Contract Price will be adjusted by the difference in the cost occasioned by such

substitution and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by OWNER or ENGINEER of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of OWNER or ENGINEER to reject *defective* Work.

6.9.1. CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier or other person or organization any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.

6.9.2. CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR. CONTRACTOR shall require all Subcontractors, Suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with the ENGINEER through CONTRACTOR.

6.10. The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

6.11. All Work performed for CONTRACTOR by a Subcontractor or Supplier will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in paragraph 5.6 or 5.7, the agreement between the CONTRACTOR and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against OWNER, CONTRACTOR, ENGINEER, ENGINEER's Consultants and all other additional insureds for all losses and damages caused by, arising out of or resulting from any of the perils covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.

Patent Fees and Royalties:

6.12. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants and the officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device not specified in the Contract Documents.

Permits:

6.13. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

Laws and Regulations:

6.14.1. CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations.

6.14.2. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses and damages caused by, arising out of or resulting therefrom; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations under paragraph 3.3.2.

Taxes:

6.15. CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of

the Project which are applicable during the performance of the Work.

Use of Premises:

6.16. CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any adjacent land or areas, resulting from the performance of the Work. Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultant and anyone directly or indirectly employed by any of them from and against all claims, costs, losses and damages arising out of or resulting from any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, ENGINEER or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR's performance of the Work.

6.17. During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery and surplus materials. CONTRACTOR shall leave the site clean and ready for occupancy by OWNER at Substantial Completion of the Work. CONTRACTOR shall restore to original condition all property not designated for alteration by the Contract Documents.

6.18. CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

Record Documents:

6.19. CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference. Upon completion of the Work, these record documents, Samples and Shop Drawings will be delivered to ENGINEER for OWNER.

Safety and Protection:

6.20. CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

6.20.1. all persons on the Work site or who may be affected by the Work;

6.20.2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

6.20.3. other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of construction.

CONTRACTOR shall comply with all applicable Laws and Regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property referred to in paragraph 6.20.2 or 6.20.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or ENGINEER's Consultant or anyone employed by any of them or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier or other person or organization directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.13 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

Safety Representative:

6.21. CONTRACTOR shall designate a qualified and experienced safety representative at the site whose duties and

responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

Hazard Communication Programs:

6.22. CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the site in accordance with Laws or Regulations.

Emergencies:

6.23. In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from OWNER or ENGINEER, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If ENGINEER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Work Change Directive or Change Order will be issued to document the consequences of such action.

6.24. *Shop Drawings and Samples:*

6.24.1. CONTRACTOR shall submit Shop Drawings to ENGINEER for review and approval in accordance with the accepted schedule of Shop Drawings and Sample submittals (see paragraph 2.9). All submittals will be identified as ENGINEER may require and in the number of copies specified in the General Requirements. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show ENGINEER the materials and equipment CONTRACTOR proposes to provide and to enable ENGINEER to review the information for the limited purposes required by paragraph 6.26.

6.24.2. CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with said accepted schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review the submittal for the limited purposes required by paragraph 6.26. The numbers of each Sample to be submitted will be as specified in the Specifications.

6.25. *Submittal Procedures:*

6.25.1. Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:

6.25.1.1. all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto,

6.25.1.2. all materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work, and

6.25.1.2. all information relative to CONTRACTOR's sole responsibilities in respect of means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto.

CONTRACTOR shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

6.25.2. Each submittal will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contact Documents with respect to CONTRACTOR'S review and approval of that submittal.

6.25.3. At the time of each submission, CONTRACTOR shall give ENGINEER specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to ENGINEER for review and approval of each such variation.

6.26. ENGINEER will review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals accepted by ENGINEER as required by paragraph 2.9. ENGINEER's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER's review and approval will not extend to means, methods, techniques, sequences or procedures of construction (except where a particular means, method, technique, sequence or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make corrections required by ENGINEER, and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals.

6.27. ENGINEER's review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract

Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of submission as required by paragraph 6.25.3 and ENGINEER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for complying with the requirements of paragraph 6.25.1.

6.28. Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submissions accepted by ENGINEER as required by paragraph 2.9, any related Work performed prior to ENGINEER's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.

Continuing the Work:

6.29. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.5 or as OWNER and CONTRACTOR may otherwise agree in writing.

6.30. *CONTRACTOR's General Warranty and Guarantee:*

6.30.1. CONTRACTOR warrants and guarantees to OWNER, ENGINEER and ENGINEER's Consultants that all Work will be in accordance with the Contract Documents and will not be *defective*. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:

6.30.1.1. abuse, modification or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors or Suppliers; or

6.30.1.2. normal wear and tear under normal usage.

6.30.2. CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents:

6.30.2.1. observations by ENGINEER;

6.30.2.3. recommendation of any progress or final payment by ENGINEER;

6.30.2.3. the issuance of a certificate of Substantial Completion or any payment by OWNER to CONTRACTOR under the Contract Documents;

6.30.2.4. use or occupancy of the Work or any part thereof by OWNER;

6.30.2.5. any acceptance by OWNER or any failure to do so;

6.30.2.6. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by ENGINEER pursuant to paragraph 14.13;

6.30.2.7. any inspection, test or approval by others; or

6.30.2.8. any correction of *defective* Work by OWNER.

Indemnification:

6.31. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants and the officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) caused by, arising out of or resulting from the performance of the Work, provided that any such claim, cost, loss or damage: (i) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, and (ii) is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, any Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of a person or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such person or entity.

6.32. In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.31 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier or other person or organization under workers' compensation acts, disability benefit acts or other employee benefit acts.

6.33. The indemnification obligations of CONTRACTOR under paragraph 6.31 shall not extend to the liability of ENGINEER and ENGINEER's Consultants, officers, directors, employees or agents caused by the professional negligence, errors or omissions of any of them.

Survival of Obligations:

6.34. All representations, indemnifications, warranties and guarantees made in, required by or given in accordance with

the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination or completion of the Agreement.

ARTICLE 7—OTHER WORK

Related Work at Site:

7.1. OWNER may perform other work related to the Project at the site by OWNER's own forces, or let other direct contracts therefor which shall contain General Conditions similar to these, or have other work performed by utility owners. If the fact that such other work is to be performed was not noted in the Contract Documents, then: (i) written notice thereof will be given to CONTRACTOR prior to starting any such other work, and (ii) CONTRACTOR may make a claim therefor as provided in Articles 11 and 12 if CONTRACTOR believes that such performance will involve additional expense to CONTRACTOR or requires additional time and the parties are unable to agree as to the amount or extent thereof.

7.2. CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (and OWNER, if OWNER is performing the additional work with OWNER's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly connect and coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

7.3. If the proper execution or results of any part of CONTRACTOR's Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to ENGINEER in writing any delays, defects or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure so to report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work except for latent or nonapparent defects and deficiencies in such other work.

Coordination:

7.4. If OWNER contracts with others for the performance of other work on the Project at the site, the following will be set forth in Supplementary Conditions:

7.4.1. the person, firm or corporation who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified;

7.4.2. the specific matters to be covered by such authority and responsibility will be itemized; and

7.4.3. the extent of such authority and responsibilities will be provided.

Unless otherwise provided in the Supplementary Conditions, OWNER shall have sole authority and responsibility in respect of such coordination.

ARTICLE 8—OWNER'S RESPONSIBILITIES

8.1. Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.2. In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer against whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER.

8.3. OWNER shall furnish the data required of OWNER under the Contract Documents promptly and shall make payments to CONTRACTOR promptly when they are due as provided in paragraphs 14.4 and 14.13.

8.4. OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4. Paragraph 4.2 refers to OWNER's identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions at the site and drawings of physical conditions in existing structures at or contiguous to the site that have been utilized by ENGINEER in preparing the Contract Documents.

8.5. OWNER's responsibilities in respect of purchasing and maintaining liability and property insurance are set forth in paragraphs 5.5 through 5.10.

8.6. OWNER is obligated to execute Change Orders as indicated in paragraph 10.4.

8.7. OWNER's responsibility in respect of certain inspections, tests and approvals is set forth in paragraph 13.4.

8.8. In connection with OWNER's right to stop Work or suspend Work, see paragraphs 13.10 and 15.1. Paragraph 15.2 deals with OWNER's right to terminate services of CONTRACTOR under certain circumstances.

8.9. The OWNER shall not supervise, direct or have control or authority over, nor be responsible for, CONTRACTOR's means, methods, techniques, sequences or procedures of construction or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work. OWNER will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

8.10. OWNER'S responsibility in respect of undisclosed Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Materials uncovered or revealed at the site is set forth in paragraph 4.5.

8.11. If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract Documents, OWNER's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9—ENGINEER'S STATUS DURING CONSTRUCTION

OWNER's Representative:

9.1. ENGINEER will be OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER as OWNER's representative during construction are set forth in the Contract Documents and shall not be extended without written consent of OWNER and ENGINEER.

Visits to Site:

9.2. ENGINEER will make visits to the site at intervals appropriate to the various stages of construction as ENGINEER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, ENGINEER will endeavor for the benefit of OWNER to determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. ENGINEER's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and on-site observations, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against *defective* Work. ENGINEER's visits and on-site observations are subject to all the limitations on ENGINEER's authority and responsibility set forth in paragraph 9.13, and particularly, but without limitation, during or as a result of ENGINEER's on-site visits or observations of CONTRACTOR's Work ENGINEER will not supervise, direct, control or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work.

Project Representative:

9.3. If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in providing more continuous observation of the Work. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.13 and in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the site who is not ENGINEER's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other person will be as provided in the Supplementary Conditions.

Clarifications and Interpretations:

9.4. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as ENGINEER may determine necessary, which shall be consistent with the intent of and reasonably inferable from Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER or CONTRACTOR believes that a written clarification or interpretation justifies an adjustment in the Contract Price or the Contract Times and the parties are unable to agree to the amount or extent thereof, if any, OWNER or CONTRACTOR may make a written claim therefor as provided in Article 11 or Article 12.

Authorized Variations in Work:

9.5. ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER and also on CONTRACTOR who shall perform the Work involved promptly. If OWNER or CONTRACTOR believes that a Field Order justifies an adjustment in the Contract Price or the Contract Times and the parties are unable to agree as to the amount or extent thereof, OWNER or CONTRACTOR may make a written claim therefor as provided in Article 11 or 12.

Rejecting Defective Work:

9.6. ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be *defective*, or

that ENGINEER believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER will also have authority to require special inspection or testing of the Work as provided in paragraph 13.9, whether or not the Work is fabricated, installed or completed.

Shop Drawings, Change Orders and Payments:

9.7. In connection with ENGINEER's authority as to Shop Drawings and Samples, see paragraphs 6.24 through 6.28 inclusive.

9.8. In connection with ENGINEER's authority as to Change Orders, see Articles 10, 11, and 12.

9.9. In connection with ENGINEER's authority as to Applications for Payment, see Article 14.

Determinations for Unit Prices:

9.10. ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR the ENGINEER's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). ENGINEER's written decision thereon will be final and binding upon OWNER and CONTRACTOR, unless, within ten days after the date of any such decision, either OWNER or CONTRACTOR delivers to the other and to ENGINEER written notice of intention to appeal from ENGINEER's decision and: (i) an appeal from ENGINEER's decision is taken within the time limits and in accordance with the procedures set forth in Exhibit GC-A, "Dispute Resolution Agreement," entered into between OWNER and CONTRACTOR pursuant to Article 16, or (ii) if no such Dispute Resolution Agreement has been entered into, a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction to exercise such rights or remedies as the appealing party may have with respect to ENGINEER's decision, unless otherwise agreed in writing by OWNER and CONTRACTOR. Such appeal will not be subject to the procedures of paragraph 9.11.

Decisions on Disputes:

9.11. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and Claims under Articles 11 and 12 in respect of changes in the Contract Price or Contract Times will be referred initially to ENGINEER in writing with a request for a formal decision in accordance with this paragraph. Written notice of each such claim, dispute or other matter will be delivered by the claimant to ENGINEER and the other party to the Agreement promptly (but in no event later than thirty days) after the start of the occurrence or event giving rise thereto, and written supporting data will be submitted to ENGINEER and the other party within sixty days after the start of such occurrence or event unless ENGINEER allows an additional period of time for the submission of additional or more accurate data in support of such claim, dispute or other matter. The opposing party shall submit any response to ENGINEER and the claimant within thirty days after receipt of the claimant's last submittal (unless ENGINEER allows additional time). ENGINEER will render a formal decision in writing within thirty days after receipt of the opposing party's submittal, if any, in accordance with this paragraph. ENGINEER's written decision on such claim, dispute or other matter will be final and binding upon OWNER and CONTRACTOR unless: (i) an appeal from ENGINEER's decision is taken within the time limits and in accordance with the procedures set forth in EXHIBIT GC-A, "Dispute Resolution Agreement," entered into between OWNER and CONTRACTOR pursuant to Article 16, or (ii) if no such Dispute Resolution Agreement has been entered into, a written notice of intention to appeal from ENGINEER's written decision is delivered by OWNER or CONTRACTOR to the other and to ENGINEER within thirty days after the date of such decision and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction to exercise such rights or remedies as the appealing party may have with respect to such claim, dispute or other matter in accordance with applicable Laws and Regulations within sixty days of the date of such decision, unless otherwise agreed in writing by OWNER and CONTRACTOR.

9.12. When functioning as interpreter and judge under paragraphs 9.10 and 9.11, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by ENGINEER pursuant to paragraphs 9.10 or 9.11 with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.16) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such claim, dispute or other matter pursuant to Article 16.

9.13. ***Limitations on ENGINEER's Authority and Responsibilities:***

9.13.1. Neither ENGINEER's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise or performance of any authority or responsibility by ENGINEER shall create, impose or give rise to any duty owed by ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them.

9.13.2. ENGINEER will not supervise, direct, control or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work. ENGINEER will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

9.13.3. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

9.13.4. ENGINEER's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds and certificates of inspection, tests and approvals and Other documentation required to be delivered by paragraph 14.12 will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests and approvals that the results certified indicate compliance with, the Contract Documents.

9.13.5. The limitations upon authority and responsibility set forth in this paragraph 9.13 shall also apply to ENGINEER's Consultants, Resident Project Representative and assistants.

ARTICLE 10—CHANGES IN THE WORK

10.1. Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the Work. Such additions, deletions or revisions will be authorized by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

10.2. If OWNER and CONTRACTOR are unable to agree as to the extent, if any, of an adjustment in the Contract Price or an adjustment of the Contract Times that should be allowed as a result of a Work Change Directive, a claim may be made therefor as provided in Article 11 or Article 12.

10.3. CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraphs 3.5 and 3.6 except in the case of an emergency as provided in paragraph 6.23 or in the case of uncovering Work as provided in paragraph 13.9.

10.4. OWNER and CONTRACTOR shall execute appropriate Change Orders recommended by ENGINEER (or Written Amendments) covering:

10.4.1. changes in the Work which are (i) ordered by OWNER pursuant to paragraph 10.1, (ii) required because of acceptance of *defective* Work under paragraph 13.13 or correcting *defective* Work under paragraph 13.14, or (iii) agreed to by the parties;

10.4.2. changes in the Contract Price or Contract Times which are agreed to by the parties; and

10.4.3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 9.11;

provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.29.

10.5. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

ARTICLE 11—CHANGE OF CONTRACT PRICE

11.1. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at CONTRACTOR's expense without change in the Contract Price.

11.2. The Contract Price may only be changed by a Change Order or by a Written Amendment. Any claim for an adjustment in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than thirty days) after the start of the occurrence or event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within sixty days after the start of such occurrence or event (unless ENGINEER allows additional time for claimant to submit additional or more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the adjustment claimed covers all known amounts to which the claimant is entitled as a result of said occurrence or event. All claims for adjustment in the Contract Price shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will

be valid if not submitted in accordance with this paragraph 11.2.

11.3. The value of any Work covered by a Change Order or of any claim for an adjustment in the Contract Price will be determined as follows:

11.3.1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of paragraphs 11.9.1 through 11.9.3, inclusive);

11.3.2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 11.6.2);

11.3.3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under paragraph 11.3.2, on the basis of the Cost of the Work (determined as provided in paragraphs 11.4 and 11.5) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 11.6).

Cost of the Work:

11.4. The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in paragraph 11.5:

11.4.1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Such employees shall include without limitation superintendents, foremen and other personnel employed full- time at the site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by OWNER.

11.4.2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

11.4.3. Payments made by CONTRACTOR to the Subcontractors for Work performed or furnished by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of ENGINEER, which bids, if any, will be accepted. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work and fee as provided in paragraphs 11.4, 11.5, 11.6 and 11.7. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

11.4.4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work.

11.4.5. Supplemental costs including the following:

11.4.5.1. The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.

11.4.5.2. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost less market value of such items used but not consumed which remain the property of CONTRACTOR.

11.4.5.3. Rentals of all construction equipment and machinery and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of ENGINEER, and the costs of transportation, loading, unloading, installation, dismantling and removal thereof—all in accordance with the terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

11.4.5.4. Sales, consumer, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

11.4.5.5. Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

11.4.5.6. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established by OWNER in accordance with paragraph 5.9), provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for services a fee proportionate to that stated in paragraph 11.6.2.

11.4.5.7. The cost of utilities, fuel and sanitary facilities at the site.

11.4.5.8. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

11.4.5.9. Cost of premiums for additional Bonds and insurance required because of changes in the Work.

11.5. The term Cost of the Work shall not include any of the following:

11.5.1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.4.1 or specifically covered by paragraph 11.4.4—all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

11.5.2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.

11.5.3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.

11.5.4. Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 11.4.5.9 above).

11.5.5. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of *defective* Work, disposal of materials or equipment wrongly supplied and making good any damage to property.

Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

11.6. The CONTRACTOR's fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:

11.6.1. a mutually acceptable fixed fee; or

11.6.2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

11.6.2.1. for costs incurred under paragraphs 11.4.1 and 11.4.2, the CONTRACTOR's fee shall be fifteen percent;

11.6.2.2. for costs incurred under paragraph 11.4.3, the CONTRACTOR's fee shall be five percent;

11.6.2.3. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of paragraphs 11.4.1, 11.4.2, 11.4.3 and 11.6.2 is that the Subcontractor who actually performs or furnishes the Work, at whatever tier, will be paid a fee of fifteen percent of the costs incurred by such Subcontractor under paragraphs 11.4.1 and 11.4.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

11.6.2.4. no fee shall be payable on the basis of costs itemized under paragraphs 11.4.4, 11.4.5 and 11.5;

11.6.2.5. the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee by an amount equal to five percent of such net decrease; and

11.6.2.5. when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 11.6.2.1 through 11.6.2.5, inclusive.

11.7. Whenever the cost of any Work is to be determined pursuant to paragraphs 11.4 and 11.5, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

Cash Allowances:

11.8. It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be furnished and performed for such sums as may be acceptable to OWNER and ENGINEER. CONTRACTOR agrees that:

11.8.1. the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and

11.8.2. CONTRACTOR's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances and no demand for additional payment on account of any of the foregoing will be valid.

Prior to final payment, an appropriate Change Order will be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.9. *Unit Price Work:*

11.9.1. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER in accordance with paragraph 9.10.

11.9.2. Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.

11.9.3. OWNER or CONTRACTOR may make a claim for an adjustment in the Contract Price in accordance with Article 11 if:

11.9.3.1. the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

11.9.3.2. there is no corresponding adjustment with respect to any other item of Work; and

11.9.3.3. if CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense or OWNER believes that OWNER is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12—CHANGE OF CONTRACT TIMES

12.1. The Contract Times (or Milestones) may only be changed by a Change Order or a Written Amendment. Any claim for an adjustment of the Contract Times (or Milestones) shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within sixty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Times (or Milestones) shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Times (or Milestones) will be valid if not submitted in accordance with the requirements of this paragraph 12.1.

12.2. All time limits stated in the Contract Documents are of the essence of the Agreement.

12.3. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost due to such delay if a claim is made therefor as provided in paragraph 12.1. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions or acts of God. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

12.4. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay. In no event shall OWNER be liable to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from (i) delays caused by or within the control of CONTRACTOR, or (ii)

delays beyond the control of both parties including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

ARTICLE 13—TESTS AND INSPECTIONS: CORRECTION, REMOVAL OR ACCEPTANCE OF *DEFECTIVE* WORK

13.1. *Notice of Defects:* Prompt notice of all *defective* Work of which OWNER or ENGINEER have actual knowledge will be given to CONTRACTOR. All *defective* Work may be rejected, corrected or accepted as provided in this Article 13.

Access to Work:

13.2. OWNER, ENGINEER, ENGINEER's Consultants, other representatives and personnel of OWNER, independent testing laboratories and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's site safety procedures and programs so that they may comply therewith as applicable.

Tests and Inspections:

13.3. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

13.4. OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

13.4.1. for inspections, tests or approvals covered by paragraph 13.5 below;

13.4.2. that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.9 below shall be paid as provided in said paragraph 13.9; and

13.4.3. as otherwise specifically provided in the Contract Documents.

13.5. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, pay all costs in connection therewith, and furnish ENGINEER the required certificates of inspection, or approval. CONTRACTOR shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for OWNER's and ENGINEER's acceptance of materials or equipment to be incorporated in the Work, or of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work.

13.6. If any Work (or the work of others) that is to be inspected, tested or approved is covered by CONTRACTOR without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation.

13.7. Uncovering Work as provided in paragraph 13.6 shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR's intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.

Uncovering Work:

13.8. If any Work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER's observation and replaced at CONTRACTOR's expense.

13.9. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover, expose or otherwise make available for observation, inspection or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is *defective*, CONTRACTOR shall pay all claims, costs, losses and damages caused by, arising out of or resulting from such uncovering, exposure, observation, inspection and testing and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, may make a claim therefor as provided in Article 11. If, however, such Work is not found to be *defective*, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement and reconstruction; and, if the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

OWNER May Stop the Work:

13.10. If the Work is *defective*, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work

shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any surety or other party.

Correction or Removal of Defective Work:

13.11. If required by ENGINEER, CONTRACTOR shall promptly, as directed, either correct all *defective* Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by ENGINEER, remove it from the site and replace it with Work that is not *defective*. CONTRACTOR shall pay all claims, costs, losses and damages caused by or resulting from such correction or removal (including but not limited to all costs of repair or replacement of work of others).

13.12. *Correction Period:*

13.12.1. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be *defective*, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions: (i) correct such *defective* Work, or, if it has been rejected by OWNER, remove it from the site and replace it with Work that is not *defective*, and (ii) satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the *defective* Work corrected or the rejected Work removed and replaced, and all claims, costs, losses and damages caused by or resulting from such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

13.12.2. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

13.12.3. Where *defective* Work (and damage to other Work resulting therefrom) has been corrected, removed or replaced under this paragraph 13.12, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

Acceptance of Defective Work:

13.13. If, instead of requiring correction or removal and replacement of *defective* Work, OWNER (and, prior to ENGINEER's recommendation of final payment, also ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall pay all claims, costs, losses and damages attributable to OWNER's evaluation of and determination to accept such *defective* Work (such costs to be approved by ENGINEER as to reasonableness). If any such acceptance occurs prior to ENGINEER's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

OWNER May Correct Defective Work:

13.14. If CONTRACTOR fails within a reasonable time after written notice from ENGINEER to correct *defective* Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.11, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph OWNER shall proceed expeditiously. In connection with such corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the site, take possession of all or part of the Work, and suspend CONTRACTOR's services related thereto, take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER's representatives, agents and employees, OWNER's other contractors and ENGINEER and ENGINEER's Consultants access to the site to enable OWNER to exercise the rights and remedies under this paragraph. All claims, costs, losses and damages incurred or sustained by OWNER in exercising such rights and remedies will be charged against CONTRACTOR and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. Such claims, costs, losses and damages will include but not be limited to all costs of repair or replacement of work of others destroyed or damaged by correction, removal or replacement of CONTRACTOR's *defective* Work. CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies hereunder.

ARTICLE 14—PAYMENTS TO CONTRACTOR AND COMPLETION

Schedule of Values:

14.1. The schedule of values established as provided in paragraph 2.9 will serve as the basis for progress payments and

will be incorporated into a form of Application for Payment acceptable to ENGINEER. Progress payments on account of Unit Price Work will be based on the number of units completed.

Application for Progress Payment:

14.2. At least twenty days before the date established for each progress payment (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that OWNER has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER's interest therein, all of which will be satisfactory to OWNER. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

CONTRACTOR's Warranty of Title:

14.3. CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

Review of Applications for Progress Payment:

14.4. ENGINEER will, within ten days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER, or return the Application to CONTRACTOR indicating in writing ENGINEER's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application. Ten days after presentation of the Application for Payment to OWNER with ENGINEER's recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.7) become due and when due will be paid by OWNER to CONTRACTOR.

14.5. ENGINEER's recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER's on-site observations of the executed Work as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules, that to the best of ENGINEER's knowledge, information and belief:

14.5.1. the Work has progressed to the point indicated,

14.5.2. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.10, and to any other qualifications stated in the recommendation), and

14.5.3. the conditions precedent to CONTRACTOR's being entitled to such payment appear to have been fulfilled in so far as it is ENGINEER's responsibility to observe the Work.

However, by recommending any such payment ENGINEER will not thereby be deemed to have represented that: (i) exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents or (ii) that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.

14.6. ENGINEER's recommendation of any payment, including final payment, shall not mean that ENGINEER is responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of Work, or for any failure of CONTRACTOR to perform or furnish Work in accordance with the Contract Documents.

14.7. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make the representations to OWNER referred to in paragraph 14.5. ENGINEER may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:

14.7.1. the Work is *defective*, or completed Work has been damaged requiring correction or replacement,

14.7.2. the Contract Price has been reduced by Written Amendment or Change Order,

14.7.3. OWNER has been required to correct *defective* Work or complete Work in accordance with paragraph 13.14, or

14.7.4. ENGINEER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 15.2.1 through 15.2.4 inclusive.

OWNER may refuse to make payment of the full amount recommended by ENGINEER because:

14.7.5. claims have been made against OWNER on account of CONTRACTORs performance or furnishing of the Work,

14.7.6. Liens have been filed in connection with the Work, except where CONTRACTOR has delivered a specific Bond satisfactory to OWNER to secure the satisfaction and discharge of such Liens,

14.7.7. there are other items entitling OWNER to a set-off against the amount recommended, or

14.7.8. OWNER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.7.1 through 14.7.3 or paragraphs 15.2.1 through 15.2.4 inclusive;

but OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action and promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and CONTRACTOR, when CONTRACTOR corrects to OWNER's satisfaction the reasons for such action.

Substantial Completion:

14.8. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Within a reasonable time thereafter, OWNER, CONTRACTOR and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within fourteen days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER's objections, ENGINEER considers the Work substantially complete, ENGINEER will within said fourteen days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, heat, utilities, insurance and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing prior to ENGINEER's issuing the definitive certificate of Substantial Completion, ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

14.9. OWNER shall have the right to exclude CONTRACTOR from the Work after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

Partial Utilization:

14.10. Use by OWNER at OWNER's option of any substantially completed part of the Work which: (i) has specifically been identified in the Contract Documents, or (ii) OWNER, ENGINEER and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:

14.10.1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, the provisions of paragraphs 14.8 and 14.9 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

14.10.2. No occupancy or separate operation of part of the Work will be accomplished prior to compliance with the requirements of paragraph 5.15 in respect of property insurance.

Final Inspection:

14.11. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all

particulars in which this inspection reveals that the Work is incomplete or *defective*. CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

Final Application for Payment:

14.12. After CONTRACTOR has completed all such corrections to the satisfaction of ENGINEER and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance required by paragraph 5.4, certificates of inspection, marked-up record documents (as provided in paragraph 6.19) and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by subparagraph 5.4.13, (ii) consent of the surety, if any, to final payment, and (iii) complete and legally effective releases or waivers (satisfactory to OWNER) of all Liens arising out of or filed in connection with the Work. In lieu of such releases or waivers of Liens and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: (i) the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and (ii) all payrolls, material and equipment bills and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

Final Payment and Acceptance:

14.13. If, on the basis of ENGINEER's observation of the Work during construction and final inspection, and ENGINEER's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application to OWNER for payment. At the same time ENGINEER will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.15. Otherwise, ENGINEER will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application. Thirty days after the presentation to OWNER of the Application and accompanying documentation, in appropriate form and substance and with ENGINEER's recommendation and notice of acceptability, the amount recommended by ENGINEER will become due and will be paid by OWNER to CONTRACTOR.

14.14. If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.1, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

Waiver of Claims:

14.15. The making and acceptance of final payment will constitute:

14.15.1. a waiver of all claims by OWNER against CONTRACTOR, except claims arising from unsettled Liens, from *defective* Work appearing after final inspection pursuant to paragraph 14.11, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and

14.15.2. a waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

ARTICLE 15—SUSPENSION OF WORK AND TERMINATION

OWNER May Suspend Work:

15.1. At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than ninety days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if CONTRACTOR makes an approved claim therefor as provided in Articles 11 and 12.

OWNER May Terminate:

15.2. Upon the occurrence of any one or more of the following events:

15.2.1. if CONTRACTOR persistently fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.9 as adjusted from time to time pursuant to paragraph 6.6);

15.2.2. if CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;

15.2.2. if CONTRACTOR disregards the authority of ENGINEER; or

15.2.4. if CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents;

OWNER may, after giving CONTRACTOR (and the surety, if any,) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of CONTRACTOR, exclude CONTRACTOR from the site and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses and damages sustained by OWNER arising out of or resulting from completing the Work such excess will be paid to CONTRACTOR. If such claims, costs, losses and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses and damages incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and when so approved by ENGINEER incorporated in a Change Order, provided that when exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

15.3. Where CONTRACTOR's services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

15.4. Upon seven days' written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Agreement. In such case, CONTRACTOR shall be paid (without duplication of any items):

15.4.1. for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

15.4.2. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

15.4.3. for all claims, costs, losses and damages incurred in settlement of terminated contracts with Subcontractors, Suppliers and others; and

15.4.4. for reasonable expenses directly attributable to termination.

CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

CONTRACTOR May Stop Work or Terminate:

15.5. If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within thirty days after it is submitted or OWNER fails for thirty days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days' written notice to OWNER and ENGINEER, and provided OWNER or ENGINEER do not remedy such suspension or failure within that time, terminate the Agreement and recover from OWNER payment on the same terms as provided in paragraph 15.4. In lieu of terminating the Agreement and without prejudice to any other right or remedy, if ENGINEER has failed to act on an Application for Payment within thirty days after it is submitted, or OWNER has failed for thirty days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may upon seven day's written notice to OWNER and ENGINEER stop the Work until payment of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph 15.5 are not intended to preclude CONTRACTOR from making claim under Articles 11 and 12 for an increase in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to CONTRACTOR's stopping Work as permitted by this paragraph.

ARTICLE 16—DISPUTE RESOLUTION

If and to the extent that OWNER and CONTRACTOR have agreed on the method and procedure for resolving disputes between them that may arise under this Agreement, such dispute resolution method and procedure, if any, shall be as set forth in Exhibit GC-A, "Dispute Resolution Agreement," to be attached hereto and made a part hereof. If no such agreement on the method and procedure for resolving such disputes has been reached, and subject to the provisions of paragraphs 9.10, 9.11, and 9.12, OWNER and CONTRACTOR may exercise

such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

ARTICLE 17—MISCELLANEOUS

Giving Notice:

17.1. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if 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 delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

Computation of Times:

17.2.1. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.2.2. A calendar day of twenty-four hours measured from midnight to the next midnight will constitute a day.

Notice of Claim:

17.3. Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 17.3 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

Cumulative Remedies:

17.4. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR by paragraphs 6.12, 6.16, 6.30, 6.31, 6.32, 13.1, 13.12, 13.14, 14.3 and 15.2 and all of the rights and remedies available to OWNER and ENGINEER thereunder, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

Professional Fees and Court Costs Included:

17.5. Whenever reference is made to "claims, costs, losses and damages," it shall include in each case, but not be limited to, all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs.

[The remainder of this page was left blank intentionally.]

EXHIBIT GC-A to General Conditions of the Agreement Between OWNER and CONTRACTOR Dated_____ For use with EJCDC No. 1910-8 (1990 ed.)

DISPUTE RESOLUTION AGREEMENT

OWNER and CONTRACTOR hereby agree that Article 16 of the General Conditions to the Agreement between OWNER and CONTRACTOR is amended to include the following agreement of the parties:

16.1. All claims, disputes and other matters in question between OWNER and CONTRACTOR arising out of or relating to the Contract Documents or the breach thereof (except for claims which have been waived by the making or acceptance of final payment as provided by paragraph 14.15) will be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining, subject to the limitations of this Article 16. This agreement so to arbitrate and any other agreement or consent to arbitrate entered into in accordance herewith as provided in this Article 16 will be specifically enforceable under the prevailing law of any court having jurisdiction.

16.2. No demand for arbitration of any claim, dispute or other matter that is required to be referred to ENGINEER initially for decision in accordance with paragraph 9.11 will be made until the earlier of (a) the date on which ENGINEER has rendered a written decision or (b) the thirty-first day after the parties have presented their evidence to ENGINEER if a written decision has not been rendered by ENGINEER before that date. No demand for arbitration of any such claim, dispute or other matter will be made later than thirty days after the date on which ENGINEER has rendered a written decision in respect thereof in accordance with paragraph 9.11; and the failure to demand arbitration within said thirty days' period will result in ENGINEER's decision being final and binding upon OWNER and CONTRACTOR. If ENGINEER renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence but will not supersede the arbitration proceedings, except where the decision is acceptable to the parties concerned. No demand for arbitration of any written decision of ENGINEER rendered in accordance with paragraph 9.10 will be made later than ten days after the party making such demand has delivered written notice of intention to appeal as provided in paragraph 9.10.

16.3. Notice of the demand for arbitration will be filed in writing with the other party to the Agreement and with the American Arbitration Association, and a copy will be sent to ENGINEER for information. The demand for arbitration will be made within the thirty-day or ten- day period specified in paragraph 16.2 as applicable, and in all other cases within a reasonable time after the claim, dispute or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

16.4. Except as provided in paragraph 16.5 below, no arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder or in any other manner any other person or entity (including ENGINEER, ENGINEER's Consultant and the officers, directors, agents, employees or consultants of any of them) who is not a party to this contract unless:

16.4.1. the inclusion of such other person or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration, and

16.4.2. such other person or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings, and

16.4.3. the written consent of the other person or entity sought to be included and of OWNER and CONTRACTOR has been obtained for such inclusion, which consent shall make specific reference to this paragraph; but no such consent shall constitute consent to arbitration of any dispute not specifically described in such consent or to arbitration with any party not specifically identified in such consent.

16.5. Notwithstanding paragraph 16.4 if a claim, dispute or other matter in question between OWNER and CONTRACTOR involves the Work of a Subcontractor, either OWNER or CONTRACTOR may join such Subcontractor as a party to the arbitration between OWNER and CONTRACTOR hereunder. CONTRACTOR shall include in all subcontracts required by paragraph 6.11 a specific provision whereby the Subcontractor consents to being joined in an arbitration between OWNER and CONTRACTOR involving the Work of such Subcontractor. Nothing in this paragraph 16.5 nor in the provision of such subcontract consenting to joinder shall create any claim, right or cause of action in favor of Subcontractor and against OWNER, ENGINEER or ENGINEER's Consultants that does not otherwise exist.

16.6. The award rendered by the arbitrators will be final, judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal.

[The remainder of this page was left blank intentionally.]

16.7. OWNER and CONTRACTOR agree that they shall first submit any and all unsettled claims, counterclaims, disputes and other matters in question between them arising out of or relating to the Contract Documents or the breach thereof ("disputes"), to mediation by The American Arbitration Association under the Construction Industry Mediation Rules of the American Arbitration Association prior to either of them initiating against the other a demand for arbitration pursuant to paragraphs 16.1 through 16.6, unless delay in initiating arbitration would irrevocably prejudice one of the parties. The respective thirty and ten day time limits within which to file a demand for arbitration as provided in paragraphs 16.2 and 16.3 above shall be suspended with respect to a dispute submitted to mediation within those same applicable time limits and shall remain suspended until ten days after the termination of the mediation. The mediator of any dispute submitted to mediation under this Agreement shall not serve as arbitrator of such dispute unless otherwise agreed.

[This page was left blank intentionally.]

DIVISION 1 – GENERAL REQUIREMENTS
SECTION 01010 - SUMMARY OF WORK

1.01 PROJECT DESCRIPTION

A. The following information, though not all-inclusive, is given to assist Contractors in their evaluation of the work required to meet the project objectives:

This project will resurface the existing wash bay and replace the existing collection trench at the wash bay. The exisiting sump at the acid dock will be removed and replaced. Fluids from the area will be conveyed to and nuetralization system and oil and water seperator and then discharged to the city sewer through a new sewer line.

END OF SECTION

SECTION 01039 - COORDINATION AND MEETINGS

1.01 GENERAL

A. Contractor shall cooperate in the coordination of activities in a manner that will provide the least interference with operations at the facility.

1.02 SHUTDOWN OF EXISTING OPERATIONS OR UTILITIES

A. Tie-in to existing services or utilities or other work that requires the temporary shutdown of any existing operations or utilities shall be planned in detail with appropriate scheduling of the work and be coordinated with the Owner and the Engineer. The approved schedule for shutdown or re-start shall be indicated on the Contractor's schedule, and advance notice shall be given in order that the Owner and Engineer may witness the shutdown, tie-in, and start-up.

B. All materials and equipment (including emergency equipment) necessary to expedite the tie-in shall be on hand prior to the shutdown of existing services or utilities.

1.03 SCHEDULING

A. Plan the work and carry it out with minimum interference to the operations at the facility. Prior to starting the work, confer with the Engineer and Owner's representative to develop an approved work schedule that will permit the existing facility to function as normally as practical.

B. Access to the facilities for personnel and chemical deliveries shall be maintained at all times during construction.

1.04 PRECONSTRUCTION CONFERENCE

The Contractor shall attend a conference that will be held after acceptance of bids to discuss the project and the Owner's safety requirements. Safety training will include OSHA hazardous communication (Hazcom) training and Owner's safety and loss prevention training. All Contractor personnel shall attend the safety training. The safety training will take a maximum of four hours. The Engineer will notify Contractor of location, time, and date of meeting.

1.05 PROJECT MEETINGS

Project meetings among the Contractor and Owner and/or Engineer will be conducted on a regular basis to discuss project progress.

END OF SECTION

SECTION 01060 - SPECIAL CONDITIONS

1.01 STANDARD SPECIFICATIONS

A. Standard specifications, such as those of American Society for Testing and Materials (ASTM) and National Fire Protection Association (NFPA), have been referred to in these contract documents. These codes and standards are applicable for work performed in the United States of America. The intent of these documents is for the minimum standards to equal those specified in the referenced standard specifications. Where these contract documents or the local government standards are more strict, they shall take precedence.

SECTION 01160 - SITE CONDITIONS

PART 1 - SITE INVESTIGATIONS AND REPRESENTATION

1.01 The Contractor acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon access to the site; handling, storage, and disposal of materials; availability of water, electricity and roads; uncertainties of weather, river stages, or similar physical conditions at the site; the conformation and conditions of the ground; the equipment and facilities needed preliminary to and during the execution of the work; and all other matters which can in any way affect the work or the cost thereof under this Contract.

1.02 The Contractor further acknowledges that he has satisfied himself as to the character, quantity of surface and subsurface materials to be encountered from his inspection of the site and from reviewing any available records of exploratory work furnished by the Engineer or included in these Documents. Failure by the Contractor to acquaint himself with the physical conditions of the site and all the available information will not relieve him from responsibility for properly estimating the difficulty or cost of successfully performing the work.

1.03 The Contractor warrants that as a result of his examination and investigation of all the aforesaid data that he can perform the work in a good and workmanlike manner and to the satisfaction of the Engineer. The Engineer and Owner assume no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract, and (2) the Contract expressly provides that the responsibility therefore is assumed by the Engineer or Owner.

PART 2 - INFORMATION ON SITE CONDITIONS

2.01 Any information obtained by the Engineer regarding site conditions, subsurface information, groundwater elevations, existing construction of site facilities, and similar data will be available for inspection, as applicable, at the office of the Engineer upon request. Such information is offered as supplementary information only and is not a part of these contract documents. Neither the Engineer nor the Owner assumes any responsibility for the completeness or interpretation of such supplementary information.

A. Differing Subsurface Conditions:

1. In the event that the subsurface or latent physical conditions are found materially different from those indicated in these Documents, and differing materially from those ordinarily encountered and generally recognized as inherent in the character of work covered in these Contract Documents, the Contractor shall promptly, and before such conditions are disturbed, notify the Engineer in writing of such changed conditions.

2. The Engineer will investigate such conditions promptly and following this investigation, the Contractor shall proceed with the work, unless otherwise instructed by the Engineer. If the Engineer finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for performing the work, the Engineer will recommend to the Owner the amount of adjustment in cost and time he considers reasonable. The Owner will make the final decision on all Change Orders to the Contract regarding any adjustment in cost or time for completion.

PART 3 - CONTRACTOR'S RESPONSIBILITY FOR PROTECTION OF UTILITIES & OTHER PROPERTIES

3.01 UTILITIES

A. Utilities such as sewer, water, electric lines, and gas lines encountered in the work shall be protected from injury and maintained in service until moved or replaced as required or abandoned. The Contractor shall remove such parts of abandoned lines as may be necessary for the proper construction and use of the new work. Utility connection extension and payment for same is the responsibility of the Contractor.

3.02 INTERFERING STRUCTURES

A. Take necessary precautions to prevent damage to existing structures whether on the surface, aboveground, or underground. An attempt has been made to show major structures on the Drawings. The completeness and accuracy cannot be guaranteed, and it is presented simply as a guide to avoid known possible difficulties.

3.03 FIELD RELOCATION

A. During the progress of construction, it is expected that minor relocations of the work will be necessary. Such relocations shall be made only by direction of the Engineer. If existing structures are encountered that prevent the construction, and that are not properly shown on the Drawings, notify the Engineer before continuing with the construction in order that the Engineer may make such field revision as necessary to avoid conflict with the existing structures. If the Contractor shall fail to so notify the Engineer when an existing structure is encountered, and shall proceed with the construction despite the interference, he shall do so at his own risk.

3.04 EASEMENTS

A. Where portions of the work are located on public or private property, easements and permits will be obtained by the Owner. Easements will provide for the use of the property for construction purposes to the extent indicated on the easements. Copies of these easements and permits are available upon request to the Owner. It shall be the Contractor's responsibility to determine the adequacy of the easement obtained in every case and to abide by all requirements and provisions of the easement. The Contractor shall confine his construction operations to within the easement limits or make special arrangements with the property owners or appropriate public agency for the additional area required. Any damage to property, either inside or outside the limits of the easements provided by the Owner, shall be the responsibility of the Contractor as specified herein. the Contractor shall remove, protect, and replace all fences or other items encountered on public or private property. Before final payment will be authorized by the Engineer, the Contractor will be required to furnish the Owner with written releases from property owners or public agencies where side agreements or special easements have been made by the Contractor or where the Contractor's operations, for any reason, have not been kept within the construction right-of-way obtained by the Owner.

B. It is anticipated that the required easements and permits will be obtained before construction is started. However, should the procurement of any easement or permit be delayed, the Contractor shall schedule and perform the work around these areas until such a time as the easement or permit has been secured.

3.05 LAND MONUMENTS

A. The Contractor shall notify the Engineer of any existing public and private land monuments encountered. Private monuments shall be preserved, or replaced by a licensed surveyor at the Contractor's expense. When government monuments are encountered, the Contractor shall notify the Engineer at least 2 weeks in advance of the proposed construction in order that the Engineer will have ample opportunity to notify the proper authority and reference these monuments for later replacement.

END OF SECTION

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Shop Drawing Submittals

B. Operation and Maintenance Data

1.02 SHOP DRAWING SUBMITTALS

A. Transmit each submittal with Engineer accepted form.

B. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.

C. Identify project, Contractor, Subcontractor, or Supplier; pertinent drawing sheet and detail number(s); and specification section number as appropriate.

D. Apply Contractor's stamp, signed or initialled, certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information, is in accordance with the requirements of the contract documents.

E. Submit number that Contractor requires, plus three copies to be retained by Engineer and Owner.

F. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.03 OPERATION AND MAINTENANCE DATA

A. Provide operating and instruction manuals and warranty and service information from equipment manufacturers to the Owner's on-site representative upon completion of the work.

B. Panelboard Circuit Directories: Provide electrical service characteristics, controls and communications.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Include manufacturer's printed operation and maintenance instructions.

F. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

G. Manufacturer's operation and maintenance manuals shall be furnished for the following equipment, as a minimum:

1. All pumps, including mix/transfer pump, liquid additive feed pump, scrubber recirculation pump, and waste pump.

2. Air compressor system.

3. All control valves, including pneumatically actuated valves, solenoid valves, and float valve.

4. Heating and ventilating equipment, including unit heaters, exhaust fan, louvers, and make-up air unit.

5. Instrumentation and controls.

END OF SECTION

SECTION 01400 - QUALITY CONTROL AND TESTING

1.01 SAMPLES AND TEST SPECIMENS

A. Where required in the Specifications, and as determined necessary by the Engineer, test specimens or samples of materials, appliances, and fittings to be used or offered for use in the connection with the work shall be submitted to the Engineer at the Contractor's expense, with information as to their sources, with all cartage charges prepaid, and in such quantities and sizes as may be required for proper examination and test to establish the quality or quantity thereof, as applicable.

B. All samples and test specimens shall be submitted in ample time to enable the Engineer to make any tests or examinations necessary, without delay to the work. The Contractor will be held responsible for any loss of time due to his neglect or failure to deliver the required samples to the engineer, as specified.

C. Samples also shall be taken during the course of the work, as required by the Engineer.

D. Material used in the work shall conform with the submitted samples and test certificates as accepted by the Engineer.

1.02 TESTING

A. All tests required by the Specifications to be performed by an independent laboratory shall be made, and the samples therefore furnished shall be at the sole expense of the Contractor. The Contractor shall contract with and pay all laboratory charges.

B. Laboratory tests and examinations that the Owner or Engineer elects to make in its own laboratory will be made at no cost to the Contractor, except that, if a sample of any material or equipment proposed for use by the Contractor fails to meet the Specifications, the cost of testing subsequent samples shall be borne by the Contractor.

C. Reports of all tests made by testing laboratories shall by distributed by the testing laboratory as follows:

1 copy - Contractor
1 copy - Applicable supplier or subcontractor
1 copy - Owner's representative
1 copy - Engineer

END OF SECTION

SECTION 01503 - PRESERVATION, RESTORATION, AND CLEANUP

PART 1 - GENERAL

1.01 SITE RESTORATION AND CLEANUP

A. At all times during the work, keep the premises clean and orderly, and upon completion of the work, repair all damage caused by equipment and leave the project free of rubbish or excess materials of any kind.

B. Stockpile excavated materials in a manner that will cause the least damage to adjacent lawns, grassed areas, gardens, shrubbery, or fences regardless of whether these are on private property, or on public rights-of-way. Remove all excavated materials from grassed and planted areas, and leave these surfaces in a condition equivalent to their original condition.

C. All existing drainage ditches and culverts shall be reopened and grade and natural drainage restored. Restore broken or damaged culverts to their original condition and location.

1.02 FINISHING OF SITE, BORROW, AND STORAGE AREAS

A. Upon completion of the project, all areas used by the Contractor shall be properly cleared of all temporary structures, rubbish, and waste materials and properly graded to drain and blend in with the abutting property. Areas used for the deposit of waste materials shall be finished to properly drain and blend with the surrounding terrain.

1.04 REMOVAL OF ROCK FROM FINISHED SURFACES

A. Remove and dispose of all loose rock and boulders larger than 2-inch diameter occurring on the finished surfaces as a result of the construction operations.

1.05 STREET CLEANUP DURING CONSTRUCTION

A. Thoroughly clean all spilled dirt, gravel, or other foreign material caused by the construction operations from all streets and roads at the conclusion of each day's operation.

1.06 DUST PREVENTION

A. Give all unpaved streets, roads, detours, or haul roads used in the construction area an approved dust-preventive treatment or periodically water to prevent dust. Applicable environmental regulations for dust prevention shall be strictly followed.

PART 2 - ENVIRONMENTAL PROTECTION

2.01 GENERAL

A. The Contractor shall provide and maintain environmental protection during the life of the Contract. Environmental protection shall be provided to control pollution that develops during normal construction practices. The Contractor's operations shall comply with all government regulations pertaining to water, air, solid waste, and noise pollution.

2.02 PROTECTION OF NATURAL RESOURCES

A. It is intended that the natural resources within the project boundaries and outside the limits of permanent work performed under this Contract be preserved in their existing condition or be restored to an equivalent or improved condition upon completion of the work. The Contractor shall confine his construction activities to areas defined by the Contract Documents.

B. Except in areas indicated to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy trees or shrubs without special permission from the Engineer. No ropes, cables, or guys shall be fastened to or attached to any existing trees for anchorages unless specifically authorized. Where such special emergency use is permitted, the Contractor shall be responsible for any damage resulting from such use.

C. All trees or other landscape features scarred or damaged by the Contractor's equipment or operations shall be repaired and/or restored to their original condition at the Contractor's expense.

D. At all times, special measures shall be taken to prevent oily or hazardous substances from entering the ground, drainage areas, or local bodies of water.

E. The Contractor shall at all times perform all work and take such steps required to prevent any interference or disturbance to fish and wildlife. The contractor will not be permitted to alter water flows or otherwise significantly disturb native habitat adjacent to the project area which is critical to fish and wildlife except as may be indicated or specified.

2.03 EROSION AND SEDIMENT CONTROL MEASURES

A. Earthwork brought to final grade shall immediately be finished as indicated and specified. Side slopes and back slopes shall be protected immediately upon completion of rough grading. All earthwork shall be planned and conducted in such a manner as to minimize the duration of exposure of unprotected soils.

B. Such methods as may be necessary shall be utilized to effectively prevent erosion and control sedimentation, including but not limited to the following:

1. The rate of runoff from the construction site shall be mechanically retarded and controlled. This includes construction of diversion ditches, benches, and berms, to retard and divert runoff to protected drainage courses.

2. Borrow will not be permitted in areas where suitable environmental controls are not possible; and/or.

3. Temporary protection will be provided on all side and back slopes as soon as rough grading is completed or sufficient soil is exposed to require protection to prevent erosion. Such protection shall be accelerated growth of permanent or temporary vegetation, mulching, or netting. Slopes too steep for stabilization by other means shall be stabilized by hydro-seeding, mulching anchored in place, covering by anchored netting, sodding, or such combination of these and other methods as may be necessary for effective erosion control.

2.04 CONTROL AND DISPOSAL OF NON-CONTAMINATED SANITARY WASTES

A. Wastes which are not contaminated shall be picked up and placed in containers which are emptied on a regular schedule. All handling and disposal shall be so conducted as to prevent contamination of the site and any other areas. On completion, the areas shall be left clean and natural looking. All signs of temporary construction and activities incidental to construction of the required permanent work in place shall be obliterated.

B. Contractor shall transport and dispose of non-contaminated waste in a manner that complies with government requirements. The Contractor shall provide the Engineer a copy of permit or license which reflects government agency's approval and compliance with their solid waste disposal regulations. The permit or license and the location of the disposal area shall be provided prior to transporting any waste material.

C. Fueling and lubricating of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spills and evaporation. Lubricants to be discarded, and waste oil shall be disposed of in accordance with approved procedures meeting government regulations.

END OF SECTION

SECTION 01510 - TEMPORARY CONSTRUCTION UTILITIES AND FACILITIES

PART 1 - WATER

1.01 TEMPORARY WATER

A. Potable water will be available to the Contractor locally.

PART 2 - TEMPORARY ELECTRIC POWER

2.01 GENERAL

A. Electric power will [*will not*] be available to the Contractor locally. The Contractor shall determine the type and amount available.

2.02 SAFETY REQUIREMENTS FOR TEMPORARY ELECTRIC POWER

A. Temporary electric power installation shall meet the construction safety requirements of all governing agencies.

PART 3 - SANITARY FACILITIES

3.01 GENERAL

A. The Contractor shall provide sanitary facilities for his employees and his subcontractors' employees and maintain the facility in a sanitary condition at all times. The facility shall conform to code requirements and be acceptable to the sanitary authorities. Upon completion of the work, the sanitary facility shall be removed and the area restored to its original condition.

PART 4 - PRODUCT DELIVERY, STORAGE, AND HANDLING

4.01 PRODUCT DELIVERY

A. Schedule delivery of products or equipment as required to allow timely installation and to avoid excessive on-site storage.

B. Delivery of products or equipment to be in manufacturer's original unbroken cartons or other containers, clearly and fully marked and identified as to manufacturer, item, location where to install, and instructions for assembly, use and storage.

C. The Contractor shall inspect all products or equipment delivered to the site prior to their unloading and shall reject all products or equipment that are damaged, used, or in any other way unsatisfactory for use on project.

4.02 STORAGE AND HANDLING

A. Store products or equipment off ground and protected from weather. Provide additional protection as required by manufacturer until the time that the item is to be installed. While storing, take care to avoid creating a humidity chamber by venting area.

B. Store products or equipment in location to avoid physical damage to items while in storage, and to facilitate prompt inspection.

C. Handle products or equipment in accord with manufacturer's recommendations and instructions.

D. Delicate instruments and materials subject to vandalism or theft shall be placed under locked cover, and if necessary, provided with temperature control as recommended by manufacturer.

END OF SECTION

SECTION 01520 - SAFETY

1.01 CONSTRUCTION SAFETY PROGRAM

A. The Contractor shall develop and maintain for the duration of this Contract, a safety program that will effectively incorporate and implement all required safety provisions. The Contractor shall appoint an employee who is qualified and authorized to supervise and enforce compliance with the safety program.

B. The duty of the Owner and/or Engineer to conduct construction review of the Contractor's performance is not intended to include a review or acceptance of the adequacy of the Contractor's safety supervisor, the safety program, or any safety measures taken in, on, or near the construction site.

1.02 SAFETY EQUIPMENT

A. The Contractor, as part of his safety program, shall maintain at his office or other well-known place at the job site, safety equipment applicable to the work as prescribed by the governing safety authorities, and all articles necessary for giving first-aid to the injured. Also, as part of his safety program, the Contractor shall establish the procedure for the immediate removal to a hospital or a doctor's care of any person who may be injured on the job site.

B. The Contractor shall do all work necessary to protect the general public from hazards, including, but not limited to, surface irregularities or unramped grade changes in pedestrian sidewalk or walkway, and trenches or excavations in roadway. Barricades, lanterns, and proper signs shall be furnished in sufficient amount to safeguard the public and the work.

C. The performance of all work and all completed construction, particularly with respect to ladders, platforms, structure openings, scaffolding, shoring, lagging, machinery guards, and the like, shall be in accordance with the applicable governing safety authorities.

D. During construction, the Contractor shall construct and at all times maintain satisfactory and substantial temporary chain link fencing, solid fencing, railing, barricades, or steel plates, as applicable, at all openings, obstructions, or other hazards in streets, sidewalks, floors, roofs, and walkways. All such barriers shall have adequate warning lights as necessary, or required, for safety.

1.03 ACCIDENT REPORTS

A. If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the Engineer and Owner. In addition, the Contractor must promptly report in writing to the Engineer all accidents whatsoever arising out of, or in connection with, the performance of the work whether on, or adjacent to, the site, giving full details and statements of witnesses.

B. If a claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

1.04 FIRE PREVENTION AND PROTECTION

A. The Contractor shall perform all work in a fire-safe manner. He shall supply and maintain on the site, adequate fire-fighting equipment capable of extinguishing incipient fires. The Contractor shall comply with applicable government fire-prevention regulations.

END OF SECTION

SECTION 01650 - SPECIAL SERVICES

1.01 INSTALLATION ASSISTANCE

A. The Contractor shall provide, at no additional cost to the Engineer or Owner, the services of competent and experienced technical personnel who shall represent the manufacturers of all equipment and systems as may be necessary to resolve assembly or installation problems at the work site which are attributable to, or associated with, the equipment furnished.

1.02 FUNCTIONAL TESTING

A. All mechanical equipment and electrical equipment, including related control systems, shall be subjected to preliminary operation and testing by the Contractor before the individual facilities and systems are put into operation. Tests shall be made to determine whether the equipment has been properly assembled, aligned, adjusted, wired, and connected. Any changes, adjustments, or replacements of equipment which are due to errors or omissions on the part of the Contractor, or which may be otherwise necessary to comply with the requirements of this Contract shall be done without additional cost to the Engineer of Owner. Upon completion of the checking and adjustment, the Contractor shall demonstrate that each piece of equipment in each system of related items of mechanical equipment and the related instrumentation and control equipment operate in accordance with the requirements of the Specifications.

B. The demonstration test shall be arranged by the Contractor, however, the scheduling shall be subject to the approval of the Engineer. The Contractor shall provide personnel from the various trades involved to operate and demonstrate the equipment.

C. The Contractor is responsible for maintaining the facilities and equipment in good repair and shall transfer them to the Engineer in good working condition, fully functional.

1.03 WARRANTIES

A. Obtain warranties and bonds, executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of the work. Except for items put into use with Engineer's permission, leave date of beginning of time of warranty until the date of substantial completion is determined.

END OF SECTION

DIVISION 2 - SITE WORK

SECTION 02100 - MOVE-IN AND SITE PREPARATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Prepare the site for construction.

B. Move in personnel and equipment.

C. Set up temporary offices, building, facilities and utilities.

1.02 RELATED WORK

A. Division 1 - General Requirements

1.03 SITE PREPARATION FOR CONTRACTOR OCCUPANCY

A. The Contractor shall provide all temporary facilities as required for performing the work.

B. The area for Contractor's storage, staging, and parking shall be coordinated with the Owner and/or Engineer. It is the responsibility of the Contractor to suitably maintain this area.

C. The Contractor may construct a temporary security fence for the protection of materials, tools, and equipment. Maintain fence during construction period. Upon completion of work, the security fence shall be removed from the site.

D. The Contractor shall obtain the necessary permits for connection to necessary services provided by utility companies serving the project area.

E. Set-up temporary construction facilities in a neat and orderly manner. Accomplish all required work in accordance with applicable portions of these specifications. Confine operations to work area shown.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 CONSTRUCTION STAKING

A. The Contractor shall stake out the construction, establish temporary bench marks, lines, levels, batterboards, reference points, centerlines, and verify all dimensions in relation to and connection with existing facilities. The Contractor shall be solely responsible for all errors in connection with this work.

B. Prior to commencement of the work, the Contractor shall report to the Engineer any inconsistencies in the proposed lines, levels, grades, dimensions, or locations shown on the Drawings.

3.02 OBSTRUCTIONS

A. Some obstructions may not be shown. Bidders are advised to carefully inspect the existing facilities before preparing their proposals. The removal and replacement of minor obstructions such as electrical conduits, air, water, and waste piping, and similar items shall be anticipated and accomplished, even though not shown or specifically mentioned.

B. Major obstructions encountered that are not shown on the Drawings or could not have been foreseen by visual inspection of the site prior to bidding should immediately be brought to the attention of the Engineer. The Engineer will make a determination for proceeding with the work. If the Engineer finds that the obstruction adversely affects the Contractor's costs or schedule for completion, a proper adjustment to the Contract will be made in accordance with the General Conditions.

3.03 CUTTING AND DEMOLITION

A. Any pipes or existing structures encountered during construction shall be preserved until accepted for removal by the Engineer. The Contractor shall be required to repair pipes or structures in use that are damaged during construction at no cost to the Owner or Engineer. The removal of abandoned pipes shall be accepted by the Engineer.

3.04 REMOVAL AND SALVAGE OF MATERIALS

A. Carefully remove materials specified to be reused or salvaged so as not to damage the material.

B. Reuse by the Contractor of salvaged material will not be permitted, except as specifically shown or specified herein.

C. Existing materials to be removed or replaced and not specifically designated for salvage shall become the property of the Contractor.

END OF SECTION

SECTION 02220 - EXCAVATION, CLEARING, FOUNDATION PREPARATION, AND BACKFILL FOR STRUCTURES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The work to be done in accordance with the requirements of this Specification consists of furnishing all material, equipment, supplies, and accessories required, and of performing all operations needed in connection with all clearing, excavation, backfill, foundation preparation, site grading, and disposal of waste and excess excavated material, that are required in connection with the Work.

Included shall be all excavation of every description, and of whatever substances encountered, to the depths and of the areas required for the Work. No classification will be made of the materials excavated either as to depth, nature, composition, or degree of water content.

PART 2 - PRODUCTS

2.01 FOUNDATION PREPARATION MATERIAL

A.

2.02 STRUCTURAL BACKFILL

A. Suitable material from the required excavation may be used for backfilling around the structures. The backfill material shall be free from rubbish, large stones, clods, and frozen lumps of earth, and shall be moistened, if required, and compacted to the specified density.

PART 3 - EXECUTION

3.01 GENERAL

A. The contractor shall confine all equipment movement, stockpiling, and all other operations within the designated limits of construction as shown on the drawings.

B. All excess materials, debris and other unusable items shall be removed from the site at the end of the contract. Any excess debris on the site during the contract that interferes with the plant operations or the Contractors operations shall be removed immediately. Clean-up and finish grading operations shall leave the site in a condition equal or better than its original condition.

3.02 EXCAVATION

A. Prior to the commencement of the excavation for the structure, the Contractor shall remove trees and brush, and blade-off the vegetation and then remove and stockpile all approved topsoil material for subsequent use for embankments and site grading, but not to exceed 12 inches in depth.

B. Except as otherwise dictated by construction conditions, the excavation shall be of such dimensions as to allow for the proper installation of concrete forms and to permit the various trades to install their work. Care shall be taken to see that the excavation does not extend below the established grades, except as subsequently provided for in the foundation preparation. If the excavation, either through accident or otherwise, without written authorization, be made below such established lines, the Contractor shall fill in the resulting excess excavation with thoroughly compacted approved material at no cost to the Owner, to the satisfaction of the Engineer.

C. Upon completion of the general excavation for footings and slabs, the Contractor will be required to remove all material that in any way projects above the bottom of the footings or the undersides of slabs, and into the side walls.

D. For all excavation, the Contractor shall provide suitable equipment to remove water, and shall keep the excavation unwatered so that forming and concrete work can be carried on under unwatered conditions.

E. To the extent required, suitable excavated material shall be used for backfill and site grading. All waste and excavated material not to be used elsewhere shall be disposed of by and at the expense of the Contractor and shall not remain on-site.

F. Any contaminated material shall be disposed of in accordance with the applicable regulations.

3.03 FOUNDATION SPACE PREPARATION

A. Should unstable material, as determined by the Engineer, be found at or near the foundation elevation, the Contractor shall over-excavate as necessary to remove such unstable material. Suitable materials approved by the Engineer will be placed and compacted to the required elevation. Otherwise the structure shall be redesigned to accommodate the site conditions.

B. The foundation preparation material shall be deposited in layers and compacted by surface or internal vibrators, by hand tampers, by hand-power tampers, or by any combination of these devices. The thickness of the horizontal layers after compaction shall be not more than six inches if the compaction is performed by surface vibrators, hand tampers, or hand-power tampers, or not more than the penetrating length of the vibrator head if compaction is performed by internal vibrators. Moisture shall be added as required to obtain the maximum compaction.

C. The relative density (dry) of the compacted material shall be not less than 100 percent, of Standard Proctor Density, ASTM D698, and the resulting modulus of subgrade reaction called for on the drawings, or better, shall be confirmed by the soils engineer.

3.04 COMPACTED STRUCTURAL BACKFILL

A. All backfill shall be consolidated by mechanical tamping in layers not to exceed 6 inches, until the dry density of the compacted material is not less than 95 percent of the laboratory maximum dry density in accordance with ASTM Specification Designation D698.

3.05 DRIVE ENBANKMENT AND SURFACE

A. Enbankment for the drive shall be compacted to 95% standard proctor.

B. Suitable material from the site may be used for embankment.

3.06 FINISH GRADING

A. The Contractor shall smooth all berms, banks, drainageways and other similar areas to eliminate abrupt changes in grade and prevent collection of drainage waters. Drainage channels shall be finished to uniform beds and side banks. The disturbed area shall be finished to permit water to drain away from the site without ponding.

3.07 RESEEDING

A. All areas disturbed during the construction shall be reseeded wherever required to match the surrounding vegetation.

END OF SECTION

DIVISION 3 - CONCRETE

SECTION 03300 - CONCRETE WORK

PART 1 - GENERAL

1.01 WORK INCLUDED

The work required under this Specification consists of furnishing all plant, labor and materials and performing all construction operations in connection with installation and erection of all concrete construction work, complete in every respect, including all related items and appurtenances as required by the Drawings, as specified herein and subject to the terms and conditions of the Contract Documents. The Contractor shall cooperate with all building trades and Subcontractors so as to insure proper incorporation within the concrete part of the structure of all piping, conduit, curb angles, frames, inserts and other miscellaneous iron, metal and wooden inserts.

1.02 COMPLIANCE WITH STANDARD AND INDUSTRY SPECIFICATIONS

Any material or operation specified by reference to published specifications shall mean the latest edition, unless otherwise noted, shall be complied with unless directed otherwise by the Engineer. These include the American Society for Testing and Materials (ASTM), the American Concrete Institute (ACI), the Portland Cement Association (PCA), the Concrete Reinforcing Steel Institute (CRSI) or other published standards herein referred to. In case of a conflict between the referenced specifications or standards and this Specification, the one having the more stringent requirements, as determined by the Engineer, shall govern.

1.03 SUBMITTALS

Shop drawings and catalog information shall be submitted to the Engineer for review prior to fabrication or incorporation into the work for concrete-related equipment and components, in order to show that equipment selected and to be installed by the Contractor generally conforms with the Contract Documents. Submittal information includes, but is not limited to the following:

A. Concrete Mix Design.

1. Identify source, proportion, and location of concrete in accordance with 2.09I(1).
2. Identify proper form, source, and type of aggregate and state conformance with ASTM C33.
3. Include preliminary test records in accordance with 2.09I(2).
4. And/or include strength test records in accordance with 2.09I(3).

B. Concrete Curing Procedure and Products.

C. Reinforcing Bar Shop Drawings Including Bar Lists.

D. Catalog information and shop drawings for: water stops, admixtures, bonding agents, membrane curing compound, joint sealer, embedded items, non-shrink grout, epoxy sealant, wedge-type expansion anchors, and other concrete appurtenances.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

A. Cementatious Materials

1. Cement shall conform to the "Standard Specification for Portland Cement," ASTM C150, type II.

2. Fly Ash shall be Class C or F, ASTM C618.

B. Admixtures.

1. Each of the following types of admixtures, when required or permitted by the Engineer, shall conform to the appropriate Specifications, as indicated:

2. Air-Entraining Admixtures - "Specification for Air-Entraining Admixtures for Concrete," ASTM C260.

3. Water-reducing, retarding and accelerating admixtures - "Specification for Chemical Admixtures for Concrete," ASTM C494.

4. For prestressed concrete and for all concrete in which aluminum or galvanized metal is to be embedded, it shall be demonstrated by tests in accordance with AASHTO T-260 that the hardened concrete, including the aggregates, cementatious materials and any admixtures used, will not contain more than .06 percent water soluble chloride ions by weight of cement.

5. Two or more admixtures may be used in the same concrete, provided such admixtures are added separately during the batching sequence and provided that the admixtures used in that combination retain full efficiency and have no deleterious effect on the concrete or on the properties of each other.

C. Water. Mixing water for concrete shall be fresh, clean and potable.

D. Aggregates.

1. Aggregates for concrete of normal weight shall conform to Specifications for Concrete Aggregates, ASTM C33.

2. Fine and coarse aggregates shall be regarded as separate ingredients. Each size of coarse aggregate, as well as the combination of sizes when two or more are used, shall conform to the grading requirements of the appropriate ASTM Specifications.

E. Storage of Materials.

1. Cement shall be stored in weather-tight buildings, bins, or silos, which will exclude moisture and contaminants.

2. Aggregate stockpiles shall be arranged and used in a manner to avoid excessive segregation or contamination with other materials or with other sizes of like aggregates. To insure that this condition is met, any test for determining conformance to requirements for cleanliness and

grading shall be performed on samples secured from the aggregates at the point of batching. Frozen or partially frozen aggregates shall not be used.

3. Sand shall be allowed to drain until it has reached a uniform moisture content before it is used.

4. Admixtures shall be stored in such a manner that will avoid contamination, evaporation, or damage. For those used in the form of suspensions of non-stable solutions, suitable agitating equipment shall be provided to assure uniform distribution of the ingredients. Liquid admixtures shall be protected from freezing and other temperature changes which would adversely affect their characteristics.

2.02 NON-SHRINK GROUT

A. Non-shrink grout shall be "Masterflow 713," or equivalent acceptable to the Engineer. Grouts with iron filings are not acceptable. The grout shall be compatible with the surfaces to be bonded.

2.03 EPOXY SEALANT

A. Epoxy sealant shall be two-component, moisture insensitive, low viscosity solvent tree, epoxy resin, Sikadur 35, Hi-Mod LV or equivalent acceptable to the Engineer.

2.04 WEDGE-TYPE EXPANSION ANCHORS

A. The wedge-type expansion anchors shall be stainless steel KWIK-bolt manufactured by Hilti, One Cummings Point Rd., Stanford, CT 06904, or equivalent acceptable to the Engineer.

2.05 MEMBRANE CURING COMPOUND

A. Membrane curing compound shall be in accordance with ASTM C309 and shall be non-toxic. Membrane curing compound shall be sprayable, 18% minimum solids content, Master Builders MB-429 or equivalent acceptable to the Engineer.

2.06 WATER STOPS

A. The material, design, and location of water stops in construction joints and expansion joints shall be as indicated on the Drawings. If not otherwise called for on Drawings, the water stops shall be a preformed plastic adhesive, Synkoflex or equivalent, Houston, Texas.

2.07 JOINT SEALER

A. Joints indicated on Drawings, shall be sealed with a polyurethane joint sealer material of uniform, non-sag consistency. The sealant shall, when installed, tenaciously adhere to primed concrete surfaces, shall remain permanently elastomeric and shall not contaminate potable water.

B. The material shall be of a type that will, when properly installed, effectively and permanently seal joints subject to minor movements. Install with primer and cure prior to filling the tank with water in accordance with the manufacturer's instructions and recommendations.

C. Joint sealer shall be Sikaflex-1a Elastic Sealant/Adhesive, as manufactured by Sika Chemical Corporation or other material acceptable to the Engineer.

2.08 EPOXY BONDING AGENT

A. Bonding agent shall be a two component, moisture insensitive epoxy adhesive, Sikadur 32, Hi-Mod or equivalent acceptable to the Engineer.

2.09 PROPORTIONING OF CONCRETE

A. General. The concrete shall be proportioned and qualified according to these specifications.

B. Strength. Strength requirements shall be based on 28-day compressive strengths, unless high early strength is specified, in which case, required strengths shall be obtained at the days specified.

Minimum concrete strength for all concrete shall be 4,000 psi at 28 days.

C. Durability. All concrete with 3/4" coarse aggregate shall contain 4.0 to 8.0 percent entrained air.

D. Slump. Slump of concrete and grout as determined by "Method of Test for Slump of Portland Cement Concrete," ASTM C143, shall be 4 inches, plus or minus 1 inch.

E. Cement Factor. Concrete shall have not less than 500 lbs. of cement and 100 lbs. of fly ash per cubic yard. Note: for cold weather slabs-on-grade, the fly ash shall be omitted and the minimum cement content shall be 600 lbs. per cubic yard of concrete.

F. Aggregates. Coarse aggregate shall be ASTM C-33 No. 67 (3/4 inch nominal maximum size aggregate).

G. Water-Cement Ratio. The water-cement ratio shall not exceed 0.45.

H. Admixtures. Any admixtures to be used shall be included in the required chloride ion tests, the concrete trial mixtures, if used, or the proposed mixture qualified by strength test records.

Pozzolith 322N or an equivalent water reducing admixture shall be added at the plant. High range water reducing admixtures (super plasticizers) shall not be used except by special testing and review by the Engineer.

Prokrete AES or an equivalent air-entraining admixture shall be added as required to achieve the specified air content at the site.

Non-Chloride accelerators may be used for cold weather concreting, in accordance with the manufacturers recommendations.

Calcium chloride is not permitted.

If required, and reviewed by the Engineer, a water-reducing retarder may be used when the temperature of the concrete as placed exceeds 75°F.

I. Proportioning of Ingredients.

1. General. The proportions of ingredients shall be selected to produce the proper placability, durability, strength and other required properties.

The proportion of ingredients shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement by the methods of placing and

consolidation employed on the work, but without permitting the materials to segregate or excessive free water to collect on the surface.

Concrete trial mixtures and testing shall be performed by an independent testing laboratory acceptable to the Engineer. The costs of the mix designs and testing shall be borne by the Contractor.

Before any concrete is placed on the job, the Contractor shall submit to the Engineer, for review, the concrete mix design he proposes to use which shall be in accordance with one of the procedures in Subsection (2) or (3).

2. Proportioning by Preliminary Tests. The determination of the cement content necessary to attain the required strength and other properties, without exceeding the maximum water-cement ratio, shall be by preliminary tests in accordance with the following procedures:

   Concrete trial mixtures having proportions and consistency suitable for the work shall be made using at least three different cement contents which will produce a range in strengths encompassing those required for the work. Trial mixes shall be designed to produce the maximum allowable slump (within ½ inch) and the maximum allowable air content (within ½ inch).

   Proportions of ingredients shall be determined and tests conducted in accordance with the basic relationships and procedures outlined in "Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete (Part I):" ACI 211.1.

   For each cement content, at least three specimens for each age to be tested shall be made and cured in accordance with "Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Laboratory," ASTM C192 and tested for strength at 7 and 28-days. Tests shall be conducted in accordance with "Method of Test of Compressive Strength of Molded Concrete Cylinders," ASTM C39.

   From the results of these tests, a curve shall be plotted by the testing laboratory showing the relationship between cement content and 28-day compressive strength. The minimum cement content to be used shall be that value shown by the curve to produce a strength at least 1200 psi greater than the strength specified.

3. Proportioning by Strength Test Records. In lieu of trial batches to establish required average strength level, as described above, appropriate field test data for a proposed concrete mixture may be used. Use of the proposed mixture proportions shall be reviewed by the Engineer based on its demonstrated ability to produce concrete meeting all requirements of the Specifications. Ability to produce the required average strength calculated in accordance with the following paragraph shall be determined on the basis of the strength test record of 30 or more consecutive tests made during the past year.

   Where the production facility has a control record, based on at least 30 consecutive strength tests of a mix obtained within the past year representing similar materials and conditions to those expected, the average strength shall exceed the specified 28-day strength by at least:

   400 psi if the standard deviation is less than 300 psi

   550 psi if the standard deviation is 300 to 400 psi

700 psi if the standard deviation is 400 to 500 psi

900 psi if the standard deviation is 500 to 600 psi

1200 psi if the standard deviation exceeds 600 psi

Materials and proportions within the population of background tests shall not have been more closely restricted than will be the case for the proposed work.

2.10 READY-MIX CONCRETE

A. General. Ready-mix concrete shall be furnished to the concrete contractor at the construction site and he shall furnish and provide all equipment necessary to receive and install the ready-mix concrete as soon as it is received at the site. A mix certificate shall be furnished to Contractor by the ready-mix driver for each load of ready-mix concrete delivered to the job. All materials and the proportioning of same shall conform in every respect to those specified heretofore.

Ready-mixed concrete shall be batched, mixed and transported in accordance with "Specifications for Ready-Mixed Concrete," ASTM C94.

B. Time Constraints. Time constraints for discharge of concrete shall be in accordance with ASTM C94. Discharge of the concrete shall be completed within 1½ hours, or before the drum has revolved 300 revolutions, whichever comes first, after the introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates. These limitations may be waived if the concrete is of such slump after the 1½ hours time or 300-revolution limit has been reached that it can be placed, without the addition of water to the batch and comply with all specification requirements. In hot weather, or under conditions contributing to quick stiffening of the concrete, a time less than 1½ hours may be required.

C. Retempering. Indiscriminate addition of water to increase slump shall be prohibited.

Concrete shall be mixed only in quantities required for immediate use. Concrete which has partially set shall not be retempered, but shall be discarded.

When concrete arrives at the project with slump below that suitable for placing, first the concrete shall be remixed for at least one minute at mixing speed, if the slump is still too low, water may be added only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded. Corrections must be made for any water contained in the aggregates. The water must be incorporated by additional mixing equal to at least half of the total mixing required. Such addition must be reviewed by the Engineer.

D. Cold-Weather Concrete Delivery. Concrete delivery, curing, and protection shall be in accordance with ACI 306, "Standard Specification for Cold-Weather Concreting." The minimum concrete temperature, as placed and maintained, shall be 55°F. If temperature is 30°F to 40°F, the as-mixed concrete temperature shall not be less than 60°F. If air temperature is 0 to 30°F, the as-mixed concrete temperature shall not be less than 65°F. If air temperature is below 0°F, the as-mixed concrete temperature shall not be less than 70°F.

If water or aggregate has been heated, the water and aggregate shall be combined in the mixer before cement is added. Cement shall not be added to mixture of water and aggregate when the temperature of the mixture is greater than 100°F.

2.11 FORMWORK

A. General. Earth cuts shall not be used as forms for vertical surfaces, unless approved by the Engineer.

B. Design of Formwork. Formwork shall be designed and constructed in accordance with "Recommended Practice for Concrete Formwork," ACI 347.

The design, engineering and construction of the formwork shall be the responsibility of the Contractor.

The forms may be steel or plywood. The finished formed surface shall be equal to those specified for plywood forms.

The maximum deflection of facing materials reflected in concrete surfaces exposed to view shall be 1/240 of the span between structural members. Suitable moldings or chamfer strips shall be placed in the corners of column, beam, slab and wall forms, except where specifically directed otherwise by the Engineer.

When necessary to maintain the specified tolerances, the formwork shall be cambered to compensate for anticipated deflections in the formwork due to the weight and pressure of the fresh concrete and construction loads.

Positive means of adjustment (wedges or jacks) of shores and struts shall be provided and all settlement shall be taken up during the concrete placing operation. They shall be securely braced against lateral deflections.

At vertical wall joints where forms overlay existing concrete, a mortar tight joint shall be required. Use a bead of silicone caulking or foam joint filler against concrete before placing forms. Alternate methods shall be reviewed by the Engineer.

Temporary openings shall be provided at the base of column and wall forms more than 8 feet high and at other points where necessary to facilitate cleaning and inspection immediately before concrete is deposited.

Forming accessories to be partially or wholly embedded in the concrete, such as ties and hangers, shall be a commercially manufactured type. Wire is not acceptable. The portion remaining within the concrete shall leave no metal within one inch of the surface. Spreader cones on ties shall not exceed one-inch diameter. Embedded ties shall have water seal washers acceptable to the Engineer.

Form coating shall be non-staining chemical release agents that will not damage concrete surfaces.

C. Tolerances. Formwork shall be constructed so as to produce the intended finishes, as required and also to conform to the tolerances of Section 203.1, ACI 347.

2.12 REINFORCEMENT

A. General. Details of concrete reinforcement not covered herein shall be in accordance with "Building Code Requirements for Reinforced Concrete," ACI 318.

B. Reinforcing Bars. Reinforcing bars No. 3 and smaller and those specifically designated on the Drawings as "Grade 40" shall conform to the requirements of the Standard Specifications for billet

steel reinforcement bars of high strength grade, ASTM A615, Grade 40, having a yield point of 40,000 psi. Grade 60 reinforcing shall not be substituted for bars marked "Grade 40" on the drawings which are intended to be field bent after being partially embedded in concrete.

Except as noted above, all reinforcement bars shall be ASTM A615, Grade 60, with a minimum yield point of 60,000 psi. Grade 60 bars shall not be bent in the field.

Shop drawings shall clearly indicate grades of reinforcing steel.

C. Welded Wire Fabric. Welded wire fabric shall be electrically welded wire fabric of cold-drawn wire (70,000 psi yield point) of gage and mesh size shown on the Drawings and shall conform to "Specification for Welded Steel Wire Fabric for Concrete Reinforcement," ASTM A185.

D. Fabrication and Placing Tolerances. Bars used for concrete reinforcement shall meet the following requirements for fabricating tolerances:

Sheared length:	± 1-inch
Depth of Truss Bars:	+ 0, – 1/2
Stirrups, ties and spirals:	± 1/2-inch
All other bends:	± 1-inch

Bars shall be placed to the following tolerances except as noted on the drawings:

Concrete cover to formed surfaces:	± 1/8-inch
Minimum spacing between bars:	– 1/4-inch
Vertical location of top bars in slabs:	
Slabs 9-inches deep or less:	± 1/8-inch
Slabs more than 9-inches but not over 18-inches deep:	+ 1/8-inch – 1/4-inch
Slabs more than 18-inches deep:	+ 1/8-inch – 1/2-inch
Crosswise of Members:	Spaced evenly within 2-inches
Lengthwise of Members:	± 2-inches

Bars shall be placed with the following minimum concrete cover unless noted otherwise on the Drawings:

6-inch or less slabs-on-grade cast against earth	2-inches
All other concrete cast against earth	3-inches
Concrete exposed to earth or water	2-inches
Beams, girders and columns (ties and stirrups)	1-1/2-inches

E. Placing. All reinforcement shall be placed in accordance with CRSI Manual of Placement and Manual of Standard Practice, except as specified herein. Reinforcement shall be supported and wired together to prevent displacement by construction loads or the placing of concrete. All reinforcement shall be tied to chairs to secure them from displacement during concrete placement. Reinforcement shall be secured at a maximum distance of four feet on center. On ground and where necessary, supporting concrete blocks or heavy plastic chairs (Medco or equivalent acceptable to the Engineer) shall be used. Over formwork, bar chairs and spacers shall be furnished. The portions of all accessories within ½-inch of the concrete surface shall be coated with plastic at least 3/32-inch thick at points of contact with the formwork. Other requirements shall be in accordance with Class 1, maximum protection, plastic protected bar supports, in Chapter 3 of the Manual of Standard Practice by the CRSI. Staples and tie wire only shall be used to secure chairs to forms, except as reviewed by the Engineer.

Mesh shall lap at least 2 meshes, plus end extension of wires, but not less than 12-inches in structural slabs and shall extend across supporting beams and walls. Adequate support for mesh shall be provided during placing of concrete so that it is completely surrounded by concrete and not less than 2-inches above the bottom of slabs-on-grade or 1/2-inch above formwork.

Vertical bars in columns or drilled piers shall be offset at least one bar diameter at splices. To insure proper placement, templates shall be furnished for all column dowels. Three equally spaced plastic disks (Plas-clips distributed by Spillman Company, Columbus, Ohio or equivalent acceptable to Engineer) at 4 feet on center shall be used to space the column reinforcing away from the forms or earth.

All splices not shown on the Drawings must have been reviewed by the Engineer. Reinforcement shall not be bent after being partially embedded in hardened concrete, except as noted or reviewed by the Engineer.

Lap all tension splices according to ACI 318, Class B, and all compression splices 30-bar diameters, except as noted. No tack welding of reinforcing bars is permitted.

Splices in horizontal wall reinforcement in circular tanks shall be staggered such that no more than one bar in two is spliced in any four foot wide vertical section.

Reinforcement shall be continuous around corners or corner bars provided.

2.13 JOINTS AND EMBEDDED ITEMS

A. Construction Joints. Joints shall be located generally as indicated on the Drawings. Alternate locations may be acceptable if located so as to least impair the strength and serviceability of the structure and reviewed by the Engineer. In general, they shall be located near the middle of the spans of non-post-tensioned slabs, beams and girders and near the quarter point of post-tensioned slabs, beams and girders and shall be keyed. Horizontal joints in walls and columns shall be at the underside of floors, slabs, beams, or girders and at the top of footings or floor slabs. Beams, girders, brackets and haunches shall be placed at the same time as the slabs. Joints shall be perpendicular to the main reinforcement. Maximum length of pour in walls without offsets or cast against previously-placed concrete shall be sixty (60) feet.

Prior to the preparation of re-bar shop Drawings or the placing of concrete, the Contractor shall submit to the Engineer a pouring schedule showing the amount and the limit of each pour in walls and columns, as well as all slabs if proposed to be different from the drawings. This schedule is for the purpose of establishing the location of all construction joints and hence, the information necessary to prepare the re-bar shop drawings, as well as a method of correlating the test cylinders to the area in which that particular batch of concrete was placed.

Horizontal construction joints will not be permitted in walls of structures intended to be liquid-tight except as shown on the drawings. All vertical tank wall joints shall be flat, with preformed plastic adhesive water stop.

All reinforcing steel and mesh shall be continued across joints. Keys and inclined dowels shall be provided where directed by the Engineer. Joints shall have water stop and/or joint sealer as directed by the Engineer.

The surface of the concrete shall be thoroughly cleaned and all laitance removed.

All construction joints shall require adequate bond. After cleaning, before new concrete is placed, vertical joints shall be thoroughly wetted. Prior to placement of concrete in walls, the bottom construction joint must be slushed with one to two inches of neat cement grout. The neat cement grout shall have a water-cement ratio less than or equal to that of the concrete and a consistency similar to thick paint. The fresh concrete shall be placed before the grout has attained its initial set.

B. Expansion or Slip Joints. Expansion joints shall be provided at locations detailed on the drawings.

Reinforcement or other embedded metal items bonded to the concrete shall not be permitted to extend continuously through any expansion or slip joint.

Sponge filler shall be closed cell neoprene or rubber conforming to ASTM D1056, Grade 2A3.

C. Water Stops. The material, design and location of water stops in construction joints and expansion joints shall be as indicated on the Drawings. If not otherwise called for on Drawings, the water stops shall be preformed plastic adhesive. Synkoflex or equivalent installed in accordance with the manufacturer's recommendations.

D. Other Embedded Items. All sleeves, inserts, anchors and embedded items required for adjoining work or for its support shall be placed prior to concreting. Columns and beams shall be sleeved and chased only where reviewed by the Structural Engineer. Refer to Mechanical and Electrical drawings for sizes and location of holes, sleeves, notches, bolts, inserts, etc.

All Subcontractors whose work is related to the concrete or must be supported by it shall be given ample notice and opportunity to furnish and install embedded items before the concrete is placed.

E. Placing Embedded Items. Expansion joint material, water stops and embedded items shall be positioned accurately and supported against displacement. Voids in sleeves, inserts and anchor slots shall be filled temporarily with readily removable materials to prevent the entry of concrete into the voids.

PART 3 - EXECUTION

3.01 PLACING CONCRETE

A. Preparation. Before placing of concrete is begun, hardened concrete and foreign materials shall be removed from the inner surfaces of the mixing and conveying equipment.

Prior to depositing concrete, formwork shall have been completed; ice and excess water shall have been removed; reinforcement shall have been secured in place and free of mud, debris, rust and splatter; expansion joint material, anchors and other embedded items shall have been positioned; and the entire preparation shall have been reviewed by the Engineer.

B. Conveying. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients and in a manner which will assure that the required quality of the concrete is obtained.

Conveying equipment shall be of size and design to insure a continuous flow of concrete at the delivery end and shall be acceptable to the Engineer. Conveying equipment and operations shall conform to the following requirements:

Truck mixers, agitators and non-agitating units and their manner of operation shall conform to the applicable requirements of "Specifications for Ready-Mixed Concrete," ASTM C94.

Chutes shall be metal or metal-lined and shall have a slope not exceeding one vertical to two horizontal and not less than one vertical to three horizontal. Chutes more than 20 feet long and chutes not meeting the slope requirements may be used, provided they discharge into a hopper before distribution.

Pumping or pneumatic conveying equipment shall be of suitable kind with adequate pumping capacity. The equipment shall be cleaned at the end of each operation.

C. Placing. Concrete shall be deposited continuously, or in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, construction joints shall be located at points as provided for in the Drawings, or as reviewed by the Engineer. Placing shall be carried on at such a rate that the concrete which is being integrated with fresh concrete is still plastic. Concrete which has partially hardened or has been contaminated by foreign materials shall not be deposited. Temporary spreaders in forms shall be removed when the concrete placing has reached an elevation rendering their service unnecessary. They may remain embedded in the concrete only if made of metal or concrete and if acceptable to the Engineer.

Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. Concrete shall not be permitted to fall free more than 4 feet and shall not be dropped through reinforcing steel or into a deep form, nor subjected to any other procedure which will cause segregation.

Where a surface mortar is to be the basis of the finish, the coarse aggregate shall be worked back from the forms with a suitable tool so as to bring a full surface of mortar against the form without the formation of excessive surface voids. All concrete shall be consolidated by mechanical vibrators, so that the concrete is thoroughly worked around the reinforcement, around embedded items and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. Mechanical vibrators shall have a minimum frequency of 8,000 rpm and shall be operated by competent workmen. Over-vibrating and use of vibrators to transport concrete within forms shall not be allowed. Vibrators shall be inserted and withdrawn at many points, from 18 to 30-inches apart, for periods of 5 to 15 seconds duration.

When placing concrete for a liquid-tight structure, the Contractor shall have a minimum of four functioning mechanical vibrators on site: at least two in operation, and at least two for standby.

D. Bonding. Joints receiving an adhesive shall have been prepared and adhesive applied in accordance with the manufacturer's recommendations prior to the placing of fresh concrete.

Surfaces of joints which have been obtained by the use of a chemical retarder shall have been prepared in accordance with the manufacturer's recommendations prior to placing of fresh concrete.

Surfaces marked "intentionally roughened" on the drawings shall be raked while wet or bush hammered after setting to ¼-inch amplitude roughness.

3.02 REMOVAL OF FORMS AND RE-SHORING

Formwork for walls, columns, sides of beams and other parts not supporting the weight of the concrete may be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations, except as noted elsewhere in these specifications.

Formwork for beam soffits, slabs and other parts that support the weight of concrete shall remain in place until the concrete has reached its specified 28-day strength, unless otherwise specified or permitted.

Forms shall not be removed in any case until the concrete has had time to set sufficiently to carry the dead loads and any construction loads it has to sustain.

When shores and other vertical supports are so arranged that the form facing material may be removed without loosening or disturbing the shores and supports, the facing material may be removed at an earlier age as specified or permitted. The shores and supports shall remain in place until the concrete has reached its specified 28-day strength, unless otherwise specified or permitted.

Backfilling over the roof slab, when present, shall not begin until the roof slab concrete has reached its specified 28-day strength.

Backfilling adjacent to cast-in-place walls, when required, shall not begin until the wall concrete has reached 50 percent of its specified 28-day strength.

Removal strengths for shored concrete or compressive strength of roof slab or wall concrete receiving backfill, when present, shall be based on pullout tests in accordance with ASTM C900 or field cylinders cured under the same conditions as the concrete they represent.

The Contractor shall adequately brace wall sections against overturning as required before and after the removal of the forms until the structure is complete.

3.03 REPAIRING, PATCHING, AND WATER-TIGHTNESS TESTING

A. Water-tightness Testing. Water-tightness testing shall be in accordance with Section 03310: Water-tightness Testing and Repair for Structures Intended to be Liquid-Tight.

B. Removal. After forms have been removed, any concrete which is not formed as shown on the Drawings, is out of alignment or level beyond the required tolerance, or which shows a defective surface which cannot be properly repaired or patched shall be removed at the Contractor's expense.

C. Patching. All tie holes and all repairable defective areas shall be cleaned, coated with epoxy bonding agent and patched immediately after form removal. Use non-shrink grout as specified in the materials section of this specification.

D. Repairing Defective Areas.

1. Walls of structures intended to be liquid-tight cannot have any honeycombing, cold joints, cracks greater than 0.1 mm wide or leakage. If in the opinion of the Engineer, any honeycombing, cold joints, cracks or leakage are excessive, the Contractor shall remove the complete wall pour and replace it. Where minor honeycombing occurs, it shall be repaired to the satisfaction of the Engineer within 24 hours of removal of the forms.

2. Replace, to satisfaction of Engineer, within 48 hours after adjacent forms have been removed, all other defective concrete.

3. Cut out and remove to sound concrete, with edges square cut to avoid feathering, all honeycombed or otherwise defective concrete.

4. Use non-shrink grout and epoxy bonding agent as specified in the Materials section of this specification.

5. Perform in a manner that will not interfere with thorough curing of surrounding concrete.

6. Adequately cure all repair work and filled blockouts.

3.04 FINISHING OF FORMED SURFACES

A. Formed Finishes. Formed surfaces shall be finished in accordance with the following table:

Surface	Finish
Outside Surfaces Against Backfill:	Rough Formed Finish
All Other Surfaces:	Smooth Form Finish

1. Rough Form Finish. No selected form facing materials are required for a rough form finish. Tie holes and defects shall be filled with non-shrink grout. Fins exceeding ¼-inch in height shall be chipped off. Otherwise surfaces may be left with the texture imparted by the forms.

2. Smooth Form Finish. Concrete shall be cast against forms constructed of plywood, tempered hardboard or metal support by studs or other backing capable of preventing excessive deflections, see Table 4.3.1 of ACI 301-84 (Revised 1988). The arrangement of plywood or liner sheets shall be orderly and symmetrical and sheets shall be in as large sizes as are practicable. Sheets showing torn grain, worn edges, patches of holes from previous use, or other defects which will impair the texture of concrete surfaces shall not be used. Tie holes and defects shall be filled with non-shrink grout. All fins shall be completely removed.

B. Rubbed Finishes. The following finishes where specified on the Drawings shall be produced on concrete which has been cast against plywood-faced forms, or metal forms.

1. Smooth-rubbed Finish. Smooth-rubbed finish shall be produced on green concrete. All necessary patching shall have been done immediately after forms have been removed and rubbing shall be completed not later than the following day. Surfaces shall be wetted and rubbed with carborundum brick or other abrasive until a uniform color and texture are produced. No cement grout or slush shall be used other than the cement paste drawn from the green concrete itself by the rubbing process.

2. Sand-floated Finish. The forms shall be removed before the surface has fully hardened. The surface shall be wetted and rubbed with a wood float by a uniform circular motion, with fine sand being rubbed into the surface until the resulting finish is even and uniform in color and texture.

3.05 FLATWORK

A. Edge Forms and Screeds. Edge forms and intermediate screed strips shall be set accurately to produce the designed elevations and contours in the finished surface and shall be sufficiently strong to support vibrating bridge screeds or roller pipe screeds if the nature of the finish specified requires the use of such equipment.

Floor slabs of structures intended to be liquid-tight shall not have stakes that penetrate the slab thickness. Use wet screeds or supports for screeds that remain partially embedded in the concrete or other means acceptable to the engineer to control the thickness of the floor slab during placing.

The concrete surface shall be aligned to the contours of screed strips by the use of strike-off templates or approved compacting type screeds.

When the formwork is cambered, screeds shall be set to a like camber to maintain the proper concrete thicknesses.

B. Jointing. Construction Joints will not be permitted except as located and detailed on the Drawings and Specifications or as acceptable to the Engineer.

C. Consolidation. Concrete in slabs shall be thoroughly consolidated. Consolidation of slabs and floors shall be obtained with vibrating bridge screeds, roller pipe screeds, or other approved means. Concrete to be consolidated shall be as dry as practicable and the surfaces thereof shall not be manipulated prior to finishing operations.

D. Finishes. Unless selection of finishes is made in the Specifications or on the Drawings, the following finishes shall be used, as applicable.

1. Floated Finish. After the concrete has been placed, struck-off, consolidated and leveled by bull floating, the concrete shall not be worked further until ready for floating. Floating shall begin when the water sheen has disappeared and/or when the mix has stiffened sufficiently to permit the proper operation of a power-driven float. The surface shall then be consolidated with power-driven floats of the impact type, except in thin sections, such as pan slabs which shall be floated by hand. Hand floating with wood or cork-faced floats shall be used in locations inaccessible to the power-driven machine. Trueness of surface shall be rechecked at this stage with a 10-foot straight-edge applied at not less than two different angles. All high spots shall be cut down and all low spots filled during this procedure to produce planes checking true under the straight-edge in any direction, with tolerances not exceeding 1/8-inch in ten feet. The slab shall then be refloated immediately to a uniform, smooth, granular texture.

2. Troweled Finish. Where a troweled finish is specified, the surface shall be finished first with impact power floats, as specified above where applicable, then with power trowels and finally with hand trowels. The first troweling after power floating shall be done by a power trowel and shall produce a smooth surface which is relatively free of defects, but which may still contain some trowel marks. Additional trowelings shall be done by hand after the surface has hardened sufficiently. The final troweling shall be done when a ringing sound is produced as the trowel is moved over the surface. The surface shall be thoroughly consolidated by the hand troweling

operations. The finished surface shall be free of any trowel marks and shall be uniform in texture and appearance. On surfaces which support floor coverings, any defects of sufficient magnitude to show through the floor covering shall be removed by troweling or grinding.

3. Broom or Belt Finish. Sidewalks slabs and slabs in other locations so specified shall be given a coarse transverse-scored texture by drawing a broom or burlap belt across the surface. This operation shall follow immediately after floating. Floatings shall be performed as outlined in Paragraph (1).

4. Related Work. Before laying concrete slabs-on-grade, fill all trenches level with the surface of the ground and water settle and tamp after all under-floor piping has been installed. Walks shall be sloped to drain away from buildings and finished with a broomed finish.

3.06 CURING AND PROTECTION

A. General. Freshly deposited concrete shall be protected from premature drying and excessively hot or cold temperatures and shall be maintained without drying at a relatively constant temperature for the period of time necessary for the hydration of the cement and proper hardening of the concrete. A list of all intended curing methods including a description of materials shall be submitted to the Engineer for review.

1. The concrete floor slab of structures intended to be liquid-tight shall be cured by keeping the slab continuously wet. Dam edges of slab and pond water two inches deep over entire surface. Maintain water on slab for 10 days, then apply membrane curing compound. Sprinkling shall begin as quickly as concrete finishing and hardening operations will allow; concrete placed early in the day shall not be allowed to dry out.

2. The forms for concrete cast-in-place walls shall be left in place for 7 days. Wood forms shall be kept continuously wet until the formwork is removed. Alternatively the walls shall be kept wet for 7 days after removal of the forms by application of the membrane curing compound applied at twice the amount recommended by the manufacturer, by means of draped plastic or Burlene securely held in position along all edges (against the wind), or other means acceptable to the Engineer.

   If forms are removed prior to 7 days after concrete is placed, then immediately after forms are removed, a membrane curing compound shall be applied before the concrete becomes surface dry. The concrete temperature shall be maintained at 70°F for 3 days or 50°F for 7 days.

3. Roof slab, when present, and other miscellaneous concrete areas shall be cured by keeping the concrete continuously moist for at least 7 days after placement by use of:

   a. Ponding or continuous sprinkling.

      1. Begin as quickly as possible after initial set.

      2. Provide complete coverage with minimum of runoff by regulating rate of water application.

      3. Interrupt application of water to walls for grout clean finishing only over areas being finished. Do not permit wall areas to become dry which are not being grout clean finished.

   b. Wet burlap, wet absorptive mats, wet sand, polyethylene sheeting, or membrane curing compound.

B. Membrane Curing Compound. Membrane curing compound in accordance with ASTM C309, when used, shall be applied to all concrete surfaces. Apply membrane curing compound immediately after completion of finishing or stripping operation. Coat surfaces uniformly, leaving no pinholes or gaps. The curing compound shall be applied in two coats perpendicular to each other at the rate of 300 square feet per gallon per coat or more as recommended by the manufacturer. Upon completion, concrete surfaces shall be clean without discoloration, or traces of excess curing compound left on the surface.

   1. May be used in lieu of water curing on concrete roof slab and other miscellaneous concrete areas except as noted on the Drawings, or elsewhere in these Specifications.

   2. Cover unformed surfaces with curing compound within 30 minutes after final finishing.

   3. Protect compound against abrasion during curing period.

   4. Curing compound shall be removed, by sandblasting or other acceptable means from all construction joints or other surfaces to receive coatings that may not bond because of the curing compound.

C. Cold-Weather Curing Protection. When the mean daily temperature of the atmosphere is less than 40°F, the temperature of the concrete shall be maintained at 70°F for a curing protection period of 3 days; or 50°F for a curing protection period of 7 days. When necessary, arrangements for heating, covering, insulating or housing shall be made in advance of placement and shall be adequate to maintain the required temperature and moisture conditions without injury due to concentration of heat. Detailed recommendations are given in "Standard Specification for Cold-Weather Concreting," ACI 306.1. Note: Fly ash concrete does not gain strength as fast as cement only concrete in cold weather, hence the Contractor should plan to provide supplemental heat or wait longer before post-tensioning or removal of shores.

If air temperatures drop below 32°F, the Contractor shall install a high-low temperature gage into the most exposed portion of concrete during the curing protection period. The gage shall be equipped to register the lowest overnight temperature. If the concrete temperature drops below the specified temperature, the curing period shall be extended until the degree-days (above) are satisfied.

D. Hot-Weather Temperature. When necessary, arrangements for installation of wind breaks, shading, fog spraying, sprinkling, ponding, or wet covering of a light color shall be made in advance of placement and such protective measure shall be taken as quickly as concrete hardening and finishing operations will allow. Detailed recommendations are given in "Recommended Practice of Hot-Weather Concreting," ACI 305.

E. Excessive Temperature Changes. Changes in temperature of the concrete shall be as uniform as possible and shall not exceed 5°F in any one hour or 50°F in any 24-hour period.

F. Protection from Mechanical Injury. During the curing period, the concrete shall be protected from damaging mechanical disturbances, particularly load stresses, heavy shock and excessive vibration. All finished concrete surfaces shall be protected from damage caused by construction equipment, materials, or methods and by rain or running water. Self-supporting structures shall not be loaded in such a way as to over-stress the concrete.

3.07 CONCRETE TESTING DURING CONSTRUCTION

A. Testing Agency. All concrete testing during construction shall be performed by an independent testing laboratory selected by the Contractor and acceptable to the Engineer.

B. Concrete Cylinder Tests. The costs of cylinder testing during construction shall be borne by the Contractor. Test specimens shall be taken by the Contractor in accordance with the "Standard Method of Making and Curing Concrete Test Specimens in the Field," ASTM C31. The Contractor shall coordinate concrete placements with the testing laboratory to insure proper testing in compliance with these Specifications.

The Contractor shall furnish all concrete for tests without additional cost to the Owner. The Contractor shall furnish a specially prepared box with high-low thermometer and thermostatically controlled heating or cooling devices in accordance with Section 9.2 of ASTM C31 for storage of the cylinders for the first 24 hours after molding.

The use of testing services shall in no way relieve the Contractor of his responsibility to furnish materials and construction in full compliance with the Drawings and Specifications.

No less than five specimens for testing shall be taken for each 100 cubic yards of concrete, or fraction thereof, in each day's pour. Slump and air content tests shall be taken on the first three loads delivered to the job for each placement, and whenever consistency or air entraining admixture

demand of concrete appears to vary. Pressure method air content tests in accordance with ASTM C231 shall be verified by the gravimetric method, ASTM C138, and the volumetric method, ASTM C173. Specimens shall be cured under laboratory conditions.

When in the opinion of the Engineer, there is a possibility of the surrounding air temperature falling below 40°F, the Engineer may require maturity meters to be imbedded in the concrete, pull-out tests in accordance with ASTM C900 or additional specimens to be cured under job conditions. Field tests are also required for shoring removal of roof slabs and prior to backfilling over roofs or adjacent to walls. Costs of field cured cylinders, pull-out tests and maturity meters shall be borne by the Contractor.

Cylinders shall be tested in accordance with the "Standard Method of Testing for Compressive Strength of Molded Concrete Cylinders," ASTM C39. Compression tests will be made as follows: 2 at 7 days; 2 at 28 days; 1 held in reserve. Test reports shall be transmitted to the Engineer for review for all breaks. All test cylinders shall be identified by location of concrete placement on project.

If the average 28-day strength of the laboratory control cylinders for any portion of the structure falls below the compressive strengths called for on the Drawings or Specifications, the Engineer shall have the right to order a change in the proportions or the water content for the remaining portion of the structure.

If the average 7-day strength of the laboratory-cured cylinders for any portion of the work falls significantly below the strengths deemed necessary to produce the 28-day required strength, the Engineer shall have the right to require conditions of temperature and moisture necessary to secure the required 28-day strength. Furthermore, the Engineer may require pull out tests in accordance with ASTM C900 or tests in accordance with the "Standard Methods of Securing, Preparing and Testing Specimens of Hardened Concrete for Compressive and Flexural Strengths," ASTM C42 or order load tests to be made on the portions of the structure so affected, in accordance with Chapter 2 of the ACI Building Code. In the event an area is found to be structurally unsound, the Engineer may order removal and replacement of concrete, as required. The costs of the testing and structural evaluation and redesign, if required, shall be borne by the Contractor.

C. Slump Tests. Slump tests will be performed by the Testing Agency, using the "Method of Test for Slump of Portland Cement Concrete," ASTM C143. The cost of slump testing shall be borne by the Owner, except for retests due to concrete not conforming to the Contract Documents. Retests shall be paid for by the Contractor.

3.08 SUPPLEMENTAL LIQUID-TIGHT CONSTRUCTION REQUIREMENTS

A. Description. The work covered by this section consists of covering all plant costs, labor, equipment, appliances and materials in performing all operations in connection with the construction of structures intended to be liquid-tight.

B. General. The structure shall conform to all applicable provisions of these Specifications and all applicable provisions of ACI 301 "Specifications for Structural Concrete."

C. Bidders Qualification. The Contractor shall have constructed several comparable structures satisfactory to the Engineer in its own name. The Contractor shall guarantee workmanship and materials entering into his portion of the work for a period of one year from date of acceptance of the work. In case leakage or other defects appear within the one-year period, the Contractor will be responsible for making the required repairs at his own expense upon written notice by the Owner that such defects have been found. Leakage shall be defined as the appearance of free water showing stream flow or wetness which can be picked up on a dry hand or facial tissue, on an exterior surface, the source of which is from the inside of the structure.

D. Procedure.

1. Construct the wall footing, floor slab, curb, and interior depressed area (if applicable) monolithically, except as detailed otherwise. No construction joints in the floor slab will be allowed except as shown or reviewed by the Engineer. The floor slab requires special curing procedures detailed earlier in these specifications.

2. Construct the wall. The wall requires special curing procedures detailed earlier in these specifications.

3. Construct the roof slab.

4. Perform watertightness testing of the structure in accordance with Section 03310: Water-tightness Testing and Repair of Structures Intended to be Liquid-Tight.

5. Backfill in accordance with the Specifications and Soils Engineer's recommendations.

E. Backfilling.

Backfilling shall not begin until the structure is complete and has passed the watertightness test.

Backfill shall be built-up in maximum 8-inch loose lifts compacted as called for in the specifications and soil report. Differential backfill elevations greater than 24-inches around the perimeter of the structure will not be permitted.

Heavy mechanical equipment shall not be allowed to compact backfill within 5 feet of the containment area or sump wall. Hand or light mechanical equipment (5,000 lbs. GVW max.) shall be used for compaction within this area.

Heavy mechanical equipment shall not be allowed on the roof. Maximum GVW on the roof is 5,000 lbs. for front end loader type equipment and 10,000 lbs. for dozer type equipment.

END OF SECTION

SECTION 03310 - WATER-TIGHTNESS TESTING AND REPAIR FOR WATER STRUCTURES - INTENDED TO BE LIQUID-TIGHT

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Water-tightness testing of sump an containment area.

2.01 PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 WATER-TIGHTNESS TESTING

After the floor, walls, and roof (if any) have reached their 28-day strength, and prior to any specified backfill placement at the footing or wall or application of any coating, the following test shall be applied to determine water tightness:

A. Performance. The Contractor shall be responsible for maintaining water tightness within the following limitations for one year from the date of Final Acceptance.

B. Preparation. Fill the structure with water to the maximum level and let it stand for at least 24 hours.

C. Tests. Measure the drop in liquid level over the next 72 hours to determine the liquid volume loss for comparison with the allowable leakage. The maximum allowable average leakage shall be 0.05% of the containment area volume per 24 hours. The Contractor may cover the water bearing structure with plastic or float a 3-foot square plastic pan at least 6" deep so as to account for evaporative losses or precipitation gains.

1. If the leakage exceeds the maximum allowable, the leakage test may be extended to a total of 6 days. If at the end of 6 days, the average daily leakage does not exceed the maximum allowable, the test shall be considered satisfactory with regard to quantity of leakage. If the net liquid loss exceeds the maximum allowable, leakage shall be considered excessive and the containment area shall be repaired, and retested until water-tightness is achieved within the specified limit.

2. Wet spots on the exterior wall surface or flowing water at the wall base shall not be permitted. Wet spots are defined as spots where moisture can be picked up on a dry hand or facial tissue. The source of water movement through the wall shall be located and permanently sealed by epoxy injection or other successful method acceptable to the Engineer. Leakage through the wall base joint or footing shall likewise be corrected. Damp spots on the wall or footing are generally to be expected, and are permissible.

3.02 REPAIRS

The Contractor shall make all necessary repairs if the water bearing structure fails the leakage or dampness test or is otherwise defective. The method of repair shall be acceptable to the Engineer.

A. Nonshrink grout. The most common repair method for honeycombed concrete (rock pockets) and other defective concrete is removal and replacement with nonshrink grout. The Contractor may attempt this method if they feels it will be successful for complying with the watertightness and dampness tests.

B. Epoxy grouting. Seeps in walls shall be repaired with a high pressure epoxy injection system. For such grouting, a low viscosity, two-component epoxy system with an in-line metering and mixing system shall be used. Pumps shall be capable of injection pressures up to a maximum of 300 psi (2.1 MPa) to insure complete penetration of the defect in the structure. Epoxy shall reach a minimum compressive strength of 6,000 psi (40 MPa) in 24 hours in accordance with the requirements of ASTM D695. A factory-trained authorized applicator with past experience shall be present on the job at all times while repairs are being made.

Work shall be guaranteed for a period of one year from the date of Final Acceptance against failure of the epoxy bond in the cracks repaired.

Any exposed defect receiving epoxy shall first have been cleaned of dirt, laitance and other material that might prevent proper bonding. A suitable temporary seal shall then be applied to the surface of a repairable crack or honeycombed area to prevent escape of the epoxy. Entry ports shall be spaced along the seal at intervals not greater than the thickness of the wall or other element.

The epoxy shall be injected at the lowest port first, with sufficient pressure to advance the epoxy to an adjacent port, using a small nozzle held tightly against the port. The operation shall continue until epoxy material begins to extrude from the adjacent port. The original port shall be sealed and the injection shall be repeated in one continuous operation until the honeycombed area or crack has been injected with epoxy for its entire length. All ports, including adjacent locations where epoxy seepage occurs, shall be sealed as necessary to prevent drips and runouts.

Upon completion of the injection, the grout shall be allowed to cure for sufficient time to allow removal of the temporary seal without any drain or runout of the adhesive epoxy material. The surface of the concrete shall then be finished flush with the adjacent surfaces and shall shown no indentations or evidence of port filling.

Floor and roof slab repairs may also be accomplished by the above method.

3.03 BACKFILL

Where wall backfill is required, it shall be initiated only after the structure has been successfully watertightness tested. Backfill material shall be placed in accordance with Section 02220.

END OF SECTION

DIVISION 6 - WOODS AND PLASTICS

SECTION 06610 - FIBERGLASS REINFORCED PLASTIC (FRP) FABRICATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish and install FRP fabrication work as shown on the Drawings and as specified.

1.02 RELATED WORK

A. Division 1 - General Requirements.

1.03 REFERENCES

A. Materials and operations to comply with latest edition of codes and standards listed in:

1. ASTM D-625, E-84.

1.04 SUBMITTALS

A. Design calculations showing selection of structural shapes, load deflections, and anchorage.

B. Submit shop drawings for fabrication and erection of assemblies. Include plans and elevations at minimum 1-inch to 12-inch scale, and include details for sections and connections at minimum 3-inch to 12-inch scale. Show anchorage and accessory items.

PART 2 - PRODUCTS

2.01 STRUCTURAL SHAPES

A. Structural shapes shall be Extren Series 625 as manufactured by Morrison Molded Fiber Glass Company, Bristol, Virginia, or acceptable equivalent.

B. All structural shapes shall meet the following requirements:

1. UL listed (yellow card) having a UL94V0 rating with a 'UV' inhibitor added to resin.

2. A polyester surfacing veil shall be used on all external surface to enhance corrosion resistance and weathering.

2.02 GRATING

A. Fiberglass grating shall be GATOR DECK II, 6 DVE6015-12 as manufactured by Fowler Fiberglass Grating, Atlanic Beack, F1, or acceptable equivalent.

B. The resin matrix shall be vinyl ester resin with a polyester surfacing veil wrap over the continuous strand mat meeting Class 1 flame spread rating of ASTM E-84 and self-extinguishing requirements of ASTM D-625.

C. Color shall be gray. Product is to be used.

1. Outdoors with a UV coating applied.

PART 3 - EXECUTION

3.01 INSTALLATION

A. All cut edges and holes shall be sealed with a resin compatible with the resin matrix used in the structural shape and grating.

B. The fabricator and contractor shall exercise precautions necessary to protect the fiberglass pultruded structural shapes and grating from abuse to prevent breakage, nicks, and gouges, during fabrication, handling, and installation.

C. Structural shapes and grating shall be fabricated and assembled in accordance with the manufacturer instructions.

END OF SECTION

DIVISION 9 - PAINTING

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Surface preparation, provision, and application of paint and protective coatings to the following:

1. Exposed metal surfaces.

2. Concrete and slabs.

1.02 WORK NOT INCLUDED

A. The following surfaces shall not be painted unless otherwise specified:

1. Nonferrous and corrosion-resistant ferrous alloys such as copper, bronze, monel, aluminum, chromium plate, weathering steel, and stainless steel unless indicated or required for the following:

a. electrical insulation.

b. aluminum in contact with concrete.

c. color coding.

2. Nonmetallic materials such as glass, PVC, wood, porcelain, and plastic (FRP except as required for architectural painting or color coding.

3. Prefinished architectural items such as acoustical tile, cabinets, elevators, building louvers, and wall panels.

4. Electrical conduits attached to unpainted concrete surfaces.

5. Insulated piping and/or insulated piping with jacket, except as required for architectural painting or color coding.

1.03 RELATED WORK

A. Division 1 - General Requirements.

B. Section 15100 - Pipe, Valves Fittings, and Appurtenances.

C. Section 16000 - Electrical.

1.04 SUBMITTALS

A. In accordance with Section 01300.

1.05 QUALITY ASSURANCE

A. Warranty

1. The Contractor shall warrant to the Owner and guarantee all painting against defective work and materials for a period of one year commencing on the date of Final Acceptance.

PART 2 - PRODUCTS

2.01 COLOR SCHEDULES

A. Color Coding

1. All exposed piping, valves, and fittings shall be color coded as indicated below in the painting color schedules.

B. Stenciling

1. All process pipelines shall be stenciled indicating the pipe contents with an arrow indicating direction of flow. Stencils shall be located at the changes in direction, valves, fittings, and not less that 30' in straight runs.

2.02 PAINT SYSTEMS

[Note: P = prime coat. F1, F2 . . . FN = first finish coat, second finish coat . . . Nth finish coat. Where a finish coat of paint is indicated to be at exterior only, it shall be in addition to the other prime and finish coats specified.]

A. Exposed Metal - Atmospheric

1. This system shall be used on the following items or areas:

a. Exposed metal surfaces, including metal pipes and valves and pipe supports, located inside and outside of structures, or exposed to weather.

b. Pumps, motors, exposed metal piping, metal tanks all metal doors and frames, window frames, vents, louvers, and exposed metal ductwork, flashings, sheet metalwork, structural steel framing such as beams, columns, bar joists, the underside of metal decking and miscellaneous architectural metal trim.

2. Tnemec

P-1-135 Chembuild
(modified polyamidoamine epoxy coating)
1 coat, 6 to 7 mdft, 220 $ft.^2$/gal.
F-1-73 Endura-Shield III
(high build acrylic polyurethane enamel)
1 coat, 4 to 5 mdft, 300 $ft.^2$/gal.

3. If factory prime coat is not compatible with exposed metal paint system, use Tnemec series 37H - Chemprime HS (Universal phenolic primer), 1 coat, 2 mdft, 250 ft^2/gal.

B. Concrete - Standard Acid-Resistant Service.

C.

1. This system shall be used on the following items or areas.

   a. Wash Bay Area Shonw on Drawings

   b. Slab around acid loading dock sump

   c. Solid seperator floors, walls, and adjacent slab

   d. Acid dock sump walls, and floors.

2. Concrete Protection Systems, Inc.

   a. Over Kote coat, Industrial coating.

      1. Areas 1a and 1b avoe to be 1/4-inch thick trowled, follow manufacturers recommendation during application.

      2. Areas 1c and 1d above to be 1/8-inch thick trowled, follow manufacturers recommendation during application.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. Ferrous Metals.

1. Ensure fabrication, welding, or burning is completed prior to sandblasting operations. Chip or grind off flux, spatter, slag, or other laminations left from welding. Remove mill scale. Grind smooth rough welds and other sharp projections.

2. Near-white blast clean in accordance with SSPC-SP10 ferrous metals located 6 inches above submerged areas and area not subject to splash, spillage, or fumes.

3. Commercial blast clean in accordance with SSPC-SP6 or SSPC-8 ferrous metals located 6 inches above submerged areas and area not subject to splash, spillage, or fumes.

4. Prime abrasive blasted surface within 8 hours or prior to rust bloom.

B. Poured concrete surfaces.

1. Surfaces to be clean, dry, and free from curing compounds, oils, grease, dirt, previous coating, or other foreign material.

2. Concrete to be cured for minimum of 28 days. Moisture content to be less that 8 percent before painting.

C. Factory finished equipment.

1. Solvent clean in effort comparable to SSPC-SP1.

2. Spot primer damaged areas on existing coatings.

3. Lightly sand and wipe clean before painting.

3.02 APPLICATION

A. Apply paint using skilled and competent workers, proper tools and application techniques for different aspects of work. Protect machinery, electrical panels and motors, couplings, and other equipment that may be damaged by paint operations. Clean off paint stops and splashes on areas not designated to receive paint as work proceeds.

B. Ensure mixing, thinning, pot life, application procedure, equipment, coverage, curing, recoating, storage, and number of coats are in accordance with this specification and coating manufacturer's instructions.

C. Do not paint when surface temperature being painted is less than 5° F. above dew point, when relative humidity is greater than 85 percent, when wind velocity is above 15 mph, when surface temperature is less than 50° F. or greater than 140° F. unless precautions accepted by Engineer are taken. Provide adequate ventilation and keep temperature constant to prevent condensation.

3.02 INSPECTION

A. Provide access to work for engineer and painting manufacturer while work is being performed.

B. Engineer to observe prepared surfaces before primer and successive coats are applied. Engineer reserves right to waive andy or all observance if previous work meets specified quality standards.

C. Have measurements of paint dry film thickness made with Mikrotest gauge calibrated against National Bureau of Standards "Certified Coating Thickness Calibration Standards" in presence of Engineer. Engineer may measure paint thickness at any time during project to ensure conformance with specification.

D. Ensure finished work is free of abrasions and uniform in color and appearance.

E. Provide wet film thickness gauges. Monitor work of painters and blasters. Provide temperature gauge and determine surface temperature of items to be blasted or painted. Provide humidity gauge to monitor humidity at all times.

F. Replace or repair work, materials, or equipment not meeting these specifications.

3.04 PROTECT

A. Protect work of other trades, against damage by painting and finishing work. Leave all such work undamaged. Clean, repair or replace, and repaint any damaged areas as directed by Engineer.

END OF SECTION

DIVISION 11 - EQUIPMENT

SECTION 11100 - TANKS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish and install one, 4,000 gallon vertical polyethylene sodium hydroixde storage tank with supports, manway, fittings, heat tracing and insulations.

B. Furnish and install one 6,100 gallon open for vertical polyethylene tank, with supports and fittings.

1.02 RELATED SECTIONS

A. Division 1 - General Requirements.

B. Section 15100 - Pipe, Valves Fittings, and Appurtenances.

C. Section 09900 - Painting.

1.03 REFERENCES

A. AICS Manual of Steel Construction.

B. ASME Boiler and Pressure Vessel Code.

C. ASTM RPT-1, D-3299, D4097.

D. Dow Chemical Company Specifications 54-100, 54-103, and 54-104.

E. OSHA Standards; 1910.27, fixed ladders.

1.04 SUBMITTALS

A. Shop drawings in accordance with Section 01300 - Submittals to include the following:

1. Drawings of all fabricated tanks, structural supports, ladders, and associated items.

B. Design calculation for all of the items covered by the shop drawings to include the following:

1. Design stresses in all structural members and connections.

2. Design loadings for all load combinations, to be transmitted to foundation or supports.

3. Size, length, and spacing of all anchor bolts or attachments to the foundations or supports.

C. The design and the calculations shall be completed by a registered engineer and the shop drawings and calculations shall bear the registered engineer's stamp prior to submittal of this information.

D. Manufacturer's certificate of proper installation.

PART 2 - PRODUCTS

2.01 GENERAL

A. Tank design

1. Tank shall be designed for the hydrostatic forces resulting from the tank being completely full of specified liquid at atmospheric pressure.

2. Tank, supports, and anchorages shall be designed to resist all contributory gravity loads and lateral forces in accordance with the latest edition of the Uniform Building Code for Seismic Zone No. 2 and shall be designed for a wind speed of 80 miles per hour.

B. The tank shall have the number and size of openings as shown on the drawings. Openings shall be flat face, 150 lb., gusseted flanges, unless otherwise shown or specified. The tank shall be furnished dry and clean inside with all openings plugged prior to shipment.

C. The tank shall be provided with one 24-inch inside diameter access manway. The manway shall be provided with a bolted and gasketed cover.

D. The tank shall be designed with a corrosion-resistant structural support capable of bearing a full tank load and elevating the tank to a minimum clearance of 6 inches. The support shall be an open structure capable of being visually inspected.

E. Tank inspection and testing.

1. All tanks shall be subject to hydrostatic tests equivalent to the maximum specified operating pressures. Tanks shall be considered satisfactory if there is no visible leakage after 24 hours of testing. Tanks shall be hydrostatically tested after the tank and all fittings and piping have been installed.

2.02 POLYETHYLENE TANKS

A. Tank Construction and Fittings

1. The tank shall be constructed of carbon filled, high density crosslinked polyethylene and shall be seamless in construction.

2. The properties of the molded polyethylene shall conform to the following as tested in accordance with the appropriate ASTM:

Property	ASTM	Value	Units
Density	D1505	59	#/cu.ft.
ESCR Spec. Thickness 125 Mils P 50	D1593	900-1,000	hrs.
Tensil Strength Ultimate 2-inch/min.	D638	2,600	PSI
	Type IV Spec		
Elongation at break 2-inch/min.	D638	400	%
Vicat softening temperature	D1525	240	deg. F.
Brittleness temperature	D740	-100	deg. F.
Flexural modulus	D790	100,000-110,000	PSI

3. Side Wall and Dome Fittings

   a. Plastic fittings below the liquid level shall be two flange style. The flange shall be constructed of PVC or other specified material. There shall be a minimum of four allthread bolts with bolt heads encapsulated in polyethylene. The polyethylene encapsulation shall fully cover the bolt head and a minimum of 1/4 inch of the threads closest to the bolt head.

The polyethylene shall be color coded to distinguish bolt material (Green = 316 Stainless Steel; Red = Hastelloy "C;" Blue = Monel; Black = Titanium). Each bolt shall have a gasket which is on the inside of the tank.

b. Stainless steel fittings shall be compression type with a minimum of four studs welded to the back plate for tightening. Each fitting shall have a gasket which shall be compressed between the inside of the tank wall and the back plate of the fitting. Stainless steel fittings shall be offered with full male, full female or half female NPT.

4. Dome Fittings

Tank shall be manufactured by Polyprocessing or per approved equal.a)

B. Sodium Hydroxide

1. The tank shall be 7-foot 10 inch diameter, Twelve foot 43/4-inch side walls, flat bottom, closed top supported a minimum of six inches above the floor on a FRP support system and have a nominal 4,000 gallon capacity.

2. Tank construction shall be compatible with 50 percent sodium hydroxide.

3. The tank shall be installed and heat traced.

C. Sodium Hydroxide Tank Electrical Heat Tracing and Insulation

1. All components shall be NEMA 4 rated unless specifcally ordered otherwise.

2. All components shall be mounted in watertight, high impact plastic or fiberglass box with hinged, gasketed cover.

a. All openings in the thermostat box shall be sealed with a watertight closure. This specifically includes electrical connection ports. Openings shall be on the bottom/or sides of the box as it is mounted.

D. Equalization Tank

1. The water storage tank shall be an upright storage polyethylene tank for potable water use. The tank shall be 11-foot 11-inch diameter, 12-foot 8-inch sidewalls, covered, with a nominal 10,000 gallon capacity.

2. The tank may be provided with a 19-inch inside diameter access manway.

3. The tank shall be black and uncoated.

E. Waste Storage Tank, T-610, Polyethylene Tank Alternative

1. The waste storage tank shall be an upright storage polyethylene tank compatible with 5 to 35 percent hydrochloric acid. The tank shall be 5-foot 4-inch diameter, 5-foot 8 3/4-inch sidewalls covered, with a nominal 1,000 gallon capacity.

2. The tank may be provided with a 19-inch inside diameter access manway.

3. The tank shall be black and uncoated.

2.04 STEEL STORAGE TANKS

A. Water Storage Tank, T-310, Steel Tank Alternative

1. The water storage tank shall be constructed of mild carbon steel for potable water storage in accordance with the ASME Boiler and Pressure Vessel Code and AISC Manual of Steel Construction. The water tank is not required to have an ASME stamp.

2. The exterior of the tank shall be coated white in accordance with Section 09900 - Painting.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation shall be in accordance with manufacturer's instructions.

B. Tank shall be set in grout to provide complete support for the tank bottom.

C. Tank shall be installed true and plumb, with a maximum 1/2-inch shim allowance.

D. Tank shall be anchored per manufacturer's recommendations with minimum 1-inch diameter monel anchor bolts.

END OF SECTION

SECTION 11200 - PUMPS

PART 1 - GENERAL

1.01 WORK INCLUDED

Furnish and install the following pumps:

A. Acid transfer/mix pump for transferring acid from the acid storage tank, for mixing the contents of the acid mix tank, and to transfer contents of the acid mix tank to the acid transports.

B. Liquid additive transfer pump, for transferring chemical additives to the mix tank.

C. Fume scrubber pump for recirculating water through the fume scrubber.

D. Waste pump for transferring wastewater from the sump to the waste storage tank.

1.02 RELATED SECTIONS

Division 1 - General Requirements.

A. Section 09900 - Painting.

B. Section 15100 - Pipe, Valves, Fittings, and Appurtenances.

PART 2 - PRODUCTS

2.01 MIX/TRANSFER PUMP (P-120)

A. Mix/transfer pump shall be self-priming, centrifugal pump with a capacity of 200 gpm at 50 feet TDH.

B. Suction and discharge pipe connections shall be flanged 4-inch suction and 3-inch discharge. Pump shall have open impeller capable of passing 1-inch solids.

C. Pump shall be FRP construction with stainless steel shaft fully compatible with 5 to 35 percent hydrochloric acid.

D. Motor shall be TEFC, 5 hp minimum, 1750 rpm, three phase, 60 cycle, 230/460 volt.

E. Pump shall be furnished with Dura CRO or acceptable equivalent mechanical seal.

F. Pump shall be MetPro Fybroc, model 1530, 3 x 4 x 8, or acceptable equivalent.

2.02 LIQUID ADDITIVE FEED PUMP (P-420)

A. Liquid additive feed pump shall be direct drive gear pump with a capacity of 30 gpm and pressure rating of 50 psi.

B. Suction and discharge pipe connections shall be 1-1/2 inch, 150 lb ANSI steel flanges.

C. Pump shall be cast iron construction.

D. Motor shall be TEFC, 2 hp, 1800 rpm, three phase, 60 cycle, 230/460V.

E. Pump shall be equipped with mechanical seals using Buna N elastomer.

F. Pump shall be supplied with a steel base plate.

G. Pump to be Viking Series 125, with "D" drive, model HL 4125, or acceptable equivalent.

2.03 SCRUBBER RECIRCULATION PUMP (P-020)

A. Scrubber recirculation pump shall be a centrifugal pump that is magnetically driven with a capacity of 30 gpm at 40 feet TDH.

B. Suction and discharge pipe connections shall be 1-inch ANSI flanged. Pump shall be capable of passing 3/4-inch solids.

C. Pump shall have glass-filled Ryton head and impeller with ceramic shaft and carbon impeller brushings, and a Ryton encapsulated driven magnet.

D. Motor shall be TEFC, 3/4 hp minimum, 3400 rpm, single-phase, 60 cycle, 115/230 volt, with thermal protection.

E. Pump shall be Little Giant model RTE-7-M D-HC (Dowell Schlumberger #486060000), or acceptable equivalent.

2.04 WASTE PUMP (P-610)

A. Waste pump shall be self-priming pneumatic double diaphragm capable of a minimum 15-foot suction lift and capable of running dry without harm. Pump shall have a capacity of 0 to 36 gpm.

B. Suction and discharge pipe connections shall be 1-inch ANSI flanged. Pump shall be capable of passing 3/4-inch solids.

C. Pump shall have polypropylene body, viton diaphragm, teflon check valves, and 316 stainless steel trim.

D. Air inlet shall be 1/4-inch NPT. Pump shall be furnished with air valve, filter, regulator, lubricator and exhaust muffler.

E. Pump shall be Marathon model MP04P-75, or acceptable equivalent.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Pumps shall be installed in conformance with manufacturer's recommendations.

3.02 TESTING

A. Pumps shall be shop tested including a hydrostatic test on casing.

B. Pumps shall be field tested to verify operation.

3.03 COATINGS

A. Refer to Section 09900, Painting.

END OF SECTION

SECTION 11400 - OWNER-FURNISHED EQUIPMENT

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Acquire and install Owner-furnished equipment for acid fume scrubber including tank, tower, and packing. Pump to be supplied by contractor.

B. Acquire and install Owner-furnished equipment for dry chemical additive system including cutting table, hopper, nozzle manifold, and 3-inch eductor.

1.02 RELATED SECTIONS

A. Division 1 - General Requirements.

B. Section 11200 - Pumps.

C. Section 15100 - Pipes, Valves, Fittings, and Appurtances.

PART 2 - PRODUCTS

2.01 ACQUISITION

A. Contractor shall coordinate acquisition of owner furnished equipment and shall be responsible for placing order through Owner's representative.

2.02 ACID FUME SCRUBBER

A. Acid fume scrubber shall be Dowell Schlumberger Part #508043000 and shall include fiberglass tank, tower, flanges, gaskets, and packing as shown on Dowell Schlumberger Drawing # 1L-508043000, Revision B.

B. Refer to Section 11200, Pumps, for fume scrubber pump.

2.03 DRY CHEMICAL ADDITIVE SYSTEM

A. Dry chemical additive system shall include cutting table, hopper, nozzle manifold, 3-inch eductor, valves, bolts, nuts, gaskets, and nipples, in accordance with Dowell Schlumberger drawings:

8P-56343, Revision A-1
4P-67626, Revision A
2P-66323, Revision A-1
2S-63108, Revision C
2P-63099, Revision B.

PART 3 - EXECUTION

3.01 GENERAL

A. Install materials and equipment as shown on the drawings and in strict accordance with drawings and/or instructions provided by the Owner.

B. Install materials and equipment in a workerlike manner. The completed work shall have a neat and finished appearance.

3.02 COATING

A. Refer to Section 09900, Painting.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15100 - PIPE, VALVES, FITTINGS, AND APPURTENANCES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish and install all pipe, valves, fittings, supports, bolts, nuts, gaskets, jointing material, and related appurtenances.

1.02 RELATED WORK

A. Division 1 - General Requirements.

B. Section 11100 - Storage Tanks.

C. Section 11200 - Pumps

1.03 REFERENCES

A. ASTM D1784 PVC and CPVC compounds.

B. ASTM D1785 PVC Plastic Pipe

C. ASTM D2464 Threaded Plastic Pipe Fittings, schedule 80.

D. ASTM D2467 Socket Type Plastic Pipe Fittings, schedule 80.

E. ASTM D2855 Plastic (polyethylene) Tubing.

PART 2 - PRODUCTS

2.01 STEEL PIPE AND FITTINGS

A. Steel pipe shall be schedule 40, ASTM A53.

B. Screwed, 150-pound galvanized, malleable iron conforming to ANSI B16.3.

C. Unions shall be 300 pound galvanized, malleable iron conforming to ANSI B16.3.

2.02 PVC PIPE AND FITTINGS

A. PVC pipe shall be schedule 80, Type I, Grade 1, conforming to ASTM D1784 and ASTM D1785.

B. Fittings shall be socket type conforming to ASTM D2466 or threaded type conforming to ASTM D2464.

C. Flanges shall be 150 lbs., flat-faced.

D. Gaskets shall be full-faced, 1/8-inch thick, fabricated from ethylene propylene rubber.

E. Bolts shall be type 316 stainless steel fabricated in accordance with ANSI B18.2.

2.04 PNEUMATIC TUBING

A. Pneumatic tubing shall be 1/4-inch polyethylene tubing conforming to ASTM D2855.

2.03 FLEXIBLE CONNECTOR

A. Teflon bellows type compatible with hydrochloric acid.

B. Type 316 stainless steel wire braid reinforcement.

C. Resistoflex, or equal.

2.04 BALL VALVES - MANUALLY ACTUATED

A. PVC Ball Valves.

1. Valves shall have PVC body, ball, and stem, with replaceable. TFE seats and Viton o-ring stem seals.

2. Valves shall be double union with socket ends.

3. Valves shall be Chemtrol SU, R&G Sloan GSR, or equal.

B. Fiberglass Composite Ball Valves.

1. Valve body, stem, and ball shall be glass and graphite fiber reinforced Derakane 470 resin.

2. Seals and packing shall be TFE.

3. Flanged end connections.

4. Valve shall be fully compatible with 35 percent hydrochloric acid.

5. Valve shall be Dresser Nil-Cor 310, or acceptable equivalent.

C. Ball Valves for Air or Water Service

1. Valves shall be all bronze, top entry type with screwed ends.

2. Valves shall have full bore ports.

3. Valves shall be hand lever operated.

4. Valves shall be rated at 400 psi WOG and 125 psi SWP.

5. Valves shall be Lunkenheimer Figure No. 700-SB, or acceptable equivalent.

2.06 PNEUMATICALLY ACTUATED BALL VALVES

A. Fiberglass composite ball valves conforming to requirements of 2.05 B.

B. Cylinder Actuators

1. Double-acting, trunnion-mounted, bronze barrel, steel caps, bronze piston, 416 stainless steel rod, Buna-N, or suitable elastomer seals, o-rings, packing, and Teflon rod wipers.

2. Rod wipers and seals shall be externally replaceable.

3. Size cylinders to operate valves when supplied with 60 to 80 psig operating air.

4. Connection between cylinders and positioned or solenoid valve shall be with flexible neoprene hose.

5. Provide pressure regulating valve and oil mister set for each cylinder operator if required by actuator manufacturer.

C. Valves shall be furnished with manual, hand wheel override.

2.07 CHECK VALVES

A. PVC Check Valves

1. PVC ball check valves 4-inches and smaller shall have ASTM D1784, Type I, Grade 1 polyvinyl chloride body with dual union socket weld ends, rated 150 psi at 75° F.

2. Valves shall be equipped with Viton seats and seals.

3. Valves shall be Chemtrol, G-F, Hills-McCanna, or acceptable equivalent.

B. Check Valves for Water Service

1. Bronze, wye pattern

2. Swing check

3. Bronze disk

4. 400 psi WOG

5. Milwaukee Check 508, Lukenheimer Figure 554Y, or acceptable equivalent.

2.08 SOLENOID VALVES

A. Solenoid valves shall be two way or three way, full line size with female threaded connections.

B. Bronze body shall be rated at 300 psi and 180° F.

C. Solenoid coil shall be of Class H construction designed for continuous operation at maximum temperature rating.

D. Valve shall operate at 120 volt, 60 Hz, ac power supply.

E. Solenoid valves shall be manufactured by Automatic Switch Co., Magnetrol Valve Corp., or acceptable equivalent.

2.09 FLOAT VALVE

A. Float valve shall maintain a relatively constant level in water storage tank.

B. Main valve shall be a single-seated, hydrostatically operated valve.

C. Pilot control shall be direct acting float.

D. Valve shall be Cla-Val model 129-01, equivalent by GA, or acceptable equivalent.

2.10 COATING

A. Refer to Section 09900, Painting.

PART 3 - EXECUTION

3.01 GENERAL

A. Cut pipe by manufacturer's recommended method. Dress cut ends with type of joint to be used.

B. Locate supports at all joints, changes in direction, and as otherwise indicted or required.

C. Install unions in piping wherever they will expedite removal of equipment and valves.

D. Install valves in conformance to manufacturer's recommendation.

3.02 TESTING

A. Contractor shall perform leak, or tightness, test on all newly installed sections of pipe. Testing shall be performed after piping is completely installed.

B. Piping system shall show no evidence of leakages. Any visible leakage shall be corrected.

C. HYDROSTATIC TESTING

1. Water shall be used as the hydrostatic test fluid unless otherwise specified. Test water shall be clean and shall be of such quality as to minimize corrosion of the materials in the piping system. Vents and drains shall be added to the piping system as required for testing. Vents at all high points of the piping system shall be opened to purge air pockets while the piping system is filling. Venting during the filling of the system also may be provided by the loosening of flanges having a minimum of four bolts or by the use of equipment vents.

2. All parts of the piping system shall be subjected to 75 psig test pressure.

3. The hydrostatic test pressure shall be continuously maintained for a minimum time of 30 minutes and for such additional time as may be necessary to conduct examinations for leakage. Examination for leakage shall be made at all joints and connections. The piping system,

exclusive of possible localized instances at pump or valve packing, shall show no visual evidence of weeping or leaking.

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 16000 - ELECTRICAL

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish, install, and test all materials, equipment, and components for the electrical system.

1.02 RELATED WORK

A. Division 1 - General Requirements.

B. 11200 - Pumps

1.03 REFERENCES

A. All work performed under this section shall be performed in accordance with the most current requirements of the following (except where exceeded by the drawings and specifications):

1. National Fire Protection Association (NFPA).
2. National Electrical Code (NEC).
3. National Electrical Manufacturers Association (NEMA).
4. American National Standards Institute (ANSI).
5. Underwriters Laboratory (U.L.).
6. Codes and Standards of the Government Authority.

B. All materials and methods shall be in strict compliance with the latest requirements of NFPA 70, National Electrical Code, and NFPA 30, Flammable and Combustible Liquids Code.

C. The evidence that material and equipment comply with the requirements of the appropriate standards shall be in the form of statement of compliance published in manufacturer's literature, labels on equipment (eg: U.L. label), or a manufacturer's statement indicating complete compliance with the applicable standards (eg: NEMA).

1.04 SUBMITTALS

A. The Contractor shall submit to the Engineer, in accordance with Division 1 - General Requirements of these Contract Documents, accurate shop drawings and catalog information for all electrical systems of this project. The interface and wiring between all instruments and motor starters shall be included in the shop drawing submittal.

PART 2 - PRODUCTS

2.01 CONDUIT

A. All conduit shall be galvanized rigid steel conduit, labeled by UL, and conforming to ANSI C80.1. Exposed conduit below top of contaminant area walls and all exposed conduit inside building shall be PVC coated.

B. Fittings and conduit bodies shall conform to ANSI/NEMA FB1; threaded type.

C. All connections to motors and equipment shall be made with liquid-tight flexible metal conduit, listed by UL. The conduit shall be a flexible steel conduit over which a PVC jacket has been factory applied.

D. All below grade conduit and conduit in the trench shall be sealed in accordance with government requirements for leaving an area classified as an explosive environment (NEC 501).

2.02 WIRING

A. Thermoplastic-Insulated Building Wire: NEMA WC 5.

B. Feeders and Branch Circuits No. 8 AWG and Larger: Copper stranded conductor, 600 volt insulation, THHN/THWN.

C. Feeders and Branch Circuits Smaller than No. 8 AWG: Copper solid conductor, 600 volt insulation, THHN/THWN.

D. Control Circuits: Copper, stranded conductor 600 volt insulation, No. 14 THHN/THWN.

E. Lighting and Receptacles Circuits: Copper conductor 600 volt insulation, No. 12 THHN/THWN unless noted otherwise.

2.03 BOXES

A. Boxes shall be UL listed, cast, galvanized malleable iron, gasketed, water-tight. Boxes shall have threaded hubs and include mounting lugs.

B. Boxes shall be rated for Class I, Group D, where applicable.

2.04 DISCONNECTS

A. Furnish and install a water-tight, dust-tight, corrosion resistant (NEMA 4x) disconnect of the type which simultaneously opens all phase conductors from the source of supply.

B. Furnish and install explosion-proof (NEMA 7) disconnects rated for Class I, Group D, where applicable.

2.05 PANELBOARD

A. The distribution panel shall be a circuit breaker panelboard with 120/240 volt, single phase power.

B. Circuit breakers shall be of the quick make, quick break, molded case type with inverse time element and thermal magnetic tripping. Multipole breakers shall have an internal common trip connection for simultaneous tripping action. Multipole breakers shall occupy one pole space per pole. All breakers shall have the ampere trip rating clearly marked on the handle. The breakers shall clearly indicate the "On," "Off," and "Tripped" positions. All branch breakers shall have a minimum AIC (Amp Interrupting Capacity) of 10,000. The circuit breakers shall meet NEMA standards and Federal Specifications WC-375b and be U.L. listed.

C. The panelboard's enclosure shall consist of a box and cover with door. The gutters provided in the box and the steel gauge used in construction shall be in accordance with NEMA PB1 and U.L. The steel used in the construction of the box, cover and door shall be galvanized or have an equivalent rust resistant treatment. The cover and door shall be painted inside and out with baked enamel.

2.05 SWITCH

A. Furnish and install an explosion proof (Class I, Division 1, Group D) single phase manual motor starter for the sump pump.

B. Starter shall be in cast iron box with disconnect.

C. Starter shall be Crouse-Hinds, or equal.

PART 3 - EXECUTION

3.01 CONDUIT

A. Unless exact locations are shown on the drawings, the Contractor shall coordinate the placement of conduit and related components with other trades and existing installations. Raceways shall not be installed under furnaces and shall be kept at least 6 inches away from parallel runs of heating flues, steam and hot water pipes in order to prevent heating the conduit and internal wiring above the wires insulation temperature rating.

B. The smallest conduit shall be 3/4-inch trade diameter. Raceways shall be installed parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings. Changes in direction of runs shall be made using symmetrical conduit bends or appropriate fittings or pull boxes.

C. An expansion fitting shall be installed on conduit wherever conduit crosses structural expansion joints, where shown on the drawings, or when necessary to compensate for natural thermal expansion and contraction.

D. Conduit shall be securely supported or fastened in place along the run and between fittings and boxes at intervals as required by the NEC. When individual conduit is mounted on steel structure members or railings, plated malleable iron type conduit clamps and supports shall be used for fastening the conduit. When two or more conduits are grouped in parallel runs, a metal channel erector system may be used to support the conduits from walls and ceilings provided the individual conduits are securely fastened to the channel with a bolt type clamp.

E. Where conduit penetrates fire-rated walls and floors, seal opening around conduit with UL listed foamed silicone elastomer compound. Where conduit penetrates waterproofed floors or exterior walls subject to entry of moisture, provide pipe sleeves two sizes larger than conduit, suitably flashed or sealed where appropriate. Seal annular space around conduit with UL listed foamed silicone elastomer compound.

F. Use liquid-tight flexible conduit when making final connections to motors, control devices and instrument devices.

3.02 WIRING CONNECTIONS AND TERMINATIONS

A. Splice only in accessible junction boxes.

B. Use solderless pressure connectors with insulating covers for copper wire splices and taps, No. 8 AWG and smaller. For No. 10 AWG and smaller use insulated spring wire connectors with plastic caps.

C. Use split bolt connectors or uninsulated compression connectors for copper wire splices and taps, No. 6 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor.

D. Thoroughly clean wires before installing lugs and connectors.

E. Make splices, taps, and terminations to carry full ampacity of conductors without perceptible temperature rise.

F. Terminate ends of spare conductors with electrical tape.

3.03 WIRE IDENTIFICATION

A. Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits, and with control wire number as indicated on schematic and interconnection diagrams, equipment manufacturer's shop drawings for control wiring.

3.04 GROUNDING

A. Provide a complete, continuous, low impedance grounding system (NEC 250).

B. Ground all non current carrying parts of equipment, raceways, and fixtures with approved connectors and fitting.

C. Run insulated equipment grounding conductor with circuit conductors and terminate at this supply panelboard ground bus.

D. Provide a supplementary system grounding electrode and grounding electrode conductor consisting of a 3/4-inch by 10-foot copper-clad driven ground rod bonded to underground concrete encased reinforcing steel (welded per NEC 250) and above grade building structural steel, where applicable. System shall be meggered to confirm grounding capacity, with additional electrodes added if required.

END OF SECTION

DOWELL SCHLUMBERGER INCORPORATED

HOBBS, NEW MEXICO DISTRICT

SPCC PLAN

SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

JUNE 1991

GeoMonitoring Services

11261 RICHMOND AVE.SUITE G-110, HOUSTON, TEXAS 77082-2617
(800) 366-9117 (713) 497-7815
FAX (713) 497-0202

TABLE OF CONTENTS

DOWELL SCHLUMBERGER INCORPORATED
HOBBS, NEW MEXICO DISTRICT
SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

1.0 INTRODUCTION

The management and personnel of Dowell Schlumberger Incorporated's Hobbs, New Mexico District realize and acknowledge the importance of preventing oil from being spilled into the navigable waters of the United States and preventing harmful releases of hazardous waste into the environment. The following Spill Prevention, Control and Countermeasure (SPCC) Plan is designed to serve two purposes to help protect the environment.

*First, it provides the procedures which will be used to prevent oil spills and waste releases.

*Second, should a spill or release occur, it describes the protocols for immediate coordination of necessary activities to minimize any harmful effects, including notifications of appropriate government agencies as required under federal regulations.

For the purpose of handling spill responses effectively, this SPCC plan provides: descriptions of the duties performed by facility personnel; procedures to be followed; equipment available; and available outside resources.

This SPCC plan was developed in accordance with the requirements of Title 40 CFR Part 112, requirements under Title 40 CFR Section 262.34 (a) for generators storing hazardous waste for less than 90 days. This plan conforms to the recommendations of API Bulletin D16, entitled " Suggested Procedures for Development of Spill Prevention, Control and Countermeasure Plans", revised April 1990.

1.1 Management Approval - This SPCC and Contingency plan, required under 40 CFR Parts 112 and 262, will be implemented as described herein, and is approved by:

D A Joyce Date: 8-19-91

Mr. Vic Joyce
Division Manager

1.2 Engineering Certification - I hereby certify that I have examined the Dowell Schlumberger Incorporated facility located on Intersection of Lovington Highway and Bender Boulevard, Hobbs, New Mexico and being familiar with the provision of 40 CFR 112, attest that the following SPCC plan has been prepared in accordance with good engineering practices and the requirement of 40 CFR parts 112.7; certified by:

(seal)

R R T Dolan Date: 6-7-91

Mr. Richard T. Dolan, P.E.
Safety & Project Manager
GMS & Associates

State of Texas
Registration No. 67429

2.0 GENERAL FACILITY INFORMATION

2.1 Brief Facility Description - Dowell Schlumberger Incorporated's Hobbs District is an oilfield cementing, acidizing and fracturing service company for the oil and gas industry. It is an on-shore, non-transportation related facility, storing bulk sand, bulk cement, and bulk liquids in tanks. Bulk liquids are stored in the following tankage: four (4) 15,000 gallon 36% Hydrochloric Acid, one (1) 7,500 gallon wastewater storage, one (1) 300 gallon of waste oil storage and miscellaneous chemicals liquids stored in containers (drums and pails) or the solid chemicals in sacks. This facility is an occasional generator of hazardous waste; however, waste is not allowed to accumulate on-site for more than 90 days and is disposed of off-site. These materials are stored in drums and containers meeting DOT specifications, and are labeled in accordance with 40 CFR 262.34. Some material is stored in tanks constructed of all steel material with welded seams. Some of the miscellaneous chemicals are stored in warehouses, or in a fenced area. Appropriate warning signs are posted at the entrances of all of the chemical storage areas. There are no process water effluents from this facility discharged into navigable waters. The Hobbs facility is located in Lea County at the Intersection of Lovington Highway and Bender Boulevard, in Hobbs, New Mexico. A facility plot plan is found in Attachment No. 1, which includes an area map for reference.

2.2 Designated Contact - Mr. Jim Flowers, District Manager, is the designated person for spill prevention and if a spill occurs the hazardous waste coordination at the D-S Hobbs facility. Correspondence should be addressed to:

Dowell Schlumberger Incorporated

P.O. Box 640

Hobbs, New Mexico 88240

Mr. Flowers is the emergency coordinator for this facility. D-S will utilize trained personnel and local fire departments to respond to emergency situations. Typically, after an emergency event, e.g. fire or explosion, some form of clean-up is necessary. As in the case of emergency events, D-S will rely on RCRA and OSHA trained personnel to conduct the spill clean-up.

2.3 Storage Tanks - The tankage at the Hobbs facility is constructed of all steel material with welded seams, the only exceptions are the acid mixing tank and the wastewater tank that is made of fiberglass. Details concerning the facility tankage are found in Attachment No. 2.

2.4 Loading and Pipelines Facilities - There are two (2) loading and unloading racks at the Hobbs facility. One is in the wastewater loading and unloading area, for the acid dock wastewater, runoff water, and the truck wash wastewater. The second loading and unloading area is the Hydrochloric Acid area. The only pipeline system at the facility is from the truck wash wastewater to the holding tank.

These loading operations are as follows:

1. Acid dock wastewater, the runoff water and the truck wash wastewater tank is in the acid storage area.
2. Acid storage area is 50 feet south of the chemical warehouse.

2.4.1 Loading and Unloading Operations - The type of operations at each of the areas can be described as follows:

1. Acid dock wastewater, storage runoff tank and truck wash wastewater is a 7,500 gallon tank the receives wastewater by pipeline from the truck wash area to a sump. This water is then pumped into the tank. This tank is unloaded by vacuum truck for disposal. The loading and unloading activities are supervised by a D-S employee.
2. Acid is delivered by transport or railcar and off-loaded into one of the 15,000 gallon storage tanks. The acid storage tanks are enclosed by a dike and spillage would be contained. The transports are also parked in a diked area, which would contain any spillage caused by loading and unloading. The railcars are not in a diked area. Loading and unloading are supervised by D-S employees.

2.4.2 Pipeline System - The facility has only one pipeline system, which is a 1 1/4 inch PVC pipe and is buried underground. Since all lines are buried, vehicle traffic warning signs are not required. If a leak does occur clean-up will be conducted by trained personnel.

3.0 OIL SPILL & HAZARDOUS WASTE EMERGENCY PREVENTION MEASURES

It is recognized that the facility must be maintained and operated to minimize the possibility of a fire, explosion, or any sudden or non-sudden release of oil, hazardous waste, or hazardous waste constituents into the air, soil, or surface water, which could threaten human health or the environment. As such, the following preventive measures have been implemented at the Dowell Schlumberger Incorporated's Hobbs facility to minimize the possibility of releases and to minimize their impact should a release occur.

3.1 Security - The entire Hobbs facility is enclosed by a six foot high hurricane fence with barbed wire across the top. There are two gates that at the facility. The main gate is left locked unless entry or exit is made, the other gate is locked at all times except when railcars are moved in and out. There is a dispatcher watching the main gate at all times. The drum warehouses are locked during non-working periods.

3.2 Lighting - The operational areas, including facilities with oil and waste storage, of the Hobbs facility are adequately lit at night, to detect spill or leakage.

3.3 Spill Containment Devices - The Hobbs facility will use dikes or booms to control accidental oil and waste releases should they occur. The majority of the significant oil, acid or waste storage areas have dikes fully enclosing the tanks or drums and D-S plans to dike all potential sources. The following storage vessels are contained within a diked to sufficiently hold 130 percent of the volume of the largest storage vessel within the diked area:

- o Truck wash wastewater and spent acid wastewater and runoff water - "Area" 1
- o Acid storage tanks - "Area" 1

All diked areas used to store material or waste material have no outlet piping or valves for drainage. Removal of accumulated liquids from all diked areas can be accomplished by using a portable pump and requires the approval of the supervisor responsible for spill prevention. Before approval, this supervisor will visually inspect this diked area to be drained. Drainage will only be allowed if no remedial action is necessary. Accumulated liquids are to be removed to one of the wastewater tanks.

3.4 Special Precautions - No hazardous waste materials will be stored within at least 50 feet of the property line in accordance with NFPA standards. Incompatible waste will be stored in segregated areas or sections of the hazardous waste drum storage area. Adequate space shall be provided in and around all areas where oil and wastes are stored to allow the unobstructed movement of personnel and equipment for spill control, emergency response, and for fire fighting needs.

Hazardous waste handling operations will be conducted by personnel who have completed OSHA/RCRA training. Hazardous waste drums within the hazardous waste drum staging area are marked and labeled in accordance with 40 CFR 262.31 and 49 CFR 172; and as necessary, tanks that contain hazardous waste liquids will also be marked in accordance with 40 CFR 262.31 and 49 CFR 172.

3.5 Inspections - Each of the facility's storage tanks will be visually inspected annually. This inspection will included at the minimum the following:

- o Integrity of joints
- o Rusted areas and associated leaks
- o Structural abnormalities
- o Breathing vent condition
- o Hoses and associated connections
- o Valving
- o Condition of paint
- o Condition of tank integrity

These inspections will be entered in the "Annual Tank Inspection Form" as provided in Attachment No. 3. Corrective action for defects will be taken as necessary and will be recorded on inspection forms.

The supervisor responsible for spill prevention and waste handling at the D-S Hobbs facility or his trained designated representative will conduct weekly facility tours to observe any abnormalities or potential problems. Any problems and subsequent corrective actions will be logged on the inspection form provided in Attachment No. 3. This inspection include the following:

- o Condition of facility drainage ditches
- o External tankage appearance
- o Condition of waste storage drums in "Area" 3
- o Condition of product drums in "Area" 3
- o Integrity of containment dikes
- o Condition of diked areas
- o Adequate aisle and work space in storage area

3.6 Personnel Training - All personnel, except office personnel, at the Hobbs facility will receive training in spill prevention, safe handling procedures of products and wastes, waste minimization, and methods for recognizing spills and waste release. This training will cover site-specific information, including implementation of this plan. The training will be conducted annually by personnel trained in oil spill prevention, response, and waste management procedures and having familiarity with the Hobbs facility. This training will include:

A. Applicable Laws and Regulations
    1. Required spill prevention
    2. Waste handling requirements
    3. Reporting releases

B. Safe Hazardous Waste Planning
    1. Equipment location
    2. Incompatible waste
    3. Access space
    4. Employee precautions

C. Spill/Release Prevention
    1. Secondary Containment devices
    2. Containment device maintenance
    3. Inspections
    4. Operational precautions

D. Spill/Release Control Equipment
    1. Proper use and limitations
    2. Inspections

C. Oil and Waste Release Response
    1. Response to minor releases
    2. Response to significant releases

F. Waste Minimization Practices

G. OSHA Required Training
    1. Personnel protective equipment
    2. Decontamination procedures
    3. Site safety plan review
    4. Confined space entry
    5. Emergency response

D-S personnel training records are maintained in the Hobbs facility master file, which is in the Main building. In accordance with 40 CFR 112 (10), D-S personnel training and employee documentation records are kept in files at the district. These records include; job titles, job descriptions for each position, description of type and amount of training,and records documenting training or job experience.

4.0 OIL SPILL CONTINGENCY & HAZARDOUS WASTE EMERGENCY RESPONSE PLAN

4.1 Objectives - There are three main objectives during a spill event. They are:

1. Stop the Source of Leakage,
2. Contain the Leakage and
3. Commence Remedial Action.

The order of priority for the above objectives will vary depending on the events and in what stage the leak is detected. Tank spills which have breached the firewall should initially be contained first. For spills associated with fires remedial action should commence first. Consideration would be given to the fact that water used in fire fighting may overload the spill containment systems. The general plan for oil spill/hazardous waste emergency response consists of four steps. They are:

1. The Spill must be reported to the Emergency Response Supervisor (refer to the Phone Numbers in Attachment No. 4).
2. The Emergency Response Supervisor will determine which outside assistance organizations to contact, if any, how to stop the leak, how to contain the leak, and what form of remedial action is necessary, he will then initiate the necessary activities.
3. The Emergency Response Supervisor will determine which government agencies are required to be notified and ensure that these notifications are made.
4. The Emergency Supervisor will see that all non-D-S Communications (i.e news media) follow company policy.

The intent of this plan is to provide the information needed for the proper respond to a spill event. Provided in Attachment No. 8 is a synopsis of this plan for use during emergency events and for quick reference.

Spill response will vary during each spill event, since each spill is typically unique. As such, no one plan can address all of the different scenarios that can happen before, during, and after a spill. Generally, the D-S Hobbs facility could have four types of spill events:

1) Contained Spill - spill inside bermed areas and all material is contained.
2) Controlled Small Spill - spill outside bermed areas but is small enough not to spread off-site.
3) Uncontrolled Spill - that is, a spill large enough to exceed bermed capacity (due to weather or fire fighting water make-up) or the spill is outside of bermed area, and the spill goes off site.
4) Reportable Spill - the spill leaves the property and is over 1000 gallons, or the reportable quantity has been exceeded.

4.2 Equipment Location - The available on-site equipment and their location is provided in Attachment No. 2. The location of this equipment is also shown on the facility plot plan provided in Attachment No. 1. Other information which may be useful during an emergency event is provided below:

- o There are several hand held radios available at the facility, which would be useful for communications.
- o Outside contractors are available to provide personnel and equipment. A listing of local contractors is provided in Attachment No. 6.

4.3 Supervisor Response - After receiving a report of a spill, leak or other emergency the Emergency Response Supervisor shall determine the following:

1. Extent of personal injuries, if any.
2. Exact location of spill, leak or other emergency event.
3. Whether the event is still occurring and when first observed.
4. The extent of spill, leak or emergency.
5. Methods to safely control the event.
6. If spill containment devices are working.
7. If there are apparent hazards associated with the event.
8. Which outside contractors will be utilized.
9. Present and predicted weather conditions at the facility.
10. Applicable government agency notifications required.
11. Determine D-S Contact for non-D-S communications.

Based on the above criteria, the Emergency Response Supervisor will implement the most appropriate spill or release response.

4.4 Other Considerations

4.4.1 Drum Leaks - If a leaking drum is detected,the contents remaining in the drum will be transferred to an intact drum if this can be done safely. The empty drum will be put in the empty drum storage area for disposal or reclamation. If the contents cannot be safely transferred to another drum, then the leaking drum will be placed in a DOT-approved overpack drum for off-site disposal. Any spillage and clean up materials will also be placed into the overpack drum for disposal. A label will be placed on the overpack drum, identifying the contents and the original date it was place in storage.

4.4.2 Evacuation of Site - Evacuation routes are shown on the facility plot plan provided in Attachment No. 1. It is not foreseen that any facility release or event would require evacuation. However, the routes are shown as a precaution.

4.4.3 Arrangements with Local Authorities - The supplemental provided in Attachment No. 8 contains the information most pertinent to outside authorities. It has been provided to the Hobbs Fire and Police Departments.

Information on the hazardous waste and materials stored at the site are kept in the D-S Emergency Response Supervisors's office. This information will be provided to police, firefighters, hospitals and other emergency response personnel as needed. This information includes Material Safety Data Sheets for stored products.

5.0 REPORTING

5.1 Spills - When a discharge of diesel, acid or other products leaves the Hobbs property, a REPORTABLE spill has occurred. The D-S Emergency Coordinator will contact the D-S Emergency Number, to determine if the spill is a reportable spill. If the spill is a reportable spill the Emergency Coordinator will then call National Response Center and the New Mexico Environmental Improvement Division (NMEID) will be notified as soon as possible by phone, according to regulatory requirements and company policy. Attachment No. 5 includes the information normally requested by the receiving agency. Whenever the facility has "discharged more than 1,000 gallons of property in a single spill event or discharged harmful quantities, as defined in 40 CFR 110, in two spill events occurring within any twelve month period..." the owner or operator of the facility must file a written report of the incident and include a copy of the facility's SPCC plan (see 40 CFR 112.4 in Attachment No. 7 for details).

5.2 Hazardous Waste Releases - If the facility has a fire, explosion or hazardous waste release which could threaten human health or the environment outside the facility, the incident must be reported, following company procedures, to the:

- Local Police and Fire Departments if evacuation is required,
- D-S Emergency Number
- National Response Center and the NMEID, and
- Environmental Protection Agency (EPA)

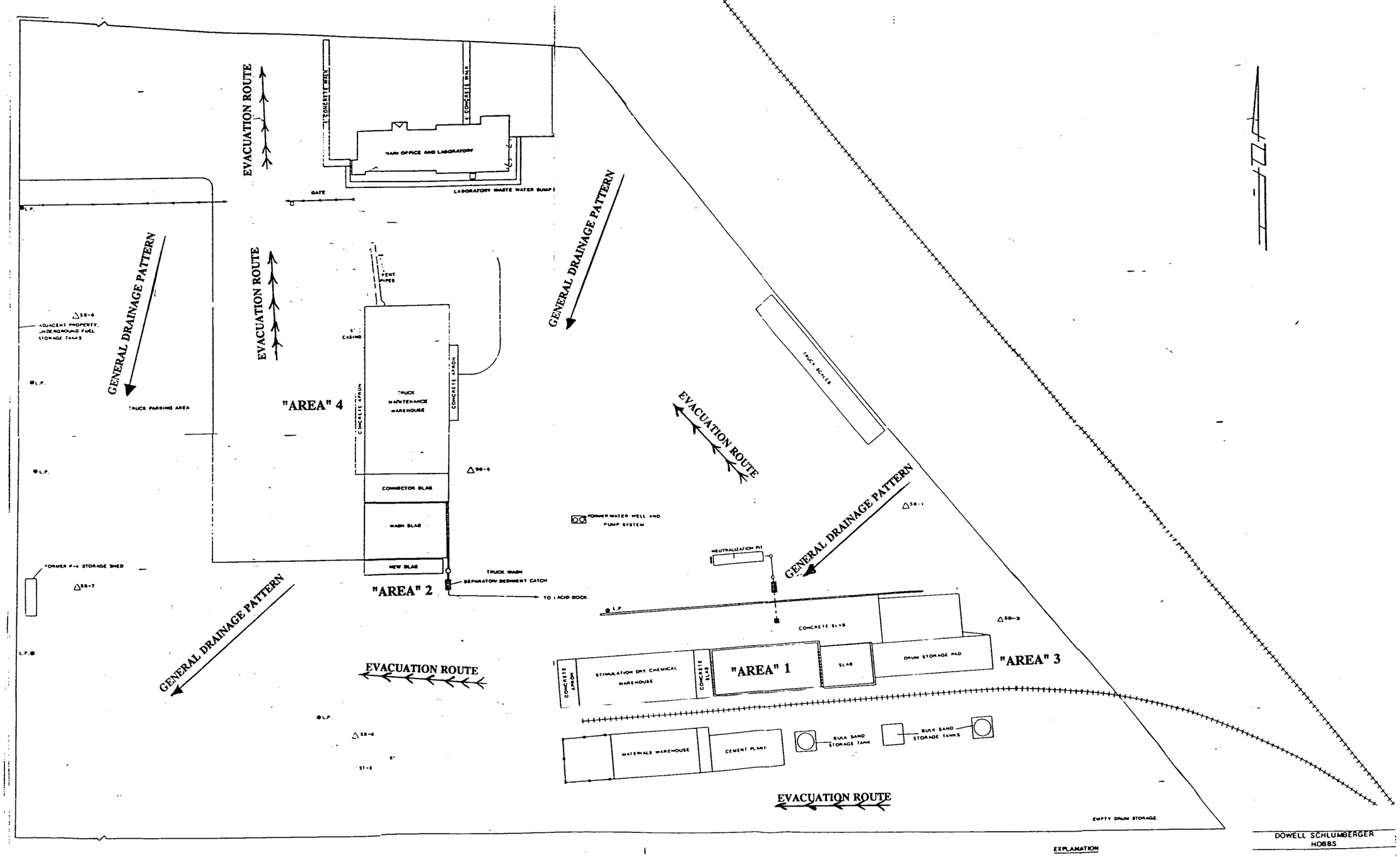
Attachment No. 5 provides the required information for reporting a hazardous waste release to governmental agencies.

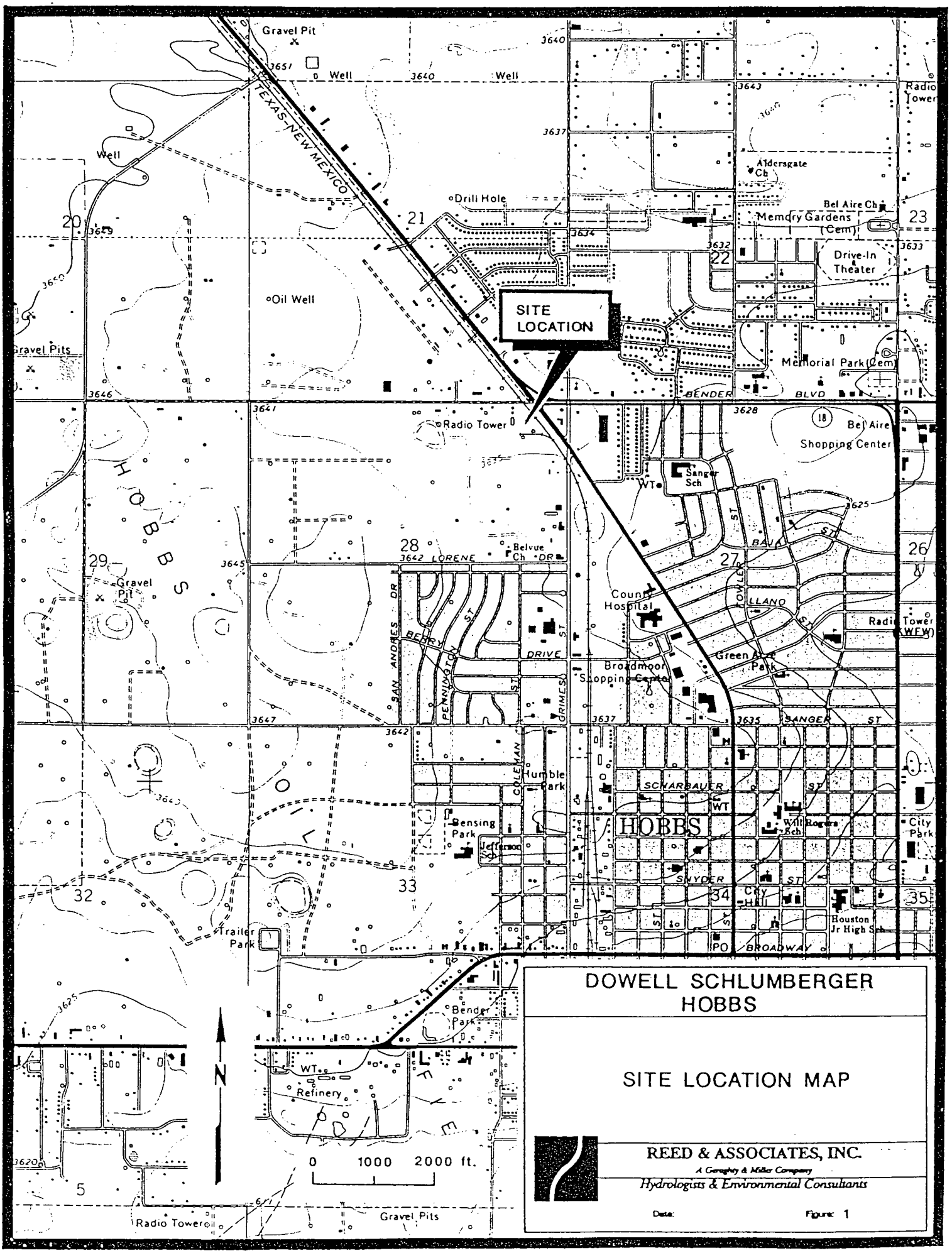
5.3 Plan Amendment - In the event this facility has a reportable event, local D-S Management will review the circumstances causing the event and determine if amendment of this plan is necessary. Every three years the SPCC plan will be reviewed for completeness by D-S Management. Further, all future modifications and changes in operations at the Hobbs facility which materially affect this plan will be incorporated into a revised plan within 6 months after such changes occur.


Cardinal®

ATTACHMENT No. 1

FACILITY PLOT PLAN & AREA MAP


EVACUATION ROUTE
CONCRETE WALL
CONCRETE WALL
MAIN OFFICE AND LABORATORY
LABORATORY WASTE WATER SUMP
GATE
L.P.
GENERAL DRAINAGE PATTERN
ADJACENT PROPERTY, UNDERGROUND FUEL STORAGE TANKS
L.P.
TRUCK PARKING AREA
"AREA" 4
EVACUATION ROUTE
VENT PIPES
CASING
CONCRETE APRON
TRUCK MAINTENANCE WAREHOUSE
CONCRETE APRON
CONNECTOR SLAB
WASH SLAB
NEW SLAB
TRUCK WASH SEPARATOR SEDIMENT CATCH
TO I ACID DOCK
"AREA" 2
FORMER WATER WELL AND PUMP SYSTEM
FORMER P-4 STORAGE SHED
GENERAL DRAINAGE PATTERN
EVACUATION ROUTE
L.P.
TRUCK SCALES
EVACUATION ROUTE
GENERAL DRAINAGE PATTERN
NEUTRALIZATION PIT
L.P.
CONCRETE SLAB
CONCRETE APRON
STIMULATION DRY CHEMICAL WAREHOUSE
CONCRETE SLAB
"AREA" 1
SLAB
DRUM STORAGE PAD
"AREA" 3
MATERIALS WAREHOUSE
CEMENT PLANT
BULK SAND STORAGE TANK
BULK SAND STORAGE TANKS
EVACUATION ROUTE
EMPTY DRUM STORAGE
SCALE
0 30 60
FEET
EXPLANATION
L.P. LIGHT POLE
SB-1 SOIL BORING LOCATIONS
ST-1 STRATIGRAPHIC TEST HOLE
DOWELL SCHLUMBERGER HOBBS
PLOT PLAN
REED & ASSOCIATES, INC.



DOWELL SCHLUMBERGER HOBBS

SITE LOCATION MAP

REED & ASSOCIATES, INC.
A Geraghty & Miller Company
Hydrologists & Environmental Consultants

Date:

Figure: 1


Cardinal®

ATTACHMENT No. 2

HOBBS RESPONSE EQUIPMENT

PRODUCT AND WASTE STORAGE AND SPILL CONTAINMENT FACILITIES

Source	Potential Type of Failure	Gallons Stored	Secondary Containment
Hydrochloric Acid	Rupture	15,000	Dike
Spent Acid, Truck Wash Wastewater and Runoff Water Tank	Rupture	7,500	Dike
Drummed Product Storage Area	Leak	55	None at This Time
Waste Oil Storage Tank	Rupture	300	None

OIL SPILL/EMERGENCY RESPONSE EQUIPMENT

ITEM	QUANTITY	PURPOSE	LOCATION
20 # Dry Chemical	10	Firefighting	At least 1 at all storage areas
Hand-held Radios	5	Communications	Main Office Building
Intercom System	1	Communications & Alarm	On-Site
Shovels & Rakes	4	Spill Clean-up	
Absorbent "Soil"	2 Sacks	Spill Clean-up	
Trucks	1	Transport	On-site
Overpack Drum	1	Spill Control	Drum Storage Pad
Drum Patch Kit	1	Spill Control	Drum Storage Pad


Cardinal®

ATTACHMENT NO. 3

RECORD-KEEPING FORMS

WEEKLY INSPECTION REPORT

DOWELL SCHLUMBERGER INCORPORATED

HOBBS, NEW MEXICO FACILITY

Location	Description of Inspection or Observation to be Performed	Inspection Date	Inspected By	Remarks
1	Check Level in 7,500 gal. Waste Tank			
2	Check Level in Waste Tank/Sump			
1	Check 15,000 gal. Acid Storage tanks for leakage			
3	Check for Leaking Drums, Proper Lighting, Gate Closed			
1	Check All Diked Areas for Water Levels. Report Any Contamination Observed.			
4	Waste Oil Storage Area			

COMMENTS: _____

_____

_____

_____

NOTE: Inspection Reports to be turned in each morning to the facility supervisor, Main building.

SPCC PLAN

DOWELL SCHLUMBERGER INCORPORATED

HOBBS, NEW MEXICO FACILITY

Weekly Inspection Record **Week Ending** _____
(40 CFR/Part 112.7)

Item	Condition		Date Deficiency Corrected
	Satisfactory	Deficient*	
Diked Acid and Wastewater Storage Area			
Material Storage Area			
Spill Response Equipment			
Fire Extinguishers			
Scott Air-Paks			
On-Site Radio Equipment			

***Describe any Deficiencies:** _____

_____

_____

_____

_____

Inspection Performed By: _____
Inspector or Supervisor

Date of Inspection: _____

ANNUAL TANK INSPECTION REPORT

DOWELL SCHLUMBERGER INCORPORATED

HOBBS, NEW MEXICO FACILITY

TANK LOCATION	TANK DESCRIPTION	INSPECTION DATE	INSPECTED BY	REMARKS
1	15,000 gal. Acid Storage	_____	_____	_____
1	Wastewater Tank	_____	_____	_____
4	Waste Oil Storage Tank	_____	_____	_____

NOTE: Inspection must include:

- o Integrity of Joints[1]
- o Rusted areas
- o Structural abnormalities
- o Breathing vents condition
- o Valving
- o Condition of plant
- o Condition of tank interior

[1] If problems are causing leakage, the entire tank will be tested for adequate steel thickness, in accordance with D-S Procedures.


Cardinal®

ATTACHMENT No. 4

EMERGENCY COMMUNICATIONS (TELEPHONE NUMBERS)

EMERGENCY CALL LIST
(In Order)

NAME	HOME	OFFICE
1. Butch Wood	392-7817	393-6186
2. Walt Crandall	392-3824	393-6186
3. Ruben Vela	392-2910	393-6186
4. Jim Flowers	392-4075	393-6186

EMERGENCY ASSISTANCE TELEPHONE NUMBERS

Hobbs FIRE Department.....911 (Main Dispatcher)

Hobbs POLICE Department.....911 (Main Dispatcher)

Ambulance

* Hobbs Fire Department (Paramedics).....911

Hospital

* Lea Regional Hospital.....392-6581
  Lovington Hwy.

ADDITIONAL TELEPHONE NUMBERS FOR USE BY THE EMERGENCY SUPERVISOR

Dave Miller 713-579-5700

.....713-579-5779

D-S Emergency Number 918-582-0104

Tony Accardo 713-556-7649

John Miller 713-556-7221

National Response Center (24 Hour).....800-424-8802

New Mexico Environmental Improvement Division 505-827-2929

EPA Dallas Office (24 Hour).....214-655-2222
(Business Hours).....214-655-2270

5

ATTACHMENT NO. 5

REPORTS TO ENVIRONMENTAL AGENCIES

VERBAL OIL SPILL REPORTS

The Emergency Response Supervisor will be responsible for seeing that all necessary notifications to governmental agencies are made. The following information is expected in a telephone report of an oil spill:

1. Name and telephone number of person reporting spill.
2. Date, location, and time of spill.
3. Has spill been contained and/or stopped.
4. Where known, the name, address and telephone number of the party responsible for the oil spill.

   If the Hobbs facility is responsible for the spill, then provide the following:

   Dowell Schlumberger Inc.
   Hobbs, New Mexico District
   Intersection of Lovington Hwy and Bender Boulevard
   Hobbs, New Mexico 88240
   (505) 393-6186
   EPA I.D. No. NMD035750942

5. Location of discharge.
6. Material(s) spilled and quantity lost.
7. What type of clean-up is underway.
8. Personnel injuries and/or fires associated with spill.
9. Fishkill or other environmental damage associated with spill.

NOTE: A written report and a copy of this SPCC plan must be submitted to the EPA if more than 1,000 gallons of oil entered the drainage ditch within 60 days of spill.

ATTACHMENT No. 6

OIL & HAZARDOUS WASTE CLEAN-UP/DISPOSAL CONTRACTORS

SPILL CLEAN-UP CONTRACTORS

CECOS INTERNATIONAL 333-2826

2407 E. Murphy Rd.

Odessa, Texas 79761

Hazardous Waste Management Inc 800 443-1587

ATTACHMENT NO. 7

LOCAL AGENCY SUPPLEMENT

DOWELL SCHLUMBERGER INCORPORATED

HOBBS, NEW MEXICO DISTRICT

SPCC PLAN

SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

JUNE 1991

GeoMonitoring Services

11261 RICHMOND AVE.SUITE G-110, HOUSTON, TEXAS 77082-2617
(800) 366-9117 (713) 497-7815
FAX (713) 497-0202

DOWELL SCHLUMBERGER INCORPORATED

HOBBS, NEW MEXICO DISTRICT

SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

1.0 INTRODUCTION

The management and personnel of Dowell Schlumberger Incorporated's Hobbs, New Mexico District realize and acknowledge the importance of preventing oil from being spilled into the navigable waters of the United States and preventing harmful releases of hazardous waste into the environment. The following Spill Prevention, Control and Countermeasure (SPCC) Plan is designed to provide necessary information to local agencies for emergency events.

2.0 GENERAL FACILITY INFORMATION

2.1 Brief Facility Description - Dowell Schlumberger Incorporated's Hobbs District is an oilfield cementing, acidizing and fracturing service company for the oil and gas industry. It is an on-shore, non-transportation related facility, storing bulk sand, bulk cement, and bulk liquids in tanks as follows: four (4) 15,000 gallon 36% Hydrochloric Acid, one (1) 7,500 gallon wastewater storage, one (1) 300 gallons of waste oil storage and miscellaneous chemicals liquids stored in containers (drums or pails) or the solid chemicals in sacks. This facility is an occasional generator of hazardous waste; however, waste is not allowed to accumulate on-site for more than 90 days and is disposed of off-site. These materials are stored in drums and containers meeting DOT

specifications, and are labeled in accordance with 40 CFR 262.34. Some material is stored in tanks constructed of all steel material with welded seams. Some of the miscellaneous chemicals are stored in warehouses, or in a fenced area. Appropriate warning signs are posted at the entrances of all of the chemical storage areas. There are no process water effluents at this facility discharged into navigable waters. The Hobbs facility is located in Lea County at Intersection of Lovington Highway and Bender Boulevard, Hobbs, New Mexico. A facility plot plan is found in Attachment A, which includes an area map for reference.

2.2 Designated Contact - Mr. Jim Flowers, District Manager, is the designated person for spill prevention and if a spill occurs the hazardous waste coordination at the D-S Hobbs facility. Correspondence should be addressed to:

Dowell Schlumberger Incorporated

P.O. Box 640

Hobbs, New Mexico 88240

3.0 POTENTIAL FIRE AND SPILL SOURCES

3.1 Storage Tanks - The tankage at the Hobbs facility is constructed of all steel material with welded seams, the exceptions are the acid mixing tank and the wastewater storage tank. Details concerning the facility tankage are found in Attachment B.

3.2 Loading and Pipelines Facilities - There are two (2) loading and unloading racks at the Hobbs facility. One is in the wastewater loading and unloading area the truck wash wastewater and fuel rack runoff water. The fifth loading and unloading area is the Hydrochloric Acid area. The only pipeline at the facility is from the fuel rack sump and the truck wash wastewater to the holding tank.

3.3 Discussion of Potential Fire and Spill Sources Locations - The following discussion provides location of potential sources of fires and spills at the Hobbs facility:

1. Acid dock wastewater, the runoff water and the truck wash wastewater tank is in the acid storage area.
2. Acid storage area is 50 feet north of the chemical warehouse.

3.4 Loading and Unloading Operations - The type of operations at each of the areas can be described as follows:

1. Acid dock wastewater, storage runoff tank and truck wash wastewater is a 7,500 gallon tank the receives wastewater by pipeline from the truck wash area to a sump. This water is then pumped into the tank. This tank is unloaded by vacuum truck for disposal. The loading and unloading activities are supervised by a D-S employee.
2. Acid is delivered by transport or railcar and off-loaded into one of the 15,000 gallon storage tanks. The acid storage tanks are enclosed by a dike and spillage would be contained. The transports are also parked in a diked area, which would contain any spillage caused by loading and unloading. The railcars are not in a diked area. Loading and unloading are supervised by D-S employees.

4.0 RESPONSE EQUIPMENT LOCATION - The available on-site equipment and their locations are provided in Attachment C. The locations are shown on the facility plot plan provided in Attachment A. Other information which may be useful during an emergency event is provided below:

- o There are several hand held radios available at the facility, which would be useful for communications.
- o Outside contractors are available to provide personnel and equipment. A listing of local contractors is provided in Attachment E.

5.0 EMERGENCY COMMUNICATIONS - The D-S Hobbs facility has three trained emergency response persons. They are:

1. Mr. Butch Wood
2. Mr. Walt Crandall
3. Mr. Ruben Vela

Their phone numbers are provided in Attachment D, which also includes other emergency numbers.

ATTACHMENT A

FACILITY PLOT PLAN & AREA MAP

ATTACHMENT B

HOBBS TANKAGE

PRODUCT AND WASTE STORAGE AND SPILL CONTAINMENT FACILITIES

Source	Potential Type of Failure	Gallons Stored	Secondary Containment
Hydrochloric Acid Tanks	Rupture	15,000	Dike
Wastewater Tank	Rupture	7,500	Dike
Drummed Product Storage Area	Leak	55	None at This Time
Waste Oil Storage Tank	Rupture	300	None at This Time

ATTACHMENT C

HOBBS RESPONSE EQUIPMENT

OIL SPILL/EMERGENCY RESPONSE EQUIPMENT

ITEM	QUANTITY	PURPOSE	LOCATION
20 # Dry Chemical	10	Firefighting	At least 1 at all storage areas
Hand-held Radios	5	Communications	Main Office Building
Intercom System	1	Communications & Alarm	On-Site
Shovels & Rakes	4	Spill Clean-up	
Absorbent "Soil"	2 Sacks	Spill Clean-up	
Trucks	1	Transport	On-site
Overpack Drum	1	Spill Control	Drum Storage Pad
Drum Patch Kit	1	Spill Control	Drum Storage Pad

ATTACHMENT D

EMERGENCY COMMUNICATIONS (TELEPHONE NUMBERS)

EMERGENCY CALL LIST
(In Order)

NAME	HOME	OFFICE
1. Butch Wood	392-7817	393-6186
2. Walt Crandall	392-3824	393-6186
3. Ruben Vela	392-2910	393-6186
4. Jim Flowers	392-4075	393-6186

EMERGENCY ASSISTANCE TELEPHONE NUMBERS

Hobbs FIRE Department.....911 (Main Dispatcher)

Hobbs POLICE Department.....911 (Main Dispatcher)

Ambulance

* Hobbs Fire Department (Paramedics).....911

Hospital

* Lea Regional Hospital.....392-6581
  Lovington Hwy.

ADDITIONAL TELEPHONE NUMBERS FOR USE BY THE EMERGENCY SUPERVISOR

Dave Miller 713-579-5700

.....713-579-5779

D-S Emergency Number 918-582-0104

Tony Accardo 713-556-7649

John Miller 713-556-7221

National Response Center (24 Hour).....800-424-8802

New Mexico Environmental Improvement Division 505-827-2929

EPA Dallas Office (24 Hour).....214-655-2222
(Business Hours).....214-655-2270

ATTACHMENT E

OIL & HAZARDOUS WASTE CLEAN-UP/DISPOSAL CONTRACTORS

SPILL CLEAN-UP CONTRACTORS

CECOS INTERNATIONAL 333-2826

2407 E. Murphy Rd.

Odessa, Texas 79761

Hazardous Waste Management Inc 800 443-1587