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September 20, 2007

Mr. David Wagner
Mr. Mike Lawless
City of Lawrence
720 West 3rd Street
Lawrence, KS 66044

RE : Design/Build West Baldwin Creek Interceptor

Dear Mr. Wagner:

Attached you will find the final proposal for the Design/Build services for the design and construction of the West Baldwin Creek Interceptor. Members of City Staff, CAS Construction and Professional Engineering Consultants (PEC) have been meeting on a regular basis, constantly communicating and sharing ideas and leveraging our collective and creative talents to make this project both highly functional, flexible and most importantly, cost efficient. We believe the work proposed herein provides the best value to the citizens of the City of Lawrence.

The final proposed Guaranteed Maximum Price (GMP) will be Three Million Nine Hundred Eight Thousand Dollars (\$3,908,000.00).

Attached you will find the following documents to support and further define the scope of this proposal:

1. Agreement: (pages 1 to 7 inclusive)
2. General Conditions of the Contract : (pages 1 to 33 inclusive)
3. Supplementary Conditions: (pages 1 to 4 inclusive)
4. Work Description : Rev 6 dated September 20, 2007(pages 1 to 6 inclusive)
5. Conceptual Drawings : (per attached drawing list dated September 20, 2007 under Drawings tab- page 1 of 1)
6. City Approval of Preliminary Design Memo (page 1 of 1)
 - a. Preliminary Design Memorandum (pages 1-1 to 4-15 inclusive of all referenced attachments and appendices)
 - b. Electronic Version of Preliminary Design Memo (CD Included)
7. Pricing Proposal : (page 1 of 1)

Substantial completion of the project will be obtained by July 1, 2008 or liquidated damages in the amount of \$500.00 will be assessed for every calendar day of delay that substantial completion is obtained after that date. Final completion will be obtained by September 1, 2008.

Access to the site for the contractor will be no later than October 1, 2007 for staging and mobilization; and to start work no later than November 1, 2007 for the interceptor lines. Property acquisition shall be sequenced to provide a continual and uninterrupted flow of work no later than November 1, 2007. Property acquisition to be 100% completed no later than January 1, 2008. Cost impacts associated with not meeting the dates or for work disruption are in an allowance item to reimburse contractor for additional costs. Time impacts will need to be addressed on an individual basis.

The schedule for the project substantial completion is based upon an ability to start mobilization, procurement and clearing activities by October 8th. Review and approval of the blasting plan is needed from Magellan no later than October 15th for blasting activities to start. In the event that a response is not received, or a negative response is received, from Magellan by October 15th to allow blasting to start, the contract completion date shall be adjusted by the time necessary to receive a final response from Magellan. Contractor will be entitled to an extension of time equal to the number of days following October 15th until a satisfactory response is received from Magellan to allow work to start. There will be no additional compensation for this extension of time.

Based upon what we have seen to date regarding the communication and commitment of all parties involved, this project is bound to succeed. We look forward to another successful project for the City of Lawrence.

Very truly yours,

Michael Hafling, P.E.
Executive Vice President / COO

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the applicable laws of the jurisdiction in which the Project is to be performed.

STANDARD FORM OF AGREEMENT
BETWEEN OWNER AND DESIGN/BUILDER
ON THE BASIS OF A STIPULATED PRICE

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By

[insert seals]

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

AMERICAN CONSULTING ENGINEERS COUNCIL

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This Standard Form of Agreement has been prepared for use with the Standard General Conditions of the Contract Between Owner and Design/Builder (No. 1910-40) (1994 Edition). Their provisions are interrelated and a change in one may necessitate a change in the other. The suggested language contained in the Guide to Use of EJCDC Design/Build Documents (No. 1910-42) (1994 Edition) is also carefully interrelated with the language of this Agreement.

Note to User

Before entering into this Agreement, it is recommended that the parties determine whether applicable Laws and Regulations prohibit or require alterations in the contemplated contractual arrangements and the assignments of responsibilities for a design/build project. Check competitive bidding, contractor licensing, design professional licensing, and professional practice Laws and Regulations, among others.

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

**EJCDC
STANDARD FORM OF AGREEMENT
BETWEEN OWNER AND DESIGN/BUILDER
ON THE BASIS OF A STIPULATED PRICE**

THIS AGREEMENT is dated as of the _____ day of _____, 2007 _____ by and
between The City of Lawrence, Kansas
_____ (hereinafter called OWNER) and _____
CAS Construction, LLC (hereinafter called DESIGN/BUILDER).

OWNER and DESIGN/BUILDER, in consideration of the mutual covenants hereinafter set forth, agree as follows:

Article 1. WORK.

1.01. DESIGN/BUILDER shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Design and construct a gravity interceptor and sewer line in the area known as Baldwin Creek upstream of City Pump Station 48 as discussed in detail in the "Work Description", Preliminary Design Memorandum and associated Preliminary Drawings attached. The work will include engineering, surveying, equipment, materials and construction and management activities to complete the project.

Article 2. THE PROJECT.

2.01. The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

West Baldwin Creek Interceptor

Article 3. CONTRACT TIMES.

[Strike inapplicable paragraph(s)]

3.01. *Dates for Substantial Completion and Final Payment*

A. The Work will be substantially completed on or before August 15, 2008, and completed and ready for final payment in accordance with paragraph 13.09 of the General Conditions on or before October 15, 2008.

This date assumes Contract Award on November 7, 2007 and Notice to Proceed on November 14, 2007, for lump sum proposal to be completed and tenured by September 20, 2007.

The schedule for the project substantial completion is based upon an ability to start mobilization, procurement and clearing activities by October 8th. Review and approval of the blasting plan is needed from Magellan no later than December 1, 2007 for blasting activities to start. In the event that a response is not received, or a negative response is received, from Magellan by December 1, 2007 to allow blasting to start, the contract completion date shall be adjusted by the time necessary to receive a final response from Magellan. Contractor will be entitled to an

extension of time equal to the number of days following December 1, 2007 until a satisfactory response is received from Magellan to allow work to start. There will be no additional compensation for this extension of time.

~~3.01. Days to Achieve Substantial Completion and Final Payment~~

~~A. The Work will be substantially completed within days after the date when the Contract Times commence to run as provided in paragraph 2.02.A of the General Conditions, and completed and ready for final payment in accordance with paragraph 13.09 of the General Conditions within days after the date when the Contract Times commence to run.~~

3.02. Liquidated Damages

A. DESIGN/BUILDER and OWNER recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 3.01.A above, plus any extensions thereof allowed in accordance with Article 11 of the General Conditions. The parties also recognize the delays, expenses and difficulties involved in proving the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and DESIGN/BUILDER agree that as liquidated damages for delay (but not as a penalty) DESIGN/BUILDER shall pay OWNER \$500.00 for each day that expires after the time specified in paragraph 3.01.A for Substantial Completion until the Work is substantially complete. After Substantial Completion, if DESIGN/BUILDER shall neglect, refuse or fail to complete the remaining Work within the time specified in paragraph 3.01.A for completion and readiness for final payment or any proper extension thereof granted by OWNER, DESIGN/BUILDER shall pay OWNER \$250.00 for each day that expires after the time specified in paragraph 3.01.A for completion and readiness for final payment.

[Where failure to reach a Milestone on time is of such consequence to OWNER that the assessment of liquidated damages for failure to reach one or more Milestones on time is to be provided, appropriate amending or supplementing language should be inserted here.]

B. The liquidated damages set forth herein shall not be cumulative. If Substantial Completion of the Work is not met within the time specified for Final Completion of all Work, the liquidated damages shall continue to be at the rate or rates specified for default on Substantial Completion until Substantial Completion is attained. If the Work is not then finally completed, the rate or rates specified for default on Final Completion shall apply until Final Completion is attained.

Article 4. CONTRACT PRICE.

4.01. OWNER shall pay DESIGN/BUILDER the following sum(s) for completion of the Work in accordance with the Contract Documents.

A. For all Work other than Unit Price Work, a Lump Sum of :

Phase 1 – See Preliminary Design/Build Agreement for detail of Lump Sum costs and associated Allocation Services : \$315,000.00. Final amount of this Phase 1 Work will be determined by the amount of Allocation Services expended, however will not exceed the amount listed above.

Phase 2 – See Design/Builder Proposal dated September 20, 2007: \$ 3,908,000.00.

The following cash allowances are included in the above price and have been computed in accordance with paragraph 10.03.A of the General Conditions.

Item	Allowance
Owners Contingency Allowance	<u>\$50,000.00 (included in Phase 2 lump sum price above)</u>

(Design/Builder Proposal outlines other specific allowances for separate and unique use and are also included in the lump sum pricing for Phase 2)

\$

[Attach additional pages if required]

B. 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 that item as indicated in this paragraph 4.01.B. As provided in paragraph 10.04.A of the General Conditions estimated quantities are not guaranteed, and determinations of actual quantities and classification are to be made by OWNER. Unit prices have been computed as provided in paragraph 10.04.B of the General Conditions.

UNIT PRICE WORK

NO.	ITEM	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL ESTIMATED
1			XX	XX	XX
2			XX	XX	XX

[Attach additional pages if required]

TOTAL OF ALL UNIT PRICES \$ 0

(Strike paragraph 4.02 if inapplicable)

~~4.02. The factor used to calculate DESIGN/BUILDER's fee for employees in the direct employ of DESIGN/BUILDER performing Design Professional Services in accordance with paragraph 10.02.A.1.b of the General Conditions shall be _____.~~

* Authorization for lump sum price for Phase 2 must be as signed by the City Manager for the City of Lawrence.

Article 5. PAYMENT PROCEDURES

5.01. DESIGN/BUILDER shall submit and OWNER will process Applications for Payment in accordance with Article 13 of the General Conditions.

A. *Progress Payments; Retainage.* OWNER shall make progress payments on account of the Contract Price on the basis of DESIGN/BUILDER's Applications for Payment, on or about the **First** day of each month during performance of the Work as provided in paragraphs 5.01.A.1 and A.2 below. All such payments will be measured by the acceptable Schedule of Values established in paragraph 2.06.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed).

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below, but, in each case, less the aggregate of payments previously made and less such amounts as OWNER may withhold in accordance with paragraph 13.04.B of the General Conditions.

a. For work associated with Phase 1, 100% of Work completed. For Work associated with Phase 2, 90% of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by OWNER, and if the character and progress of the Work have been satisfactory to OWNER, OWNER may determine that as long as the character and progress of the Work remain satisfactory to OWNER, there will be no additional retainage on account of Work completed, in which case the remaining progress payments prior to Substantial Completion will be in an amount equal to 100 percent of the Work completed.

b. 100 percent (with the balance being retainage) of the cost of materials and equipment not incorporated in the Work (but delivered, suitably stored and accompanied by documentation satisfactory to OWNER as provided in paragraph 13.02.A of the General Conditions).

2. Upon Substantial Completion, payment will be made in an amount sufficient to increase total payments to DESIGN/BUILDER to 100 percent of the Contract Price (with the balance being retainage), less such amounts as OWNER may withhold in accordance with paragraph 13.04.B of the General Conditions, less two times the amount required to correct or complete the project after Substantial Completion. Substantial Completion will be defined as all of the Work to be completed with the exception of final grading, seeding, demobilization and final cleanup of the site.

B. *Final Payment.* Upon final completion and acceptance of the Work in accordance with paragraph 13.09 of the General Conditions, OWNER shall pay the remainder of the Contract Price.

Article 6. INTEREST.

6.01. All moneys not paid when due as provided in Article 13 of the General Conditions shall bear interest at the rate of 8 percent per annum.

Article 7. DESIGN/BUILDER'S REPRESENTATIONS.

7.01. DESIGN/BUILDER makes the following representations:

A. DESIGN/BUILDER has examined and carefully studied the Contract Documents (including the Addenda) listed in paragraphs 8.01.A through J but excluding the documents described in paragraph 8.01.K and the other related data identified in the Request for Proposals.

B. DESIGN/BUILDER has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, performance or furnishing of the Work.

C. DESIGN/BUILDER is familiar with and is satisfied as to all federal, state and local Laws and Regulations, that are in place at the time of execution of this Agreement, that may affect cost, progress, performance or furnishing of the Work.

D. DESIGN/BUILDER has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site which have been identified or made available by OWNER.

E. DESIGN/BUILDER is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.

F. DESIGN/BUILDER has correlated the information known to DESIGN/BUILDER, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

G. DESIGN/BUILDER has given OWNER written notice of all conflicts, errors, ambiguities or discrepancies that DESIGN/BUILDER has discovered in the Contract Documents and the written resolution thereof by OWNER is acceptable to DESIGN/BUILDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

Article 8. CONTRACT DOCUMENTS.

8.01. The Contract Documents which comprise the entire agreement between OWNER and DESIGN/BUILDER concerning the Work consist of the following:

- A. This Agreement (pages 1 to 7 , inclusive).
- B. Exhibits to this Agreement: (not applicable)
- C. Conceptual Documents identified in Contractor Proposal dated September 20, 2007.
- D. DESIGN/BUILDER's Proposal dated September 20, 2007. (pages 1 to 2 , inclusive, also including all documents listed in the proposal letter, and as may be duplicated herein without limit)
- E. Notice to Proceed.
- F. Performance, Payment, and other Bonds, identified as Exhibits A & B and consisting of 4 pages.
- G. Standard General Conditions of the Contract Between Owner and Design/Builder (pages 1 to 33 , inclusive).
- H. Supplementary Conditions (pages 1 to 4 , inclusive).
- I. Addenda numbers N/A through N/A inclusive.
- J. Documentation submitted by DESIGN/BUILDER prior to Notice of Award (pages N/A to N/A , inclusive).
- K. The following which may be delivered, prepared, or issued after the Effective Date of this Agreement and are not attached hereto.
 - 1. All Written Amendments and other documents amending, modifying or supplementing the Contract Documents pursuant to paragraph 3.03.A of the General Conditions.
 - 2. Specifications as defined in Paragraph 1.01.A.42 of the General Conditions.
 - 3. Drawings as defined in Paragraph 1.01.A.18 of the General Conditions.

8.02. The documents listed in paragraph 8.01 above are attached to this Agreement (except as expressly noted otherwise above).

8.03. 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 paragraph 3.03.A of the General Conditions.

Article 9. MISCELLANEOUS.

9.01. The Standard General Conditions of the Contract Between Owner and Design/Builder are referred to herein as the General Conditions.

9.02. Terms used in this Owner-Design/Builder Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated therein.

9.03. 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.

9.04. OWNER and DESIGN/BUILDER each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

9.05. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and DESIGN/BUILDER, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

9.06. **OTHER PROVISIONS.** The Design Builder agrees that the Design Builder shall observe the provisions of the Kansas Act Against Discrimination and shall not discriminate against any person in the performance of work under the present contract because of race, religion, color, sex, disability, national origin or ancestry. The Design Builder shall in all solicitations or advertisements for employees include the phrase, "equal opportunity employer." The Design Builder agrees that if the Design Builder fails to comply with the manner in which the Design Builder reports to the Kansas Human Rights Commission in accordance with the provisions of K.S.A. 44-1031 and amendments thereto, the Design Builder shall be deemed to have breached the present contract and it may be canceled, terminated or suspended, in whole or in part, by the City. If the Design Builder is found guilty of a violation of the Kansas Act Against Discrimination under a decision or order of the Commission which has become final, the Design Builder shall be deemed to have breached the present contract and it may be canceled, terminated or suspended, in whole or in part, by the City"

~~[Insert other provisions here if applicable.]~~

IN WITNESS WHEREOF, OWNER and DESIGN/BUILDER have signed this Agreement in duplicate. One counterpart each has been delivered to OWNER and DESIGN/BUILDER. All portions of the Contract Documents have been signed, initialed or identified by OWNER and DESIGN/BUILDER.

This Owner-Design/Builder Agreement will be effective on _____, 19_____.

OWNER: **The City of Lawrence, Kansas**

DESIGN/BUILDER: **CAS Construction, LLC**

By: _____

By: _____

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest _____

Attest _____

Address for giving notices:

Address for giving notices:

501 NE Burgess St, Topeka, KS 66608

(If OWNER is a corporation, attach evidence of authority to sign. If OWNER is a public body, attach (a) evidence of authority to sign, (b) resolution or other documents authorizing execution of Agreement and (c) statement of fiscal officer regarding availability of funds.)

License No. _____
(Where applicable)

(If DESIGN/BUILDER is a corporation, attach evidence of authority to sign.)

Designated Representative:

Designated Representative:

Name: _____

Name: _____

Title: _____

Title: _____

Address: _____

Address: _____

Phone: _____

Phone: _____

Facsimile: _____

Facsimile: _____

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the applicable laws of the jurisdiction in which the Project is to be performed.

STANDARD GENERAL CONDITIONS OF THE
CONTRACT BETWEEN
OWNER AND DESIGN/BUILDER

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By

[insert seals]

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
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AMERICAN CONSULTING ENGINEERS COUNCIL

AMERICAN SOCIETY OF CIVIL ENGINEERS

These General Conditions have been prepared for use with the Agreements between Owner and Design/Builder (Nos. 1910-40-A and -B) (1995 Edition) of the Engineers Joint Contract Documents Committee. Their provisions are interrelated and a change in one may necessitate a change in the others. The suggested language and instructions contained in the Guide to Use of EJCDC Design/Build Documents (No. 1910-42) (1995 Edition) is also carefully interrelated with the language of these General Conditions. Comments concerning their usage are also contained in Document No. 1910-42 (1995 Edition).

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345 East 47th Street, New York, NY 10017

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GENERAL CONDITIONS

ARTICLE 1--DEFINITIONS

1.01 *Defined Terms*

A. 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. *Addenda*--Written or graphic instruments issued prior to the opening of Proposals which clarify, correct or change the Request for Proposals or the Contract Documents.

2. *Agreement*--The written contract between OWNER and DESIGN/BUILDER covering the Work; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

3. *Application for Payment*--The form which is to be used by DESIGN/BUILDER in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

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.

5. *Bonds*--Performance and payment bonds and other instruments of security.

6. *Cash Flow Projection*--A schedule prepared by DESIGN/BUILDER estimating that portion of the Contract Price to be due during each month of performance.

7. *Change Order*--A written order which is signed by DESIGN/BUILDER and OWNER which 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.

8. *Conceptual Documents*--The drawings and specifications and/or other graphic or written materials, criteria and information concerning OWNER's requirements for the Project, such as design objectives and constraints, space, capacity and performance requirements, flexibility and expandability, including those items enumerated in the Request for Proposals which show or describe the character and scope of, or relate to, the Work to be performed or furnished and which have been prepared by or for OWNER.

9. *Construction*--The performing or furnishing of labor, the furnishing and incorporating of materials and equipment into the Work and the furnishing of services (other than Design Professional Services) and documents, all as required by the Contract Documents.

10. *Construction Subagreement*--A written agreement between DESIGN/BUILDER and a construction contractor for provision of Construction.

11. *Contract Documents*--The Agreement, the Conceptual Documents, Addenda (which pertain to the Contract Documents), DESIGN/BUILDER's Proposal, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings together with all Work Change Directives, Change Orders, Written Amendments, and Field Orders, issued on or after the Effective Date of the Agreement. The Contract Documents also include those documents specifically identified by the OWNER in the Request for Proposals.

12. *Contract Price*--The moneys payable by OWNER to DESIGN/BUILDER for completion of the Work in accordance with the Contract Documents.

13. *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 in accordance with paragraph 13.08.A.

14. *defective*--An adjective which when modifying the term Construction refers to Construction 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 OWNER's final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion).

15. *DESIGN/BUILDER*--The individual or entity with whom OWNER has entered into the Agreement.

16. *Design Subagreement*--A written agreement between DESIGN/BUILDER and a design professional for provision of Design Professional Services.

17. *Design Professional Services*--Services related to the preparation of Drawings, Specifications, and other design submittals specified by the Contract Documents and required to be performed by licensed design professionals, as well as services provided by or for licensed design professionals during Bidding/Negotiating, Construction, or Operational phases.

18. *Drawings*--Those portions of the Contract Documents prepared by or for DESIGN/BUILDER and approved by OWNER consisting of drawings, diagrams, illustrations, schedules and other data which show the scope, extent, and character of the Work.

19. *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.

20. *Engineer*--A duly licensed individual or entity designated by DESIGN/BUILDER to perform or furnish specified Design Professional Services in connection with the Work.

21. *Field Order*--A written order issued by OWNER which orders minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

22. *Hazardous Condition*--The presence at the Site of Asbestos, Hazardous Waste, PCB's, Petroleum

Products or Radioactive Materials in such quantities or circumstances that there is a danger to persons or property.

23. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903).

24. *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.

25. *Liens*--Charges, security interests or encumbrances upon real property or personal property.

26. *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.

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

28. *Notice to Proceed*--A written notice given by OWNER to DESIGN/BUILDER fixing the date on which the Contract Times will commence to run.

29. *OWNER*--The public body, or authority, individual or entity with whom DESIGN/BUILDER has entered into the Agreement and for whom the Work is to be provided.

30. *OWNER's Consultant*--An individual or entity having a contract with OWNER to furnish services as OWNER's consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

31. *OWNER's Representative*--A person designated in writing to act as OWNER's representative with respect to DESIGN/BUILDER's performance of the Work. Such person shall have complete authority to transmit instructions, receive information, interpret and define OWNER's policies,

make decisions with respect to performance of the Work, and provide such other services as may be agreed upon.

32. *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.

33. *PCBs*--Polychlorinated biphenyls.

34. *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.

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

36. *Proposal*--The documents submitted by DESIGN/BUILDER in response to the Request for Proposals setting forth the design concepts, proposed prices, and other conditions for the Work to be performed.

37. *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.

38. *Request for Proposals*--The document prepared by or for OWNER specifying and describing OWNER's objectives and the procedure to be followed in preparing and submitting a Proposal and awarding a contract.

39. *Resident Project Representative*--The authorized representative of OWNER who may be assigned to the Site or any part thereof.

40. *Schedule of Values*--A schedule prepared by DESIGN/BUILDER and acceptable to OWNER indicating that portion of the Contract Price to be paid for each major component of the Work.

41. *Site*--Lands or other areas designated in the Contract Documents as being furnished by OWNER

for the performance of the Construction, storage, or access.

42. *Specifications*--Those portions of the Contract Documents prepared by or for DESIGN/BUILDER and approved by OWNER consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Construction and certain administrative details applicable thereto.

43. *Subcontractor*--An individual or entity other than a Supplier or Engineer having a direct contract with DESIGN/BUILDER or with any other Subcontractor for the performance of a part of the Work.

44. *Submittal*--A written or graphic document prepared by or for DESIGN/BUILDER which is required by the Contract Documents to be submitted to OWNER by DESIGN/BUILDER. Submittals may include Drawings, Specifications, progress schedules, shop drawings, samples, Cash Flow Projections, and Schedules of Values. Submittals other than Drawings and Specifications are not Contract Documents.

45. *Substantial Completion*--The time at which the Construction (or a specified part) has progressed to the point where it is sufficiently complete, in accordance with the Contract Documents, so that the Construction (or a specified part) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Construction refer to Substantial Completion thereof.

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

47. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman or vendor having a direct contract with DESIGN/BUILDER or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by DESIGN/BUILDER or any Subcontractor.

48. *Unit Price Work*--Work to be paid for on the basis of unit prices.

49. *Work*--The entire completed construction or the various separately identifiable parts thereof

required to be performed or furnished under the Contract Documents. Work includes and is the result of performing or furnishing Design Professional Services and Construction required by the Contract Documents.

50. *Work Change Directive*--A written directive to DESIGN/BUILDER, issued on or after the Effective Date of the Agreement and signed by OWNER ordering an addition, deletion or revision in the Work, or responding to differing site conditions under which the Work is to be performed as provided in paragraph 4.02 or to emergencies under paragraph 6.15. 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.

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

ARTICLE 2--PRELIMINARY MATTERS

2.01 *Delivery of Bonds*

A. When DESIGN/BUILDER delivers the executed Agreements to OWNER, DESIGN/BUILDER shall also deliver to OWNER such Bonds as DESIGN/ BUILDER may be required to furnish in accordance with paragraph 5.01.A.

2.02 *Commencement of Contract Times; Notice to Proceed*

A. 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 ninetieth day after the last day for receipt of the Proposal or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.03 *Starting the Work*

A. DESIGN/BUILDER shall start to perform the Work on the date when the Contract Times commence to run.

2.04 *Before Starting Construction*

A. DESIGN/BUILDER shall submit the following for review within ten days after commencement of the Contract Times:

1. A preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work including each Milestone specified in the Contract Documents;

2. A preliminary schedule of required Submittals and the times for submitting, reviewing and processing each Submittal;

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 performance of the Work. Such prices will include a pro rata amount of overhead and profit applicable to each item of Work; and

4. A preliminary Cash Flow Projection.

B. Before any Work is started, DESIGN/BUILDER 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

DESIGN/BUILDER and OWNER respectively are required to purchase and maintain in accordance with paragraphs 5.02.A, 5.04.A and 5.04.B.

2.05 Initial Conference

A. Within twenty days after the Contract Times start to run a conference attended by OWNER and DESIGN/BUILDER and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the design concepts, schedules referred to in paragraph 2.04.A, procedures for handling Submittals, processing Applications for Payment, maintaining required records, items required pursuant to paragraph 8.01.A.6 and other matters.

2.06 Initially Acceptable Schedules

A. At least ten days before submission of the first Application for Payment a conference attended by DESIGN/BUILDER, OWNER and others as appropriate will be held to review for acceptability the schedules submitted in accordance with paragraph 2.04.A. DESIGN/BUILDER 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 DESIGN/BUILDER until the schedules are submitted to and acceptable to OWNER as provided below. The progress schedule will be acceptable to OWNER 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 OWNER responsibility for the sequencing, scheduling or progress of the Work nor interfere with or relieve DESIGN/BUILDER from DESIGN/BUILDER's full responsibility therefor. The format and structure of the progress schedule will be as set forth in the Contract Documents. OWNER's acceptance shall not be deemed to confirm that the schedule is a reasonable plan for performing the Work. DESIGN/BUILDER's schedule of Submittals will be acceptable to OWNER as providing a workable arrangement for reviewing and processing the required Submittals. DESIGN/BUILDER's Schedule of Values and Cash Flow Projection will be acceptable to OWNER as to form and substance.

ARTICLE 3--CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 Intent

A. The Contract Documents comprise the entire agreement between OWNER and DESIGN/BUILDER 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.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be designed and 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.

3.02 References

A. 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 on the last day for receipt of Proposals except as may be otherwise specifically stated in the Contract Documents.

B. 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 3.03.A, 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:

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

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).

C. No provision of any such standard, specification, manual, code or instruction shall be effective to change the duties and responsibilities of OWNER, DESIGN/BUILDER 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 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 8.02 or any other provision of the Contract Documents.

3.03 Amending and Supplementing Contract Documents

A. 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:

1. OWNER's approval of required Submittals (pursuant to paragraph 6.16.B);
2. A Work Change Directive;
3. A Change Order;
4. A formal Written Amendment; or
5. A Field Order.

3.04 Reuse of Documents

A. All documents including Drawings and Specifications prepared or furnished by DESIGN/BUILDER pursuant to this Agreement are instruments of service in respect of the Project and DESIGN/BUILDER shall retain an ownership and property interest therein whether or not the Project is completed. OWNER may make and retain copies for information and reference in connection with the use and occupancy of the Project by OWNER and others; however, such documents are not intended or represented to be suitable for reuse by OWNER or others on extensions of the Project or on any other project. Any reuse without written verification or adaptation by DESIGN/BUILDER for the specific purpose intended will be at OWNER's sole risk and without liability or legal exposure to DESIGN/BUILDER and OWNER shall indemnify and hold harmless DESIGN/BUILDER, Subcontractors, and Engineer from all claims, damages, losses and expenses including attorneys' fees arising out of or resulting therefrom. Any such verification or adaptation will entitle DESIGN/BUILDER to further compensation at rates to be agreed upon by OWNER and DESIGN/BUILDER.

ARTICLE 4--AVAILABILITY OF LANDS; DIFFERING SITE CONDITIONS; REFERENCE POINTS; HAZARDOUS CONDITIONS

4.01 Availability of Lands

A. OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the Construction is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of DESIGN/BUILDER.

B. Upon reasonable written request, OWNER shall furnish DESIGN/BUILDER with a correct statement of record legal title and legal description of the lands upon which the Construction 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 DESIGN/BUILDER 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 DESIGN/BUILDER 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, DESIGN/BUILDER may make a claim therefor as provided in Article 9.

C. DESIGN/BUILDER shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 Differing Site Conditions

A. DESIGN/BUILDER shall promptly, and before the conditions are disturbed, give a written notice to OWNER of (i) subsurface or latent physical conditions at the Site which differ materially from those indicated in the Contract Documents, or (ii) unknown physical conditions at the Site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character called for by the Contract Documents.

B. OWNER will investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the DESIGN/BUILDER's cost of, or the time required for, performing any part of the Work, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the Contract Price or Times modified in writing by Change Order in accordance with Article 9.

C. No request by DESIGN/BUILDER for an equitable adjustment under paragraph 4.02 shall be allowed unless DESIGN/BUILDER has given the written notice required; provided that the time prescribed in 9.02.A for giving written notice may be extended by OWNER.

4.03 Reference Points

A. DESIGN/BUILDER shall be responsible for laying out the construction and shall protect and preserve the reference points established by OWNER pursuant to paragraph 8.01.A.6.e and shall make no changes or relocations without the prior written approval of OWNER. DESIGN/BUILDER shall report to OWNER whenever any reference point or property monument 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 or property monuments by professionally qualified personnel.

4.04 Hazardous Conditions

A. OWNER will be responsible for any Hazardous Condition encountered at the Site which was not identified in the Contract Documents to be within the scope of the Work. OWNER shall not be responsible for materials creating a Hazardous Condition brought to the Site by DESIGN/BUILDER, Subcontractors, Suppliers or anyone else for whom DESIGN/BUILDER is responsible.

B. DESIGN/BUILDER and any affected Subcontractor shall immediately (i) stop all Construction in connection with such Hazardous Condition and in any area affected thereby (except in an emergency as required by paragraph 6.15), and (ii) notify OWNER (and thereafter confirm such notice in writing). OWNER shall promptly determine the necessity of retaining a qualified expert to evaluate such Hazardous Condition or take corrective action, if any. DESIGN/BUILDER shall not be required to resume Construction 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 DESIGN/BUILDER special written notice (i) specifying that such Hazardous Condition and any affected area is or has been rendered safe for the resumption of Construction, or (ii) specifying any special conditions under which such Construction may be resumed safely. If OWNER and DESIGN/BUILDER 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 Construction stoppage or such special conditions under which Construction is agreed by DESIGN/BUILDER to be resumed, either party may make a claim therefor as provided in Article 9.

C. If after receipt of such special written notice DESIGN/BUILDER does not agree to resume

Construction based on a reasonable belief it is unsafe, or does not agree to resume such Construction under such special conditions, then OWNER may order such portion of the Work that is related to such Hazardous Condition or in such affected area to be deleted from the Work. If OWNER and DESIGN/BUILDER 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 Article 9. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others in accordance with Article 7.

D. To the fullest extent permitted by Laws and Regulations, OWNER shall indemnify and hold harmless DESIGN/BUILDER, Subcontractors, Suppliers, Engineers 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 (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) 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 completed Construction Services), including the loss of use resulting therefrom, and (ii) nothing in this paragraph 4.04.D shall obligate OWNER to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence or willful misconduct.

E. The provisions of paragraph 4.02 are not intended to apply to materials uncovered or revealed at the Site which are or could be a Hazardous Condition when such materials are identified in the Supplementary Conditions.

ARTICLE 5--BONDS AND INSURANCE

5.01 *Performance, Payment and Other Bonds*

A. DESIGN/BUILDER 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 DESIGN/BUILDER'S obligations to furnish, provide and pay for Construction and related materials 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. DESIGN/BUILDER 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.

B. If the surety on any Bond furnished by DESIGN/BUILDER 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 5.01.A, DESIGN/BUILDER shall within thirty days thereafter substitute another Bond and surety meeting the requirements of paragraphs 5.01.A and 5.09.

5.02 *DESIGN/BUILDER's Liability Insurance*

A. DESIGN/BUILDER shall purchase and maintain such Comprehensive or Commercial General Liability (subject to customary exclusions in respect of professional liability), Automobile Liability and Worker's Compensation 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 DESIGN/BUILDER's performance and furnishing of the Work and DESIGN/BUILDER's other obligations under the Contract Documents, whether it is to be performed or furnished by DESIGN/BUILDER, 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:

1. Claims under workers' compensation, disability benefits and other similar employee benefit acts;

2. Claims for damages because of bodily injury, occupational sickness or disease, or death of DESIGN/BUILDER's employees;

3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than DESIGN/BUILDER's employees;

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 DESIGN/BUILDER, or (ii) by any other person for any other reason;

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

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.

B. The policies of insurance required by paragraph 5.02.A shall:

1. With respect to insurance required by paragraphs 5.02.A.3 through 5.02.A.6 inclusive, include as additional insureds OWNER and OWNER's Consultants and any other persons or entities indicated 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;

2. Include at least 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;

3. Include completed operations insurance;

4. Include contractual liability insurance covering DESIGN/BUILDER's indemnity obligations under paragraphs 6.06, 6.10 and 6.19;

5. Contain a provision or endorsement that the coverage afforded will not be cancelled, materially changed or renewal refused until at least 30 days prior written notice has been given to OWNER and each other additional insured indicated in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the DESIGN/BUILDER pursuant to paragraph 5.09.B will so provide);

6. Remain in effect at least until final payment and at all times thereafter when DESIGN/BUILDER may be correcting, removing or replacing *defective* Construction in accordance with paragraphs 12.06 and 12.07; and

7. With respect to completed operations insurance, and any other insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and DESIGN/BUILDER shall furnish OWNER and each other additional insured indicated 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).

5.03 OWNER's Liability Insurance

A. In addition to the insurance required to be provided by DESIGN/BUILDER under paragraph 5.02, 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.

5.04 Property Insurance

A. Unless otherwise provided in the Supplementary Conditions, OWNER shall purchase and maintain property insurance upon the Construction 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 will:

1. Include the interests of OWNER, DESIGN/BUILDER, Subcontractors, and any other persons or entities indicated in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

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 and damage to the Construction, temporary buildings, falsework and all materials and equipment in transit, and shall insure against at least the following perils or causes of loss: 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 or causes of loss as may be specifically required by the Supplementary Conditions;

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);

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 Construction, provided that such materials and equipment have been included in an Application for Payment approved by OWNER;

5. Be maintained in effect until final payment is made unless otherwise agreed to in writing by OWNER and DESIGN/BUILDER with thirty days written notice to each other additional insured to whom a certificate of insurance has been issued; and

6. Allow partial utilization in accordance with paragraph 5.08.

B. 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, DESIGN/BUILDER, Subcontractors, and any other individuals or entities indicated in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained by OWNER in accordance with paragraph 5.04 will contain a provision or endorsement that the coverage afforded will not be cancelled or materially changed or renewal refused until at least 30 days' prior written notice has been given to DESIGN/BUILDER and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with paragraph 5.05.A.

D. OWNER shall not be responsible for purchasing and maintaining any property insurance to protect the interests of DESIGN/BUILDER, Subcontractors, Suppliers, Engineers 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 DESIGN/BUILDER, 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.

E. If DESIGN/BUILDER requests in writing that other special insurance be included in the property insurance policies provided under paragraph 5.04, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to DESIGN/BUILDER by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the Site, OWNER shall in writing advise DESIGN/BUILDER whether or not such other insurance has been procured by OWNER.

5.05 *Waiver of Rights*

A. OWNER and DESIGN/BUILDER intend that all policies purchased in accordance with paragraph 5.04 will protect OWNER, DESIGN/BUILDER, Engineers, Subcontractors, and all other individuals or entities indicated 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 or causes of loss 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 DESIGN/BUILDER 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 or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, Suppliers, Engineers and all other individuals or entities indicated 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. In addition, OWNER waives all rights against DESIGN/BUILDER, Subcontractors, Engineers and Suppliers and the officers, directors, employees and agents of any of them for business interruption, loss of use of OWNER's property and any other consequential damages caused by, arising out of or resulting from any of such insured perils or causes of loss or any other peril or cause of loss whether or not insured.

5.06 *Receipt and Application of Proceeds*

A. Any insured loss under the policies of insurance required by paragraph 5.04 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 5.06.B. 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.

B. 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.

5.07 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either party 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 their not complying 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 2.04.B. OWNER and DESIGN/BUILDER 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 supposed to provide such coverage, and a Change Order or Written Amendment shall be issued to adjust the Contract Price accordingly.

5.08 *Partial Utilization--Property Insurance*

A. If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Construction, such use or occupancy may be accomplished in accordance with paragraph 13.06; 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.

5.09 *Licensed Sureties and Insurers; Certificates of Insurance*

A. All Bonds and insurance required by the Contract Documents to be purchased and maintained by OWNER or DESIGN/BUILDER 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.

B. DESIGN/BUILDER shall deliver to OWNER, with copies to each additional insured indicated in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which DESIGN/BUILDER is required to purchase and maintain in accordance with paragraph 5.02.A. OWNER shall deliver to DESIGN/BUILDER, with copies to each additional insured indicated in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by DESIGN/BUILDER or any other additional insured) which OWNER is required to purchase and maintain in accordance with paragraphs 5.04.A and 5.04.B.

ARTICLE RESPONSIBILITIES

6--DESIGN/BUILDER'S

6.01 *Design Professional Services*

A. *Standard of Care:* DESIGN/BUILDER shall perform or furnish Design Professional Services and related services in all phases of the project. The standard of care for all such services performed or furnished under this Agreement will be the care and skill ordinarily used by members of the engineering profession practicing under similar conditions at the same time and locality.

B. *Preliminary Design Phase:* After the Contract Times commence to run, DESIGN/BUILDER shall:

1. Consult with OWNER to understand OWNER's requirements for the Project and review available data.

2. Advise OWNER as to the necessity of OWNER's providing or obtaining from others additional reports, data or services of the types provided in paragraph 8.01.A.6.a-f and assist OWNER in obtaining such reports, data, or services.

3. Identify and analyze requirements of governmental authorities having jurisdiction to approve the portions of the Project designed or specified by DESIGN/BUILDER with whom consultation is to be undertaken in connection with the Project.

4. Obtain such additional geotechnical and related information which it deems necessary for performance of the Work.

5. On the basis of the Conceptual Documents and DESIGN/BUILDER's Proposal, prepare preliminary design documents consisting of final design criteria, preliminary drawings, outline specifications, and written descriptions of the Project.

6. Furnish the preliminary design documents to and review them with OWNER within the time indicated in the schedules described in paragraph 2.06.A.

C. *Final Design Phase:* After written acceptance by OWNER of the preliminary design phase documents DESIGN/BUILDER shall:

1. On the basis of the accepted Preliminary Design Phase documents, prepare final Drawings showing the scope, extent, and character of the Construction to be performed and furnished by DESIGN/BUILDER and Specifications (which will be prepared, where appropriate, in general conformance with the sixteen division format of the Construction Specifications Institute).

2. Provide technical criteria, written descriptions and design data required for obtaining approvals of such governmental authorities as have jurisdiction to review or approve the final design of the Project, and assist OWNER in consultations with appropriate authorities.

3. Furnish the above documents, Drawings and Specifications to and review them with OWNER within the time indicated in the schedules described in paragraphs 2.04.A and 2.06.A.

D. *Operational Phase:* During the Operational Phase, DESIGN/BUILDER shall:

1. Provide assistance in connection with the start-up, testing, refining and adjusting of any equipment or system.
2. Assist OWNER in training staff to operate and maintain the Project.
3. Assist OWNER in developing systems and procedures for control of the operation and maintenance of and record keeping for the Project.

6.02 *Supervision and Superintendence of Construction*

A. DESIGN/BUILDER shall supervise, inspect and direct the Construction competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to provide the Construction in accordance with the Contract Documents. DESIGN/BUILDER shall be solely responsible for the means, methods, techniques, sequences and procedures employed for the provision of Construction. DESIGN/BUILDER shall be responsible to see that the completed Construction complies accurately with the Contract Documents and shall keep OWNER advised as to the quality and progress of the Construction.

B. DESIGN/BUILDER shall keep on the Site at all times during construction a competent resident superintendent, who shall not be replaced without written notice to OWNER except under extraordinary circumstances. The superintendent will be DESIGN/BUILDER's representative at the Site and shall have authority to act on behalf of DESIGN/BUILDER. All communications to the superintendent shall be as binding as if given to DESIGN/BUILDER.

6.03 *Labor, Materials and Equipment*

A. DESIGN/BUILDER shall provide competent, suitably qualified personnel to survey and lay out the Construction and perform Construction as required by the Contract Documents. DESIGN/BUILDER 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 Construction at the Site shall be performed during regular working hours, and DESIGN/BUILDER

will not permit overtime work or the performance of Construction on Saturday, Sunday or any legal holiday without OWNER's written consent, which will not be unreasonably withheld.

B. Unless otherwise specified in the Contract Documents, DESIGN/BUILDER shall furnish or cause to be furnished and assume full responsibility for 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. DESIGN/BUILDER, in the presence of OWNER's personnel, will direct the checkout of utilities and operations of systems and equipment.

C. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Contract Documents shall expressly run to the benefit of OWNER. If required by OWNER, DESIGN/BUILDER 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.

6.04 *Progress Schedule*

A. DESIGN/BUILDER shall adhere to the progress schedule established in accordance with paragraph 2.06.A as it may be adjusted from time to time.

1. DESIGN/BUILDER shall submit to OWNER for acceptance 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.

2. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of Article 11. Such adjustments may only be made by a Change Order or Written Amendment.

6.05 *Concerning Subcontractors, Suppliers and Others*

A. DESIGN/BUILDER shall not employ any Subcontractor, Engineer, Supplier or other individual or entity against whom OWNER may have reasonable objection. DESIGN/BUILDER shall not be required to employ any Subcontractor, Engineer, Supplier or other individual or entity to furnish or perform any of the Work against whom DESIGN/BUILDER has reasonable objection.

B. DESIGN/BUILDER shall be fully responsible to OWNER for all acts and omissions of the Subcontractors, Engineers, Suppliers and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with DESIGN/BUILDER. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Engineer, Supplier or other individual or entity any contractual relationship between OWNER and any such Subcontractor, Engineer, Supplier or other individual or entity, nor shall it create any obligation on the part of OWNER to pay or to see to the payment of any moneys due any such Subcontractor, Engineer, Supplier or other individual or entity except as may otherwise be required by Laws and Regulations.

C. DESIGN/BUILDER shall be solely responsible for scheduling and coordinating Subcontractors, Engineers, Suppliers and other individuals and entities performing or furnishing any of the Work under a direct or indirect contract with DESIGN/BUILDER. DESIGN/BUILDER shall require all Subcontractors, Engineers, Suppliers and such other individuals and entities performing or furnishing any of the Work to communicate with the OWNER through DESIGN/BUILDER.

D. All services performed or provided to and material and equipment supplied to DESIGN/BUILDER by a Subcontractor or Supplier will be pursuant to an appropriate Design Subagreement or Construction Subagreement between DESIGN/BUILDER and the Subcontractor, Engineer or Supplier which specifically binds the Subcontractor, Engineer or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of OWNER. Whenever any such agreement is with a Subcontractor, Engineer or Supplier who is listed as an additional insured on the property insurance provided in paragraph 5.04.A or 5.04.B, the agreement between the DESIGN/BUILDER and the Subcontractor, Engineer or Supplier will contain provisions whereby the Subcontractor, Engineer or

Supplier waives all rights against OWNER, DESIGN/BUILDER, OWNER's Consultants and all other additional insureds for all losses and damages caused by any of the perils or causes of loss 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, Engineer or Supplier, DESIGN/BUILDER will obtain the same.

6.06 *Patent Fees and Royalties*

A. DESIGN/BUILDER 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 Conceptual Documents for use in the performance of the Construction and if to the actual knowledge of OWNER 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 Conceptual Documents. To the fullest extent permitted by Laws and Regulations, DESIGN/BUILDER shall indemnify and hold harmless OWNER, 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) 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 Conceptual Documents.

6.07 *Permits*

A. Unless otherwise provided in the Contract Documents, DESIGN/BUILDER shall directly or through one or more Subcontractors obtain and pay for all necessary permits and licenses. OWNER shall assist DESIGN/BUILDER, when necessary, in obtaining such permits and licenses. DESIGN/BUILDER shall pay all governmental charges and inspection fees necessary for the prosecution of the Construction, which are applicable on the last day for receipt of Proposals. DESIGN/BUILDER 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.

6.08 Laws and Regulations

A. DESIGN/BUILDER shall give all notices and comply with all Laws and Regulations of the place of the Project which are applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, OWNER shall not be responsible for monitoring DESIGN/BUILDER's compliance with any Laws or Regulations.

B. If DESIGN/BUILDER performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, DESIGN/BUILDER shall bear all costs arising therefrom.

C. Changes in Laws and Regulations not known or foreseeable on the date of receipt of Proposals having an effect on the cost or time of performance may be the subject of a claim under Article 9.

6.09 Taxes

A. DESIGN/BUILDER shall pay all sales, consumer, use, gross receipts and other similar taxes required to be paid by DESIGN/BUILDER in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.10 Use of Site and Other Areas

A. DESIGN/BUILDER shall confine construction equipment, the storage of materials and equipment and the operations of construction workers to those lands and areas permitted by the OWNER 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. DESIGN/BUILDER 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 Construction. Should any claim be made by any such owner or occupant because of the performance of the Construction, DESIGN/BUILDER shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law. DESIGN/BUILDER shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless OWNER, OWNER's Consultants and anyone directly or indirectly employed by any of them from and against all claims, costs, losses and damages (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration or other dispute resolution costs) arising out of or resulting from any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, or any other party indemnified hereunder to the extent caused by or based upon DESIGN/BUILDER's performance of the Construction.

B. During the performance of the Construction, DESIGN/BUILDER shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Construction. At the completion of the Construction DESIGN/BUILDER shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment, temporary construction and machinery and surplus materials. DESIGN/BUILDER shall leave the Site clean and ready for occupancy by OWNER at Substantial Completion. DESIGN/BUILDER shall restore to original condition all property not designated for alteration by the Contract Documents.

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

6.11 Record Documents

A. DESIGN/BUILDER shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Field Orders and Work Change Directives, in good order and annotated to show all changes made during construction. These record documents together with all approved Submittals will be available to OWNER for reference. Upon completion of the Work, these record documents and Submittals, including a reproducible set of record drawings, will be delivered to OWNER.

6.12 Safety and Protection

A. DESIGN/BUILDER shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Construction. DESIGN/BUILDER shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Construction;
2. all Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
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.

B. DESIGN/BUILDER shall comply with 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. DESIGN/BUILDER 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 caused, directly or indirectly, in whole or in part, by DESIGN/BUILDER, any Subcontractor, Supplier or any other individual or entity 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

DESIGN/BUILDER. DESIGN/BUILDER's duties and responsibilities for safety and for protection of the construction shall continue until such time as all the Work is completed and OWNER has issued a notice to DESIGN/BUILDER in accordance with paragraph 13.09 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.13 Safety Representative

A. DESIGN/BUILDER 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.

6.14 Hazard Communication Programs

A. DESIGN/BUILDER 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.

6.15 Emergencies

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

6.16 Submittals

A. OWNER will review and approve Submittals in accordance with the schedule of required Submittals accepted by OWNER as required by paragraph 2.06.A. OWNER's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the construction, 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. OWNER'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. DESIGN/BUILDER shall make corrections required by OWNER, and shall return the required number of corrected copies of the required Submittal for review and approval. DESIGN/BUILDER shall direct specific attention in writing to revisions other than the corrections called for by OWNER on previous Submittals.

B. OWNER's review and approval of required Submittals shall not relieve DESIGN/BUILDER from responsibility for any variation from the requirements of the Contract Documents unless DESIGN/BUILDER has in writing called OWNER's attention to each such variation at the time of submission and OWNER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Submittal.

C. Where a Submittal is required by the Contract Documents or the final schedule of Submittals accepted by OWNER as required by paragraph 2.06.A, any related Construction provided prior to OWNER's review and approval of the pertinent Submittal will be at the sole expense and responsibility of DESIGN/BUILDER.

6.17 *Continuing the Work*

A. DESIGN/BUILDER 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 DESIGN/BUILDER and OWNER may otherwise agree in writing.

6.18 *DESIGN/BUILDER's General Warranty and Guarantee*

A. DESIGN/BUILDER warrants and guarantees to OWNER that all Construction will be in accordance with the Contract Documents and will not be *defective*. DESIGN/BUILDER's warranty and guarantee hereunder excludes defects or damage caused by:

1. Abuse, modification or improper maintenance or operation by persons other than DESIGN/BUILDER, Subcontractors or Suppliers; or

2. Normal wear and tear under normal usage.

B. DESIGN/BUILDER'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 DESIGN/BUILDER's obligation to perform the Work in accordance with the Contract Documents:

1. Observations by OWNER;

2. The making of any progress or final payment;

3. The issuance of a certificate of Substantial Completion;

4. Use or occupancy of the Work or any part thereof by OWNER;

5. Any acceptance by OWNER or any failure to do so;

6. Any review and approval of a Submittal;

7. Any inspection, test or approval by others; or

8. Any correction of *defective* Construction by OWNER.

6.19 *Indemnification*

A. DESIGN/BUILDER shall indemnify and hold harmless OWNER, OWNER's officers, directors, employees, agents and consultants 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) arising out of or resulting from the performance of Construction, provided that 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, but only to the extent such claim, cost or damage is caused by any negligent act or omission of DESIGN/BUILDER, any Subcontractor, Engineer, any Supplier, any individual or entity 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.

B. In any and all claims against OWNER or any of their respective consultants, agents, officers, directors or employees by any employee (or the survivor or personal representative of such employee) of DESIGN/BUILDER, any Subcontractor, any Engineer, any Supplier, any individual or entity 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 6.19.A shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for DESIGN/BUILDER or any such Subcontractor, Engineer, Supplier or other individual or entity under workers' compensation acts, disability benefit acts or other employee benefit acts.

C. The indemnification obligations of DESIGN/BUILDER under paragraph 6.19 shall not extend to the liability of OWNER's Consultants, officers, directors, employees or agents arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, designs, or specifications.

ARTICLE 7--OTHER CONSTRUCTION

7.01 *Related Construction at Site*

A. OWNER may perform other Work related to the Project at the Site by OWNER's own forces, or let other direct contracts therefor or have other work performed by utility owners. If the fact that such other work is to be performed was not noted in the Conceptual Documents then (i) written notice thereof will be given to DESIGN/BUILDER prior to starting any such other work and (ii) DESIGN/BUILDER may make a claim therefor as provided in Article 9 if DESIGN/BUILDER believes that such performance will involve additional expense to DESIGN/BUILDER or requires additional time and the parties are unable to agree as to the amount or extent thereof.

B. DESIGN/BUILDER 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 Construction with theirs. Unless otherwise provided in the Contract Documents, DESIGN/BUILDER 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. DESIGN/BUILDER 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 OWNER and the others whose work will be affected. The duties and responsibilities of DESIGN/BUILDER 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 DESIGN/BUILDER in said direct contracts between OWNER and such utility owners and other contractors.

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

7.02 *Coordination*

A. 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:

1. The individual or entity who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified;
2. The specific matters to be covered by such authority and responsibility will be itemized; and
3. The extent of such authority and responsibilities will be provided.

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

ARTICLE 8--OWNER'S RESPONSIBILITIES

8.01 General

A. OWNER shall do the following in a timely manner so as not to delay the services of DESIGN/BUILDER.

1. Designate in writing a person to act as OWNER's Representative with respect to the services to be rendered under this Agreement.

2. Provide such legal services as OWNER may require with regard to legal issues pertaining to the Project including any that may be raised by DESIGN/BUILDER.

3. If requested in writing by DESIGN/BUILDER, furnish reasonable evidence satisfactory to DESIGN/BUILDER, that sufficient funds are available and committed for the entire cost of the Project. Unless such reasonable evidence is furnished, DESIGN/BUILDER is not required to commence or continue any Work, or may, if such evidence is not presented within a reasonable time, stop Work upon 15 days notice to the Owner.

4. Make payments to DESIGN/BUILDER promptly when they are due as provided in paragraph 13.04 and 13.09.

5. Furnish lands and easements as set forth in paragraph 4.01.A.

6. Furnish to DESIGN/BUILDER, as required for performance of DESIGN/BUILDER's Services the following, all of which DESIGN/BUILDER may use and rely upon in performing services under this Agreement:

- a. Environmental assessment and impact statements;
- b. Property, boundary, easement, right-of-way, topographic and utility surveys;
- c. Property descriptions;

d. Zoning, deed and other land use restrictions;

e. Engineering surveys to establish reference points for design and construction which in OWNER's judgment are necessary to enable DESIGN/BUILDER to proceed with the Work;

f. Assistance in filing documents required to obtain necessary approvals of governmental authorities having jurisdiction over the Project;

g. Subsurface data used in preparation of the Conceptual Documents.

7. Review submittals subject to OWNER review pursuant to paragraph 6.16.A.

8. Provide information known to or in the possession of OWNER relating to the presence of materials and substances at the site which could create a Hazardous Condition.

B. OWNER's responsibilities in respect of purchasing and maintaining liability and property insurance are set forth in paragraphs 5.03.A through 5.04.E.

8.02 Scope of OWNER's Safety and Hazardous Waste Responsibilities

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

B. 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 4.04.

8.03 Resident Project Representation

A. OWNER may furnish a Resident Project Representative to observe the performance of Construction. The duties, responsibilities and limitations

of authority of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions.

ARTICLE 9--CHANGES IN THE WORK; CLAIMS

9.01 General--Rights and Obligations

A. 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 within the general scope of the contract by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, DESIGN/BUILDER shall promptly proceed with the Work involved which will be performed under the applicable provisions of the Contract Documents (except as otherwise specifically provided).

9.02 Notice of Intent to Make Claim

A. If OWNER and DESIGN/BUILDER 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 any order of OWNER pursuant to paragraph 9.01.A or other occurrence for which the Contract Documents provide that such adjustment(s) may be made, a claim may be made therefor. Written notice of intent to make such a claim shall be submitted to the other party promptly and in no event more than 30 days after the start of the occurrence or event giving rise to the claim.

9.03 Claim Documentation

A. Substantiating documentation shall be submitted by the claiming party within 30 days after delivery of the notice required by paragraph 9.02.A.

9.04 Decision

A. The other party shall render a decision on the claim no more than 30 days after the receipt of the substantiating documentation required by paragraph 9.03.A. This decision will be final and binding unless the claiming party gives notice of intention to exercise its rights under Article 15 within 30 days of receipt of the decision and exercises such rights within 30 days of giving the notice of intent.

9.05 Time Limit Extension

A. The time limits of paragraphs 9.03.A and 9.04.A may be extended by mutual agreement.

9.06 Exceptions

A. DESIGN/BUILDER 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 paragraph 3.03, except in the case of an emergency as provided in paragraph 6.15 or in the case of uncovering Construction as provided in paragraph 12.04.

9.07 Execution of Change Orders

A. OWNER and DESIGN/BUILDER shall execute appropriate Change Orders or Written Amendments covering:

1. changes in the Work which are (i) ordered by OWNER pursuant to paragraph 9.01, (ii) required because of acceptance of *defective* Construction under paragraph 12.08 or correcting *defective* Work under paragraph 12.09 or (iii) agreed to by the parties; and

2. changes in the Contract Price or Contract Times which are agreed to by the parties.

9.08 Notice to Sureties

A. 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 DESIGN/BUILDER's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

ARTICLE 10--CHANGE OF CONTRACT PRICE

10.01 General

A. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to DESIGN/BUILDER for performing the Work.

B. 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 promptly in accordance with paragraph 9.02.A.

C. 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:

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;

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 10.02) or by mutually agreed unit prices;

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 10.01.C.2, on the basis of the Cost of the Work (determined as provided in paragraph 10.02) plus a DESIGN/BUILDER's Fee for overhead and profit (determined as provided in paragraph 10.02.C).

10.02 Cost of the Work

A. *Costs Included:* The term Cost of the Work means the sum of all costs necessarily incurred and paid by DESIGN/BUILDER 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 10.02.B:

1. Payroll costs for employees in the direct employ of DESIGN/BUILDER in the performance of the Work under schedules of job classifications agreed upon by OWNER and DESIGN/BUILDER.

- a. 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 Site shall be apportioned on the basis of their time

spent on the Site. 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.

- b. Such employees shall also include engineers and engineering technicians providing Design Professional Services. For purposes of this paragraph 10.02.A.1, DESIGN/BUILDER shall be entitled to payment for such employees an amount equal to salary costs times a factor, both as designated in the Agreement, for all services performed or furnished by such employees engaged on the Project.

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 DESIGN/BUILDER unless OWNER deposits funds with DESIGN/BUILDER 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 DESIGN/BUILDER shall make provisions so that they may be obtained.

3. Payments made by DESIGN/BUILDER to Subcontractors for Work performed or furnished by Subcontractors.

4. Payments made by DESIGN/BUILDER to Engineers for Design Professional Services provided or furnished by Engineers under a Design Subagreement.

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

6. Supplemental costs including the following items:

a. The proportion of necessary transportation, travel and subsistence expenses of DESIGN/BUILDER's employees incurred in discharge of duties connected with the Work.

b. 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 DESIGN/BUILDER.

c. Rentals of all Work equipment and machinery and the parts thereof whether rented from DESIGN/BUILDER or others in accordance with rental agreements approved by OWNER, 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.

d. Sales, consumer, use or similar taxes related to the Work, and for which DESIGN/BUILDER is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of DESIGN/BUILDER, 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.

f. Losses, damages and related expenses caused by damage to the Work not compensated by insurance or otherwise, sustained by DESIGN/BUILDER in connection with the furnishing and performance of the Work provided they have resulted from causes other than the negligence of DESIGN/BUILDER, 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

DESIGN/BUILDER's fee. If, however, any such loss or damage requires rework and DESIGN/BUILDER is placed in charge thereof, DESIGN/BUILDER shall be paid for services a fee proportionate to that stated in paragraph 10.02.C.

g. The cost of utilities, fuel and sanitary facilities at the Site.

h. 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.

i. Cost of premiums for all Bonds and insurance DESIGN/BUILDER is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following:

1. Payroll costs and other compensation of DESIGN/BUILDER's officers, executives, principals (of partnerships and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by DESIGN/BUILDER whether at the Site or in DESIGN/BUILDER'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 10.02.A.1 -- all of which are to be considered administrative costs covered by the DESIGN/BUILDER's fee.

2. Expenses of DESIGN/BUILDER's principal and branch offices other than DESIGN/BUILDER's office at the Site.

3. Any part of DESIGN/BUILDER's capital expenses, including interest on DESIGN/BUILDER's capital employed for the Work and charges against DESIGN/BUILDER for delinquent payments.

4. Costs due to the negligence of DESIGN/BUILDER, 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.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 10.02.

C. *Fee:* The DESIGN/BUILDER's fee allowed to DESIGN/BUILDER for overhead and profit on Change Orders priced by paragraph 10.01.C.3 shall be determined as follows:

1. A mutually acceptable fixed fee; or
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:

a. For costs incurred under paragraphs 10.02.A.1, A.2, A.5 and A.6 the DESIGN/BUILDER's fee shall be 15 percent;

b. For costs incurred under paragraph 10.02.A.3 and 10.02.A.4, the DESIGN/BUILDER's fee shall be five percent;

c. 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 10.02.A.1, 10.02.A.2 and 10.02.A.3 is that the Subcontractor who actually performs or furnishes Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under paragraphs 10.02.A.1 and 10.02.A.2 and that any higher tier Subcontractor and DESIGN/BUILDER will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. The amount of credit to be allowed by DESIGN/BUILDER 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 DESIGN/BUILDER's fee by an amount equal to five percent of such net decrease; and

e. When both additions and credits are involved in any one change, the adjustment in DESIGN/BUILDER's fee shall be computed on the basis of the net change in accordance with

paragraphs 10.02.C.2.a through 10.02.C.2.d, inclusive.

D. *Documentation:* Whenever the cost of any Work is to be determined pursuant to paragraph 10.02.A and 10.02.B, DESIGN/BUILDER will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to OWNER an itemized cost breakdown together with supporting data.

10.03 Cash Allowances

A. The Contract Price includes all allowances so named in the Contract Documents.

1. The allowances include the cost to DESIGN/BUILDER (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Except as set forth in the Contract Documents, DESIGN/BUILDER'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.

B. Prior to final payment, an appropriate Change Order will be issued to reflect actual amounts due DESIGN/BUILDER on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

10.04 Unit Prices

A. 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 of Unit Price Work an amount equal to the sum of the established unit prices 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 DESIGN/BUILDER will be made by OWNER.

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

C. DESIGN/BUILDER or OWNER may make a claim for an adjustment in the Contract Price in accordance with Article 9 if:

1. the quantity of any item of Unit Price Work performed by DESIGN/BUILDER differs from the estimated quantity of such item indicated in the Contract Documents by more than the percentage indicated in the Supplementary Conditions; and

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

3. DESIGN/BUILDER believes that DESIGN/BUILDER is entitled to an increase in Contract Price as a result of having incurred additional expense or OWNER believes the 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 11--CHANGE OF CONTRACT TIMES

11.01 General

A. 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 pursuant to paragraph 9.02.

B. All Contract Times and Milestones are of the essence of the Agreement.

11.02 Time Extensions

A. Where DESIGN/BUILDER is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of DESIGN/BUILDER, 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 Article 9. Delays beyond the control of DESIGN/BUILDER shall include, but not be limited to,

acts or neglect by OWNER, governmental agencies, acts or neglect of utility owners or other contractors performing other construction 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 DESIGN/BUILDER.

B. Nothing in this paragraph 11.02 bars a change in Contract Price pursuant to Article 10 to compensate for the direct costs incurred by DESIGN/BUILDER due to delay, interference, or disruption directly attributable to actions or inactions of OWNER or OWNER's Consultants. However, OWNER shall not be liable to DESIGN/BUILDER for costs or damages arising out of or resulting from (i) delays caused by or within the control of DESIGN/BUILDER, 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 governmental agencies, utility owners, or other contractors performing other work as contemplated by Article 7.

ARTICLE 12--TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE CONSTRUCTION

12.01 Notice of Defects

A. Prompt written notice of all defective Construction of which OWNER has actual knowledge will be given to DESIGN/BUILDER by OWNER. All defective Construction may be rejected, corrected or accepted as provided in this Article 12.

12.02 Access to Construction

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

12.03 Tests and Inspections

A. If the Contract Documents or Laws or Regulations of any public body having jurisdiction require any part of the Construction specifically to be inspected, tested or approved, DESIGN/BUILDER shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, pay all costs in connection therewith, and furnish OWNER the required certificates of inspection or approval. DESIGN/BUILDER 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 acceptance of materials or equipment to be incorporated in the Construction or of materials, mix designs, or equipment submitted for approval prior to DESIGN/BUILDER's purchase thereof for incorporation in the Construction.

B. DESIGN/BUILDER shall give OWNER reasonable notice of the planned schedule for all required inspections, tests or approvals.

C. If any Construction (or the construction work of others) that is required to be inspected, tested or approved is covered by DESIGN/BUILDER without written concurrence of OWNER, it must, if requested by OWNER, be uncovered for observation at DESIGN/BUILDER's expense unless DESIGN/BUILDER has given OWNER timely notice of DESIGN/BUILDER's intention to cover the same and OWNER has not acted with reasonable promptness in response to such notice.

12.04 Uncovering Construction

A. If any Construction is covered contrary to the written request of OWNER, it must, if requested by OWNER, be uncovered for OWNER's observation and recovered at DESIGN/BUILDER's expense.

B. If OWNER considers it necessary or advisable that covered Construction be observed by OWNER or inspected or tested by others, DESIGN/BUILDER, at OWNER's request, shall uncover, expose or otherwise make available for observation, inspection or testing as OWNER may require, that portion of the Construction in question, furnishing all necessary labor, material and equipment. If it is found that such Construction is *defective*, DESIGN/BUILDER shall pay all costs and damages caused by or resulting from such uncovering, exposure, observation, inspection and testing and of satisfactory replacement or rework, (including but not limited to all fees and charges of engineers, architects,

attorneys and other professionals, all court or arbitration or other dispute resolution costs, and 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 9. If, however, such Construction is not found to be *defective*, DESIGN/BUILDER 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 rework; and, if the parties are unable to agree as to the amount or extent thereof, DESIGN/BUILDER may make a claim therefor as provided in Article 9.

12.05 Owner May Stop the Construction

A. If the Construction is *defective*, or DESIGN/BUILDER fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Construction in such a way that the completed Construction will conform to the Contract Documents, OWNER may order DESIGN/BUILDER to stop Construction or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop Construction will not give rise to any duty on the part of OWNER to exercise this right for the benefit of DESIGN/BUILDER or any other party.

12.06 Correction or Removal of Defective Construction

A. OWNER will have authority to disapprove or reject *defective* Construction and will have authority to require special inspection or testing of the Construction whether or not the Construction is fabricated, installed or completed. If required by OWNER, DESIGN/BUILDER shall promptly, as directed, either correct all *defective* Construction, whether or not fabricated, installed or completed, or, if the Construction has been rejected by OWNER, remove it from the Site and replace it with nondefective Construction. DESIGN/BUILDER shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

12.07 Correction Period

A. 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 Construction is found to be *defective*, DESIGN/BUILDER shall promptly, without cost to OWNER and in accordance with OWNER's written instructions, (i) correct such *defective* Construction, or, if it has been rejected by OWNER, remove it from the Site and replace it with Construction that is not *defective*, and (ii) satisfactorily correct or remove and replace any damage to other Construction or the work of others resulting therefrom. If DESIGN/BUILDER 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* Construction corrected or the rejected Construction removed and replaced, and all costs and damages caused by or resulting from such removal and replacement (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs, and all costs of repair or replacement of work of others) will be paid by DESIGN/BUILDER.

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

C. Where *defective* Construction (and damage to other Construction resulting therefrom) has been corrected, removed or replaced under this paragraph 12.07, the correction period hereunder with respect to such Construction will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

12.08 Acceptance of Defective Construction

A. If, instead of requiring correction or removal and replacement of *defective* Construction, OWNER prefers to accept it, OWNER may do so. DESIGN/BUILDER shall pay all costs attributable to OWNER's evaluation of and determination to accept such *defective* Construction (such costs to include 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). If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Construction; 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 9. If the acceptance occurs after final payment, an appropriate amount will be paid by DESIGN/BUILDER to OWNER.

12.09 OWNER May Correct Defective Construction

A. If DESIGN/BUILDER fails within a reasonable time after written notice from OWNER to correct defective Construction or to remove and replace rejected Construction as required by OWNER in accordance with paragraphs 12.06.A or 12.07.A, or if DESIGN/BUILDER fails to perform the Construction in accordance with the Contract Documents, or if DESIGN/BUILDER fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to DESIGN/BUILDER, 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 DESIGN/BUILDER from all or part of the Site, take possession of all or part of the Construction, and suspend DESIGN/BUILDER's services related thereto, take possession of DESIGN/BUILDER's tools, appliances, construction equipment and machinery at the Site and incorporate in the Construction all materials and equipment stored at the Site or for which OWNER has paid DESIGN/BUILDER but which are stored elsewhere. DESIGN/BUILDER shall allow OWNER, OWNER's representatives, agents and employees, OWNER's other contractors and Consultants access to the Site to enable OWNER to exercise the rights and remedies under this paragraph. All costs and damages incurred or sustained by OWNER in exercising such rights and remedies will be charged against DESIGN/BUILDER and a Change Order will be issued incorporating the necessary revisions in the Contract Documents 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 9. Such costs and damages will include but not be limited to all fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs and all costs of repair or replacement of work of others destroyed or damaged by correction, removal or replacement of DESIGN/BUILDER's defective Construction. DESIGN/BUILDER shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Construction attributable to the exercise by OWNER of OWNER's rights and remedies hereunder.

ARTICLE 13--PAYMENTS TO DESIGN/BUILDER AND COMPLETION

13.01 Schedule of Values

A. The Schedule of Values established as provided in paragraph 2.06.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to OWNER. Progress payments on account of Unit Price Work will be based on the number of units completed.

13.02 Application for Progress Payment

A. At least twenty days before the date established for each progress payment (but not more often than once a month), DESIGN/BUILDER shall submit to OWNER for review an Application for Payment filled out and signed by DESIGN/BUILDER 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.

13.03 DESIGN/BUILDER's Warranty of Title

A. DESIGN/BUILDER warrants and guarantees that title to all construction 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. This paragraph 13.03.A does not apply to any documents covered by paragraph 3.04.A.

13.04 Progress Payments

A. Progress payments shall be made by the OWNER to the DESIGN/BUILDER according to the following procedure:

1. OWNER will, within ten days of receipt of each Application for Payment, either indicate in writing its acceptance of the Application and state that the Application is being processed for payment, or return the Application to DESIGN/BUILDER indicating in writing its reasons for refusing to accept the Application. Not more than ten days after accepting such Application the amount will become due and when due will be paid by OWNER to DESIGN/BUILDER.

2. If the OWNER should fail to pay the DESIGN/BUILDER at the time the payment of any amount becomes due, then DESIGN/BUILDER may, at any time thereafter, upon serving written notice that he will stop the Work within seven days after receipt of the notice by the OWNER, and after such seven day period, stop the Work until payment of the amount owing has been received. Written notice shall be deemed to have been duly served if sent by certified mail to the last known business address of the OWNER.

3. Payments due but unpaid shall bear interest at the rate specified in the Agreement.

4. No Progress Payment nor any partial or entire use or occupancy of the Project by the OWNER shall constitute an acceptance of any Work not in accordance with the Contract Documents.

B. OWNER may refuse to make the whole or any part of any such payment, or because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any previous payment, to the extent that is reasonably necessary to protect OWNER from loss because:

1. The Work is *defective*, or completed Work has been damaged requiring correction or replacement; or

2. The Contract Price has been reduced by Written Amendment or Change Order; or

3. OWNER has been required to correct *defective* Work or complete Work in accordance with paragraph 12.09.A, or

4. OWNER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.02.A.1 through A.3 inclusive; or

5. Claims have been made against OWNER on account of DESIGN/BUILDER's performance or furnishing of the Work; or

6. Liens have been filed in connection with the Work, except where DESIGN/BUILDER has delivered a specific Bond satisfactory to OWNER to secure the satisfaction and discharge of such Liens; or

7. There are other items entitling OWNER to a set off against the amount for which application is made.

13.05 Substantial Completion

A. When DESIGN/BUILDER considers the Construction ready for its intended use DESIGN/BUILDER shall notify OWNER in writing that the Construction is substantially complete (except for items specifically listed by DESIGN/BUILDER as incomplete) and request that OWNER issue a certificate of Substantial Completion. Within a reasonable time thereafter, OWNER and DESIGN/BUILDER shall make an inspection of the Construction to determine the status of completion. If OWNER does not consider the Construction substantially complete, OWNER will notify DESIGN/BUILDER in writing giving the reasons therefor. If OWNER considers the Construction substantially complete, OWNER will prepare and deliver to DESIGN/BUILDER a certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a list of items to be completed or corrected before final payment. At the time of delivery of the certificate of Substantial Completion OWNER will deliver to DESIGN/BUILDER a written determination as to division of responsibilities pending final payment between OWNER and DESIGN/BUILDER with respect to security, operation, safety, maintenance, heat, utilities, insurance and warranties and guarantees.

B. OWNER will have the right to exclude DESIGN/BUILDER from the Site after the date of Substantial Completion, but OWNER will allow DESIGN/BUILDER reasonable access to complete or correct items on the list of items to be completed.

13.06 Partial Utilization

A. Use by OWNER at OWNER's option of any substantially completed part of the Construction which (i) has specifically been identified in the Contract

Documents, or (ii) OWNER and DESIGN/BUILDER agree constitute a separately functioning and usable part of the Construction that can be used by OWNER for its intended purpose without significant interference with DESIGN/BUILDER's performance of the remainder of the Construction, may be accomplished prior to Substantial Completion of all the Construction subject to the following:

1. OWNER at any time may request DESIGN/BUILDER in writing to permit OWNER to use any such part of the Construction which OWNER believes to be ready for its intended use and substantially complete. If DESIGN/BUILDER agrees that such part of the Construction is substantially complete, DESIGN/BUILDER will certify to OWNER that such part of the Construction is substantially complete and request OWNER to issue a certificate of Substantial Completion for that part of the Construction. DESIGN/BUILDER at any time may notify OWNER in writing that DESIGN/BUILDER considers any such part of the Construction ready for its intended use and substantially complete and request OWNER to issue a certificate of Substantial Completion for that part of the Construction. Within a reasonable time after either such request, OWNER and DESIGN/BUILDER shall make an inspection of that part of the Construction to determine its status of completion. If OWNER does not consider that part of the Construction to be substantially complete, OWNER will notify DESIGN/BUILDER in writing giving the reasons therefor. If OWNER considers that part of the Construction to be substantially complete, the provisions of paragraph 13.05 will apply with respect to certification of Substantial Completion of that part of the Construction and the division of responsibility in respect thereof and access thereto.

2. No occupancy or separate operation of part of the Construction will be accomplished prior to compliance with the requirements of paragraph 5.08 in respect of property insurance.

13.07 Final Inspection

A. Upon written notice from DESIGN/BUILDER that the entire Construction or an agreed portion thereof is complete, OWNER will make a final inspection with DESIGN/BUILDER and will notify DESIGN/BUILDER in writing of all particulars in which this inspection reveals that the Construction is incomplete or defective. DESIGN/BUILDER shall immediately take such

measures as are necessary to complete such Construction or remedy such deficiencies.

13.08 Final Application for Payment

A. After DESIGN/BUILDER has completed all such corrections to the satisfaction of OWNER 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 5.09.B, certificates of inspection, marked-up record documents (as provided in paragraph 6.11) and other documents, DESIGN/BUILDER may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied (unless previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by subparagraph 5.02.B.7, (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, DESIGN/BUILDER may furnish receipts or releases in full and an affidavit of DESIGN/BUILDER 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, DESIGN/BUILDER may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

13.09 Final Payment and Acceptance

A. If OWNER is satisfied that the Work has been completed and DESIGN/BUILDER's other obligations under the Contract Documents have been fulfilled, OWNER will, within ten days after receipt of the final Application for Payment, give written notice to DESIGN/BUILDER that the Work is acceptable. Otherwise, OWNER will return the Application to DESIGN/BUILDER, indicating in writing the reasons for refusing to process final payment, in which case DESIGN/BUILDER shall make the necessary corrections and resubmit the Application. Thirty days after the presentation to OWNER of the acceptable Application and accompanying documentation, in appropriate form and substance and with OWNER's notice of acceptability, the amount will become due and will be paid by OWNER to DESIGN/BUILDER.

B. If, through no fault of DESIGN/BUILDER, final completion of the Work is significantly delayed, OWNER shall, upon receipt of DESIGN/BUILDER's final Application for Payment, 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 5.01.A, 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 DESIGN/BUILDER to OWNER 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.

13.10 Waiver of Claims

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

1. A waiver of all claims by OWNER against DESIGN/BUILDER, except claims arising from unsettled Liens, from *defective* Construction appearing after final inspection pursuant to paragraph 13.07, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from DESIGN/BUILDER's continuing obligations under the Contract Documents; and

2. A waiver of all claims by DESIGN/BUILDER against OWNER other than those previously made in writing and still unsettled.

ARTICLE 14--SUSPENSION OF WORK AND TERMINATION

14.01 Owner May Suspend Work

A. At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than 90 days by notice in writing to DESIGN/BUILDER which will fix the date on which Work will be resumed. DESIGN/BUILDER shall resume the Work on the date so fixed. DESIGN/BUILDER 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 DESIGN/BUILDER makes a claim therefor as provided in Article 9.

14.02 Owner May Terminate for Cause

A. The occurrence of any one or more of the following events justifies termination for cause:

1. DESIGN/BUILDER 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 2.06.A as revised from time to time.

2. DESIGN/BUILDER disregards Laws or Regulations of any public body having jurisdiction.

3. DESIGN/BUILDER otherwise violates in any substantial way any provisions of the Contract Documents.

B. OWNER may, after giving DESIGN/BUILDER (and the surety, if any) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of DESIGN/BUILDER, exclude DESIGN/BUILDER from the Site and take possession of the Work and of all DESIGN/BUILDER's tools, appliances, construction equipment and machinery at the Site and use the same to the full extent they could be used by DESIGN/BUILDER (without liability to DESIGN/BUILDER for trespass or conversion),

incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid DESIGN/BUILDER but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case DESIGN/BUILDER shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all costs, losses and damages sustained by OWNER arising out of or resulting from completing the Work (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) such excess will be paid to DESIGN/BUILDER. If such costs, losses and damages exceed such unpaid balance, DESIGN/BUILDER shall pay the difference to OWNER. Such costs, losses and damages incurred by OWNER will be 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.

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

14.03 Owner May Terminate for Convenience

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

1. 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;

2. 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;

3. Amounts paid in settlement of terminated contracts with Subcontractors, Engineers, Suppliers and others (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 incurred in connection with termination of contracts with Subcontractors, Engineers and Suppliers); and

4. Reasonable expenses directly attributable to termination.

B. DESIGN/BUILDER 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.

14.04 DESIGN/BUILDER May Stop Work or Terminate

A. If, through no act or fault of DESIGN/BUILDER, 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 OWNER fails to act on any Application for Payment within thirty days after it is submitted or OWNER fails for thirty days to pay DESIGN/BUILDER any sum finally determined to be due, then DESIGN/BUILDER may, upon seven days' written notice to OWNER, and provided OWNER does 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 14.03.A. In lieu of terminating the Agreement and without prejudice to any other right or remedy, or OWNER has failed for thirty days to pay DESIGN/BUILDER any sum finally determined to be due, DESIGN/BUILDER may upon seven day's written notice to OWNER stop the Work until payment is made of all such amounts due DESIGN/BUILDER, including interest thereon. The provisions of this paragraph 14.04.A are not intended to preclude DESIGN/BUILDER from making claim under Article 9 for an increase in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to DESIGN/BUILDER's stopping Work as permitted by this paragraph.

ARTICLE 15--DISPUTE RESOLUTION

If and to the extent that OWNER and DESIGN/BUILDER 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, OWNER and DESIGN/BUILDER 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 16--MISCELLANEOUS

16.01 Giving Notice

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given.

1. 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;

2. If delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice; or

3. If transmitted by facsimile, the time at which a machine generated confirmation states the notice was received at the facsimile telephone number of the intended recipient last known by the sender.

16.02 Computation of Times

A. 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.

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

16.03 Notice of Claim

A. Should OWNER or DESIGN/BUILDER 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 16.03.A shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

16.04 Cumulative Remedies

A. 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, any general or specific warranties, guarantees and indemnities imposed upon DESIGN/BUILDER and all of the rights and remedies available to OWNER 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.

16.05 Survival of Obligations

A. 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.

EXHIBIT GC-A to GENERAL CONDITIONS OF THE
AGREEMENT BETWEEN OWNER AND
DESIGN/BUILDER DATED _____
For use with EJCDC No. 1910-40 (1995 ed.)

15.01 Dispute Resolution Agreement

A. Article 15 of the General Conditions of the Contract between OWNER and DESIGN/BUILDER is amended to include paragraphs 15.01.B-15.01.F.

B. OWNER and DESIGN/BUILDER agree that they will 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 _____

prior to either of them initiating against the other a demand for arbitration pursuant to paragraph 15.01.C through 15.01.F, unless delay in initiating arbitration would irrevocably prejudice one of the parties. Any time limits within which to file a demand for arbitration shall be suspended with respect to a dispute submitted to mediation within those same applicable time limits and shall remain suspended until 10 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.

C. All claims, disputes and other matters in question between OWNER and DESIGN/BUILDER 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 13.10) will be decided by binding arbitration in accordance with _____

subject to the limitations of this paragraph 15.01. This agreement so to arbitrate and any other agreement or consent to arbitrate entered into in accordance herewith as provided in this paragraph 15.01 will be specifically enforceable under the prevailing law of any court having jurisdiction.

D. Notice of the demand for arbitration will be filed in writing with the other party to the Agreement and with the designated arbitration entity. The demand for arbitration will be made 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.

E. Except as provided in paragraph 15.01.F below, no arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder or in any other manner any other individual or entity who is not a party to this contract unless:

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

2. such other individual 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

3. the written consent of the other individual or entity sought to be included and of OWNER and DESIGN/BUILDER 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.

F. Notwithstanding paragraph 15.01.E, if a claim, dispute or other matter in question between OWNER and DESIGN/BUILDER involves the Work of a Subcontractor, Supplier or Engineer either OWNER or DESIGN/BUILDER may join such entity as a party to the arbitration between OWNER and DESIGN/BUILDER hereunder. DESIGN/BUILDER shall include in all subcontracts required by paragraph 6.05.D a specific provision whereby the Subcontractor consents to being joined in an arbitration between OWNER and DESIGN/BUILDER involving the Work of such Subcontractor. Nothing in this paragraph 15.01.F nor in the provision of such subcontract consenting to joinder shall create any claim, right or cause of action in favor of Subcontractor, Supplier or Engineer against OWNER.

SUPPLEMENTARY CONDITIONS

SC-1	Definitions
SC-1.01A.31	OWNER's Representative
SC-4.02A	Differing Site Conditions
SC-5.01.A	Performance, Payment and Other Bonds
SC-5.02A	DESIGN/BUILDER's Liability Insurance
SC-5.02.B.4	DESIGN/BUILDER's Liability Insurance
SC-5.04.A	Property Insurance
SC-5.04.B	Property Insurance
SC-6.01.B	Design Professional Services
SC-6.01.D.2	Design Professional Services
SC-6.01.D.3	Design Professional Services
SC-6.09	Taxes
SC-6.11	Record Documents
SC-6.19	Indemnification
SC-8.01.A.6.e	OWNER's Responsibilities
SC-8.03	Resident Project Representative
SC-10.02.B	Cost of Work
SC-10.02.C	Cost of Work
SC-10.04	Unit Prices
SC-11.02.B	Change of Contract Times
SC-11.03	Change of Contract Times
SC-13.04	Progress Payments
SC-17	Waiver
SC – EXHIBIT GC-A	Dispute Resolution Agreement

These Supplementary Conditions amend or supplement the Standard General Conditions of the Contract between the OWNER and DESIGN/BUILDER (No. 1910-40, 1995 ed.) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

SC-1 Definitions

The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Contract between the OWNER and the DESIGN/BUILDER (No. 1910-40, 1995 ed.) have the meanings assigned to them in the General Conditions.

SC-1.01A.31 OWNER's Representative

Add the following at the end of Paragraph 1.01.A.31 : "The OWNER has appointed Dave Wagner, or his successor, as their representative during the construction of the project."

SC-4.02A Differing Site Conditions

Add the following to (i) : "or those which are indicated or should reasonably have been indicated in the subsurface investigation performed by the DESIGN/BUILDER."

Add the following additional paragraph : : Severe inclement weather shall not constitute a differing site condition, but will entitle the DESIGN/BUILDER to additional time."

SC-5.01.A Performance, Payment and Other Bonds

Change "Contract Price" to "value of the Construction Services portion of the contract".

DESIGN/BUILDER's Liability Insurance

Add the following at the end of the paragraph 5.02.A :

The limits of liability for the insurance required by paragraph 5.02.A of the general conditions shall provide the following coverage for not less than the following amounts or greater where required by the Laws and Regulations:

1. Worker's Compensation under paragraph 5.02.A:
 - a. State : Statutory
 - b. Applicable Federal (e.g. Longshoreman's) : Statutory
 - c. Employer's Liability : \$500,000
2. Contractor's General Liability Insurance which shall include completed operations and product liability coverages:
 - a. General Aggregate (Except Product – Completed Operations) \$1,000,000
 - b. Products – Completed Operations Aggregate \$1,000,000
 - c. Personal and Advertising Injury (per Person/Organization) \$1,000,000
 - d. Each Occurrence (Bodily Injury and Property Damage) \$1,000,000
 - e. Limit per person Medical Expense \$ 5,000
 - f. Personal Injury Liability coverage will include claims arising out of employment
 - g. Property Damage liability insurance will provide Explosion, Collapse and Underground coverages where applicable
 - h. Excess Liability
 - General Aggregate \$2,000,000
 - Each Occurrence \$1,000,000
3. Automobile Liability
 - a. Bodily Injury : Each person - \$500,000; Each accident - \$1,000,000
 - b. Property Damage : Each accident - \$1,000,000
 - c. Combined Single Limit Bodily Injury and Property Damage : \$1,000,000 each accident

Note that reference to a combined single limit for bodily injury and property damage with respect to automobile liability will permit the insurance broker to negotiate the most advantageous arrangement for the insured and either alternative should be acceptable although the amount of coverage provided may not be identical.

DESIGN/BUILDER's Liability Insurance

The contractual liability coverage required by paragraph 5.02.B shall provide coverage for not less than the following requirements:

- | | |
|----------------------------------------------------------|-------------|
| a. General Aggregate : | \$2,000,000 |
| b. Each Occurrence (Bodily Injury and Property Damage) : | \$1,000,000 |

Property Insurance

The Builder's Risk coverage will be provided by the DESIGN/BUILDER.

Property Insurance

Delete Paragraph

Design Professional Services

The DESIGN/BUILDER has completed, and the OWNER has accepted, the requirements of 6.01.B.1 through 6.01.B.6.

Design Professional Services

The DESIGN/BUILDER will not be performing the requirements of this section. They will be provided by others.

Design Professional Services

The DESIGN/BUILDER will not be performing the requirements of this section. They will be provided by others.

SC-6.09 **Taxes**

Add the following language at the end of Paragraph 6.09 of the General Conditions:

"Materials and equipment incorporated into this project are exempt from the payment of sales tax under the laws of the State in which the project is located and such sales tax shall not be included in project cost. OWNER will provide CONTRACTOR with a proper exemption certificate number within 10 days of the date of the Agreement. Should OWNER fail to provide an exemption certificate number within the required time period, CONTRACTOR will be reimbursed monthly for sales tax amounts for which he becomes liable until such certificate number is provided. To minimize CONTRACTOR'S record keeping expense, OWNER will provide an exemption certificate number within 60 days or it shall be presumed that the project will proceed on a non-exempt basis, and the contract amount will be equitably adjusted in writing in a lump sum amount sufficient to cover CONTRACTOR'S sales tax expense. Upon issuance of a proper exemption certificate number to CONTRACTOR, CONTRACTOR shall assume full responsibility for his own proper use of the certificate number, and shall pay all costs of any legally assessed penalties relating to CONTRACTOR'S improper use of the exemption certificate number."

SC-6.11 **Record Documents**

For purposes of paragraph 6.11 of the General Conditions, a reproducible set of record drawings will be delivered in CADD format.

SC-6.19 **Indemnification**

Delete "including loss of use resulting therefrom" from lines twelve and thirteen of this paragraph.

SC-8.01.A.6.e **OWNER's Responsibilities**

Delete Paragraph.

SC-8.03 **Resident Project Representative**

Add the words "...if required." to the end of the sentence that begins with "The duties, responsibilities and limitations of authority....".

SC-10.02.B **Cost of Work**

The exclusions provided for in B.1 and B.2 shall not be applicable to personnel whose efforts are directly related to the work and shall be limited to the following individuals:

CAS Construction, LLC -

Michael Hafling
Travis Stryker
Jamie King
Bryan Catterson
Kacy Simonson
Tom Parkin
Jeff Piersol

PEC -

Jim Martin
Rod Hofer

SC-10.02.C **Cost of Work**

Add a new paragraph : 3. Where Engineering services are provided, the fee would be a multiplier of 3.3 times the direct cost of such services.

SC-10.04 **Unit Prices**

Delete Paragraph

SC-11.02.B **Change of Contract Times**

Delete "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 government agencies, utility owners, or other contractors performing other work as contemplated by Article 7" from this paragraph.

SC-11.03 **Change of Contract Times**

Add the following Section 11.03: "In the event and to the extent that an act or omission of Owner, or any error or change in Owner-provided information, or change in law, or event of force majeure affects the services or increases Design\Builder's costs or schedule, Design\Builder shall be entitled to a change to the Work and an equitable adjustment in the compensation and schedule, as appropriate."

SC-13.04 **Progress Payments**

Paragraph A.1. change the sentence to read "Not more than thirty days after accepting such Application the amount will become due and when due will be paid by OWNER to DESIGN/BUILDER."

SC-17 **Waiver**

Add the following provision :

"Consequential Damages. In no event will Design/Builder be liable for any special, indirect, or consequential damages including, without limitation, damages or losses in the nature of increased Project costs, loss of revenue or profit, lost production, claims by customers of OWNER, or governmental fines or penalties.

Limitation of Liability. The Design/Builder's aggregate liability for all damages connected with its services for the Project will not exceed the total value of this Agreement. The obligations and remedies stated in this Agreement are the sole and exclusive obligations of Design/Builder and remedies of Owner, regardless of the cause of action pled including, without limitation, negligence of every character."

SC – EXHIBIT GC-A **Dispute Resolution Agreement**

Delete this Exhibit.



Design / Build Firm : CAS CONSTRUCTION, LLC

Project: West Baldwin Creek Interceptor
Lawrence, KS

WORK DESCRIPTION

01000 GENERAL CONDITIONS

Supervision, Administrative Costs, Temporary Facilities including temporary power and water.

No Sales Tax included, Owner to provide Exempt Certification for project.

No Building Permits and/or Fees included for Local Government.

Application of Storm Water plan permit included.

Builders Risk provided.

KDHE, DWR, US Army Corps and other regulatory agency applications – City to pay fee.

Design/builder will coordinate with wildlife and other agencies as necessary to determine impacts.

Design Services supplied by PEC as a subcontract to CAS.

GMP development costs and preliminary engineering costs associated with the Phase I contract are not included as a part of this contract.

Civil testing lab services are included for gradation and soil testing (as per allowance 01550).

Performance Bond for Construction provided; not for Design. Bond is for one (1) year term.

E&O coverage is on the design portion only and is provided by PEC.

No Owner's Protective insurance is included.

Build, maintain and remove access roads and temporary staging areas.

Install, maintain and remove construction entrances to public streets for mud control.

Install temporary fencing at access points.

Remove and replace existing fences as required for construction.

Clear right of way for construction as necessary.

In the event that there are discrepancies between the Preliminary Design Memorandum and this document, this document shall govern.

Substantial completion of the project will be obtained by August 15, 2008 or liquidated damages in the amount of \$500.00 per calendar day of delay will be assessed for every calendar day of delay that substantial completion is obtained after that date.

Final Completion shall be achieved no later than 60 calendar days from substantial completion, but no later than October 15, 2008.

The schedule for the project substantial completion is based upon an ability to start mobilization, procurement and clearing activities by November 14th. Review and approval of the blasting plan is needed from Magellan no later than December 1st for blasting

activities to start. In the event that a response is not received, or a negative response is received, from Magellan by December 1st to allow blasting to start, the contract completion date shall be adjusted by the time necessary to receive a final response from Magellan. Contractor will be entitled to an extension of time equal to the number of days following December 1st until a satisfactory response is received from Magellan to allow work to start. There will be no additional compensation for this extension of time.

Seeding shall be separated from the project substantial completion date due to project completion being outside of the allowable timeframe for proper seeding. Seeding shall be completed in the first available opportunity to allow for proper completion, but no later than October 15, 2008. A separate GMP of \$70,000 will be established and is included in the total amount of this contract.

Construction services by PEC to include:

- Construction staking, access easements and construction limits as required.
- Shop drawing reviews.
- Construction observation (one full time resident observer).
- Periodic professional observation.
- Coordination of daily observation logs and photo logs.
- Record drawing surveys and record drawings.
- Follow up consult during warranty period.

01015 OWNER FURNISHED ITEMS

Owner to acquire land necessary for project as well as for temporary access and staging areas. Access to the site for the contractor will be no later than **November 14, 2007** for staging and mobilization at the site; and access to start work no later than **December 1, 2007**. Property acquisition shall be sequenced to provide a continual and uninterrupted flow of work.

Property acquisition to be 100% completed no later than **February 15, 2008**. There will be cost impacts to contractor associated with property acquisition not meeting the above dates. These costs will be reimbursed to contractor.

Time impacts will need to be addressed on an individual basis.

Owner will pay fees associated with the KDHE, DWR, US Army Corps and other regulatory agency applications.

Design / builder will video inspect the gravity line. In the event that the Owner can provide video services, a credit will be issued as detailed in 01560. If Owner elects to video the line, Design/Builder will provide access for equipment to access areas to complete the inspection.

City shall supply and install the flow meter at the manhole supplied and installed by Design/builder.

01550 ALLOWANCES – (these numbers are included in the total price)

Allowance items are included in the GMP and decisions will be made by the Owner for use.

In the event that the decisions made are in excess of the amounts listed, the Owner shall pay such additional cost. In the event that the decisions made are less than the amounts listed, the Owner shall be entitled to the amounts remaining. Any costs associated with

these allowances shall be at actual cost without markup. Design costs will be at billable rates and passed through with no additional markup.

Dewatering : Geotechnical information obtained at the project indicate the presence of groundwater at varying levels. The design has tried to compensate for the presence of water. An allowance of \$ **75,000.00** is included in the GMP. This allowance will be utilized for groundwater dewatering in the event that it is encountered. This allowance will also be used for additional sedimentation and/or erosion control requirements necessary for the increased water flow. Any groundwater or excess surface water encountered that cannot be handled by means other than a 2" submersible will be included here.

Civil Testing : \$10,000 : for all soil and materials testing necessary to complete the project.

Repair & Maintain Existing Roads : allow \$**20,000** for labor, material and equipment to maintain public roads accessing temporary construction roads and staging areas.

Remediation : allow \$**10,000** : for anything necessary other than seeding and mulching of disturbed areas. See 02935 for additional details.

Rock Breakup & Replacement Allowance : \$350,000 : the initial geotechnical borings along the route indicate areas of considerable rock removal necessary to complete the line installation. This allowance will accommodate the removal by blasting. This allowance covers the excavation, removal, haul off and replacement cost and includes equipment, labor and cost of material.

PS #45 Tie-in : \$10,000.00 : as the scope of the work to tie-in to the existing pump station is not known, this allowance covers the work to be accomplished at the Owner's request.

Erosion Control : \$30,000.00: this allowance is for materials necessary to comply with KDHE requirements

Staging Area Prep & Removal : \$35,000.00: this allowance is to haul rock to prepare and maintain access roads and temporary staging areas as well as removal of material at completion of project. Seeding of these areas following removal is a part of a separate contract.

Clearing : \$40,000.00 : this allowance is for clearing and disposal necessary for construction.

Contingency for Unforeseen Items : \$50,000: Contingency amount for unforeseen items in design and/or construction scope or changes to the contract scope not defined in the proposal.

01560 VALUE ENGINEERING

Video Inspection : \$30,000 : In the event that the City wants to self perform the video inspection, this amount shall be credited to the Owner.

General Conditions : \$45,000 : the schedule is anticipated to be complete in a six (6) month period. Due to unknowns associated with the rock and weather, the current price contains eight (8) months of general conditions costs. In the event that the project can reach substantial completion earlier than currently priced, the Owner will be credited \$750.00 per calendar day up to a maximum of \$45,000.00 (60 calendar days). By addition of this clause, there will be no extension or additional cost or time requested due to inclement weather during the course of the project.

01700 SPECIAL SITE CONDITIONS

Property site survey and geotechnical information is included in this proposal and completed under Phase I of this project. Costs for this are under Phase I of this work.

No hazardous or special waste is anticipated to be encountered in the course of this project.

02000 LINE CLEARING / GRUBBING

All areas to be stripped and stockpiled - all materials to be utilized or wasted on site. Rock to be disposed of at the site of excavation or to be hauled to the borrow area for replacement material. Topsoil shall be stockpiled as close as practical to the area removed so that it can be replaced in the same general vicinity.

02010 ROAD CROSSINGS

Sewer crossings at 1750 Road and at Queens Road shall be by open cut with casing. Chip and seal damaged during construction to be replaced / repaired as necessary to return to original condition. Asphalt may be required in lieu of chip and seal, but scope of repair is included as a part of the lump sum amount.

02020 CREEK CROSSINGS

Fifteen (15) permitted crossings anticipated. Crossings to be constructed per the attached detail. All creek or stream crossings necessary to accomplish the work detailed in the documents are included as a part of the scope, whether permits are required or not.

02275 TRENCH EXCAVATION/BACKFILL

(Per the City of Lawrence specifications)

Aggregate Bedding - 6" below pipe - 12" in areas of rock - open graded materials

Backfill around pipe to 95%, Above pipe - 2' to 90%, except in Roadways.

Rock in trenches to be removed as defined by geotechnical borings.

02370 DUST & EROSION CONTROL

Silt fence will be per KDHE requirements.

02750 PRECAST MANHOLES / STRUCTURES

All concrete manholes shall receive an epoxy system interior lining as specified in Section 2510.3 of the City of Lawrence Construction and Material Specifications. Zebron 100% solids hybrid polyurethane.

All manholes shall have joints between manhole sections, adjustment rings, and below the ring and cover and shall be encapsulated with a wrap around heat shrinkable sheet with crosslinked polyolefin backing, coated with a protective heat activated adhesive. Material shall be Canusa-CPS WrapidSeal or approved equal.

All manhole covers to be bolt-down type.

Manholes along Interceptor Sewer shall be marked with a red or orange colored T-post with a City approved sign perpendicular to the post set into a 2.0 feet deep concrete base (6"-9") in diameter, and extending at least 4' above grade.

Manholes shall be of a diameter as necessary based upon line sizes and angles into the manholes. Scope includes the additional flow metering manhole – City will supply and install the flow meter.

02930 SEEDING

Areas that are disrupted by construction activities will be seeded and mulched for remediation.

Seed will be in accordance with site restoration report as prepared by Norman Ecological Consulting, LLC.

Seeding shall be separated from the main contract for construction and shall have a separate completion date as established in section 01000.

Anything other than seeding necessary is covered by the allowance (see section 01550).

02935 SPECIAL PROPERTY RESTORATION

This section covers any known agreements or discussions with Owners prior to execution of Phase II contract. Costs for the following known issues are covered as a part of the GMP:

#13 – Graham, Jack – stockpile some quantity of rock at the spillway of the pond.

02940 LINE TESTING

Pressure testing of all lines and vacuum testing manholes (excluding the manholes on existing lines) per the City Standards prior to putting into service. Infiltration testing of all manholes to meet City specifications. All lines will be mandrel tested.

02942 DEWATERING

Initial geotechnical data indicate that there is the potential for groundwater during the course of construction. An allowance has been made and is detailed in section 01550 above.

09910 SPECIAL MANHOLE COATING

Zebron 100% solids hybrid polyurethane.

10100 SPECIALTIES

None required.

15061

GRAVITY SEWER

Gravity Sewer

10" - 24" piping shall be PVC / SDR 26

30" piping shall be C905 PVC

VERTICAL SURVEY CONTROL

BM-BC 1
Elev. = 857.715
Railroad spike in SW face of 1st power pole west of Freestride pump station on north side of N 1750 Road, northwest of house at 1057 N 1750 Road.

BM-BC 2
Elev. = 857.85
T post driven to surface on north side of N 1750 Road in north back slope 122' east of CP-202.

BM-BC 3
Elev. = 863.345
T post driven to surface on south side of N 1750 Road east of E 1029 Road.

BM-BC 4
Elev. = 861.14
T post driven to surface at south edge of bean field where timber projects north, 54' NNE of CP-204.

BM-BC 5
Elev. = 867.175
T post driven to surface at south edge of bean field 27' west of CP-205.

BM-BC 6
Elev. = 876.81
Railroad spike in north side of 5th power pole south of N 1750 Road on west side of Queens Road.

BM-BC 7
Elev. = 870.085
Railroad spike in north side of 4th power pole west of Queens Road at south edge of field southwest of N 1750 Road and Queens Road.

BM-BC 8
Elev. = 873.085
T post driven to surface at southeast corner of east field on Freney's property (28' N. of north/south fence and 25' north of Freney's).

BM-BC 9
Elev. = 874.285
Railroad spike in north face of 15' Hackberry 65' northeast of CP-211.

BM-BC 10
Elev. = 873.585
T post driven to surface 3' north of 36' Oak tree southwest of CP-212.

BM-BC 11
Elev. = 885.15
T post driven to surface 15' north of northernmost linear edge in west field on Freney's property.

BM-BC 12
Elev. = 884.085
T post driven to surface 15' east of west edge of timber and 15' south of centerline of cleared road along stationer's sewer alignment.

BM-BC 13
Elev. = 880.095
Railroad spike in east face 12' Walnut 65' +/- west of CP-220.

BM-BC 14
Elev. = 846.485
Railroad spike in west face 30' Sycamore 100' +/- northeast of CP-232.

BM-BC 15
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.

BM-BC 16
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.

BM-BC 17
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.

BM-BC 18
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.

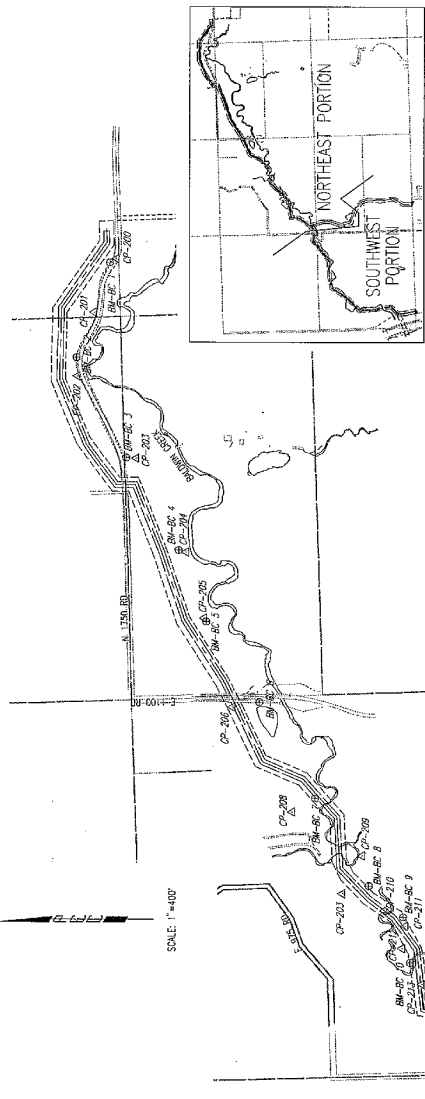
BM-BC 19
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.

BM-BC 20
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.

BM-BC 21
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.

BM-BC 22
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.

BM-BC 23
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.



KEY MAP
N.T.S.

HORIZONTAL SURVEY CONTROL

- CP-200
5/8" rebar set on south side of N 1750 Road and north of house at 1057 N 1750 Road
N = 251807.1099
E = 207870.4771
1. 60d Nail in south face of pole on north side of N 1750 Road
2. Centerline line stake at 1057 N 1750 Road
3. Centerline mailbox post at 1057 N 1750 Road
- CP-201
5/8" rebar set on north side of N 1750 Road and east of field entrance to north
N = 251960.8370
E = 207799.9706
1. Centerline N 1750 Road
2. 60d Nail in south face power pole
3. East edge of field entrance to north
- CP-202
5/8" rebar set on north side of N 1750 Road
N = 251960.8370
E = 207799.9706
1. North edge of N 1750 Road
2. 60d Nail in south face power pole
3. Edge of crop line
- CP-203
5/8" rebar set on north side of N 1750 Road and west of private gravel road E 1029 Road
N = 251865.9243
E = 207670.4706
1. First edge private gravel road E 1029
2. Second edge private gravel road E 1029
3. 60d Nail in south face power pole
- CP-204
5/8" rebar set on the north side of creek between E 1029 Road and E 1000 Road
N = 251317.9264
E = 207612.9908
1. 60d Nail in north face 10' Oak
2. 60d Nail in west face 8' Oak
3. 60d Nail in south face 15' Walnut
- CP-205
5/8" rebar set on the north side of creek between E 1029 Road and E 1000 Road
N = 251119.27816
E = 207604.1111
1. 60d Nail in north face 8' Elm
2. 60d Nail in west face 8' Elm
3. 60d Nail in north face 10' Hackberry
- CP-206
5/8" rebar set on the west side of E 1000 Road and 700' south of N 1750 Road
N = 250980.32800
E = 207503.18040
1. 60d Nail west face power pole
2. Centerline telephone pole on east side Queens Road
3. Centerline Gas One Marker on west side Queens Road
- CP-207
5/8" rebar set on the north side of N 1750 Road
N = 250971.57878
E = 207432.64170
1. 60d Nail in north face 15' Oak
2. 60d Nail in south face 8' Elm
3. Edge of timber
- CP-208
5/8" rebar set
N = 250571.57878
E = 207432.64170
1. 60d Nail in north face 15' Oak
2. 60d Nail in south face 8' Elm
3. Edge of timber
- CP-209
5/8" rebar set
N = 250403.131015
E = 207403.131015
1. 60d Nail in east face 15' Oak
2. 60d Nail in north face 8' Elm
3. 60d Nail in south face 10' Walnut
- CP-210
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in southeast face 8' Elm
2. 60d Nail in west face 10' Walnut
3. 60d Nail in west face 10' Walnut
- CP-211
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-212
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-213
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-214
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-215
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-216
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-217
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-218
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-219
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-220
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-221
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-222
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-223
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-224
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-225
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-226
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-227
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-228
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-229
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-230
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-231
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-232
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-233
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut
- CP-234
5/8" rebar set
N = 249335.89778
E = 207352.30275
1. 60d Nail in north face 15' Walnut
2. 60d Nail in west face 10' Walnut
3. 60d Nail in south face 10' Walnut

VERTICAL SURVEY CONTROL

- BM-BC 1
Elev. = 857.715
Railroad spike in SW face of 1st power pole west of Freestride pump station on north side of N 1750 Road, northwest of house at 1057 N 1750 Road.
- BM-BC 2
Elev. = 857.85
T post driven to surface on north side of N 1750 Road in north back slope 122' east of CP-202.
- BM-BC 3
Elev. = 863.345
T post driven to surface on south side of N 1750 Road east of E 1029 Road.
- BM-BC 4
Elev. = 861.14
T post driven to surface at south edge of bean field where timber projects north, 54' NNE of CP-204.
- BM-BC 5
Elev. = 867.175
T post driven to surface at south edge of bean field 27' west of CP-205.
- BM-BC 6
Elev. = 876.81
Railroad spike in north side of 5th power pole south of N 1750 Road on west side of Queens Road.
- BM-BC 7
Elev. = 870.085
Railroad spike in north side of 4th power pole west of Queens Road at south edge of field southwest of N 1750 Road and Queens Road.
- BM-BC 8
Elev. = 873.085
T post driven to surface at southeast corner of east field on Freney's property (28' N. of north/south fence and 25' north of Freney's).
- BM-BC 9
Elev. = 874.285
Railroad spike in north face of 15' Hackberry 65' northeast of CP-211.
- BM-BC 10
Elev. = 873.585
T post driven to surface 3' north of 36' Oak tree southwest of CP-212.
- BM-BC 11
Elev. = 885.15
T post driven to surface 15' north of northernmost linear edge in west field on Freney's property.
- BM-BC 12
Elev. = 884.085
T post driven to surface 15' east of west edge of timber and 15' south of centerline of cleared road along stationer's sewer alignment.
- BM-BC 13
Elev. = 880.095
Railroad spike in east face 12' Walnut 65' +/- west of CP-220.
- BM-BC 14
Elev. = 846.485
Railroad spike in west face 30' Sycamore 100' +/- northeast of CP-232.
- BM-BC 15
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.
- BM-BC 16
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.
- BM-BC 17
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.
- BM-BC 18
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.
- BM-BC 19
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.
- BM-BC 20
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.
- BM-BC 21
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.
- BM-BC 22
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.
- BM-BC 23
Elev. = 919.88
Railroad spike in north face 15' Walnut 120' +/- west of CP-234.

Project located in Sections 20, 21 and 29, Township 12 South, Range 19 East of the 6th Principal Meridian.

07A30--002 BCW-C01.0



City	State	Year	Scale	Sheet
CITY OF LAWRENCE	MO	2007	1" = 400'	1 of 1
BALDWIN CREEK WEST				
INTERCEPTOR SEWER				
HORIZONTAL & VERTICAL SURVEY CONTROL				
NORTHEAST PORTION				
Prepared by	Drawn by	Checked by	Reviewed by	Scale
J. L. Lawrence	J. L. Lawrence	J. L. Lawrence	J. L. Lawrence	1" = 400'
Professional Engineer	Professional Engineer	Professional Engineer	Professional Engineer	
License No. 12066	License No. 12066	License No. 12066	License No. 12066	
12066	12066	12066	12066	

BU-BC: 13	Site = 888.045
Reinforced spike in south face of 20' littoral 50' west of CP-217	
BU-BC: 14	Site = 882.705
Reinforced spike in littoral face of wood rectangle power pole 30' northeast of CP-218	
BU-BC: 15	Site = 899.18
Reinforced spike in west face of 35' Sycamore 225' northeast of CP-219	
BU-BC: 16	Site = 897.955
Reinforced spike in southwest face of 15' Hackberry 100' northeast of CP-219	
BU-BC: 17	Site = 899.68
Reinforced spike in south face 15' Elm 50' east of CP-220	
BU-BC: 18	Site = 891.525
Reinforced spike in south face of 15' Hackberry 100' northeast of CP-221	
BU-BC: 19	Site = 891.525
Reinforced spike in south face of 15' Hackberry 100' northeast of CP-221	



CP-217
5/8" rebar set
N = 248104.74719
E = 2072363.14479

1.	60d Nail in east face of 4" Oak	24.20 N
2.	60d Nail in south face of 12" Elm	24.27 E
3.	60d Nail in west face of 8" Double Hickory	7.10 S



BU-9C: 19
 Elev = 890.7
 Railroad spike in west face of 15' Walnut 70' northeast of CP-222

BU-9C: 20
 Elev = 917.05
 Railroad spike in west face of 35' oak 11.4' southwest of CP-223

BU-9C: 21
 Elev = 923.35
 Railroad spike in southeast face of 16' Walnut 88' southwest of CP-224.

BU-9C: 22
 Elev = 919.85
 Railroad spike in east face of 18' Walnut 30' west of CP-225

BU-9C: 23
 Elev = 922.48
 T post driven to surface 3.5' south of top bank of creek and 10.2' west of intersection of 10' Oak

BU-9C: 24
 Elev = 926.35
 T post driven to surface 32' west of CP-226 and 26' south of 16" hedge tree

BU-9C: 25
 Elev = 944.28
 T post driven to surface 35' north of creek channel midway between CP-226 and CP-227

BU-9C: 26
 Elev = 970.24
 Railroad spike in south face of sixth board in cleared timber zone at south end of job.

FOR CP-9C: 27 THROUGH BU-9C: 29 SEE NORTHEAST PORTION SHEET

BU-9C: 30
 Elev = 919.88
 Railroad spike in north face 18' Walnut 120' +/- west of CP-224

BU-9C: 31
 Elev = 925.175
 Railroad spike in east face 18' Walnut 70' +/- north of CP-235

BU-9C: 32
 Elev = 933.58
 Railroad spike in east face 24' Walnut 80' +/- north northwest of CP-236

BU-9C: 33
 Elev = 940.26
 Railroad spike in west southwest face 15' Hedge 80' +/- east of CP-237

BU-9C: 34
 Elev = 935.58
 Spore cut on south edge of well wall monolith west of P.S. 45

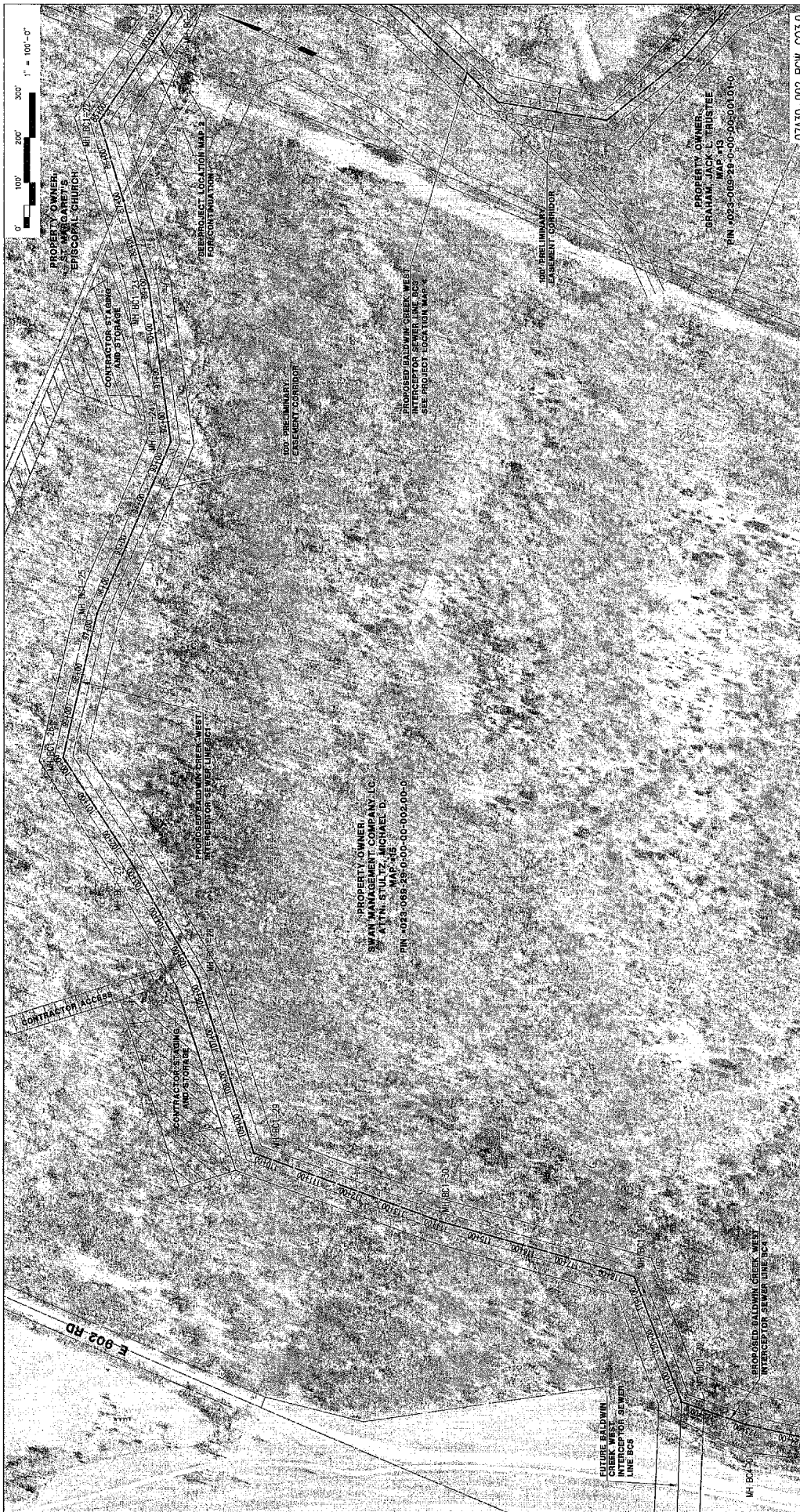
Project located in Sections 20, 21 and 29, Township 12 South, Range 19 East of the 6th Principal Meridian.


07A30-002 BCW-C02.0



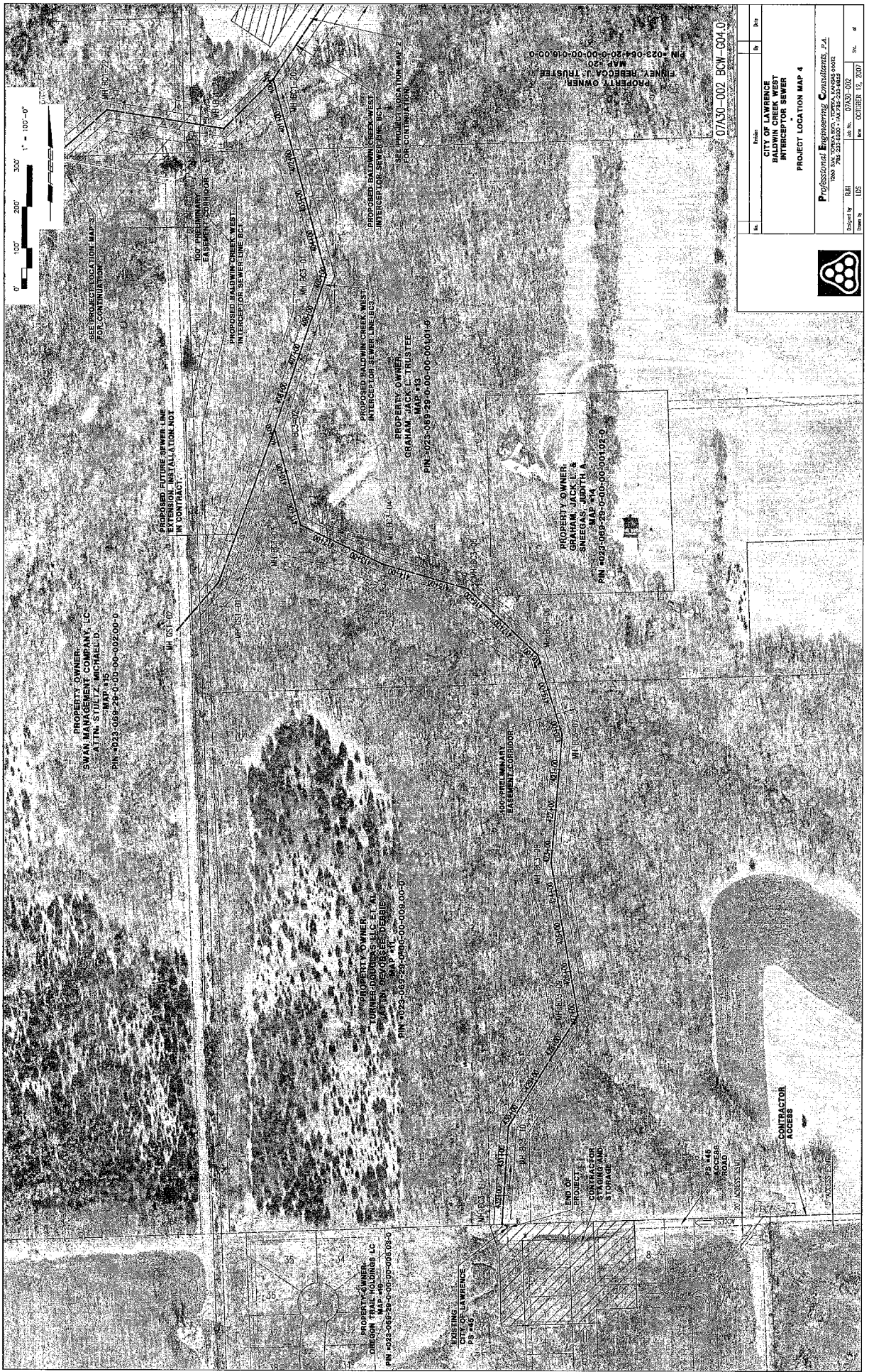
3M-6C 35
Elev. = 935.97
southeast corner of east headwall on the first box culvert south of 6th Street
under K-10 (three chamber box culvert near the X-10 east R.O.W. line)

[illegible]



	IN		Source		By	Date
	<p style="text-align: center;">CITY OF LAWRENCE BALDWIN CREEK WEST INTERCEPTOR SEWER PROJECT LOCATION MAP 2</p>					
<p style="text-align: center;">Professional Engineering Consultants, P.A. 5045 SW TOWER WAY, SUITE 200, GAINESVILLE, FLORIDA 32608 TEL: 352-381-1100 FAX: 352-381-1101 WWW.PEC-PA.COM</p>						
Designed by	RJS	On Site	07/04/02	Scale	1"	
Drawn by	LJS	Date	08/08/02	3, 2007		

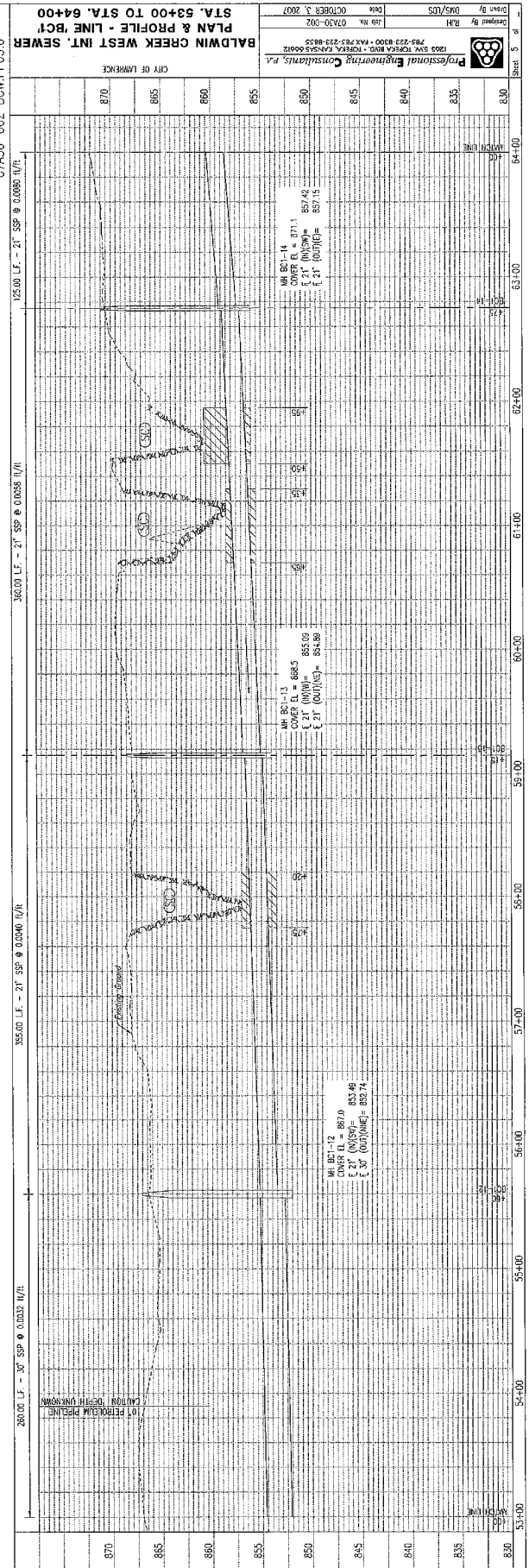
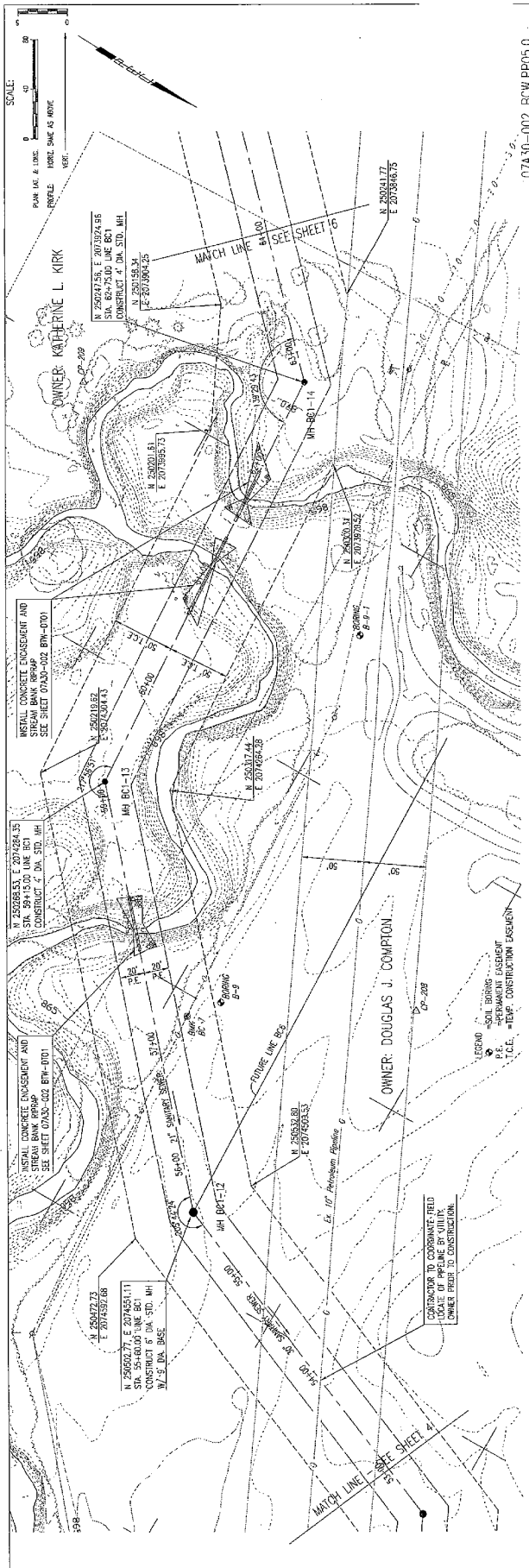
PLAN DIRECTORY	
DRAWING ID	DRAWING NAME
07A00-002 BOM-P007	PLAN & PROFILE - LANE "B1" STA. 75+00 TO STA. 86+00
07A00-002 BOM-P008	PLAN & PROFILE - LANE "B1" STA. 86+00 TO STA. 97+00
07A00-002 BOM-P009	PLAN & PROFILE - LANE "B1" STA. 97+00 TO STA. 106+00
07A00-002 BOM-P010	PLAN & PROFILE - LANE "B1" STA. 106+00 TO STA. 119+00
07A00-002 BOM-P011	PLAN & PROFILE - LANE "B1" & "B2" STA. 119+00 TO STA. 129+25



Sheet	4
City of Lawrence	
Interceptor Sewer	
Project Location Map 4	
Professional Engineer Consultants, P.A.	
1000 N. 10th St., Suite 200	
Lawrence, KS 66044	
Project No.	07A30-002
Drawn By	US
Date	OCTOBER 12, 2007



07A30-002-002-004-001
SHEET 4 OF 4
10/12/07

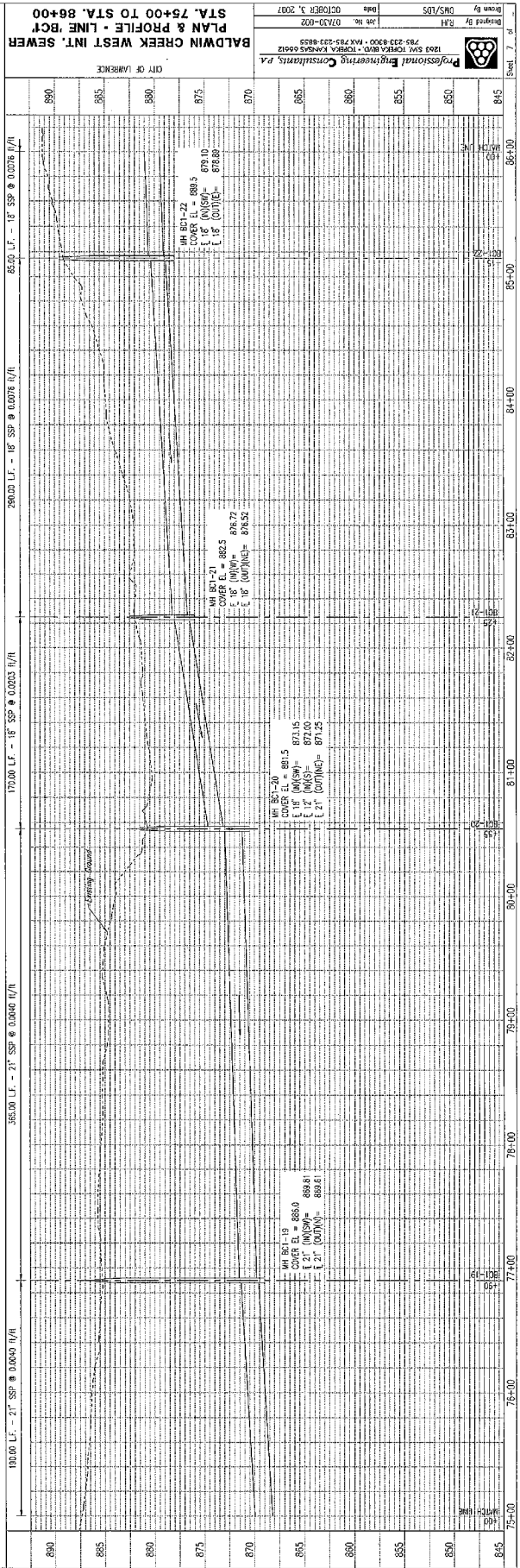
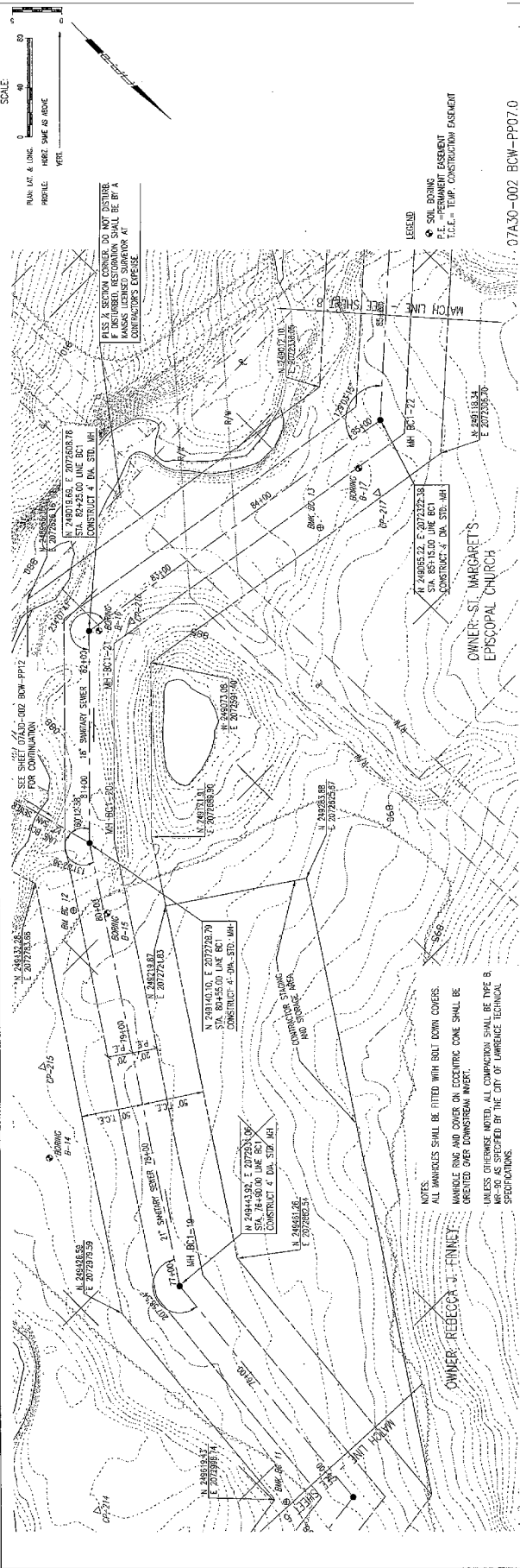


PLAN	CHECKED
DATE	

PROFILE	CHECKED
DATE	

Professional Engineering Consultants, P.A.
1000 S.W. TOWERS ROAD, TOWERS CANAL 00002
780-223-8000 FAX 780-223-8025
DATE: OCTOBER 3, 2007
JOB NO. 07A30-002
DESIGNED BY: RHM
DRAWN BY: BMS/UTS

BALDWIN CREEK WEST INT. SEWER
PLAN & PROFILE - LINE BCI
STA. 53+00 TO STA. 64+00
CITY OF LAWRENCE



PLAN	RECORD	DATE

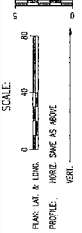
PROFILE	RECORD	DATE

Professional Engineering Consultants, P.A.
1800 S.W. TOWER ROAD - TOWER, KANSAS 66602
785-233-8300 - FAX 785-233-8303

Drawn By: JAH
Date: OCTOBER 3, 2007
Job No: 07A30-002

BALDWIN CREEK WEST INT. SEWER
PLAN & PROFILE - LINE, BCT
STA. 75+00 TO STA. 86+00

CITY OF LAWRENCE



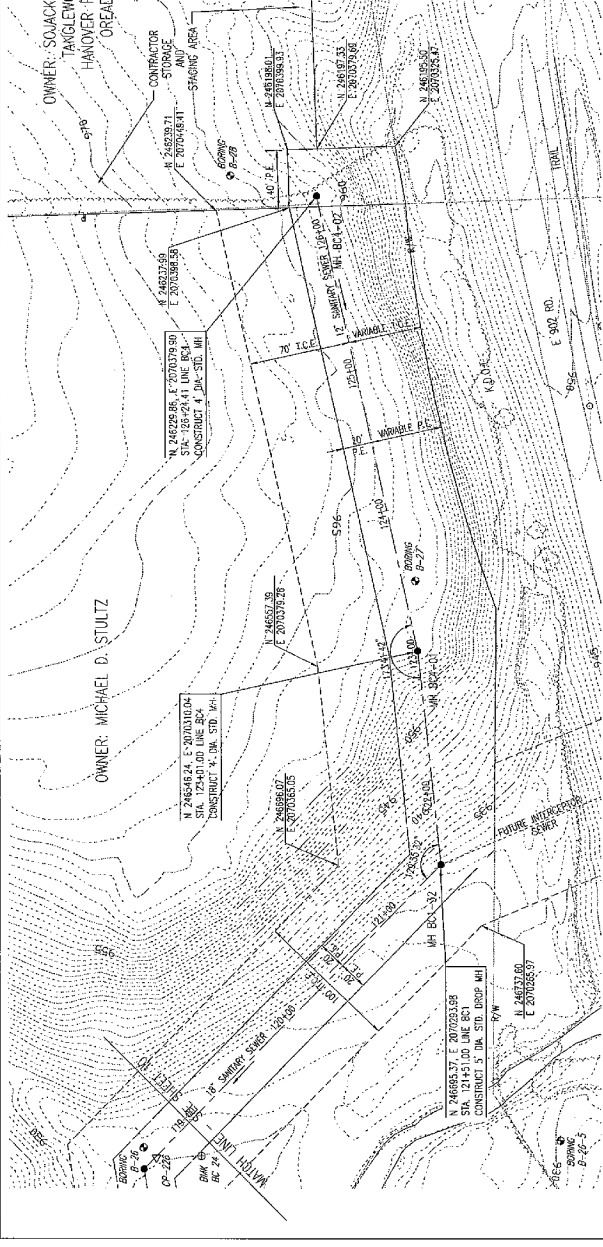
OWNER: SQUACK LAND CO. LC
TANGLEWOOD LC
HANDOVER PLACE LC
DREAD LC

OWNER: MICHAEL D. STULTZ

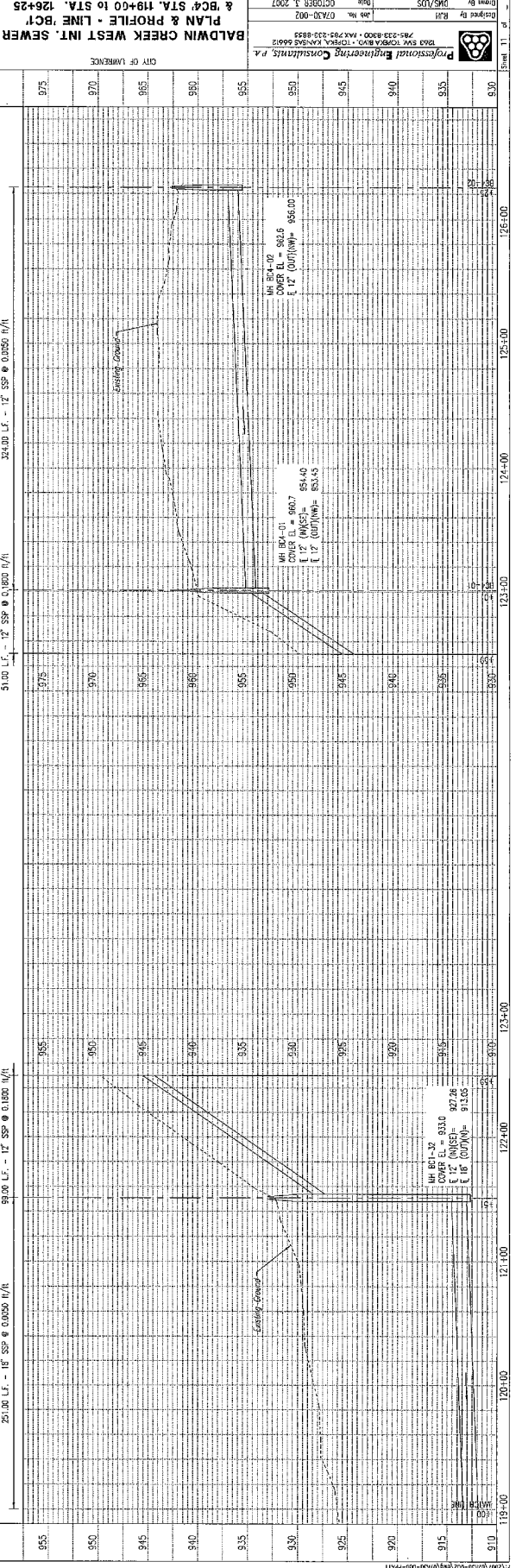
CONTRACTOR
STORAGE
SPACING AREA

LEGEND
S = SOIL BORING
P.E. = PERMANENT EASEMENT
T.E.C. = TEMPORARY CONSTRUCTION EASEMENT

NOTES:
ALL MANHOLES SHALL BE FITTED WITH BUILT DOWN COVERS.
MANHOLE RING AND COVER ON EXISTING CONE SHALL BE
ORIENTED OVER DOWNSTREAM INLET.
UNLESS OTHERWISE NOTED, ALL CONSTRUCTION SHALL BE TYPE B.
MANHOLE SHALL BE SPECIFIED BY THE CITY OF LAWRENCE
TECHNICAL SPECIFICATIONS.



PLAN	DATE
08/08/20	08/08/20

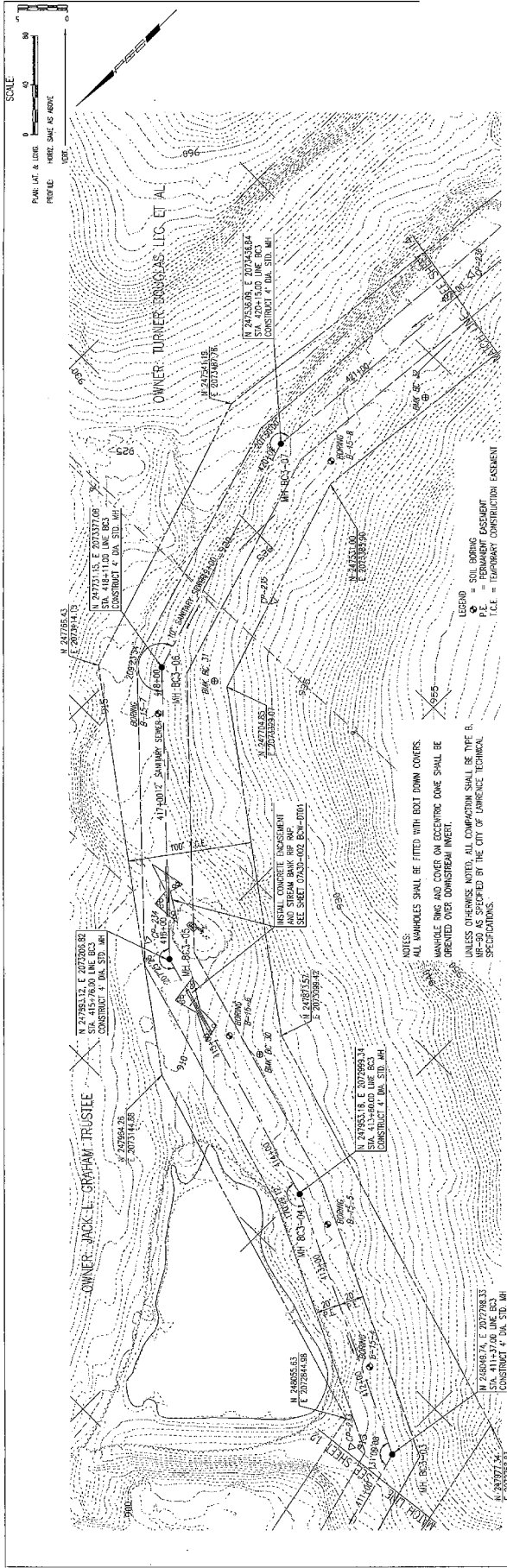


PROFILE	DATE
08/08/20	08/08/20

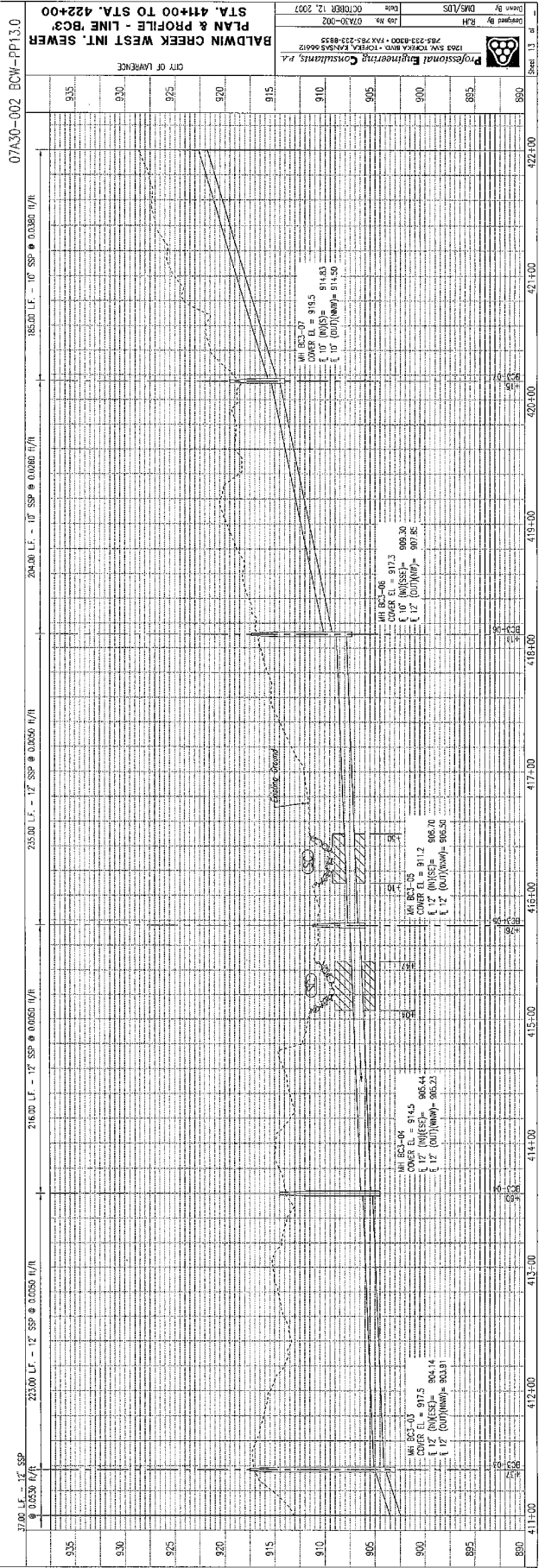
07430-002 BCW-PP11.0

PLAN & PROFILE - LINE B/C1
& B/C4 STA. 119+00 TO STA. 126+25
BALDWIN CREEK WEST INT. SEWER
CITY OF LAWRENCE

Drawn By: JMS/LJS
Job No.: 07430-002
Date: OCTOBER 3, 2007
7/25-333-8300 - FAX 7/25-333-8353
7/25-333-8300 - FAX 7/25-333-8353
Professional Engineering Consultants P.A.
5042 SW TOWER BLVD. - CORVALLIS, OREGON 97331



PLAN	CHECKED	DATE



PROFILE	CHECKED	DATE

07A30-002 BCW-PP13.0

PLAN & PROFILE - LINE 8C1
 BALDWIN CREEK WEST INT. SEWER
 STA. 411+00 TO STA. 422+00

CITY OF LAWRENCE

Professional Engineering Consultants, P.A.
 1303 S.W. CHURCH STREET, SUITE 200
 LAWRENCE, MISSOURI 64503
 PHONE: 781-233-8833
 FAX: 781-233-8833
 DATE: 07/30/2012
 DRAWN BY: DMS/LDS
 CHECKED BY: RLM

CITY OF LAWRENCE

**BALDWIN CREEK WEST
INTERCEPTOR SEWER**

DESIGN MEMORANDUM

DESIGN BUILD PROJECT

**CAS CONSTRUCTION
&
PROFESSIONAL ENGINEERING CONSULTANTS**

PEC Project No. 07A30-001-4028

September 20, 2007

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Numerous Figures are presented within this Design Memo. Figures that indicate drawings are considered conceptual in nature only and do not represent final design/construction drawings and details.

SECTION 1

INTRODUCTION

The City of Lawrence Department of Utilities is currently implementing a series of major wastewater system improvements in the northern, southern, and western areas of the City. These improvements consist of upgrading existing pumping facilities, increasing interceptor sewer capacity to expanded service areas, establishment of new pumping facilities, and designing a new (additional) wastewater treatment plant known as the Wakarusa Water Reclamation Facility (WWRF). All of these new facilities will allow the City to meet the current and future needs resulting from rapid growth throughout the City service areas.

As part of this effort, the Free State Interceptor Sewer and Pump Station No. 48 were completed in July 2007 to provide additional service capability for the connection of currently unserved areas, removal of two existing pump stations from service, and to allow for extension of interceptor sewers into the Baldwin Creek Basin serving the developing northwestern area of the City.

The current project consists of a Design Build extension of a interceptor sewer into Baldwin Creek Sub-Basin BC2. This project is known as the Baldwin Creek West Interceptor Sewer.

The following sections will provide a summary of the design criteria and assumptions utilized for the pre-design conceptual development and GMP cost estimating. These criteria and guidelines will serve as the basis for actual design and construction of the facilities..

The indicated criteria will be subject to review and modification by the Project Team as they move forward into the actual design of the facilities as Phase 2 of the Design Build effort.

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SECTION 2

BACKGROUND

The need for interceptor sewers and pump stations to serve the Baldwin Creek Watershed was originally identified in the 2003 Wastewater Master Plan for the City of Lawrence. Development and associated wastewater growth along 6th Street, which generally forms the southern ridge of the Baldwin Creek Watershed, had been accommodated during the previous decade by a series of pumps stations which discharged to the Yankee Tank Watershed. These included PS#18, PS#40, PS#44, and PS#45.

During the past several years, accelerated residential and commercial development pressures led to additional review of the area. With a companion City effort to establish a new wastewater treatment plant along the Wakarusa River in south Lawrence, the assessments in Northwest Lawrence also considered the potential and probable need for the City to have capabilities to divert Baldwin Creek Basin wastewater flows to both the Kansas River Basin (Pump Station #16, tributary to the existing City WWTP) and to the Yankee Tank Basin (tributary to the proposed Wakarusa Water Reclamation Facility "WWRF").

Reviews were performed on projected wastewater flows from local developments along and north of 6th Street (i.e. Bauer Farms, Bauer Brook Estates, Westwood Hills, etc.), as well as the entire northwest area inclusive of the Baldwin Creek and Yankee Tank Basins. These reviews resulted in the "Westwood Hills and Bauer Brook Estates Sanitary Sewer Study" by Professional Engineering Consultants in December 2005 and the "Northwest Area Master Plan Update", Draft Report, by Black and Veatch in May 2006.

The recommendations contained in the reports led to the construction of the Baldwin Creek Pump Station (PS#48) and the Free State Interceptor Sewer which were completed in July 2007. These improvements allowed for the abandonment of PS#18 and PS#40. Improvements to the existing Pump Station #16, downstream of PS#48 within the Kansas River Basin, were also completed in 2007. In addition, construction of increased interceptor sewer capacity within the Yankee Tank Watershed was recommended to allow for potential transfer of flow from the Baldwin Creek Basin to the WWRF. These improvements are currently under construction.

In February 2007, Black and Veatch issued the draft report "Wakarusa Water Reclamation Facility, Basis of Design Report" as part of the WWRF development. Information contained in this report reflected updated wastewater system model results which outlined the proposed distribution of wastewater flows between the existing WWTP and the proposed WWRF. As proposed, PS#44 and PS#45 would continue to discharge to the Yankee Tank Creek Basin. In general, all other flows generated within the Baldwin Creek Basin would flow to PS#48. Future flow equalization basin(s) at PS#48 were proposed to dampen future wet-weather peak flows generated within the

Baldwin Creek Basin and allow PS#48 to continue discharging to the Kansas River Basin without overloading PS#16.

As part of the overall Baldwin Creek Sub-Basin plan, additional interceptor sewer capacity had to be configured for the most readily developable portions of the Baldwin Creek Basin located north of 6th Street, east of K-10 Highway, south of the Kansas Turnpike, and east of the recently completed Free State Interceptor Sewer. The City Department of Utilities initiated detailed planning for the Baldwin Creek West Interceptor Sewer with a desired completion by the summer of 2008

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SECTION 3 SYSTEM OVERVIEW

SECTION 3.1 GENERAL:

Figure 3.1.1 indicates the proposed project with new gravity interceptor sewer construction beginning in the vicinity of N 1750 Road at the junction with the recently completed Free State Interceptor Sewer. Preliminary sewer sizing estimates indicate that the sewer will begin as a 30" diameter sewer at the junction with the Free State Interceptor Sewer and reduce in size to 8" or 12" in the upper reaches of the project. The green alignments indicated in Figure 3.1.1 represent potential interceptor sewer extensions into other subwatersheds and are not included in the scope of this project.

SECTION 3.2 MAPPING

With the accelerated schedule desired by the Owner, and the substantial length of the overall routing, the need to obtain up-to-date topographic and mapping information was critical. The City of Lawrence initiated the aerial mapping of this project prior to selection of the Design/Build Team. The aerial mapping was completed and was available from the beginning of the project.

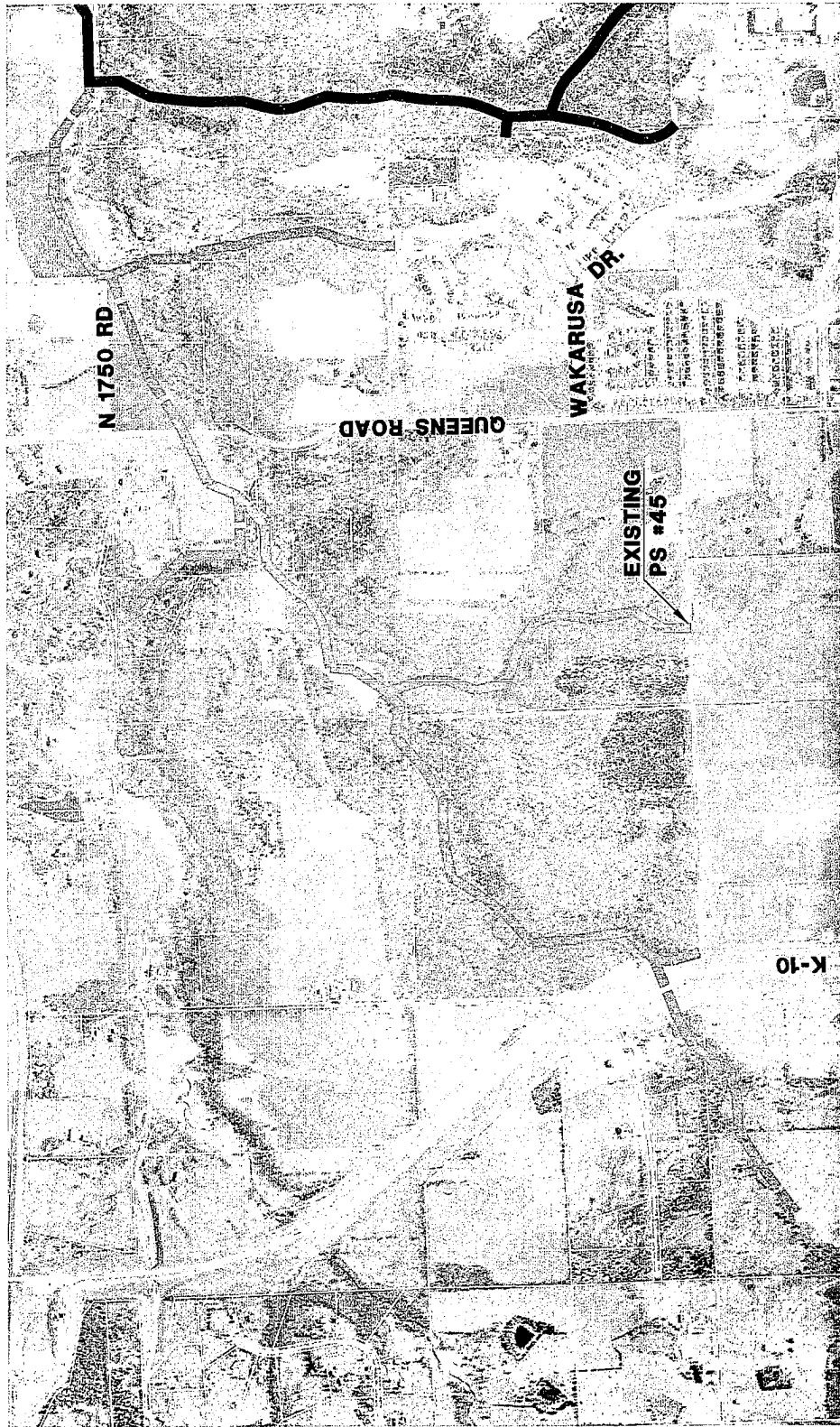
The topographic mapping obtained through aerial mapping was supplemented with select ground surveys and confirmation of specific features in the preparation of preliminary design and construction drawings.

City of Lawrence GIS parcel map overlays were used for initial route configuration and planning maps. This information will be supplemented along the interceptor sewer route by more accurate property information as property and section corners are located and legal descriptions verified.

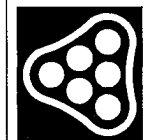
SECTION 3.3 FLOOD PLAIN CONSIDERATIONS

The FEMA Flood Insurance Study, dated November 7, 2001, was used to evaluate the floodplain limits along the proposed interceptor sewer route. The floodway and 100-Year flood boundaries were obtained from the FEMA study and electronically superimposed on the alignment route maps and aerial photography. The floodway and 100-Year flood boundaries extend along the entire length of Baldwin Creek from the beginning of the project along N 1750 Rd to K-10 highway. Except for the main branch of Baldwin Creek that joins Baldwin Creek west of Queens Road, no floodplain mapping exists for the smaller tributaries to Baldwin Creek.

In general, the proposed alignment of the Baldwin Creek West Interceptor Sewer lies within the 100-Year floodplain but outside the floodway along its entire length from the project beginning near N 1750 Rd to the end of the project near K-10 highway. The



——— FREE STATE INTERCEPTOR SEWER
 - - - PROPOSED INTERCEPTOR SEWER
 . . . FUTURE INTERCEPTOR SEWER



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CITY OF LAWRENCE
 BALDWIN CREEK WEST INTERCEPTOR SEWER

FIGURE 3.1.1 – PRELIMINARY ALIGNMENT

proposed alignment crosses the floodway three times in the vicinity of the confluence with the north branch of Baldwin Creek west of Queens Road and lies within the floodway for approximately 900 feet as the sewer approaches K-10 highway.

Interceptor sewer line construction will not result in any significant change to the ground elevations in comparison to pre-construction conditions. No obstructions to the flow of floodwaters will result from the project. Interceptor sewer stream crossings and concrete encasement/erosion cutoff wall installation will be below the flowline of the creek. Rock rip rap erosion protection is also not expected to constrict the stream channel cross-section. Details of these proposed installations are illustrated in Section 4.

All manhole covers used on this project will be bolt-down lids with gaskets to inhibit flood water inflow into the new interceptor sewer line. All manhole joints will receive a shrink-wrap seal application in addition to the bitumastic joint sealing material to further limit any infiltration of flood waters into the new interceptor sewer line. In general, the tops of manholes will be located approximately 6" above existing grade.

SECTION 3.4 SYSTEM PLANNING:

The northwest Lawrence area has been the subject of a number of recent studies and reports. These include:

“Westwood Hills and Bauer Brook Estates Sanitary Sewer Study”, Professional Engineering Consultants, December 2005

“Northwest Area Master Plan Update”, Draft, Black and Veatch, May 2006

“Pump Station #18 Evaluation Report”, Draft, Professional Engineering Consultants, July 2006

“Pump Station No. 48 Design Memorandum”, CAS Construction and Professional Engineering Consultants, September 19, 2006

“Water Reclamation Facility Basis of Design Report”, Draft, Black and Veatch, February 2007

Information from these reports was utilized to coordinate proper configuration of the proposed interceptor sewer.

SECTION 3.5 GEOLOGY:

Due to the highly varied terrain throughout the project area and the known presence and variation of rock, a major field geology effort was initiated to provide the Owner and Project Team contractors a better ability to assess cost impacts.

The primary purpose of the geotechnical field work and study were to explore and evaluate the subsurface conditions at the various locations along the interceptor route. Based on field information, Kleinfelder Geological Services developed specific recommendations relating to the geotechnical aspects of the project design and

construction. The scope of services provided to achieve these purposes included the following:

- Review of available soil and geological information.
- Drill and log a total of 48 initial borings to explore the subsurface conditions along the routes and to obtain samples at selected locations for laboratory testing.
- Performed field and laboratory tests on select samples to evaluate the geotechnical engineering properties of the materials.
- Reviewed and analyzed field and laboratory data to assess subsurface conditions and to develop geotechnical engineering recommendations.
- Prepared an engineering report summarizing findings and recommendations.

A report was completed and entitled "Subsurface Exploration & Geotechnical Report, Baldwin Creek West Interceptor Sewer, K-10 Highway to N1750 & Queens Road, Lawrence, Kansas, Project No. 85788".

The report is referenced as a supplement to this Design Memorandum. The information, results, conclusions, and recommendations will be utilized with the other indicated criteria for final design of the interceptor sewer. All information from the report has been included as a stand alone Appendix to this Design Memorandum.

SECTION 3.6 UTILITIES:

The proposed alignment of the Baldwin Creek West Interceptor Sewer traverses a relatively undeveloped area with few utilities. Initial attempts have been made to configure the proposed interceptor sewer to minimize any impact on existing utilities. Contractor members of the Project Team including the geotechnical consultant shall notify DIGSAFE prior to any excavation activities.

Magellan Petroleum Pipeline: A 10" diameter petroleum pipeline follows Baldwin Creek along the lower half of the project alignment. The pipeline has been located by Magellan and its location surveyed by PEC. The proposed interceptor sewer and associated temporary construction easements are designed to lie outside a 100-foot corridor centered on the Magellan Petroleum Pipeline to minimize potential impacts. Two crossings of the Magellan Petroleum Pipeline are necessary to complete the sewer installation.

Rural Water District No. 1: Water lines in the project area are owned by Douglas County Rural Water District No. 1. The proposed sewer is expected to cross existing waterlines along N 1750 Rd and Queens Road.

Westar: In addition to overhead electrical distribution lines typically located along existing roadways, the proposed interceptor sewer alignment crosses beneath a high voltage electrical transmission line west of where the BC3 segment (branch serving

existing PS#45) joins BC1, the main Baldwin Creek branch. Contractor members of the Project Team will confer with Westar regarding precautions to be utilized for construction in proximity to the high voltage transmission line.

Gas and Telephone: Buried gas distribution and telephone service lines are known to exist along roadways crossed by the proposed sewer alignment. These will be located for identification on the plans. Contractor members of the Project Team will work with utility representatives to protect, support or relocate these utilities within the construction zone at the time of sewer installation.

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SECTION 4

DESIGN CRITERIA

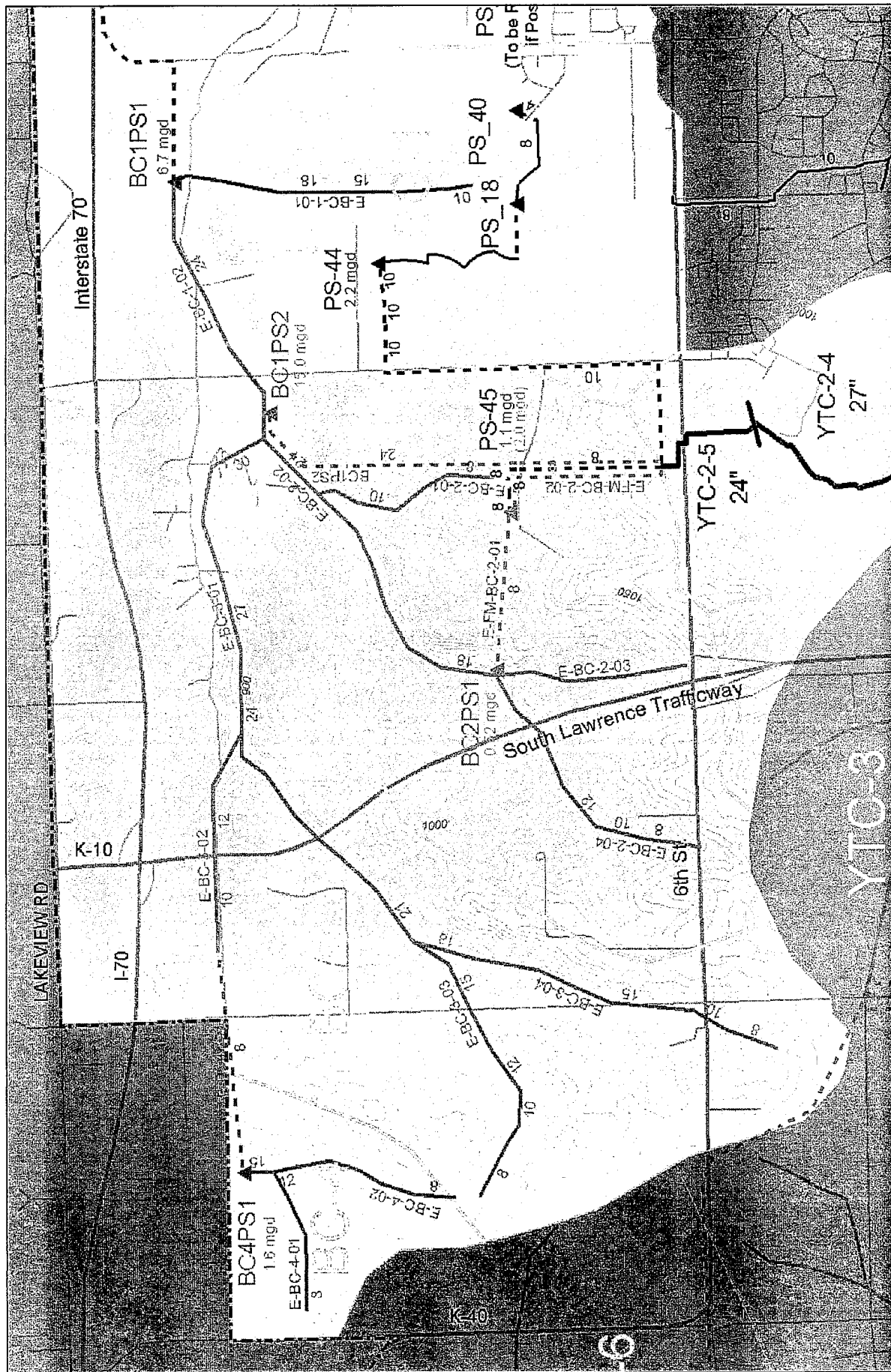
SECTION 4.1 FLOW PROJECTIONS AND LINE SIZING CONFIRMATION

Flow Projections: Flow projections for Baldwin Creek have been addressed to varying degrees within each of the studies identified in Section 3.4. The flow projections contained in the most recent study, "Water Reclamation Facility Basis of Design Report", reportedly incorporated the Southeast and Northwest Updates to the 2003 Master Plan and represents the most current overall data available. This data was used as the primary check for estimating sub-basin wastewater flow generation within the Baldwin Creek Basin for this project. An excerpt from Figure 1 of the Master Plan Update reproduced in the Figure on the following page shows the Baldwin Creek Basin with the its four sub-basins designated BC-1 through BC-4.

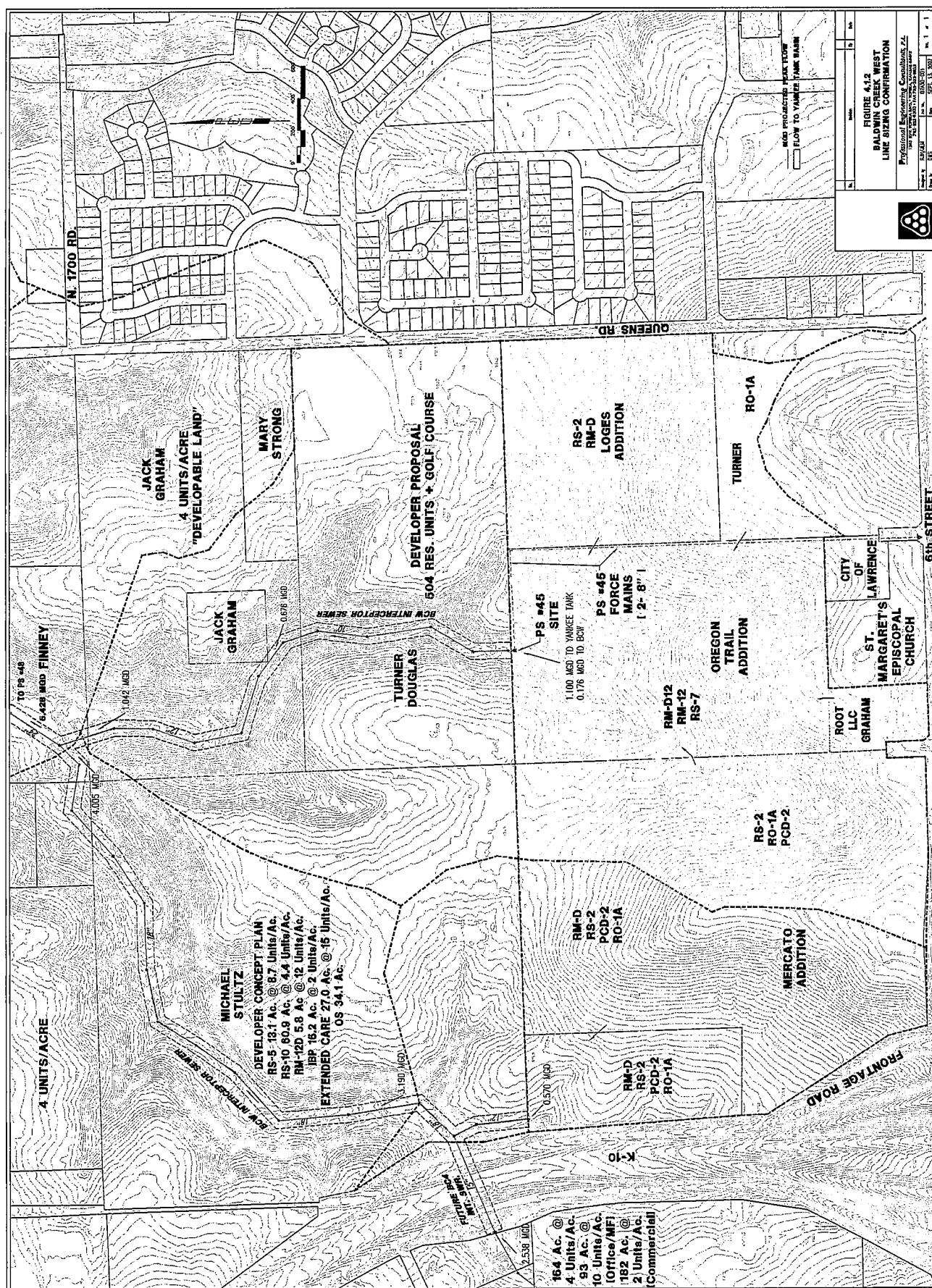
Except for the PS #44 and PS#45 service areas, flow projections for areas smaller than the four Baldwin Creek sub-basins were not provided in the various reports. Since this project lies primarily within the BC-2 Sub-Basin, flows within the BC-2 Sub-Basin were estimated by PEC by applying proposed or projected land use types and densities to the City of Lawrence Development Land Use Input worksheet. The worksheet was developed for the City from the modeling data obtained from the 2003 Wastewater Master Plan and incorporates numerous criteria for estimating wastewater generation and peaking rates.

Pump Station #45: A Benefit District was created for the construction of PS#45 several years ago. The pump station was constructed but has never been used to pump wastewater. The station's rated capacity is 1.10 MGD. The two 8" force mains from this station discharge to the south into the Yankee Tank Basin. This flow will eventually be treated by the future Wakarusa Water Reclamation Facility (WWRF). The Benefit District includes all land within the one-half mile strip immediately north of Sixth Street between Queen's Road and K-10 Highway that is tributary to the Baldwin Creek Basin and lies within the Lawrence city limits. The service area for PS#45 is illustrated in yellow on Figure 4.1.2. The far western portion of the benefit district encompassing the western portion of the proposed Mercato Addition is not tributary to PS#45. The future construction of another pump station in the far northwestern corner of the Mercato property was originally intended to serve this portion of the benefit district with discharge to the PS#45 service area. The extension of the Baldwin Creek West Interceptor Sewer to this northwest corner of the Mercato Addition as proposed in this project eliminates the future need for this pump station.

Development Land Use Input worksheets for this area were developed independently by Black & Veatch (Master Plan Update), the City of Lawrence Department of Utilities staff (Planning and Zoning efforts), and PEC (for this project). The projected peak flow estimated for this area by all three entities fell within the very close range of 1.846 to



NORTHWEST AREA PLAN UPDATE - FIGURE 1 EXCERPT



1.869 MGD although there were variances in the distribution of flows between the area tributary to PS#45 and the western portion of the proposed Mercato Addition. A more precise estimate of the distribution of flows between the two service areas cannot be provided without a wastewater service plan for the Mercato Addition.

Based on the PEC estimate of flows for the PS#45 benefit district, the estimated peak flow at PS#45 is 1.276 MGD, 0.176 MGD more than the rated capacity of the pump station. The design of the Baldwin Creek West Interceptor Sewer will include capacity for at least 0.176 MGD of flow from the PS#45 service area. The proposed Baldwin Creek West Interceptor Sewer also enables the elimination of the proposed future pump station in the northwest corner of the Mercato Addition. Capacity for a peak flow of 0.570 MGD from the western portion of the Mercato Addition will be incorporated in the design of the Baldwin Creek West Interceptor Sewer downstream of this connection point.

Baldwin Creek Sub-Basin BC-2: The distribution of projected flows within Sub-Basin BC-2 and the anticipated slope of the interceptor sewer serving the contributing area are the primary variables affecting the sewer line size. Unlike the PS#45 service area where preliminary plats, final plats, or other documents have been submitted with planned development density information, the only development information available for the remainder of Baldwin Creek Sub-Basin BC-2 was a draft concept plan for the Northwest Area Wastewater Master Plan Update prepared by the Lawrence-Douglas County Metropolitan Planning Office. However, during the preparation of this Design Memorandum, developers of two large tracts within Sub-Basin BC-2 submitted concept plans of what they intend to request from the Planning Office. The concept plan for the 172-acre Stulz tract, located between K-10 and the confluence with the interceptor sewer serving PS#45, envisions a wide variety of uses from low density residential to extended care facilities involving duplexes and more densely occupied apartments. The concept plan for the Turner-Douglas tract was submitted by Lindsey Management Company. A golf course/residential plan was proposed for this tract immediately north of PS#45 and west of Queens Road. The proposed housing density depicted on these concept plans were used in the projection of flows. The development density assumptions made to project flows within Sub-Basin BC-2 outside of the areas tributary to PS#45 are outlined below. It should be emphasized that these concept plans have not been formally submitted to or acted upon by the City. The following criteria were used in updating the worksheets:

Areas West of K-10 Highway:

- Land use classifications derived from Draft Concept Plan for NW Area Wastewater Master Plan Update.
- A density of 4 units per acre was used for the estimated 164 acres classified as Low Density Residential.
- The estimated development density for the 182 acres of Office/Industrial/Warehouse classification was set at the Commercial default density of 2 units per acre with an equivalent capita/unit of 3.0.

- The estimated development density for the 93 acres classified as Commercial was set at the default density of 10 units/acre.
- An estimated 90 acres of highway right of way, bike paths, and stream beds was classified as Agriculture/Park

Stultz Tract:

- A preliminary concept plan was provided on September 11, 2007 depicting the following levels of development. A copy of the concept plan appears in Appendix D.
- The Baldwin Creek riparian area including the steep slopes to upland areas is classified as Open Space (34.1 acres).
- The zoning classification RS10 allows up to 267 residential units on 60.9 acres.
- The zoning classification RS5 allows up to 113 residential units on 13.1 acres.
- The zoning classification RM12D allows up to 69 residential units on 5.8 acres.
- The density assumed for the zoning classification Industrial/Business Park (IBP) was set at the default rate of 2 units/acre for the 16.2 acres classified as IBP.
- The 27.0 acres designated as Extended Care was assigned a density of 15 units/acre.

Areas North of Stultz to Ridge Line: This northern fringe of the Baldwin Creek Sub-Basin BC-2 is characterized by relatively flat upland areas with steeper slopes dropping down to Baldwin Creek. The area includes a number of large acreage rural homesites. Development densities for Low Density Residential of 4 units per acre were used for this area.

Turner-Douglas Tract: This 80 acre tract is under contract to a development firm that is proposing a golf course/apartment development. The following is based on a preliminary concept plan submitted on September 6, 2007 by the developers. A copy of the concept plan labeled "The Links at Lawrence" appears in Appendix D.

- 18 acres of rough terrain classified as Agriculture/Park. Most of this area will be fairways and adjacent natural areas.
- Remaining acreage classified as multi-family with 504 units.

Strong/Graham/Finney Tracts

- Floodplain and heavily sloping areas (55 acres) classified as Agriculture/Park.
- All remaining 147 acres classified as Low Density Residential at a default density of 4 units/acre.

The Development Land Use Input worksheets utilized to predict flows at various key points within Sub-Basin BC-2 have been included in Appendix D. The worksheet for the entire sub-basin indicates an average daily flow of 1.157 MGD with a calculated design

(peak) flow of 5.252 MGD. Figure 4.1.2 depicts the estimated flows at key locations within the proposed system. Each of the worksheet flows downstream of PS#45 was increased by 0.176 MGD of excess flow expected to bypass PS#45 into the Baldwin Creek West Interceptor Sewer.

The Lawrence-Douglas County Metropolitan Planning Office provided population estimates for the Baldwin Creek Basin prior to the Master Plan Update which is documented in Appendix B of that report. Three estimates were provided to acknowledge different density scenarios for the area. The medium population estimate was reportedly used as the basis for both subsequent Black & Veatch wastewater planning reports. The medium population for Sub-Basin BC-2 at ultimate build-out is 12,162. The Planning Office estimate is for the entire sub-basin and would reflect the combined population being served by PS#45 and the Baldwin Creek West Interceptor Sewer. The population equivalent represented by the development scenarios presented in the Development Land Use Input worksheets for PS#45 and Sub-Basin BC-2 is 14,307. Removing the population equivalent associated with the Agriculture/Park and Commercial land use categories leaves a population equivalent of 12,632. This population equivalent is considered representative of the residential population of the area. Therefore, the development assumptions utilized to predict flows within the Development Land Use Input worksheets yield a residential population within the sub-basin that is less than 4% greater than the medium population estimate provided by the Planning Office.

Sub-Basin BC-1 Interceptor Sewer: Approximately one-quarter of a mile west of Queens Road Baldwin Creek divides into two major tributary basins. Sub-Basin BC-2 is tributary to the south fork. Sub-Basins BC-3 and BC-4 are tributary to the north fork. Projected wastewater flows were estimated in the Master Plan Update and the subsequent Basis of Design Report, both issued by Black & Veatch. Figure 1 from the Basis of Design Report is reproduced in this section and shows the Average Daily Flow (ADF) projected from each of the four Baldwin Creek Sub-Basins based on the Buildout Population for each Sub-Basin. Two subareas, BC-1S and BC-2S within Baldwin Creek Sub-Basins BC-1 and BC-2, represent the contributing service areas to existing PS#44 and PS#45, respectively. PS#44 will continue to discharge to the Yankee Tank Basin via force main rather than by gravity to the Baldwin Creek system. Although the service area for PS#45 is currently undeveloped, future flows tributary to it will also be pumped to the Yankee Tank Basin south of 6th Street. As discussed in the previous section, a tributary reach of the proposed Baldwin Creek West Interceptor Sewer project will extend to PS#45. Provisions will be included in the current project to permit flows in excess of the pump station capacity to overflow into the Baldwin Creek West Interceptor Sewer. Although normal flows tributary to PS#45 could also be temporarily diverted to the Baldwin Creek West Interceptor Sewer at the option of the City for operational flexibility, the downstream sewer was not designed to accommodate wet-weather flows from PS #45 on a full-time basis.

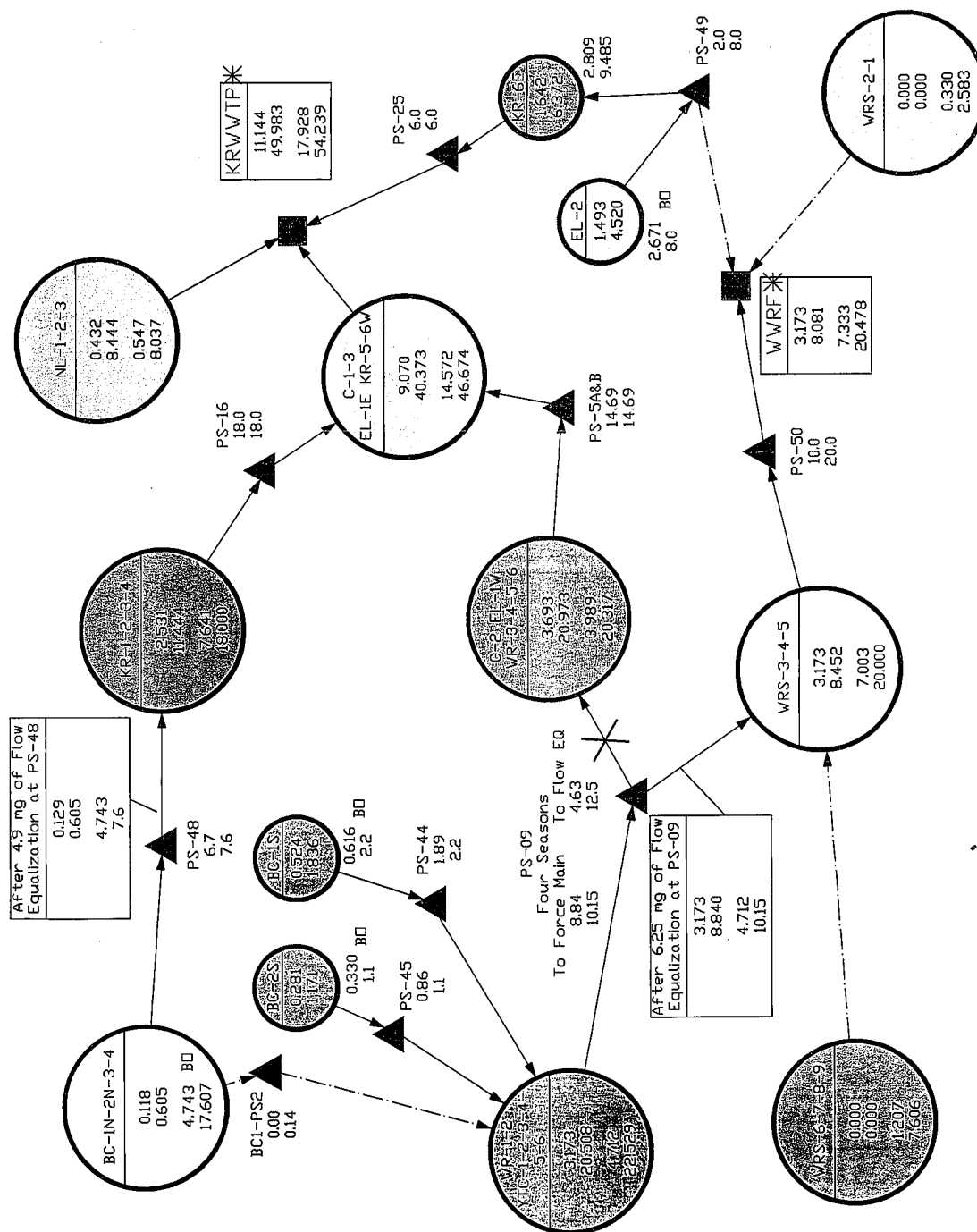
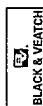
Figure 2 from the Basis of Design Report illustrates the projected Average Daily Flow (ADF) and Peak Wet Weather Flow (PF) at the start-up of the Wakarusa Water Reclamation Facility and at Design Conditions. The flow for the entire Baldwin Creek



Legend

Drainage Areas	
Subsiding Number	WRS-1
Waste Water	■
Treatment Facility	▲
Pumping Station	
Pump Station Firm Capacity (mgd)	1.95
Plant Startup	6.00
Planned Future	
Planned Future	
Cumulative At Startup	
ADP (mgd)	0.259
Peak Flow (mgd)	0.614
Cumulative At 2003	
MP & Updates	
ADP (mgd)	0.659
Peak Flow (mgd)	1.965
Drainage Basins	
BC	Baldwin Creek
C	Central
EL	East Lawrence
KR	Kansas River
NL	North Lawrence
WR	Wakarusa River
WRS	Wakarusa River South
YTC	Yankee Tank Creek

**Figure 2
Simplified
Subsystem Schematic
Projected Flows
2003 Master Plan Basis
with SE and NW
Build Out Updates**



* - All Flows Based on Capacity of Collections (180,000 People)
 B - Flows Based on Buildout Populations

City of Lawrence
Kansas
WWRF Basis of Design
Flows and Loads



Legend

Average Daily
Flow (gpd)
Subsystem
Capacity
(gpd)

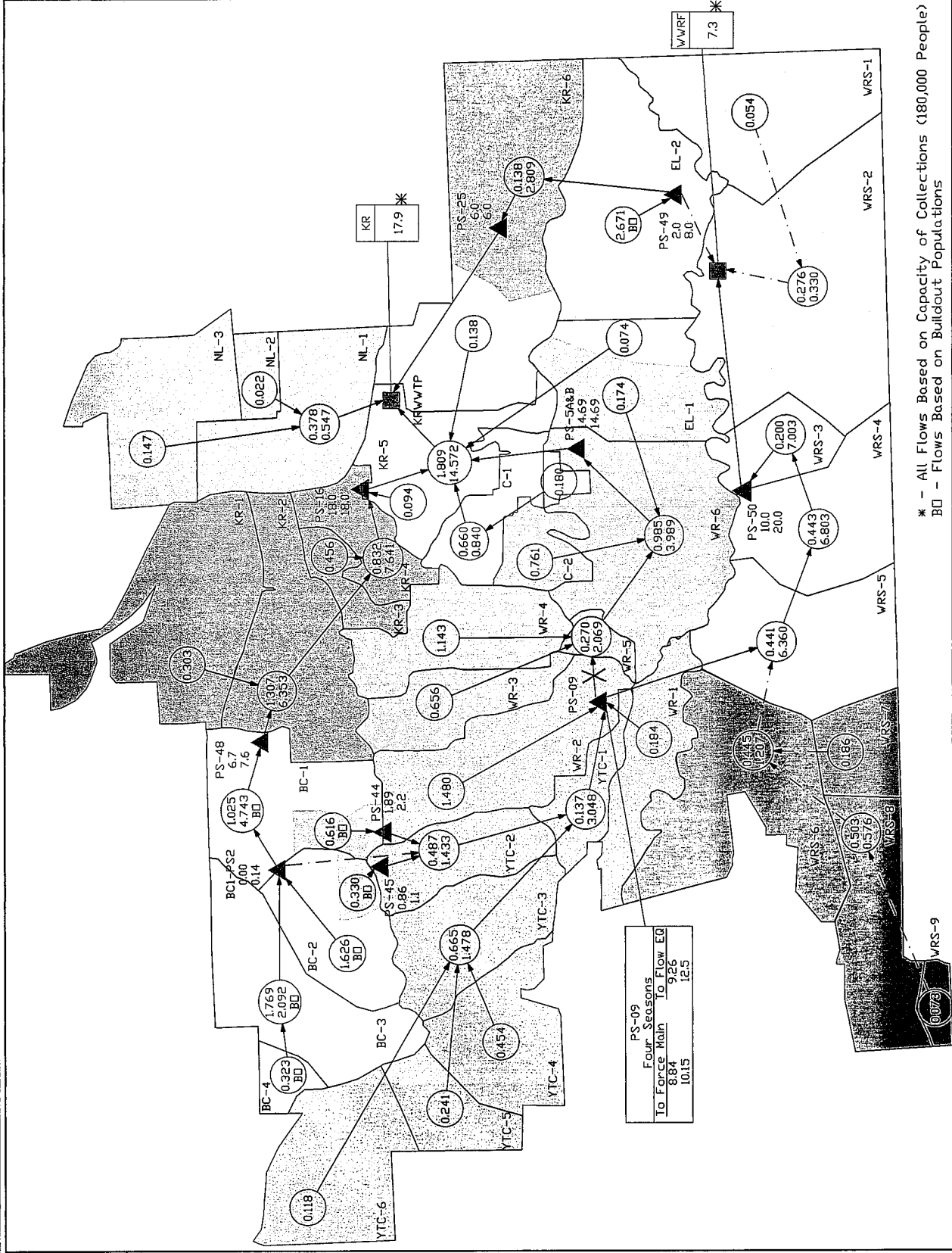
Waste Water
Treatment Facility
Pumping Station
Pump Station Firm
Capacity (gpd)
Plant Startup
Planned Future
VRS-1 Subsystem
Number

Drainage Basins

BC
C
EL
KR
NL
PS
VR
VRS
YTC

Figure 1
Collection System
Projected ADF
2003 Master Plan Basis
with SE and NW
Build Out Updates

02/09/2007
BLACK & VEATCH
CONSULTANTS



Basin is illustrated in the upper left corner of the diagram and lists design conditions of 4.743 MGD ADF and 17.607 MGD PF. The two smaller circles represent the subareas, BC-1S and BC-2S. A small future pump station labeled BC1-PS2 is shown on the illustration. For purposes of this analysis, all flows projected from Baldwin Creek Basin exclusive of PS#44 and PS#45 are assumed to flow toward PS#48 and the future flow equalization basins projected for that location.

PEC compared the design flow and population data that appeared in the Master Plan Update and the WWRP Basis of Design report. This comparison is summarized in Table 4.1.1. As there appeared to be differences in the data, the City of Lawrence, PEC, and Black & Veatch representatives met on September 10, 2007 to identify and resolve any issues regarding the data. The following items were noted during the discussion:

- The flow identified in the Master Plan Update as Average Daily Flow (ADF) is actually the Average Daily Dry-Weather Flow (ADDF). The Master Plan Update flows will be approximately 17% lower than the ADF indicated in the Basis of Design Report.
- Design flows in both reports were estimated through the use of the Development Land Use Input worksheet. No flow modeling of the Baldwin Creek Basin was conducted by Black & Veatch.
- The use of the Development Land Use Input worksheet does reflect some peak flow attenuation as the service area increases. Therefore, the summation of peak flows for component areas will not be the same as the results derived from a single worksheet incorporating all of the component areas. For instance, the Basis of Design indicates a combined flow from the entire Baldwin Creek Basin exclusive of PS#44 and PS#45 to be 17.607 MGD whereas the Master Plan Update indicated a combined flow from Sub-Basins BC-2, BC-3, and BC-4 to be 14.593 MGD and the flow from BC-1 to be 6.628. Summing these two latter values equals 21.221 MGD in comparison to the 17.607 MGD predicted for all four basins combined.
- Part of the difference in population between the two reports is that the Master Plan Update is in "population equivalents" while the Basis of Design is in population. For residential areas, these should be the same. For non-residential areas, the flows generated by commercial, industrial and open space areas are divided by the typical wastewater generation of a single residential person to yield a population equivalent for the flow.
- Part of the difference in population is that the residential population associated with the worksheet category "Office/ Commercial/Multi Family" in the Basis of Design population was inadvertently excluded.
- Both Black & Veatch population estimates include approximately 2,700 additional persons in excess of the target medium density population estimate of 43,419 persons contained in the Planning Office Memo.

In the joint discussions with Black & Veatch, the compatibility of the projections from the Master Plan Update and the Basis of Design Report was generally confirmed. The 14.593 MGD peak flow that appears in the Master Plan Update represents the design

TABLE 4.1.1: BLACK & VEATCH REPORT DATA COMPARISON							
NORTHWEST AREA MASTER PLAN UPDATE (MPU) AND							
WAKARUSA WATER RECLAMATION FACILITY (WWRF)							
	MPU ¹ ADDF (MGD)	WWRF ¹ ADF (MGD)	MPU Design Flow (MGD)	WWRF Design Flow (MGD)	MPU ³ Population Equivalent	WWRF ⁴ Population	
PS#44	0.526	0.616	2.125	2.200 ²	5264	4088	
PS#45	0.282	0.33	1.337	1.100 ²	2819	2272	
BC-1 PS#48	1.102	1.025	6.628	17.607	8765	4531	
BC-2	3.565	1.626	14.593		35653	13029	
BC-3		1.769					28092
BC-4		0.323					
Total	5.475	5.689	24.683	20.907	52501	38983	
						Total	

(1) ADDF equals the Average Daily Dry Weather Flow which is 17% less than the ADF or Average Daily Flow

(2) The flows for PS#44 and PS#45 in the WWRF Basis of Design were set at the respective pump station capacities

(3) Population Equivalent includes the resident population plus the equivalent resident population that would generate the same amount of wastewater as estimated for commercial, industrial and other non-residential customers.

(4) Population estimate inadvertently excludes resident population in the category "Office/Commercial/Multi Family"

flow at the confluence of the upper three sub-basins and includes the flow from a proportionate share of the 2700+ excess population above the target medium density development level presented by the Planning Office. A consensus was reached by City Staff, Black & Veatch, and PEC that flow estimates generated by the current review were consistent and compatible with previous efforts, documented report modifications, and the overall planning process and goals.

The peak design flow for Sub-Basin BC-1 as presented in the WWRf Basis of Design Report is 17.607 MGD. This is 3.014 MGD lower than the sum of the peak flows from Sub-Basin BC-1 and the combined area of Sub-Basins BC-2, BC-3 and BC-4 that appeared in the Master Plan Update worksheets. Due to the shorter times of concentration, it can be assumed that the peak flow from all subareas of Sub-Basin BC-1, including the Free State and Martin Park subareas, would reach PS#48 long before the peak flows from the upper three sub-basins. The attenuation of peak flows that occurs in a large watershed is reportedly reflected in the Development Land Use Input worksheet results when all four sub-basins are included in one worksheet as was done to determine the 17.607 MGD in the Basis of Design Report.

The flows used for Free State and Martin Park subareas were derived from updated versions of the Development Land Use Input worksheets presented in the Westwood Hills and Bauer Brook Estates Sanitary Sewer Study. The same acreage and land use density data from the sanitary sewer study was inserted into the newer version of the Development Land Use Input worksheet that was used in the Master Plan Update Report. This results in estimated peak flows from the Martin Park and Free State subareas of 1.105 and 2.627 MGD with estimated average daily flows (ADF) of 0.139 and 0.505 MGD, respectively. The ADF estimate for the Upper BC-1 Sub-basin, including areas downstream of PS#44 and on both sides of the KTA west of PS#48, was calculated from the average daily flow for Sub-Basin BC-1 less the ADF for Free State and Martin Park subareas. Approximately 37.2 % of the Sub-Basin BC-1 flow is allocated to the Upper BC-1 Sub-Basin.

To estimate the attenuated flow from each of the three BC-1 subareas (Martin Park, Free State and Upper BC-1), the 3.014 MGD increase in peak flow between the confluence of upper three Sub-Basins and PS#48 was distributed in proportion to the average daily flow assigned to each of these BC-1 subareas. Although the peak flow from the three subareas would have passed through the system before the peak flow from Sub-Basins BC-2, BC-3 and BC-4 reach Sub-Basin BC-1, the calculated residual peak flow from these three subareas would still represent a 2.94 times increase above the average daily flow for these subareas.

The peak flow entering PS#48 presented in the WWRf Basis of Design is 17.607 MGD. Within 25 feet of PS#48 the sewer serving the future Martin Park development area east and south of PS#48 connects to the main interceptor sewer. Subtracting the residual peak flow of the Martin Park area (0.407 MGD) from the PS#48 peak flow (17.607 MGD) results in the 17.200 MGD estimated peak flow for the recently constructed 30" and 36" interceptor sewer between the entrance manhole to PS#48 and the junction of the

proposed Baldwin Creek West Interceptor Sewer and the Free State Interceptor Sewer. The proposed Baldwin Creek West Interceptor Sewer project begins at this junction with the Free State Interceptor Sewer north of N 1750 Rd. Reducing the 17.200 MGD estimated peak flow downstream of the junction with the Free State Interceptor Sewer by the residual peak flow allocated to the Free State Interceptor Sewer (1.486 MGD) results in an estimated peak flow of 15.714 MGD for the Baldwin Creek West Interceptor Sewer upstream of the Free State confluence. For design purposes, the residual peak flow expected from the Upper BC-1 subarea was inserted along the proposed Baldwin Creek West Interceptor Sewer alignment north of N 1750 Road where the sewer serving the area downstream of PS#44 would be expected to connect. Removing the residual peak flow allocated to the Upper BC-1 subarea (1.121 MGD) leaves the 14.593 MGD contributed by the three upper Baldwin Creek Sub-Basins as presented in the Master Plan Update.

As indicated in the discussions with Black & Veatch, the population estimate underlying these flow estimates is more than 2700 persons above the target population estimate agreed to in earlier discussions. This excess population would contribute more than 1 MGD to the peak flow at PS#48. To more accurately reflect the expected peak flows along various reaches of the Baldwin Creek West Interceptor Sewer, the peak flows as presented above were reduced in direct proportion to the respective ADF. A summary of the data is presented in the following table.

Interceptor Sewer Segment	Unadjusted Design Flow (Peak Wet Weather Flow) MGD	Adjusted Design Flow (Peak Wet Weather Flow) MGD
PS#48 Influent Pipe	17.607	16.564
Free State Interceptor Sewer to PS#48	17.200	16.180
N 1750 Rd Crossing to Free State Interceptor Sewer	15.714	14.778
Confluence BC-2/BC-3 to N 1750 Rd Crossing	14.593	13.721
Confluence SE BC-2 Branch / SW BC-2 Branch to BC-2/BC-3 Confluence	N/A	5.428
SE Branch (below PS#45)	N/A	1.042
SW Branch (below K-10)	N/A	4.005
K-10 East Side	0.521	0.570
K-10 West Side	N/A	2.538

The Design Team is not responsible for any future variation from these developed wastewater flows and assumed design flow volumes and rates due to short-term and long-term changes in development characteristics. This includes changes due to revisions in preliminary plans, zoning, plats, approved wastewater service plans (following publication of this design memo) and/or inclusion of development and wastewater flow generation beyond or imported into the indicated watershed boundaries.

SECTION 4.2 INTERCEPTOR SEWER LINE SIZING

The Projected Peak Wet Weather Flow (PF) is the design flow used to size the proposed sewer line. The design flows for sewers within Sub-Basin BC-2 are those derived from the Development Land Use Input worksheets prepared by PEC and presented in Figure 4.1.2. The design flows for the interceptor sewer within Sub-Basin BC-1 were the adjusted design flows as calculated and discussed above.

The following design criteria were used in the capacity calculations for the proposed interceptor sewer. They are consistent with KDHE requirements, those used in the Lawrence Wastewater Master Plan, and other previous studies conducted for the City of Lawrence.

- Manning's 'n' = 0.013
- 2/3-full pipe capacity up through 18-inch diameter sewers
- 3/4-full pipe capacity for sewers > 18-inch diameter

The minimum required slope is the sewer gradient at which the designated pipe size can convey the design flow at the design depth. Each sewer segment will be designed to equal or exceed the minimum required slope for the required design flows and depths. The following summary table outlines the assumed criteria.

The 16.180 MGD Design Flow for the existing sewer downstream of the junction of the Baldwin Creek West and Free State Interceptor Sewers is approximately 1.4 MGD higher than the design flow estimate used at the time of the PS#48 design. The slope of the existing 30" sewer is more than sufficient to convey the revised flow within the ¾ of full capacity criteria. However, the 36" sewer would operate at approximately 97% of full pipe capacity at the adjusted design flow rather than the original design concept of operating below 75% of full pipe capacity. The ability to convey the 10-Year wet weather peak flow at full pipe flow has been considered as an acceptable design condition by both the City and KDHE on previous hydraulic studies.

The proposed 30" sewer from the connection to the Free State Interceptor Sewer upstream to the confluence of the upper Baldwin Creek Sub-Basins will operate between 75% and full flow capacity at the Adjusted Peak Wet Weather Design Flow. All other proposed interceptor sewer segments are designed to convey the estimated peak wet weather flow at the more conservative criteria of less than ¾ of full flow capacity for sewers larger than 18" in diameter and 2/3 full for 18" and smaller sewers.

The 12" sewer segment designated K-10 East Side is a short connector sewer between the Mercato Subdivision and the 18" Baldwin Creek West Interceptor Sewer before it passes under K-10 highway. Because of the presence of rock and highly variable terrain, part of the line is very steep while the remainder is relatively flat.

Interceptor Sewer Segment	Design Flow (MGD)	Line Size	Minimum Expected Slope (ft/ft)	Capacity* Design/Full (MGD)
Existing Sewer				
Free State Interceptor Sewer Junction to PS#48	16.180	36"	0.0015 (Existing)	15.22/16.69
Free State Interceptor Sewer Junction to PS#48	16.180	30"	0.0110 (Existing)	25.35/27.80
Proposed Project				
N 1750 Rd Crossing to Free State Interceptor Sewer Junction	14.778	30"	0.0032	13.67/15.00
BC-2/BC-3 Confluence to N 1750 Rd Crossing	13.721	30"	0.0032	13.67/15.00
Confluence SE BC Branch/SW BC Branch to BC-2/BC-3 Confluence	5.428	21"	0.0040	5.91/6.48
SE Branch Lower Reach	1.042	12"	0.0050	1.28/1.63
SE Branch (below PS#45)	0.676	10"	0.0130	1.27/1.61
SW Branch Lower Reach	3.190	18"	0.0050	3.76/4.80
SW Branch (below K-10)	4.005	18"	0.0070	4.45/5.68
K-10 East Side	0.570	12"	0.005	1.28/1.63
K-10 West Side (Not included in current Project)	2.538	15"	0.0065	2.64/3.37

*Design Capacity calculated at a depth equal to 2/3 of pipe diameter for sewers 18" or less in diameter and 3/4 of pipe diameter for sewers greater than 18" in diameter.

The line sizes projected for the Baldwin Creek West Interceptor Sewer at the projected design flows generally conform to those presented in the Northwest Area Master Plan Update with one major exception. The interceptor sewer between the confluence of the three upper Baldwin Creek Sub-Basins to the junction with the Free State Interceptor Sewer is proposed as a 30" sewer rather than the 24" illustrated in Figure 1 of the Master Plan Update. In the WWRf Basis of Design Report, the future 15.0 MGD pump station proposed in the Master Plan Update in the vicinity of the confluence of the three upper Sub-Basins was essentially eliminated and flow equalization adjacent to the newly constructed PS#48 substituted. This change requires the interconnecting sewer to be able to convey the entire peak wet weather flow to the equalization basins and necessitated the change to a 30" sewer.

SECTION 4.3 PIPING MATERIALS AND SPECIAL CONSTRUCTION NEEDS

Piping Materials: Piping materials under consideration include both materials specified in the City of Lawrence Construction and Material Specifications and some that are not.

Any materials that are not currently specified by the City of Lawrence will require submittal of sufficient supporting documentation to satisfy the Design Build Team and the City as to the material's applicability for use on this project. The following materials have been considered:

- **PVC, SDR26** Sanitary Sewer Pipe as specified under the City of Lawrence Construction and Material Specifications.
- **Ductile Iron Pipe (DIP)** as specified under the City of Lawrence Construction and Material Specifications including Protecto 401 epoxy coating. Class 250 subject to design confirmation.
- **PVC, C905 Pressure Pipe, DR25.** This pipe is being considered for use as 30" diameter sewer pipe. It has a slightly thicker wall than PVC, SDR26 Sanitary Sewer Pipe. Installation would be subject to the same City of Lawrence Construction and Material Specifications as applicable for the PVC Sanitary Sewer Pipe.
- **Vylon PVC Sewer Pipe.** This pipe is not specified by the City of Lawrence. It is being priced for comparative purposes. No review of construction criteria has been conducted at the present time.
- **HDPE SDR17 Pipe.** This pipe is not specified by the City of Lawrence. It is being priced for comparative purposes. No review of construction criteria has been conducted at the present time.
- **Welded PVC/SDR 26 Pipe.** This specialized pipe is not specified by the City of Lawrence. Although it is PVC pipe of the same thickness designation as the specified PVC pipe, it is butt-fused into continuous runs of pipe rather than joined by a gasketed connection.

Manholes: All manholes supplied as part of this project shall conform to the following requirements:

- Interior lining as specified in Section 2510.3 of the City of Lawrence Construction and Material Specifications and applied per manufacturer's specifications. Zebtron 100% solids hybrid polyurethane or Raven 100% solids, ultra high build epoxy coating.
- Bolt-down type lids (Four bolts or less) with seal
- Joints between manhole sections and adjustment rings shall be encapsulated with a wrap-around heat shrinkable sheet with crosslinked polyolefin backing, coated with a protective heat activated adhesive. Material shall be Canusa-CPS WrapidSeal or approved equal.

Stream Crossing Details: Eighteen stream crossings have been identified along the proposed sewer alignment, fifteen of which require permits from the Division of Water Resources (DWR). Details for the construction of concrete encasement/erosion cutoff walls and rip rap erosion protection were developed for and utilized on the PS#48 project. These are reproduced here as Figures 4.2.1, 4.2.2 and 4.2.3 and are proposed for use on

the Baldwin Creek West Interceptor Sewer project. Figure 4.2.4 is a modification of the concrete encasement detail to reflect the inclusion of a communications conduit in the encasement in conjunction with the sewer line. The regulatory compliance requirements for these crossings are addressed in Section 5.

Road Crossings: The proposed alignment will require permits for road crossings at two locations. These are crossings of township roads N 1750 Rd and E 1000 Rd (Queens Road). Permit applications will be submitted to Kanwaka Township through the Douglas County Public Works Department. It is anticipated that 42" steel casing will be installed by open cut excavation across both road right of ways. Special consideration will be provided along 1750 Road to account for future ROW width for arterial street construction.

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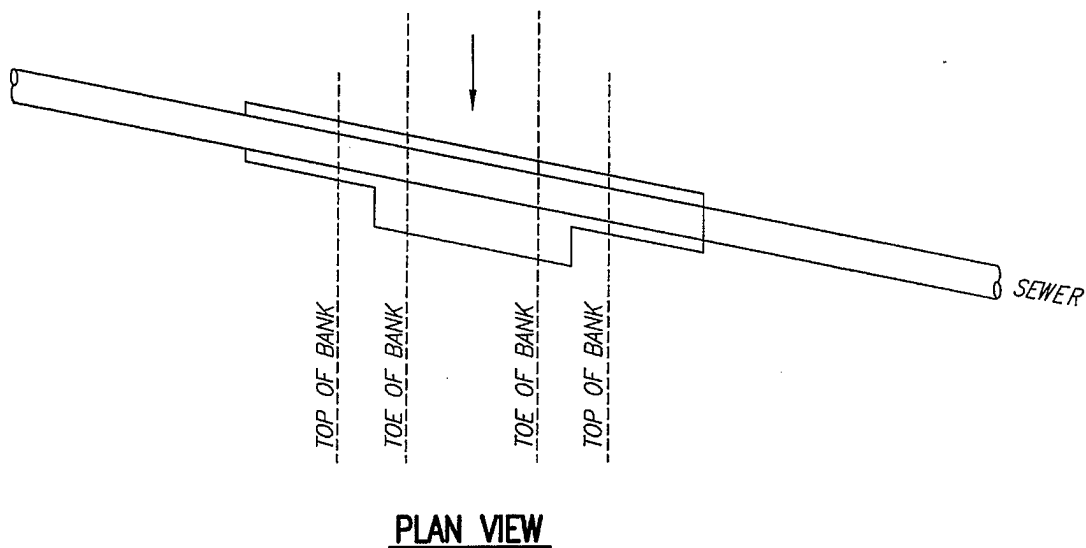
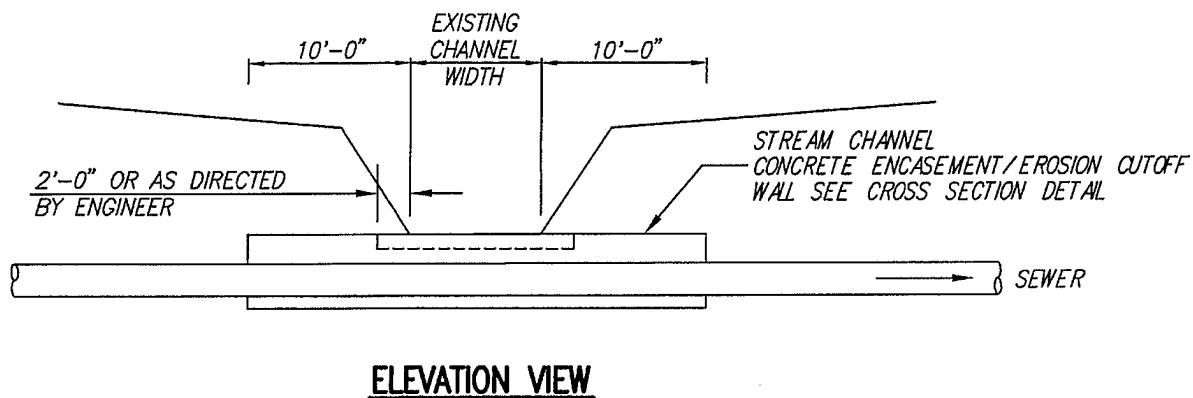
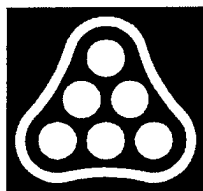


FIGURE 4.21 - STREAM CHANNEL CROSSING DETAIL



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Engr. RJH

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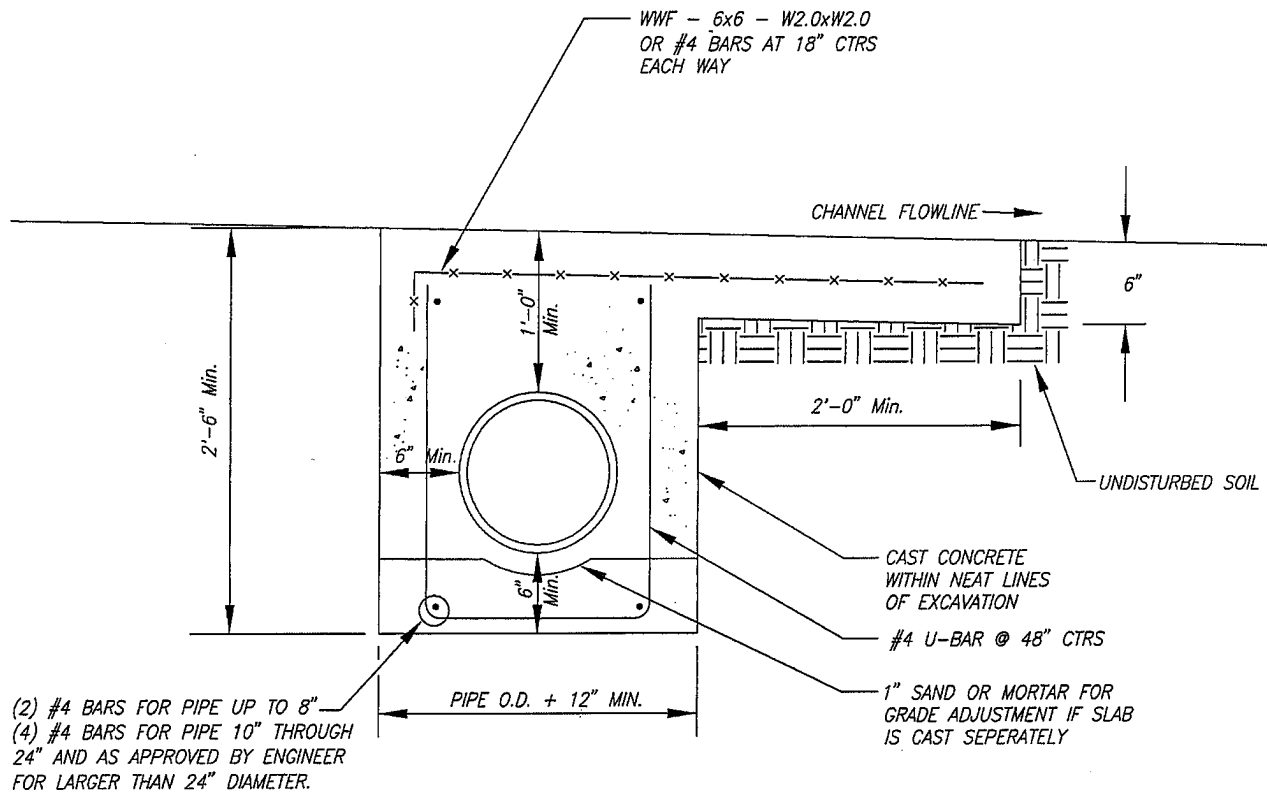
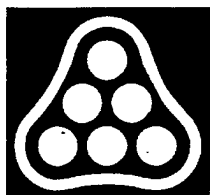


FIGURE 4.2.2 - CONCRETE ENCASEMENT/EROSION CUTOFF WALL



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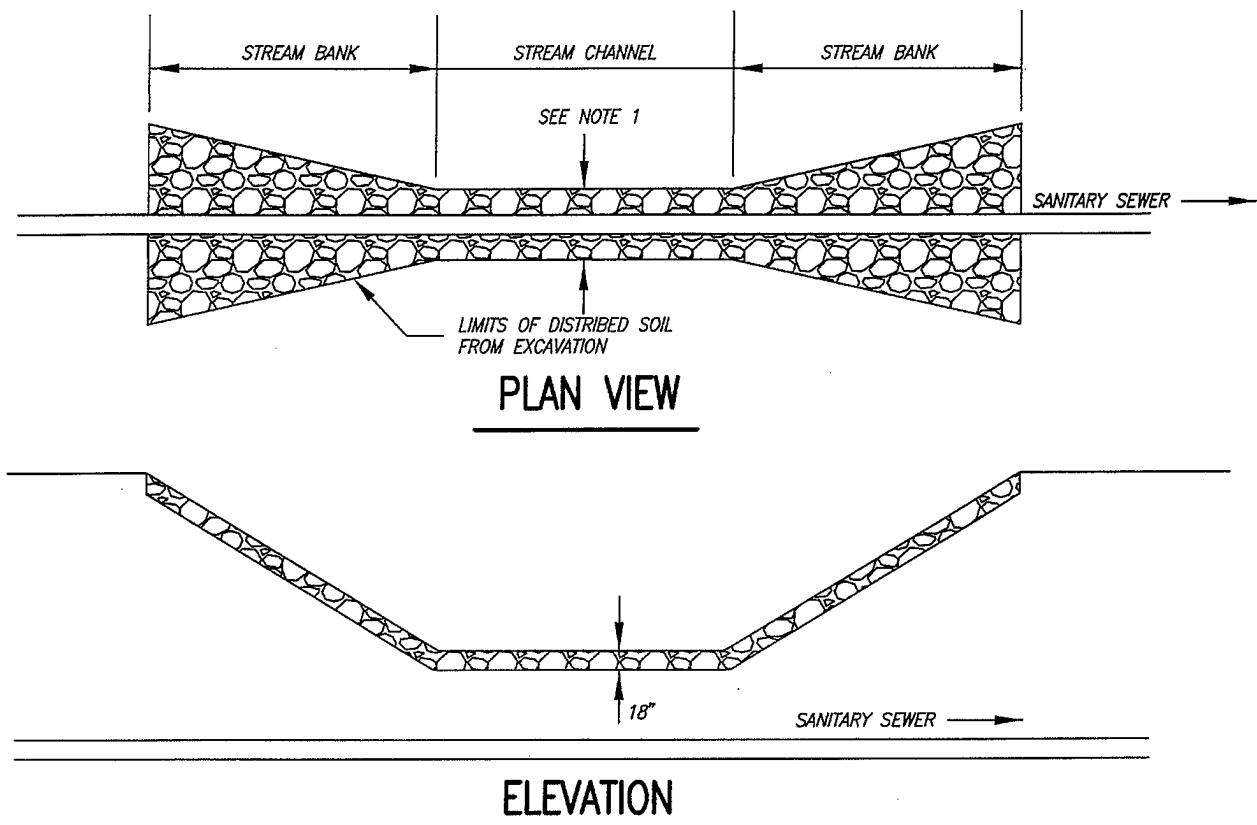
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Date 08-20-07

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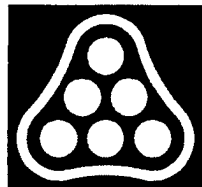
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NOTES:

1. STONE RIP RAP SHALL BE PLACED ALONG BANK AND THROUGH CHANNEL TO THE EXTENT THAT SOIL WAS DISTURBED DURING EXCAVATION FOR THE SEWER LINE INSTALLATIONS.
2. A CONCRETE EROSION CUT OFF WALL SHALL BE CONSTRUCTED FOR STREAM CROSSINGS WITH 30" OR LESS COVER MEASURED FROM STREAM CHANNEL TO TOP OF SEWER.
3. STONE RIP RAP SHALL BE USED FOR EROSION PROTECTION WHEN TOP OF SEWER IS GREATER THAN 30" BELOW THE STREAM CHANNEL.
4. RIP RAP SHALL BE PER KDOT SPECIFICATIONS SECTION 1116 "LIGHT STONE SERIES (FACING)" WITH A D50 OF 75 LBS.

FIGURE 4.23 - RIP RAP EROSION PROTECTION DETAIL



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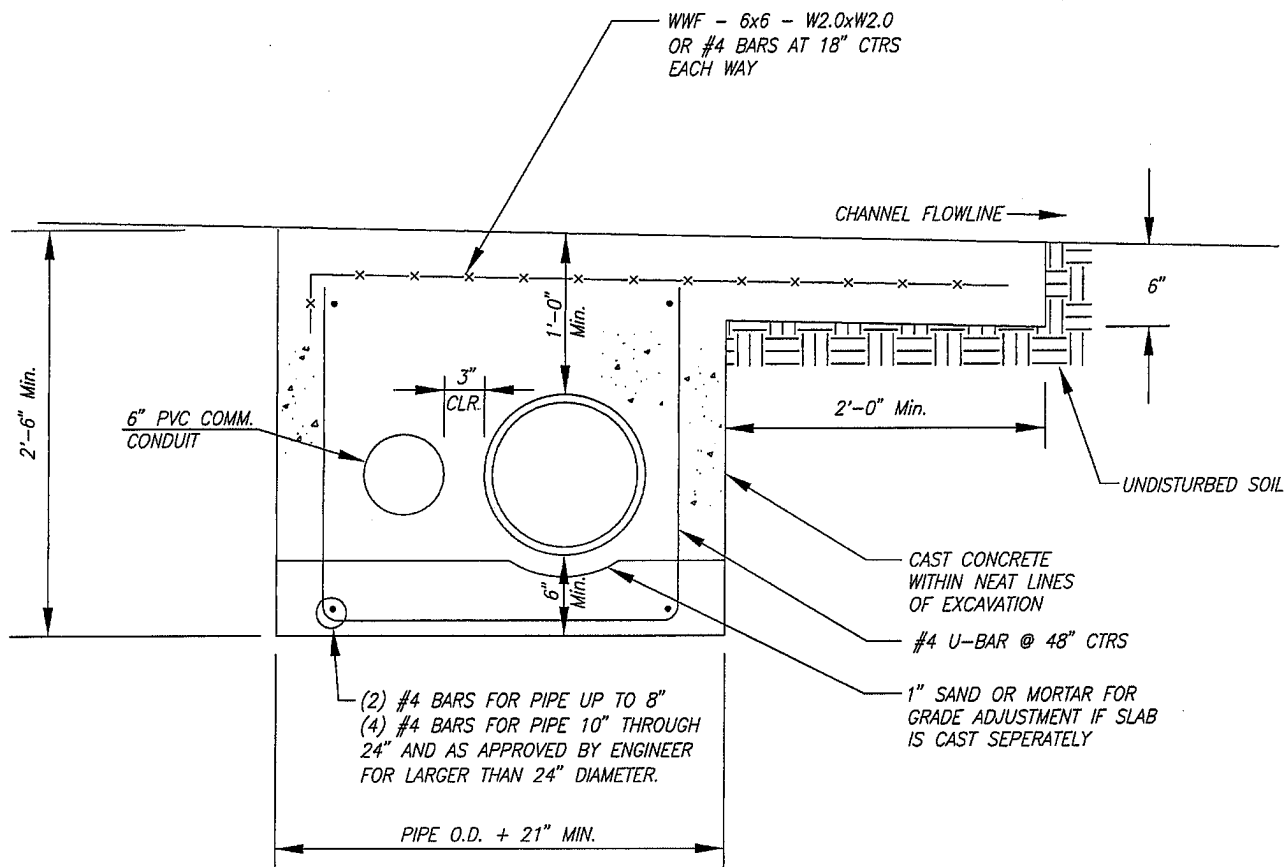
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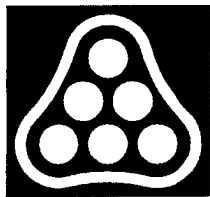
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**FIGURE 4.2.4 - CONCRETE ENCASEMENT/EROSION CUTOFF WALL -
SEWER AND COMMUNICATION DUCT**



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$$1'' = 1'$$

Job No. 07A30-001

Date

08-20-07

*Baldwin Creek West
Lawrence, Kansas*

Sht. 1 of 1

SECTION 5 REGULATORY REQUIREMENTS

SECTION 5.1 KDHE REQUIREMENTS:

- **NOI:** A Notice of Intent (NOI) is required to be submitted for any project which disturbs more than one acre of land. An NOI along with all required supporting documentation was completed for the proposed project and submitted to the City of Lawrence on August 28, 2007, for signature and forwarding to the KDHE. A copy has been included in the Appendix A.
- **Storm Water Pollution Prevention Plan (SWPPP):** A SWPPP was developed for this project and is included in the Appendix B.
- **Sediment and Erosion Control Plan:** An Erosion Control Plan was developed, and provided to the City of Lawrence to be submitted to KDHE as an attachment to the NOI. The plan provides storm water pollution control measures and BMP's for the project. A copy of the sediment and erosion control plan is included in Appendix C.
- **Sediment and Erosion Control Concepts:** The sediment and erosion control plan primarily utilizes silt fence to filter storm water prior to its discharge into the receiving stream. Silt fence will be placed on the downstream side of disturbed areas between the disturbed area and the receiving stream. Straw bale checks are utilized to filter water flowing in ditches parallel to disturbed areas. Stabilized construction entrances will be utilized to control erosion at construction entrances where tracking onto public roads would otherwise be a problem. All disturbed areas will be seeded per City of Lawrence specifications upon completion of the project.
- **Sewer System Extension Permit:** Shortly after completion of this Design Memo, a Sewer System Permit application will be completed and submitted to the City of Lawrence for signature, with follow-up submittal to KDHE along with a copy of the Design Memo for review and approval.

SECTION 5.2 DWR PERMIT REQUIREMENTS:

- **Pipeline Crossing Applications:** Applications for 15 interceptor sewer stream crossings were submitted to the City of Lawrence for signature, and follow-up submittal to the Division of Water Resources for approval. All permit applications are currently under review by the Division of Water Resources.

SECTION 5.3 US ARMY CORPS OF ENGINEERS REQUIREMENTS:

- **Corps Permits:** A permit application for the project along with supporting documentation was prepared and provided to the City of Lawrence for signature and forwarding to the Corps. It is anticipated that the Corps will respond that the project is

covered under Nationwide Permit 12 – Utility Line Activities; however, it may be determined that a Section 404 permit is required. The application is currently under review by the CORPS.

SECTION 5.4 SPECIAL CONSIDERATIONS:

- **Red Belly Snake Habitat:** The Kansas Department of Wildlife and Parks (KDWP) determined that a portion of the interceptor sewer route may contain habitat conducive to the Red Belly Snake, a State Listed Threatened Species. A survey for that portion of the project area was requested by KDWP. James Larson, with the KDWP, completed the survey on August 27th, 2007. It is anticipated that a small acreage of Red Belly Snake habitat may be impacted by the project, and mitigation of that habitat may be required. Multiple mitigation options including an in-lieu fee option exist for mitigation.
- **Archeological Survey:** The Kansas State Historical Society (KSHS) determined that portions of the site are in an area of either high or moderate archeological potential. A survey for that portion of the project area was requested by KSHS. Quotes for the selection of a consultant to complete the archeological survey are being obtained, and an archeological survey will be completed in the near future. Any additional requirements will be dictated by the findings of the survey.

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APPENDIX A

KDHE STORMWATER NOI



See Attached Sheet for Instructions

02A30-001-4028
file

NOTICE OF INTENT (NOI)
For Authorization to Discharge Stormwater Runoff from Construction Activities
In accordance with the Kansas Water Pollution Control General Permit
Under the National Pollutant Discharge Elimination System

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form requests authorization for coverage under the Kansas Water Pollution Control general permit, or KDHE issued successor permits, issued for stormwater runoff from construction activities in the State of Kansas. Becoming a permittee obligates the discharger to comply with the terms and conditions of the general permit. Completion of this NOI does not provide automatic coverage under the general permit. Coverage is provided and discharge permitted when the Kansas Department of Health and Environment (KDHE) authorizes the discharge of stormwater runoff from the construction activities identified on the NOI and supporting documentation. A signed and dated copy of the first page of the NOI indicating the Authorization will be provided to the owner or operator, or all three pages for Conditional Authorizations. Upon authorization of the construction activity discharge, a Kansas permit number and a Federal permit number will be assigned to the construction project. A complete request for Authorization for coverage under the general permit must be submitted or the request will not be processed (see listing on Page 3 of this NOI). KDHE will notify owners or operators whose Notice of Intent (NOI) and supporting documentation for Authorization of stormwater runoff associated with construction activities are incomplete, deficient, or denied. Please Print or Type.

I. OWNER OR OPERATOR ADDRESS & RECORD LOCATION INFORMATION

Owner or Operator's Name: City of Lawrence Contact Name: Dave Corliss, City Manager
Company Name: _____ Company Name: City of Lawrence
Owner or Operator's Phone: (785) 832-3400 Contact Phone: (785) 832-3400
Mailing Address: P.O. Box 708 Mailing Address: P.O. Box 708
City: Lawrence State: KS Zip Code: 66604-2268 E-mail Address: _____
Billing Contact Name: Mike Lawless, P.E. Address where records will be kept (if not on site):
Billing Address (if different): 720 W. 3rd Street Records Address: 720 W. 3rd Street
City: Lawrence State: KS Zip Code: 66044 City: Lawrence State: KS Zip Code: 66055

II. SITE INFORMATION

A. LOCATION

Project Name: Baldwin Creek West Interceptor Sewer
Street Address: Sections 20, 21, 29, 30
City: Lawrence State: KS Zip Code: 66044

B. LEGAL SITE DESCRIPTION

QTR, QTR, QTR, Section
12 South 19 E; W;
Township Range
County: Douglas

For Official Use Only:

Received RECEIVED SEP 10 2007 BUREAU OF WATER <i>Godwin L. Brady</i> Secretary, Kansas Department of Health and Environment	Paid <u>\$160</u>	Authorized <input checked="" type="checkbox"/> Y; <input type="checkbox"/> N
	Date: <u>9-10-07</u>	Is Authorization Conditional? <input type="checkbox"/> Y; <input checked="" type="checkbox"/> N (if yes see page 3 of NOI for conditions)
	Initials: <u>dg</u>	Reviewer <i>Timothy D. Hook</i> <u>9/10/07</u> Date
Check No: <u>319109</u>		Federal Permit No. <u>KSR104560</u>
KS Permit No. <u>S-KS31-0128</u>		

To receive a hard copy of the general permit packet, check yes: ☒ Y; ☐ N

Send completed 3 page NOI form with original signature to:

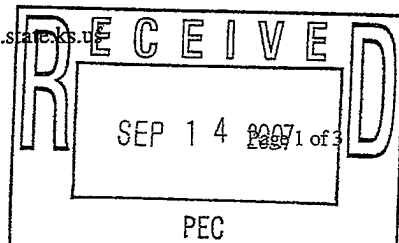
KDHE Contact Information:

Kansas Department of Health and Environment
Bureau of Water, Industrial Programs Section
1000 SW Jackson, Suite 420
Topeka, KS 66612 - 1367

Phone: (785) 296-5545
E-mail: stormwater@kdhe.state.ks.us

Effective Jan. 2, 2007

NOI for Stormwater Runoff from Construction Activities



C. EXISTING CONDITIONS/USES

Is any part of the project located on Indian Country land?

☐ Y; ☒ N

If yes, contact EPA regarding discharging stormwater runoff from industrial activities on Indian Country land.

If stormwater runoff drains to or through a Municipal Separate Storm Sewer System (MS4); MS4 Name: N/AName of the first receiving water; stream; or lake: Baldwin Creek River Basin: Kansas/Lower Republican

Are contaminated soils present on the site or is there groundwater contamination located within the site boundary?

☐ Y; ☒ N

If yes, on separate paper please explain in detail the locations, contaminants and concentrations.

Are there any contaminated soils that will be disturbed or any contaminated groundwater that will be pumped by the proposed construction activity? If yes, on separate paper please explain the special erosion and sediment control measures to be utilized.

☐ Y; ☒ N

Are there any surface water intakes for public drinking water supplies located within 1/2 mile of the site discharge points?

☐ Y; ☒ N

Has the Kansas State Historical Society been contacted to determine if there are any known historical or archeological sites present within the site boundary or any historical structures located within 1000 feet of the project site?

☒ Y; ☐ N

Please include documentation of project site coordination with KSHS.

Has the Kansas Department of Wildlife and Parks been contacted to determine if any threatened or endangered species habitat is located within the site boundary or in the receiving water body? Please include documentation of coordination with KDWP.

☒ Y; ☐ N

Will the project impact the line or grade of a stream or does it include dredge or fill of a potential jurisdictional water body or wetlands? If yes, please include documentation of project site coordination with the Corps of Engineers.

☒ Y; ☐ N

Are any Critical Water Quality Management Areas, Special Aquatic Life Use Waters, or Outstanding National Resource Waters located within 1/2 mile of the facility boundary? _____

☐ Y; ☒ N**D. PROJECT DESCRIPTION**Project Description: Construction of approximately 14,985 linear feet of interceptor sewer.

Does this NOI include all proposed soil disturbing activities associated with the entire common plan of development?

☒ Y; ☐ N

If no, explain what areas of the site and contact information, if available, that this NOI does not apply to. _____

Anticipated project Start Date: 10/1/2007 and Completion Date: 10/1/2008Estimated total area to be disturbed: 6.9 Acres Total area of the site: 34 Acres

Do you plan to disturb ten or more acres that are within a common drainage area?

☐ Y; ☒ N

If yes, will a sedimentation basin be installed in that drainage area? (Attach design calculations for all proposed sediment basins)

☐ Y; ☐ N

If no, on a separate sheet, indicate why the sediment basin is not feasible and explain what similarly effective erosion and sediment control measures will be implemented in lieu of a sedimentation basin.

E. MAPS

Include an area map showing the outline of the construction site and the general topographic features of the area at least one mile beyond the project site boundary.

F. EROSION CONTROL PLAN AND BEST MANAGEMENT PRACTICES

Provide a site plan showing the existing contour, proposed contour, the erosion control measures and the locations of stormwater management or pollution control features including BMPs. Incorporate details and notes as necessary to describe the erosion control plans and BMPs.

Provide a description of the best management practices which will be utilized to control erosion, sedimentation and other pollutants in stormwater runoff during construction.

Summarize the sequence of major soil disturbing activities and the corresponding erosion control measures or BMPs.

Project Name: Baldwin Creek West Interceptor Sewer

Notice of Intent (NOI)

Provide the name and License or Certification Number of the engineer, geologist, architect, landscape architect, or certified erosion and sediment control specialist under which the construction stormwater pollution prevention plan has been developed.

Joe D. File	17467	Engineer
Name	License/Certification Number	Profession or Field (Engineer, Architect, etc.)

III. ANNUAL FEE

Enclose a check for the first year of the annual permit fee specified in K.A.R. 28-16-56 et seq. as amended. Make the check payable to "KDHE". Per K.A.R. 28-16-56, as amended, the current annual permit fee for this general permit is \$60. An invoice for the annual permit fee will be sent to the contact person requesting a permit until such time as the permittee submits a Notice of Termination (NOT).

Failure to pay the annual fee will result in termination of the construction stormwater discharge Authorization.

IV. OWNER OR OPERATOR CERTIFICATIONS

I, the undersigned, certify that a Stormwater Pollution Prevention Plan (SWP2 Plan) will be or has been developed for the construction site described in this NOI and supporting documentation. I further certify that the plan will be implemented at the time construction begins, and, as required by the NPDES general permit for Stormwater Runoff from Construction Activity, will revise the SWP2 plan if necessary.

I understand that continued coverage under the NPDES general permit for Stormwater Runoff from Construction Activities is contingent upon maintaining eligibility as provided for in the requirements and conditions of the general permit, and paying the annual fee.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature (owner or operator)

Date

Name and Official Title (Please Print)

Conditions of Authorization - For Official Use Only

When indicated, Conditions of Authorization are as follows:

A complete request for Authorization for coverage under the general permit must be submitted or the request will not be processed. A complete request for Authorization includes:

- An NOI form (construction stormwater) with an original authorized signature;
- The annual permit fee for the first year; (\$60.)
- An area map showing the outline of the construction site and the general topographic features of the area at least one mile beyond the project site boundary;
- A detailed site plan showing the existing contours, proposed contours, erosion and sediment control features, locations where stormwater runoff leaves the construction site;
- A narrative summary of the additional erosion and sediment control and other best management practices that will be utilized to prevent or reduce contamination of stormwater runoff from the construction activities;
- Design calculations for any proposed sedimentation basin; and
- Copies of letters or e-mails documenting coordination with appropriate local, state or federal agencies.

APPENDIX B

STORMWATER POLLUTION PREVENTION PLAN

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) or (SWP3)

for

CITY OF LAWRENCE BALDWIN CREEK WEST INTERCEPTOR SEWER

The intent of this Storm Water Pollution Prevention Plan is to describe and provide the details necessary to implement stormwater pollution control measures to significantly reduce erosion on site during construction, and to prevent sediment and other runoff generated pollutants from leaving the site during construction.

The construction activities taking place in the project area are detailed extensively on the project drawings and/or in the project specifications. The drawings and specifications are, therefore, incorporated by reference into this SWPPP. The pages herein provide information and details for the SWPPP under the following main areas:

'Site Description'

'Erosion & Sediment Controls' for stabilization, structural & storm water management practices.

'Other Controls' for waste materials and offsite vehicle tracking.

'Timing of Controls/Measures'

'Maintenance & Inspection Procedures'

'Materials Inventory for the SWPPP'

'Spill Prevention Practices' for good housekeeping, hazardous materials, & general spill control.

'KDHE Forms'

'Erosion and Sediment Control Inspection Form(s)'

'Details'

PEC Project No. 07A30-001-4028

August 2007

SITE DESCRIPTION			
Project Name and Location:	The City of Lawrence Baldwin Creek West Interceptor Sewer project is located on the west end of Lawrence along the Kansas Turnpike. The project consists of the construction of an interceptor sewer line which connects to an existing gravity sewer line. The attached sediment and erosion control drawings provide the specific location of the project.	Owner Name and Address:	City of Lawrence PO Box 708 Lawrence, KS 66044-2268
Description:	<p>This project generally consists of the following soil disturbing activities:</p> <ol style="list-style-type: none"> 1. Clearing and grubbing. 2. Erosion and/or sediment controls. 3. Construction of improvements as detailed in the construction drawings and specifications. 4. Preparation for final seeding, fertilizing and mulching. 		
Runoff Coefficient:	The estimated runoff coefficient for the site will be C = 0.3		
Site / Project Area:	The site / project area is shown on the construction drawings.		
<p>Site-Specific Erosion Control Schedule:</p> <p>Prior to any construction activity on the site, the Contractor will submit a Site-Specific Erosion Control Schedule to the Engineer for review. Upon review and incorporation of any necessary changes, this schedule will be incorporated by reference into this SWPPP. The Contractor's schedule will include, at a minimum, the following:</p> <ol style="list-style-type: none"> a) Description of initial controls to be installed, possibly including stabilized construction entrance(s), perimeter controls, earth dikes, and sediment basin(s). b) Description of controls to be installed during and subsequent to major clearing, grubbing, & soil stockpiling; possibly including seed stabilization of areas to be left unimproved for more than 14 days, and additional perimeter controls. c) Description of controls to be installed during the construction of the primary project improvements described in the Contract Documents. Installation and removal of controls shall be phased where appropriate. d) Removal of sediment from basins, repair and maintenance of controls. e) Final seeding, fertilizing and mulching of major disturbed areas; to be in phases where necessary and/or appropriate. f) Removal of all controls. Final seeding, fertilizing & mulching. 			
Name of Receiving Water(s):	Baldwin Creek and the Kansas River		

Erosion and Sediment Controls

(See Attached Details)

Stabilization Practices

Temporary Stabilization- Top soil stock piles and disturbed portions of the site where construction activity ceases for at least 7 days shall be contained with a sediment barrier or stabilized with temporary seed, fertilizer and mulch. No ground shall be left disturbed for more than 14 days of non-activity without being temporarily mulched and/or seeded. Temporary seeding, fertilizing and mulching shall be applied in accordance with City of Lawrence Standard Specifications, and at the rates provided on the standard details.

Permanent Stabilization- Disturbed portions of the site where construction activities permanently cease shall be stabilized with permanent seed as soon as possible after the last construction activity. Permanent seeding, fertilizing and mulching shall be applied in accordance with City of Lawrence Standard Specifications, and at the rates provided on the standard details.

Structural Practices

Structural practices and controls to be implemented on this project site will be identified on the Contractor's Site-Specific Erosion Control Schedule. The structural controls shall typically be selected from the standard details provided with this SWPPP, but may be from other sources if approved by the Engineer. The structural control details provided with this SWPPP are as follows:

- Construction Entrance
- Drainage Swale
- Storm Drain Diversion
- Sediment Basin/Trap
- Earth Berm/Dike
- Berm/Slope Drain
- Stream Crossing
- Inlet Sediment Barrier
- Slope Barrier
- Ditch Check

Storm Water Management

Storm water drainage will typically be provided by curb and gutter and storm sewer in developed areas. Areas which are not developed will be graded with slopes no greater than 4:1 and have permanent seeding or plantings, unless otherwise specified in the contract documents. Storm water management during construction should be accomplished utilizing the appropriate structural practice outlined above, and as stated on the Contractor's Site-Specific Erosion Control Schedule.

OTHER CONTROLS

Waste Disposal

Waste Materials - All waste materials will be collected and stored in a securely lidded metal dumpster. The dumpster will meet all local and State of Kansas solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied as necessary and trash will be hauled to an appropriate trash facility. No construction waste materials will be buried onsite. All personnel will be instructed regarding the correct procedure for waste disposal. Notices stating these practices will be posted in the office trailer and the individual who manages the day-to-day operations will be responsible for seeing that these practices are followed.

Hazardous Waste - All hazardous waste materials will be disposed of in the manner specified by local or State regulation or by the manufacturer. Site personnel will be instructed in these practices and the individual who manages site operations will be responsible for seeing that these practices are followed.

Sanitary Waste - All sanitary waste will be collected from portable units as required by local regulation.

Off-site Vehicle Tracking

A stabilized construction entrance may be provided to help reduce vehicle tracking of sediments (see plan). The paved street adjacent to the site entrance will be swept daily to remove any excess mud, dirt or rock tracked from the site.

TIMING OF CONTROLS/MEASURES

Prior to any construction activity on the site, the Contractor will submit a Site-Specific Erosion Control Schedule to the Engineer for review and approval. Upon approval, this schedule will be incorporated by reference into this SWPPP. In general, the sequence of activities would include: installation of initial controls; controls during and subsequent to clearing, grubbing & soil stockpiling; controls during construction of primary project improvements; routine repair/maintenance/sediment removal; final seeding, fertilizing and mulching; final removal of controls.

Once construction activity ceases permanently in the project area, the area will be stabilized with permanent seed, fertilizer and mulch. After the entire site is stabilized, the accumulated sediment will be removed from any sediment barrier and erosion and sediment controls will be removed.

For subdivision development projects, lot owners will be responsible for installing and maintaining additional silt fence or other approved sediment barrier and/or inlet protection before beginning construction on their lot. Silt fence or approved sediment barrier will be required around the lot perimeter where water drains to the property line. Each new owner of a lot or parcel that is part of a larger common plan of development has to complete a KDHE Individual Lot Certification (ILC). The ILC is an agreement between the new owner of the lot or parcel and the permittee to implement the SWPPP and the conditions of the general NPDES permit cooperatively.

MAINTENANCE/INSPECTION PROCEDURES

Erosion and Sediment Control Inspection and Maintenance Practices

Following are the inspection and maintenance practices that will be used to maintain erosion and sediment controls. Standard inspection forms have been included with this SWPPP.

1. All control measures will be inspected at least once each week and following any storm event of 0.5 inches of rain or greater.
2. All measures will be maintained in good working order. If repairs are necessary, they will be initiated within 24 hours of discovery.
3. Built-up sediment will be removed from silt fence when it has reached one-third the height of the fence.
4. Silt fence will be inspected for depth of sediment, tears, to see if fabric is securely attached to the fence posts, and to see that the fence posts are securely in the ground.
5. Temporary and permanent seeding and planting will be inspected for bare spots, washouts and unhealthy growth.
6. Written reports of weekly inspections will be kept on site with this plan. Reports need to include: the inspector's name and signature, date of inspection, observations on sediment control measures, actions taken or necessary to correct deficiencies, and a listing of areas where construction activities have permanently or temporarily stopped.

Non-Storm Water Discharge

It is expected that the following non-storm water discharges will occur from the site during the construction period:

1. Water from water line flushing.
2. Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).
3. Uncontaminated groundwater (from dewatering excavations).

MATERIALS INVENTORY for the SWPPP

The materials or substances listed below are expected to be present onsite during typical construction projects. Additional materials may be onsite for specific projects, and these shall be identified by the Contractor in the Site-Specific Erosion Control Schedule.

Concrete	Geotextile fabric
Detergents	Rebar
Paint	Wire mesh fabric
Tar	Joint sealant
Fertilizers	Aggregate
Petroleum based products	Wood
Cleaning solvents	

SPILL PREVENTION PRACTICES

Material Management Practices

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials to storm water runoff.

Good Housekeeping - The following good housekeeping practices will be followed during the construction project:

1. An effort will be made to store only enough product required to do the job.
2. All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
3. Products will be kept in their original container with the original manufacturer's label.
4. Substances will not be mixed with one another unless recommended by the manufacturer.
5. Whenever possible, all of a product will be used up before disposing of the container.
6. Manufacturer's recommendations for proper use and disposal will be followed.
7. The site superintendent will inspect daily to ensure proper use & disposal of materials.
8. Dump trucks hauling excavated material from the site will be loaded to prevent spilling materials while in transport.

Hazardous Products - These practices are used to reduce the risk associated with hazardous materials.

1. Products will be kept in original containers unless they are not re-sealable.
2. Original labels and material safety data will be retained; they contain important product information.
3. If surplus product must be disposed of, manufacturer's and local and State recommended methods for proper disposal will be followed.

Product Specific Practices

The following product specific practices will be followed onsite:

Petroleum Products - All onsite vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.

Fertilizers - Fertilizers used will be applied using the amounts indicated on the standard details or as recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

Paints - All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system or drainage ways but will be properly disposed of according to manufacturer's instructions or State and local regulations.

Concrete Truck Washout - Concrete trucks will typically not be allowed to wash out or discharge surplus concrete or drum wash water on the site, unless the Contractor's Site-Specific Erosion Control Schedule provides for an appropriate place to do so. If utilized, the washout area should consist of a large (~15' X 20') area for the trucks to wash out in, surrounded by 2' high soil berms to prevent any washout water from entering the streets, storm water sewer or nearby water bodies. Instead of berms, a 2' deep pit would be acceptable, as long as the washout water is contained. When the washout pit needs to be moved or is no longer needed, the concrete sediment is to be excavated and hauled to an appropriate waste disposal site and the pit area is to be graded to final grade and seeded appropriately.

SPILL PREVENTION AND CONTROL (cont'd)

Spill Control Practices

In addition to the good housekeeping and materials management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup.

1. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and location of the information and cleanup supplies.
2. Material and equipment necessary for spill cleanup will be kept in the material storage area onsite. Equipment and materials will include but not be limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
3. All spills will be cleaned up immediately after discovery.
4. The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
5. Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of the size of spill.
6. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.
7. The site superintendent responsible for day-to-day site operations will be the spill prevention and cleanup coordinator. The names of responsible spill personnel will be posted in the material storage area and in the office trailer onsite.

KDHE Forms

The KDHE provides a number of forms necessary to comply with the General Permit. Blank forms have been provided for convenience, and are as follows:

Contractor's Certification Form (1 page)

Document Certification Form (1 page)

Individual Lot Certification Form (1 page)

Notice of Termination (NOT) (2 pages)

Notice of Transfer of Ownership (NOTO) (1 page)



CONTRACTOR'S CERTIFICATION FORM

For Stormwater Discharges Associated with Construction Activity
Authorized by a Kansas Water Pollution Control General Permit
Under the National Pollutant Discharge Elimination System

This form is to be completed by the Contractor responsible for implementation of the day to day activities necessary to complete the requirements of the Stormwater Pollution Prevention Plan. This completed form must be included in, or kept with the Stormwater Pollution Prevention Plan for the site identified below.

I certify under penalty of law that I understand the terms and conditions of the Kansas Water Pollution Control general permit that authorizes the stormwater discharges associated with construction activity from the construction site identified below, and the Stormwater Pollution Prevention Plan prepared for the project.

Name of Project: _____

Address: _____ City: _____ County: _____ State: KS Zip Code: _____

Kansas Water Pollution Control General Permit No. S-MCST-0110-1

Kansas Permit No. _____ Federal Permit No. _____

Company Name: _____

Company Address: _____

Company Phone Number: _____

Project Responsibilities: _____

Contractor's Signature: _____

Name (typed or printed): _____



DOCUMENT CERTIFICATION FORM

For Stormwater Discharges Associated with Construction Activity
Authorized by a Kansas Water Pollution Control General Permit
Under the National Pollutant Discharge Elimination System

Complete this form and attach it to any documents or forms (except the NOI, NOT, or NOTO) required by this general permit. Any documents or reports requested by KDHE regarding the project and its stormwater discharges shall include this form.

TO BE COMPLETED BY THE PERMITTEE

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon the information gathered and the belief formed after a reasonable inquiry, the statements and information submitted with this form are true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Name of Project: _____

Address: _____ City: _____ County: _____ State: KS Zip Code: _____

Kansas Water Pollution Control General Permit No. S-MCST-0110-1

Kansas Permit No. _____ Federal Permit No. _____

Name of Document(s): _____

Description of Document(s): _____

Date of Document(s): _____

Signature: _____

Permittee, or Authorized Agent, Name (typed or printed): _____

Title: _____

Date: _____



INDIVIDUAL LOT CERTIFICATION

For Stormwater Runoff from Construction Activity
Authorized by Kansas Water Pollution Control General Permit
S-MCST-0110-1

The permittee shall maintain this form on-site, or in a readily available location. The permittee shall provide ILC forms to KDHE or EPA upon request.

TO BE COMPLETED BY THE NEW LOT OWNER

I certify under penalty of law that I have received a copy of the Kansas Water Pollution Control General Permit and Authorization to Discharge Stormwater from Construction Activities S-MCST-0110-1 which authorizes the permit holder to discharge stormwater runoff from construction activities, and a copy of the Stormwater Pollution Prevention Plan prepared by the permit holder. I have reviewed the terms and conditions of this general NPDES permit and the Stormwater Pollution Prevention plan. I accept responsibility for erosion and sediment control during construction of the home or building for each of the lots or parcels listed below. In the event KDHE notifies the undersigned of water quality violations due to conditions at any lot listed below and I am unable or unwilling to take action within 30 days to further reduce erosion or control sediment, then I agree to allow the permit holder to have reasonable access to the site to implement erosion and sediment control measures. I understand this certification is an agreement between the parties named herein to cooperatively implement the SWP2 plan and the conditions of the general NPDES permit.

Subdivision / Project: _____

Legal Description of the Transferred Parcel(s) and/or Lot No.(s): _____

New Owner's Signature: _____

Name (typed or printed): _____

If the New Owner is a Corporation and not an Individual

Company Name: _____ Phone: _____

Company Address: _____

TO BE COMPLETED BY PERMIT HOLDER

As the permittee for the overall tract wherein the above listed parcel(s) and/or lot(s) are located, I certify that I have provided the above named lot purchaser with a copy of the general NPDES permit and the Stormwater Pollution Prevention plan for the project, and I have informed the lot purchaser of his responsibility to minimize erosion and control sedimentation. I understand this certification does not constitute a transfer of the permit. I also understand this certification is an agreement between the parties named herein to cooperatively implement the SWP2 plan and the conditions of the general NPDES permit.

Name of Project: _____

Address: _____ City: _____ County: _____ State: KS Zip Code: _____

Kansas Water Pollution Control General Permit No. S-MCST-0110-1

Kansas Permit No. _____ Federal Permit No. _____

Company Name: _____ Phone: _____

Company Address: _____

Permittee Signature: _____

Permittee Name: _____



NOTICE OF TERMINATION

To Relinquish the Authorization to Discharge Stormwater Runoff from Construction Activities from the Construction Site Described Herein.

Submission of this Notice of Termination (NOT) constitutes notice that the party identified in Section I of this form relinquishes authorization for coverage under the Kansas Water Pollution Control general permit, or KDHE authorized successors, issued for Stormwater Runoff from Construction Activities in the State of Kansas. Submission of this Notice of Termination to KDHE relinquishes the permittee's authorization to discharge stormwater associated with construction activity at the site described herein. Completion of this NOT does not automatically relieve the former permittee of any civil, criminal and/or administrative penalties.

For completed projects, coverage is terminated when the Kansas Department of Health and Environment (KDHE) receives a complete NOT. For transfer of ownership, coverage is terminated when KDHE receives a complete NOT and a complete NOTO for the project, and KDHE confirms the transfer. To be considered complete, the NOT and the NOTO must be signed by the current permittee or a duly authorized representative of the current permittee, and must include the permit number assigned to the construction site. KDHE will notify any permittee whose NOT is incomplete, deficient or denied. **Please Print or Type.**

I. PERMITTEE INFORMATION

Permittee: _____ Were permit records located on site? ☐ Y; ☐ N

Name of Company: _____ If not, where were permit records kept:

Mailing Address: _____ Business Name: _____

_____ Street Address: _____

City: _____ State: _____ Zip Code: _____ - _____ City and County: _____

II. SITE INFORMATION

LOCATION

Name of Project: _____ Quarter of the _____ Quarter of Section _____

Address: _____ Township: _____ South, Range: _____ ☐ E; ☐ W;

City: _____ State: KS Zip Code: _____ - _____ County: _____

Contact Person: _____ Phone: _____ - _____

Kansas Water Pollution Control General Permit No. S-MCST-0110-1

Kansas Permit No. _____ Federal Permit No. _____

I certify under penalty of law that all authorized discharges of stormwater associated with construction activity at the construction site described herein have been eliminated; or the permittee named herein is no longer the owner or operator of this construction site. I understand that by submitting this Notice of Termination, I am no longer authorized under the general NPDES permit S-MCST-0110-1 to discharge stormwater associated with construction activity at this construction site. I understand that discharging pollutants in stormwater associated with construction activity to waters of the State is unlawful under K.S.A. 65-164 and 65-165 and the Clean Water Act without authorization by a valid Kansas Water Pollution Control Permit. I understand that by submitting this Notice of Termination, I am not released from liability for any violations of the general NPDES permit S-MCST-0110-1, K.S.A. 65-164 and 65-165, the Kansas Surface Water Quality Standards (K.A.R. 28-16-28 et seq.), or the Clean Water Act. When ownership of the entire tract or project is being transferred, I understand that the transfer of permit responsibilities is effective when KDHE confirms the transfer. *I also hereby certify that I am authorized to sign this Notice of Termination as a representative of the permittee named herein.*

Name of Project: _____
Address: _____ City: _____ County: _____ State: KS Zip Code: _____

Kansas Water Pollution Control General Permit No. S-MCST-0110-1

Kansas Permit No. _____ Federal Permit No. _____

Print Name: _____ Date: _____

Signature: _____

This Notice of Termination is being submitted because:

- ☐ The construction project or larger common plan of development is finished and the final stabilization has been completed. (See Part VIII of the general NPDES permit).
- ☐ Ownership of the site has changed. When ownership of the entire permitted tract changes, the previous permittee shall submit an NOT and a copy of the Notice of Transfer of Ownership (NOTO).

Submit the NOT (and NOTO if applicable) to:

Kansas Department of Health and Environment
Bureau of Water, Industrial Programs Section
1000 SW Jackson, Suite 420
Topeka, KS 66612 - 1367



NOTICE OF TRANSFER OF OWNERSHIP

For Stormwater Discharges Associated with Construction Activity Authorized by a Kansas Water Pollution Control General Permit Under the National Pollutant Discharge Elimination System

Use this form when ownership of the entire permitted tract or project will be changed. Otherwise use the Individual Lot Certification form. Submission of the Notice of Transfer of Ownership (NOTO) constitutes notice that the new permittee, or an authorized representative, requests authorization for coverage under the Kansas Water Pollution Control general permit, or KDHE authorized successors, issued for Stormwater Runoff from Construction Activities in the State of Kansas. **Completion of this NOTO does not provide automatic coverage under the general permit to the new permittee. Coverage is provided and discharge permitted when the Kansas Department of Health and Environment (KDHE) receives a complete NOT from the current permittee and a complete NOTO for the project, and KDHE confirms the transfer. TO CONTINUE COVERAGE, THE NEW PERMITTEE MUST PAY THE \$60 ANNUAL PERMIT FEE. Please Print or Type.**

Submission of this NOTO to KDHE does not relinquish the current permittee's authorization to discharge stormwater runoff from construction activity at the site described herein. The current permittee must complete a Notice of Termination (NOT) to relinquish coverage under the general permit. Completion of this NOTO does not automatically relieve the current permittee of any civil, criminal and/or administrative penalties. Coverage is terminated when KDHE receives a complete NOT from the current permittee and a complete NOTO for the project, and KDHE confirms the transfer. To be considered complete, the NOT and the NOTO must be signed by the current permittee or a duly authorized representative of the current permittee, and must include the permit number assigned to the construction site. KDHE will notify any new permittee whose NOTO is incomplete, deficient or denied.

TO BE COMPLETED BY THE NEW PERMITTEE

I hereby accept transfer of the general NPDES permit, which was issued to _____. I have reviewed the terms and conditions of the general permit and the Stormwater Pollution Prevention plan and accept full responsibility, coverage, and liability. This transfer will be effective when KDHE confirms the transfer.

The NEW permittee is:

Owner or Operator's Name: _____ Contact Name: _____
Company Name: _____ Company Name: _____
Owner or Operator's Phone: _____ Contact Phone: _____
Mailing Address: _____ Mailing Address: _____
City: _____ State: _____ Zip Code: _____ City: _____ State: _____ Zip Code: _____

I certify under penalty of law that I have personally examined and am familiar with the information described herein, and based upon my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

New Permittee's Signature: _____ Date: _____

Name (typed or printed): _____ Title: _____

TO BE COMPLETED BY THE CURRENT PERMITTEE

As previous permittee, I hereby agree to the transfer of the permit and all responsibilities thereof. I understand that the transfer of permit responsibilities is effective when KDHE confirms the transfer.

Name of Project: _____

Address: _____ City: _____ County: _____ State: KS Zip Code: _____

Kansas Water Pollution Control General Permit No. S-MCST-0110-1

Kansas Permit No. _____ Federal Permit No. _____

Permittee Signature: _____ Date: _____

Permittee Name: _____ Title: _____ Phone Number: _____

Submit the NOT within 14 days of the transfer of ownership to:
Kansas Department of Health and Environment
Bureau of Water, Industrial Programs Section
1000 SW Jackson, Suite 420, Topeka, KS 66612 - 1367

EROSION AND SEDIMENT CONTROL INSPECTION FORM(s)

The following form(s) should be utilized to conduct inspections of erosion and sediment controls as required in this SWPPP.

SWPPP Inspection Report

Erosion and Sediment Control Type	General Condition (1)	Remarks
Construction Entrance(s)		
Drainage Swale		
Storm Drain Diversion		
Sediment Basin/Trap		
Earth Berm/Dike		
Berm/Slope Drain		
Stream Crossing		
Inlet Sediment Barrier		
Slope Barrier		
Ditch Check		

1. Condition Descriptions

- A. Good – Condition of BMP is functional and not in need of repair.
- B. Fair – BMP is operable, showing signs of deterioration, but not requiring repair
- C. Poor – BMP can be made operable with immediate attention.
- D. Failed – BMP requires replacement.
- E. Obsolete – BMP no longer required.
- F. N/A – BMP not being employed.

Details

The following sheets provide details for structural controls and BMP practices to be utilized on this project. The Contractor may use other details if approved by the Engineer.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

GENERAL NOTES

- 1) The use of Straw or Hay Bales, Silt Fence or Biodegradable Logs is at the option of the Contractor.
- 2) The slope barriers shall be placed along contour lines, with a short section turned updrift at each end of the barrier.
- 3) At culverts, the Straw or Hay Bales or Silt Fence shall be placed over the culvert, not through the streambed fillline.
- 4) Barriers damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired immediately by Contractor at no additional cost to KDOT.

INSTALLATION NOTES

STRAW OR HAY BALES:

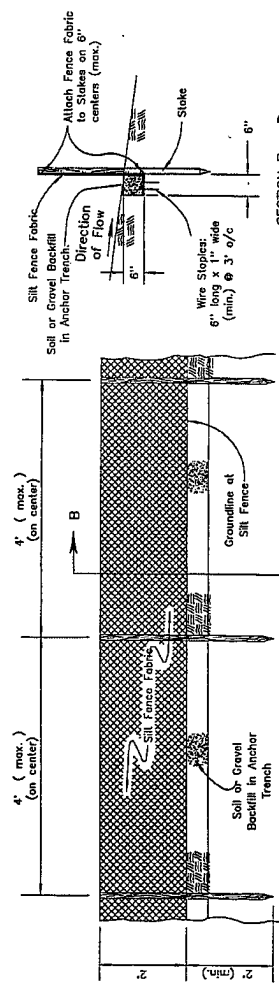
1. Place bales tightly together, with loose straw or hay wedged between bales to close off openings.
2. Wood stakes shall be 2" x 2" (nom.) x 4' (min.) long.
3. Refer to plans sheets to estimate the length of bales required.
4. Use only twine to bind bales. The use of wire binding is prohibited because it does not readily biodegrade.

SILT FENCE:

1. Stakes shall be 4' (min.) long and of one of the following materials:
 - a. Hardwood - 1 3/16" x 1 3/16" x 1 3/16"
 - b. Southern Pine (No. 2) - 2 5/8" x 2 5/8" x 1"
 - c. Steel U, L, or C Section - 1.33 lbs. per 1'-0"; or
 - d. Synthetic - same strength as wood stakes.
2. Attach fence fabric to stakes with staples, wire or nails.
3. Refer to plan sheets to estimate the length of Silt Fence required.

BIODEGRADABLE LOG BARRIERS

1. Place biodegradable logs tightly together.
2. Wood stakes shall be 2" x 2" (nom.) x 4' (min.) long.
3. Wire staples shall be 6" long x 1/4" wide (min.) and placed on 3' (max.) centers.
4. Refer to plan sheets to estimate length of biodegradable log barriers required.



TYPICAL ELEVATION

SECTION B - B

SILT FENCE SLOPE BARRIER

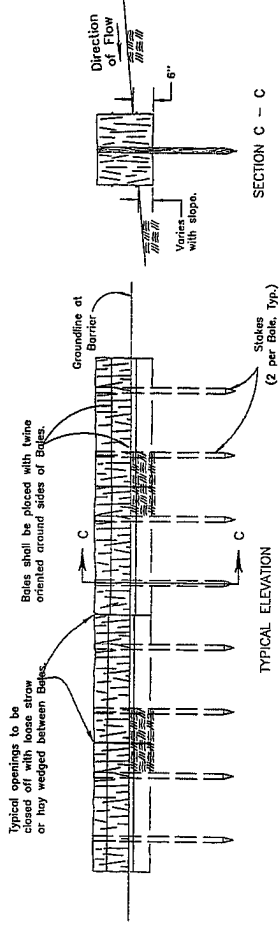
NO SCALE

TYPICAL ELEVATION

SECTION C - C

STRAW BALE SLOPE BARRIER

NO SCALE

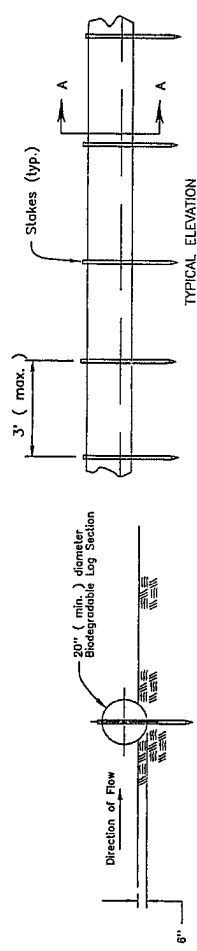


TYPICAL ELEVATION

SECTION C - C

STRAW BALE SLOPE BARRIER

NO SCALE



TYPICAL ELEVATION

SECTION A - A

BIODEGRADABLE LOG SLOPE BARRIER

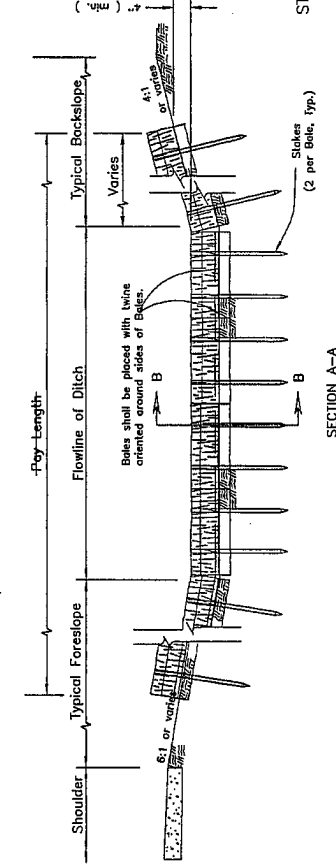
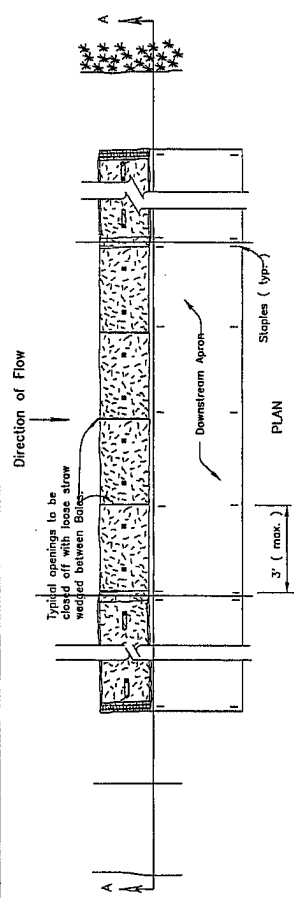
NO SCALE

NO.	REVISION	DATE	BY	APP'D
1	AS BUILT	5/26/2014	W. J. HARRIS	W. J. HARRIS
2	REVISED	5/26/2014	W. J. HARRIS	W. J. HARRIS
3	REVISED	5/26/2014	W. J. HARRIS	W. J. HARRIS

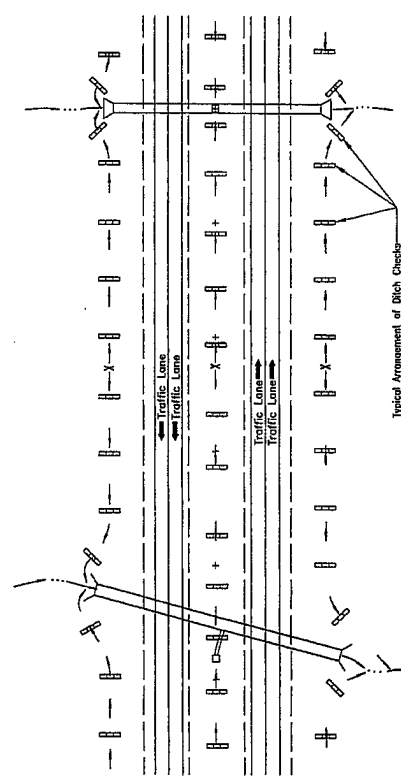
KANSAS DEPARTMENT OF TRANSPORTATION
TEMPORARY EROSION AND POLLUTION CONTROL
STRAW OR HAY BALE SLOPE BARRIERS
SILT FENCE SLOPE BARRIERS
BIODEGRADABLE LOG SLOPE BARRIERS

PROJECT NO. 115506
SHEET NO. 115506-01
DATE: 5/26/2014
DESIGNED BY: W. J. HARRIS
CHECKED BY: W. J. HARRIS
IN CHARGE: W. J. HARRIS

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				



STRAW OR HAY BALE DITCH CHECK
NO SCALE

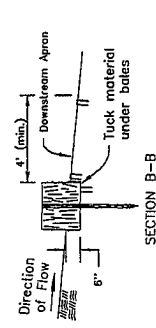


TYPICAL DITCH CHECK LAYOUT PLAN
NO SCALE

TEMPORARY DITCH CHECK SPACING	
DITCH & CHECK WIDTH (FEET)	SPACING (FEET)
1.0	200
2.0	100
3.0	65
4.0	40
5.0	30
6.0	25

NOTE: Use this spacing for all except Rock Ditch Checks.

- GENERAL NOTES:
- The choice of ditch check methods is at the option of the Contractor.
 - Use only rock checks in situations where the ditch slope exceeds 6 percent.
 - When ditch checks are damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired by Contractor at no extra cost to MODOT.



SECTION B-B

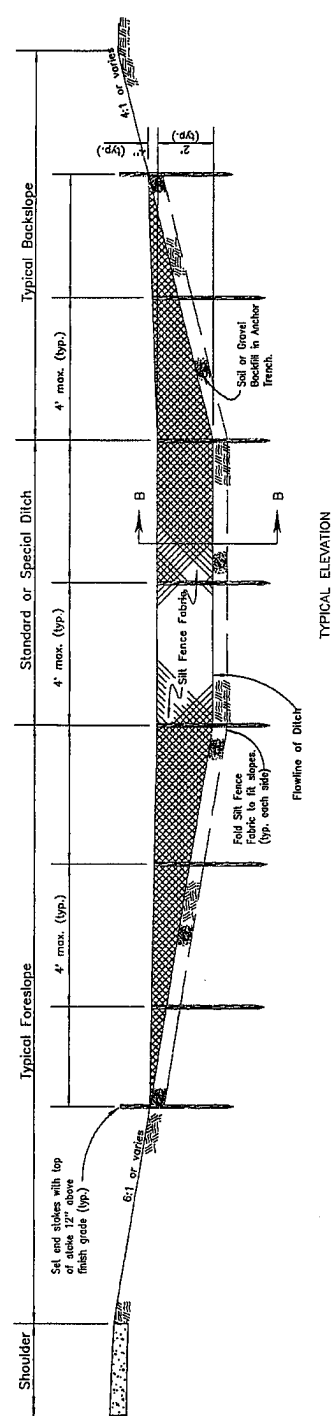
- STRAW OR HAY BALE NOTES:
- Place bales tightly together, with loose straw or hay wedged between bales to close off openings.
 - Wood stakes shall be 2" x 2" (nom.) x 4' (min.) long.
 - Use as many bales as necessary to completely block the ditch and to prevent water from flowing around the ends of the ditch check.
 - Use only twine to bind bales. The use of wire binding is prohibited.
 - Use silt fence material as the downstream apron to prevent scour below the ditch check.
 - Wire staples shall be 6" long by 1" wide, minimum.

NO.	DATE	REVISIONS	BY	APP'D
1	5/1/98	Revised Standard		
2				
3				
4				

KANSAS DEPARTMENT OF TRANSPORTATION	
TEMPORARY EROSION AND POLLUTION CONTROL	
STRAW OR HAY BALE DITCH CHECKS	
KANSAS	
DESIGNED BY	2/20/98 JCP
CHECKED BY	2/20/98 JCP
IN CHARGE	2/20/98 JCP
APPROVED BY	2/20/98 JCP

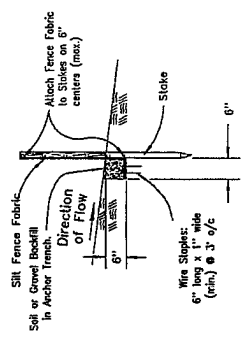
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

- SILT FENCE:**
- Staples shall be 4' (min.) long and of one of the following materials:
 - Hardwood - 1 3/16" x 1 3/16"
 - Southern Pine (No. 2) - 2 5/8" x 2 5/8"
 - Steel U, L, or C Section - 1.33 lbs. per 1'-0"; or
 - Synthetic - same strength as wood stakes.
 - Attach fence fabric to stakes with staples, wire or nails.
 - Refer to plan sheets to estimate the length of Silt Fence required.
 - Use support fencing when tributary area is greater than 2.4 acres or when ditch gradient is greater than 2 percent.

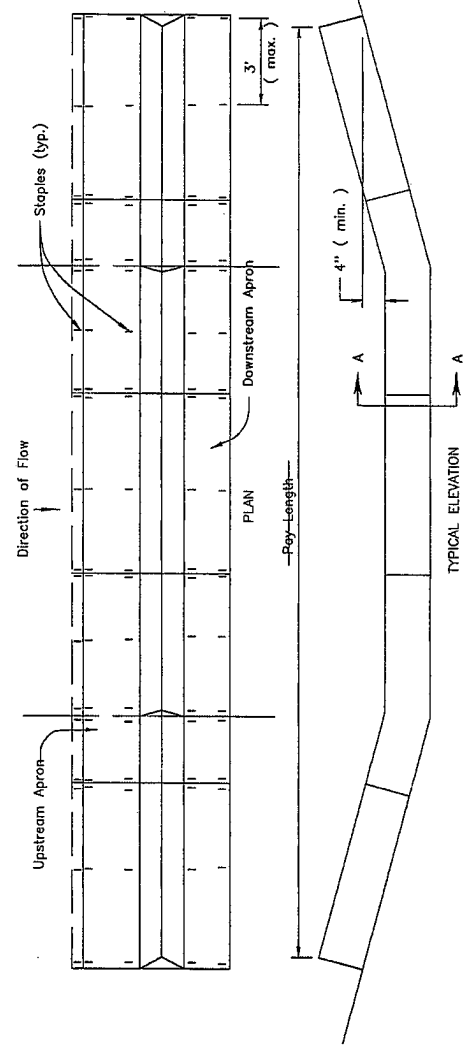


TYPICAL ELEVATION

SILT FENCE DITCH CHECK
NO SCALE

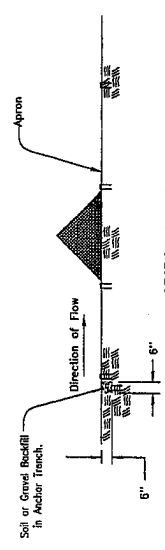


SECTION B - B



- TRIANGULAR SILT DIKE NOTES**
- Place Triangular Silt Dike sections tightly together, with apron material overlapping end-to-end by 6".
 - Wire Staples shall be 6" long by 1" wide, minimum.
 - Use as many Triangular Silt Dike sections as necessary to insure water does not flow around end of ditch check.

SECTION A - A



NO.	DATE	REVISIONS	BY	APPD.
1				
2				
3				

KANSAS-DEPARTMENT-OF-TRANSPORTATION
TEMPORARY EROSION AND POLLUTION CONTROL
SILT FENCE DITCH CHECKS
TRIANGULAR SILT DIKE CHECKS

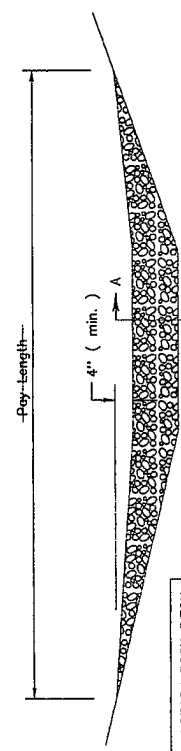
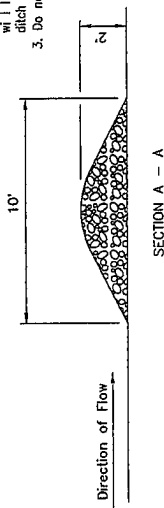
DESIGNED BY: [blank] CHECKED BY: [blank] DRAWN BY: [blank] SCALE: [blank]

TRIANGULAR SILT DIKE CHECK
NO SCALE

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

ROCK DITCH CHECK NOTES:

1. Rock shall be clean aggregate, D50 = 6".
2. Place rock in such manner that water will flow over ditch check, not around ditch check.
3. Do not use rock ditch checks in clear zone.



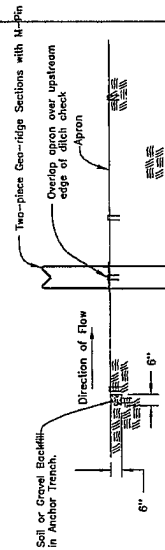
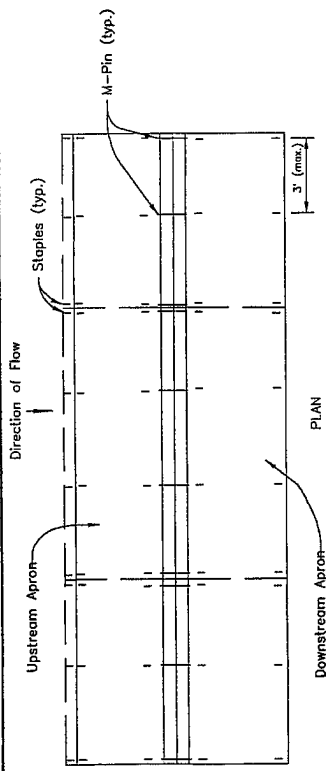
DITCH & SPACING	TEMPORARY ROCK DITCH CHECK
SIZE (INCHES)	SPACING (FEET)
5.0	50
6.0	50
7.0	43
8.0	35
9.0	28
10.0	28

NOTE: Use this spacing only for Rock Ditch Checks.

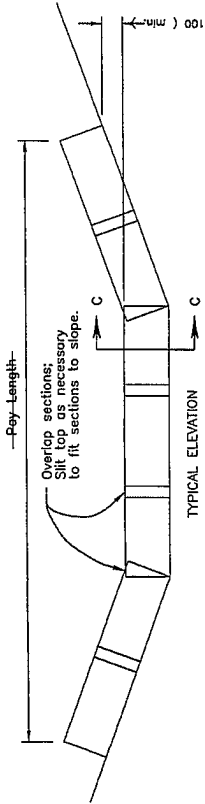
ROCK DITCH CHECK
NO SCALE

GEO-RIDGE PERMEABLE BERM NOTES

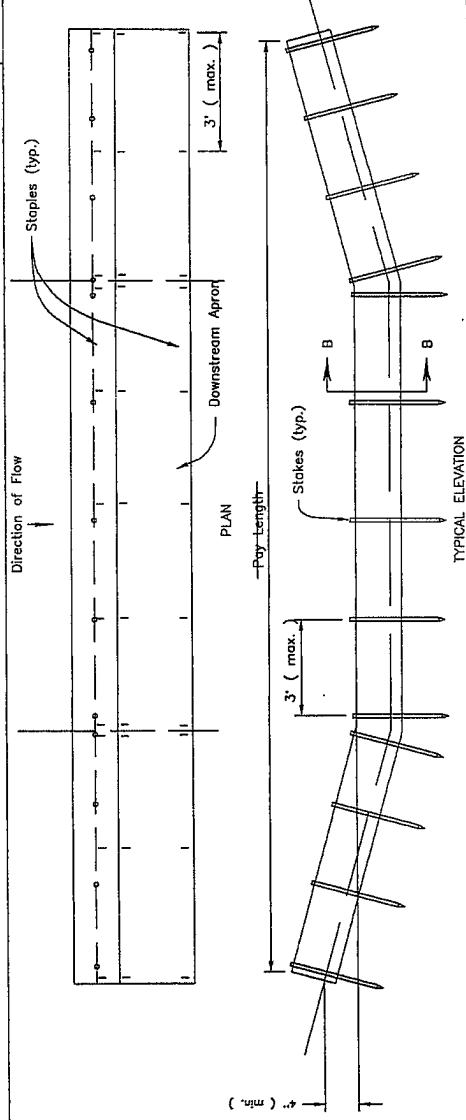
1. Overlap Geo-ridge Berm sections and apron material by 6".
2. Use M-Pins supplied by manufacturer to secure geo-ridge Berm sections.
3. Use as many Geo-ridge Berm sections as necessary to insure water does not flow around end of ditch check.
4. Use silt fence material as the apron to prevent scour above and below the ditch check.
5. Wire Staples shall be 6" long by 1" wide, minimum.



SECTION C - C



GEO-RIDGE PERMEABLE BERM DITCH CHECK
NO SCALE

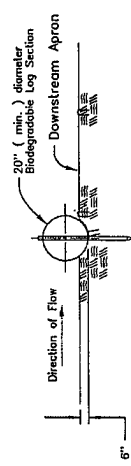


BIO-DEGRADABLE LOG DITCH CHECK
NO SCALE

BIO-DEGRADABLE LOG DIKE NOTES

1. Place bio-degradable logs tightly together, with apron material overlapping end-to-end by 6".
2. Wire staples shall be 6" long by 1" wide, minimum.
3. Use as many bio-degradable log sections as necessary to insure water does not flow around end of ditch check.
4. Wood stakes shall be 2" x 2" (nom.) x 4' (min.) long.
5. Use silt fence material as the downstream apron to prevent scour below the ditch check.

SECTION B - B



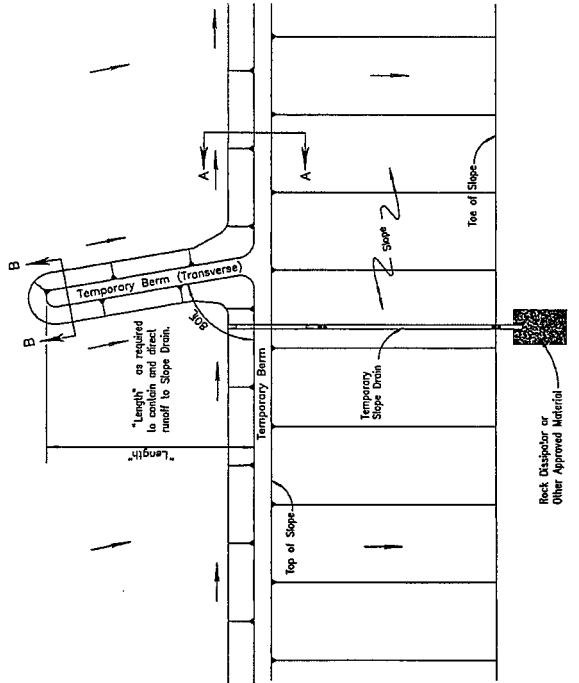
NO.	DATE	REVISION	BY	APP'D
1				
2				

DESIGNED BY: J. L. BARNETT
CHECKED BY: J. L. BARNETT
DRAWN BY: J. L. BARNETT
SCALE: AS SHOWN
PROJECT NO.: 08-11-2004 11:58:51 am

BIO-DEGRADABLE LOG DITCH CHECK
NO SCALE

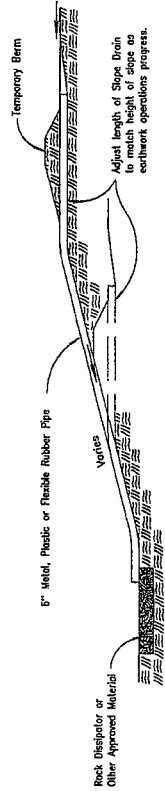
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

- NOTES:
- 1) Temporary Slope Drain and Temporary Berm may be used on either project foreslopes or project backlopes.
 - 2) Discharge of Slope Drains shall be into stabilized ditch or area, or into Sediment Basin.
 - 3) Pipe shall be secured in place as approved by Engineer.



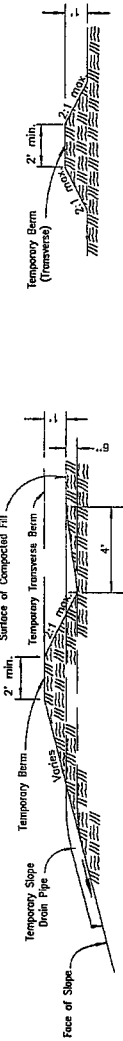
TYPICAL PLAN VIEW OF
TEMPORARY BERM AND
TEMPORARY SLOPE DRAIN

NO SCALE



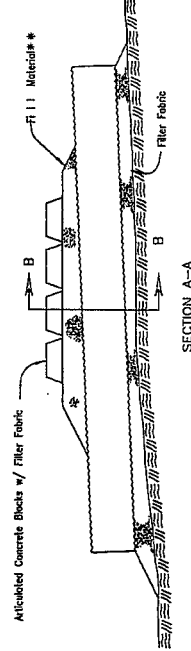
TYPICAL PROFILE OF TEMPORARY SLOPE DRAIN

NO SCALE



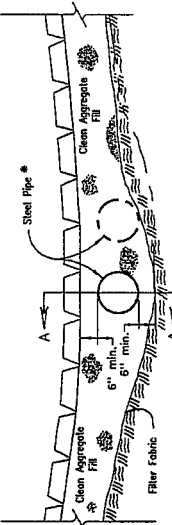
TYPICAL PROFILE OF TEMPORARY BERM

NO SCALE



* NOTE:
Quantity, length and diameter
of steel pipe to be determined
by design flow calculations.

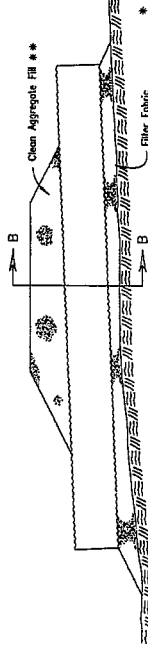
SECTION A-A



SECTION B-B

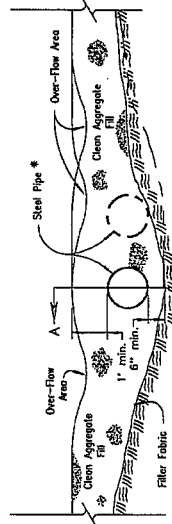
TEMPORARY STREAM CROSSING (ARTICULATED CONCRETE BLOCKS)

NO SCALE



* NOTE:
Quantity, length and diameter
of steel pipe to be determined
by design flow calculations.

SECTION A-A



SECTION B-B

TEMPORARY STREAM CROSSING (AGGREGATE)

NO SCALE

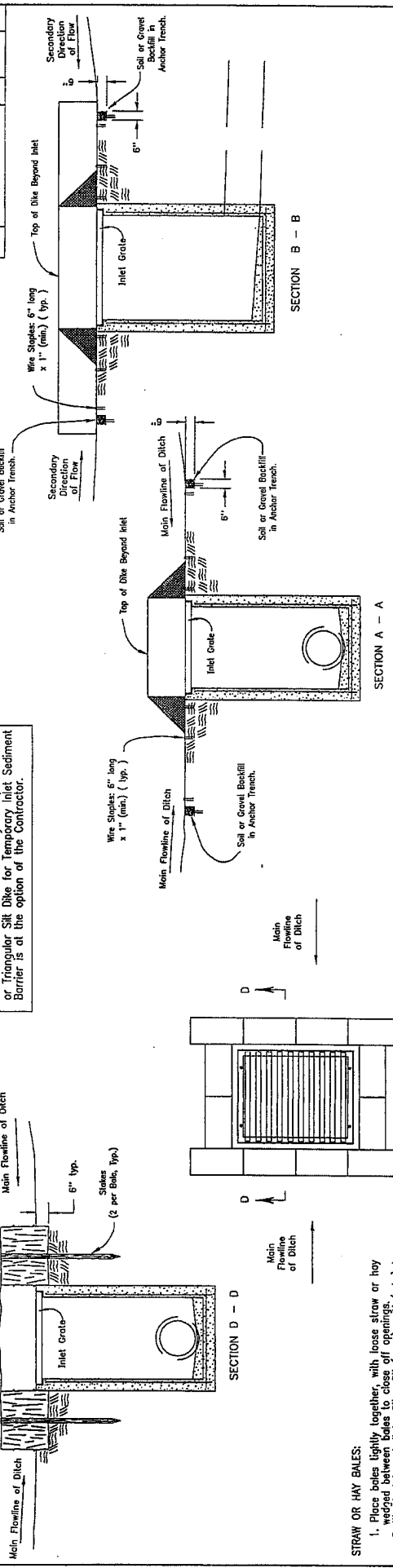
NO.	DATE	REVISIONS	BY	APP'D
1	5/1/03	Revised Standard	WCL	WCL
2				
3				

KANSAS DEPARTMENT OF TRANSPORTATION
POLLUTION EROSION CONTROL
TEMPORARY SLOPE DRAIN
TEMPORARY STREAM CROSSING (AGGREGATE)
TEMP. STREAM CROSS. (ARTIC. CONC. BLOCKS)
LA652B

DESIGNED BY: WCL
CHECKED BY: WCL
IN CHARGE: WCL
DATE: 5/1/03

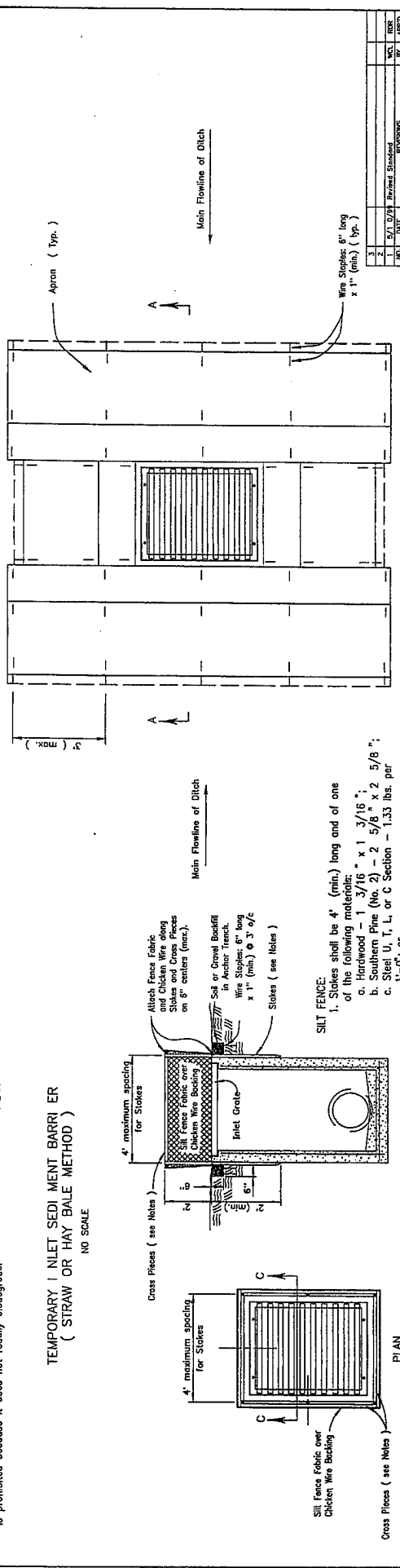
STATE	PROJECT NO.	YOUR SHEET NO.	TOTAL SHEETS
KANSAS			

NOTE: The use of Straw or Hay Bales, Silt Fence or Triangular Silt Dike for Temporary Inlet Sediment Barrier is at the option of the Contractor.



SECTION A - A

SECTION B - B



SECTION A - A

SECTION B - B

TEMPORARY INLET SEDIMENT BARRIER (STRAW OR HAY BALE METHOD)

TEMPORARY INLET SEDIMENT BARRIER (SILT FENCE METHOD)

NO SCALE

1. Place bales tightly together, with loose straw or hay wedged between bales to close off openings.
2. Wood stakes shall be 2" x 4" (min.) x 4' (min.) long. Use only one stake to bind bales. The use of wire binding is prohibited because it does not readily biodegrade.

1. Stakes shall be 4' (min.) long and of one of the following materials:
a. Hardwood - 1 3/16" x 1 3/16"
b. Southern Pine (No. 2) - 2 5/8" x 2 5/8"
c. Steel U, T, L, or C Section - 1.33 lbs. per 1'-0"; or
d. Synthetic - same strength as wood stakes.
2. Cross pieces shall be of some material as stakes, or nails.
3. Attach fence fabric to stakes with staples, wire or nails.
4. Refer to plan sheets to estimate the length of Silt Fence required.

TEMPORARY INLET SEDIMENT BARRIER (SILT FENCE METHOD)

NO SCALE

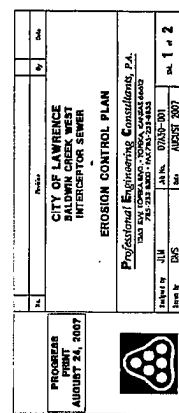
NO SCALE

Seeding/Fertilizing/Mulching

Areas that are disrupted by construction activities will be seeded and mulched for remediation. Seed will be in accordance with the site restoration report as prepared by Norman Ecological Consulting, Inc.

APPENDIX C

EROSION CONTROL PLAN



GENERAL

EROSION AND SEDIMENT CONTROL

CONTRACTOR SHALL KEEP A WRITTEN LOG OF WHEN CONSTRUCTION ACTIVITIES BEGIN, EROSION AND SEDIMENT CONTROLS ARE INSTALLED, INSPECTED AND REPAIRED. COPIES OF LOG SHALL BE FURNISHED TO THE DISTRICT.

1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED UPON STABILIZATION OF DISTURBED AREAS, WITH A PLANTING OF VEGETATION.



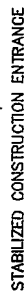
STRAW OR HAY BALE DITCH CHECK

NO SCALE

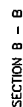


TEMPORARY INLET SEDIMENT BARRIER
(STRAW OR HAY BALE METHOD)

3 IVAS ON



31935 BY



SILT FENCE SLOPE BARRIER

NO SCALE



NO SCALE


INSTALLATION NOTES

INSTALL FENCE SLOPE BARRIER + DITCH CHECK:

1. Slakes shall be 4" (min.) long and of one of the following materials:
 - a. Hardwood - $1 \frac{3}{16}" \times 1 \frac{3}{16}"$
 - b. Southern Pine (No. 2) - $2 \frac{5}{8}" \times 2 \frac{5}{8}"$
 - c. Steel U, I, L, or C Section - 1.33 lbs. per 1'-0"; or
 - d. Synthetic - same strength as wood slakes.
2. Attach fence fabric to slakes with staples, wire or nails.
3. Refer to plan sheets to estimate the length of 36" Fence required.

TRIM OR MOW BYLE DITCH CHECK + INLET SETTLEMENT BASIN

1. Place staves tightly together, with noose short or lay
wood between staves to allow off openings.
2. Wood staves should be $2'' \times 2''$ (nom).
3. $4''$ (min) long.
4. Use as many bates as necessary to completely block the ditch
and to prevent water from flowing around the ends of the
ditch check.
5. Use only twine to bind bates. The use of wire binding is
prohibited because it does not readily biodegrade.

PROGRESS PRINT AUGUST 24, 2007	<div style="display: flex; justify-content: space-between;"> <div> <p>Scale</p> <p>CITY OF LAWRENCE BALDWIN CREEK WEAT INTERCEPTOR SEWER</p> </div> <div> <p>SEDIMENT AND EROSION CONTROL DETAILS</p> <p>Professional Engineering Consultants, P.A. 1204 HWY. 70, TORONTO, ONT. M6H 1A5, CANADA 4M62 TEL: 416 763 8800 • FAX: 416 763 8801 • WWW.PEC-PA.COM</p> </div> </div>										
	<div style="display: flex; justify-content: space-between;"> <div> <p>Sheet No. 07</p> </div> <div> <p>Job No. 0102-1028</p> </div> <div> <p>Date 2/2/07</p> </div> </div>										
											

APPENDIX D

**CONCEPT PLANS AND
DEVELOPMENT LAND USE INPUT
WORKSHEETS**

NW 1/4, SECTION 29

TOWNSHIP 12 SOUTH, RANGE 19 EAST, LAWRENCE, KANSAS

CONCEPT PLAN

BG
CONSULTANTS

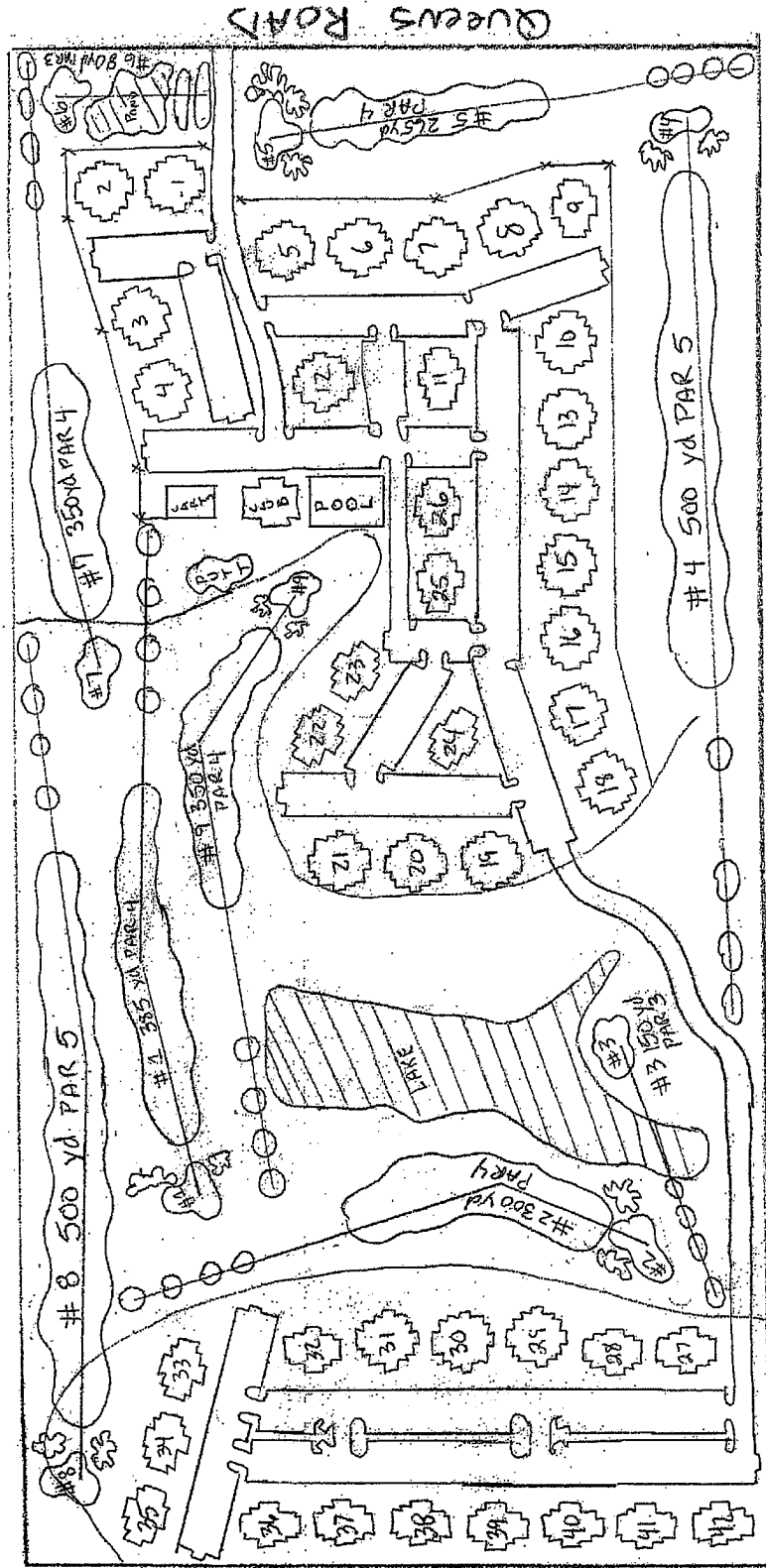
PROJECT NO. 1
SHEET NO. 1



Scale: 1" = 300'

"THE LINKS" LAWRENCE KANSAS

- * 42 BUILDINGS = 504 UNITS
- * 22 custom Deluxe II = 264 UNITS
- * 20 classic Deluxe II = 240 UNITS
- * GOLF COURSE PAR 36 2883 yards



1" = 200'

DEVELOPMENT LAND USE INPUT

SUB-BASIN BC2

Input Area Zoned acres	Calculated Percent Zone as decimal	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent capita/acre	Calculated Equivalent Capita	Given Capita Usage gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
0	0.00	1	Very Low Density Res	1.0	12.3	2.3	0	100	230	500	0.0035
464	0.42	2	Low Density Res	4.2	2.3	9.6	4450	100	959.1	500	0.0035
20.5	0.02	3	Medium Density Res	10.3	2.3	23.6	485	100	2364.4	500	0.0035
203	0.18	4	Office/Commercial/Multi Fam	11.1	2.3	25.5	5178	100	2550.7	200	0.0030
208	0.19	5	Commercial	2.0	3.0	6.0	1248	100	600	200	0.0030
0	0.00	6	Heavy Industry	1.0	25.0	25.0	0	100	2500	200	0.0030
0	0.00	7	Public	1.0	7.0	7.0	0	100	700	0	0.0005
205	0.19	8	Agriculture/Park	1.0	1.0	1.0	205	100	100	0	0.0005
1100.5	1.00		Calculated Weighted Averages	4.6	2.2	10.5	11566	100	1051	295	0.0028

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

Inflow + Peak WWP + Infiltration =											
				Calculated			Calculated		Calculated		
Developed (acres)	Tc (minutes)	10 Yr i (in/hr)	WWP Peaking Factor	Inflow (cfs)	Peak WWP (cfs)	Infiltration (cfs)	Design Flow (cfs)	Design Flow (mgd)	ADF (mgd)	Design Flow/ADF Peaking Factor	Calculated Equivalent Population
1000	126	1.54	1.66	4.24	2.70	0.46	7.40	4.781	1.051	4.55	10510
1100.5	129.10	1.54	1.66	4.67	2.96	0.50	8.13	5.252	1.157	4.54	11566
1250	133.7	1.54	1.64	5.30	3.33	0.57	9.21	5.950	1.314	4.53	13137
Lesser value from table below											
Results for Developments											
Higher value from table below											

Lesser value from table below
Results for Development
 Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr i in/hr	WWP Peaking Factor
1	62.1	2.58	2.17
10	66.6	2.58	2.00
25	70.4	2.58	1.93
50	74.7	2.58	1.88
75	78.1	2.16	1.85
100	80.9	2.16	1.83
250	93.0	1.89	1.76
500	106.6	1.69	1.71
750	117.1	1.69	1.68
1000	126.0	1.54	1.66
1250	133.7	1.54	1.64
1500	140.8	1.40	1.63
1750	147.3	1.40	1.62
2000	153.3	1.30	1.61
2500	164.3	1.30	1.59
3000	174.2	1.21	1.58
4000	191.9	1.13	1.56
5000	207.5	1.13	1.54
7500	234.5	1.00	1.52
10000	240.6	0.90	1.51
50000	268.6	0.90	1.49
	526.4	0.53	1.37

Data to be input by user
 Data from 2003 Master Plan used in above calculations
 Calculated Results for development represented by land use entered

DEVELOPMENT LAND USE INPUT

K-10 WEST

Input Area Zoned acres	Calculated Percent Zone as decimal	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent Capita	Given Capita gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
10	0.00	1	Very Low Density Res	11.0	2.3	0	100	230	500	0.0035
163.7	0.31	2	Low Density Res	4.0	2.3	1506	100	920	500	0.0035
0	0.00	3	Medium Density Res	12.0	2.3	0	100	2760	500	0.0035
93.1	0.18	4	Office/Commercial/Multi Fam	10.0	2.3	2141	100	2300	200	0.0030
182.2	0.34	5	Commercial	2.0	3.0	1093	100	600	200	0.0030
0	0.00	6	Heavy Industry	1.0	25.0	0	100	2500	200	0.0030
0	0.00	7	Public	1.0	7.0	0	100	700	0	0.0005
90	0.17	8	Agriculture/Park	1.0	1.0	90	100	100	0	0.0005
529	1.00		Calculated Weighted Averages	3.9	2.3	4831	100	913	259	0.0027

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

Developed (acres)	Tc (minutes)	10 Yr i (in/hr)	WWP Peaking Factor	Inflow + Peak WWP + Infiltration =				Calculated				Calculated Design Flow/ADF Peaking Factor	Calculated Equivalent Population
				Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Infiltration (cfs)	Calculated Design Flow (cfs)	Calculated Design Flow (mgd)	Calculated ADF (mgd)				
500	106.6	1.69	1.71	2.31	1.21	0.20	3.71	2.401	0.457	5.26	4566		
529	107.82	1.69	1.71	2.44	1.28	0.21	3.93	2.538	0.483	5.25	4831		
750	117.1	1.69	1.68	3.46	1.78	0.30	5.54	3.581	0.685	5.23	6849		

Lesser value from table below

Results for Development

Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr i in/hr	WWP	Peaking Factor
1	62.1	2.58	1.71	2.17
10	66.6	2.58	1.69	2.00
25	70.4	2.58	1.69	1.93
50	74.7	2.58	1.68	1.88
75	78.1	2.16	1.85	1.85
100	80.9	2.16	1.83	1.83
250	93.0	1.89	1.76	1.76
500	106.6	1.69	1.71	1.71
750	117.1	1.69	1.68	1.68
1000	126.0	1.54	1.66	1.66
1250	133.7	1.54	1.64	1.64
1500	140.8	1.40	1.63	1.63
1750	147.3	1.40	1.62	1.62
2000	153.3	1.30	1.61	1.61
2500	164.3	1.30	1.59	1.59
3000	174.2	1.21	1.58	1.58
4000	191.9	1.13	1.56	1.56
5000	207.5	1.13	1.54	1.54
7000	234.5	1.00	1.52	1.52
7500	240.6	0.90	1.51	1.51
10000	268.6	0.90	1.49	1.49
50000	526.4	0.53	1.37	1.37

Data to be input by user

Data from 2003 Master Plan used in above calculations

Calculated Results for development represented by land use entered

9/17/2007

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DEVELOPMENT LAND USE INPUT

MERCATO BCW (WEST + CENTRAL)

Input Area Zoned acres	Calculated Percent Zone as decimal	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent capita/acre	Calculated Equivalent Capita	Given Capita Usage gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
0	0.00	1	Very Low Density Res	1.0	2.3	2.3	0	100	230	500	0.0035
12.26	0.19	2	Low Density Res	3.3	2.3	7.6	93	100	759	500	0.0035
7.63	0.12	3	Medium Density Res	4.7	2.3	10.8	82	100	1081	500	0.0035
28.87	0.45	4	Office/Commercial/Multi Fam	18.1	2.3	41.6	1194	100	4163	200	0.0030
9.83	0.16	5	Commercial	2.0	3.0	6.0	59	100	600	200	0.0030
0	0.00	6	Heavy Industry	1.0	25.0	25.0	0	100	2500	200	0.0030
0	0.00	7	Public	1.0	7.0	7.0	0	100	700	0	0.0005
4.87	0.08	8	Agriculture/Park	1.0	1.0	1.0	5	100	100	0	0.0005
63.26	1.00		Calculated Weighted Averages	9.8	2.3	22.7	1433	100	2265	279	0.0030

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

				Inflow + Peak WWP + Infiltration =				Calculated Flow/ADF			
Developed (acres)	Tc (minutes)	10 Yr i (in/hr)	WWP Peaking Factor	Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Infiltration (cfs)	Calculated Design Flow (cfs)	Calculated ADF (mgd)	Calculated Design Flow Peaking Factor	Calculated Flow/ADF Equivalent Population	
50	74.7	2.58	1.88	0.38	0.33	0.02	0.73	0.113	4.19	1133	
63.26	76.50	2.36	1.86	0.44	0.41	0.03	0.88	0.143	3.96	1433	
75	78.1	2.16	1.85	0.48	0.49	0.03	1.00	0.170	3.80	1699	

Lesser value from table below
Results for Development
Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr I in/hr	WWP Peaking Factor
1	62.1	2.58	2.17
10	66.6	2.58	2.00
25	70.4	2.58	1.93
50	74.7	2.58	1.88
75	78.1	2.16	1.85
100	80.9	2.16	1.83
250	93.0	1.89	1.76
500	106.6	1.69	1.71
750	117.1	1.69	1.68
1000	126.0	1.54	1.66
1250	133.7	1.54	1.64
1500	140.8	1.40	1.63
1750	147.3	1.40	1.62
2000	153.3	1.30	1.61
2500	164.3	1.30	1.59
3000	174.2	1.21	1.58
4000	191.9	1.13	1.56
5000	207.5	1.13	1.54
7000	234.5	1.00	1.52
7500	240.6	0.90	1.51
10000	268.6	0.90	1.49
50000	526.4	0.53	1.37

Data to be input by user
Data from 2003 Master Plan used in above calculations
Calculated Results for development represented by land use entered

DEVELOPMENT LAND USE INPUT

K-10 CONFLUENCE

Input Area Zoned	Calculated Percent Zone as decimal	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent capita/acre	Calculated Equivalent Capita	Given Capita Usage gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
0	0.00	1	Very Low Density Res	1.0	2.3	2.3	0	100	230	500	0.0035
196.36	0.32	2	Low Density Res	4.2	2.3	9.7	1906	100	970.6	500	0.0035
13.43	0.02	3	Medium Density Res	7.8	2.3	18.0	242	100	1798.6	500	0.0035
121.67	0.20	4	Office/Commercial/Multi Fam	11.9	2.3	27.4	3333	100	2739.3	200	0.0030
191.83	0.31	5	Commercial	2.0	3.0	6.0	1151	100	600	200	0.0030
0	0.00	6	Heavy Industry	1.0	25.0	25.0	0	100	2500	200	0.0030
0	0.00	7	Public	1.0	7.0	7.0	0	100	700	0	0.0005
95.37	0.15	8	Agriculture/Park	1.0	1.0	1.0	96	100	100	0	0.0005
619.16	1.00		Calculated Weighted Averages	4.6	2.3	10.9	6727	100	1087	271	0.0028

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

Developed (acres)	Tc (minutes)	10 Yr i (in/hr)	WWP Peaking Factor	Calculated Inflow + Peak WWP + Infiltration =			Calculated Design Flow/ADF				
				Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Infiltration (cfs)	Calculated Design Flow (cfs)	Calculated Design Flow (mgd)	Calculated ADF (mgd)	Calculated Peaking Factor	Calculated Equivalent Population
500	106.6	1.69	1.71	2.35	1.44	0.21	4.00	2.584	0.543	4.76	5433
119.16	116.0	1.69	1.70	2.91	1.76	0.26	4.94	3.190	0.673	4.74	5727
750	117.1	1.69	1.68	3.53	2.12	0.31	5.96	3.851	0.815	4.73	8149

Lesser value from table below
Results for Development
Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr i in/hr	WWP	Peaking Factor
1	62.1	2.58	2.17	
10	66.6	2.58	2.00	
25	70.4	2.58	1.93	
50	74.7	2.58	1.88	
75	78.1	2.16	1.85	
100	80.9	2.16	1.83	
250	93.0	1.89	1.76	
500	106.6	1.69	1.71	
750	117.1	1.69	1.68	
1000	126.0	1.54	1.66	
1250	133.7	1.54	1.64	
1500	140.8	1.40	1.63	
1750	147.3	1.40	1.62	
2000	153.3	1.30	1.61	
2500	164.3	1.30	1.59	
3000	174.2	1.21	1.58	
4000	191.9	1.13	1.56	
5000	207.5	1.13	1.54	
7000	234.5	1.00	1.52	
7500	240.6	0.90	1.51	
10000	268.6	0.90	1.49	
50000	526.4	0.53	1.37	

Data to be input by user
Data from 2003 Master Plan used in above calculations
Calculated Results for development represented by land use entered

DEVELOPMENT LAND USE INPUT

SOUTHWEST BRANCH

Input Area Zoned	Calculated Percent Zone as decimal	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent capita/acre	Calculated Equivalent Capita	Given Capita/gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
1	0.00	1	Very Low Density Res	1.0	2.3	2.3	0	100	230	500	0.0035
2	0.39	2	Low Density Res	4.2	2.3	9.7	3036	100	966	500	0.0035
3	0.03	3	Medium Density Res	10.3	2.3	23.6	483	100	2364.4	500	0.0035
4	0.15	4	Office/Commercial/Multi Fam	11.9	2.3	27.4	3333	100	2739.3	200	0.0030
5	0.26	5	Commercial	2.0	3.0	6.0	1248	100	600	200	0.0030
6	0.00	6	Heavy Industry	1.0	25.0	25.0	0	100	2500	200	0.0030
7	0.00	7	Public	1.0	7.0	7.0	0	100	700	0	0.0005
8	0.17	8	Agriculture/Park	1.0	1.0	1.0	132	100	100	0	0.0005
796.56	1.00		Calculated Weighted Averages	4.4	2.3	10.3	8232	100	1033	293	0.0028

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

Developed (acres)	Tc (minutes)	10 Yr i (in/hr)	WWP	Peaking Factor	Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Infiltration (cfs)	Calculated Design Flow (cfs)	Calculated Design Flow (mgd)	Calculated Design Flow/ADF Peaking Factor	Calculated Equivalent Population
750	117.1	1.69	1.68	1.68	3.54	2.01	0.34	5.90	3.812	4.92	7751
1796.56	113.76	1.66	1.68	1.68	3.70	2.44	0.36	6.20	4.005	4.87	8232
1000	126	1.54	1.66	1.66	4.30	2.65	0.45	7.41	4.791	4.64	10335

Lesser value from table below

Results for Development

Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr i in/hr	WWP	Peaking Factor
1	62.1	2.58	2.17	
10	66.6	2.58	2.00	
25	70.4	2.58	1.93	
50	74.7	2.58	1.88	
75	78.1	2.16	1.85	
100	80.9	2.16	1.83	
250	93.0	1.89	1.76	
500	106.6	1.69	1.71	
750	117.1	1.69	1.68	
1000	126.0	1.54	1.66	
1250	133.7	1.54	1.64	
1500	140.8	1.40	1.63	
1750	147.3	1.40	1.62	
2000	153.3	1.30	1.61	
2500	164.3	1.30	1.59	
3000	174.2	1.21	1.58	
4000	191.9	1.13	1.56	
5000	207.5	1.13	1.54	
7000	234.5	1.00	1.52	
7500	240.6	0.90	1.51	
10000	268.6	0.90	1.49	
50000	526.4	0.53	1.37	

Data to be input by user

Data from 2003 Master Plan used in above calculations

Calculated Results for development represented by land use entered

9/17/2007

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DEVELOPMENT LAND USE INPUT

TURNER-DOUGLAS

Input Area Zoned acres	Calculated Percent Zone as decimal	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent capita/acre	Calculated Equivalent Capita	Given Capita Usage gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
0	0.00	1	Very Low Density Res	1.0	2.3	2.3	0	100	230	500	0.0035
0	0.00	2	Low Density Res	4.0	2.3	9.2	0	100	920	500	0.0035
0	0.00	3	Medium Density Res	12.0	2.3	27.6	0	100	2760	500	0.0035
61.5	0.77	4	Office/Commercial/Multi Fam	8.2	2.3	18.8	1159	100	1884.85	200	0.0030
0	0.00	5	Commercial	2.0	3.0	6.0	0	100	600	200	0.0030
0	0.00	6	Heavy Industry	1.0	25.0	25.0	0	100	2500	200	0.0030
0	0.00	7	Public	1.0	7.0	7.0	0	100	700	0	0.0005
18	0.23	8	Agriculture/Park	1.0	1.0	1.0	18	100	100	0	0.0005
79.5	1.00		Calculated Weighted Averages	6.6	2.0	14.8	1177	100	1481	155	0.0024

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

Inflow +											
Peak WWP +											
Infiltration =											
Developed (acres)	Tc (minutes)	10 Yr i (in/hr)	WWP Peaking Factor	Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Infiltration (cfs)	Calculated Design Flow (cfs)	Calculated Design Flow (mgd)	Calculated ADF (mgd)	Calculated Design Flow/ADF Peaking Factor	Calculated Equivalent Population
79.5	78.1	2.16	1.85	0.39	0.32	0.02	0.73	0.472	0.111	4.25	1111
100	80.9	2.16	1.83	0.42	0.34	0.02	0.77	0.500	0.118	4.25	1177
				0.53	0.42	0.02	0.97	0.626	0.148	4.23	1481

Lesser value from table below

Results for development

Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr i in/hr	WWP Peaking Factor
1	62.1	2.58	2.17
10	66.6	2.58	2.00
25	70.4	2.58	1.93
50	74.7	2.58	1.88
75	78.1	2.16	1.85
100	80.9	2.16	1.83
250	93.0	1.89	1.76
500	106.6	1.69	1.71
750	117.1	1.69	1.68
1000	126.0	1.54	1.66
1250	133.7	1.54	1.64
1500	140.8	1.40	1.63
1750	147.3	1.40	1.62
2000	153.3	1.30	1.61
2500	164.3	1.30	1.59
3000	174.2	1.21	1.58
4000	191.9	1.13	1.56
5000	207.5	1.13	1.54
7000	234.5	1.00	1.52
7500	240.6	0.90	1.51
10000	268.6	0.90	1.49
15000	526.4	0.53	1.37

Data to be input by user

Data from 2003 Master Plan used in above calculations

Calculated Results for development represented by land use entered

9/17/2007

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DEVELOPMENT LAND USE INPUT

SE CONFLUENCE (BELOW PS#45)

Input Area Zoned	Calculated Percent Zone as decimal	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent capita/acre	Calculated Equivalent Capita	Given Capita gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
10	0.00	1	Very Low Density Res	0.5	2.3	1.2	0	100	124.2	500	0.0035
21	0.15	2	Low Density Res	4.7	2.3	10.7	226	100	1074.1	500	0.0035
30	0.00	3	Medium Density Res	12.0	2.3	27.6	0	100	2760	500	0.0035
81.5	0.56	4	Office/Commercial/Multi Fam	9.9	2.3	22.7	1850	100	2270.1	200	0.0030
10	0.00	5	Commercial	2.0	3.0	6.0	0	100	600	200	0.0030
10	0.00	6	Heavy Industry	1.0	25.0	25.0	0	100	2500	200	0.0030
10	0.00	7	Public	1.0	7.0	7.0	0	100	700	0	0.0005
42	0.29	8	Agriculture/Park	1.0	1.0	1.0	42	100	100	0	0.0005
144.5	1.00		Calculated Weighted Averages	6.5	1.9	14.7	2118	100	1466	185	0.0023

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

Developed (acres)	Tc (minutes)	10 Yr i (in/hr)	WWP Peaking Factor	Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Infiltration (cfs)	Calculated Design Flow (cfs)	Calculated Design Flow (mgd)	Calculated ADF (mgd)	Calculated Design Flow/ADF Peaking Factor	Calculated Equivalent Population
100	80.9	2.16	1.83	0.51	0.41	0.03	0.95	0.614	0.147	4.19	1466
144.5	84.9	2.08	1.81	0.71	0.59	0.04	1.34	0.866	0.212	4.09	2118
250	93	1.89	1.76	1.11	1.00	0.07	2.18	1.408	0.366	3.84	3664

Lesser value from table below
Results for development
Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr i in/hr	WWP Peaking Factor
1	62.1	2.58	2.17
10	66.6	2.58	2.00
25	70.4	2.58	1.93
50	74.7	2.58	1.88
75	78.1	2.16	1.85
100	80.9	2.16	1.83
250	93.0	1.89	1.76
500	106.6	1.69	1.71
750	117.1	1.69	1.68
1000	126.0	1.54	1.66
1250	133.7	1.54	1.64
1500	140.8	1.40	1.63
1750	147.3	1.40	1.62
2000	153.3	1.30	1.61
2500	164.3	1.30	1.59
3000	174.2	1.21	1.58
4000	191.9	1.13	1.56
5000	207.5	1.13	1.54
7000	234.5	1.00	1.52
7500	240.6	0.90	1.51
10000	268.6	0.90	1.49
50000	526.4	0.53	1.37

Data to be input by user

Data from 2003 Master Plan used in above calculations

Calculated Results for development represented by land use entered

9/17/2007

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DEVELOPMENT LAND USE INPUT

PS#45 (Revision after Zoning)

Input Area Zoned	Calculated Percent Zone as decimal	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent Capita	Calculated Equivalent Capita/acre	Given Capita Usage gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
0	0.00	1	Very Low Density Res	1.0	2.3	0	2.3	100	230	500	0.0035
41.23	0.23	2	Low Density Res	3.8	2.3	361	8.8	100	876.3	500	0.0035
50.01	0.28	3	Medium Density Res	5.6	2.3	649	13.0	100	1297.2	500	0.0035
40.95	0.23	4	Office/Commercial/Multi Fam	16.0	2.3	1509	36.8	100	3684.6	200	0.0030
35.48	0.20	5	Commercial	2.0	3.0	213	6.0	100	600	200	0.0030
0	0.00	6	Heavy Industry	1.0	25.0	0	25.0	100	2500	200	0.0030
0	0.00	7	Public	1.0	7.0	0	7.0	100	700	0	0.0005
9.02	0.05	8	Agriculture/Park	1.0	1.0	9	1.0	100	100	0	0.0005
176.69	1.00		Calculated Weighted Averages	6.7	2.4	2741	15.5	100	1551	345	0.0031
Total Area											

DEVELOPMENT DESIGN FLOW CALCULATION

		Inflow + Peak WWP + Infiltration =		Calculated		Calculated		Calculated		Calculated		Calculated	
Developed (acres)	Tc (minutes)	10 Yr i (in/hr)	WWP	Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Infiltration (cfs)	Calculated Design Flow (cfs)	Calculated Design Flow (mgd)	Calculated ADF (mgd)	Calculated Design Flow Peaking Factor	Calculated Equivalent Population	Calculated Design Flow Peaking Factor	Calculated Equivalent Population
100	80.9	2.16	1.83	0.88	0.44	0.05	1.17	0.755	0.155	4.87	1551	4.87	1551
176.69	87.09	2.02	1.79	1.42	0.76	0.09	1.97	1.276	0.274	4.95	2741	4.95	2741
250	93	1.89	1.76	1.48	1.06	0.13	2.67	1.725	0.388	4.45	3878	4.45	3878

Lesser value from table below
Results for Development
Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr i in/hr	WWP
1	62.1	2.58	2.17
10	66.6	2.58	2.00
25	70.4	2.58	1.93
50	74.7	2.58	1.88
75	78.1	2.16	1.85
100	80.9	2.16	1.83
250	93.0	1.89	1.76
500	106.6	1.69	1.71
750	117.1	1.69	1.68
1000	126.0	1.54	1.66
1250	133.7	1.54	1.64
1500	140.8	1.40	1.63
1750	147.3	1.40	1.62
2000	153.3	1.30	1.61
2500	164.3	1.30	1.59
3000	174.2	1.21	1.56
4000	191.9	1.13	1.56
5000	207.5	1.13	1.54
7000	234.5	1.00	1.52
10000	240.6	0.90	1.51
15000	268.6	0.90	1.49
20000	526.4	0.53	1.37

Data to be input by user
Data from 2003 Master Plan used in above calculations
Calculated Results for development represented by land use entered

DEVELOPMENT LAND USE INPUT

OREGON TRAIL

Input Area Zoned acres	Calculated Percent Zone as decimal	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent capita/acre	Calculated Equivalent Capita	Given Capita Usage gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
11.4	0.00	1	Very Low Density Res	10.1	2.3	2.3	0	100	230	500	0.0035
30.81	0.19	2	Low Density Res	4.4	2.3	10.1	115	100	1009.7	500	0.0035
13786	0.51	3	Medium Density Res	4.7	2.3	10.7	331	100	1074.1	500	0.0035
0	0.23	4	Office/Commercial/Multi Fam	8.9	2.3	20.5	283	100	2051.6	200	0.0030
0	0.00	5	Commercial	2.0	3.0	6.0	0	100	600	200	0.0030
0	0.00	6	Heavy Industry	1.0	25.0	25.0	0	100	2500	200	0.0030
0	0.00	7	Public	1.0	7.0	7.0	0	100	700	0	0.0005
4337	0.07	8	Agriculture/Park	1.0	1.0	1.0	4	100	100	0	0.0005
60.333	1.00		Calculated Weighted Averages	5.3	2.2	12.2	733	100	1215	396	0.0032

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

Developed (acres)	Tc (minutes)	10 Yr.1 (in/hr)	WWP Peaking Factor	Inflow + Infiltration =				Calculated			
				Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Infiltration (cfs)	Calculated Design Flow (cfs)	Calculated Design Flow (mgd)	Calculated ADF (mgd)	Calculated Design Flow/ADF Peaking Factor	Calculated Equivalent Population
50	74.7	2.58	1.88	0.41	0.18	0.03	0.62	0.398	0.061	6.56	608
60.333	76.1	2.41	1.87	0.46	0.21	0.04	0.71	0.459	0.073	6.25	733
75	78.1	2.16	1.85	0.51	0.26	0.05	0.82	0.530	0.091	5.82	911

Lesser value from table below
 Results for development
 Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr.1 in/hr	WWP Peaking Factor
10	62.1	2.58	2.17
25	66.6	2.58	2.00
50	70.4	2.58	1.93
75	74.7	2.58	1.88
100	78.1	2.16	1.85
250	80.9	2.16	1.83
500	93.0	1.89	1.76
750	106.6	1.69	1.71
1000	117.1	1.69	1.68
1250	126.0	1.54	1.66
1500	133.7	1.54	1.64
1750	140.8	1.40	1.63
2000	147.3	1.40	1.62
2500	153.3	1.30	1.61
3000	164.3	1.30	1.59
4000	174.2	1.21	1.58
5000	191.9	1.13	1.56
7000	207.5	1.13	1.54
10000	234.5	1.00	1.52
	240.6	0.90	1.51
	268.6	0.90	1.49
50000	526.4	0.53	1.37

Data to be input by user
 Data from 2003 Master Plan used in above calculations
 Calculated Results for development represented by land use entered

DEVELOPMENT LAND USE INPUT

ROOT LLC GRAHAM

Input Area Zoned	Calculated Percent Zone as decimal	Zone	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent capita/acre	Calculated Equivalent Capita	Given Capita Usage gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
0	0.00	1	Very Low Density Res	1.0	2.3	2.3	0	100	230	500	0.0035
0	0.00	2	Low Density Res	3.7	2.3	8.6	0	100	857.9	500	0.0035
0	0.00	3	Medium Density Res	7.2	2.3	16.5	0	100	1653.7	500	0.0035
5.4	1.00	4	Office/Commercial/Multi Fam	19.4	2.3	44.7	241	100	4471.2	200	0.0030
0	0.00	5	Commercial	2.0	3.0	6.0	0	100	600	200	0.0030
0	0.00	6	Heavy Industry	1.0	25.0	25.0	0	100	2500	200	0.0030
0	0.00	7	Public	1.0	7.0	7.0	0	100	700	0	0.0005
0	0.00	8	Agriculture/Park	1.0	1.0	1.0	0	100	100	0	0.0005
5.4	1.00		Calculated Weighted Averages	19.4	2.3	44.7	241	100	4471	200	0.0030

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

		Inflow + Peak WWP + Infiltration =		Calculated		Calculated		Calculated		Calculated		Calculated	
Developed (acres)	Tc (minutes)	10 Yr 1 (in/hr)	WWP Peaking Factor	Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Infiltration (cfs)	Calculated Design Flow (cfs)	Calculated Design Flow (mgd)	Calculated ADF (mgd)	Calculated Design Flow/ADF Peaking Factor	Calculated Equivalent Population	Calculated Design Flow/ADF Peaking Factor	Calculated Equivalent Population
1	62.1	2.58	2.17	0.01	0.02	0.00	0.02	0.015	0.004	3.33	45	3.33	45
5.4	64.30	2.58	2.09	0.04	0.08	0.00	0.12	0.078	0.024	3.25	241	3.25	241
10	66.6	2.58	2	0.08	0.14	0.00	0.22	0.141	0.045	3.16	447	3.16	447

Lesser value from table below
Results for Development
Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr 1 in/hr	WWP Peaking Factor
1	62.1	2.58	2.17
10	66.6	2.58	2.00
25	70.4	2.58	1.93
50	74.7	2.58	1.88
75	78.1	2.16	1.85
100	80.9	2.16	1.83
250	93.0	1.89	1.76
500	106.6	1.69	1.71
750	117.1	1.69	1.68
1000	126.0	1.54	1.66
1250	133.7	1.54	1.64
1500	140.8	1.40	1.63
1750	147.3	1.40	1.62
2000	153.3	1.30	1.61
2500	164.3	1.30	1.59
3000	174.2	1.21	1.58
4000	191.9	1.13	1.56
5000	207.5	1.13	1.54
7000	234.5	1.00	1.52
7500	240.6	0.90	1.51
10000	268.6	0.90	1.49
50000	526.4	0.53	1.37

Data to be input by user
Data from 2003 Master Plan used in above calculations
Calculated Results for development represented by land use entered

DEVELOPMENT LAND USE INPUT

MERCATO (Entire Tract)

Input Area Zoned acres	Calculated Percent Zone as decimal	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent capita/acre	Calculated Equivalent Capita	Given Capita Use gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
10	0.00	1	Very Low Density Res	1.0	2.3	2.3	0	100	230	500	0.0035
22.52	0.18	2	Low Density Res	3.3	2.3	7.7	172	100	765.9	500	0.0035
7.83	0.06	3	Medium Density Res	4.7	2.3	10.9	83	100	1085.6	500	0.0035
39.63	0.32	4	Office/Commercial/Multi Fam	18.6	2.3	42.7	1693	100	4271.1	200	0.0030
45.31	0.37	5	Commercial	2.0	3.0	6.0	272	100	600	200	0.0030
0	0.00	6	Heavy Industry	1.0	25.0	25.0	0	100	2500	200	0.0030
0	0.00	7	Public	1.0	7.0	7.0	0	100	700	0	0.0005
7.59	0.06	8	Agriculture/Park	1.0	1.0	1.0	8	100	100	0	0.0005
122.64	1.00		Calculated Weighted Averages	7.7	2.5	18.2	2227	100	1816	261	0.0030

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

Developed (acres)	Tc (minutes)	10 Yr i (in/hr)	WWP Peaking Factor	Inflow + Infiltration =				Calculated			
				Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Infiltration (cfs)	Calculated Design Flow (cfs)	Calculated Design Flow (mgd)	Calculated ADF (mgd)	Calculated Design Flow/ADF Peaking Factor	Calculated Equivalent Population
100	80.9	2.16	1.83	0.64	0.51	0.04	1.20	0.773	0.182	4.26	1816
122.64	82.73	2.12	1.82	0.77	0.63	0.05	1.45	0.936	0.223	4.20	2227
250	93	1.89	1.76	1.40	1.24	0.10	2.74	1.771	0.454	3.90	4540

Lesser value from table below

Results for Development

Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr i in/hr	WWP Peaking Factor
1	62.1	2.58	2.17
10	66.6	2.58	2.00
25	70.4	2.58	1.93
50	74.7	2.58	1.88
75	78.1	2.16	1.85
100	80.9	2.16	1.83
250	93.0	1.89	1.76
500	106.6	1.69	1.71
750	117.1	1.69	1.68
1000	126.0	1.54	1.66
1250	133.7	1.54	1.64
1500	140.8	1.40	1.63
1750	147.3	1.40	1.62
2000	153.3	1.30	1.61
2500	164.3	1.30	1.59
3000	174.2	1.21	1.58
4000	191.9	1.13	1.56
5000	207.5	1.13	1.54
7000	234.5	1.00	1.52
7500	240.6	0.90	1.51
10000	268.6	0.90	1.49
50000	526.4	0.53	1.37

Data to be input by user

Data from 2003 Master Plan used in above calculations

Calculated Results for development represented by land use entered

9/17/2007

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TURNER

DEVELOPMENT LAND USE INPUT

Input Area Zoned	Calculated Percent Zone as decimal	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent Capita	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
0	0.00	1	Very Low Density Res	1.0	2.3	0	230	500	0.0035
0	0.00	2	Low Density Res	3.7	2.3	0	857.9	500	0.0035
0	0.00	3	Medium Density Res	7.2	2.3	0	1653.7	500	0.0035
10.8	1.00	4	Office/Commercial/Multi Fam	19.6	2.3	488	4514.9	200	0.0030
0	0.00	5	Commercial	2.0	3.0	0	600	200	0.0030
0	0.00	6	Heavy Industry	1.0	25.0	0	2500	200	0.0030
0	0.00	7	Public	1.0	7.0	0	700	0	0.0005
0	0.00	8	Agriculture/Park	1.0	1.0	0	100	0	0.0005
10.8	1.00		Calculated Weighted Averages	19.6	2.3	488	4515	200	0.0030

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

Developed (acres)	Tc (minutes)	10 Yr i (in/hr)	WWP Peaking Factor	Inflow + Peak WWP + Infiltration =		Calculated Design Flow/ADF		Calculated Equivalent Population
				Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Design Flow (mgd)	Calculated ADF (mgd)	
10.8	66.6	2.58	2	0.08	0.14	0.22	0.045	451
10.8	66.6	2.58	2.00	0.08	0.15	0.24	0.048	488
25	70.4	2.58	1.93	0.19	0.34	0.54	0.113	1129

Lesser value from table below
Results for development
Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan

Developed Acres	Tc minutes	10 Yr i in/hr	WWP Peaking Factor
1	62.1	2.58	2.17
10	66.6	2.58	2.00
25	70.4	2.58	1.93
50	74.7	2.58	1.88
75	78.1	2.16	1.85
100	80.9	2.16	1.83
250	93.0	1.89	1.76
500	106.6	1.69	1.71
750	117.1	1.69	1.68
1000	126.0	1.54	1.66
1250	133.7	1.54	1.64
1500	140.8	1.40	1.63
1750	147.3	1.40	1.62
2000	153.3	1.30	1.61
2500	164.3	1.30	1.59
3000	174.2	1.21	1.58
4000	191.9	1.13	1.56
5000	207.5	1.13	1.54
7000	234.5	1.00	1.52
7500	240.6	0.90	1.51
10000	268.6	0.90	1.49
50000	526.4	0.53	1.37

Data to be input by user

Data from 2003 Master Plan used in above calculations

Calculated Results for development represented by land use entered

DEVELOPMENT LAND USE INPUT

LOGES

Input Area Zoned	Calculated Percent Zone	Zone Type	Land Use Description	Input Density units/acre	Given Equivalent capita/unit	Calculated Equivalent capita/acre	Calculated Equivalent Capita	Given Capita Usage gal/capita/day	Calculated Average WWP gal/acre/day	Given Infiltration gal/acre/day	Given Inflow Coeff K
0.00	0.00	1	Very Low Density Res	1.0	2.3	2.3	0	100	230	500	0.0035
19.57	0.48	2	Low Density Res	3.7	2.3	8.6	168	100	857.9	500	0.0035
19.2	0.47	3	Medium Density Res	7.2	2.3	16.5	318	100	1653.7	500	0.0035
0.00	0.00	4	Office/Commercial/Multi Fam	8.9	2.3	20.5	0	100	2051.6	200	0.0030
0.00	0.00	5	Commercial	2.0	3.0	6.0	0	100	600	200	0.0030
0.00	0.00	6	Heavy Industry	1.0	25.0	25.0	0	100	2500	200	0.0030
0.00	0.00	7	Public	1.0	7.0	7.0	0	100	700	0	0.0005
2.2	0.05	8	Agriculture/Park	1.0	1.0	1.0	2	100	100	0	0.0005
40.77	1.00		Calculated Weighted Averages	5.2	2.2	12.0	487	100	1195	475	0.0034

Total Area

DEVELOPMENT DESIGN FLOW CALCULATION

Developed (acres)	Tc (minutes)	10 Yr i (in/hr)	WWP	Peaking Factor	Calculated Inflow (cfs)	Calculated Peak WWP (cfs)	Calculated Infiltration (cfs)	Calculated Design Flow (cfs)	Calculated Design Flow ADF (mgd)	Calculated Design Flow/ADF Peaking Factor	Calculated Population
25	70.4	2.58	1.93	1.93	0.22	0.09	0.02	0.32	0.030	7.00	299
40.77	73.1	2.58	1.90	1.90	0.35	0.14	0.03	0.53	0.049	6.97	487
50	74.7	2.58	1.88	1.88	0.43	0.17	0.04	0.64	0.060	6.95	598

Lesser value from table below
Results for Development
Higher value from table below

Lawrence Design Data From 2003 Wastewater Master Plan			
Developed Acres	Tc minutes	10 Yr i in/hr	WWP
1	62.1	2.58	2.17
10	66.6	2.58	2.00
25	70.4	2.58	1.93
50	74.7	2.58	1.88
75	78.1	2.16	1.85
100	80.9	2.16	1.83
250	93.0	1.89	1.76
500	106.6	1.89	1.74
750	117.1	1.69	1.68
1000	126.0	1.54	1.66
1250	133.7	1.54	1.64
1500	140.8	1.40	1.63
1750	147.3	1.40	1.62
2000	153.3	1.30	1.61
2500	164.3	1.30	1.59
3000	174.2	1.21	1.58
4000	191.9	1.13	1.56
5000	207.5	1.13	1.54
7000	234.5	1.00	1.52
7500	240.6	0.90	1.51
10000	288.6	0.90	1.49
50000	526.4	0.53	1.37

Data to be input by user
Data from 2003 Master Plan used in above calculations
Calculated Results for development represented by land use entered

9/17/2007

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Price Proposal
City of Lawrence
Baldwin Creek West Interceptor

Base Price- **\$2,986,000.00**

Allowances* --

(scope of the allowances are as described in the Work Description)

1. Dewatering	\$ 75,000.00
2. Civil Testing	\$ 10,000.00
3. Repair & Maintain Roads	\$ 20,000.00
4. Remediation / Landscaping	\$ 10,000.00
5. Rock Breakup / Replacement	\$350,000.00
6. Pump Station #45 Tie in	\$ 10,000.00
7. Erosion Control	\$ 30,000.00
8. Staging Area Prep / Removal	\$ 35,000.00
9. Clearing	\$ 40,000.00

Total Allowances : ***\$ 580,000.00***

Subtotal **\$3,566,000.00**

Engineering ***\$ 292,000.00***

Subtotal **\$3,858,000.00**

Unforeseen Items / Contingency** ***\$ 50,000.00***

Grand Total / Contract Value **\$3,908,000.00**

Separate GMP – Seeding **\$ 70,000.00**

* - Allowances are items carried within the GMP to provide coverage for costs that are not yet fully defined. Costs in these areas will not be released without a decision by the Owner. Costs in excess of these amounts will be paid by the Owner. Costs less than the amounts listed will be returned to the Owner by deductive change order to the Owner. Costs for these items will be without markup from CAS.

** - Contingency amount for unforeseen items in scope or changes to the contract scope not defined in the proposal. Charges against this account will not be made without approval of the Owner.