ACEC
American Council of Engineering Companies
of Kansas

APWA Kansas City Metropolitan Chapter
American Public Works Association

ACEC
Missouri

RECOMMENDATIONS AND CHECKLISTS FOR ENSURING QUALITY INFRASTRUCTURE PROJECTS

A partnering project of the ACEC-Kansas, APWA Kansas City Chapter, and ACEC-Missouri
June 14, 2006

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ENSURING QUALITY INFRASTRUCTURE PROJECTS

1.1 INTRODUCTION

1.1.1 Objectives

The general objective of this document is to develop recommendations to ensure quality on municipal projects in the Kansas City area. To ensure quality, there is a need to go beyond just a focus on plan preparation. Other important items including right-of-way acquisition, utility relocations, and permitting are all integral components of the design process. Also, there are different design processes depending on the type of project/public works improvement. Some cities are "full service" cities with utility improvements, treatment plants, water distribution facilities, storm drainage and street improvements, etc. Other cities are confined to just storm drainage and street improvement projects. In this report the focus will be on project checklist for storm drainage and street improvement projects since these are traditional projects common to all cities and are usually the most complex.

1.2 PROCEDURES RECOMMENDED

In developing a standard project checklist for Municipal projects in the Kansas City area six issues were addressed.

1. Develop a Standard Process – Establish a comprehensive standard process for various types of projects from project conception to completion of construction. The following will be developed:
   - A general flowchart showing project activities.
   - Project task descriptions with required activities.

2. Contractor/Inspector Involvement – On more complicated projects, especially those involving staging and constructability issues, determine ways to involve persons familiar with construction issues such as engineers with field experience, contractor and/or inspectors earlier in the design process. The following will be developed on more complicated projects when constructability is an issue:
   - Constructability Review – Determine the methods and timing for conducting constructability reviews during the design process with contractors, inspectors, engineers with field experience in the type of project.
   - Plan review and contractor useful information – Associated with the previous item, determine a feasible way to allow the contractor to review the plans and specifications before advertising the project to identify information useful to contractors which should be incorporated into the plans and specifications as well as identify constructability issues.

3. Measure Progress/Performance – Develop a system to determine progress and compliance with project activities and requirements. Develop the following tools:
   - Progress Reports
   - Back-up Documentation

4. Site Investigation/Inventory Review – Develop a system to ensure that what is being designed in the office fits with what is actually out in the field. The following checking procedures will be developed:
   - Survey Check – Conduct a review of critical horizontal/vertical survey information to sift out

any survey busts.
- Topography Check – Conduct a field check of the topography to make sure all miscellaneous items have been properly identified on the plans including utility facilities, fences, landscaping, sprinklers, etc.
- Utility Check: Conduct a scan of the project site for utilities not previously identified or mis-identified.
- Design Field Check – Conduct a joint city/consultant walk-through of the 50% complete plans so that all items impacted by the project are taken into account.

5. Review Procedures/Guidelines – Develop formal review procedures for the plans and specifications. This will include determining:
   - What to review, when to review, and how long to review
   - Level of Detail for different reviews during the course of a project.

6. Training/Qualification – Develop a career development program to train young professionals and so that designers and reviewers have a full range of project experiences. This will improve the quality of the design and the reviews.

1.3 A STANDARD PROCESS

A general comprehensive project procedures flow chart was developed. This flowchart takes the reader through the basic tasks necessary to move a project forward from conception, through design, and through construction. It provides the following benefits:

- Consistency – It ensures that all tasks are consistently being performed on every project.
- Thorough – It reduces the chance of missing steps along the way.
- Training Tool – It is an excellent training tool for young engineers and for those new to the City.

A copy of the standard flow chart and the associated task descriptions are included in the Appendix. The tasks shown should be tasks common to any Public Works project in the Kansas City Metropolitan area. Each City will have additional tasks beyond those shown which are unique to that City.

1.3.1 Follow-up Action Items by City

- Develop a more detailed/customized flow chart for your City beyond the standard flowcharts to reflect the unique process within your City.
- Develop a customized checklist for your City with sign-off responsibilities established to ensure that each task is being performed on all projects.
- Assemble example documents for your City (sample letters, forms, permits, etc.) and reference these to the respective tasks in the flowchart. This will increase efficiency and uniformity in the everyday activities for a project.
- Larger cities should consider developing a centrally maintained web-based procedures manual. This will improve user access and will ensure that viewed items are the “latest and greatest”. The web-based manual will also allow people from the outside to view the City procedures.

1.4 CONTRACTOR/INSPECTOR INVOLVEMENT DURING DESIGN

1.4.1 Constructability Review

Plan reviews to evaluate constructability issues should be conducted by individuals with experience in construction. This could include experienced designers, contractors and/or inspectors. While these reviews should be conducted on all projects, the following situations might warrant a formal evaluation by an independent contractor/inspector:

- Should be completed on projects of a certain size and scope. The specific dollar size of a project would not necessarily mean a review is needed, but might be a factor.
- Projects where the rehabilitation of existing structures, the reconstruction or realignment of existing roadways is included should always be reviewed. Existing roadways and structures should be re-surveyed to verify the as-built drawings are correct as to location and alignment.
- Projects with complex traffic control plans should be reviewed. The review should include factors such as the safety of the traveling public and of the worker's safety (work place safety should always be a factor). Traffic control plans should be as simple as possible to allow the project to be completed as fast as possible. Limiting the number of phases greatly increases productivity and minimizes the inconvenience to the traveling public.
- Projects with major utility relocations should be checked to see if the relocations provide sufficient construction room and access to the work site.

1.4.2 Contractor/Inspector Involvement

Contractor involvement should take place during the design phase. It should begin when the traffic control/sequence of construction concept is developed, it should continue with a review of the field check plans, and end with the final plans, contract documents, and specifications.

Another source of reviewers could be retired construction inspectors. These could be either city or state personnel.

1.4.3 Contractor Useful Information

Contractors can use all available information concerning a project. All as-built drawings should be included or made available. All utility locations and owner representatives should be provided. All adjoining property owners names should be listed especially on projects where blasting might occur. More job specific specifications should be included rather than trying to adapt standard specifications that do not reflect the actual work involved. If a geotechnical report is available it should also be open to the contractor for review.

1.5 MEASURE PROGRESS/PERFORMANCE

Measuring progress and performance will vary by the type and size of the project. With this in mind, the objectives related to this issue are as follows:

1.5.1 Project Milestones

Identify time or milestones in the project schedule where progress information needs to be transmitted to the client.

1.5.2 Project Progress

Identify the method of transmitting the progress information to the client via a summary checklist similar to checklists in the Appendix.

The use of the progress submittals should be identified during the pre-contract negotiations. The progress information submitted under these guidelines is only intended to inform the client of the consultant's progress in addressing the pertinent issues in a timely manner during the course of the project. They are not intended to replace review submittals or act as review checklists. In general, this information should be a summary of the consultants detailed internal tracking system.

The "Phase" represents the approximate time in the project when the progress form should be submitted. The "Submittal" represents the basic information to be included on the form. An example of the form for survey is attached.

Phase	**Submittal**
Concept	Project Design Criteria
Preliminary Design	Survey (see examples in the Appendix) Utility Coordination
Preliminary Alignment	Horiz./vert. curves, Entrances, Drainage Environmental Process/Permits/Public Hearings Preliminary right-of-way limits, Owners
Final Design	Preliminary Plans List Utility Coordination
Construction	Inspector's Daily Diary or Weekly Progress Meeting Minutes

1.5.3 Project Progress Meetings

Although written reports are important, project meetings can help with communication and the city should consider milestone meetings that include the consultant and inspector as appropriate for the stage of the project.

1.5.4 Follow-up Action Items by City

- Review forms in the Appendix and modify for your city.

1.6 SITE INVESTIGATION/INVENTORY REVIEW

Too often what appears on the plans doesn't always coincide with what exists in the field. There are several reasons for this problem:

- Many times the design of a project occurs over a long time period. Modifications to adjoining properties occur during that time period and these new topo items are never picked up and added to the plans.

- Sometimes the initial survey is performed and never field checked to see whether all the topographical items have been picked up and/or properly shown on the base mapping.
- Quite often not all the available as-built plans are reviewed to pick up underground information not visible to the eye.
- Sometimes all utility and property owner information is not researched, field located, and plotted properly on the base mapping.

To make sure these problems do not occur and that each project produces quality base mapping information, the following recommendations should be followed.

1.6.1 Coordination

Surveyors and designers should regularly meet to discuss optimum approaches to collecting field data and deciding what's important/what's not. Surveyors should understand how information will be used, designers should understand how much effort is really involved in meeting certain requests. Special attention is needed in having a thorough understanding of how buried utilities will be located and shown on the plans.

1.6.2 Procurement of Survey Services

Design firms should try to develop relationships with survey firms for out-of-house surveying and extend the same quality-based selection considerations to surveyors that are extended to engineers (i.e., not bid for services).

1.6.3 Checking Procedure

Follow a three part check process:

Survey Review – Control
Topo Review – Location of physical features
Field Check (note that this should also occur during the right-of-way plan development phase if the project has a long schedule).

1.6.4 Follow-up Surveys

Allow budget up front for second and third trips to survey, so that the survey process can be interactive with design. The second field trip should occur during preliminary plans, after designers have found the added items needed. The third survey field trip should occur after the field check so that additional items noted can be gathered.

1.6.5 Miscellaneous Items

Pay special attention to the following items (as the case may warrant)

- Driveway materials and borders
- Fences
- Irrigation systems
- Utility service connections
- Landscape features such as size and type of trees, and type of sod.

- Septic systems and lateral fields
- Property corners pins & land corners
- Retaining walls

1.6.6 Grading/Cross Section Check

Cross sections should be plotted early in the design process and careful cross checking between plan/profile and cross sections should be made repeatedly. A thorough and careful drainage and grading design will expose most survey elevation busts.

1.6.7 Utilities

Utility locations and coordination are a major factor in keeping the project on schedule. Following is a listing of activities that may be necessary to properly manage the utility coordination on a project.

1. During the design survey locate utilities and show locations on base mapping. Identify utility companies in project area. Contact utility companies to request existing and proposed utility plans. Contact ONE-CALL and survey located utilities in the field – get list of utilities and contact information.

2. Contact utility companies and confirm that utility location information is shown correctly on base mapping.

3. Set up meeting to review project scope and typical section with utilities and establish preliminary utility corridors.

4. Utility companies prepare utility relocation plans.
    - Send preliminary plans with pipe profiles and cross sections to utility companies.
    - Hold meeting to finalize utility corridors.
    - Verify critical depth information through pot holing, vacuum excavation, or ground penetrating radar.
    - Hold several meetings to report status of utility relocation plans.

5. Finalize utility relocation plans and execute utility agreements.
    - Hold several meetings to report status of utility relocation plans.
    - Execute utility agreements for those utilities within easements.

6. Monitor utility relocations in the field (optional).
    - Stake reference information for utility relocations.
    - Provide observation/verification of utility relocations.
    - Develop as-built information and show new locations in plans.

1.6.8 Formatting Layouts

Drawing layouts should be formatted so that survey information is presented completely and accurately, to assist in Quality Assessment/Quality Control (QA/QC).

1.6.9 Survey/Mapping Source

Plan sets should contain a note that clearly indicates the survey company, date, and type of survey methods used. If a mixture of methods (field/aerial, etc.) are used, this should be generally explained.

The note should be sufficient to let the contractor, engineer, reviewers, etc. know to what likely accuracy individual drawing elements were found, as well as the source of the survey information.

1.6.10 Proper Reference Information

Plans should contain sufficient horizontal control points referenced to land corners by coordinates, grids, station angles, etc. so that horizontal control can be checked from the plan set alone. Land corners shall be referenced as required by state law. Datum bench marks used for elevation shall be described and shown on the plans.

1.6.11 Staking Considerations

The needs of the staking surveyor should be taken into consideration in laying out the drawings. Available information should be shared to reduce need for redundant efforts and potential for mistakes.

1.6.12 Follow-up Action Items by City

- Review survey checklist in the Appendix and if appropriate develop a customized checklist for your city.

1.7 REVIEW PROCEDURES/GUIDELINES

One of the key components to a successful and quality project is a clear understanding of the review process to be undertaken by the municipality and the time it will take for these reviews to be completed. The recommendations contained within this activity are meant to:

- Encourage a better exchange of expectations prior to starting a project.
- Improve uniformity of review.
- Develop guidelines for what items are appropriate to review at different project stages.

It is not the intent of these recommendations to address every possible event that can occur during a project. Instead these recommendations should be utilized to foster a better partnering effort between clients and consultants.

1.7.1 Establish review time expectations at the time of contract negotiations

Slow review times can upset consultant's schedules just as late submittals upset client schedules. The client and consultant should establish a clear understanding at the time of contract negotiation of the number of submittals that will be made by the consultant and the time that should be allocated for review. Implementation of this discussion into the contract stage should help set expectations for the entire project.

1.7.2 Guidelines for Reviews

Consistent with the project procedure flow chart, plans should be reviewed, as a minimum, at the preliminary/field check stage and at final plan stage. For larger more complex plans reviews at concept stage and at right of way stage might also be added. The schedule of reviews should be established during contract negotiations.

The following general guidelines should be followed in determining items to review at each design phase. Specific items will vary depending on the type and complexity of the project. The review items listed below are intended to be examples and guidelines, not an exhaustive list.

1.7.2(a) Concept Plans

General review should be focused on plan conformity to the design intent of the project. The following questions should be asked:

- Does the project meet design objectives?
- Does the project meet general design criteria (design speed, design rainfall/runoff, etc.)?
- Are there unexpected design considerations that need to be incorporated into the project?
- Does the project fit within the expected budget?

1.7.2(b) Preliminary Plans/Field Check Plans

This submittal should receive the highest scrutiny since plan modifications become more difficult and time consuming as more detail is added to the plans. The following questions should be asked:

- Has design criteria been accurately applied to the project?

- Are plan notes clear and legible?
- Are plan notes complete?
- Does the project meet specific project and design objectives?
- Do dimensions check?
- Do typical sections match plan views?
- Review storm drainage calculations at this stage if this is a required submitta.
- Are utilities listed and shown correctly?
- Have required environmental permits been considered or initiated?
- Are land corners properly noted and provisions made for preservation or restoration?

1.7.2(c) Right of Way Plans

If a specific review of right of way plans is done, it should focus specifically on right-of-way issues. The following questions should be asked:

- Are all grading limits shown?
- Are easements and rights-of-way adequate for the extent and type of work to be done?
- Are utility easements needed for relocation and are they shown?
- Are all legal descriptions submitted for the easements shown on the plans?

1.7.2(d) Final Plans & Specifications

Final plan review should focus on items added since the preliminary plan submittal. The following questions should be asked:

- Have all preliminary plan comments been addressed?
- Are plans formatted per city standards?
- Is the plan set complete for bidding and construction?
- Have required permits been applied for and on schedule for issuance?
- Are utility relocations and coordination on schedule?
- Are all needed details supplied?
- For plans that include quantity summaries, are all required pay items covered?
- Do specifications cover all required construction items?
- Have all City specific sections been included?

1.7.3 Develop Checklists for Review

Standard checklists should be developed for each stage of project review, examples are available in the Appendix. The checklists will serve as a valuable tool for reviewers that should improve the following:

- Review efficiency.
- Review consistency. This will be particularly helpful when reviewers change during the design process.
- Review documentation.

1.8 TRAINING and QUALIFICATIONS

It is very important to establish a framework for developing programs to ensure that individuals doing the design work and doing the review work have the necessary background and engineering experiences to do provide the best quality project. The following recommendations should be considered:

1.8.1 Training Guidelines

Employers should develop training guidelines and a "curriculum" or outline of essential skills their designers should develop, and work to make that training a part of the everyday operations of the firm. Training includes "On-The-Job" training through project assignments and need not be separate courses or non-billable time. Achievement of the essential skills can be made part of an individual training plan.

1.8.2 Practical/Useful Training

Training should focus on nut-and-bolts aspects of plan production and designing the work, including efficient use of resources and applied principles.

1.8.3 Mentorship

Mentorship from project management/senior project engineer ranks (5-15 year experience range) is an important part of transferring skills. Employers should strive to encourage mentorship opportunities, and should try to retain stability in employment for individuals at that level.

1.8.4 Quality Control/Checking Procedure

Consistent, formal, quality control procedures can be an important part of training new designers. Designers can learn both by checking other's work and having their own work constructively critiqued in a formal and regular manner.

1.8.5 Continuing Education

Strong encouragement should be given for continuing technical and management education, including study for master's degree.

1.8.6 Field Experience

Training opportunities should include field assignments as inspectors or observers whenever possible. If full-time inspection opportunities are not available, younger engineers should be encouraged to visit their projects under construction, even if outside their contractual duties, to become familiar with the implementation of their designs.

1.8.7 Design Experience

Designers should carefully think through the geometry of what is designed. High quality field designs cannot be done with engineers just "setting criteria" and untrained technicians/designers "drawing lines."

1.8.8 Constructive Criticism

Clients should strive to communicate back to consultants regarding positive aspects of the work produced, as well as constructive criticism. This communication should be shared with newer engineers so that they gain an understanding of how to improve and an understanding of the differing viewpoints clients may have regarding how to prepare designs.

1.8.9 Field Trips

The Cities, Consultants, and Professional Organizations of the metro area should consider setting up a series of field trips during the construction season and focus on inviting younger engineers to attend. The field trips should allow for an interaction between the engineers, the contractors, and the inspectors to both see how the construction processes work and to discuss aspects of design that improve constructability.

1.8.10 Improved Communication

Many of the issues related to improved communications between clients, contractors and consultants in general also relate to the training of consultant staff. The young designer training process should also incorporate the lessons learned from the procedures suggested in other sections of this document.

1.8.11 Contract Documents and Specifications

Greater emphasis should be placed on training engineers to understand contract documents and specifications, and the relationship that these documents bear to the plans and cost estimates. An appreciation for the importance of good specification writing appears to be one of the items most commonly overlooked in the early part of most designer's education.

1.9 SUMMARY

In developing a standard project checklist to ensure quality for municipal projects in the Kansas City area six (6) issues were addressed.

1. **Develop a Standard Process**
2. **Contractor/Inspector Involvement During Design**
3. **Measure Progress/Performance**
4. **Site Investigation/Inventory Review**
5. **Review Procedures/Guidelines**
6. **Training and Qualifications**

Recommendations are made to address each issue. Documents are provided in the Appendix to implement the recommendations.

In conjunction with the recommendations, a number of follow-up action items have been listed which will require additional effort beyond the initial documents. Many Cities will want to act upon these action items themselves to address the unique way in which they administer projects. For those Cities without the staff and/or time to undertake such an effort, the consultant community in conjunction with city representation could develop these action items in more detail creating the necessary standard policies, procedures, and documentation.

KANSAS CITY METRO AREA
PROJECT TASK DESCRIPTIONS

PHASE 1 - VISION

Task No. 1 - Prepare Preliminary Study/Cost Estimate - For major projects a preliminary study and a cost estimate should be prepared. This study will be the basis of establishing the design parameters and preliminary project cost. For street projects, this report will also establish the cross section, right-of-way widths, median openings, intersection geometrics, future traffic signal locations, and vertical and horizontal alignments. The preliminary study is a valuable tool to ensure subsequent private development complies with the ultimate construction.

Task No. 2 - Prepare Feasibility Report - A feasibility report is required when a project is proposed whereby the method of financing all or part of the project will be paid by property owners through assessments or special districts.

Examples of these special districts use:

- Benefit Districts (BD)
- Tax Increment Financing (TIF)
- Transportation Development Districts (TDD)

These reports for special districts generally include the following:

- project description
- estimate of probable cost
- a legal description of the property to be included in the district
- method of assessment
- apportionment of cost

Task No. 3 - Draft BD Petitions - The City Attorney with assistance from the City Engineer will prepare petitions for financing either all or part of a project using the BD Statutes. The petitions shall include the information and data as described in Task No. 2.

Task No. 4 - Check BD Petitions and Documents - The City Engineer and City Attorney will check petitions for signatures compared to the public record and percentage of property owner signatures. City council approval is necessary to establish the BD.

Task No. 5 - Prepare BD Resolution for Public Hearing - The City Attorney in conjunction with the City Engineer will prepare resolutions when financing either all or part of a project using the BD Statutes by proposing the Public Hearing process rather than the Petition process as described in Task No. 3. City Council approval is necessary to establish the BD.

Task No. 6 - Distribute CIP Project Request Memo - The designated city officials at the beginning of each budget year or when the appropriate city officials shall distribute a memo to all city Department Heads requesting for projects to be considered in the CIP. New projects may be added, existing projects

deleted or rescheduled and revised project costs. All new projects submitted shall have an estimated project cost, requested construction year and proposed method of financing.

Task No. 7-10 - Prepare, Review and Obtain City Council Approval of the CIP - The designated City Official will review the submitted projects with the City Department Directors. The recommended CIP will be submitted to the Planning Commission and appropriate City Council Committees for review and recommendation to the City Council. The City Council will schedule a CIP Public Hearing prior to approval of the CIP.

Task No. 11 - Update the MARC Functional Classification Map - The appropriate City Official shall annually review the City's Street System to determine if the street's functional classification should be revised and submitted for MARC's approval. The appropriate City Officials will attend the scheduled MARC meeting(s) when this subject is discussed for the Metro area.

Task No. 12 - Draft MARC Kansas Long Range Plan - The designated City Official will attend the Committee meetings of the Kansas Metro staff to discuss and establish the Kansas Long Range Plan and the Priority ranking of the projects on the Kansas portion of the Metro area.

Task No. 13 - Draft MARC Missouri Long Range Plan – The designated City Officials will attend the Enhancement Committee meetings. This committee consisting of City and County staff officials prioritize projects for the Long Range Plan for the Missouri portion of the Metro Area.

Task No. 14 - Submit Projects for CMAQ Evaluation/Funding - A CMAQ committee has been established with MARC to determine project priorities and make recommendations to the MARC Board. Presently the committee consists of two elected local officials, transit and air quality representatives.

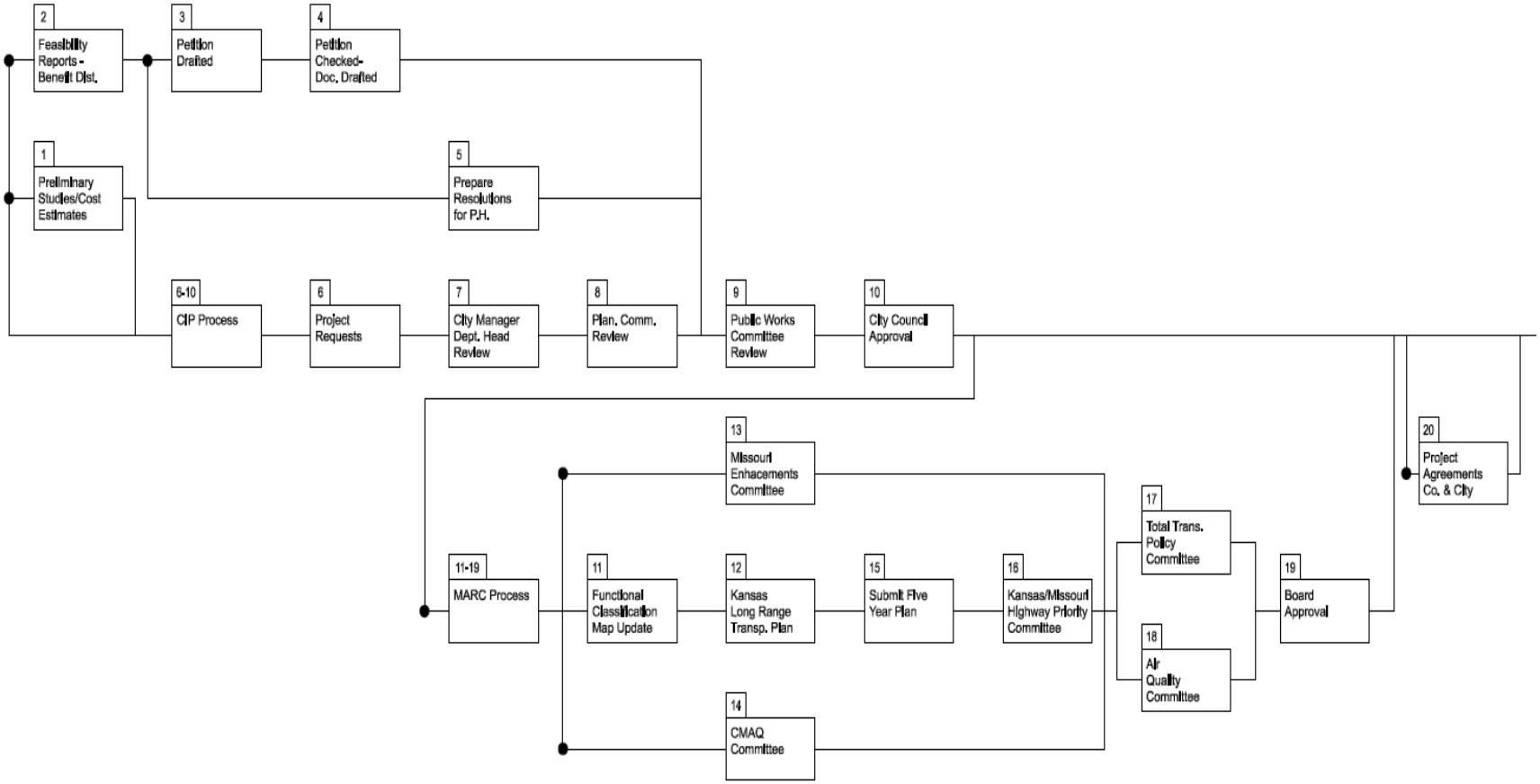
Task No. 15 - Submit MARC Five Year Plan - The designated City Official shall annually submit, as requested by MARC, the city's transportation projects that are designated in the CIP to receive federal transportation funds.

Task No. 16 – Attend Kansas/Missouri Highway Priority Committees – The designated City/County Officials shall attend these separate state committee meetings. The purpose of these committees is to prioritize projects in each state in the Metro area and make recommendations to the MARC Board.

Task No. 17,18, & 19 - Complete the MARC Process – All projects must be reviewed by the Total Transportation and Air Quality Committees prior to consideration by the MARC Board.

Task No. 20 - Execute City Project Agreement - If there are two or more cities involved with a project, an agreement should be executed prior to the beginning of project engineering. The agreement will establish which city will administer the project. If there is CARS, SMAC, KDOT or MoDOT funding for the project, the agreement between the two cities is to be executed prior to forwarding to the other governmental agencies.

KANSAS CITY METRO AREA - PROJECT PROCEDURES FLOW CHARTS
PHASE I - VISION - CAPITAL IMPROVEMENTS PLAN/PROCESS



Project Phase I
Date: 11/ 4/ 2005

Task

Decision Node "Optional" Task

Decision Node "Mandatory" Task

KANSAS CITY METRO AREA
PROJECT TASK DESCRIPTIONS

PHASE 2 - PRELIMINARY PLAN

Task No. 1 - Hire Consultant - The Consultant selection process is generally as follows:

- develop a scope of services
- submit Request for Proposal (RFP)
- shortlist consultants
- interview consultants
- select consultant
- negotiate contract & scope of services
- Legal department review contract
- Governing body approval

NOTE: MARC's rules and regulations do not permit federal dollars to be used for project design services for transportation projects.

***Task No. 2 - Schedule Kick-Off/Design Criteria* Meeting** - A Kick-Off/Design Criteria meeting shall be scheduled prior to commencing any significant design work. A meeting agenda shall be prepared and distributed in advance of the meeting to the scheduled attendees. Meeting minutes shall be prepared and distributed to all attendees. The purpose of this meeting is to discuss and resolve as many anticipated design issues as possible as follows:

- specific limits of improvements
- median openings and left/right turn storage lengths
- detailed schedule
- confirmation of appropriate design criteria
- determine detours/street closings
- project phasing/traffic control

Transportation projects shall be designed in accordance with the following:

- City/County Technical Specifications and Design Criteria for Public Improvement projects.
- Current edition of the Green Book A Policy on Geometric Design of Highways and Streets by the American Association of State Highway and Transportation officials.
- Current edition of the Standard Specifications for State Road and Bridge Construction for KDOT or MoDOT.
- Traffic signals, signing and pavement markings shall be designed in accordance with the latest edition of Manual on Uniform Traffic Control Devices and City/County Technical Specifications and design criteria.

Task No. 3 - Prepare-Forward Pre-Survey Info. Letter to Residents & Utility Companies - The Consultant in conjunction with the appropriate City Official will prepare and forward to all utility companies, residents and property owners an informational letter. This letter should contain the

following:

- scope of the project
- consultant's name, address and phone number
- what the survey crew will be doing
- mention future public meetings

Task No. 4 - Prepare-Forward Project Schedule - When a Consultant is to be hired, the anticipated construction time period shall be provided. The Consultant shall submit a schedule indicating the design phases, R/W/easement submittal, meetings, bid opening date and construction time period. If the City Staff is designing the project, a similar schedule shall be prepared by the City Engineer.

Task No. 5 - Conduct Field Surveys - Sufficient and required data necessary for design purposes shall be collected. The field survey shall locate all above ground utilities and as possible buried utilities. All survey work shall be in accordance with current accepted and required surveying practices. The vertical control shall be datum established by the city. The horizontal control shall reference land corners in the area and the state plane coordinate system.

Task No. 6 - Complete Title Report - The title work is sometimes included as part of the consultant's work. The consultant shall prepare a map or plan indicating the location of the project and the number of tracts of land involved for submittal to the title company. The title company should provide the following information:

- name and address of property owner
- legal description of the property
- mailing address of the property owner
- all lien holders of record
- all easements of record
- width of dedicated R/W
- records of previous condemnations

In addition to paper submittals the title company should provide all data in electronic format. The agreement with the title company will establish a date for completing the title certification and report.

Task No. 7 - Complete Geotechnical Report - The Consultant, in conjunction with the city, shall determine what appropriate geotechnical information and data is necessary to adequately design the project. If the Consultant cannot provide this service, use of a subconsultant may be obtained after receiving written approval from the City.

Task No. 8 - Prepare-Forward Letter Notification to Utilities - When a Consultant is selected or the City begins design, an informational letter shall be forwarded to all possible utilities that might be involved with the project. This letter shall introduce the project, request utility plans/records, provide a preliminary project schedule and request the utility company to designate a contact for the project.

Task No. 9 - Complete Preliminary Plans - The Consultant shall have the plans approximately fifty percent complete for preliminary plans submittal to the city. For street/highway projects the plan profile should be complete with all proposed right-of-way and easements identified and established. A preliminary construction cost estimate should be prepared at this time in the schedule. The plans shall be stamped "PRELIMINARY".

Task No. 10 - Prepare Preliminary Cost Estimate - The Consultant in conjunction with the city engineer's office shall prepare a preliminary construction cost estimate.

Task No. 11 – Begin Environmental Process – For federally funded projects, KDOT and MoDOT will generally control the environmental process task for projects with categorical exclusion. The complexity and effort will depend on each project. The exception would be if an Environmental Assessment or an Environmental Impact Statement is required. In this case, the City or Consultant would perform this task with State and FHWA approval. Review and follow National Environmental Policy Act (NEPA) and Federal Highway Administration (FHWA) guidelines to assess whether a Categorical Exclusion (CE), an Environmental Assessment (EA), or an Environmental Impact Statement (EIS) is required. The following Environmental Studies may be required under either the NEPA process or a Corps of Engineers (CoE) permit:

- Endangered Species Act
- Farmland Protection Policy Act
- Section 106 Cultural Resources (Historic and Archaeological Sites)
- Air Quality
- Noise Standards/Noise Abatement
- Hazardous Waste
- Wetlands

For non-Federal funded projects, the appropriate City Official and the Consultant will determine the needed environmental work. For typical projects the following environmental permits may be needed for the project.

Type of Permit	**Missouri**	**Kansas**
Corps of Engineers 404	KC District	KC District
Stream Obstruction	MDNR	Division of Water Resources
NPDES Land Disturbance	MDNR & local	KDHE & local
Flood Plain Development	Local	Local

Task No. 12 - Schedule First Public Meeting - The Consultant/Project Manager shall schedule the first public meeting. The purpose of this meeting is to explain the preliminary plans, present the project schedule, hear the citizen's concerns and issues, discuss design issues and introduce the involved City Officials and Consultant employees.

NOTE: This and all the subsequent Public Information Meeting notices should ask if participants need a language interpreter or a hearing assistance device and a phone number. All meeting rooms shall be ADA accessible.

Task No. 13 - Schedule-Conduct Field Check Meeting-City Projects - The Consultant/Project Manager shall schedule a field check meeting. The Preliminary Plans will be used for this meeting. The appropriate City/County/State Officials shall be informed of this scheduled meeting.

Task No. 14 - Submit Plans to Utilities and Schedule First Utility Meeting - When the Preliminary

Plans are distributed to the utility companies, the first utility meeting is scheduled. An agenda shall accompany the letter and meeting minutes prepared and distributed. The purpose of this meeting is as follows:

- Check accuracy of utility locations on plans,
- establish what utilities need to be relocated,
- establish timetable for accomplishing the relocations,
- re-confirm utility representative contacts,
- establish if there are any utilities located on private easements.

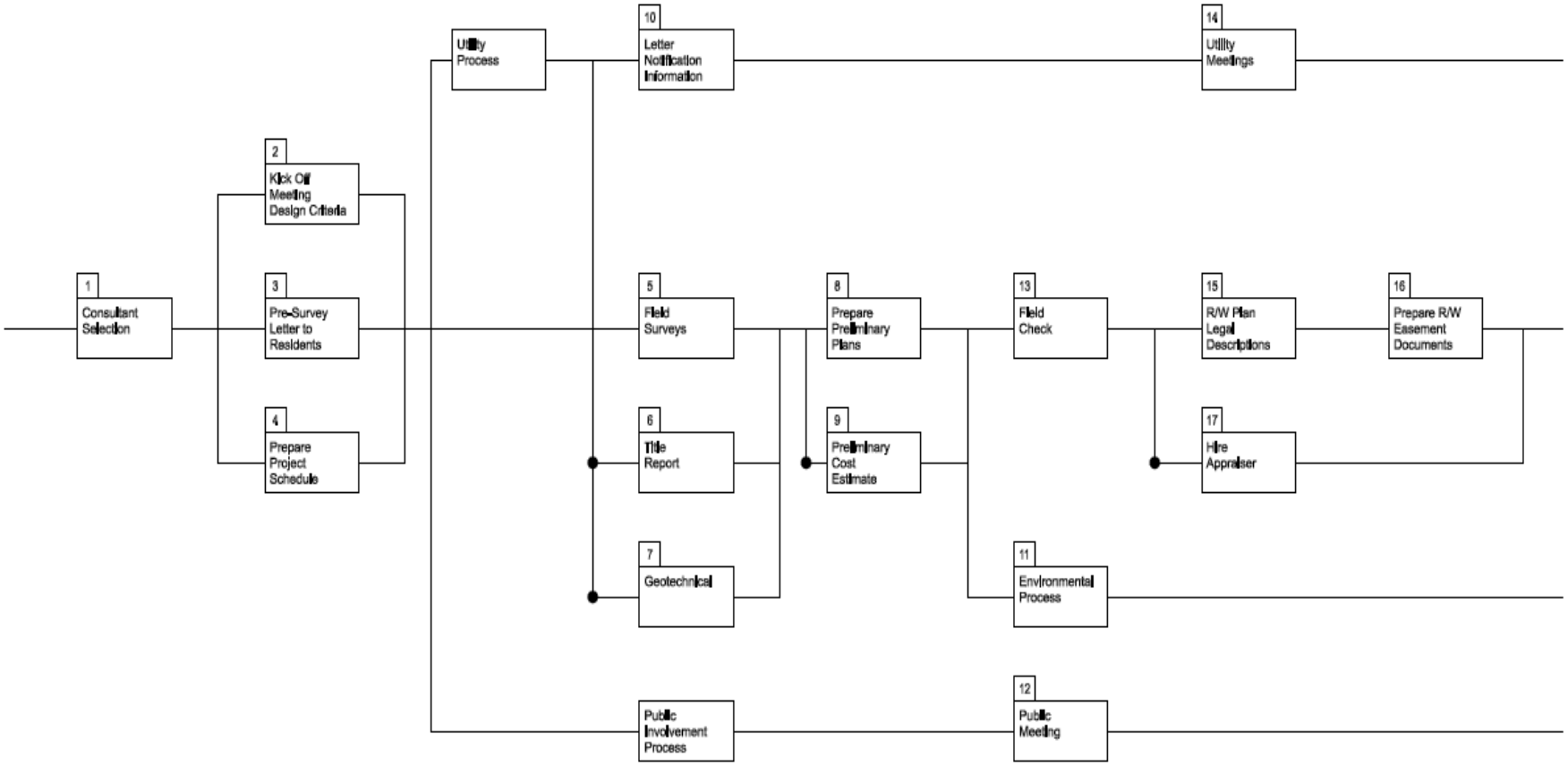
Task No. 15 - Submit R/W Plans/Legal Descriptions - The R/W plans/legal descriptions shall provide complete and final information for the City to acquire the R/W and easements necessary to construct the project.

The Consultant shall submit this information on the date as established with the project schedule or contract. The legal descriptions shall be provided in electronic media (disk) with a written original sealed by a registered State Land Surveyor. Also included will be a copy of all the title company information and R/W plan sheets with proposed easement requirements highlighted incolor. A map or sketch of the taking, stamped by a registered State Land Surveyor shall be provided by the Consultant.

Task No. 16 - Prepare R/W and Easement Documents - For certain projects and if requested, the Consultant/Project Manager will coordinate the preparation of the various documents necessary for the takings required to construct the project.

Task No. 17 - Hire Appraiser and Obtain Appraisals – If an outside appraiser is used, usually a City Official will hire the appraiser. The Project Manager shall coordinate with the appropriate City Official in order to provide the appraiser with the necessary information such as drawings, legal descriptions, property owner names and addresses, and title work so the appraiser may conduct the appraisals. Staking of takings may be required, and will be preformed by the consultant as stated in the scope of services.

KANSAS CITY METRO AREA - PROJECT PROCEDURES FLOW CHARTS
PHASE II - PRELIMINARY DESIGN



Project Phase II
Date: 11/ 4/ 2005

Task

Decision Node "Optional" Task

Decision Node "Mandatory" Task

PHASE 3 - FINAL DESIGN

Task No. 1 - Complete Environmental Process **-** If any environmental mitigation is required, other than what is handled by the State, the City will incorporate such requirements in the project plans and specifications. Any necessary environmental permits will be obtained.

For Non-Federal projects, the City will consider the environmental impacts when considering projects. The appropriate City Official in conjunction with the Project Consultant will determine what action is needed.

Task No. 2 - Begin R/W Easement Negotiations - Subsequent to receiving the appraisal report, the City will begin the negotiation process for Federal funded projects. If Federal funding is involved, environmental approval is necessary prior to proceeding with acquisition.

Task No. 3 - Begin Condemnation Process – If negotiation is unsuccessful, the City Attorney shall obtain the authority from the Governing Body to condemn property and shall file documents to begin the condemnation procedure.

Task No. 4 - Complete Condemnation Process - After the appraiser's report is filed and the award is deposited with the court, the agency can take possession of the property.

Task No. 5 - Acquire R/W & Easemenst – Submit Forms to state DOT - For Federal funded projects, the State DOT's will require certification that all R/W/easement have been acquired. In Kansas this will be Form 1303 and 1304, in Missouri a Utility Coordination letter and a land clearance letter from MoDOT.

Task No. 6 - Submit Final Plans for Review - The Consultant shall complete the project plans and make distribution to the appropriate persons.

Task No. 7 - Submit Specifications and Special Provisions - The Consultant shall complete the Specifications and Special Provisions to the specifications that is applicable and necessary for the project.

Task No. 8 - Submit Contract Documents & Insurance - The Consultant shall complete the Contract Documents and determine, in conjunction with the City Officials, the required insurance coverage for the project.

Task No. 9 - Establish the Bid Opening Date - The appropriate City Official, with consultation with the Consultant, will establish the bid opening date in accordance with state laws and city procedures, and schedule a room for this purpose.
NOTE: The appropriate City Official shall determine if a pre-bid conference is required prior to preparing the notice to bidders. If one is required, it shall be scheduled approximately one week prior to the bid opening. The Notice to Bidders shall give this date as information to potential bidders and will serve as the invitation to this meeting.

Task No. 10 - Execute Utility Agreements **-** If documentation is confirmed that utilities to be relocated

are on private easements, the Project Manager shall receive the utility agreement(s), forward the agreement(s) to the City Attorney's office for review/approval and schedule for Governing Body approval if required by City policy.

Task No. 11 - Schedule Second Utility Meeting - When the plans are approximately 80 percent complete or at the stage where the street horizontal and vertical alignment and the stormsewer profiles have been approved, the second utility meeting will be scheduled by the Consultant/Project Manager. A pre-meeting agenda shall be distributed and meeting minutes prepared.

The primary purpose of this meeting is to confirm what utilities probably need to be relocated, establish what, if any, utilities have been relocated, provide a status of R/W-Easement acquisitions, discuss what utilities are on private easements, status of relocation agreements(s) and discuss-confirm future meeting dates.

Task No. 12 - Schedule Optional Second Public Meeting - The purpose of this meeting is to present the final plans to the residents and property owners. The format of this meeting may be informal or formal.

Task No. 13 - Complete Utility Relocations – For Federal funded projects, State DOT's will generally require all utilities that are practical to be relocated, be completed prior to the bid opening.

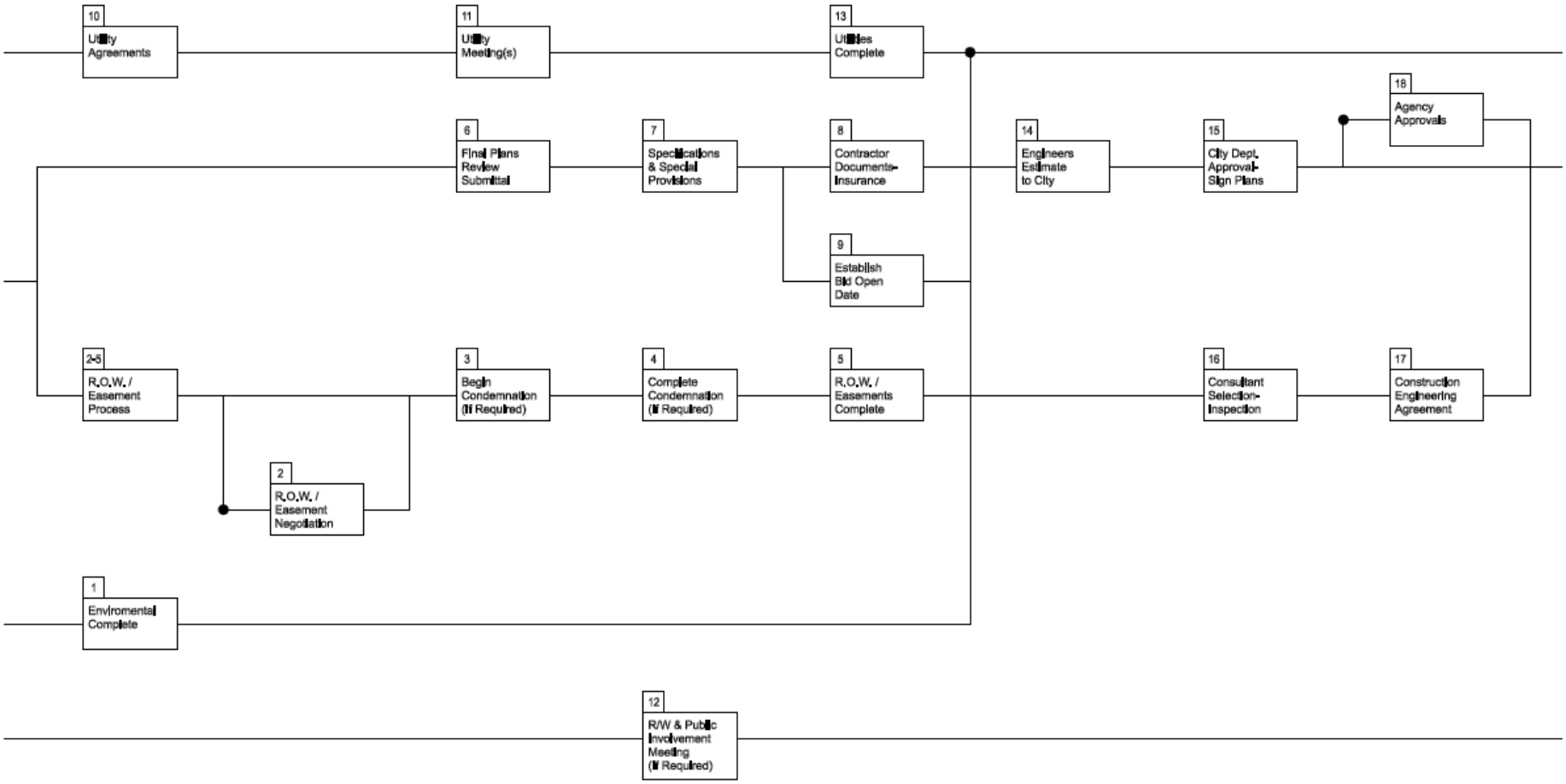
Task No. 14 – Submit the Engineer's Cost Estimate – The Consultant shall prepare a formal Engineers Cost Estimate, notarized if required, and Submit it to the City.

Task No. 15 - Obtain City Signatures for Plan Approvals - The Project Manager shall obtain the appropriate City officials signature on the plan title sheet as well as a County signature for CARS and SMAC projects.

Task No. 16-17 - Select Inspection Consultan & -Execute Agreement – The Consultant, if used for project inspection, shall be selected as described in Task No. II-1.

Task No. 18 – Obtain Agency Plan Approvals **–** The Project Manager shall determine if other agency plan approvals are necessary. If there is other city, Federal or state funding, other agency approvals will usually be required. This is usually stipulated in the agreements. The appropriate official name and title shall be placed on the plan title sheet.

KANSAS CITY METRO AREA - PROJECT PROCEDURES FLOW CHARTS
PHASE III - FINAL DESIGN



Project Phase III
Date: 11/ 4/ 2005

Task

Decision Node "Optional" Task

Decision Node "Mandatory" Task

PHASE 4 - PRE-CONSTRUCTION (LETTING PROCESS)

Task No. 1 - Publish Legal Advertisement - Notice to Bidders needs to be published in the *Official agency* newspaper at the appropriate time(s) prior to the scheduled bid opening.

NOTE: For Federal funded projects special advertisements may be necessary.

Task No. 2 – Forward Notice to Bidders/Specific Firms/Agencies - The Consultant or the appropriate City Official shall forward the Notice to Bidders to specialty contractors and Specific Firms/Agencies

Task No. 3-4 - Distribute Plans/Contract Documents and Prepare Addendum - The plans/contract documents shall be distributed by the Consultant or the appropriate City Official to potential bidders. The Consultant/Project Manager shall establish a fair price for the plans/contract documents which amount shall not be refundable. This amount shall be included in the Notice to Bidders as well as the non-refundable statement. Plans and Contract Documents shall be provided free to the firms and agencies as listed on each agency list to receive free plans and contract documents.

The Consultant/Project Manager, as a result of the Pre-Bid Conference or other Contractor inquires/suggestions, shall make final contract document changes, prior to the bid opening, by issuing an addendum. The addendum shall be prepared and communicated/faxed to all plan holders of record. No addenda will be issued later than 48 hours (or applicable city requirements) prior to the date for receipt of bids, except an addendum withdrawing the request for bids or one which includes postponement of the date to receive bids.

Project Manager shall submit an official Engineers Estimate prior to bid opening to be opened at the bid opening.

Task No. 5 - Prepare Material Testing Proposals – Most Cities provide project material testing services by using private material testing firms. Usually a firm is selected to perform this service for each project. The Consultant shall assist the Project Manager in preparing these proposals.

Task No. 6 - Conduct Pre-Bid Conference - If a pre-bid conference is scheduled by the Consultant/Project Manager, an agenda shall be prepared and distributed at the beginning of the meeting. The following issues are appropriate to discuss:

- project scope/requirements
- any unusual contract requirements
- any unusual work requirements
- status of r/w and utility relocations
- contract completion date
- traffic control plan(s)
- contractor/bidder questions

Task No. 7 - Complete Bid Opening - If addenda to the contract documents have been issued by the Consultant/Project Manager, this must be indicated on the bid tab. The bids and engineers estimate are

opened by the appropriate City Official and properly recorded.

Task No. 8 - Determine Contractor Pre-Qualifications – Certain agencies require Contractor pre-qualification. If this is an agency requirement, the Consultant should include this requirement in the Contract documents, and after bid opening check that bidders are prequalified.

Task No. 9 - Select Material Testing Firm - The Proposals for material testing received from Task No. IV-5 shall be forwarded to the appropriate City Official for review and recommendation.

Task No. 10 - Complete Detailed Bid Tabulation - Subsequent to the bid opening and prior to the scheduled agency award, the Consultant/Project Manager shall prepare a detail bid tabulation from the submitted contractors bid proposals. This detailed bid tabulation shall be in the same format as the contract document bid form. The accuracy of the contractor's multiplication and addition shall be checked and confirmed. The Engineer's estimate shall also be included on this tabulation.

Task No. 11 - Determine/Approve the Lowest and Best Qualified Contractor and Sub-Contractor Percentage - The Project Manager shall determine if the low bid Contractor has performed similar and satisfactory work for the agency or other agencies in the Kansas City Metro area.

The Project Manager shall contact the apparent low bidder and request a list of sub-contractor(s), and a tabulation of the dollar volume or percentage of work to be performed by the bidder. The percent of work required by the Prime Contractor varies within the Metro area.

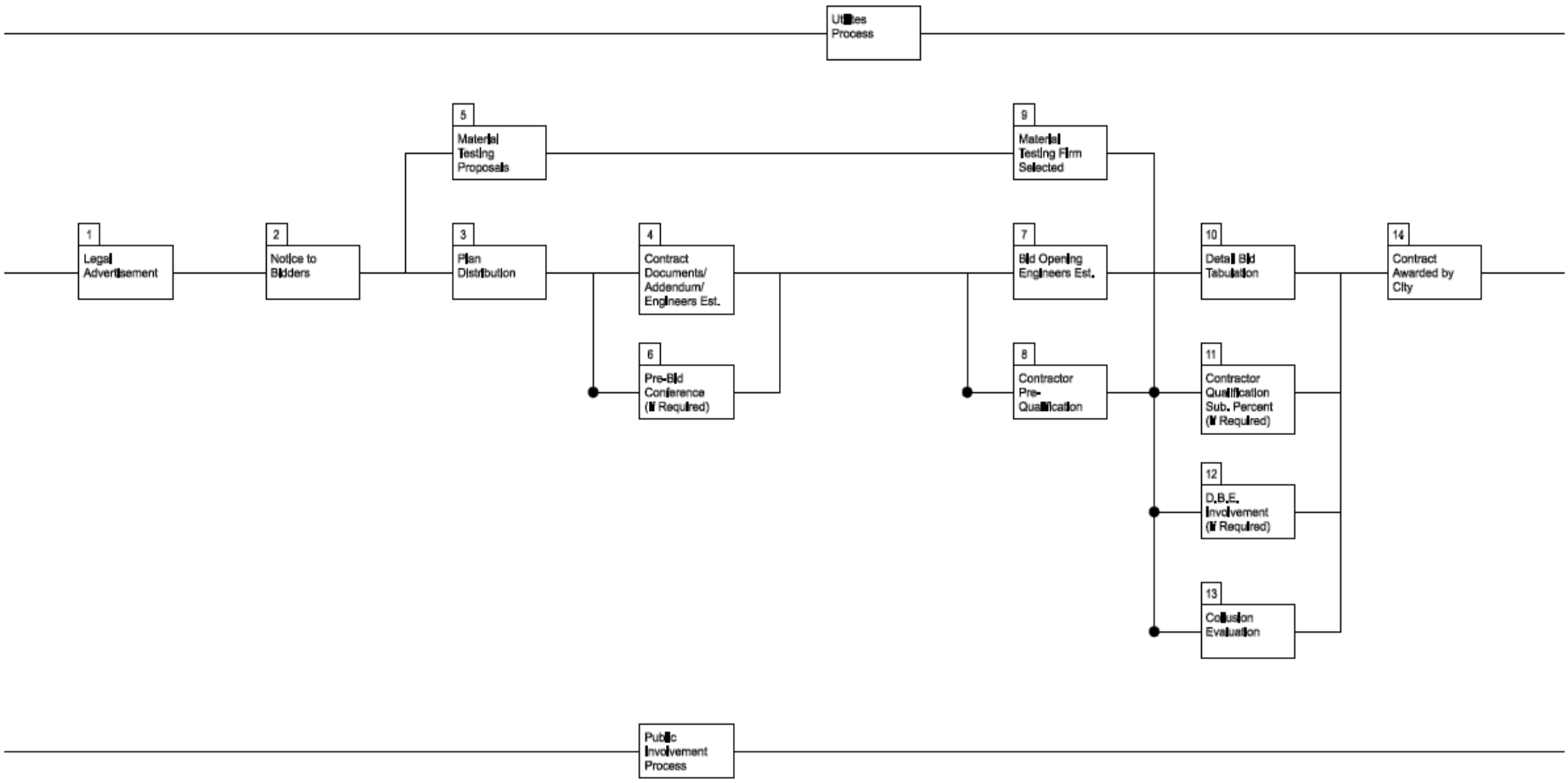
Task No. 12 - Determine DBE Involvement – If DBE is required, and the low bid Contractor is not a DBE firm, the Project Manager, for most projects, shall contact and receive from the apparent low bidder a list of DBE sub-contractor(s) and the work description with a dollar amount of the work to be performed. The percentage goals for DBE firms varies within the Metro area.

Task No. 13 - Evaluate Possible Contractor Collusion - The Project Manager should be aware of the potential for collusion between bidders or bid rigging. If collusion is suspected the Project Manager should discuss this with the appropriate City Staff.

For Federal funded projects, all bidders are required to complete the noncollusive affidavit as provided in the Contract Documents.

Task No. 14 - Obtain Contract Award by City - Subsequent to receiving staff written recommendation, the City Staff will schedule the bid tabulation for City consideration. For Federal funded projects, the bid tabulations may need to be forward to State DOT's for review and concurrence prior to being considered by the City. The City should award the contract to the lowest responsible and qualified bidder.

KANSAS CITY METRO AREA - PROJECT PROCEDURES FLOW CHARTS
PHASE IV - PRECONSTRUCTION (Letting Process)



Project Phase IV
Date: 11/ 4/ 2005

Task

Decision Node "Optional" Task

Decision Node "Mandatory" Task

PHASE 5 - CONSTRUCTION

Task No. 1 - Distribute Executed Contract Documents – The stipulated number of copies of the Contract Documents need to be prepared for the Contractor's execution. These executed copies are distributed according to each agency policy.

The Contractor is given stipulated days to execute the Contract Documents. He/She must have all their insurance certificates, bonds and agent for service of process filled out, sealed, and Power of Attorneys attached and submitted in the stipulated time period. The Instructions to Bidders explains the proper insurance requirements.

Task No. 2 - Schedule Pre-Construction Conference – When the executed contract documents are distributed, the Consultant or the Project Manager will schedule a pre-construction conference. An agenda should be forwarded with the invitation letter and meeting minutes prepared with distribution to all meeting participants. The primary purpose of this meeting is:

- review the plans, special provisions and specifications for the project,
- meet the Contractor's assigned Superintendent,
- meet the Sub-Contractor(s),
- receive/discuss the Contractor's schedule,
- confirm City's payment schedule,
- status of r/w,
- status report/confirmation of utility relocations,
- answer contractor questions,
- status of permits and review permit requirements,
- review the requirements for shop drawing submittals, and
- date for issuing the "Notice to Proceed".

The following persons/firms will be invited to attend this conference.

- City Engineer or designated representative,
- Contractor's representative and project Superintendent/Sub-Contractors,
- Utility company representatives,
- Consultant,
- County Officials (if applicable),
- State DOT's (if applicable),
- Material testing laboratory, and
- Project Inspector

Task No. 3 - Issue Notice to Proceed - After the Pre-Construction meeting, the Consultant/Project Manager shall issue the "Notice to Proceed" in accordance with the terms of the contract. This notice shall state the date the work is to be completed or the number of working days. **NOTE:** The Notice to Proceed is usually not issued prior to the Pre-Construction meeting.

Task No. 4 - Issue Information Letter to Residents - After the pre-construction conference has been conducted, the Consultant or the Project Manager shall issue a project information letter to all residents and property owners. The letters should include the following:

- The Contractor's name, Superintendent's name and phone numbers for daytime/night-weekends
- The Project Schedule
- The Project Inspector's name and phone number
- Traffic Control plan
- Expected Critical neighborhood inconveniencies/disruptions and
- Mention caution and safety

Task No. 5 - Confirm Project Sign - The Consultant/Project Manager shall confirm the placement and accuracy of the Project Signs as required for certain projects.

Task No. 6 - Complete Shop Drawing Check - The Consultant/Project Manager shall assign personnel to review Contractor submitted shop drawings/catalog cuts. The objective is to respond to these submittals within 7 calendar days.

Task No. 7 - On-Going Utility Meeting(s)-Complete Relocations - The Consultant/Project Manager/Contractor will schedule monthly utility meetings or as appropriate until all utilities are relocated. For Federal funded projects all utility relocations, that are practical to be made, will be relocated prior to bidding the project. For other projects, if approved by the appropriate City Official, utility relocations may be completed during the construction time period.

Task No. 8 - On-Going Construction Observation - The Consultant/City Staff selected to provide construction engineering services shall select construction observers with the appropriate project experience. For large, lengthy street improvement projects other construction observers may be assigned to the project on a full or part time basis depending upon the construction activity occurring. For small projects, one construction observer may be assigned to more than one project. The construction observers shall keep a daily journal/log for each project. This journal/log shall record the temperature, weather, contractor activities, material testing performed, visitors to the site, and any important daily communication between the Contractor's Superintendent and the inspector(s). It is very important that material certifications and mix designs be received prior to placement.

Task No. 9 - Provide Davis-Bacon Wage Rate Information - If applicable, the Project Observer shall interview the contractor's project employees. The employee's title and receiving wage shall be recorded. This shall be done monthly. A report on this information shall be placed in the project file.

Task No. 10 - On-Going Material Testing – Most agencies use private Material Testing Laboratories to provide material testing services. A firm is selected to provide this service usually on an individual project basis. The guidelines for quality control/material testing will be established by each agency.

Task No. 11 - On-Going Contractor/ Payments – Most Cities/agencies pays Contractors on a monthly basis. Ten percent is usually withheld from Contractor payments. This may be reduced to five percent during construction if allowed by state law, and if approved by the appropriate City Official.

The Consultant in consultation with the Project Construction Observer will prepare the Contractor's monthly payments based upon work completed by a certain specific day of the month. After the payments have been signed by the Contractor, they will be forwarded to the City Project Manager for further handling and approved.

Task No. 12 – On-Going Consultant Payments – Most agencies pay Consultants on a monthly basis for construction engineering services. The payment formula will be as described in the Consultant agreement. Payment requests shall be directed to the appropriate City Official.

Task No. 13 - On-Going Change Orders - The Consultant/City Staff shall prepare a change order to construct additional items of work, modify the contract time, or change the character and scope of the work. Change Orders shall be checked for accuracy and reasonableness and forwarded to the appropriate City Official for approval after the change order is signed by the Consultant and Contractor.

On unit price contracts a final change order shall be prepared at the end of each project indicating final quantities (overruns and underruns).

Task No. 14 - Complete Final Inspection - The Consultant/Project Manager shall schedule a final walk through when the project is complete and the Contractor and Construction Observer concurs that a final inspection is appropriate. The inspection party shall be the Consultant/Project Manager, Contractor/Sub-Contractors representatives and other agency representatives, if necessary.

As a result of this inspection, a "Punch List" will be prepared by the Consultant and forwarded to the Contractor.

If the project is complete except for sod/seeding due to season restrictions, the Contractor will be advised of the next time period when this work will be completed. An amount of money to perform this work shall be held from the Contractor until this work is complete.

Task No. 15 - Prepare Revisions/Record Dranwings - The Consultant shall prepare record drawings in the format required by the City subsequent to final inspection. Final pay to the Consultant will generally not be made until record drawings are submitted.

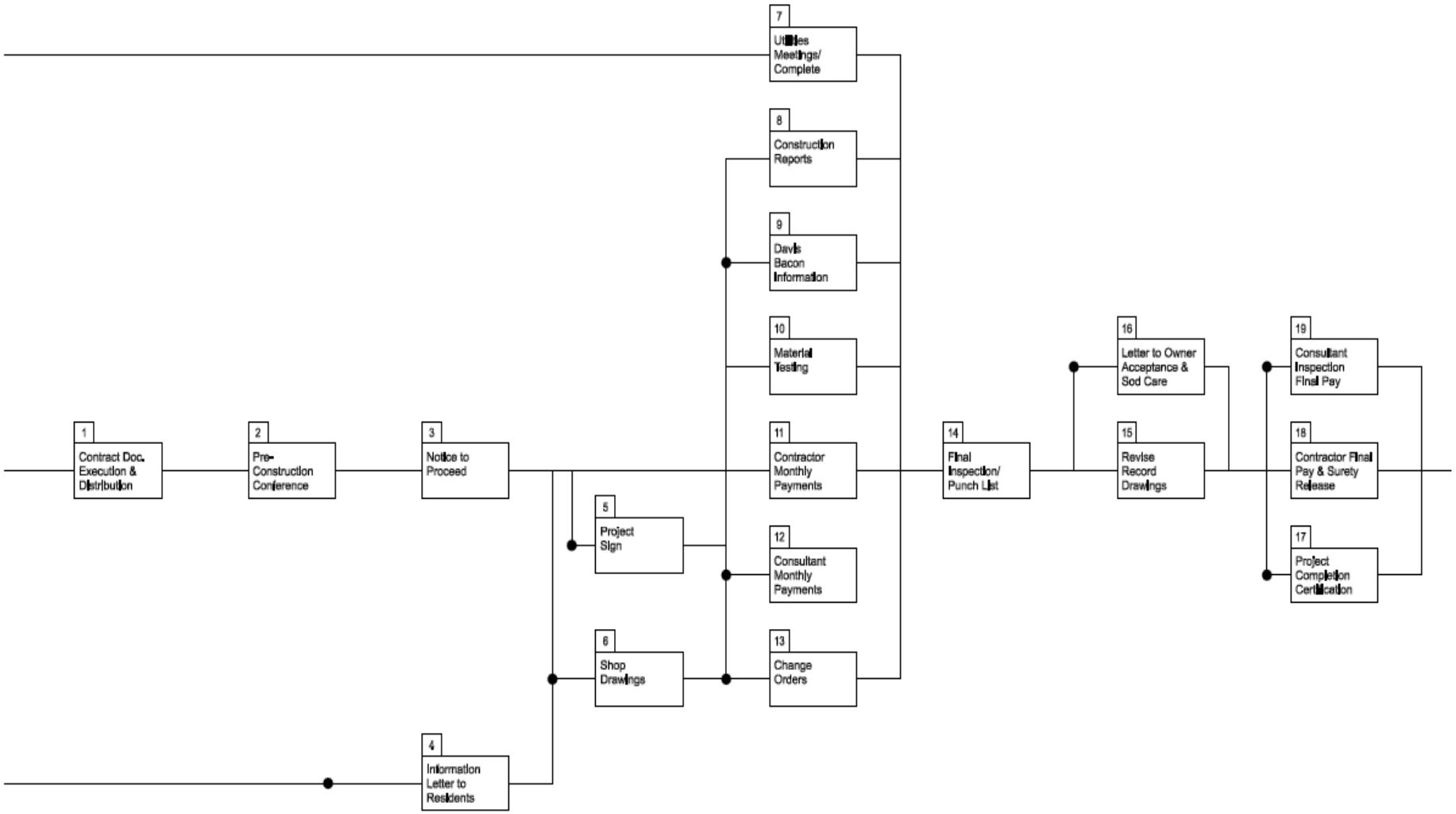
Task No. 16 - Send Letter to Owners Regarding Sod Care, etc. – The Consultant or the Project Manager, subsequent to the final inspection, will provide all property owners a letter explaining that the project has been completed. The primary message is to convey to the property owners that the sod/seed care (watering and fertilizing) is now the property owners responsibility. The letter should suggest guidelines for taking care of the sod/seed.

Task No. 17 - Project Completion Certification - The Consultant/Project Manager shall execute a "Project Completion Certification". This shall not be signed until all "Punch List" items have been completed and acknowledged by the Project Construction Observer.

Task No. 18 - Approve Contractor Final Pay and Surety Release - The Consultant will prepare the Contractor's final pay and the final change order.

Task No. 19 - Approve Consultant Final Pay - Subsequent to completing all required Consultant duties and responsibilities, the final pay will be submitted for payment in accordance with the Consultant Agreement.

KANSAS CITY METRO AREA - PROJECT PROCEDURES FLOW CHARTS
PHASE V - CONSTRUCTION



Project Phase V
Date: 11/ 4/ 2005

Task

Decision Node "Optional" Task

Decision Node "Mandatory" Task

PHASE 6 - RETROSPECT

Task No. 1 - Certify Final Project Cost - The appropriate City Official, after a project is complete, and when all costs are known, shall coordinate with the Finance Department to prepare the final project cost.

Other agency certifications, if applicable, as to final project costs shall be submitted at this time. The project cost shall be separated into the following possible categories:

- Construction
- Engineering (Consultant)
- Contract Administration
- Construction Engineering
- Material Testing
- Legal Publications
- Title Work (Ownership Certifications)
- Filing Fees
- Utility Relocations
- Landscaping
- Appraiser's Fee
- R/W and Easements
- Condemnation

Task No. 2 - Submit Final Invoices - The Project Manager at the time the final costs are being determined will review the project file to determine if all agency reimbursements have been requested and any other invoices that should be forwarded for payment to the City.

Task No. 3 - Forward Letter Questionnaire to Property Owners - Prior to the scheduled post-project conference, the appropriate City Official will forward a questionnaire to all residents and property owners that were involved with the project. The Questionnaire results will be tabulated and discussed at the post-project conference.

Task No. 4 - Complete Property Owner Assessments - For Benefit Districts (BD), the appropriate City Officials will prepare the assessment roll, and any necessary maps to accompany the assessments. The assessments must be as described and set forth in the resolutions creating the BD.

Task No. 5 - Complete Bond Sale - If all or part of the project costs are to be bonded, the appropriate City Official will coordinate the preparation of information/data.

Task No. 6 - Conduct Post-Project Conference - The appropriate City Official shall schedule a post-project conference for all major projects. The conference shall be scheduled within one month of final acceptance from the Contractor. The following should be invited to this conference:

- Department Director
- Project Manager
- Contractor (Owner)
- Contractor's Superintendent

- Sub-Contractors
- Utility Company Representatives
- Consultant-Design
- State Agency Staff (if applicable)
- Project Construction Observers
- County Staff (if applicable)

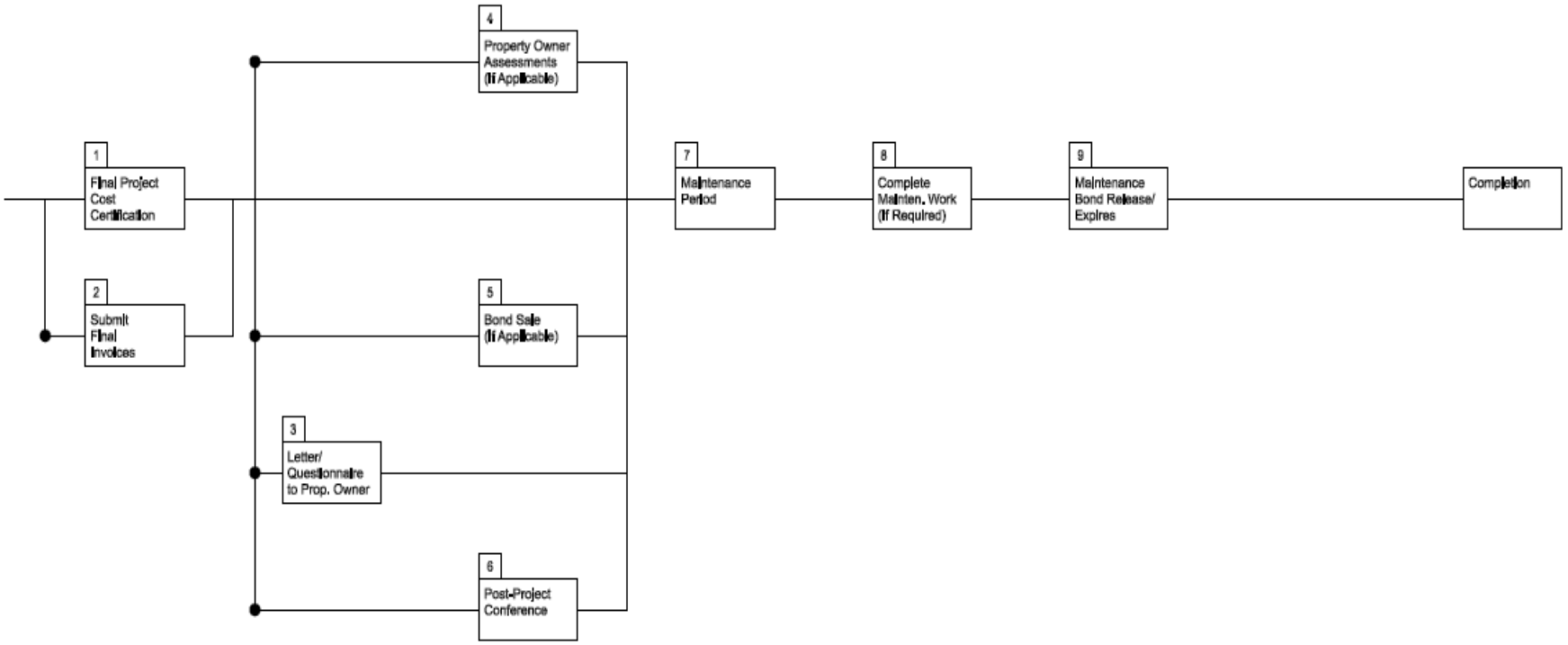
The primary purpose of this meeting is to critique the project. A pre-meeting agenda will be distributed prior to the meeting with conference minutes prepared.

Task No. 7 - Perform the Maintenance Time Period Project Inspection - The Project Manager with the Contractor's representative shall perform an inspection of the project prior to the expiration of the maintenance time period. All items of repair shall be noted on a punch list and officially presented to the Contractor for correction.

Task No. 8 - Complete Maintenance Work by the Contractor - Subsequent to receiving the punch list from the City, the Contractor shall perform all maintenance work required. A final inspection of this work shall be performed by the Project Manager and the Contractor's representative.

Task No. 9 - Release of Contractor's Maintenance Bond - The City shall release the Contractor's maintenance bond when notified by the appropriate City Official that all maintenance work required by the contractor has been completed.

KANSAS CITY METRO AREA - PROJECT PROCEDURES FLOW CHARTS
PHASE VI - RETROSPECT



Project Phase VI
Date: 11/ 4/ 2005

Task

Decision Node "Optional" Task

Decision Node "Mandatory" Task

APPENDIX

A Project Progress Checklists

- *Survey*
- *Utility Coordination*
- *Preliminary Alignment*
- *Environmental Process*
- *Preliminary Right-Of-Way*
- *Preliminary Plans List*

B Design Criteria

- *Street, Storm Sewer, Sanitary Sewer & Water*

C Checklists

- *Plan Review Checklist*
- *Changeorder Checklist*
- *Final Project Checklist*
- *Survey Checklist*
- *Design Engineer Scope of Services*

D Miscellaneous Forms

- *Preconstruction Conference Agenda*
- *Consultant Performance Evaluation*
- *Monthly Progress Report*
- *Utility Location Report*

PROJECT PROGRESS RECORD
SURVEY

Owner Name: _____

Project Name: _____

Owner Project No.: _____

Project Location: _____

Submitted by:

Company Name: _____

Project Manager: _____

Lead Surveyor: _____

Date: _____

Survey Criteria	Designer Approval	Owner Approval
Units – metric or english	_____	_____
Horizontal Control Datum _____	_____	_____
Vertical Control Datum _____	_____	_____

Survey Tasks	Date Completed
Pre-Survey Notice to Residents	_____
Title Reports Ordered/Received	_____
Utility Locate Ordered/Performed	_____
Topographic Survey	_____
Bridge/hydrology Survey	_____
Legal Survey	_____
Alignment Points Set and Referenced	_____
Property Ownership Log	_____
Bench Loop Checked	_____
Traverse(s) Checked	_____
Topography Field Review	_____
Land Corners referenced and filed	_____
_____	_____
_____	_____

PROJECT PROGRESS RECORD
UTILITY COORDINATION

(Submit at ____%, ____% and ____% project completion)

Owner Name: _____

Project Name: _____

Owner Project No.: _____

Project Location: _____

Submitted by:

Company Name: _____

Date: _____

Project Manager: _____

Utility Tasks

		Date Completed
1.	Letter of Notification and request Utility Plans	
2.	Field Survey of Utility Location	
3.	Submit base maps to Utilities to confirm locations	
4.	Submit preliminary plans to Utilities	
5.	First Utility meeting and establishes Utility corridors	
6.	Final plans to Utilities and request relocation plans	
7.	Utility relocation plans completed	
8.	Optional second utility meeting	
9.	Relocation agreement executed	
10.	Utilities notified to begin relocations	
11.	Stake reference points for utility	
12.	Utilities begin relocations	
13.	Verify utilities clear construction	
14.	Utility relocations completed	
15.	Develop as-builts and show new location on plans	

*Indicate no conflict with N/C

Comments: _____

_____

_____

_____

_____

PROJECT PROGRESS RECORD
PRELIMINARY ALIGNMENT

Owner Name: _____

Project Name: _____

Owner Project No.: _____

Project Location: _____

Submitted by:

Company Name: _____

Project Manager: _____

Date: _____

Preliminary Alignment Status	Date Completed
Horizontal Alignment	
Vertical Alignment	
Cross-Sections/Earthwork	
Intersection Improvements	
Storm Drainage	
Utility Conflict Identification	
Construction Limits	
Right of Way Requirements	
_____	
_____	

Comments: (Describe potential concerns with the alignment that you are aware of at this time.)

_____

_____

_____

_____

_____

_____

_____

_____

PROJECT PROGRESS RECORD
ENVIRONMENTAL PROCESS

Owner Name: _____

Project Name: _____

Owner Project No.: _____

Project Location: _____

Submitted by:

Company Name: _____

Project Manager: _____

Date: _____

Date Completed

National Environmental Policy Act (NEPA)

Review and follow National Environmental Policy Act (NEPA) and Federal Highway Administration (FHWA) guidelines to assess whether a Categorical Exclusion (CE), an Environmental Assessment (EA), or an Environmental Impact Statement (EIS) is required.

The following Environmental Studies may be required under either the NEPA process or a Corps of Engineers (CoE) permit:

Endangered Species Act	_____
Farmland Protection Policy Act	_____
Section 106 Cultural Resources (Historic and Archaeological Sites)	_____
Air Quality	_____
Noise Standards/Noise Abatement	_____
Hazardous Waste	_____
Wetlands	_____

Permits/Clearances Required

Kansas	Date Completed	**Missouri**	Date Completed
NPDES (Land Disturbance) – Kansas Department of Health & Environment (KDHE)		NPDES (Land Disturbance) – Missouri Department of Natural Resources (MDNR)	
Division of Water Resources (DWR) – Board of Agriculture o Stream Obstruction o Floodplain Fill/Levee		Missouri DNR Stream Obstruction Floodplain Fill/Levee	
Corps of Engineers (CoE) 404 o Nationwide o Individual		Corps of Engineers (CoE) 404 o Nationwide o Individual	
Local Agency o Floodplain Development (FEMA Floodplain Admin.) o Temporary Erosion Control o Other		Local Agency o Floodplain Development (FEMA Floodplain Admin.) o Temporary Erosion Control o Other	
KDOT/Other Agency o R/W Permit o Railroad R/W Permit		MoDOT/Other Agency o R/W Permit o Railroad R/W Permit	
401 Water Quality Certification – automatically granted under CoE 404 Nationwide or review initiated by KDHE under CoE 404 Individual Permit application		401 Water Quality Certification – MDNR – Submit separate permit if CoE 404 Nationwide or review occurs automatically by CoE 404 Individual Permit application	
Kansas Department of Wildlife and Parks (KDWP) – Action Permit review initiated with either a DWR or CoE 404 Individual Permit application		Missouri Department of Conservation – Reviewing agency on CoE 404 Individual Permits	

PROJECT PROGRESS RECORD
PRELIMINARY RIGHT-OF-WAY

Owner Name: _____

Project Name: _____

Owner Project No.: _____

Project Location: _____

Submitted by:

Company Name: _____

Project Manager: _____

Date: _____

	Date Completed
Existing Right-of-Way Features	
Section Corners and Lines Located & reports filed	
Property Corners Located	
Property Owners Identified	
Existing Right-of-Way Established	
_____	
_____	
Proposed Right-of-Way Elements	
Construction Limits Identified	
Permanent Right-of-Way Needs Identified	
Permanent Easement Needs Identified	
Temporary Easement Needs Identified	
_____	
_____	
_____	

Comments: (Describe potential right-of-way problems that you are aware of at this time.)

_____

_____

_____

_____

_____

_____

PROJECT PROGRESS RECORD
PLANS LISTING

Owner Name: _____

Project Name: _____

Owner Project No.: _____

Project Location: _____

Submitted by:

Company Name: _____

Project Manager: _____

Date: _____

Indicate the plan sheets anticipated for this project. This list is not intended to be all inclusive. Add or delete sheets as appropriate for this project.

	Number of Sheets	Date Completed
Anticipated Plan Sheets		
Title Sheet		
Index of Drawings		
Roadway Sheets		
General Notes		
Summary of Quantities		
Demolition Plan		
Geometric Data and Survey Control		
Easement /Right-of-Way Plan		
Typical Sections		
Plan and Profile Sheets		
Entrances		
Curb Return Profiles		
Temporary Erosion Control Details		
Ditches		
Ditch Lining		
Fencing Plan and Details		
Storm Sewer Profiles		
Storm Drainage Plan		
Construction Phasing Plan		
Signing and Pavement Markings		
Detour Plan		
Detour Signing Details		
Guard Fence Details		

PROJECT PROGRESS RECORD
PLANS LISTING

	Number of Sheet	Date Completed
Cross Section Sheets		
Erosion Control Plan		
RCB Details		

Bridge Sheets

General Notes and Quantities		
General Plan and Elevation		
Boring Log		
End Bent (Abutment) Details		
Interior Bent (Pier) Details		
Bearing Device Details		
Framing Plan		
Prestressed Concrete Girder Details		
Steel Girder Details		
Miscellaneous Girder Details		
Slab Plan		
Slab Details		
Expansion Device Details		
Precast-Prestressed Deck Panel Details		
Diaphragn Details		
Sidewalk Details		
Barrier Curb Details		
Barrier Transition Details		
Pedestrian Fence Details		
Slab Drain Details		
Bill of Reinforcing Steel		
Bridge Approach Slab		
Retaining Wall Details		

Utility Plans

Existing Utility Layout		
Water Line Relocation Layout Sheet		

PROJECT PROGRESS RECORD
PLANS LISTING

	Number Of sheets	Date Completed
Water Line Plan and Profile Sheet		
Miscellaneous Water Line Details		
Sanitary Sewer Relocation Layout Sheet		
Sanitary Sewer Plan and Profile		
Miscellaneous Sanitary Sewer Details		

Lighting Plans

Street Lighting Plan		
Street Lighting Details		

Landscape Plans

Landscape Plan		
Planting Details		

Traffic Signal Plans

Temporary Traffic Signal Layout		
Permanent Traffic Signal Layout		
Traffic Signal Control Operation		
Summary of Quantities		
Traffic Signal Symbols		
Traffic Signal Heads		
Pull Boxes and Bases		
Detectors		

DESIGN CRITERIA

STREET, STORM SWER, SANITARY SEWER, WATER

Owner Name: _____

Project Name: _____

Owner Project No.: _____

Project Location: _____

Submitted by:

Company Name: _____

Project Manager: _____

Date: _____

Design Standards	Designer Approval	Owner Approval
AASHTO Policy on Geometric Design of Highways and Streets		
AASHTO Standard Specifications for Highway Bridges		
APWA Standard Specifications and Design Criteria		
_____ City/County Design Standards		
_____ State Design Standards		

DESIGN CRITERIA

Design Speed			
Design Vehicle			
Roadway/Street Classification			
Current ADT (Year)			
Design ADT (Year)			
Percent Truck Traffic			
Maximum Grade			
Maximum Superelevation			
Clear Zone			
Entrance Maximum Grade			
Typical Section			
Surfacing Type			
Roadway Width			
Fore Slopes			
Back Slopes			
Standard Ditch			
Surface Width			
Shoulder Width			
Shoulder Type			

DESIGN CRITERIA

		Designer Approval	Owner Approval
Curb and Gutter Type			
Sidewalk Width (Lt. or Rt.)			
Right of Way Width			
Minimum Curb Return Radius			
Bridge Information			
Design Loading			
Design Storm Frequency			
Freeboard Requirements			
FEMA Criteria			
Backwater Requirements			
Storm Sewer Information			
APWA Section 5600	yes or no		
Design Storm Frequency			
Runoff Coefficients			
Tributary Area (acres)			
Rainfall Intensity			
Computation Method			
Sanitary Sewer Information			
Basis for Capacity Determination			
Ultimate Tributary Population	yes or no		
Design Tributary Population (____years)	yes or no		
Industrial Sources	yes or no		
Commercial Sources	yes or no		
Design Flow			
Average Flow			
Ratio (Maximum Hour/Average)			
Inflow Basis			
Length of Line	yes or no		
Ratio of Average Flows	yes or no		
Historical Records	yes or no		
Infiltration Basis			
Length of Line	yes or no		
Ratio of Average Flows	yes or no		
Historical Records	yes or no		
Total Design Flow			

DESIGN CRITERIA

		Designer Approval	Owner Approval
Design Capacity			
Minimum Velocity (flowing full)			
Maximum Velocity (flowing full)			
Minimum Slope			
_____Diameter Pipe			
_____Diameter Pipe			
_____Diameter Pipe			
_____Diameter Pipe			
Water Line Information			
Normal Working Pressure			
Minimum Working Pressure			
Design Flow			
Basis for Design Flow			
Fire Protection (ISO Determination made?)	yes or no		
By System Analysis	yes or no		
Based on Service Area (what unit rate?)	yes or no		
Based on Historical Records	yes or no		
Ratio (Maximum Day/Average Day) Flows	yes or no		
Ratio (Maximum Hour/Maximum Day) Flows	yes or no		
No Design Flow, Use Minimum Pipe Size	yes or no		
Pipe Sizes			
Maximum Fire Hydrant Spacing			
Location and Spacing of Sectionalizing Valves			
Location of Flushing Valves			
Air Relief Valves Required			
Road and Stream Crossings			
Method (tunnel or open cut)	yes or no		
Encasement Required	yes or no		
Depth Required	yes or no		
Minimum Distance to Sewer Lines			
Minimum Distance to Other Utilities			
Pressure and Leakage Test Requirements			
Disinfection Requirements			
Booster Pump Stations Required			

STREET AND STORM SEWER PROJECT
PLAN REVIEW CHECKLIST

PURPOSE

The purpose of the checklist is to provide a description of the general aspects of public street and storm sewer plan review.

A. Preliminary Considerations

___ 1. Plans submitted on City Standard size sheets.

___ 2. Special City Requirements or Stipulations:

___ a. Parkland tracts identified.

___ b. Greenway linkage system located.

___ c. Flood studies submitted.

____ d. Bank stability studies submitted.

___ e. Collector and/or thoroughfare construction plans.

___ (1) Preliminary plan and profiles provided for future collector and/or thoroughfare improvements adjacent to development.

___ f. Detention requirements fulfilled.

___ 3. Sealed by a State Licensed Professional Engineer.

B. Cover Sheet

___ 1. Project title is correct.

___ 2. Signature Block Complete.

___ 3. Index of Sheets.

___ 4. General Location Map.

___ 5. General Notes:

___ a. Consistent with Municipal Code.

___ b. Consistent with project requirements.

___ 6. Benchmark Data including Datum Benchmark.

___ 7. List of Utilities and Contacts.

___ 8. Legend.

C. Drainage Plan

___ 1. Drainage Map:

___ a. Scale (1"=100' or larger) and North arrow.

___ b. Onsite and Offsite Drainage Areas clearly outlined.

___ c. Existing Drainage patterns maintained.

___ d. Contour lines:

___ (1) Minimum of 50 ft. beyond project boundary or watershed boundary.

___ (2) Existing/Proposed shown with different line weights.

___ e. Storm Sewer System:

___ (1) Existing/Proposed Systems identified.

___ (2) Overall storm sewer system minimizes length of pipe under pavement and through intersections.

___ (3) Structures referenced.

___ 2. Drainage Calculations

___ a. Design Frequency noted:

___ (1) Design Frequency Standards met.

___ b. Appropriate runoff coefficient "C" for all tributary areas. For undeveloped upstream areas, use the composite "C" for the planned zoning.

___ c. Do curbs have adequate capacity to route runoff to inlets?

D. Street Plan and Profile

___ 1. Plan View of Proposed Street:

___ a. Stationing accurately located and identified.

___ b. Street and right-of-way widths clearly dimensioned.

___ c. Islands and medians located, widths and radii dimensioned.

___ d. Street curve radii clearly dimensioned.

___ e. Curb return radii and 1/4-point stations provided.

___ f. Sidewalk locations shown:

___ (1) Passing squares located.

___ (2) Ramps shown.

___ (3) Sidewalks across islands as necessary and provisions to construct in unusual situations.

___ g. Street lights located (If required.)

___ h. Street light conduit shown and installation noted (If required).

___ i. Easements and rights of way shown and noted.

___ j. Construction notes:

___ (1) Sawcut or removal limits at existing pavement

___ (2) Structure sizes and locations identified.

___ k. Future street improvements indicated (at intersections with unimproved collectors or thoroughfares).

___ l. Bridge analysis for culverts with spans 5 feet or more.

___ m. Handrails on culverts where necessary.

___ n. Section/Fractional Section corner markers disturbed shown to be reset.

___ 2. Profile of Proposed Street:

___ a. Elevations provided at minimum 25-foot intervals, highpoints and lowpoints.

___ b. Intersecting streets located:

___ (1) Stationing of intersecting streets correlate.

___ (2) Intersecting streets centerline/survey line angles noted.

___ c. Vertical curve information provided:

___ (1) PVC, PVI, PVT stations and elevations.

___ (2) Slopes indicated and in conformance with Design Criteria for Project.

___ (3) Stopping sight distance identified and in conformance with Design Criteria.

___ (4) Elevation and slope information match at existing streets.

___ d. Future improvements indicated (at intersection with unimproved collectors and thoroughfares):

___ (1) Future elevation of intersecting roadway.

___ (2) Future profile information if different than proposed.

___ (3) Design minimizes future demolition.

E. Storm Sewer Profiles

___ 1. Existing/Proposed systems labeled.

___ 2. Invert elevations provided at existing and proposed inlets and outlets.

___ 3. For structures with more than two (2) pipe connections, provide direction of

pipes.

___ 4. Length, slope, diameter, and type of line provided:

___ a. Design velocities conform with Design Criteria.

___ b. Minimum pipe diameter conforms with Design Criteria.

___ 5. Adequate vertical drop through catch basins.

___ 6. Type and top elevations of structures described.

___ 7. Minimum depth of cover standards met.

___ 8. Existing/Proposed ground surface:

___ a. Erosion control provided at outlet ends as necessary (based on discharge velocities).

___ b. Pipes collared or anchored on steep slopes.

___ 9. System designed to maintain water surface elevations below design standard maximum levels.

F. Intersection and Cul-de-sac Details

___ 1. Plan view of curb returns:

___ a. Elevations at quarterpoints, highpoints and lowpoints.

___ b. Stationing identified at curb returns and along centerlines.

___ c. Drainage arrows depicting drainage patterns.

___ 2. Curb types noted:

___ 3. Design Criteria for minimum drainage slopes met.

___ 4. Cul-de-sacs details:

___ a. Consistent with street profile.

___ b. Top-of-curb elevations provided around bulb and island.

___ c. Drainage arrows provided.

___ d. Curb types denoted.

G. Erosion Control Plans

Erosion Control Plan (possibly on separate sheet).

___ a. Note the contractor is responsible for providing berms, silt fences, straw bales, or other means to prevent erosion from reaching the public right-of-way. In the event the prevention measures are not effective, the contractor shall remove any debris and erosion and restore the right-of-way to original or better condition.

H. Detail Sheet(s)

___ 1. Street & Entrance Details:

___ a. Street Typical Section.

___ b. Typical Medians.

___ c. Curb and Gutter.

___ 2. Drainage Structures Details:

___ a. Standard curb and/or area inlets.

___ (1) Steel inlet frame.

___ (2) Manhole covers.

___ b. Manhole and/or junction box:

___ (1) Manhole covers.

___ c. End section with reinforced toewall:

___ (1) Grate (trash rack) details for inlet end sections with diameters equal to or greater than 24 inches.

___ d. Storm sewer trenching and bedding.

___ 3. Sidewalk Details:

___ a. Typical section.

___ b. Wheelchair passing square.

___ c. Ramp details.

___ 4. Driveway Details

___ a. Typical Section

___ b. Jointing Details Driveway Details

___ 5. Miscellaneous Details

___ a. Monument and Monument Box Detail

Change Order Checklist

Project: _____ **Project No:** _____

Contractor: _____

Prepared By: **Date:**

Type of Change:

☐ Added (New) Bid Item ☐ Unit Price Increase or Decrease ☐ Materials/Labor/Equipment Cost Plus

Bid Item:

Evaluation of Proposed Change (reference drawings or document numbers, as necessary)

If Unit Price Change – Unit Price Justified By:

☐ Comparing to Similar Item In Contract ☐ Comparing to Similar Item In Another Contract

☐ Comparing to Similar Items In Bid Tabs ☐ Evaluating Labor plus Materials

Description:

If Cost Plus – Basis for Equipment Hourly Rates:

Reason for Change: (check appropriate boxes and provide detailed explanation)

☐ Correction ☐ Revised Scope ☐ Design Error ☐ Material Preference ☐ Constructability

☐ Utility Conflict ☐ Other (list) _____

Explanation:

If Change order due to design error - determine and explain if error resulted in additional costs to County:

Cost and Schedule Impacts:

☐ Cost Increase $_____ ☐ Schedule Increase (Days): _____

☐ Cost Decrease $_____ ☐ Schedule Decrease (Days): _____

Checking:

Math Checked: ☐ _____ Date: _____

Math Checked: ☐ _____ Date: _____

Overhead & Profit: ☐ _____ Date: _____

Attached Documentation: ☐ _____ Date: _____

Evaluation Outcome: (to be completed by PDE or PEM)

County Engineer Approval: ☐ Required ☐ Not Required

Approval: ☐ Proceed with Change ☐ Do Not Proceed with Change

Inspector: ☐ _____ Date: _____

Const. Projects Supervisor: ☐ _____ Date: _____

Construction Engineer: ☐ _____ Date: _____

County Engineer: ☐ _____ Date: _____

Distribution: (Add initials as required for distribution)

☐ _____ Contractor ☐ _____ Inspector ☐ _____ Const. Projects Super. ☐ _____ Const. Engineer

Change Order Procedures

Inspectors

1. Pass on any change order requests to the construction projects supervisor.
2. Document all details about the change order request and the work itself on their daily diary sheets. Be sure to include a list of materials and labor/equipment hours for any change order that has a new or revised unit price.
3. Complete the field documentation change order list. Be sure to include details. Include who, what, when, where, how, and why as appropriate.

Construction Projects Supervisor

1. If reasonable prepare an estimate of the change order cost prior to receiving the contractor's proposal.
2. Obtain a signed proposal from the contractor. Verify the person who signed has the authority.
3. Check the math. Prepare an Excel spreadsheet to verify the correct math.
4. Check that overhead and profit request comply with the contract documents.
5. If contractor's proposal isn't reasonable negotiate with contractor. Document all negotiation.
6. Complete the change order checklist.
7. Compile documentation of change order and attach to the change order request.
8. Forward to Construction Engineer for approval.

Construction Engineer

1. Check the math.
2. Check that overhead and profit request comply with the contract documents.
3. Determine if contractor's proposal is reasonable.
4. Review the change order checklist.
5. Review documentation of change order.
6. Approve the change order request.
7. Forward to County Engineer for approval if required.

Project: _____

Construction Projects Finalization Checklist

Item	Initials	Date
Construction Projects Supervisor		
Issue Notice of Acceptance		
Complete Recapitulation of days charged		
Review/Complete Documentation Checklist		
Change order explanations		
Final Pay Application		
Prepare Change Order		
Compile Final Papers		
Copy & Mail Papers To Contractor		
Final Papers Returned		
Final Pay Voucher		
Voucher To Accounts Payable		
Record Date Payment Made		
Make Copy Of Finalization Checklist And File		
Inspectors		
As Built Plans Scanned		
36"X24" Plans Recycled		
11"X17" Plans Recycled		
Original Contract Filed		
Gather Project Papers		
Sort Files and Scan		
Store Tickets		
Inspectors And/Or Others		
Check Fencing Agreements and Verify Fencing Completed		
Check DWR Permit Notice		
Check Other Permit Notice		
Notices Of Completion Done		
Check Other Agencies Agreements		
Construction Projects Supervisor		
Invoice Other Agencies		
Payments Deposited		
Move computer directory to project's scanned files directory		
E-Mail - Project Account Closed		
Inspectors		
Files Scanned		
Store The Original Files		

SURVEY REQUEST / CHECKLIST

Date:_____ Information Supplied By:_____

Project Title: _____Project No.:_____

Project Description:_____

Estimated time for survey:_____ Survey information needed by:_____

Property Owners Contacted, When? _____ By: _____

FIELD REQUIREMENTS

Horizontal Datum (State Plane or Arbitrary): _____

Vertical Datum (NAVD88, City, Arbitrary): _____

No.	Task	Yes	No	Remarks
1.	Cross sections at _____ centers			
2.	Extend sections _____ Lt. and Rt. from survey baseline.			
3.	Locate all structures (Bldgs., Foundations.)			
4. 4a.	Utilities (pedestals, valves, manholes, fire hydrants, poles, anchors or markers). Call One-Call"_____ for utility locates.			
5.	Locate all trees _____" in diameter or larger.			
6.	Locate all fences (note type), signs, poles, mail boxes.			
7.	Measure all driveways (note type).			
8.	Measure existing pavement (note type).			
9.	Extend topography and elevations _____ past end of project.			
10.	Profile all driveways.			
11.	Profile crossroads _____ Lt. or Rt. from baseline.			

No.	Task	Yes	No	Remarks
12.	Cross section crossroads at _____ centers			
13.	Locate property corners.			
14.	Reset property corners at Project completion.			
15.	Reference survey baseline			
16.	Measure rod down on all inlets and manholes			
17.	Measure storm and sanitary pipes (Note type).			
18.	Shoot flowlines and tie down stream bed horizontally and vertically _____ Lt. and Rt. of baseline			
19. 19a. 	Use Section Line as Baseline File Section Corner References			
20.	Use centerline of proposed improvements as baseline			
21.	Centerline shots at _____ interval			
22.	Point plot or contour plot			
23.	Who is plotting? A) Surveyors B) Designers			
24.	Who is responsible for base sheets, including property line layout? A) Surveyors B) Designers			
25.	Administration of survey? A) Surveyors B) Designers			
26.	Survey crew shall discuss project with Project Manager prior to field work?			

Special Comments:

Sample Scope of Services for Design Engineer

Scope of project: This project includes design, plans, and specifications to be used for construction of _____Road as a _____
_____.

The Consulting Engineer shall furnish and perform the various professional duties and services required for the construction of the Project in accordance with all tasks listed in the current City Ordinances.

General Design Requirements
All plan development stages shall be completed no later than the current project schedule's due dates as issued by *(KDOT/MDOT),* exclusive of delays beyond the consultant's control. The consultant shall submit to the City (and to the *(KDOT/MDOT),* Secretary of Transportation upon request) progress reports at monthly or at mutually agreed intervals in conformity with the official project schedule.

The consultant shall design the Project in conformity with the state and federal design criteria appropriate for the Project in accordance with the current *(KDOT/MDOT),* Design Manual, Geotechnical Bridge Foundation Investigation Guidelines, Bureau of Design's road memorandums, the current version of the Manual on Uniform Traffic Control Devices (MUTCD) as adopted by the Secretary, the City's Ordnances, and the current version of the Standard Specifications for State Road and Bridge Construction with Special Provisions, and with any necessary Project Special Provisions with the rules and regulations of the Federal Highway Administration pertaining thereto.

The Design plans shall be signed and sealed by the licensed professional engineer responsible for the preparation of the design plans. Geological investigations or studies shall be signed and sealed by the licensed Geologist responsible for the preparation of the geological investigations or studies. Rights of way descriptions shall be signed and sealed by the licensed land surveyor responsible for the preparation of the rights of way descriptions.

General Survey Requirements:

Vertical Control:
Elevations for plans must be obtained from a benchmark on the _____ Vertical Control Network. Show the datum benchmark and elevation of the datum benchmark on the plans.

Horizontal Control:
Section Corner and quarter section corner locations must be referenced to the _____ Horizontal Control Network. As part of the design survey all Section Corners and Quarter Section Corners within the project area and others used for project control must be located, reference and state plane coordinates determined with GPS equipment. The coordinates and referenced ties shall be shown on the plans and the standard corner reference reports shall be submitted to all agencies in a timely manner as . If a _____ Horizontal Control marker may be damaged by construction the project engineer shall notified and arrangements made for relocating the monument prior to the bid letting.

Plan Notes - Johnson County Control Bench Marks:

Any benchmarks, horizontalcControl monuments and any Section Corner and Quarter Section Corners within the area surveyed for the project must be conspicuously indicated on the plans. All bench marks and section and quarter section corners and property pins within the construction limits shall include a note for the re-establishment of the monuments.

Task I. Preliminary Design

1.01. Data Collection

A. Attend pre-design meeting.

B. Develop design criteria for the project; prepare design memorandum.

C. Develop detailed design schedule in a form compatible with MS Project 4.0 or later. Submit copy to City, and provide digital updates at scheduled progress meetings. Include at least the following benchmarks:

1. Survey complete.
2. Data collection complete.
3. Preliminary plans complete.
4. Preliminary plans to all utilities.
5. Field check complete.
6. Legal descriptions to City.
7. First neighborhood meeting.
8. All other agency permit applications submitted.
9. Final plans submitted for review.
10. Project ready for bid.

D. Schedule and coordinate project activities with KDOT/MoDot and the City (where applicable).

E. Field data collection**:**

1. Establish land corners.
2. Field surveys.
3. Contact utilities and field locate all utilities.
4. Low opening elevation of all existing structures.
5. Stream crossing elevation data, including historical high-water elevations where applicable.
6. Contact homes associations property owners, field locate all irrigation systems.
7. Field locate all septic systems and lateral fields.
8. Stake centerline every 100 feet

F. Ownership and abutting property information:

1. Secure plats
2. Obtain ownership information. The Consulting Engineer shall contract with a City approved title company for ownership information investigations. The costs

associated with ownership information investigations shall be paid by the Consulting Engineer to the title company. This cost shall be included in the total compensation fee as outlined in Section II of the Engineering/Architectural Services Agreement.

3. Collect record drawings on abutting projects and subdivisions

G. The Consulting Engineer shall contract with a City approved geotechnical firm for sub-surface investigations and foundation recommendations. The costs associated with the work, including field staking boring locations and elevations, shall be paid by the Consulting Engineer to the geotechnical firm. This cost shall be included in the total compensation fee as outlined in Section II of the Engineering/Architectural Services Agreement.

H. Obtain from the City current daily traffic volumes and peak period traffic counts.

I. With the City, determine the required lane configurations and traffic control along the project. Analyze the existing geometrics along the project and determine traffic control and/or geometric improvement recommendations as might be warranted.

J. Analyze the storm drainage needs along the project.

1. Determine watershed areas for all streams and basins draining onto the proposed roadway.
2. Determine ultimate development land uses for all watershed and sub-basin areas draining onto project.
3. Determine ultimate development 5-year., 25-year, and 100-year stormwater flows crossing or entering the proposed roadway.
4. Locate all storm drainage system discharges upstream from the project.

K. Prepare an analysis of the construction phasing and traffic control needs to maintain acceptable access to the existing land uses along the project corridor.

1.02. Prepare base map showing both contours and property lines.

A. Develop preliminary plans:

1. Cover sheet.
2. Typical sections.
3. Pavement design
4. Subsurface drainage design
5. Surface drainage design
   a. Drainage area maps.
   b. Pavement spread calculations.
   c. Inlet and other structure design calculations.
   d. Hydraulic grade calculations.
6. Plan and Profile sheets
   a. Plan scale: 1"=_____

b. Profile scale: 1"=_____

7. Length of tapers and storage lanes for turn lanes.
8. Bridge plans
    a. Contour Map
    b. Construction Layout
    c. Typical section.
    d. Foundation types and locations.
    e. Geology sheet with calculated scour shown.
    f. Design loading.
    g. Prepare a "Hydraulic Assessment Checklist for Drainage Design," KDOT/MoDot Bridge Manual. This document and the supporting calculations shall be sealed by a licensed Professional Engineer.
    h. Channel protection.
9. Driveway profiles
10. Preliminary traffic control for construction plan sheets.
11. Preliminary street lighting.
    a. Pole locations.
    b. Define design parameters.

a. Preliminary traffic signals
    a. Location 1:
    b. Location 2:
    c. Location 3:

9. Preliminary pavement marking and signing.
10. Property lines and owner information.
11. Cross sections every 50 ft
12. Preliminary retaining wall elevation views as required.

1.03 Submit preliminary plans to the city and KDOT/MoDOT at a design concept development meeting (where applicable).

1.04 Submit preliminary plans to utility companies for their use in preparing for relocations.

1.05 Develop preliminary opinion of probable project costs itemized by unit of work, including right-of-way and contingency.

1.06 Submit preliminary plans and opinion of probable cost to city for review.

1.07 Meet with city not less than bi-weekly as necessary in connection with such preliminary work.

1.08 Field check to be performed with representatives of the consulting engineer and the cities at the project site with appropriate detailed plans.

1.09 Right-of-way and easements.

A. Describe right-of-way and easements necessary to complete project.

1. Furnish legal descriptions sealed by a land surveyor licensed in the state. Legal descriptions are also to be provided in a digital format compatible with Microsoft Word.
2. Furnish necessary title information.
3. Maps and sketches as follows:
    a. Plan and profile pages showing all proposed takings.
    b. Individual drawings of takings for each ownership including:
        1) Title block.
        2) Ownership boundaries.
        3) Existing rights-of-ways and easements.
        4) Proposed takings identified with text and graphically.
        5) Legend for taking type.
        6) Graphical scale and north arrow.
        7) Ownership information.
        8) Legal description of all takings.

B. The Consulting Engineer shall stake in the field the location of rights-of-way and/or easements prior to acquisition and construction as requested by the City, and shall meet with appraisers to identify easement and right-of-way locations.

1.10 Public Information:

A. Prepare for and attend four neighborhood meetings to explain the project to residents of the project area, and to receive public comments at a time and place arranged for by the City.

1. Prepare exhibits, including preliminary plans (showing right-of-way taking and easements).
2. Have persons available to explain the proposed work and to answer questions.

B. The Consulting Engineer will be available to meet with City staff and concerned property owners as directed by the City to discuss the project at any time throughout the project.

1.11 Permitting.

A. Prepare the necessary plans and applications for permit submission to and approval of:

1. Adjoining City.
2. County.

3. State including but not limited to:
    a. Division of Water Resources/ MDNR.
    b. KDOT/MoDot
4. Federal including but not limited to.
    a. US Army Corps of Engineers 404
    b. NPDES.
    c. Section 4(f) Evaluations.
    d. FEMA Map Revisions

1.12. Environmental Analysis

A. Prepare the necessary plans and applications for submission and approval of:
    1. Environmental Assessment
    2. Environmental Impact Statement
    3. Wetlands Analysis

Task II. **<u>Final Design</u>**

2.01 Prepare detailed plans and specifications.

A. Cover sheet.
B. Typical sections.
C. Pavement design
D. Subsurface drainage design
E. Surface drainage design
    1. Drainage area maps.
    2. Pavement spread calculations.
    3. Inlet and other structure design calculations.
F. Plan and Profile sheets
    1. Plan scale: 1"=_____
    2. Profile scale: 1"=_____
G. Length of tapers and storage lengths for turn lanes
H. Bridge sheets.
    1. General Notes and Quantities
    2. Contour Map
    3. Construction Layout
    4. Geology Sheet
    5. Abutment Details

6. Abutment Drainage Details
7. Pier Details
8. Superstructure Details

I. Intersection details.

J. Driveway profiles.

K. Street lighting.

1. Pole locations.
2. Design parameters.
3. Circuit information with includes control center locations.

L. Traffic signals.

Location 1:

Location 2:

Location 3:

M. Pavement marking and signing.

N. Existing and proposed right-of-way limits.

O. Property lines and owner information.

P. Cross sections every 50 ft.

Q. Retaining wall elevation views as required.

R. Traffic control plan and construction phasing including detour routing for each phase of the project.

S. Irrigation (lawn sprinkler) restoration plans.

1. Develop plan sheets and specifications showing final irrigation plans.
2. Identify plant materials which will require interim (during construction) irrigation.
3. Develop details and specifications for interim irrigation.

T. Landscape replacement schedule and subdivision marker replacement details.

U. Location of existing utilities and underground facilities.

V. Erosion control plans meeting all KDOT/MoDOT and NPDES requirements.

W. Sanitary sewer relocation plans.

X. Septic system reconstruction plans and sanitary sewer connection plans.

2.02 Schedule and attend utility coordination meetings as required.

2.03 Prepare a detailed opinion of probable cost.

A. Include an appropriate contingency.

B. Estimate time required to complete construction.

C. Provide input to the City regarding forms for:

1. Proposals
2. Construction contracts.
3. Bonds.

2.04 At the completion of the project, furnish to the City the CAD drawings of the project in the Consulting Engineer's digital format and TIFF images in compressed CCITT, group 4 at 200 dpi format for the City's future use. The record contract documents for the project will be the original sealed drawings.

2.05 Furnish ____ copies of detailed plans and specifications.

A. Plan sets will be prepared in:

1. Full size (22" x 34")
2. Half size (11"x 17")

B. These plans are to be furnished at no additional cost, and are separate from those sold to prospective bidders.

2.06 Meet with City not less than bi-weekly as necessary during preparation of detailed plans.

Task III. <u>Bidding</u>

3.01 Prepare and provide plans and specifications to bidders at cost to recover expenses of duplication and handling.

3.02 Attend bid letting.

3.03 Consult with and advise the City as to the acceptability of substitute materials and equipment when substitution prior to the award of the contract is allowed in the bidding documents.

3.04 Consult with and advise the City as to the acceptability of subcontractors and others proposed to do work by the general contractor.

3.05 Prepare written addenda to the bidding documents as required and or requested.

3.06 Assist the City in analyzing bids and making recommendation for award of the construction contract.

3.07 Prepare a bid tabulation in printed and MS Excel format.

3.08 Arrange for, attend, and prepare meeting minutes for a pre-bid conference.

3.09 Arrange for, attend, and prepare meeting minutes for a pre-construction conference with City representatives, the successful bidder, and utility companies.

Task IV. <u>Construction Services</u>

4.01 Be available for discussion and consultation during the construction phase, but construction observation will be the responsibility of the City.

4.02 Review shop drawings and be available for consultation with the City during construction.

4.03 Prepare plan revisions as necessitated by conditions encountered in the field during construction, with the exception of traffic control plans.

4.04 Prepare bridge database information.

A. Structure Inventory and Appraisal (SI & A) information as required by FHWA and KDOT/MoDOT.

B. Load rating calculations using the computer program _____.

C. Digital photographs of the upstream and downstream elevation of the structure, the upstream and downstream sections of the channel, both roadway approaches, and the superstructure elements from the underside of the bridge.

4.05 Prepare final record drawings which reflect:

A. All change orders.

B. Minor design changes.

C. Changes made in the field by City representatives and are marked on the construction plan set.

D. Submit updated CAD drawings and TIFF images of the revised sheets.

4.06 Attend weekly construction progress meetings as directed by the City.

Completion time: The Consulting Engineer hereby agrees to complete preliminary plans suitable for a public information meeting including easement and right-of-way descriptions and drawings (Task I) by _____*(Date)*_____ and to complete all work necessary to and including preparation of final plans (Task II) by _____(Date)_____.

Preconstruction Conference
TYPICAL AGENDA ITEMS

Introductions and Sign in Sheet
Status of Contract
Contract Administration Responsibilities
- Owner
- Project Engineer
- Resident Project Representative
- Contractor Superintendent

Notice to Proceed and Completion Date
Site Access, Easements, and Right of Way
Utilities Status
- Electric
- Telephone
- Water
- Sanitary Sewer
- Cable
- Gas
- Street Lighting
- Others

Construction Schedule
Project Signs
Construction Field Office
Special Postings
- "Notice to Employees" – wage rate determination
  (CDBG Projects)
- Davis-Bacon Act postings and follow up requirements
  (CDBG and Fed Funded projects)

Compliance Submittals
Construction Staking
Testing of Materials
Field Office
Safety
Preconstruction Photographs and Documentation
Construction Records
Pay Requests (Due Dates and Processing Schedule)
Change Orders
Plan Quantity versus Field Measured Quantities
Sales Tax Exemption
Local Concerns
- (i.e. postal service, parking, school bus route, trash pickup)

CITY NAME & DEPARTMENT **Consultant Performance Evaluation Form**

GENERAL INFORMATION

Prime Consultant ❑ Subconsultant ❑ Project No._____

Type: ❑ Interim Indicate Milestone: _____ _____

❑ Final

Consultant: _____

Project Description: _____

_____

_____

_____

_____

Consultant's Project Manager/Engineer: _____

Other Key Personnel: _____

Duration of Contract: From: _____/_____/_____ To: _____/ _____/_____

Type of Work:

❑ Roads, Streets & Hwys.	❑ Traffic Engineering/ Signals	❑ Parks, Recreation & Landscaping
❑ Architecture	❑ Structures & Bridges	❑ Sanitary Sewer Systems
❑ Airports	❑ Water Systems	❑ Drainage & Storm Sewer Systems
❑ Public Involvement	❑ Other: _____	

SUMMARY:

Overall Evaluation:

Excellent	Good	Satisfactory	Substandard	Unacceptable
❑	❑	❑	❑	❑

Would you recommend continuing selection of the firm for this type of project? **No** ❑ **Yes** ❑

Comments: (use separate sheet, if needed) _____

_____

_____

Evaluated by: _____ Date: _____

PROJECT MANAGEMENT

Understanding of the city's project objectives, including budgets and schedules:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Initiative in identifying important design issues and developing alternative solutions:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Timeliness with which work was accomplished and met established schedules:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Communication of project status and schedule with the city:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Coordination exhibited by the Consultant communicating with the City, subconsultants, agencies, utilities, and others to accomplish tasks and resolve problems:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Cooperation and responsiveness in dealing with residents, land owners, and the general public:

❑ Exceeds ❑ Meets ❑ Needs Improvement

DESIGN PHASE

Knowledge of city standards, codes, policies, and procedures:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Quality and adequacy of surveys and field investigations:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Quality and completeness of computations, calculations, and schedules:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Consistency among various plan sections (e.g., plan view and details, etc.)

❑ Exceeds ❑ Meets ❑ Needs Improvement

Quality, clarity, and organization of plans:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Quality and adequacy of specifications, special provisions, and other documents.

❑ Exceeds ❑ Meets ❑ Needs Improvement

Overall quality and adequacy of contract documents:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Timeliness and completeness of permits and permit information:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Adequacy of quality control procedures, as evidenced by extent of corrections and resubmittals:

❑ Exceeds ❑ Meets ❑ Needs Improvement

CONSTRUCTION PHASE

Timeliness and quality of processing submittals:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Timeliness of answers to design questions:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Constructability of the project:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Impacts of design-related changes during construction:

❑ Severe ❑ Average ❑ Minimal

Quality and responsiveness of construction observation services, if provided:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Adequacy of final project close-out documentation, if provided:

❑ Exceeds ❑ Meets ❑ Needs Improvement

Evaluator's Comments:

Engineering Progress Report

Report No _____

Date _____

Project _____

County _____

Month Ending _____

Job No _____

Item	% Complete		% of Project	% of Project Complete	Date Due	Remarks
	Last Report	This Report				
Task I. Data collection				0.%		
Task 2. Conceptual Design				0.0%		
Task 3. Roadway Design				0.0%		
Task 4. Drainage Design				0.0%		
Task 5. Geotechnical Engineering				0.0%		
Task 6. Public Involvement				0.0%		
Task 7. Project Administration				0.0%		
Task 8. Subconsultant:						
Project Total			0.0%	0.0%		

Submitted by: _____
Project Manager

Representing: _____

_____

Work this Period: _____

Anticipated Work Next Period: _____

Issues Pending: _____

UTILITY LOCATION REPORT

The purpose of this report is to provide a better understanding of the existing utilities located within the project limits. As part of our standard plan development procedures and required by law, our office has contacted or will be contacting the state One-Call Program for utility locates.

Attached is a drawing that provides a general location of the project. Please return a copy of this form and any information noted below to this office as soon as possible. Thank you for your cooperation and assistance. If you have any questions, please feel free to contact our project manager.

Project Manager	(insert name)			**Date**	
Office Address:					
Phone:		**Fax :**		**Email:**	
File No.:					
Project Name:					
Project Location:					
Project Description:	insert brief description of project (i.e reconstruction of what, from where, to where); 3 lins max.				
Utility Company Name:					
Type of Utility:					
Utility Size (diameter, voltage, etc) :					
Material Type (plastic, steel, fiber, etc) :					
Location of Utility (right-of-way or, easement; above or below ground) **:**					
Approximate Depth:					
Age of Utility:					
☐	**Note:** All proprietary information provided will remain confidential. Only utility location will be provided on the plans if requested. Please check the box to the left for confidentiality.				

General Questions

1. Does the Utility Company have an easement: _____ Yes _____ No
   (If yes, please submit a copy of the legal description).

2. Are Utility Plans available: _____ Yes _____ No
   (If yes, please submit a copy)

3. Are there any plans in progress for additional facilities
   Or other improvements within the project limits? _____ Yes _____ No

If yes to #3, please describe: _____

_____

_____

4. In addition to the present facilities, does the utility have any abandoned facilities that might be encountered on the project? _____ Yes _____ No

   If yes, please describe: _____

_____

5. Are there any encasements or clearance requirements? _____ Yes _____ No

   If yes, please describe: _____

_____

6. In the event that relocation of the line is necessary, please describe any seasonal or operational constraints that may impact the sequencing or construction of any utility relocation.

_____

_____

_____

_____

UTILITY CONTACT INFORMATION		
	During Design	**During Construction**
Name :		
Title :		
Mailing Address :		
Street Address: (if different for UPS delivery)		
Office Telephone :		
Fax :		
Mobile Phone (optional) **:**		
E-Mail :		
Emergency Contact/Locate Telephone No. to be shown on Plans		

Additional Remarks or Data : _____

Submitted By: _____ Date: _____

Title : _____